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MINERALS YEARBOOK

1955

Volume II of Three Volumes

FUELS

Prepared by the staff of the

BUREAU OF MINES

DIVISION OF PETROLEUM
DIVISION OF BITUMINOUS COAL
DIVISION OF ANTHRACITE

UNITED STATES DEPARTMENT OF THE INTERIOR

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FOREWORD

MINERALS YEARBOOK, 1955, published in three volumes, provides a record of performance of the Nation's mineral industries during the year, with enough background information to interpret the year's developments.

Volume I includes chapters on metal and nonmetal mineral commodities, with the exception of the mineral fuels. Included also are a chapter reviewing these mineral industries, a statistical summary, and chapters on mining technology, metallurgical technology, and employment and injuries.

Volume II includes chapters on each mineral fuel, an employment and injuries presentation, and a mineral-fuels review chapter that summarizes developments in the fuel industries and incorporates all data previously published in the Statistical Summary chapter. Also now included in this review chapter are data on energy production and uses that have previously been included in the Bituminous-Coal chapter.

Volume III is comprised of chapters covering each of the 48 States, plus chapters on the Territory of Hawaii and island possessions in the Pacific Ocean, and the Commonwealth of Puerto Rico and island possessions in the Caribbean Sea, including the Canal Zone. Volume III also has a Statistical Summary chapter, identical with that in volume I, and another presenting employment and injury data.

The data in the Minerals Yearbook are based largely upon information supplied by mineral producers, processors, and users, and acknowledgment is made of this indispensable cooperation given by industry. Information obtained from individuals by means of confidential surveys has been grouped to provide statistical aggregates. Data on individual producers are presented only if available from published or other nonconfidential sources, or when permission of the individuals concerned has been granted.

MARLING J. ANKENY, *Director.*

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Because of the many sources of data presented, it is impossible to give credit to each source individually, but acknowledgment is here made of the ready and willing cooperation of producers and users of fuels who supplied data and of the business press, trade associations, scientific journals, international organizations, and State and Federal agencies. The United States Department of Commerce, Bureau of the Census, furnished data on foreign trade, and the Department of State, United States Foreign Service provided information on foreign production and developments.

The mining and geology and related departments of the respective States and Alaska have been most cooperative and have made available supplementary and verifying information with respect to production and plant operations. For their assistance the Bureau is deeply grateful, and acknowledgment is made to the following State organizations that assisted with the canvasses of bituminous coal and lignite:

Alabama: Division of Safety and Inspection, Birmingham.
Alaska: Territorial Department of Mines, Juneau.
Arizona: State mine inspector, Phoenix.
Arkansas: State mine inspector, Fort Smith.
Colorado: Colorado Coal Mine Inspection Department, Denver.
Georgia: Department of Mines, Mining, and Geology, State Division of Conservation, Atlanta.
Illinois: State Department of Mines and Minerals, Springfield.
Indiana: Bureau of Mines and Mining, Terre Haute.
Iowa: State mine inspectors, Des Moines.
Kansas: State Mine Inspection Division, Pittsburg.
Kentucky: Kentucky Department of Mines and Minerals, Lexington.
Maryland: Maryland Bureau of Mines, Westernport.
Missouri: Division of Mine Inspection, Jefferson City.
New Mexico: State inspector of mines, Albuquerque.

North Dakota: State coal-mine inspector, Bismarck.
Ohio: Division of Mines and Mining, Ohio Department of Industrial Relations, Columbus.
Oklahoma: Chief mine inspector, Oklahoma City.
Pennsylvania: Pennsylvania Department of Mines, Harrisburg.
Tennessee: Tennessee Division of Mines, Knoxville.
Utah: Safety Division, Industrial Commission of Utah, Salt Lake City.
Virginia: Division of Mines, Virginia Department of Labor and Industry, Big Stone Gap.
Washington: Chief coal-mine inspector, Department of Labor and Industries, Seattle.
West Virginia: West Virginia Department of Mines, Charleston.
Wyoming: State coal-mine inspector, Rock Springs.

Appreciation is also expressed to the Commonwealth of Pennsylvania Department of Mines, Harrisburg, and Commonwealth of Massachusetts, Division on Necessaries of Life, Boston, for assistance in acquiring data on anthracite and to the following for their assistance with the peat canvass:

Michigan: Department of Conservation, Lansing.
New Jersey: Department of Conservation and Economic Development, Bureau of Geology and Topography, Trenton.
Washington: Department of Conservation and Development, Olympia.

Credit is also due the following State organizations that assisted with the petroleum and natural-gas canvasses:

Arkansas: Arkansas Oil and Gas Commission, El Dorado.
California: California Department of Natural Resources, San Francisco. Public Utilities Commission, State of California, San Francisco.
Illinois: Oil and Gas Division, and State Geological Survey Division, Urbana.
Kansas: State Geological Survey, Lawrence.
Maryland: Department of Geology, Mines and Water Resources, Baltimore.
Michigan: Geological Survey Division, Department of Conservation, Lansing.
Missouri: Division of Geological Survey and Water Resources, Department of Business and Administration, Rolla.
New York: New York State Science Service, Albany.
North Dakota: North Dakota Geological Survey, Grand Forks.
Ohio: Oil and Gas Section, Department of Natural Resources, Columbus.
Tennessee: Division of Geology, Department of Conservation, Nashville.
Virginia: Geological Survey Division, Department of Conservation and Development, Charlottesville.
West Virginia: Geological and Economic Survey, Morgantown.

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PART I. GENERAL REVIEWS

Review of the Mineral-Fuel Industries in 1955

By T. W. Hunter, D. S. Colby, and J. A. Corgan

GENERAL SUMMARY

AS INDICATED by table 1 and figure 1, the total production of energy in the United States in 1955 increased 8.7 percent over 1954. The output of bituminous coal and lignite, crude petroleum, and natural gas increased from the previous year, while the output of Pennsylvania anthracite decreased. The total energy production in 1955 (38,431 trillion B. t. u.) was the highest in history and exceeded the previous high (1951) by 1.5 percent.

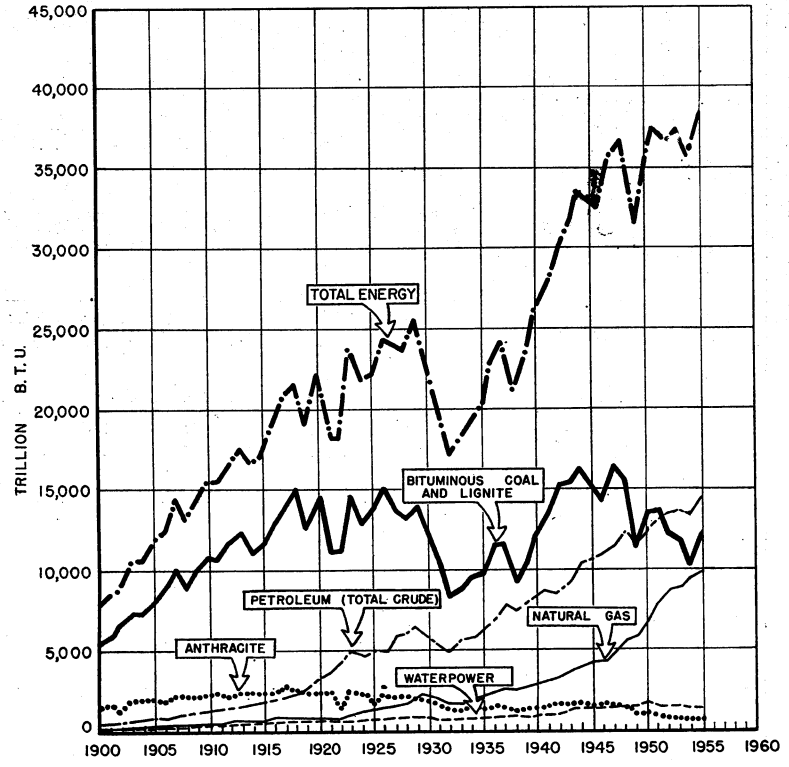

FIGURE 1.—Production of mineral energy fuels and energy from waterpower in continental United States, 1900–55.

TABLE 1.—Production of mineral-energy fuels and energy from waterpower in trillion British thermal units and percentage contributed by each in continental United States [1]

Year	Bituminous coal and lignite			Anthracite	Crude petroleum	Natural gas wet	Water-power	Grand total	Percentage					
	Continental United States	Alaska	Total United States						Btumous coal and lignite	Anthra-cite	Crude petro-leum	Natural gas wet	Water-power	Total
1900	5,563		5,563	1,457	369	254	250	7,893	70.5	18.4	4.7	3.2	3.2	100.0
1901	5,917		5,917	1,714	402	283	264	8,580	68.9	20.0	4.7	3.3	3.1	100.0
1902	6,818		6,818	1,051	515	301	289	8,974	76.0	11.7	5.7	3.4	3.2	100.0
1903	7,408		7,408	1,895	583	319	321	10,526	70.4	18.0	5.5	3.0	3.1	100.0
1904	7,301		7,301	1,858	679	333	354	10,525	69.4	17.6	6.4	3.2	3.4	100.0
1905	8,255		8,255	1,973	781	377	386	11,772	70.1	16.8	6.6	3.2	3.3	100.0
1906	8,983		8,983	1,811	734	418	414	12,360	72.7	14.7	5.9	3.4	3.3	100.0
1907	10,343		10,343	2,174	963	437	441	14,358	72.0	15.1	6.7	3.1	3.1	100.0
1908	8,713		8,713	2,115	1,035	432	476	12,771	68.2	16.6	8.1	3.4	3.7	100.0
1909	9,949		9,949	2,059	1,062	517	513	14,100	70.6	14.6	7.5	3.7	3.6	100.0
1910	10,928		10,928	2,146	1,215	547	539	15,375	71.1	14.0	7.9	3.5	3.5	100.0
1911	10,635		10,635	2,298	1,279	551	565	15,328	69.4	15.0	8.3	3.6	3.7	100.0
1912	11,793		11,793	2,143	1,293	604	585	16,418	71.8	13.0	7.9	3.7	3.6	100.0
1913	12,535		12,535	2,325	1,441	626	609	17,536	71.5	13.2	8.2	3.6	3.5	100.0
1914	11,075		11,075	2,307	1,541	636	636	16,195	68.4	14.3	9.5	3.9	3.9	100.0
1915	11,597		11,597	2,260	1,630	676	659	16,822	69.0	13.4	9.7	4.0	3.9	100.0
1916	13,166		13,166	2,224	1,744	810	681	18,625	70.7	11.9	9.4	4.3	3.7	100.0
1917	14,456	1	14,457	2,530	1,945	855	700	20,487	70.6	12.3	9.5	4.2	3.4	100.0
1918	15,178	2	15,180	2,510	2,064	775	701	21,230	71.5	11.8	9.7	3.7	3.3	100.0
1919	12,204	2	12,206	2,238	2,195	802	718	18,159	67.2	12.3	12.1	4.4	4.0	100.0
1920	14,897	2	14,899	2,276	2,569	883	738	21,365	69.7	10.7	12.0	4.1	3.5	100.0
1921	10,895	2	10,897	2,298	2,739	732	620	17,286	63.0	13.3	15.9	4.2	3.6	100.0
1922	11,061	2	11,063	1,389	3,234	843	643	17,172	64.5	8.1	18.8	4.9	3.7	100.0
1923	14,788	4	14,792	2,371	4,248	1,113	685	23,209	63.7	10.2	18.3	4.8	3.0	100.0
1924	12,670	2	12,672	2,233	4,141	1,263	648	20,957	60.5	10.6	19.8	6.0	3.1	100.0
1925	13,623	2	13,625	1,570	4,430	1,314	668	21,607	63.1	7.2	20.5	6.1	3.1	100.0
1926	15,019	1	15,020	2,145	4,471	1,452	728	23,816	63.1	9.0	18.8	6.1	3.0	100.0
1927	13,563	2	13,565	2,034	5,227	1,598	776	23,200	58.5	8.8	22.5	6.9	3.3	100.0
1928	13,116	4	13,120	1,914	5,229	1,734	854	22,851	57.4	8.4	22.9	7.6	3.7	100.0
1929	14,014	3	14,017	1,875	5,842	2,118	816	24,668	56.8	7.6	23.7	8.6	3.3	100.0
1930	12,246	3	12,249	1,762	5,208	2,148	752	22,119	55.4	8.0	23.5	9.7	3.4	100.0
1931	10,008	3	10,011	1,515	4,936	1,869	668	18,999	52.7	8.0	26.0	9.8	3.5	100.0
1932	8,112	2	8,114	1,266	4,554	1,729	713	16,376	49.5	7.7	27.8	10.6	4.4	100.0
1933	8,739	2	8,741	1,258	5,253	1,733	711	17,696	49.4	7.1	29.7	9.8	4.0	100.0
1934	9,413	2	9,415	1,452	5,267	1,970	698	18,802	50.1	7.7	28.0	10.5	3.7	100.0
1935	9,753	3	9,756	1,325	5,780	2,136	806	19,803	49.2	6.7	29.2	10.8	4.1	100.0
1936	11,501	3	11,504	1,386	6,378	2,411	812	22,491	51.2	6.1	28.4	10.7	3.6	100.0
1937	11,669	4	11,673	1,317	7,419	2,684	871	23,964	48.7	5.5	31.0	11.2	3.6	100.0
1938	9,128	4	9,132	1,171	7,043	2,565	866	20,777	44.0	5.6	33.9	12.3	4.2	100.0

1939	10,341	4	10,345	1,308	7,337	2,763	838	22,591	45.8	5.8	32.5	12.2	3.7	100.0
1940	12,068	4	12,072	1,308	7,849	2,979	880	25,088	48.1	5.2	31.3	11.9	3.5	110.0
1941	13,464	7	13,471	1,432	8,133	3,162	934	27,132	49.6	5.3	30.0	11.7	3.4	100.0
1942	15,260	7	15,267	1,532	8,043	3,436	1,136	29,414	51.9	5.2	27.3	11.7	3.9	100.0
1943	15,455	8	15,463	1,540	8,733	3,839	1,304	30,879	50.1	5.0	28.3	12.4	4.2	100.0
1944	16,224	9	16,233	1,618	9,732	4,176	1,344	33,103	49.0	4.9	29.4	12.6	4.1	100.0
1945	15,126	8	15,134	1,395	9,939	4,423	1,442	32,333	46.8	4.3	30.7	13.7	4.5	100.0
1946	13,979	10	13,989	1,537	10,057	4,550	1,406	31,539	44.3	4.9	31.9	14.4	4.5	100.0
1947	16,513	9	16,522	1,453	10,771	5,012	1,426	35,184	47.0	4.1	30.6	14.2	4.1	100.0
1948	15,697	10	15,707	1,451	11,717	5,615	1,481	35,971	43.7	4.0	32.6	15.6	4.1	100.0
1949	11,461	11	11,472	1,085	10,683	5,911	1,539	30,690	37.4	3.5	34.8	19.3	5.0	100.0
1950	13,517	10	13,527	1,120	11,449	6,841	1,573	34,510	39.2	3.2	33.2	19.8	4.6	100.0
1951	13,969	13	13,982	1,084	13,037	8,106	1,559	37,768	37.0	2.9	34.5	21.5	4.1	100.0
1952	12,213	18	12,231	1,031	13,282	8,705	1,581	36,830	33.2	2.8	36.1	23.6	4.3	100.0
1953	11,958	23	11,981	786	13,671	9,116	1,522	37,076	32.3	2.1	36.9	24.6	4.1	100.0
1954	10,245	17	10,262	739	13,427	9,488	1,449	35,365	29.0	2.1	38.0	26.8	4.1	100.0
1955	12,157	17	12,174	665	14,410	9,735	1,447	38,431	31.7	1.7	37.5	25.3	3.8	100.0

[1] The unit heat values employed are: Anthracite, 12,700 B. t. u. per pound; bituminous coal and lignite, 13,100 B. t. u. per pound; petroleum, 5,800,000 B. t. u. per barrel; natural gas, total production x 1,075 B. t. u. minus repressuring vent and waste gas x 1,035. Waterpower includes installations owned by manufacturing plants and mines, as well as Government and privately owned public utilities. The fuel equivalent of waterpower is calculated from the kilowatt-hours of power produced wherever available, as it is true of all public-utility plants since 1919. Otherwise, the fuel equivalent is calculated from the reported horsepower of installed water wheels, assuming a capacity factor of 20 percent for factories and mines and 40 percent for public utilities.

TABLE 2.—Calculated consumption of energy fuels and energy from waterpower in continental United States [1]

Year	Bituminous coal and lignite [2]	Anthracite [2]	Crude petroleum [3]	Petroleum products net: E, exported; I, imported [3]	Natural gas dry [4 5]	Natural gas liquids [6]	Electricity from waterpower [7]		
							Production	Net imports	Total
1920	508,595	85,786	521,876	E 67,634	799,248	385	18,779	940	19,719
1921	391,849	81,950	520,044	E 58,597	658,470	450	17,529	1,009	18,538
1922	426,915	56,799	584,547	E 54,874	758,839	506	19,634	965	20,599
1923	518,993	86,914	715,428	E 66,809	997,056	816	21,788	1,331	23,119
1924	484,004	80,717	728,908	E 82,099	1,129,970	934	22,484	1,290	23,774
1925	499,193	64,061	800,217	E 84,121	1,171,291	1,127	25,496	1,257	26,753
1926	532,581	77,221	840,697	E 95,605	1,289,916	1,359	29,249	1,493	30,742
1927	499,801	74,672	866,784	E112,452	1,415,218	1,628	32,548	1,619	34,167
1928	498,828	73,650	943,807	E124,209	1,534,219	1,819	37,683	1,573	39,256
1929	519,555	71,457	1,016,188	E106,942	1,875,968	2,236	37,524	1,423	38,947
1930	454,990	67,628	1,060,067	E 89,305	1,901,994	2,212	35,878	1,592	37,470
1931	371,869	58,408	914,484	E 60,022	1,657,427	1,820	33,548	1,209	34,757
1932	306,917	50,500	832,767	E 44,451	1,540,327	1,440	36,529	644	37,173
1933	317,685	49,600	886,617	E 54,071	1,546,318	1,307	37,175	967	38,142
1934	343,814	55,500	885,527	E 56,801	1,757,873	1,463	36,747	1,234	37,981
1935	356,326	51,100	999,804	E 53,947	1,906,781	1,539	42,727	1,337	44,064
1936	408,293	53,200	1,107,977	E 54,356	2,146,131	1,674	43,045	1,556	44,600
1937	430,777	50,400	1,207,651	E 72,404	2,384,988	1,887	46,173	1,827	48,001
1938	336,281	45,200	1,193,219	E 82,459	2,268,417	1,897	47,219	1,808	49,027
1939	376,098	49,700	1,263,305	E 86,776	2,453,614	2,012	46,355	1,894	48,249
1940	430,910	49,000	1,321,073	E 36,119	2,633,735	2,211	50,131	2,114	52,245
1941	492,115	52,700	1,438,533	E 27,699	2,754,344	3,399	53,207	2,331	55,538
1942	540,050	56,500	1,377,032	E 58,166	2,996,968	3,440	66,706	2,418	69,124
1943	593,797	57,100	1,472,063	E 58,227	3,363,580	3,552	79,078	2,497	81,575
1944	589,599	59,400	1,710,906	E124,848	3,647,663	4,171	78,905	2,515	81,420
1945	559,567	51,600	1,758,505	E 97,018	3,838,524	4,652	84,747	2,562	87,309
1946	500,386	53,900	1,770,652	E 55,005	3,950,483	4,662	83,150	2,391	85,541
1947	545,891	48,200	1,907,686	E 51,287	4,365,617	5,371	83,066	1,915	84,981
1948	519,909	50,200	2,083,569	E 30,942	4,862,437	5,909	86,992	1,543	88,535
1949	445,538	37,700	1,965,828	I 1,704	5,109,667	6,309	94,773	1,588	96,361
1950	454,202	39,900	2,121,358	I 58,933	5,942,429	7,511	100,885	1,786	102,671
1951	468,904	37,000	2,390,860	I 7,760	7,002,534	8,409	104,376	2,178	106,554
1952	418,757	35,300	2,456,586	I 11,619	7,497,966	9,235	109,708	2,269	111,977
1953	426,798	28,000	2,571,089	I 18,965	7,879,715	9,745	109,617	2,008	111,625
1954	[5] 363,060	26,900	2,556,928	I 33,283	8,264,319	10,111	111,640	2,340	113,980
1955	423,412	23,600	2,751,053	I 51,803	8,920,259	11,655	116,236	4,068	120,304

[1] Data on consumption calculated from production minus exports plus imports, which includes shipments to noncontiguous Territories, and change in stocks. Except for bituminous coal and lignite for 1933 to date, these data represent actual consumption including a small amount of coal consumed in noncontiguous Territories.
[2] Thousand net tons.
[3] Thousand barrels.
[4] Million cubic feet.
[5] Revised.
[6] Million gallons.
[7] Million kilowatt-hours; source—Federal Power Commission, except production for 1920–42. For these years the fuel equivalent of waterpower converted to kilowatt-hours at the prevailing rate of pounds of coal per kilowatt-hour at central electric stations.

This increase in energy production was consistent with the 8.4-percent rise in gross national product during the year—from 361.2 billion dollars in 1954 to 391.7 billion in 1955.

Figure 2 indicates the percentages contributed by the respective mineral fuels and waterpower to total energy supplies since 1900, and table 2 shows calculated consumption for each of the respective energy sources for the period—1920–55.

As indicated in table 3, the production of bituminous coal increased to the highest point since the 1952 output of 466.8 million tons. Production—464.6 million tons—was nearly 19 percent more than in the previous year but was 8.5 percent under the average of 507.5 million tons per year for the postwar period 1946–54. Anthracite production declined further, to the lowest output since 1878. Employment in the coal industry continued to decline and was the lowest since the turn of the century.

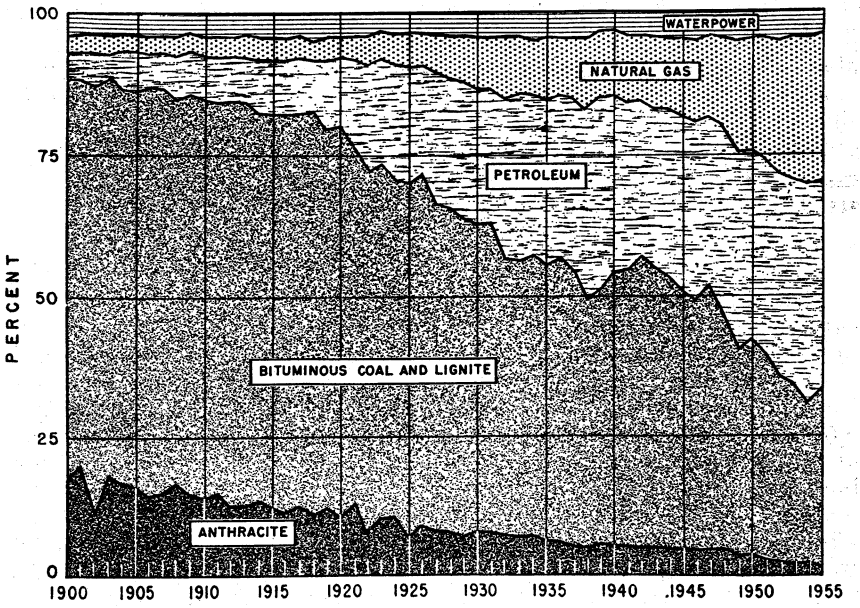

FIGURE 2.—Percentage of total production of British thermal units equivalent of mineral-energy fuels and energy from waterpower in continental United States, 1900–55.

TABLE 3.—Salient statistics of the fuel industries in the United States, 1954–55

	1954	1955	Change from 1954 (percent)
Production:			
Bituminous coal—million net tons	391.7	464.6	+18.6
Crude petroleum—million bbl	2,315.0	2,484.4	+ 7.3
Natural gas, marketed production—billion cubic feet	8,742.5	9,405.4	+ 7.6
Anthracite—million net tons	29.1	26.2	−10.0
Value of production:			
Bituminous coal, f. o. b. mines or plants—million dollars	1,769.6	2,092.4	+18.2
Crude petroleum, value of production at wells—do	6,424.9	6,870.7	+ 6.9
Natural gas, value at wells—do	882.5	978.4	+10.9
Anthracite, f. o. b. mines or plants—do	247.9	206.1	−16.9
Consumption (apparent):			
Bituminous coal—million net tons	363.1	423.4	+16.6
Crude petroleum, runs to stills—million bbl	2,539.6	2,730.2	+ 7.5
Natural gas—billion cubic feet	8,402.9	9,070.3	+ 7.9
Anthracite—million net tons	26.9	23.6	−12.3
Stocks, year end:			
Bituminous coal—million net tons	73.5	72.6	− 1.2
Crude petroleum—million bbl	258.4	265.6	+ 2.8
Natural gas—billion cubic ft [1]	1,280.6	1,368.3	+ 6.8
Anthracite—million net tons [2]	2.8	1.9	−32.1
Imports:			
Bituminous coal—million net tons [3]	.2	.3	+50.0
Crude petroleum—million bbl [4]	239.5	285.4	+19.2
Natural gas—billion cubic ft [4]	6.8	10.9	+60.3
Anthracite—thousand net tons [3]	5.8	.2	−96.6
Exports:			
Bituminous coal—do	31.0	51.3	+65.1
Crude petroleum—million bbl [3]	13.6	11.5	−15.4
Natural gas—billion cubic ft [4]	28.7	31.0	+8.0
Anthracite—million net tons [3]	2.9	3.2	+10.3
Employment:			
Bituminous coal (average number working daily), in thousand	227.4	225.1	− 1.0
Crude petroleum and natural gas production (annual average in thousand) [5]	303.8		
Anthracite (average number men working daily), in thousand	44.0	33.5	−23.9

[1] American Gas Association.
[2] Producers and estimated retail-dealer stocks only.
[3] Bureau of the Census, U. S. Department of Commerce.
[4] Bureau of Mines data.
[5] Bureau of Labor Statistics, U. S. Department of Labor.

Production of crude oil in 1955 more than recovered from the decline of 1954; in 1955 it was 7.3 percent above 1954 and 5.4 percent above 1953. The increased production came from the Southwest and Rocky Mountain areas, with the Appalachian States and California showing declines. Natural-gas production continued its long-term growth, with a 7.6-percent increase for the year. Drilling effort, as measured by the total number of completions, also increased substantially, with over 56,000 completions.

CONSUMPTION

Bituminous-coal consumption increased in 1955 in every consumer category except Class I railroads. Electric power utilities used 25.3 million tons more than in 1954. Consumption at coke plants and steel and rolling mills rose 22.3 million tons. Increases in other consumer categories follow: 12.9 million tons by "other industrials," 0.02 million tons in bunker fuel used in foreign trade, 0.6 million tons at cement mills, and 1.2 million tons in retail deliveries. These increases, which totaled 62.3 million tons, were partly offset by a decrease of 1.9 million tons in bituminous-coal consumption by Class I railroads. Exports of bituminous coal increased 20.2 million tons from 1954.

TABLE 4.—Consumption of bituminous coal and lignite in the United States, 1954–55, by major consumer groups

(Thousand net tons)

Year	Electric power utilities [1]	Class I railroads [2]	Coke plants	Steel and rolling mills	Cement mills	Other industrials	Retail deliveries	Bunker foreign trade [3]	Total
1954	115,235	17,370	85,391	4,944	8,124	78,953	52,616	427	363,060
1955	140,550	15,473	107,377	5,221	8,728	91,856	53,762	445	423,412

[1] Federal Power Commission.
[2] Association of American Railroads.
[3] Bureau of Census, U. S. Department of Commerce.

TABLE 5.—Sales of fuel oil and natural gas in the United States, 1954–55, by major consumer groups

(Fuel oils—thousand barrels; natural gas—million cubic feet)

	Railroads	Vessels	Gas and electric power-plants	Smelters, mines, and manufactures	Space heating and cooking	Military	Oil-company fuel	Miscellaneous	Total
Distillate fuel oil:									
1954	77,389	15,563	6,070	41,589	320,117	8,752	7,699	49,066	526,245
1955	84,668	16,675	5,884	43,606	357,088	10,914	8,597	54,163	581,595
Residual fuel oil:									
1954	16,122	108,790	70,749	160,121	78,845	26,887	52,165	7,035	520,714
1955	15,018	115,128	75,966	173,030	86,282	27,900	53,387	9,804	556,515
Natural gas:									
1954	-------	-------	[1] 1,165,498	3,903,449	2,479,205	-------	2,020,198	-------	8,402,852
1955	-------	-------	[1] 1,153,280	4,184,258	2,753,171	-------	2,132,914	-------	9,070,343

[1] Memo entry, not additive, includes gas other than natural. Natural-gas component included under "Smelters, mines, and manufactures."

The decline in anthracite consumption resulted from slackening in demand in the United States market, as exports to Canada remained relatively constant and overseas exports increased approximately 300,000 tons.

Increased industrial activity and the colder weather in 1955 affected the demand for petroleum products. Of the major products, only kerosine showed a decline, and only residual fuel oil did not exceed 1953. Domestic demand for gasoline, which had increased only 2.1 percent in 1954, increased 7.4 percent in 1955.

EMPLOYMENT AND WORKING TIME

The average number of employees working daily in the bituminous-coal- and anthracite-mining industries declined 1.0 and 23.9 percent respectively, in 1955. The average daily working force in the bituminous-coal and lignite industry totaled 225,093 men in 1955, compared with 227,397 in 1954. In the anthracite industry the decline was from 43,996 men to 33,523. Because of competitive pressures for continually advancing efficiency in coal production, it is significant that the net tons mined per man-day in the bituminous-coal and lignite industry was 9.84, compared with 9.47 in 1954, an increase of 3.9 percent. The output per man-year increased from 1,724 tons to 2,064—the highest in history.

In the anthracite industry the output per man-day decreased from 4.02 tons in 1954 to 3.96 in 1955. The output per man per year was 780 net tons in 1955, compared with 659 in 1954.

The total employment in the petroleum production and refining industry during 1955 was 513,400, about 1.2 percent more than in the preceding year. Of this total, 312,100 were engaged in the production division and 201,300 in refining.

The average weekly hours worked in 1955 in the bituminous-coal industry increased from 32.6 in 1954 to 37.6 in 1955. For the anthracite industry the average weekly hours worked in 1955 was 33.4. In 1955 the bituminous coal industry averaged 210 days of work, as against 182 days in 1954. In the anthracite industry the average number of days worked increased from 164 to 197.

As wages strongly influence total production costs in the fuel industries, wage increases granted by the respective branches of the fuel industries are significant. In 1955 hourly earnings in the bituminous-coal industry increased 3.2 percent from 1954. In the anthracite industry hourly earnings increased 0.8 percent. In petroleum and natural-gas production earnings increased 2.2 percent. Hourly earnings in the anthracite industry were $2.53, in the bituminous-coal industry $2.56, and in the petroleum and natural-gas industry $2.32. Weekly earnings in the bituminous-coal industry were highest of the three— $96.26—followed by petroleum and natural gas, with $95.94, and anthracite, with $84.50.

TABLE 6.—Hours worked and gross earnings of production workers in the fuel industries, 1951–55

[Bureau of Labor Statistics, U. S. Department of Labor]

	1951	1952	1953	1954	1955
Bituminous coal:					
Average weekly earnings	$77.79	$78.09	$85.31	$80.85	$96.26
Average weekly hours	35.2	34.1	34.4	32.6	37.6
Average hourly earnings	$2.21	$2.29	$2.48	$2.48	$2.56
Anthracite:					
Average weekly earnings	$66.66	$71.19	$72.91	$75.05	$84.50
Average weekly hours	30.3	31.5	29.4	29.9	33.4
Average hourly earnings	$2.20	$2.26	$2.48	$2.51	$2.53
Petroleum and natural gas production (except contract services):					
Average weekly earnings	$79.76	$85.90	$90.39	$91.94	$94.19
Average weekly hours	40.9	41.1	40.9	40.5	40.6
Average hourly earnings	$1.95	$2.09	$2.21	$2.27	$2.32

FUEL PRICES

The index of wholesale prices for all commodities increased from 110.3 in 1954 to 110.7 in 1955 (see table 7). The average value per ton, f. o. b. mines, for bituminous coal declined from $4.52 to $4.50 and for anthracite from $8.52 to $7.86. The average price per barrel at the well for crude petroleum dropped from $2.78 in 1954 to $2.77 in 1955.

For natural gas the 1955 average price at the well of 10.4 cents per thousand cubic feet was 0.3 cent higher than in 1954.

The index of wholesale prices of petroleum and petroleum products in 1955 was 112.7 percent of the 1947–49 base and 1.7 percent above 1954.

TABLE 7.—Average monthly wholesale price indexes for fuels, 1950–55

(1947–49=100)

[Bureau of Labor Statistics, U. S. Department of Labor]

	1950	1951	1952	1953	1954	1955
Gas	98.2	100.7	103.7	107.8	108.8	111.6
Petroleum and petroleum products	103.7	110.5	109.3	112.7	110.8	112.7
Coal	106.2	108.4	108.7	112.8	106.3	104.8
Average index for all commodities	103.1	114.8	111.6	110.1	110.3	110.7

Convenience and price are significant factors in competition among the various fuels. Another important factor that strongly influences utilization of fuels is transportation cost. Compared with the relatively low cost of pipeline transmission of oil and natural gas, 76.6 percent of all bituminous coal is shipped from the mines via railroads at rates in 1955 that added 72 percent to the coal cost, f. o. b. mines. The average railroad freight-rate charge per net ton on bituminous coal and lignite in 1955 was $3.24—an increase of 1 cent per ton from 1954.

Data on the wholesale prices of bituminous coal for 1954 and 1955 are not fully comparable (as indicated in table 8), because the Bureau of Labor Statistics, United States Department of Labor, changed its method of collecting these data beginning with May 1954.

TABLE 8.—Comparative fuel prices, 1954–55

Fuel	1954	1955
Bituminous coal:		
Average wholesale prices, dollars per net ton: [1]		
Large domestic sizes, f. o. b. car at mine, to retail dealers	[2] 6.74	6.83
Domestic stoker, f. o. b. car at mine, to retail dealers	[2] 6.17	6.24
Screenings for industrial use, f. o. b. car at mine, to industrial consumers	[2] 4.50	4.53
Metallurgical coal, f. o. b. car at mine, to coke manufacturers	[2] 5.68	5.62
Other average prices, dollars per net ton:		
Railroad fuel, f. o. b. mine [3]	4.60	4.65
Average retail price [1]	14.94	15.10
Cost of coal at merchant coke ovens	9.57	9.16
Anthracite, average sales realization per net ton on Pennsylvania anthracite from breakers to points outside region, dollars:		
Chestnut	12.01	11.36
Pea	9.18	8.12
Buckwheat No. 1	8.15	6.49
Petroleum and petroleum products:		
Crude petroleum, average price per barrel at well, dollars	2.78	2.77
Gasoline, average dealers' net price (excluding taxes) of gasoline in 50 U. S. cities, cents per gallon [4]	16.19	16.18
Residual fuel oil:		
No. 6 fuel oil, average of high and low prices in Philadelphia dollars per barrel (refinery) [5]	2.28	2.60
Bunker C, average price for all Gulf ports, do [5]	1.93	2.04
Distillate fuel oil:		
Average of high and low prices at Philadelphia:		
No. 2 distillate, cents per gallon (refinery) [5]	9.4	9.9
No. 2 distillate, average for all Gulf ports, do [5]	8.5	8.9
Natural gas:		
Average U. S. value, at well, cents per thousand cubic feet	10.1	10.4
Average U. S. value, at points of consumption, do	38.1	40.0
Average wholesale price index for all commodities [1]	110.3	110.7

[1] Bureau of Labor Statistics, U. S. Department of Labor.
[2] April through December only. Data not comparable for entire year.
[3] Interstate Commerce Commission.
[4] The Texas Co.
[5] Platt's Oil Price Handbook.

NATIONAL INCOME ORIGINATED, GROSS NATIONAL PRODUCT, WAGES, AND SALARIES

As compared to an 8.4-percent increase in national income originated during the year, income in the bituminous-coal and petroleum and natural-gas industries increased 10.8 and 7.5 percent, respectively, over 1954. In the anthracite industry income decreased 12.6 percent.

Although total United States wages and salaries increased 7.6 percent, wages and salaries in the bituminous-coal and petroleum and natural-gas industries rose 8.4 and 8.2 percent, respectively. In the anthracite industry there was a decrease of 15.5 percent.

TABLE 9.—National income originated and wages and salaries in the fuel industries, 1952–55

[U. S. Department of Commerce]

	Million dollars			
	1952	1953	1954	1955
National income originated:				
Bituminous- and other soft-coal mining	1,565	1,492	1,143	1,266
Anthracite	252	201	159	139
Crude petroleum and natural gas	2,278	2,404	2,164	2,327
Total	4,095	4,097	3,466	3,732
United States national income	290,177	302,129	298,955	324,068
Total as a percent of United States national income	1.41	1.36	1.16	1.15
Wages and salaries:				
Bituminous- and other soft-coal mining	1,256	1,206	916	993
Anthracite	224	183	142	120
Crude petroleum and natural gas	1,292	1,374	1,431	1,548
Total	2,772	2,763	2,489	2,661
Total United States wages and salaries	184,918	197,287	195,513	210,339
Total for the fuels industries as a percent of total United States wages and salaries	1.50	1.40	1.27	1.27

ENERGY FUELS IN INTERNATIONAL TRADE

In 1955 total United States coal exports (bituminous and anthracite) amounted to 54.4 million net tons compared with approximately 34 million tons in 1954—an increase of 60 percent. The sharp increase in United States coal exports is attributable to the rapid rise in the general industrial and economic growth in Western Europe and the inability of the European coal industry to meet growing energy demands.

Of the approximate 20.4 million net tons increase in United States exports in 1955, Western Europe received 18.4 million tons, and Canada took 1.3 million tons; most of the balance was shipped to Korea, South America, and Africa. A large portion of the increased movements to these latter countries resulted from declining coal supplies normally obtained from European sources.

Comparative statistics for 1954–55, showing distribution of United States coal exports by continents, in thousand net tons, are as follows:

	1954		1955	
	Bituminous	Anthracite	Bituminous	Anthracite
North America	16,020	2,517	17,286	2,499
South America	1,385	0	1,447	1
Europe	10,471	320	28,669	591
Asia	3,049	14	3,726	61
Africa	114	0	139	0
Undesignated	2	0	3	0
Total	31,041	2,851	51,270	3,152

SOURCE: Bureau of the Census, U. S. Department of Commerce.

The strong demand for United States coal in the Western European countries in 1955 has led to considerable speculation regarding the extent to which the United States will participate in this market in the years ahead. Observations and analyses based on reports and estimates for future energy requirements of Western Europe by fuel experts of international organizations, such as the Organization for Economic Cooperation, the United Nations Economic Commission for Europe, and the European Coal and Steel Community, indicate that, as long as no significant general economic or military disturbances occur, the United States will continue to be the principal external supplier of coal to European countries for many years.

Exports of petroleum products from the United States increased in 1955, primarily because of the efforts to reduce excessive stocks of residual fuel oil on the west coast. Exports of crude oil continued downward, as Canada again was able to supply a larger share of its needs.

Imports of crude oil increased 20 percent in 1955, with large increases in imports from Canada, Venezuela, and Kuwait. Venezuela also was the source of a large share of the increased residual imports, reflecting increased refining in that country.

In 1955 estimated inland consumption of primary energy in Western Europe totaled 730 million metric tons of standard coal equivalent, of which coal supplied 74.3 percent; crude oil, 17.2 percent; hydroelectric power, 7.8 percent; and natural gas, 0.7 percent. Although coal's share in the total energy requirements has declined steadily since 1948, when it composed 83.2 percent of the total, coal consumption actually increased 24 percent during the same period. This apparent paradox is explained by the fact that other sources of energy, particularly petroleum, have met an increasing share of the growing energy requirements—a trend that is expected to continue.

The following table shows the estimated contributions to the total production of primary energy, in million metric tons of coal equivalent, from indigenous sources in the Western European area, as reported by the Organization for European Economic Cooperation (OEEC) in 1956:

Source:	*1955*
Coal	480
Lignite	31
Hydropower	57
Crude oil	13
Natural gas	5
Total	586

Taking the Organization for European Economic Cooperation estimated consumption of primary energy in 1955 (730 million metric tons of coal equivalent) and subtracting the figures shown above for energy production, the following estimated difference between indigenous supply and demand was apparent:

	Million metric tons
Primary energy consumption	730
Indigenous production	586
Deficit	144
Percent	19.7

To supply this deficit in energy requirements it was necessary for the European countries to import 34 million metric tons of coal and 84 million tons of crude oil and petroleum products. Of the 34 million tons of coal imported by Europe, over 25 million tons (28.6 million net tons) or about 75 percent was obtained from the United States. The remaining coal imports were principally from Poland and the U. S. S. R.

WORLD REVIEW

COAL

Estimated world coal production in 1955 was 2,353 million net tons, an increase of 181 million tons or about 8 percent, compared with the output in 1954. Of the total 1955 coal production, 1,615 million tons was bituminous, 145 million tons anthracite, and 593 million tons lignite. The world coal output, by continental groups, was as follows:

	Million net tons
North America	507
South America	7
Europe:	
Free countries	669
Soviet Bloc countries	878
Asia	214
Africa	42
Oceania	36
Total	2,353

The most notable increase in production took place in the United States, amounting to approximately 60 million net tons. The next largest producing country was the U. S. S. R., where the 1955 coal output was about 49 million tons greater than in the preceding year.

Of the total increase (181 million net tons) the Soviet-controlled countries supplied approximately 95 million tons (53 percent). The increased output of these countries, in order of importance (in million net tons), was as follows: U. S. S. R., 48.6; East Germany, 20.6; Communist China, 14.6; Czechoslovakia, 4.8; Poland, 3.2; and Albania, Bulgaria, Hungary, and North Vietnam, 2.8.

The only areas among the free countries of Europe reporting significant production increases above the 1954 output were: West Germany, 5.8 million net tons; France, 1.2 million tons; Yugoslavia, 1.7 million tons; and Belgium, 0.8 million tons. The United Kingdom reported a decline of 2.8 million tons in 1955.

Asia's output in 1955 was approximately 18 million net tons higher than in 1954. Of this amount, Communist China produced 14.6 million tons. India increased production 1.5 million tons for the year, whereas production in Japan declined 0.4 million tons. Small increases in output were noted in Korea, Taiwan, and North Vietnam.

Activities in the African coal industry reflected a strong position in 1955, when output rose approximately 4 million net tons above 1954. The Union of South Africa reported the largest increased output, amounting to 3.1 million tons, followed by Southern Rhodesia, with 0.6 million more tons than was produced in 1954. The Belgian Congo, Mozambique, and Nigeria also improved production by a small but significant tonnage.

Oceania, Australia, and New Zealand reported only small production changes for the year.

TABLE 10.—Trends in Western Europe coal productivity, by selected countries, 1950 and 1953–55

Country	Number of workers overall (thousand)				Output per man-shift overall (metric tons)			
	1950	1953	1954	1955	1950	1953	1954	1955
Belgium	157	156	150	146	0.693	0.766	0.784	0.825
France	259	229	220	210	.768	.926	.988	1.042
Germany (West)	391	435	432	430	1.063	1.104	1.126	1.163
Netherlands	42	47	48	48	1.112	.986	.967	.953
Saar	60	58	57	57	.960	1.082	1.119	1.157
United Kingdom	697	717	707	704	1.211	1.239	1.250	1.243

Source: United Nations Quarterly Bulletin of Coal Statistics for Europe, vol. 3, No. 1, June 1954, and vol. 5, No. 4, March 1957.

PETROLEUM

World crude-oil production increased 12.5 percent in 1955 to total 5.6 billion barrels (15.4 million barrels daily). The largest increases occurred in the United States—169.5 million barrels; the U. S. S. R.—an estimated 99.0 million; Iran—98.5 million; Venezuela—95.6 million; Kuwait—51.2 million; Canada—33.4 million; and Iraq—22.8 million barrels. The United States furnished 44 percent of the world production in 1955 compared with 46 percent in 1954. Venezuela, the second largest producer, furnished about 14 percent of the world total in both years. The countries of the Middle East (Bahrein Island, Iran, Iraq, Kuwait, Neutral Zone, Qatar, Saudi Arabia, Turkey, and Egypt) produced over 1 billion barrels in 1955 to increase their share of the world total from 20 percent to 21. Crude-oil production in the Western Hemisphere increased 9.4 percent, and output in the Eastern Hemisphere increased 18.6 percent.

COMPARATIVE STATISTICAL SUMMARY

Tables in this chapter summarize mineral-fuels production in the continental United States, defined as the 48 States and the District of Columbia, by individual fuels, both in terms of quantity and value of production. The total value of all mineral production, including mineral fuels, is also shown to provide an integrated summary of the mineral industries during 1955. For a detailed summary of all minerals other than fuels, see volume I of the Minerals Yearbook.

The value of all mineral production, by States, is given in table 3. Bituminous-coal production includes all marketable production, excluding washery and other refuse, while anthracite production is measured at the sizing and cleaning stage.

Crude petroleum is measured at the time it is removed from the producing property, and natural-gas liquids are measured in the form in which they are shipped from the natural-gasoline or cycle plants. For a precise description of the stage of measurement, see the individual commodity chapters.

World production and the proportion of the total produced by the United States are given in table 14.

TABLE 11.—Value of mineral production in continental United States, 1925–55, by mineral groups [1]

(Million dollars)

Year	Mineral fuels	Nonmetallic minerals (except fuels)	Metals	Total
1925	2,910	1,187	715	4,812
1926	3,371	1,219	721	5,311
1927	2,875	1,201	622	4,698
1928	2,666	1,163	655	4,484
1929	2,940	1,166	802	4,908
1930	2,500	973	507	3,980
1931	1,620	671	287	2,578
1932	1,460	412	128	2,000
1933	1,413	432	205	2,050
1934	1,947	520	277	2,744
1935	2,013	564	365	2,942
1936	2,405	685	516	3,606
1937	2,798	711	756	4,265
1938	2,436	622	460	3,518
1939	2,423	754	631	3,808
1940	2,662	784	752	4,198
1941	3,228	989	890	5,107
1942	3,568	1,056	999	5,623
1943	4,028	916	987	5,931
1944	4,574	836	900	6,310
1945	4,569	888	774	6,231
1946	5,090	1,243	729	7,062
1947	7,188	1,338	1,084	9,610
1948	9,502	1,552	1,219	12,273
1949	7,920	1,559	1,101	10,580
1950	8,689	1,822	1,351	11,862
1951	9,779	2,079	1,671	13,529
1952	9,616	2,163	[2] 1,617	[2] 13,396
1953	10,249	2,342	[2] 1,800	[2] 14,391
1954	[2] 9,912	[3] 2,619	[2] 1,507	[2] 14,038
1955	10,774	[2] 2,959	2,044	15,727

[1] Data for 1925–46 are not strictly comparable with those for subsequent years, since for the earlier years the value of heavy clay products has not been replaced by the value of raw clays used in such products.
[2] Revised figure.
[3] The total has been adjusted to eliminate duplicating the value of clays and stone.

TABLE 12.—Mineral-fuels production in continental United States, 1952–55, by individual fuels

Mineral fuels	1952		1953		1954		1955	
	Quantity	Value (thousand dollars)	Quantity	Value (thousand dollars)	Quantity	Value (thousand dollars)	Quantity	Value (thousand dollars)
Petroleum asphalt: Bituminous limestone and sandstone ---short tons	1,570,698	4,688	1,440,544	4,349	1,337,822	3,686	1,427,207	4,111
Gilsonite ---do	60,740	1,780	60,505	2,184	75,943	2,724	82,822	3,117
Carbon dioxide, natural (estimated) ---thousand cubic feet	737,000	226	670,600	203	638,900	211	702,417	234
Coal:								
Bituminous [1] ---thousand short tons	463,138	2,276,189	453,578	2,232,700	386,797	[2] 1,752,847	460,828	2,079,080
Lignite ---do	3,017	7,212	2,851	6,794	4,243	10,330	3,166	7,544
Pennsylvania anthracite ---do	40,583	379,714	30,949	299,140	29,083	247,870	26,205	206,097
Helium (shipments) ---thousand cubic feet	145,492	1,896	157,652	2,103	189,873	3,202	235,868	3,881
Natural gas ---million cubic feet	8,013,457	623,649	8,396,916	774,966	8,742,546	882,501	9,405,351	978,357
Natural-gas liquids:								
Natural gasoline and cycle products ---thousand gallons	5,102,244	371,468	5,327,448	406,242	5,385,282	402,418	5,844,904	423,775
LP-gases ---do	4,285,386	161,692	4,692,870	191,598	5,204,304	178,994	5,972,698	195,231
Peat ---short tons	210,582	1,730	204,209	1,618	[2] 244,163	[2] 2,258	273,669	2,283
Petroleum (crude) ---thousand barrels	2,289,836	5,785,230	2,357,082	6,327,100	[2] 2,314,988	6,424,930	2,484,428	6,870,690
Total mineral fuels		9,616,000		10,249,000		9,912,000		10,774,000
Total all other minerals		3,780,000		4,142,000		4,126,000		5,003,000
Grand total, mineral production		13,396,000		14,391,000		14,038,000		15,777,000

[1] Includes small quantity of anthracite mined in States other than Pennsylvania; excludes Alaska.
[2] Revised.

TABLE 13.—Value of mineral production in continental United States, 1952–55, by States, in thousand dollars, and principal minerals produced in 1954

State	1952	1953	1954	1955			
				Value	Rank	Percent of United States total	Principal minerals in order of value
Alabama	158,382	187,087	154,639	186,453	19	1.18	Coal, iron ore, cement, stone.
Arizona	232,824	258,471	254,479	378,277	12	2.40	Copper, sand and gravel, cement, zinc.
Arkansas	117,687	127,090	131,745	132,822	24	.84	Petroleum, bauxite, stone, cement.
California	1,215,130	1,393,987	1,429,627	1,457,554	2	9.24	Petroleum, natural gas, cement, natural gasoline.
Colorado	189,852	212,690	255,852	286,121	17	1.81	Petroleum, molybdenum, coal, cement.
Connecticut	7,125	7,917	9,581	10,428	45	.07	Stone, sand and gravel, lime, clays.
Delaware	677	659	947	1,658	48	.01	Sand and gravel, stone clays.
District of Columbia	7	15					
Florida	82,878	92,336	106,510	108,957	28	.69	Phosphate rock, stone, cement, clays.
Georgia	51,450	51,395	55,828	60,417	33	.38	Clays, stone, cement, sand and gravel.
Idaho	77,895	67,063	69,689	68,513	29	.43	Lead, silver, phosphate rock, copper.
Illinois	460,005	462,443	473,077	533,464	7	3.38	Petroleum, coal, stone, sand and gravel.
Indiana	162,031	169,781	165,369	183,479	20	1.16	Coal, cement, stone, petroleum.
Iowa	52,481	51,994	58,798	63,555	32	.40	Cement, stone, sand and gravel, coal.
Kansas	403,370	413,231	449,587	470,830	9	2.98	Petroleum, natural gas, cement, salt.
Kentucky	398,446	381,742	327,503	391,068	11	2.48	Coal, petroleum, natural gas, stone.
Louisiana	848,401	965,237	998,057	1,156,637	3	7.33	Petroleum, natural gas, natural gasoline, salt.
Maine	8,981	10,503	10,716	12,991	44	.08	Cement, sand and gravel, stone, slate.
Maryland	26,847	27,085	30,743	35,491	39	.23	Sand and gravel, cement, stone, coal.
Massachusetts	17,812	17,191	18,851	22,109	42	.14	Stone, sand and gravel, lime, clays.
Michigan	254,518	286,487	279,940	363,787	13	2.31	Iron ore, cement, copper, petroleum.
Minnesota	397,440	542,545	351,474	501,151	8	3.18	Iron ore, sand and gravel, stone, cement.
Mississippi	101,875	107,868	110,563	122,620	25	.78	Petroleum, natural gas, sand and gravel, clays.
Missouri	140,977	128,207	131,280	151,626	23	.96	Lead, cement, stone, lime.
Montana	122,069	132,184	126,412	166,993	22	1.06	Copper, petroleum, zinc, manganese ore.
Nebraska	20,597	33,281	42,393	54,237	35	.34	Petroleum, cement, sand and gravel, stone.
Nevada	64,231	73,523	89,138	113,231	27	.72	Copper, tungsten, manganese ore, sand and gravel.
New Hampshire	1,945	1,805	2,112	2,605	46	.02	Sand and gravel, stone, feldspar, mica.
New Jersey	57,468	51,945	47,044	57,495	34	.36	Stone, sand and gravel, iron ore, zinc.
New Mexico	288,474	336,545	373,519	435,911	10	2.76	Petroleum, potassium salts, copper, natural gas.

New York	180,751	186,868	192,738	216,907	18	1.37	Cement, iron ore, stone, sand and gravel.
North Carolina	34,726	38,451	41,651	41,210	37	.26	Stone, tungsten concentrate, sand and gravel, mica.
North Dakota	12,057	19,237	22,223	44,123	36	.28	Petroleum, coal, sand and gravel, LP-gases.
Ohio	292,689	302,242	293,659	340,457	14	2.16	Coal, stone, cement, lime.
Oklahoma	621,351	679,003	650,205	711,089	6	4.51	Petroleum, natural gas, natural gasoline, cement.
Oregon	26,674	24,449	32,268	31,736	40	.20	Sand and gravel, stone, cement, nickel.
Pennsylvania	1,145,633	1,121,622	925,545	971,064	4	6.16	Coal, cement, stone, petroleum.
Rhode Island	1,250	1,462	1,461	1,834	47	.01	Sand and gravel, stone, graphite.
South Carolina	14,686	17,771	17,744	20,197	43	.13	Cement, clays, sand and gravel, verniculite.
South Dakota	30,455	33,823	37,874	40,526	38	.26	Gold, and and gravel, stone, cement.
Tennessee	100,932	98,050	105,686	119,316	26	.76	Coal, cement, phosphate rock, zinc.
Texas	3,379,813	3,647,913	3,730,705	3,993,310	1	25.31	Petroleum, natural gas, natural gasoline, LP-gases.
Utah	265,676	298,589	255,495	331,929	15	2.10	Copper, coal, iron ore, gold.
Vermont	17,891	20,302	20,483	23,884	41	.15	Stone, slate, asbestos, copper.
Virginia	164,679	152,979	129,603	172,541	21	1.09	Coal, stone, cement, lime.
Washington	56,139	54,577	53,300	67,334	30	.43	Sand and gravel, cement, stone, zinc.
West Virginia	825,733	790,110	636,311	755,512	5	4.79	Coal, natural gas, sand and gravel, stone.
Wisconsin	55,710	55,212	54,286	65,813	31	.42	Sand and gravel, stone, iron ore, cement.
Wyoming	206,828	255,906	281,306	297,752	16	1.89	Petroleum, coal, clays, sodium carbonate and sulfate.
Total	13,396,000	14,391,000	14,038,000	15,777,000	-------	100.00	Petroleum, coal, natural gas, cement.

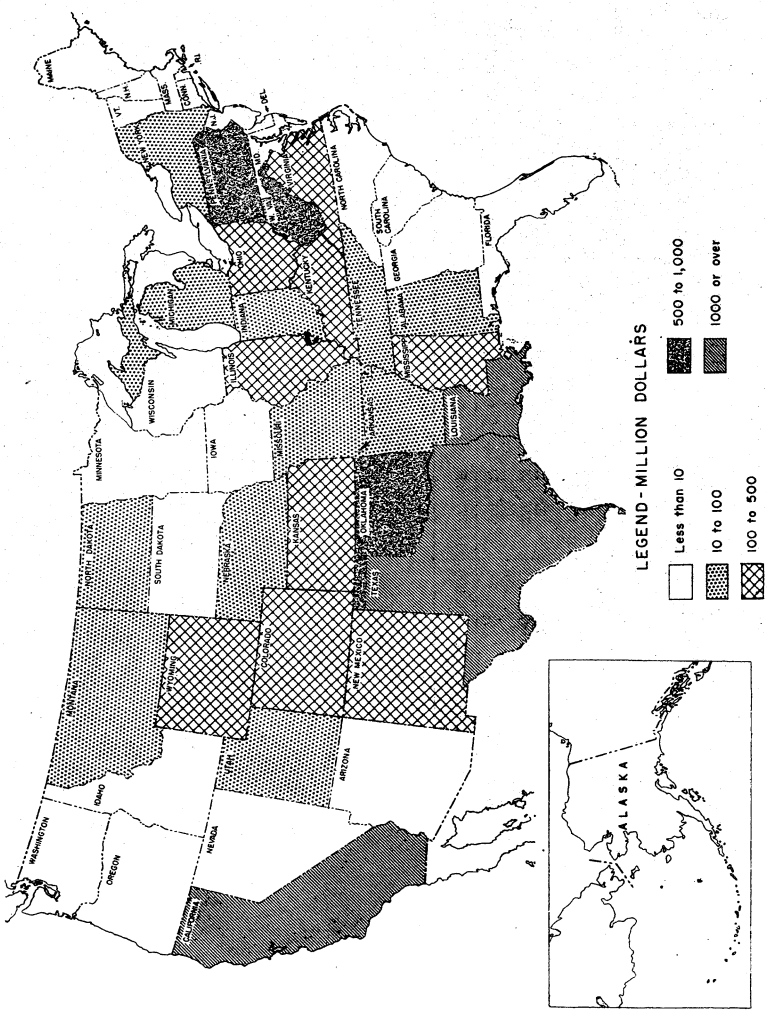

FIGURE 3.—Value of mineral-fuels production in continental United States and Alaska, 1955, by States.

TABLE 14.—Comparison of world and United States [1] production of principal fuels, 1954–55

[Compiled under the supervision of Berenice B. Mitchell of the Division of Foreign Activities, Bureau of Mines]

Mineral	1954			1955		
	World	United States		World	United States	
	Thousand short tons		Percent of world	Thousand short tons		Percent of world
Coal:						
Bituminous	1,459,100	389,157	27	P 1,615,000	461,468	29
Lignite	546,000	2,843	(2)	P 592,710	P 3,166	(2)
Pennsylvania anthracite	137,200	29,083	21	P 144,600	26,205	18
Coke (excluding breeze):						
Gashouse [3]	47,000	256	(2)	49,000	(4)	(4)
Oven and beehive	233,000	59,662	26	266,000	75,302	28
Fuel briquets and packaged fuel	123,000	1,701	1	125,000	1,699	1
Natural gas—million cubic feet	(5)	8,742,546	(5)	(5)	9,405,351	(5)
Peat	58,000	244	(2)	59,000	274	(2)
Petroleum—thousand barrels	5,006,205	2,314,988	46	5,634,412	2,484,521	44

[1] Including Alaska and noncontiguous Territories.
[2] Less than 1 percent.
[3] Includes low- and medium-temperature and gashouse coke.
[4] Bureau of Mines not at liberty to publish United States figure separately.
[5] Data not available.

Employment and Injuries in the Fuel Industries

By John C. Machisak

INTRODUCTION

IN THIS CHAPTER of the Minerals Yearbook the injury and related employment experience of the coal-mining, coking, and oil and gas industries for 1955 is outlined and discussed. Each industry is treated separately, and no attempt has been made to combine data to show overall experience for the fuel section of the mineral industries, inasmuch as the inherent accident hazards for these three sections are not comparable. The employment and injury records for the mineral industries as a whole are discussed in volume III.

COAL

The overall injury experience (fatal and nonfatal) at the Nation's coal mines was less favorable in 1955 than in the preceding year. The number of injuries, both fatal and nonfatal, was considerably higher than in 1954. The resulting injury-frequency rate per million man-hours of time worked increased from 46.69 to 49.86, or 7 percent.

The total number of fatalities resulting from accidents that were determined to be chargeable to the coal-mining industry was 417—an increase of 21 fatalities, or 5 percent, over the number in the preceding year. The fatality rate of 1.04 deaths per million man-hours of worktime, or exposure to the hazards of the industry, was 2 percent higher than in 1954. The total worktime increased from 388 million man-hours in 1954 to 400.9 million in 1955, or 3 percent.

The coal mines in the United States were free of a major disaster (one in which five or more men are killed) during 1955. The last major disaster occurred in a West Virginia mine on November 13, 1954, when a gas explosion resulted in the death of 16 men.

A rise in the total number of deaths was recorded for each phase of the industry. At underground workings the number of fatalities increased 7, at surface workings 9, and at strip operations 5 over the previous year. The number of nonfatal injuries, or those involving loss of time beyond the day on which the injuries occurred, was 19,570, or 10 percent more than the previous year's total.

Employment decreased in 1955; there was an average of 236,200 men working daily, or 17 percent less than in 1954. Although the number of men working declined, the total worktime (man-hours)

TABLE 1.—Employment and injury experience at coal mines in the United States, 1951–55

Industry and year	Average men working daily [1]	Average active mine days [2]	Million man-days worked	Million man-hours worked	Number of injuries		Frequency rates per million man-hours	
					Fatal	Nonfatal	Fatal	Nonfatal
Bituminous-coal mines: [3]								
1951	372,138	201	74.9	590.4	684	28,081	1.16	47.56
1952	338,719	186	63.0	498.0	449	23,719	.90	47.64
1953	295,425	191	56.3	444.3	397	20,112	.89	45.26
1954	241,919	177	42.8	337.7	334	14,746	.99	43.66
1955 [4]	209,600	217	45.5	360.0	357	16,540	.99	45.94
Anthracite mines:								
1951	69,767	207	14.5	106.8	101	7,472	.95	69.94
1952	62,610	207	13.0	95.8	99	6,355	1.03	66.35
1953	55,701	169	9.4	69.3	64	4,146	.92	59.85
1954	41,786	164	6.8	50.2	62	2,972	1.23	59.18
1955 [4]	26,600	209	5.6	40.8	60	3,030	1.47	74.21
Total coal mines:								
1951	441,905	202	89.4	697.2	785	35,553	1.13	50.99
1952	401,329	189	76.0	593.7	548	30,074	.92	50.66
1953	351,126	187	65.7	513.6	461	24,258	.90	47.23
1954	283,705	175	49.6	388.0	396	17,718	1.02	45.67
1955 [4]	236,200	216	51.1	400.9	417	19,570	1.04	48.82

[1] Average number of men at work each day mine was active. Because absenteeism and labor turnover are taken into consideration, this number is lower than the number of men available for work, as measured by a count of names on payroll.
[2] Average in which operating time of each mine is weighted by average number of workers in mine.
[3] Includes lignite.
[4] Preliminary; based on an average of 80-percent coverage.

increased 3 percent. The average miner worked a 7.85-hour shift during 1955 and accumulated a total of 1,697 hours of work.

Bituminous-Coal Mines.—The safety record of the bituminous-coal-mining industry was not as favorable as in 1954. The rate of 46.93 injuries (fatal and nonfatal) per million man-hours was 5 percent higher than in 1954. In all, 357 men were killed at bituminous-coal mines during 1955 at a frequency rate of 0.99 per million man-hours—the same frequency rate as in 1954. Of the 357 fatalities, 300 were underground at deep mines, 33 at surface installations operated in connection with deep mines, and 24 at strip-pit operations. Accidents from roof falls and haulage causing underground fatalities increased by 11 in 1955 and totaled 254. The number of fatal injuries from explosions declined from 17 in 1954 to 2 in 1955. Deaths from hazards of explosives and electricity increased 5 and 4, respectively, whereas the number from machinery accidents was the same in each year. The number of fatal injuries from falls of roof, rib, or face increased 10 percent. This was the greatest single cause of underground fatalities—194 in 1955 as compared with 177 in 1954. Underground haulage accidents resulted in the death of 60 men in 1955 as compared with 66 in 1954—a decrease of 9 percent.

The average number of men working daily at bituminous-coal mines in 1955 was 209,600—a decline of 13 percent from 1954. The average days of employment per man increased to 217 in 1955—40 days more per man than in 1954. Total man-hours of worktime increased 7 percent, which resulted in a workyear of 1,718 hours—an increase of 322 hours of work per man over the preceding year.

Anthracite Mines.—Fatal accidents at anthracite mines resulted in the death of 60 men—49 underground at deep mines, 8 at surface operations connected with deep mines, and 3 at stripping operations. Falls of roof, face, or rib killed 34 men—a decline of 5 from the previous year. Only 2 deaths resulted from explosions—1 more than in 1954. The number of haulage accidents underground decreased in 1955, causing two less deaths than in 1954. Falls of roof, face, or rib and haulage accidents were the chief causes of fatal injuries at underground anthracite mines. These 2 agencies caused 40 of the 49 fatal injuries underground.

Employment continued to decline in 1955 at Pennsylvania anthracite mines. An average daily working force of 26,600 men worked 209 days, for a total working time of 40.8 million man-hours. This was a decline of 36 percent in the average number of men working daily and 19 percent in the total man-hours of employment from 1954. Each employee had an average of 1,535 man-hours of work during the year, or 333 hours more than in 1954.

COKE

Work fatalities and disabling work injuries increased in the coke industry during 1955. Despite this, however, the combined frequency rates (fatal and nonfatal) were the second lowest recorded since 1916, when complete reports were first made available to the Bureau of Mines. From the 21,120 coke ovens in operation during the year, reports show the combined fatal and nonfatal rates were 5.74 injuries per million man-hours of worktime and 4.16 per million tons of coke produced. Each rate was slightly higher than in the previous year, because a 27-percent increase in the number of injuries was not offset by the 11-percent increase in the number of man-hours worked, and also because of the 26-percent increase in production. Days worked in 1955 increased by 10, and a 7.99-hour shift was worked both in 1954 and in 1955. The average worker accumulated 2,812 hours of worktime—80 more than in the previous year.

Byproduct-Coke Plants.—Injuries reported at byproduct-coke plants revealed 9 fatalities and 280 disabling work injuries for 1955—a 13-percent increase in the number killed and a 14-percent increase in the number of nonfatal injuries. However, the fatal rate for 1955 increased by only 7 percent and the nonfatal rate by 4 percent, owing entirely to a 9-percent increase in the number of man-hours worked. Production in 1955 increased 25 percent, and the average employee worked a straight 8-hour shift and accumulated 2,894 hours of worktime. Byproduct ovens operated 1 more day in 1955 than in 1954.

Beehive-Coke Ovens.—The beehive-coke industry has operated 3 consecutive years without a fatal injury. Nonfatal injuries increased from 9 in 1954 to 45 in 1955. The average working force dropped from 1,265 in the preceding year to 1,084, or 14 percent; however, man-hours of exposure and production rose sharply—116 and 187 percent, respectively. The average employee worked 108 more days in 1955 than in the previous year, with a 7.47-hour shift which was approximately the same as that worked in 1954. Each worker accumulated 1,341 hours of worktime, 810 more than in the previous year.

TABLE 2.—Employment and injury experience at coke plants in the United States, 1951–55

Industry and year	Average men working daily [1]	Average active plant days [2]	Million man-days worked	Million man-hours worked	Number of injuries		Frequency rates per million man-hours	
					Fatal	Nonfatal	Fatal	Nonfatal
Byproduct ovens:								
1951	22,058	363	8.0	64.1	9	533	0.14	8.31
1952	21,919	336	7.4	58.6	7	420	.12	7.16
1953	21,011	362	7.6	61.1	8	332	.13	5.43
1954	17,944	361	6.5	51.8	8	245	.15	4.73
1955	19,597	362	7.1	56.7	9	280	.16	4.94
Beehive ovens:								
1951	3,657	225	.8	6.1	1	235	.16	38.60
1952	3,322	170	.6	4.2	1	126	.24	30.29
1953	2,429	201	.5	3.6	--------	93	--------	25.98
1954	1,265	71	.1	.7	--------	9	--------	13.40
1955	1,084	179	.2	1.5	--------	45	--------	30.96
All ovens:								
1951	25,715	344	8.8	70.2	10	768	.14	10.94
1952	25,241	315	7.9	62.8	8	546	.13	8.69
1953	23,440	345	8.1	64.7	8	425	.12	6.57
1954	19,209	342	6.6	52.5	8	254	.15	4.84
1955	20,681	352	7.3	58.2	9	325	.15	5.59

[1] Average number of men at work each day oven was active. Because absenteeism and labor turnover are taken into consideration, this number is lower than the number of men available for work, as measured by a count of names on payroll.

[2] Average in which operating time of each plant is weighted by average number of workers in the plant.

NOTE. All data are final.

OIL AND GAS

The injury-frequency rate of the oil and gas industry was the lowest recorded since statistics on the industry were first collected in 1942 by the Bureau of Mines, United States Department of the Interior. The record rate of 10.11 injuries per million man-hours of exposure to the hazards of the industry was 4 percent better than in the preceding year. Of the 13,173 injuries suffered by the industry in 1955, 135 were fatalities or permanent total disabilities, 646 were permanent partial disabilities, and 12,392 were of a temporary nature. The phases of the industry in which injuries occurred less frequently in 1955 than in 1954 were: Exploration, production, pipeline oil, pipeline gas, refining, and miscellaneous.

Daily employment in the industry increased 6 percent in 1955 over 1954 to an average of 617,274 men, who worked more than 1¼ billion man-hours—an average of 2,111 hours each during the year.

TABLE 3.—Employment and injury experience in the oil and gas industry of the United States, 1951–55

Year	Average men working daily	Million man-hours worked	Number of injuries		Frequency rates per million man-hours	
			Fatal	Nonfatal	Fatal	Nonfatal
1951	539,095	1,148	142	15,130	0.12	13.18
1952 [1]	586,138	1,228	150	15,465	.12	12.59
1953 [1]	594,398	1,264	179	14,452	.14	11.43
1954 [1]	580,783	1,229	122	12,796	.10	10.41
1955 [1]	617,274	1,303	135	13,038	.10	10.01

[1] Fatal and permanent total injuries combined.

CONCLUSION

The number of injuries, both fatal and nonfatal, suffered by all phases of the fuel industries increased in 1955 over the preceding year. Accompanying this increase was a sharp rise in the exposure to the hazards of each segment. The net result of these increases was reflected by an upward trend in the injury-frequency rates for coal-mining and coking operations; despite an increase in injuries sustained, the oil and gas industry reduced its injury-frequency rate 4 percent from the previous year.

PART II. COMMODITY REVIEWS

A. Coal and Related Products

Coal—Bituminous and Lignite

By W. H. Young, R. L. Anderson, and E. M. Hall

GENERAL SUMMARY

THE BITUMINOUS-COAL AND LIGNITE INDUSTRY generally improved sharply in 1955 compared with 1954. Production, consumption, exports, sales of mechanical equipment, days worked, and tons per man per day all increased. Also, the percentages mechanically loaded, mechanically cleaned, mined by auger, and mined by stripping were greater in 1955 than in 1954. Only average value per ton and men working declined slightly.

Production.—The output of soft coal in 1955—464.6 million tons—was 19 percent greater than the 391.7 million tons produced in 1954. The higher production in 1955 was due largely to increased consumption in the United States as a result of a general increase in business activity and a sharp rise in exports.

Production fluctuated less during 1955 than for many years. There was only a slight seasonal variation in the spring, and the only major fluctuation resulted from the miners' vacation period of 10 days in midsummer. An added influence on stable production rates was the significant decrease in time lost on account of strikes, which, according to the Bureau of Labor Statistics, United States Department of Commerce, amounted to only 273,000 man-days in 1955, compared with 344,000 in 1954.

Trend of Employment.—Employment continued to decrease, owing largely to the increased production per man-day. The increase in productivity was due largely to the greatly expanded mechanization in the soft-coal industry, particularly in loading and stripping.

Index to Capacity.—As it is impossible for all mines to operate every working day in the year, a conservative figure of 280 days for calculating potential capacity was suggested some years ago by the coal committee of the American Institute of Mining and Metallurgical Engineers. (See Minerals Yearbook, 1935, pp. 631–632.) The average output per day worked in 1955 was 2.2 million tons, which, if applied to 280 days, gives an annual potential output of 620 million tons, compared with the actual production of 464.6 million tons.

Mechanization.—A greater proportion—85 percent—of coal was loaded mechanically at underground mines in the United States in 1955 than in any other year. Sales of continuous mining machines increased in 1955. Production at auger mines increased 36 percent over the previous year.

Mechanical Cleaning.—Approximately 59 percent of the soft coal mined in the United States in 1955 was mechanically cleaned. This continues the general trend toward more mechanical cleaning that has paralleled the growth of mechanical mining very closely. It is due partly to the fact that in mechanical mining a larger amount of refuse is loaded with the coal, requiring more mechanical cleaning. Also, the soft-coal industry has attempted to meet consumers' demands for cleaner coal. A large portion of the remaining 41 percent was hand-picked and screened into various sizes at tipples with no mechanical cleaning facilities.

Consumption.—Consumption of bituminous coal and lignite in the United States increased sharply—17 percent—in 1955 over the previous year. All classes of consumers except railroads used more coal in 1955 than in 1954.

Trends of Fuel Efficiency.—As for many years past, electric public-utility powerplants chalked up new records in fuel efficiency.

Competition With Oil and Gas.—Although consumption of energy has increased steadily since 1920, the proportion supplied by bituminous coal has consistently decreased, indicating that soft coal continues to have serious competition from oil and gas. As a percentage of total energy consumed in 1955, bituminous coal and lignite represented 28 percent; anthracite, 1; oil, 41; gas, 26; and waterpower, 4.

Electric-power utilities consumed 22 percent more bituminous coal and 1 percent less gas in 1955 than in 1954. Thirteen percent more fuel oil was consumed in 1955 than in 1954.

Class I railroads decreased their consumption of coal 11 percent in 1955 from 1954 and their purchases of fuel oil and diesel fuel 4 percent during the same period.

Stocks.—The reserve supply of bituminous coal and lignite in the hands of industrial consumers and retail coalyards decreased from 69.2 million tons at the beginning of 1955 to 68.4 million tons at the close. These decreases were small and within the normal fluctuations of the market. The days' supply of stocks decreased from 60 to 47. Stocks on the upper Lake docks decreased 194,049 tons from January 1 to December 31, 1955.

SCOPE OF REPORT

These data include all coal produced in Alaska and in the United States except Pennsylvania anthracite and Texas lignite. The production in Alaska is included in the total production of the United States.

Throughout this chapter all tonnage figures represent net tons of marketable coal and exclude washery and other refuse. Also, "tons" refers to net short tons of 2,000 pounds.

The statistics for 1955 are final and are based upon detailed annual reports of production and mine operation furnished by the producers. All but a small percentage of the output was covered by the reports submitted. For the remaining production not directly reported, which consisted chiefly of small mines, it has been possible to obtain reason-

ably accurate data from the records of the various State mine departments, which have statutory authority to require such reports, or, in a few instances, from railroad carloadings. Thus, the report represents complete coverage of all mines having an output of 1,000 tons a year or more. The report does not attempt to include many small mines that produce less than 1,000 tons a year.

In 1955, for the first time, the annual production form did not request information on employment. The figures on men working daily, days worked, man-days worked, and tons per man per day were obtained from the Accident Analysis Branch of the Bureau of Mines.

Additional details on statistical procedures are given in the following sections: Production by Months and Weeks, Number and Size of Mines, Mechanical Cleaning, Production by States and Counties, Consumption, Relative Rate of Growth of Mineral Fuels and Waterpower, and Stocks.

TABLE 1.—Salient statistics of the bituminous-coal and lignite industry in the United States, 1954–55

(All tonnage figures represent net tons)

	1954	1955	Change from 1954 (percent)
Production—net tons	391,706,300	464,633,408	+18.6
Consumption in the United States—do	363,060,000	423,412,000	+16.6
Stocks at end of year:			
Industrial consumers and retail yards—do	69,201,000	68,423,000	−1.1
Stocks on upper Lake docks—do	4,332,436	4,138,387	−4.5
Imports and exports: [1]			
Imports—do	198,799	337,145	+69.6
Exports—do	31,040,564	51,255,531	+65.1
Price indicators (average per net ton):			
Average cost of railroad fuel purchased, f. o. b. mines [2]	$4.60	$4.65	+1.1
Average cost of coking coal at merchant coke ovens	$9.57	$9.16	−4.3
Average retail price [3]	$14.94	$15.10	+1.1
Average railroad freight charge per net ton [2]	$3.23	$3.24	+.3
Average value f. o. b. mines	$4.52	$4.50	−0.2
Equipment sold:			
Mobile loading machines	92	120	+30.4
Continuous mining machines	101	109	+7.9
Augers	55	65	+18.2
Scrapers	5		
Shuttle cars	242	348	+43.8
Conveyors:			
"Mother"	19	78	+310.5
Room or transfer	61	143	+134.4
Method of mining:			
Hand-loaded underground—net tons	46,142,382	52,793,925	+14.4
Mechanically loaded underground—do	242,969,649	290,671,314	+19.6
Percentage of total underground production mechanically loaded	84.0	84.6	+.7
Mined at auger mines—net tons	4,460,019	6,075,400	+36.2
Mined by stripping—do	98,134,250	115,092,769	+17.3
Mechanically cleaned—do	232,764,023	272,715,484	+17.2
Number of mines	6,130	7,856	+28.2
Average number of days worked [4]	182	210	+15.4
Average number of men working daily [4]	227,397	225,093	−1.0
Production per man per day [4]—net tons	9.47	9.84	+3.9
Fuel-efficiency indicator: Pound of coal per kilowatt-hour at electric powerplants [5]	0.99	0.95	−4.0

[1] U. S. Department of Commerce.
[2] Interstate Commerce Commission.
[3] Bureau of Labor Statistics, U. S. Department of Labor.
[4] Accident Analysis Branch, Federal Bureau of Mines.
[5] Federal Power Commission.

RESERVES*

TABLE 2.—Coal reserves of the United States, January 1, 1953, by States

(In million short tons)

State	Estimated original reserves					Reserves depleted to Jan. 1, 1953		Remaining reserves Jan. 1, 1953	Recoverable reserves Jan. 1, 1953, assuming 50-percent recovery
	Bituminous coal	Subbituminous coal	Lignite	Anthracite and semianthracite	Total	Production [1]	Production plus loss in mining, assuming past losses equal production		
Alabama [2]	67,570				67,570	861	1,722	65,848	32,924
Arkansas	1,396		90	230	1,716	94	188	1,528	764
COLORADO [3]	90,258	9,437		713	100,408	484	968	99,440	49,719
GEORGIA	100				100	12	24	76	38
ILLINOIS	[4] 137,321				[4] 137,321	[5] 156	[5] 312	137,009	68,504
INDIANA	37,293				37,293	1,039	2,078	35,215	17,607
Iowa	29,160				29,160	348	696	28,464	14,232
KANSAS	[4] 20,774		(6)		20,774	[5] 6	[5] 12	20,762	10,381
Kentucky	123,327				123,327	2,177	4,354	118,973	59,487
MARYLAND	[4] 1,200				[4] 1,200	[5] 2	[5] 4	1,196	598
MICHIGAN	297				297	[7] 46	[8] 77	220	110
Missouri	79,362				79,362	267	534	78,828	39,414
MONTANA	2,363	132,151	87,533		222,047	164	328	221,719	110,860
NEW MEXICO	10,948	50,801		6	61,755	123	246	61,509	30,754
NORTH CAROLINA	112				112	1	2	110	55
NORTH DAKOTA			350,910		350,910	77	154	350,756	175,378
Ohio	86,584				86,584	1,806	3,612	82,972	41,486
Oklahoma	54,951				54,951	166	332	54,619	27,309
PENNSYLVANIA	75,093			22,805	97,898	12,761	25,522	72,376	36,189
SOUTH DAKOTA			2,033		2,033	1	2	2,031	1,015
Tennessee	25,665				25,665	340	680	24,985	12,493
Texas	8,000		23,000		31,000	62	124	30,876	15,438
Utah	88,184	5,156			93,340	218	436	92,904	46,452
VIRGINIA	11,696			355	12,051	609	1,218	10,833	5,417
Washington	11,413	52,442		23	63,878	145	290	63,588	31,794

WEST VIRGINIA	116,618				116,618	5,428	10,856	105,762	52,881
WYOMING	13,235	[9] 108,319	(9)		121,554	383	766	120,788	60,395
Other States	[10] 820	[11] 15,500	[12] 50		16,370	9	18	16,352	8,176
Total	1,093,740	373,806	463,616	24,132	1,955,294	[13] 27,785	55,555	1,899,739	949,870

[1] Production, 1800–85, from Eavenson, H. N., The First Century and A Quarter of American Coal Industry, Pittsburgh, 1942, pp. 432–434; production, 1886–1952, from Geol. Survey Mineral Resources volumes and Bureau of Mines Minerals Yearbooks unless otherwise indicated.

[2] Reserve estimates of States in lower case letters were prepared by, or under the direction, M. R. Campbell before 1928.

[3] Reserve estimates of States in capital letters supersede earlier estimates by M. R. Campbell.

[4] Remaining reserves, January 1, 1950.

[5] Production, 1950–52.

[6] See discussion in text.

[7] Production, 1860–1949, Michigan Geological Survey Division, as cited in Cohee, G. V., Burns, R. N., Brown, Andrew, Brant, R. A., and Wright, Dorothy, Coal Resources of Michigan: Geol. Survey Circ. 77, 1950, p. 56.

[8] Past losses assumed to be 40 percent of coal originally in the ground.

[9] Small reserves and production of lignite included under subbituminous coal.

[10] Includes Arizona, California, Idaho, and Oregon.

[11] Includes Arizona, California, and Oregon.

[12] Includes California and Louisiana.

[13] Somewhat less than total recorded production. *See* footnote 5.

*Averitt, Paul, Berryhill, Louise R., and Taylor, Dorothy A., Coal Resources of the United States: Geol. Survey Circ. 293, 1954, p. 5.

THICKNESS OF BITUMINOUS-COAL AND LIGNITE SEAMS

The Bureau of Mines has compiled and published detailed data on thickness of seams for coal mines in 1945 [1] and 1950.[2] An earlier study, based on data collected by the United States Coal Commission, was made on thickness of seams in 1920.[3] Because of the importance of seam thickness in mining operations, the data for 1955 follow.

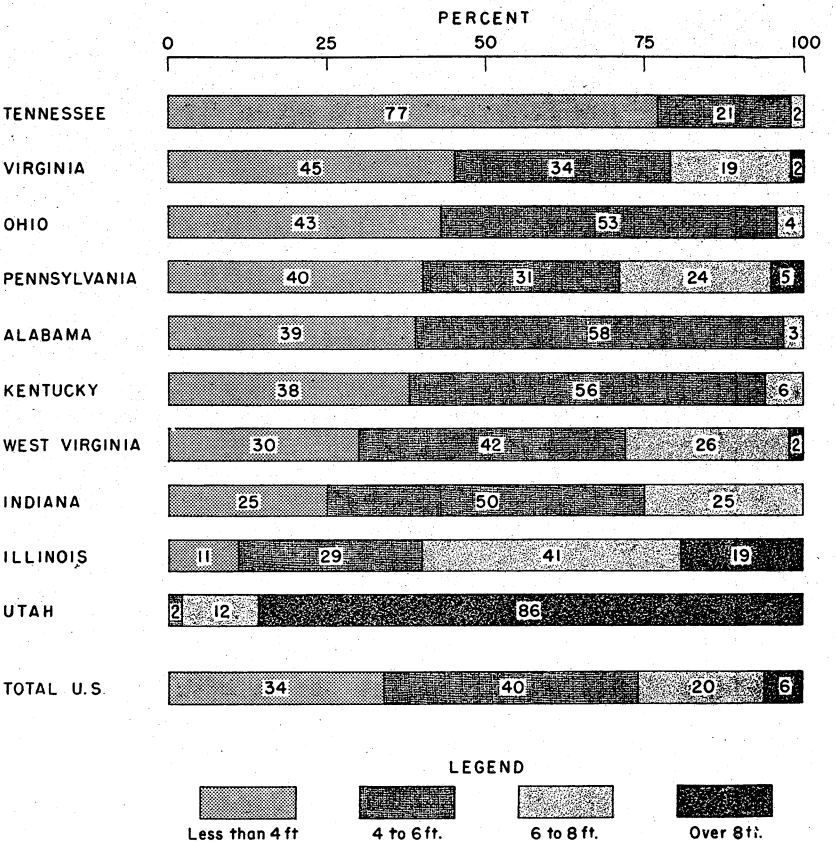

FIGURE 1.—Percentage of bituminous coal and lignite produced in the 10 largest coal-producing States and total United States, 1955, by thickness of seams mined.

[1] Young, W. H. and Anderson, R. L., Thickness of Bituminous-Coal and Lignite Seams Mined in the United States in 1945: Bureau of Mines Inf. Circ. 7442, 1947, 17 pp.

[2] Young, W. H. and Anderson, R. L., Thickness of Bituminous-Coal and Lignite Seams at All Mines, and Thickness of Overburden at Strip Mines in the United States in 1950: Bureau of Mines Inf. Circ. 7642, 1952, 18 pp.

[3] Hotchkiss, W. E., Warner, C. K., Plein, L. N., Dake, W. M., Anderson, R. L., Gallagher, J. J., and Schoenfeld, M. H., Mechanization, Employment, and Output per Man in Bituminous-Coal Mining: Work Projects Administration, National Research Project, vol. 1, 1939, p. 62.

TABLE 3.—Number and production of bituminous-coal and lignite mines in the United States, 1955, classified by thickness of seams mined

Item	Less than 2 feet	2 to 3 feet	3 to 4 feet	4 to 5 feet	5 to 6 feet	6 to 7 feet	7 to 8 feet	8 feet and over	Total
Number of mines:									
Underground	32	1,289	2,467	1,243	438	251	152	163	6,035
Strip	117	484	503	267	113	47	23	63	1,617
Auger	-------	35	78	67	14	7	--------	3	204
Total	149	1,808	3,048	1,577	565	305	175	229	7,856
Percentage of mines:									
Underground	.5	21.4	40.9	20.6	7.2	4.2	2.5	2.7	100.0
Strip	7.2	30.0	31.1	16.5	7.0	2.9	1.4	3.9	100.0
Auger	-------	17.2	38.2	32.8	6.9	3.4	--------	1.5	100.0
Total	1.9	23.0	38.8	20.1	7.2	3.9	2.2	2.9	100.0
Production (thousand tons):									
Underground	269	17,610	81,934	69,650	65,621	50,397	35,107	22,877	343,465
Strip	4,232	19,303	31,516	29,016	17,579	5,923	1,077	6,447	115,093
Auger	-------	423	1,627	2,774	661	525	--------	65	6,075
Total	4,501	37,336	115,077	101,440	83,861	56,845	36,184	29,389	464,633
Percentage of production:									
Underground	.1	5.1	23.9	20.2	19.1	14.7	10.2	6.7	100.0
Strip	3.7	16.8	27.4	25.2	15.2	5.2	.9	5.6	100.0
Auger	-------	7.0	26.8	45.7	10.9	8.6	--------	1.0	100.0
Total	1.0	8.0	24.8	21.8	18.1	12.2	7.8	6.3	100.0

TABLE 4.—Production and average thickness of seams mined at underground, strip, and auger bituminous-coal and lignite mines in the United States, 1955, by States

(Exclusive of mines producing less than 1,000 tons)

State	Underground mines		Strip mines		Auger mines		Total, all mines	
	Production (net tons)	Average thickness coal mined (feet)	Production (net tons)	Average thickness coal mined (feet)	Production (net tons)	Average thickness coal mined (feet)	Production (net tons)	Average thickness coal mined (feet)
Alabama	10,970,610	4.4	2,110,979	3.2	6,888	8.0	13,088,477	4.6
Alaska	239,571	20.7	400,125	23.7	--------	--------	639,696	22.6
Arizona	8,898	5.5	--------	--------	--------	--------	8,898	5.5
Arkansas	317,001	2.6	260,725	1.7	--------	--------	577,726	2.2
California (lignite)	--------	--------	7,650	8.0	--------	--------	7,650	8.0
Colorado	3,211,125	7.1	356,805	6.2	--------	--------	3,567,930	7.0
Georgia	12,471	1.5	--------	--------	--------	--------	12,471	1.5
Illinois	27,256,495	7.3	18,675,619	4.8	--------	--------	45,932,114	6.3
Indiana	4,967,089	6.2	11,182,221	4.4	--------	--------	16,149,310	5.0
Iowa	297,490	4.5	960,867	3.9	--------	--------	1,258,357	4.1
Kansas	14,819	2.7	727,463	1.6	--------	--------	742,282	1.6
Kentucky	54,440,144	4.4	13,643,240	4.8	936,526	4.4	69,019,910	4.4
Maryland	275,454	3.8	237,015	4.7	--------	--------	512,469	4.2
Missouri	157,103	3.6	3,075,382	2.5	--------	--------	3,232,485	2.6
Montana:								
Bituminous	415,338	5.1	801,555	23.7	--------	--------	1,216,893	17.3
Lignite	23,947	17.8	6,413	7.4	--------	--------	30,360	15.6
Total Montana	439,285	5.8	807,968	23.5	--------	--------	1,247,253	17.3
New Mexico	174,299	5.8	27,280	6.3	--------	--------	201,579	5.9
North Dakota (lignite)	21,357	10.1	3,080,730	12.1	--------	--------	3,102,087	12.1
Ohio	12,632,165	4.8	23,958,329	3.8	1,279,297	4.1	37,869,791	4.2
Oklahoma	694,323	3.7	1,469,213	2.3	--------	--------	2,163,536	2.8
Pennsylvania	64,904,231	5.5	20,518,113	3.2	291,112	3.0	85,713,456	4.9
South Dakota (lignite)	--------	--------	25,782	4.5	--------	--------	25,782	4.5
Tennessee	5,340,664	3.9	1,635,052	2.5	77,128	3.3	7,052,844	3.6
Utah	6,295,524	11.1	--------	--------	--------	--------	6,295,524	11.1
Virginia	22,241,262	4.5	981,782	5.0	284,465	4.5	23,507,509	4.5
Washington	578,076	7.6	31,714	5.5	--------	--------	609,790	7.5
West Virginia	126,588,262	5.1	9,379,643	5.8	3,199,984	4.7	139,167,889	5.1
Wyoming	1,387,521	8.0	1,539,072	33.1	--------	--------	2,926,593	21.2
Total	343,465,239	4.7	115,092,769	4.9	6,075,400	4.4	464,633,408	4.8

DOMESTIC PRODUCTION

TABLE 5.—Growth of the bituminous-coal and lignite-mining industry in the United States, 1890–1955

Year	Production (net tons)	Value of production		Number of mines	Capacity at 280 days (million tons)	Foreign trade [1]	
		Total	Average per ton			Exports (net tons)	Imports (net tons)
1890	111,302,322	$110,420,801	$0.99	[2]	137	1,272,396	1,047,416
1891	117,901,238	117,188,400	.99	[2]	148	1,651,694	1,181,677
1892	126,856,567	125,124,381	.99	[2]	162	1,904,556	1,491,800
1893	128,385,231	122,751,618	.96	[2]	174	1,986,383	1,234,499
1894	118,820,405	107,653,501	.91	[2]	196	2,439,720	1,286,268
1895	135,118,193	115,779,771	.86	2,555	196	2,659,987	1,411,323
1896	137,640,276	114,891,515	.83	2,599	202	2,515,838	1,393,095
1897	147,617,519	119,595,224	.81	2,454	213	2,670,157	1,442,534
1898	166,593,623	132,608,713	.80	2,862	221	3,004,304	1,426,108
1899	193,323,187	167,952,104	.87	3,245	230	3,897,994	1,409,338
1900	212,316,112	220,930,313	1.04	[2]	255	6,060,688	1,911,925
1901	225,828,149	236,422,049	1.05	[2]	281	6,455,085	2,214,507
1902	260,216,844	290,858,483	1.12	[2]	316	6,048,777	2,174,393
1903	282,749,348	351,687,933	1.24	[2]	350	5,835,561	4,043,519
1904	278,659,689	305,397,001	1.10	4,650	386	7,206,879	2,179,882
1905	315,062,785	334,658,294	1.06	5,060	417	7,512,723	1,704,810
1906	342,874,867	381,162,115	1.11	4,430	451	8,014,263	2,039,169
1907	394,759,112	451,214,842	1.14	4,550	473	9,869,812	1,892,653
1908	332,573,944	374,135,268	1.12	4,730	482	11,071,152	2,219,243
1909	379,744,257	405,486,777	1.07	5,775	510	10,101,131	1,375,201
1910	417,111,142	469,281,719	1.12	5,818	538	11,663,052	1,819,766
1911	405,907,059	451,375,819	1.11	5,887	538	13,259,791	1,972,555
1912	450,104,982	517,983,445	1.15	5,747	566	16,475,029	1,456,333
1913	478,435,297	565,234,952	1.18	5,776	577	18,013,073	1,767,656
1914	422,703,970	493,309,244	1.17	5,592	608	17,589,562	1,520,962
1915	442,624,426	502,037,688	1.13	5,502	610	18,776,640	1,703,785
1916	502,519,682	665,116,077	1.32	5,726	613	21,254,627	1,713,837
1917	551,790,563	1,249,272,837	2.26	6,939	636	23,839,558	1,448,453
1918	579,385,820	1,491,809,940	2.58	8,319	650	22,350,730	1,457,073
1919	465,860,058	1,160,616,013	2.49	8,994	669	20,113,536	1,011,550
1920	568,666,683	2,129,933,000	3.75	8,921	725	38,517,084	1,244,990
1921	415,921,950	1,199,983,600	2.89	8,038	781	23,131,166	1,257,589
1922	422,268,099	1,274,820,000	3.02	9,299	832	12,413,085	5,059,999
1923	564,564,662	1,514,621,000	2.68	9,331	885	21,453,579	1,882,306
1924	483,686,538	1,062,626,000	2.20	7,586	792	17,100,347	417,226
1925	520,052,741	1,060,402,000	2.04	7,144	748	17,461,560	601,737
1926	573,366,985	1,183,412,000	2.06	7,177	747	35,271,937	485,666
1927	517,763,352	1,029,657,000	1.99	7,011	759	18,011,744	549,843
1928	500,744,970	933,774,000	1.86	6,450	691	16,164,485	546,526
1929	534,988,593	952,781,000	1.78	6,057	679	17,429,298	495,219
1930	467,526,299	795,483,000	1.70	5,891	700	15,877,407	240,886
1931	382,089,396	588,895,000	1.54	5,642	669	12,126,299	206,303
1932	309,709,872	406,677,000	1.31	5,427	594	8,814,047	186,909
1933	333,630,533	445,788,000	1.34	5,555	559	9,036,947	197,429
1934	359,368,022	628,383,000	1.75	6,258	565	10,868,552	179,661
1935	372,373,122	658,063,000	1.77	6,315	582	9,742,430	201,871
1936	439,087,903	770,955,000	1.76	6,875	618	10,654,959	271,798
1937	445,531,449	864,042,000	1.94	6,548	646	13,144,678	257,996
1938	348,544,764	678,653,000	1.95	5,777	602	10,490,269	241,305
1939	394,855,325	728,348,366	1.84	5,820	621	11,590,478	355,115
1940	460,771,500	879,327,227	1.91	6,324	639	16,465,928	371,571
1941	514,149,245	1,125,362,836	2.19	6,822	666	20,740,471	390,049
1942	582,692,937	1,373,990,608	2.36	6,972	663	22,943,305	498,103
1943	590,177,069	1,584,644,477	2.69	6,620	626	25,836,208	757,634
1944	619,576,240	1,810,900,542	2.92	6,928	624	26,032,348	633,689
1945	577,617,327	1,768,204,320	3.06	7,033	620	27,956,192	467,473
1946	533,922,068	1,835,539,476	3.44	7,333	699	41,197,378	434,680
1947	630,623,722	2,622,634,946	4.16	8,700	755	68,666,963	290,141
1948	599,518,229	2,993,267,021	4.99	9,079	774	45,930,133	291,337
1949	437,868,036	2,136,870,571	4.88	8,559	781	27,842,056	314,980
1950	516,311,053	2,500,373,779	4.84	9,429	790	25,468,403	346,706
1951	533,664,732	2,626,030,137	4.92	8,009	736	56,721,547	292,378
1952	466,840,782	2,289,180,401	4.90	7,275	703	47,643,150	262,268
1953	457,290,449	2,247,828,694	4.92	6,671	670	33,760,263	226,900
1954	391,706,300	1,769,619,723	4.52	6,130	603	31,040,564	198,799
1955	464,633,408	2,092,382,737	4.50	7,856	620	51,255,531	337,145

[1] Figures for 1890–1914 represent fiscal year ended June 30.
[2] Data not available.

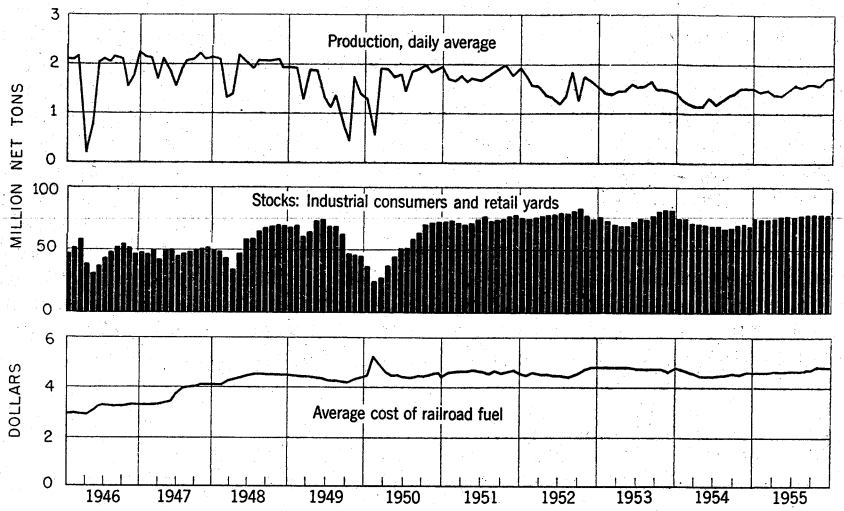

FIGURE 2.—Trends of production, stocks, and railroad fuel prices of bituminous coal and lignite in the United States, 1946–55.

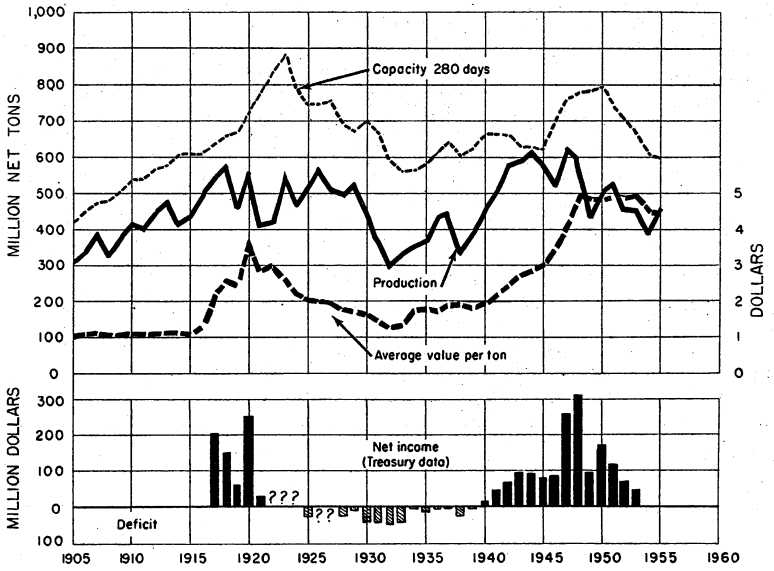

FIGURE 3.—Trends of bituminous-coal and lignite production, realization, mine capacity, and net income or deficit in the United States, 1905–55.

PRODUCTION BY MONTHS AND WEEKS

The figures on monthly and weekly production are estimates based upon (1) railroad carloadings of coal reported daily and weekly by all the important carriers, (2) shipments on the Allegheny and Monongahela Rivers reported by the United States Army Engineers, (3) direct reports from a number of mining companies, and (4)

monthly production statements compiled by certain local operators' associations and State mine departments. In computing the estimates, allowance is made for commercial truck shipments, local sales, colliery fuel, and small truck mines producing over 1,000 tons a year. Preliminary estimates are made currently and published in the Weekly Coal Reports. These preliminary estimates have proved very reliable and for many years have been within approximately 1 percent of the final figure of total production, based upon complete coverage of all mines producing over 1,000 tons a year. The preliminary estimates are revised later to agree with the final total production based on the canvass. Thus, the monthly and weekly estimates of production, summarized in tables 6–9, represent final figures and vary slightly from the preliminary figures of production published currently in the Weekly Coal Report.

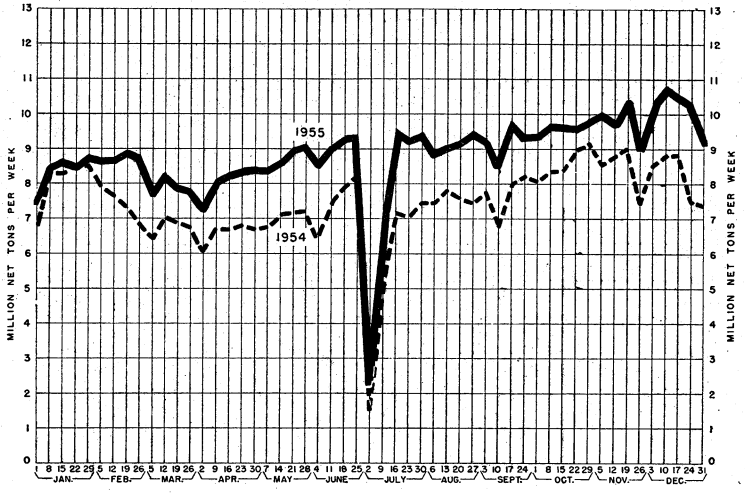

FIGURE 4.—Production of bituminous coal and lignite in the United States, 1954–55, by weeks.

TABLE 6.—Production of bituminous coal and lignite in the United States, 1954–55, with estimates by months

Month	Production (thousand net tons)		Maximum number of working days		Average production per working day (thousand net tons)	
	1954	1955	1954	1955	1954	1955
January	34,345	36,255	25	25	1,374	1,450
February	29,972	35,248	24	24	1,249	1,469
March	31,785	36,857	27	27	1,177	1,365
April	28,528	34,220	25.3	25.4	1,128	1,347
May	29,206	37,898	25.4	25.5	1,150	1,486
June	30,671	35,576	23.3	22.6	1,316	1,574
July	27,706	36,078	23.4	23.3	1,184	1,548
August	33,439	42,484	26	27	1,286	1,573
September	34,402	40,324	25	25	1,376	1,613
October	36,553	41,332	26	26	1,406	1,590
November	37,061	43,135	24.8	24.9	1,494	1,732
December	38,038	45,226	25.4	25.6	1,498	1,767
Total	391,706	464,633	300.6	301.3	1,303	1,542

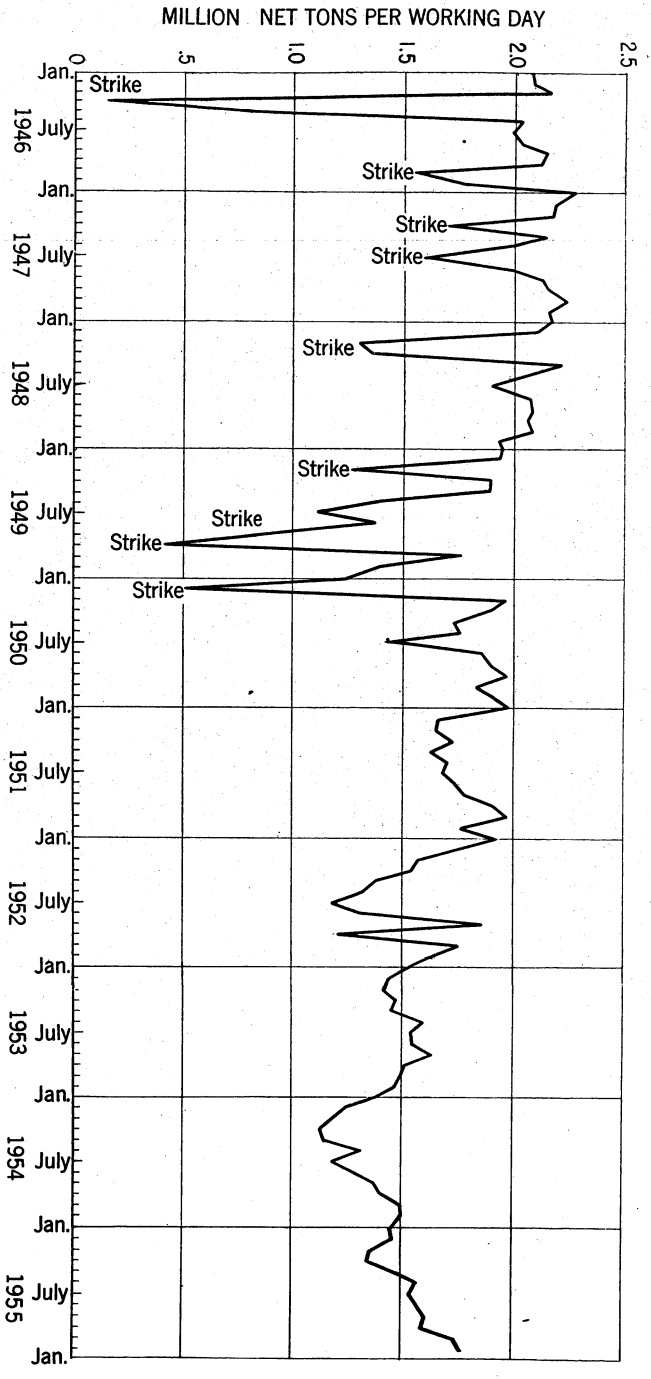

FIGURE 5.—Average production of bituminous coal and lignite in the United States per working day in each month, 1946–55.

TABLE 7.—Production of bituminous coal and lignite in the United States in 1955, by States, with estimates by months, in thousand net tons

(Totals for year are based on final complete returns from all operators known to have produced 1,000 tons and over per year. In most instances monthly apportionment is based on current records of railroad carloadings and shipments on the Allegheny and Monongahela Rivers, supplemented by direct reports from local sources)

State	January	February	March	April	May	June	July	August	September	October	November	December	Total
Alabama	1,052	1,032	1,030	810	1,174	1,062	1,084	1,077	1,194	1,132	1,154	1,287	13,088
Alaska	78	61	64	59	55	40	50	27	41	40	61	64	640
Arkansas	52	48	38	33	37	38	40	46	51	59	67	69	578
Colorado	393	337	290	211	198	184	180	251	298	326	421	479	3,568
Illinois	4,480	4,429	4,040	3,142	3,264	3,036	2,911	3,689	3,639	3,999	4,383	4,920	45,932
Indiana	1,494	1,537	1,496	1,171	1,132	1,118	997	1,234	1,251	1,357	1,588	1,774	16,149
Iowa	128	129	102	76	63	68	76	90	74	88	153	211	1,258
Kansas	80	70	63	46	47	46	50	54	57	65	74	90	742
Kentucky:													
Eastern	3,188	3,087	2,246	1,973	3,273	3,587	3,694	4,514	4,134	4,235	4,360	4,419	42,710
Western	1,995	2,144	2,002	1,743	1,909	2,093	2,005	2,463	2,348	2,467	2,549	2,592	26,310
Total Kentucky	5,183	5,231	4,248	3,716	5,182	5,680	5,699	6,977	6,482	6,702	6,909	7,011	69,020
Maryland	45	52	41	20	27	32	33	42	39	48	64	69	512
Missouri	308	314	273	201	191	204	206	258	257	291	352	377	3,232
Montana:													
Bituminous	140	108	120	84	87	79	67	87	109	102	122	112	1,217
Lignite	3	2	3	2	2	2	2	2	3	2	4	3	30
Total, Montana	143	110	123	86	89	81	69	89	112	104	126	115	1,247
New Mexico	17	14	14	15	14	16	16	21	18	21	16	19	201
North Dakota (lignite)	287	260	271	176	161	181	158	198	253	324	419	414	3,102
Ohio	2,446	2,319	3,115	3,219	3,340	3,133	3,136	3,390	3,243	3,498	3,641	3,390	37,870
Oklahoma	215	206	169	121	140	153	170	197	173	189	204	227	2,164
Pennsylvania	6,678	6,559	7,188	6,808	7,121	6,572	6,542	7,864	7,442	7,388	7,365	8,186	85,713
South Dakota (lignite)	3	2	2	2	2	2	2	2	2	2	2	3	26
Tennessee	519	473	464	376	649	628	634	896	507	534	675	698	7,053
Utah	589	520	575	455	434	409	341	610	505	519	622	717	6,296
Virginia	1,608	1,596	1,634	1,748	1,995	1,910	1,986	2,304	2,191	2,221	2,145	2,170	23,508
Washington	59	46	56	46	50	49	36	53	48	58	56	53	610
West Virginia:													
Southern [1]	7,152	6,696	7,767	7,881	8,656	7,507	7,857	9,228	8,663	8,578	8,576	8,548	97,109
Northern [2]	3,024	2,992	3,556	3,621	3,713	3,232	3,653	3,622	3,530	3,448	3,688	3,980	42,059
Total West Virginia	10,176	9,688	11,323	11,502	12,369	10,739	11,510	12,850	12,193	12,026	12,264	12,528	139,168
Wyoming	219	212	235	178	162	194	151	264	251	338	371	352	2,927
Other States [3]	3	3	3	3	2	1	1	1	3	3	3	3	29
Total	36,255	35,248	36,857	34,220	37,898	35,576	36,078	42,484	40,324	41,332	43,135	45,226	464,633

[1] Includes operations on the N. & W., C. & O., T. & O. C., B., C. & G., and on the B. & O. in Kanawha, Mason, and Clay Counties.

[2] Rest of State, including the Panhandle District and Grant, Mineral, and Tucker Counties.

[3] Includes Arizona, California, and Georgia.

TABLE 8.—Production of bituminous coal and lignite in the United States in 1955, by districts, with estimates by months, in thousand net tons

[Districts as defined in the Bituminous Coal Act of April 26, 1937 (50 Stats. 72, 91-94), and modifications thereto]

(Totals for year are based on final complete returns from all operators known to have produced 1,000 tons and over per year. In most instances monthly apportionment is based on current records of railroad carloadings and shipments on the Allegheny and Monongahela Rivers, supplemented by direct reports from local sources)

District	January	February	March	April	May	June	July	August	September	October	November	December	Total
1. Eastern Pennsylvania	2,687	2,671	2,861	2,734	2,875	2,728	2,821	3,255	3,089	3,035	3,164	3,515	35,435
2. Western Pennsylvania	4,046	3,950	4,380	4,106	4,285	3,888	3,766	4,664	4,404	4,413	4,277	4,753	50,932
3. Northern West Virginia	2,827	2,798	3,325	3,385	3,471	3,021	3,416	3,386	3,300	3,223	3,448	3,720	39,320
4. Ohio	2,446	2,319	3,115	3,219	3,340	3,133	3,136	3,390	3,243	3,498	3,641	3,390	37,870
5. Michigan													
6. Panhandle	187	184	219	224	230	199	225	223	218	213	228	247	2,597
7. Southern Numbered 1	3,386	3,194	3,650	3,724	4,111	3,611	3,776	4,426	4,163	4,134	4,114	4,109	46,398
8. Southern Numbered 2	8,867	8,463	8,270	8,099	10,195	9,762	10,134	12,146	11,123	11,214	11,363	11,438	121,074
9. West Kentucky	1,995	2,144	2,002	1,743	1,909	2,093	2,005	2,463	2,348	2,467	2,549	2,592	26,310
10. Illinois	4,480	4,429	4,040	3,142	3,264	3,036	2,911	3,689	3,639	3,999	4,383	4,920	45,932
11. Indiana	1,494	1,537	1,496	1,171	1,132	1,118	997	1,234	1,251	1,357	1,588	1,774	16,149
12. Iowa	128	129	102	76	63	68	76	90	74	88	153	211	1,258
13. Southeastern	1,267	1,228	1,222	966	1,442	1,322	1,346	1,448	1,404	1,353	1,434	1,576	16,008
14. Arkansas-Oklahoma	153	145	117	90	103	110	120	138	132	148	163	176	1,595
15. Southwestern (bituminous and lignite)	502	493	426	311	312	331	346	417	406	456	534	587	5,121
16. Northern Colorado	118	91	72	41	26	22	12	21	35	54	100	121	713
17. Southern Colorado	281	251	223	176	177	168	174	238	270	280	327	365	2,930
18. New Mexico	13	11	11	11	10	10	10	13	13	15	12	14	143
19. Wyoming	219	212	235	178	162	194	151	264	251	338	371	352	2,927
20. Utah	589	520	575	455	434	409	341	610	505	519	622	717	6,296
21. North-South Dakota (lignite)	290	262	273	178	163	183	160	200	255	326	421	417	3,128
22. Montana (bituminous and lignite)	143	110	123	86	89	81	69	89	112	104	126	115	1,247
23. Washington	137	107	120	105	105	89	86	80	89	98	117	117	1,250
Total	36,255	35,248	36,857	34,220	37,898	35,576	36,078	42,484	40,324	41,332	43,135	45,226	464,633

TABLE 9.—Production of bituminous coal and lignite in the United States, 1954–55, with estimates by weeks

1954				1955			
Week ended—	Production (thousand net tons)	Maximum number of working days	Average production per working day (thousand net tons)	Week ended—	Production (thousand net tons)	Maximum number of working days	Average production per working day (thousand net tons)
Jan. 2	[1] 483	[1] 1	[2] 1,358	Jan. 1	[1] 26	(1)	[2] 1,486
Jan. 9	8,359	6	1,393	Jan. 8	8,547	6	1,425
Jan. 16	8,357	6	1,393	Jan. 15	8,720	6	1,453
Jan. 23	8,573	6	1,429	Jan. 22	8,583	6	1,431
Jan. 30	8,573	6	1,429	Jan. 29	8,871	6	1,479
Feb. 6	7,977	6	1,330	Feb. 5	8,733	6	1,456
Feb. 13	7,721	6	1,287	Feb. 12	8,733	6	1,456
Feb. 20	7,375	6	1,229	Feb. 19	8,977	6	1,496
Feb. 27	6,899	6	1,150	Feb. 26	8,829	6	1,472
Mar. 6	6,450	6	1,075	Mar. 5	7,733	6	1,289
Mar. 13	7,112	6	1,185	Mar. 12	8,315	6	1,386
Mar. 20	6,922	6	1,154	Mar. 19	7,986	6	1,331
Mar. 27	6,837	6	1,140	Mar. 26	7,843	6	1,307
Apr. 3	6,048	5.3	1,141	Apr. 2	7,294	5.4	1,351
Apr. 10	6,782	6	1,130	Apr. 9	8,126	6	1,354
Apr. 17	6,749	6	1,125	Apr. 16	8,330	6	1,388
Apr. 24	6,856	6	1,143	Apr. 23	8,459	6	1,410
May 1	6,773	6	1,129	Apr. 30	8,475	6	1,413
May 8	6,834	6	1,139	May 7	8,467	6	1,411
May 15	7,154	6	1,192	May 14	8,642	6	1,440
May 22	7,202	6	1,200	May 21	9,031	6	1,505
May 29	7,274	6	1,212	May 28	9,132	6	1,522
June 5	6,452	5.4	1,195	June 4	8,552	5.5	1,555
June 12	7,561	6	1,260	June 11	9,080	6	1,513
June 19	7,950	6	1,325	June 18	9,367	6	1,561
June 26	8,287	5.7	1,454	June 25	9,425	5.6	1,683
July 3	1,492	1	1,492	July 2	2,217	1.3	1,705
July 10	5,355	5	1,071	July 9	7,281	5	1,456
July 17	7,199	6	1,200	July 16	9,566	6	1,594
July 24	7,099	6	1,183	July 23	9,314	6	1,552
July 31	7,508	6	1,251	July 30	9,478	6	1,580
Aug. 7	7,491	6	1,249	Aug. 6	8,978	6	1,496
Aug. 14	7,858	6	1,310	Aug. 13	9,114	6	1,519
Aug. 21	7,638	6	1,273	Aug. 20	9,259	6	1,543
Aug. 28	7,502	6	1,250	Aug. 27	9,516	6	1,586
Sept. 4	7,808	6	1,301	Sept. 3	9,322	6	1,554
Sept. 11	6,743	5	1,349	Sept. 10	8,425	5	1,685
Sept. 18	8,039	6	1,340	Sept. 17	9,800	6	1,633
Sept. 25	8,249	6	1,375	Sept. 24	9,398	6	1,566
Oct. 2	8,090	6	1,348	Oct. 1	9,457	6	1,576
Oct. 9	8,396	6	1,399	Oct. 8	9,724	6	1,621
Oct. 16	8,393	6	1,399	Oct. 15	9,694	6	1,616
Oct. 23	9,005	6	1,501	Oct. 22	9,657	6	1,610
Oct. 30	9,182	6	1,530	Oct. 29	9,869	6	1,645
Nov. 6	8,584	6	1,431	Nov. 5	10,084	6	1,681
Nov. 13	8,831	5.8	1,523	Nov. 12	9,764	5.9	1,655
Nov. 20	9,044	6	1,507	Nov. 19	10,366	6	1,728
Nov. 27	7,416	5	1,483	Nov. 26	8,965	5	1,793
Dec. 4	8,563	6	1,427	Dec. 3	10,319	6	1,720
Dec. 11	8,844	6	1,474	Dec. 10	10,809	6	1,802
Dec. 18	8,880	6	1,480	Dec. 17	10,560	6	1,760
Dec. 25	7,533	4.4	1,712	Dec. 24	10,323	5.6	1,843
Jan. 1	[1] 7,404	[1] 5	[2] 1,486	Dec. 31	9,098	5	1,820
Total	391,706	300.6	1,303	Total	464,633	301.3	1,542

[1] Figures represent output and number of working days in that part of the week included in the calendar year shown. Total production for the week ended January 2, 1954, was 6,790,000 net tons, and for January 1, 1955, 7,430,000 net tons.

[2] Average daily output for the entire week and not for working days in the calendar year shown.

SUMMARY BY STATES

TABLE 10.—Bituminous coal and lignite produced in the United States, by States, 1946–55, with production of maximum year and cumulative production from earliest record to end of 1955, in thousand net tons

State	Maximum production		Production by years										Total production from earliest record to end of 1955
	Year	Quantity	1946	1947	1948	1949	1950	1951	1952	1953	1954	1955	
Alabama	1926	21,001	16,183	19,048	18,801	12,934	14,422	13,597	11,383	12,532	10,282	13,088	897,582
Arkansas	1907	2,670	1,631	1,871	1,662	962	1,169	1,107	873	775	477	578	96,355
Colorado	1917	12,483	5,914	6,358	5,631	4,636	4,259	4,103	3,623	3,575	2,900	3,568	493,149
Illinois	1918	89,291	63,469	67,860	65,342	47,208	56,291	54,200	45,790	46,010	41,971	45,932	3,421,477
Indiana	1918	30,679	21,697	25,449	23,849	16,550	19,957	19,451	16,350	15,812	13,400	16,149	1,086,407
Iowa	1917	8,966	1,788	1,684	1,670	1,725	1,891	1,630	1,381	1,388	1,197	1,258	346,478
Kansas	1918	7,562	2,493	2,745	2,538	2,031	2,125	1,961	2,029	1,715	1,372	742	275,995
Kentucky	1947	84,241	66,553	84,241	82,084	62,583	78,495	74,972	66,114	56,060	65,964	69,020	2,366,399
Maryland	1907	5,533	2,003	2,051	1,661	668	648	589	588	530	422	512	263,114
Missouri	1917	5,671	3,733	4,236	4,023	3,647	2,963	3,269	2,955	2,393	2,514	3,232	274,794
Montana (bituminous and lignite)	1944	4,844	3,723	3,178	2,898	2,766	2,520	2,345	2,070	1,873	1,491	1,247	168,809
New Mexico	1918	4,023	1,280	1,443	1,364	1,004	727	783	760	514	123	201	124,548
North Dakota (lignite)	1950	3,261	2,555	2,760	2,961	2,967	3,261	3,224	2,984	2,803	(1)	3,102	[2] 83,014
Ohio	1920	45,878	32,314	37,548	38,708	30,961	37,761	37,949	36,209	34,737	32,469	37,870	1,914,677
Oklahoma	1920	4,849	2,647	3,421	3,462	3,022	2,679	2,223	2,193	2,168	1,915	2,164	172,117
Pennsylvania	1918	178,551	125,497	147,079	134,542	89,215	105,870	108,164	89,181	93,331	72,010	85,713	7,920,060
Tennessee	1942	8,158	5,618	6,258	6,483	4,172	5,070	5,401	5,265	5,467	6,429	7,053	358,997
Utah	1947	7,429	5,994	7,429	6,813	6,160	6,670	6,136	6,140	6,544	5,008	6,296	234,660
Virginia	1952	21,579	15,527	20,171	17,999	14,584	17,667	21,400	21,579	19,119	16,387	23,508	673,783
Washington	1918	4,082	991	1,118	1,220	899	874	857	844	690	619	610	146,943
West Virginia	1947	176,157	144,020	176,157	168,862	122,610	144,116	163,310	141,713	134,105	115,996	139,168	5,800,151
Wyoming	1945	9,847	7,635	8,051	6,412	6,001	6,348	6,430	6,088	5,245	2,831	2,927	393,330
Other States [3]			657	468	533	563	528	564	729	904	4,929	695	181,612
Total	1947	630,624	533,922	630,624	599,518	437,868	516,311	533,665	466,841	457,290	391,706	464,633	27,694,451

[1] North Dakota included in "Other States" in 1954 to avoid disclosing individual operations.

[2] Excludes production of North Dakota in 1954 to avoid disclosure of individual operations.

[3] Production, if any, in Alaska, Arizona, California, Georgia, Idaho, Michigan, North Carolina, Oregon, South Dakota, or Texas, included in "Other States."

TABLE 11.—Number of mines, production, value, men working daily, days active, man-days, and output per man per day at bituminous-coal and lignite mines in the United States, 1955, by States

(Exclusive of mines producing less than 1,000 tons)

State	Number of active mines	Production (net tons)				Average value per ton [3]	Average number of men working daily	Average number of days mines worked	Number of man-days worked	Average tons per man per day
		Shipped by rail or water [1]	Shipped by truck	Used at mine [2]	Total					
Alabama	235	10,507,672	1,235,895	1,344,910	13,088,477	$6.06	8,838	215	1,900,047	6.89
Alaska	13	620,887	12,463	6,346	639,696	9.00	264	250	66,097	9.68
Arizona	2		8,898		8,898	6.66	23	139	3,201	2.78
Arkansas	27	570,687	6,534	505	577,726	7.48	574	166	95,082	6.08
California (lignite)	1			7,650	7,650	10.00	2	250	500	15.30
Colorado	117	2,641,562	866,403	59,965	3,567,930	5.63	2,882	196	564,120	6.32
Georgia	6		12,471		12,471	5.00	25	182	4,620	2.70
Illinois	171	40,378,380	5,273,582	280,152	45,932,114	3.66	13,422	201	2,697,571	17.02
Indiana	100	13,473,622	2,019,163	656,525	16,149,310	3.59	4,368	201	878,119	18.39
Iowa	60	662,288	594,347	1,722	1,258,357	3.50	677	188	127,521	9.87
Kansas	24	548,663	192,923	696	742,282	4.27	347	189	65,454	11.34
Kentucky	2,004	60,349,830	8,306,792	363,288	69,019,910	4.18	38,426	184	7,080,555	9.75
Maryland	84	220,549	290,820	1,100	512,469	3.91	561	163	91,445	5.60
Missouri	47	2,785,598	445,025	1,862	3,232,485	3.95	928	217	201,213	16.06
Montana:										
Bituminous	16	1,144,043	68,121	4,729	1,216,893	3.01	272	235	63,807	19.07
Lignite	8		30,259	101	30,360	3.82	27	128	3,455	8.79
Total Montana	24	1,144,043	98,380	4,830	1,247,253	3.03	299	225	67,262	18.54
New Mexico	31	96,308	104,010	1,261	201,579	6.13	222	212	47,060	4.28
North Dakota (lignite)	45	2,298,988	450,306	352,793	3,102,087	2.34	406	218	88,482	35.06
Ohio	530	25,430,841	11,091,355	1,347,595	37,869,791	3.53	11,340	227	2,576,631	14.70
Oklahoma	35	2,119,674	43,320	542	2,163,536	5.86	1,322	177	234,563	9.22
Pennsylvania	1,411	71,165,034	11,391,136	3,157,286	85,713,456	5.14	47,974	217	10,419,304	8.23
South Dakota (lignite)	2		25,782		25,782	3.50	10	250	2,500	10.31
Tennessee	504	4,371,959	2,654,915	25,970	7,052,844	4.08	6,397	162	1,038,054	6.79
Utah	50	5,605,128	433,367	257,029	6,295,524	6.35	2,795	231	645,636	9.75
Virginia	1,059	20,781,990	2,648,579	76,940	23,507,509	4.60	15,225	209	3,186,108	7.38
Washington	13	489,081	111,303	9,406	609,790	6.99	572	203	116,395	5.24
West Virginia	1,237	134,398,283	3,190,450	1,579,156	139,167,889	4.70	66,231	224	14,837,347	9.38
Wyoming	24	2,738,805	98,916	88,872	2,926,593	4.05	963	198	190,781	15.34
Total	7,856	403,399,872	51,607,135	9,626,401	464,633,408	4.50	225,093	210	47,225,668	9.84

[1] Includes coal loaded at mines directly into railroad cars or river barges, hauled by trucks to railroad sidings, and hauled by trucks to waterways.

[2] Includes coal transported from mines to point of use by conveyor belts or trams, used by mine employees, taken by locomotive tenders at tipples, used at mines for power and heat, made into beehive coke at mines, and all other uses at mines.

[3] Value received or charged for coal, f. o. b. mines. Includes a value, estimated by producer, for coal not sold.

TABLE 12.—Number of mines, production, value, men working daily, days active, man-days, and output per man per day at bituminous-coal and lignite mines in the United States, 1955, by districts

[Districts as defined in the Bituminous Coal Act of April 26, 1937 (50 Stats. 72, 91–94), and modifications thereto]

(Exclusive of mines producing less than 1,000 tons)

District	Number of active mines	Production (net tons)				Average value per ton [3]	Average number of men working daily	Average number of days mines worked	Number of man-days worked	Average tons per man per day
		Shipped by rail or water [1]	Shipped by truck	Used at mine [2]	Total					
1. Eastern Pennsylvania	1,020	29,221,239	4,619,407	1,594,627	35,435,273	$4.64	21,574	206	4,447,469	7.97
2. Western Pennsylvania	497	42,181,521	7,186,707	1,563,834	50,932,062	5.47	27,142	225	6,094,916	8.36
3. Northern West Virginia	431	37,797,561	1,363,177	159,407	39,320,145	4.19	16,355	207	3,392,011	11.59
4. Ohio	530	25,430,841	11,091,355	1,347,595	37,869,791	3.53	11,340	227	2,576,631	14.70
5. Michigan										
6. Panhandle	22	1,735,668	273,733	587,908	2,597,309	4.21	1,241	205	254,949	10.19
7. Southern Numbered 1	613	44,599,019	1,270,106	528,910	46,398,035	5.37	27,717	224	6,196,626	7.49
8. Southern Numbered 2	3,322	108,849,900	11,473,744	750,285	121,073,929	4.65	71,612	194	14,433,591	8.39
9. West Kentucky	133	24,956,676	1,338,927	14,524	26,310,127	3.00	6,683	212	1,419,821	18.53
10. Illinois	171	40,378,380	5,273,582	280,152	45,932,114	3.66	13,422	201	2,697,571	17.02
11. Indiana	100	13,473,622	2,019,163	656,525	16,149,310	3.59	4,368	201	878,119	18.39
12. Iowa	60	662,288	594,347	1,722	1,258,357	3.50	677	188	127,521	9.87
13. Southeastern	502	12,453,733	2,205,257	1,349,155	16,008,145	5.67	11,353	204	2,318,097	6.91
14. Arkansas-Oklahoma	45	1,583,434	11,310	603	1,595,347	6.72	1,096	170	186,537	8.55
15. Southwestern	88	4,441,188	676,492	3,002	5,120,682	4.34	2,075	300	409,775	12.50
16. Northern Colorado	13	352,616	334,374	26,337	713,327	4.47	398	187	74,279	9.60
17. Southern Colorado	113	2,345,793	549,584	34,865	2,930,242	5.93	2,537	198	501,866	5.84
18. New Mexico	25	39,461	95,353	7,674	142,488	6.40	194	200	38,736	3.68
19. Wyoming	24	2,738,805	98,916	88,872	2,926,593	4.05	963	198	190,781	15.34
20. Utah	50	5,605,128	433,367	257,029	6,295,524	6.35	2,795	231	645,636	9.75
21. North-South Dakota	47	2,298,988	476,088	352,793	3,127,869	2.35	416	218	90,982	34.41
22. Montana	24	1,144,043	98,380	4,830	1,247,253	3.03	299	225	67,262	18.54
23. Washington	26	1,109,968	123,766	15,752	1,249,486	8.02	836	218	182,492	6.70
Total	7,856	403,399,872	51,607,135	9,626,401	464,633,408	4.50	225,093	210	47,225,668	9.84

[1] Includes coal loaded at mines directly into railroad cars or river barges, hauled by trucks to railroad sidings, and hauled by trucks to waterways.

[2] Includes coal transported from mines to point of use by conveyor belts or trams, used by mine employees, taken by locomotive tenders at tipples, used at mines for power and heat, made into beehive coke at mines, and all other uses at mines.

[3] Value received or charged for coal, f. o. b. mines. Includes a value, estimated by producer, for coal not sold.

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NUMBER AND SIZE OF MINES

The unit in the statistical record is the mine, and operating companies are requested to make a separate report for each mine because its location is definitely known and can be related to a specific district or county; its identity can be followed through successive changes of

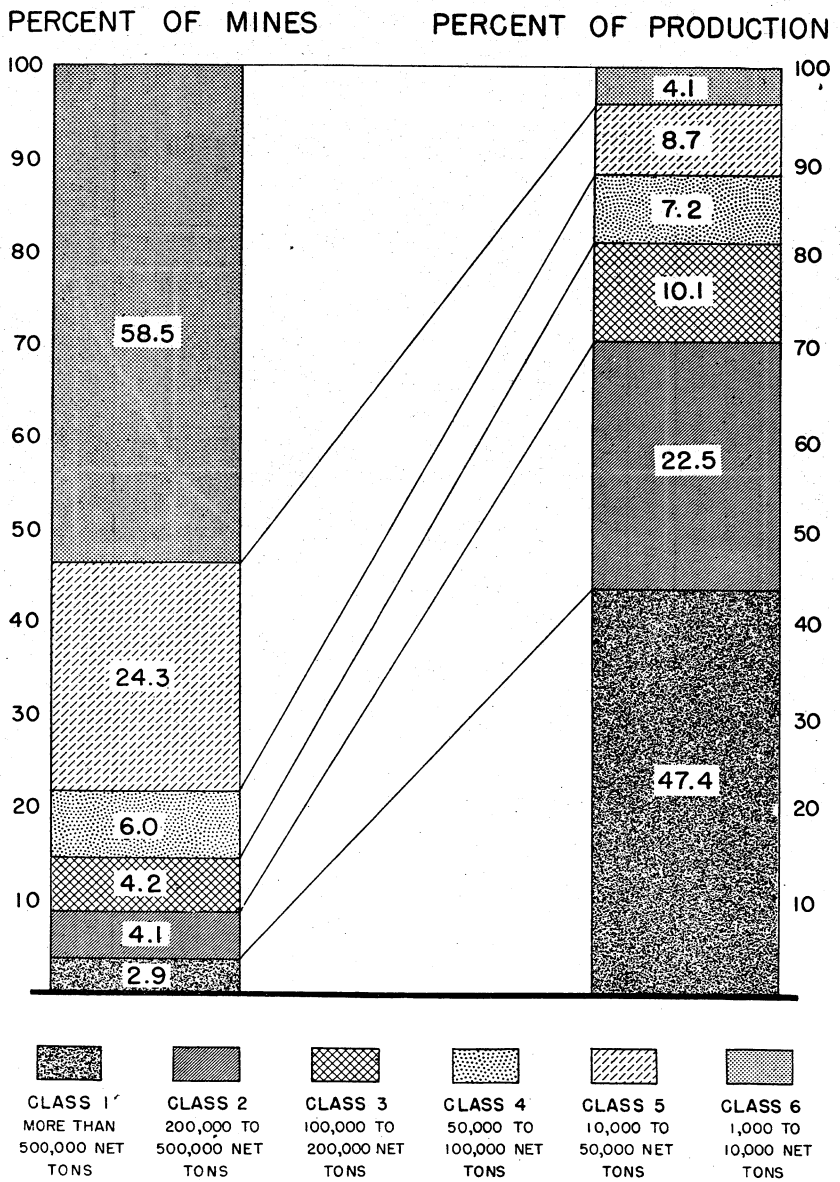

FIGURE 6.—Percentage of number of mines and of production of bituminous-coal and lignite mines in the United States, 1955, by size of output.

TABLE 13.—Number and production of bituminous-coal and lignite mines in the United States, 1955, by States and size of output

(Exclusive of mines producing less than 1,000 tons)

State	Class 1—500,000 tons and over				Class 2—200,000 to 500,000 tons				Class 3—100,000 to 200,000 tons			
	Mines		Production		Mines		Production		Mines		Production	
	Number	Percentage	Net tons	Percentage	Number	Percentage	Net tons	Percentage	Number	Percentage	Net tons	Percentage
Alabama	7	3.0	6,691,204	51.2	10	4.2	2,924,771	22.3	9	3.8	1,161,200	8.9
Alaska					1	7.7	205,295	32.1	2	15.4	268,050	41.9
Arizona												
Arkansas												
California (lignite)									1	3.7	129,535	22.4
Colorado	1	.9	683,553	19.2	2	1.7	666,982	18.7	6	5.1	889,942	24.9
Georgia												
Illinois	38	22.2	37,667,349	82.0	14	8.2	5,057,012	11.0	8	4.7	1,290,419	2.8
Indiana	10	10.0	8,332,833	51.6	15	15.0	5,615,498	34.8	4	4.0	622,127	3.8
Iowa					1	1.6	275,634	21.9				
Kansas					1	4.2	484,614	65.3	1	4.2	111,665	15.0
Kentucky	35	1.7	29,780,080	43.1	44	2.2	13,802,047	20.0	48	2.4	6,383,071	9.2
Maryland												
Missouri	2	4.3	1,339,372	41.4	4	8.5	1,359,105	42.1	2	4.3	278,719	8.6
Montana (bituminous and lignite)	1	4.2	795,955	63.8	1	4.2	253,300	20.3				
New Mexico												
North Dakota (lignite)	1	2.2	510,566	16.4	5	11.1	1,804,106	58.2	2	4.5	371,102	12.0
Ohio	16	3.0	16,875,814	44.4	18	3.4	6,103,466	16.1	51	9.6	6,965,716	18.6
Oklahoma					2	5.7	473,700	21.9	8	22.9	1,294,376	59.8
Pennsylvania	35	2.5	40,447,472	47.2	47	3.3	16,453,438	19.2	66	4.7	9,388,430	11.0
South Dakota (lignite)												
Tennessee					5	1.0	1,459,512	20.7	9	1.8	1,372,395	19.5
Utah	2	4.0	1,137,690	18.1	9	18.0	3,547,419	56.3	6	12.0	822,584	13.1
Virginia	7	.6	6,662,211	28.3	14	1.3	4,058,960	17.3	14	1.3	2,075,847	8.8
Washington									2	15.4	335,704	55.1
West Virginia	70	5.6	68,404,763	49.1	124	10.0	38,890,432	27.9	89	7.2	12,661,521	9.1
Wyoming	2	8.3	1,084,768	37.1	3	12.5	1,200,865	41.0	3	12.5	349,705	12.0
Total	227	2.9	220,413,630	47.4	320	4.1	104,636,156	22.5	331	4.2	46,772,108	10.1

TABLE 13.—Number and production of bituminous-coal and lignite mines in the United States, 1955, by States and size of output—Con.

(Exclusive of mines producing less than 1,000 tons)

State	Class 4—50,000 to 100,000 tons				Class 5—10,000 to 50,000 tons				Class 6—Less than 10,000 tons				Total		
	Mines		Production		Mines		Production		Mines		Production		Mines	Production (net tons)	
	Number	Percentage	Net tons	Percentage	Number	Percentage	Net tons	Percentage	Number	Percentage	Net tons	Percentage		Total	Average per mine
Alabama	11	4.7	838,091	6.4	39	16.7	860,057	6.5	159	67.6	613,154	4.7	235	13,088,477	55,696
Alaska	1	7.7	93,984	14.7	3	23.0	49,717	7.8	6	46.2	22,650	3.5	13	639,696	49,207
Arizona									2	100.0	8,898	100.0	2	8,898	4,449
Arkansas	4	14.8	277,326	48.0	7	25.9	114,430	19.8	15	55.6	56,435	9.8	27	577,726	21,397
California (lignite)									1	100.0	7,650	100.0	1	7,650	7,650
Colorado	6	5.1	413,591	11.6	29	24.8	625,869	17.5	73	62.4	287,993	8.1	117	3,567,930	30,495
Georgia									6	100.0	12,471	100.0	6	12,471	2,079
Illinois	12	7.0	845,753	1.8	31	18.1	774,945	1.7	68	39.8	296,636	.7	171	45,932,114	268,608
Indiana	12	12.0	886,391	5.5	26	26.0	526,486	3.3	33	33.0	165,975	1.0	100	16,149,310	161,493
Iowa	3	5.0	227,544	18.1	28	46.7	619,298	49.2	28	46.7	135,881	10.8	60	1,258,357	20,973
Kansas					3	12.5	77,561	10.5	19	79.1	68,442	9.2	24	742,282	30,928
Kentucky	72	3.6	5,166,461	7.5	444	22.2	8,660,058	12.6	1,361	67.9	5,228,193	7.6	2,004	69,019,910	34,441
Maryland					17	20.2	265,593	51.8	67	79.8	246,876	48.2	84	512,469	6,101
Missouri					5	10.6	121,701	3.8	34	72.3	133,588	4.1	47	3,232,485	68,776
Montana (bituminous and lignite)	1	4.2	65,134	5.2	2	8.3	40,685	3.3	19	79.1	92,179	7.4	24	1,247,253	51,969
New Mexico	1	3.2	59,206	29.4	3	9.7	51,328	25.5	27	87.1	91,045	45.1	31	201,579	6,503
North Dakota (lignite)	2	4.4	100,414	3.2	9	20.0	203,382	6.6	26	57.8	112,517	3.6	45	3,102,087	68,935
Ohio	46	8.7	3,162,046	8.4	153	28.9	3,723,235	9.8	246	46.4	1,039,514	2.7	530	37,869,791	71,452
Oklahoma	2	5.7	174,894	8.1	7	20.0	169,994	7.9	16	45.7	50,572	2.3	35	2,163,536	61,815
Pennsylvania	109	7.7	7,739,130	9.0	386	27.4	8,611,587	10.0	768	54.4	3,073,399	3.6	1,411	85,713,456	60,747
South Dakota (lignite)					1	50.0	23,982	93.0	1	50.0	1,800	7.0	2	25,782	12,891
Tennessee	14	2.8	927,094	13.1	90	17.8	1,846,555	26.2	386	76.6	1,447,288	20.5	504	7,052,844	13,994
Utah	8	16.0	523,822	8.3	9	18.0	193,343	3.1	16	32.0	70,666	1.1	50	6,295,524	125,910
Virginia	43	4.1	2,769,470	11.8	239	22.6	4,494,756	19.1	742	70.1	3,446,265	14.7	1,059	23,507,509	22,198
Washington	1	7.7	95,895	15.7	5	38.5	158,780	26.0	5	38.4	19,411	3.2	13	609,790	46,907
West Virginia	121	9.8	8,854,362	6.4	367	29.7	8,145,153	5.9	466	37.7	2,211,658	1.6	1,237	139,167,889	112,504
Wyoming	2	8.4	129,608	4.4	5	20.8	134,446	4.6	9	37.5	27,201	.9	24	2,926,593	121,941
Total	471	6.0	33,350,216	7.2	1,908	24.3	40,492,941	8.7	4,599	58.5	18,968,357	4.1	7,856	464,633,408	59,144

ownership; and it is the natural operating unit from the point of view of cost, mechanical equipment, mining practice, and output per man per day.

EMPLOYMENT AND PRODUCTIVITY

The bituminous-coal and lignite industry has become highly mechanized, mostly in the last 20 years. This has had a substantial influence on production per man per day and on the number of employees required. Roughly speaking, productivity has doubled and the number of employees has declined 50 percent in the past 20 years.

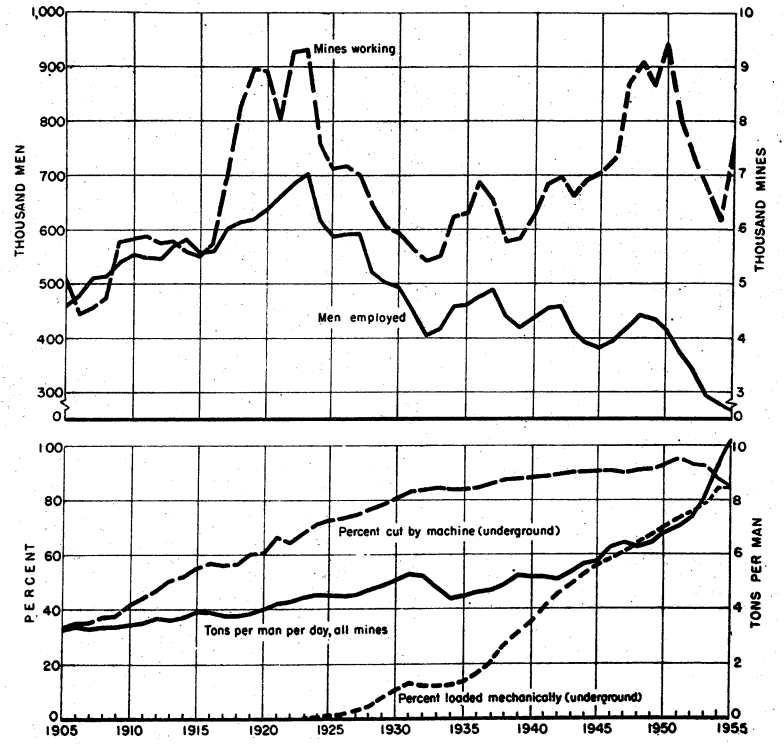

FIGURE 7.—Trends of employment, mechanization, and output per man at bituminous-coal and lignite mines in the United States, 1905–55.

TABLE 14.—Growth of the bituminous-coal- and lignite-mining industry in the United States, 1890–1955

Year	Men employed	Average number of days worked	Average days lost per man on strike	Net tons per man—		Percentage of underground production—		Percentage of total production—	
				Per day	Per year	Cut by machines [1]	Mechanically loaded	Mechanically cleaned [2]	Mined by stripping
1890	192,204	226	(3)	2.56	579	(3)	(3)	(3)	(3)
1891	205,803	223	(3)	2.57	573	5.3	(3)	(3)	(3)
1892	212,893	219	(3)	2.72	596	(3)	(3)	(3)	(3)
1893	230,365	204	(3)	2.73	557	(3)	(3)	(3)	(3)
1894	244,603	171	(3)	2.84	486	(3)	(3)	(3)	(3)
1895	239,962	194	(3)	2.90	563	(3)	(3)	(3)	(3)
1896	244,171	192	(3)	2.94	564	11.9	(3)	(3)	(3)
1897	247,817	196	(3)	3.04	596	15.3	(3)	(3)	(3)
1898	255,717	211	(3)	3.09	651	19.5	(3)	(3)	(3)
1899	271,027	234	46	3.05	713	22.7	(3)	(3)	(3)
1900	304,375	234	43	2.98	697	24.9	(3)	(3)	(3)
1901	340,235	225	35	2.94	664	25.6	(3)	(3)	(3)
1902	370,056	230	44	3.06	703	26.8	(3)	(3)	(3)
1903	415,777	225	28	3.02	680	27.6	(3)	(3)	(3)
1904	437,832	202	44	3.15	637	28.2	(3)	(3)	(3)
1905	460,629	211	23	3.24	684	32.8	(3)	(3)	(3)
1906	478,425	213	63	3.36	717	34.7	(3)	2.7	(3)
1907	513,258	234	14	3.29	769	35.1	(3)	2.9	(3)
1908	516,264	193	38	3.34	644	37.0	(3)	3.6	(3)
1909	543,152	209	29	3.34	699	37.5	(3)	3.8	(3)
1910	555,533	217	89	3.46	751	41.7	(3)	3.8	(3)
1911	549,775	211	27	3.50	738	43.9	(3)	(3)	(3)
1912	548,632	223	35	3.68	820	46.8	(3)	3.9	(3)
1913	571,882	232	36	3.61	837	50.7	(3)	4.6	(3)
1914	583,506	195	80	3.71	724	51.8	(3)	4.8	0.3
1915	557,456	203	61	3.91	794	55.3	(3)	4.7	.6
1916	561,102	230	26	3.90	896	56.9	(3)	4.6	.8
1917	603,143	243	17	3.77	915	56.1	(3)	4.6	1.0
1918	615,305	249	7	3.78	942	56.7	(3)	3.8	1.4
1919	621,998	195	37	3.84	749	60.0	(3)	3.6	1.2
1920	639,547	220	22	4.00	881	60.7	(3)	3.3	1.5
1921	663,754	149	23	4.20	627	66.4	(3)	3.4	1.2
1922	687,958	142	117	4.28	609	64.8	(3)	(3)	2.4
1923	704,793	179	20	4.47	801	68.3	0.3	3.8	2.1
1924	619,604	171	73	4.56	781	71.5	.7	(3)	2.8
1925	588,493	195	30	4.52	884	72.9	1.2	(3)	3.2
1926	593,647	215	24	4.50	966	73.8	1.9	(3)	3.0
1927	593,918	191	153	4.55	872	74.9	3.3	5.3	3.6
1928	522,150	203	83	4.73	959	76.9	4.5	5.7	4.0
1929	502,993	219	11	4.85	1,064	78.4	7.4	6.9	3.8
1930	493,202	187	43	5.06	948	81.0	10.5	8.3	4.3
1931	450,213	160	35	5.30	849	83.2	13.1	9.5	5.0
1932	406,380	146	120	5.22	762	84.1	12.3	9.8	6.3
1933	418,703	167	30	4.78	797	84.7	12.0	10.4	5.5
1934	458,011	178	15	4.40	785	84.1	12.2	11.1	5.8
1935	462,403	179	4 7	4.50	805	84.2	13.5	12.2	6.4
1936	477,204	199	21	4.62	920	84.8	16.3	13.9	6.4
1937	491,864	193	4 19	4.69	906	(3)	20.2	14.6	7.1
1938	441,333	162	13	4.89	790	87.5	26.7	18.2	8.7
1939	421,788	178	36	5.25	936	87.9	31.0	20.1	9.6

See footnotes at end of table.

TABLE 14.—Growth of the bituminous-coal- and lignite-mining industry in the United States, 1890–1955—Continued

Year	Men employed	Average number of days worked	Average days lost per man on strike	Net tons per man—		Percentage of underground production—		Percentage of total production—	
				Per day	Per year	Cut by machines [1]	Mechanically loaded	Mechanically cleaned [2]	Mined by stripping
1940	439,075	202	8	5.19	1,049	88.4	35.4	22.2	9.2
1941	456,981	216	27	5.20	1,125	89.0	40.7	22.9	10.7
1942	461,991	246	7	5.12	1,261	89.7	45.2	24.4	11.5
1943	416,007	264	[4] 15	5.38	1,419	90.3	48.9	24.7	13.5
1944	393,347	278	[4] 5	5.67	1,575	90.5	52.9	25.6	16.3
1945	383,100	261	[4] 9	5.78	1,508	90.8	56.1	25.6	19.0
1946	[5] 396,434	214	[4] 23	6.30	1,347	90.8	58.4	26.0	21.1
1947	[5] 419,182	234	[4] 5	6.42	1,504	90.0	60.7	27.7	22.1
1948	[5] 441,631	217	[4] 16	6.26	1,358	90.7	64.3	30.2	23.3
1949	[5] 433,698	157	[4] 15	6.43	1,010	91.4	67.0	35.1	24.2
1950	[5] 415,582	183	[4] 56	6.77	1,239	91.8	69.4	38.5	23.9
1951	[5] 372,897	203	[4] 4	7.04	1,429	93.4	73.1	45.0	22.0
1952	[5] 335,217	186	[4] 6	7.47	1,389	92.8	75.6	48.7	23.3
1953	[5] 293,106	191	[4] 3	8.17	1,560	92.3	79.6	52.9	23.1
1954	[5] 227,397	182	[4] 4	9.47	1,724	88.8	84.0	59.4	25.1
1955	[5] 225,093	210	[4] 4	9.84	2,064	88.1	84.6	58.7	24.8

[1] Percentages for 1890–1913 are of total production, as separation of strip and underground production is not available for those years.
[2] Percentages for 1906–26 are exclusive of coal cleaned at central washeries operated by consumers.
[3] Data not available.
[4] Bureau of Labor Statistics, U. S. Department of Labor.
[5] Average number of men working daily.

UNDERGROUND MINING

Three-fourths of the bituminous coal and lignite produced is mined underground. The major tasks underground are cutting, drilling shot holes, loading, and haulage. Loading is so important that it is given special treatment later in the section on Mechanical Loading. For many years approximately 90 percent of the underground production has been cut by machine. The use of power drills for shot holes has increased rapidly in the past 15 years; and by 1955, 83 percent of the production was from mines using power drills. Trolley locomotives are the principal method of underground haulage; however, in recent years the use of shuttle cars has been growing rapidly.

TABLE 15.—Production and average output per man per day of bituminous-coal and lignite mines in the United States, 1955, by States and by underground, auger, and strip mining

State	Production (net tons)				Percentage of total production				Average tons per man per day			
	Underground	Auger	Strip	Total	Underground	Auger	Strip	Total	Underground	Auger	Strip	Total
Alabama	10,970,610	6,888	2,110,979	13,088,477	83.8	0.1	16.1	100.0	6.25	20.00	14.64	6.89
Alaska	239,571		400,125	639,696	37.5		62.5	100.0	5.64		16.94	9.68
Arizona	8,898			8,898	100.0			100.0	2.78			2.78
Arkansas	317,001		260,725	577,726	54.9		45.1	100.0	4.36		11.65	6.08
California (lignite)			7,650	7,650			100.0	100.0			15.30	15.30
Colorado	3,211,125		356,805	3,567,930	90.0		10.0	100.0	5.84		24.41	6.32
Georgia	12,471			12,471	100.0			100.0	2.70			2.70
Illinois	27,256,495		18,675,619	45,932,114	59.3		40.7	100.0	14.23		23.87	17.02
Indiana	4,967,089		11,182,221	16,149,310	30.8		69.2	100.0	10.66		27.14	18.39
Iowa	297,490		960,867	1,258,357	23.6		76.4	100.0	4.33		16.35	9.87
Kansas	14,819		727,463	742,282	2.0		98.0	100.0	3.17		11.97	11.34
Kentucky	54,440,144	936,526	13,643,240	69,019,910	78.9	1.3	19.8	100.0	8.38	19.17	25.36	9.75
Maryland	275,454		237,015	512,469	53.8		46.2	100.0	3.82		12.22	5.60
Missouri	157,103		3,075,382	3,232,485	4.9		95.1	100.0	2.99		20.69	16.06
Montana:												
Bituminous	415,338		801,555	1,216,893	34.1		65.9	100.0	7.91		70.72	19.07
Lignite	23,947		6,413	30,360	78.9		21.1	100.0	8.63		9.42	8.79
Total Montana	439,285		807,968	1,247,253	35.2		64.8	100.0	7.95		67.25	18.54
New Mexico	174,299		27,280	201,579	86.5		13.5	100.0	3.86		14.44	4.28
North Dakota (lignite)	21,357		3,080,730	3,102,087	.7		99.3	100.0	7.99		35.90	35.06
Ohio	12,632,165	1,279,297	23,958,329	37,869,791	33.3	3.4	63.3	100.0	8.47	35.38	22.83	14.70
Oklahoma	694,323		1,469,213	2,163,536	32.1		67.9	100.0	4.57		17.75	9.22
Pennsylvania	64,904,231	291,112	20,518,113	85,713,456	75.7	.4	23.9	100.0	7.19	13.50	14.99	8.23
South Dakota (lignite)			25,782	25,782			100.0	100.0			10.31	10.31
Tennessee	5,340,664	77,128	1,635,052	7,052,844	75.7	1.1	23.2	100.0	5.72	11.62	16.72	6.79
Utah	6,295,524			6,295,524	100.0			100.0	9.75			9.75
Virginia	22,241,262	284,465	981,782	23,507,509	94.6	1.2	4.2	100.0	7.19	14.06	13.78	7.38
Washington	578,076		31,714	609,790	94.8		5.2	100.0	5.01		25.66	5.24
West Virginia	126,588,262	3,199,984	9,379,643	139,167,889	91.0	2.3	6.7	100.0	8.86	22.92	22.96	9.38
Wyoming	1,387,521		1,539,072	2,926,593	47.4		52.6	100.0	9.35		36.32	15.34
Total	343,465,239	6,075,400	115,092,769	464,633,408	73.9	1.3	24.8	100.0	8.28	22.22	21.12	9.84

TABLE 16.—Underground production of bituminous coal and lignite in the United States, 1955, by States and mining methods

State	Cut by hand and shot from solid		Cut by machines				Mined by continuous mining machines		Total underground (net tons)
	Net tons	Percentage of total underground	Net tons	Percentage of total underground	Number of coal-cutting machines	Average output per machine (net tons)	Net tons	Percentage of total underground	
Alabama	485,546	4.4	9,174,289	83.6	252	36,406	1,310,775	12.0	10,970,610
Alaska	223,358	93.2					16,213	6.8	239,571
Arizona	3,000	33.7	5,898	66.3	1	5,898			8,898
Arkansas	16,000	5.0	301,001	95.0	36	8,361			317,001
Colorado	789,595	24.6	2,344,856	73.0	256	9,160	76,674	2.4	3,211,125
Georgia	12,471	100.0							12,471
Illinois	92,017	.3	24,625,528	90.4	238	103,469	2,538,950	9.3	27,256,495
Indiana	67,594	1.4	4,798,485	96.6	95	50,510	101,010	2.0	4,967,089
Iowa	110,668	37.2	186,822	62.8	26	7,185			297,490
Kansas	1,300	8.8	13,519	91.2	4	3,380			14,819
Kentucky	3,371,119	6.2	50,391,912	92.6	1,683	29,942	677,113	1.2	54,440,144
Maryland	115,409	41.9	160,045	58.1	38	4,212			275,454
Missouri	11,855	7.5	145,248	92.5	22	6,602			157,103
Montana:									
Bituminous	16,113	3.9	399,225	96.1	23	17,358			415,338
Lignite	23,947	100.0							23,947
Total Montana	40,060	9.1	399,225	90.9	23	17,358			439,285
New Mexico	42,280	24.3	132,019	75.7	12	11,002			174,299
North Dakota (lignite)	6,092	28.5	15,265	71.5	2	7,633			21,357
Ohio	135,951	1.1	11,034,650	87.3	363	30,398	1,461,564	11.6	12,632,165
Oklahoma	16,007	2.3	678,316	97.7	83	8,172			694,323
Pennsylvania	1,557,595	2.4	50,182,668	77.3	1,754	28,529	13,163,968	20.3	64,904,231
Tennessee	804,438	15.1	4,536,226	84.9	267	16,990			5,340,664
Utah	20,334	.3	5,744,243	91.3	126	45,589	530,947	8.4	6,295,524
Virginia	2,296,210	10.3	18,962,744	85.3	820	23,125	982,308	4.4	22,241,262
Washington	146,477	25.4	170,729	29.5	33	5,174	260,870	45.1	578,076
West Virginia	3,124,263	2.5	117,195,469	92.6	2,785	42,081	6,268,530	4.9	126,588,262
Wyoming	6,267	.5	1,309,972	94.4	135	9,703	71,282	5.1	1,387,521
Total	13,495,906	3.9	302,509,129	88.1	9,054	33,390	27,460,204	8.0	343,465,239

TABLE 17.—Use of power drills for shot holes in underground bituminous-coal and lignite mines in the United States, 1940–55

(Production in thousand net tons)

Year	Number of mines using power drills	Number of power drills		Production in working places where shot holes are power-drilled (net tons)			
		Electric	Compressed	Electric drills	Compressed-air drills	Total	Percentage of total underground
1940	1,172	6,613	1,378	189,534	7,548	197,082	47.2
1941	1,266	7,697	1,502	230,841	6,372	237,213	51.7
1942	1,364	8,482	1,564	274,880	6,650	281,530	54.6
1943	1,376	8,930	1,630	293,599	6,206	299,805	58.7
1944	1,501	9,755	1,903	317,049	7,066	324,115	62.5
1945	1,504	10,267	1,855	298,867	3,919	302,786	64.7
1946	1,702	10,968	1,884	275,835	2,899	278,734	66.2
1947	2,522	12,940	1,449	349,113	2,753	351,866	71.6
1948	2,798	13,970	1,312	335,001	1,872	336,873	73.2
1949	2,923	14,087	1,411	249,941	1,388	251,329	75.7
1950	3,112	14,277	1,282	284,904	1,757	286,661	73.0
1951	3,027	14,231	1,345	322,345	2,300	324,645	78.0
1952	2,830	13,468	1,292	281,549	2,499	284,048	79.7
1953	2,501	12,054	1,054	291,297	1,864	293,161	83.9
1954	2,137	10,782	885	231,084	2,473	233,557	80.7
1955	2,003	9,533	476	282,697	2,651	285,348	83.1

TABLE 18.—Use of power drills for shot holes in underground bituminous-coal and lignite mines in the United States, 1955, by States

State	Number of mines using power drills	Number of power drills		Production in working places where shot holes are power-drilled (net tons)			
		Electric	Compressed air	Electric drills	Compressed-airs drills	Total	Percentage of total underground
Alabama	37	291	----------	8,725,727	----------	8,725,727	79.5
Alaska	5	19	22	131,318	90,940	222,258	92.8
Arizona	1	1	----------	5,898	----------	5,898	66.3
Arkansas	7	14	15	53,024	----------	53,024	16.7
Colorado	67	306	24	2,806,743	175,072	2,981,815	92.9
Illinois	79	389	6	24,567,493	4,700	24,572,193	90.2
Indiana	35	140	1	4,825,234	1,850	4,827,084	97.2
Iowa	11	20	----------	134,606	----------	134,606	45.2
Kentucky	427	1,622	10	42,559,224	352,533	42,911,757	78.8
Maryland	7	19	----------	80,541	----------	80,541	29.2
Missouri	6	9	----------	95,996	----------	95,996	61.1
Montana:							
Bituminous	10	25	----------	401,573	----------	401,573	96.7
Lignite	3	10	----------	20,663	----------	20,663	86.3
Total Montana	13	35	----------	422,236	----------	422,236	96.1
New Mexico	7	12	----------	106,487	----------	106,487	61.1
North Dakota (lignite)	3	3	----------	18,252	----------	18,252	85.5
Ohio	138	431	2	10,783,838	----------	10,783,838	85.4
Oklahoma	5	81	----------	662,508	----------	662,508	95.4
Pennsylvania	293	1,619	156	47,773,613	15,432	47,789,045	73.6
Tennessee	36	161	8	2,558,024	483,507	3,041,531	57.0
Utah	38	204	4	5,743,971	----------	5,743,971	91.2
Virginia	272	710	31	18,080,788	479,030	18,559,818	83.4
Washington	5	27	93	93,997	378,363	472,360	81.7
West Virginia	502	3,184	104	111,158,496	668,980	111,827,476	88.3
Wyoming	9	236	----------	1,309,129	----------	1,309,129	94.4
Total	2,003	9,533	476	282,697,143	2,650,407	285,347,550	83.1

TABLE 19.—Number of underground bituminous-coal and lignite mines and number of haulage units in use in the United States, in selected years [1]

Units	1924	1946	1948	1949	1950	1951	1952	1953	1954	1955
Underground mines	7,352	5,888	7,108	6,798	7,559	6,225	5,632	5,034	4,653	6,036
Locomotives:										
Trolley	[2] 12,765	14,110	14,617	14,090	13,822	13,327	12,545	11,311	10,155	9,538
Battery	1,515	1,011	904	928	949	900	812	678	762	658
Other types	443	110	74	59	62	51	41	45	38	40
Total	14,723	15,231	15,595	15,077	14,833	14,278	13,398	12,034	10,955	10,236
Rope haulage units:										
Portable	([3])	4,084	3,886	3,904	4,225	3,875	3,584	2,838	1,926	1,327
Stationary	([3])	1,009	1,044	1,073	1,037	916	852	727	781	577
Total	649	5,093	4,930	4,977	5,262	4,791	4,436	3,565	2,707	1,904
Shuttle cars:										
Cable reel	([3])	([3])	([3])	2,144	2,782	3,191	3,382	3,797	4,400	4,413
Battery	([3])	([3])	([3])	623	512	567	462	425	431	241
Total	([3])	([3])	([3])	2,767	3,294	3,758	3,844	4,222	4,831	4,654
"Mother" conveyors	([3])	457	755	860	1,013	1,094	1,066	1,042	1,081	1,002
Animals	36,352	10,185	10,834	10,313	10,033	7,478	6,555	5,354	5,409	6,440

[1] Exclusive of lignite and Virginia semianthracite mines in 1946, 1948, and 1949.
[2] Includes combination trolley and battery locomotives.
[3] Data not available.

TABLE 20.—Number of haulage units in use in underground bituminous-coal and lignite mines in the United States, 1954–55, by States

State	Locomotives						Shuttle cars				Rope-haulage units				"Mother" conveyor units		Animals	
	Trolley		Battery		Other types		Cable reel		Battery		Portable		Stationery					
	1954	1955	1954	1955	1954	1955	1954	1955	1954	1955	1954	1955	1954	1955	1954	1955	1954	1955
Alabama	365	357	6	6	-------	6	206	161	10	3	25	9	19	12	27	33	189	227
Alaska	2	2	14	14	-------	-------	-------	-------	2	1	5	1	-------	-------	-------	-------	2	-------
Arizona	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	5	3
Arkansas	4	4	11	14	-------	-------	-------	-------	-------	-------	7	7	8	10	5	9	8	11
Colorado	117	96	67	56	-------	-------	32	43	26	18	20	32	57	63	5	4	171	146
Georgia	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	4	4
Illinois	482	371	110	76	-------	-------	362	313	47	21	4	3	43	24	92	96	153	113
Indiana	176	133	2	3	-------	-------	107	80	25	8	-------	1	4	6	3	-------	57	42
Iowa	4	3	2	1	-------	-------	-------	-------	-------	-------	-------	-------	10	7	-------	-------	90	74
Kansas	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	1	3	-------	-------	10	5
Kentucky	1,298	1,463	25	18	3	2	742	747	60	24	100	157	105	65	189	177	1,066	2,299
Maryland	9	5	3	1	-------	-------	5	-------	-------	-------	1	1	1	6	-------	-------	69	76
Missouri	1	2	4	3	-------	-------	-------	-------	-------	-------	-------	-------	-------	2	-------	-------	24	27
Montana (bituminous)	27	27	1	1	-------	-------	3	6	5	-------	3	3	8	4	-------	-------	11	9
Montana (lignite)	(1)	-------	(1)	-------	(1)	-------	(1)	-------	(1)	2	(1)	-------	(1)	-------	(1)	-------	(1)	5
New Mexico	16	4	17	4	-------	-------	-------	-------	-------	-------	-------	-------	21	11	-------	1	15	31
North Dakota (lignite)	(1)	-------	(1)	-------	(1)	-------	(1)	1	(1)	-------	(1)	-------	(1)	2	(1)	-------	(1)	7
Ohio	386	329	20	19	1	-------	118	143	-------	-------	10	7	38	19	34	39	179	169
Oklahoma	11	10	9	7	-------	-------	5	4	-------	-------	5	1	3	4	24	4	10	4
Pennsylvania	2,662	2,491	166	115	6	7	848	863	81	63	1,368	826	242	161	197	170	944	699
Tennessee	131	154	7	10	4	1	33	32	-------	-------	3	2	9	2	13	11	432	489
Utah	173	161	24	21	-------	-------	157	144	15	8	5	5	34	29	13	22	24	20
Virginia	650	688	82	114	6	7	211	263	2	2	44	44	36	39	28	31	688	1,005
Washington	37	34	3	1	-------	-------	-------	-------	-------	-------	10	5	22	25	-------	-------	4	3
West Virginia	3,435	3,104	185	170	18	17	1,533	1,584	156	91	217	159	68	59	442	398	1,236	967
Wyoming	169	100	4	4	-------	-------	38	29	-------	-------	99	64	50	24	9	7	8	5
Lignite	-------	-------	-------	-------	-------	-------	-------	-------	[2] 2	-------	-------	-------	[2] 2	-------	-------	-------	[2] 10	-------
Total	10,155	9,538	762	658	38	40	4,400	4,413	431	241	1,926	1,327	781	577	1,081	1,002	5,409	6,440

[1] Included in lignite total; not published to avoid disclosing individual operations.
[2] Includes lignite in Montana and North Dakota.

TABLE 21.—Number and production of underground bituminous-coal and lignite mines using "mother" conveyors and number and length of units in use, in the United States, 1945–55 [1]

Year	Number of mines	Production (net tons)	Number of units in use	Average length (feet)	Total length (miles)
1945	117	40,189,857	359	1,438	97.6
1946	161	46,022,710	457	1,484	128.5
1947	199	70,690,920	594	1,470	165.3
1948	270	81,821,361	755	1,460	208.8
1949	314	69,947,713	860	1,514	246.7
1950	374	92,413,644	1,013	1,538	294.9
1951	372	99,643,003	1,094	1,568	325.0
1952	358	92,168,992	1,066	1,526	308.2
1953	322	100,155,249	1,042	1,541	303.9
1954	291	83,211,284	1,081	1,626	332.9
1955	314	97,677,313	1,002	1,682	319.6

[1] Includes all belt conveyers 500 feet long and over used for underground transportation of coal, except main slope conveyors. Excludes lignite and Virginia semianthracite mines in 1945–49.

TABLE 22.—Number and production of underground bituminous-coal and lignite mines using "mother" conveyors, and number and length of units in use in the United States, 1954–55, by States [1]

State	Number of mines		Production (net tons)		Number of units in use		Average length (feet)		Total length (miles)	
	1954	1955	1954	1955	1954	1955	1954	1955	1954	1955
Alabama	6	6	1,721,459	2,380,340	27	33	1,470	1,677	7.5	10.5
Arkansas	2	3	78,336	89,523	5	9	1,160	713	1.1	1.2
Colorado	3	3	114,138	102,295	5	4	2,660	1,573	2.5	1.2
Illinois	20	17	12,120,982	13,846,060	92	96	1,904	1,974	33.2	35.9
Indiana	2	------	607,864	------	3	------	1,000	------	.6	------
Kentucky	47	53	17,922,777	19,775,419	189	177	1,679	1,584	60.1	53.1
New Mexico	------	1	------	3,788	------	1	------	900	------	.2
Ohio	10	13	2,225,444	4,387,737	34	39	1,612	1,603	10.4	11.8
Oklahoma	4	2	685,316	426,278	24	4	1,331	1,438	6.1	1.1
Pennsylvania	46	44	9,559,467	16,318,000	197	170	1,471	1,645	54.9	53.0
Tennessee	5	5	1,098,886	802,544	13	11	1,269	1,318	3.1	2.7
Utah	6	11	975,539	1,599,950	13	22	1,023	1,091	2.3	4.5
Virginia	14	10	3,801,426	2,171,170	28	31	1,566	1,339	8.3	7.9
West Virginia	121	142	31,546,567	35,032,207	442	398	1,679	1,788	140.6	134.8
Wyoming	5	4	753,083	742,002	9	7	1,289	1,314	2.2	1.7
Total	291	314	83,211,284	97,677,313	1,081	1,002	1,626	1,682	332.9	319.6

[1] Includes all mines using belt conveyors, other than main-slope conveyors, 500 feet long and over for underground transportation of coal.

AUGER MINING

Augers are generally used in areas where strip mining has become economically impracticable because of thick overburden. They were used first about 1945, and separate statistics on coal-recovery augers begin with 1952. The rapidly expanded production of coal by stripping during World War II in the mountainous areas of the northern Appalachian region left many miles of highwall containing exposed coal seams. After several years of experimentation, large, efficient augers 20 to 52 inches in diameter were developed to recover the coal from these exposed coal seams.

Production at auger mines increased rapidly from less than 2 million tons in 1952 to more than 6 million tons in 1955. Auger mining was active in 7 States in 1955; and the sales, as reported by 4 manufacturers, indicate continued rapid growth of this type of mining. A few coal-recovery augers have been sold for underground use, but these units and the coal produced by them have been included with coal loaded mechanically underground.

TABLE 23.—Auger-mining operations in the bituminous-coal and lignite fields of the United States, 1955, by States and counties

State and county	Number of auger mines	Equipment in use (number of units)				Mined by augers (net tons)	Average number of men working daily	Average number of days mines worked	Number of man-days worked	Average tons per man per day
		Augers	Power shovels	Power drills	Bulldozers					
Alabama: Jefferson	1	1				6,888	4	86	344	20.00
Total Alabama	1	1				6,888	4	86	344	20.00
Kentucky:										
Clay	2	2				16,500	11	88	972	16.98
Harlan	4	4			1	71,565	45	202	9,079	7.88
Leslie	3	3				58,470	41	84	3,443	16.98
Magoffin	1	1			2	39,467	29	106	3,098	12.74
Perry	4	4				207,136	122	73	8,890	23.30
Pike	19	18	1	1	3	537,388	151	152	23,014	23.35
Pulaski	1	1				6,000	5	71	353	17.00
Total Kentucky	34	33	1	1	6	936,526	404	121	48,849	19.17
Ohio:										
Athens	2	2				20,138	4	250	988	20.38
Belmont	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)
Carroll	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)
Columbiana	6	7			3	58,310	17	160	2,691	21.67
Gallia	1	1			1	106,000	12	300	3,584	29.57
Guernsey	1	1			1	126,048	8	240	1,873	67.30
Harrison	3	3			2	142,246	47	66	3,083	46.13
Hocking	1	1			1	3,400	2	150	300	11.33
Jefferson	7	7	1		5	373,161	64	164	10,426	35.79
Meigs	4	7			4	298,815	26	253	6,536	45.72
Noble	1	1				5,801	2	198	432	13.43
Perry	2	2			1	87,896	18	200	3,516	25.00
Tuscarawas	4	4			1	35,280	4	283	1,145	30.70
Wayne	1	1			1	6,700	3	229	631	10.62
Other countries	5	4			2	15,502	12	80	955	16.23
Total Ohio	38	41	1		22	1,279,297	219	165	36,160	35.38
Pennsylvania:										
Armstrong	3	3			1	44,722	22	148	3,276	13.65
Beaver	1	1				4,095	7	149	1,043	3.93
Butler	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)
Cambria	2	2				5,386	3	184	534	10.08
Clearfield	10	11			1	81,693	40	153	6,175	13.23
Clinton	3	7			2	73,653	20	297	5,940	12.40
Elk	1	1			1	5,981	2	139	334	17.90
Indiana	3	3			2	27,025	12	90	1,116	24.21
Jefferson	1	1				7,245	2	200	400	18.11
Somerset	1	1				13,440	4	305	1,221	11.00

Westmoreland	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)
Other counties	4	4			1	27,872	12	127	1,524	18.29
Total Pennsylvania	29	34			8	291,112	124	174	21,563	13.50
Tennessee:										
Anderson	2	3				9,090	8	63	505	18.00
Campbell	1	1				21,250	20	89	1,771	12.00
Claiborne	1	1				3,900	5	52	260	15.00
Morgan	1	1				5,414	3	170	535	10.12
Scott	3	3				37,474	19	188	3,569	10.50
Total Tennessee	8	9				77,128	55	127	6,640	11.62
Virginia:										
Buchanan	9	11	1		5	162,939	65	184	12,016	13.56
Dickenson	1	1			1	28,125	16	104	1,699	16.55
Russell	2	2			2	30,815	5	231	1,155	26.68
Scott	1	1				1,000	3	50	150	6.67
Tazewell	3	3				22,384	22	90	1,955	11.45
Wise	5	5			3	39,202	28	117	3,262	12.02
Total Virginia	21	23	1		11	284,465	139	146	20,237	14.06
West Virginia:										
Barbour	2	2			1	75,828	9	183	1,568	48.37
Boone	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)
Clay	1	1				1,092	1	150	109	10.00
Fayette	7	7	1		4	63,431	85	38	3,213	19.74
Gilmer	1	1				66,666	11	200	2,222	30.00
Greenbrier	1	1				10,880	3	136	409	26.59
Harrison	12	12	2		11	832,601	195	227	44,263	18.81
Kanawha	9	14	1		9	560,208	110	178	19,506	28.72
Lewis	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)
Logan	3	3	1		4	212,986	69	97	6,715	31.72
McDowell	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)
Mercer	4	6			1	115,110	25	176	4,451	25.86
Mingo	5	7	1		3	163,819	21	213	4,527	36.19
Nicholas	1	1			1	23,007	6	240	1,343	17.13
Pocahontas	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)
Preston	1	1				23,193	32	66	2,112	10.98
Raleigh	3	4			3	119,923	22	242	5,323	22.53
Randolph	2	2				11,670	5	125	625	18.67
Webster	1	1				36,425	6	202	1,214	30.00
Wyoming	8	10	2		5	242,404	42	164	6,954	34.86
Other counties	12	15	2		13	640,741	373	94	35,081	18.26
Total West Virginia	73	88	10		55	3,199,984	1,015	138	139,635	22.92
Total United States	204	229	13	1	102	6,075,400	1,960	140	273,428	22.22

[1] Included in "Other counties"; not published to avoid disclosing individual operations.

TABLE 24.—Units of coal-recovery augers sold to bituminous-coal and lignite mines for surface use in the United States, as reported by manufacturers, 1945–52 and 1953–55, by States

State	1945–52 [1]	1953	1954	1955
Alabama			1	
Colorado				1
Illinois				1
Kentucky		5	10	11
Maryland		1		
Ohio		11	12	5
Pennsylvania		8	9	8
Tennessee		2		
Virginia		2	1	6
West Virginia		26	21	33
Total	259	55	54	65

[1] Separate data by years and States not available.

STRIP MINING

Strip mines have two substantial advantages over underground mines. First, the output per man per day in strip mines more than doubles that in underground mines; and, second, the average value of strip coal, f. o. b. mines, is about one-third lower than that from underground mines.

The rapid growth of strip mining was made possible by development of larger and improved stripping and drilling equipment and trucks. The most notable recent changes in stripping equipment have included almost complete disappearance of steam shovels and the increased number of diesel-powered shovels and draglines and large electric shovels and draglines.

The average capacity of trucks used in strip mines has increased considerably, which resulted in reducing the number required. The average distance that coal was hauled from strip mines to tipples or ramps has remained approximately 4 miles.

The average thickness of overburden at all bituminous-coal and lignite strip mines in the United States was 39 feet in 1950 [5] and probably averaged nearly 45 feet in 1955. Several strip mines handled an average of more than 60 feet of overburden in 1955, and a few handled over 70 feet.

[5] Young, W. H., and Anderson, R. L., Thickness of Bituminous-Coal and Lignite Seams at All Mines and Thickness of Overburden at Strip Mines in the United States in 1950: Bureau of Mines Inf. Circ. 7642, 1952, 18 pp.

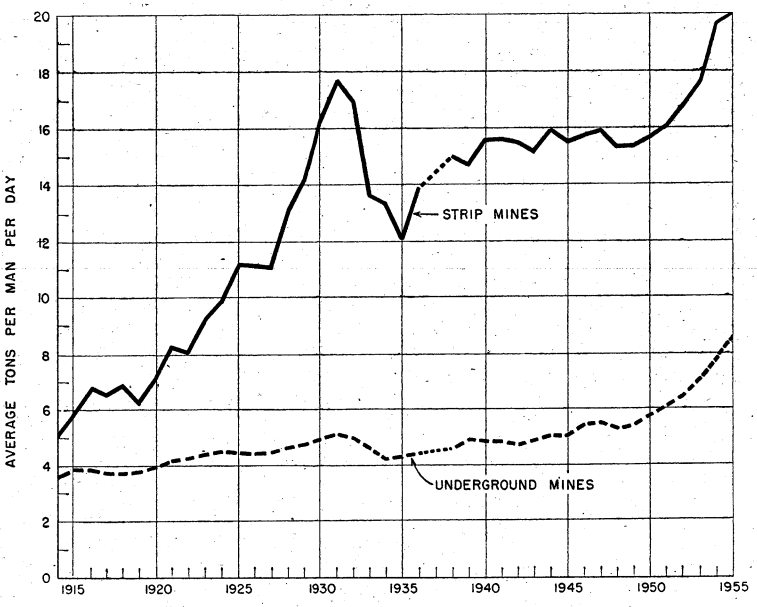

FIGURE 8.—Average tons per man per day at bituminous-coal and lignite mines in the United States, 1914–55, by strip mines and underground mines.

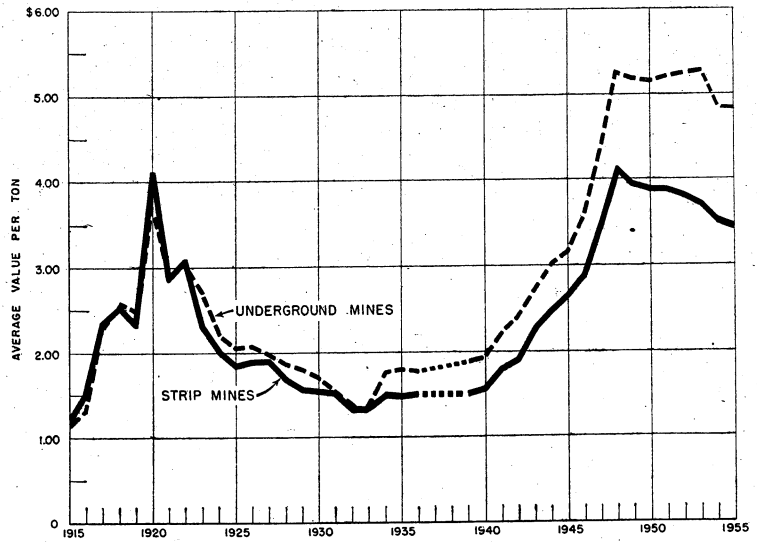

FIGURE 9.—Average value per ton, f. o. b. mines, of bituminous coal and lignite produced in the United States, 1915–55, by strip mines and underground mines.

TABLE 25.—Growth of strip mining at bituminous-coal and lignite mines in the United States, 1914–55, compared with underground and auger mining

Year	Production (thousand net tons)				Percentage of total mined by stripping	Average tons per man per day				Average value per ton, f. o. b. mine				Number of strip mines	Number of power shovels and draglines
	Underground mines	Auger mines	Strip mines [1]	Total		Underground mines	Auger mines	Strip mines [1]	Total	Underground mines	Auger mines	Strip mines [1]	Total		
1914	421,423		1,281	422,704	0.3	3.71		5.06	3.71	(2)		(2)	$1.17	[3] 35	48
1915	439,792		2,832	442,624	.6	3.90		5.81	3.91	$1.13		$1.18	1.13	[3] 60	87
1916	498,587		3,933	502,520	.8	3.88		6.67	3.90	1.32		1.51	1.32	[3] 79	111
1917	546,001		5,790	551,791	1.0	3.75		6.52	3.77	2.26		2.34	2.26	[3] 126	182
1918	571,098		8,288	579,386	1.4	3.76		6.81	3.78	2.58		2.54	2.58	[3] 165	276
1919	460,225		5,635	465,860	1.2	3.82		6.21	3.84	2.49		2.33	2.49	[3] 168	287
1920	559,807		8,860	568,667	1.5	3.97		7.20	4.00	3.74		4.12	3.75	[3] 174	312
1921	410,865		5,057	415,922	1.2	4.18		8.28	4.20	2.89		2.87	2.89	[3] 155	279
1922	412,059		10,209	422,268	2.4	4.24		8.09	4.28	3.02		3.07	3.02	272	379
1923	552,625		11,940	564,565	2.1	4.43		9.32	4.47	2.69		2.31	2.68	263	442
1924	470,080		13,607	483,687	2.8	4.50		9.91	4.56	2.20		2.00	2.20	234	420
1925	503,182		16,871	520,053	3.2	4.45		11.18	4.52	2.05		1.84	2.04	227	389
1926	556,444		16,923	573,367	3.0	4.42		11.13	4.50	2.07		1.89	2.06	237	410
1927	499,385		18,378	517,763	3.6	4.47		11.06	4.55	1.99		1.90	1.99	255	455
1928	480,956		19,789	500,745	4.0	4.61		13.02	4.73	1.87		1.69	1.86	250	415
1929	514,721		20,268	534,989	3.8	4.73		14.08	4.85	1.79		1.57	1.78	200	411
1930	447,684		19,842	467,526	4.3	4.93		16.21	5.06	1.71		1.54	1.70	218	341
1931	363,157		18,932	382,089	5.0	5.12		17.68	5.30	1.54		1.51	1.54	235	314
1932	290,069		19,641	309,710	6.3	4.99		16.95	5.22	1.31		1.32	1.31	255	332
1933	315,360		18,270	333,630	5.5	4.60		13.59	4.78	1.34		1.33	1.34	289	389
1934	338,578		20,790	359,368	5.8	4.23		13.28	4.40	1.76		1.49	1.75	344	458
1935	348,726		23,647	372,373	6.4	4.32		12.01	4.50	1.79		1.47	1.77	368	507
1936	410,962		28,126	439,088	6.4	4.42		13.91	4.62	1.77		1.49	1.76	381	562
1937	413,780		31,751	445,531	7.1	(2)		(2)	4.69	(2)		(2)	1.94	449	(2)
1938	318,138		30,407	348,545	8.7	4.60		15.00	4.89	(2)		(2)	1.95	465	737
1939	357,133		37,722	394,855	9.6	4.92		14.68	5.25	1.88		1.49	1.84	537	914
1940	417,604		43,167	460,771	9.4	4.86		15.63	5.19	1.94		1.56	1.91	638	1,071
1941	459,078		55,071	514,149	10.7	4.83		15.59	5.20	2.23		1.79	2.19	769	1,321
1942	515,490		67,203	582,693	11.5	4.74		15.52	5.12	2.41		1.90	2.36	834	1,438
1943	510,492		79,685	590,177	13.5	4.89		15.15	5.38	2.75		2.28	2.69	1,004	1,839
1944	518,678		100,898	619,576	16.3	5.04		15.89	5.67	3.01		2.48	2.92	1,240	2,312

1945	467,630	----------	109,987	577,617	19.0	5.04	----------	15.46	5.78	3.16	----------	2.65	3.06	1,370	2,439
1946	420,958	----------	112,964	533,922	21.1	5.43	----------	15.73	6.30	3.59	----------	2.87	3.44	1,445	2,744
1947	491,229	----------	139,395	630,624	22.1	5.49	----------	15.93	6.42	4.35	----------	3.47	4.16	1,750	3,254
1948	460,012	----------	139,506	599,518	23.3	5.31	----------	15.28	6.26	5.26	----------	4.11	4.99	1,971	3,712
1949	331,823	----------	106,045	437,868	24.2	5.42	----------	15.33	6.43	5.18	----------	3.94	4.88	1,761	3,576
1950	392,844	----------	123,467	516,311	23.9	5.75	----------	15.66	6.77	5.15	----------	3.87	4.84	1,870	3,877
1951	416,047	----------	117,618	533,665	22.0	6.08	----------	16.02	7.04	5.21	----------	3.88	4.92	1,784	3,810
1952	356,425	1,506	108,910	466,841	23.3	6.37	20.07	16.77	7.47	5.24	$4.31	3.81	4.90	1,643	3,527
1953	349,551	2,291	105,448	457,290	23.1	7.01	25.30	17.62	8.17	5.27	4.15	3.75	4.92	1,554	3,409
1954	289,112	4,460	98,134	391,706	25.1	7.99	24.12	19.64	9.47	4.87	3.41	3.52	4.52	1,329	3,390
1955	343,465	6,075	115,093	464,633	24.8	8.28	22.22	21.12	9.84	4.86	3.60	3.48	4.50	1,617	3,265

[1] Includes power strip pits proper and excludes horse stripping operations and mines combining stripping and underground in the same operations for the period 1914–42. The years 1943–55 include data on all strip mines.

[2] Data not available.

[3] Exclusive of horse stripping operations.

TABLE 26.—Number and production of bituminous-coal and lignite strip mines, and units of stripping and loading equipment in use in the United States, 1932–55

Year	Number of strip mines	Production (thousand net tons)	Number of power shovels and dragline excavators											Number of carryall scrapers	Number of bull-dozers
			By type of power				By capacity (in cubic yards) of dipper or bucket				By type of machine		Total		
			Steam	Electric	Diesel	Gasoline	Less than 3	3-5, inclusive	6-12, inclusive	More than 12	Power shovels	Dragline excavators			
1932	255	19,641	166	105	[1] 61	[2]	[3]	[3]	[3]	[3]	[3]	[3]	332	[3]	[3]
1933	289	18,270	169	117	[1] 103	[2]	[3]	[3]	[3]	[3]	[3]	[3]	389	[3]	[3]
1934	344	20,790	188	121	[1] 149	[2]	[3]	[3]	[3]	[3]	[3]	[3]	458	[3]	[3]
1935	368	23,647	174	139	[1] 194	[2]	[3]	[3]	[3]	[3]	[3]	[3]	507	[3]	[3]
1936	381	28,126	188	151	[1] 223	[2]	[3]	[3]	[3]	[3]	[3]	[3]	562	[3]	[3]
1937	449	31,751	[3]	[3]	[3]	[3]	[3]	[3]	[3]	[3]	[3]	[3]	[3]	[3]	[3]
1938	465	30,407	142	155	[1] 440	[2]	[3]	[3]	[3]	[3]	[3]	[3]	737	[3]	[3]
1939	537	37,722	206	184	[1] 524	[2]	[3]	[3]	[3]	[3]	[3]	[3]	914	[3]	[3]
1940	638	43,167	180	194	[1] 697	[2]	[3]	[3]	[3]	[3]	[3]	[3]	1,071	[3]	[3]
1941	769	55,071	200	210	[1] 911	[2]	1,009	153	95	64	[3]	[3]	1,321	[3]	[3]
1942	834	67,203	199	219	[1] 1,020	[2]	1,114	159	97	68	[3]	[3]	1,438	[3]	[3]
1943	1,004	79,685	172	234	[1] 1,433	[2]	1,488	173	106	72	[3]	[3]	1,839	[3]	[3]
1944	1,240	100,898	166	244	[1] 1,902	[2]	1,900	225	113	74	[3]	[3]	2,312	[3]	[3]
1945	1,370	109,987	141	256	[1] 2,042	[2]	2,004	243	117	75	[3]	[3]	2,439	[3]	[3]
1946	1,445	112,964	111	261	1,619	753	2,256	302	112	74	2,406	338	2,744	263	[3]
1947	1,750	139,395	83	301	2,279	591	2,685	362	123	84	2,822	432	3,254	275	[3]
1948	1,971	139,506	54	337	2,675	646	3,048	446	130	88	3,177	535	3,712	362	[3]
1949	1,761	106,045	51	352	2,646	527	2,931	367	168	110	3,011	565	3,576	320	[3]
1950	1,870	123,467	42	348	2,880	607	3,182	416	170	109	3,247	630	3,877	286	[3]
1951	1,784	117,618	26	346	2,905	533	3,088	420	187	115	3,164	646	3,810	220	[3]
1952	1,643	108,910	19	321	2,642	545	2,800	425	183	119	2,892	635	3,527	218	[3]
1953	1,554	105,448	17	317	2,629	446	2,692	413	193	111	2,793	616	3,409	244	1,954
1954	1,329	98,134	18	381	2,617	374	2,480	579	211	120	2,605	785	3,390	269	2,599
1955	1,617	115,093	10	315	2,603	337	2,381	550	223	111	2,592	673	3,265	187	2,106

[1] Includes gasoline shovels.
[2] Included with diesel shovels.
[3] Data not available.

TABLE 27.—Number and production of bituminous-coal and lignite strip mines, and units of stripping and loading equipment in use in the United States, 1955, by States

State	Number of strip mines	Production (net tons)	Number of power shovels and dragline excavators											Number of carryall scrapers	Number of bull-dozers
			By type of power				By capacity (in cubic yards) of dipper or bucket				By type of machine		Total		
			Steam	Electric	Diesel	Gasoline	Less than 3	3–5, inclusive	6–12, inclusive	More than 12	Power shovels	Dragline excavators			
Alabama	39	2,110,979		4	81	5	72	12	4	2	72	18	90	9	59
Alaska	7	400,125			11	2	11	2			12	1	13	4	23
Arkansas	8	260,725		3	8	3	8	3	2	1	7	7	14		7
California (lignite)	1	7,650			2		2				1	1	2		3
Colorado	7	356,805		1	4	1	2	3	1		4	2	6		7
Illinois	68	18,675,619		82	64	15	44	41	39	37	106	55	161	1	88
Indiana	56	11,182,221		47	63	25	66	30	21	18	83	52	135	4	90
Iowa	30	960,867		4	41	18	45	17		1	33	30	63	7	31
Kansas	19	727,463	6	7	16	5	20	5	6	3	23	11	34	2	15
Kentucky:															
Eastern	72	1,902,493			104	5	102	7			109		109	2	40
Western	46	11,740,747		35	79	6	53	31	26	10	86	34	120	1	66
Total Kentucky	118	13,643,240		35	183	11	155	38	26	10	195	34	229	3	106
Maryland	26	237,015			22	6	24	4			25	3	28		19
Missouri	28	3,075,382	2	20	13	7	18	9	6	9	32	10	42	3	26
Montana:															
Bituminous	2	801,555		6	1	1	2	1	2	3	5	3	8	1	1
Lignite	3	6,413				1	1				1		1	1	2
Total Montana	5	807,968		6	1	2	3	1	2	3	6	3	9	2	3
New Mexico	3	27,280			2	1	3				3		3		3
North Dakota (lignite)	40	3,080,730		21	20	15	37	8	10	1	45	11	56	29	37
Ohio	259	23,958,329	1	57	488	72	464	99	39	16	505	113	618	45	421
Oklahoma	21	1,469,213		4	26	1	16	7	6	2	20	11	31	1	17
Pennsylvania	484	20,518,113		12	1,109	98	969	191	53	6	928	291	1,219	44	799
South Dakota (lignite)	2	25,782			2	1	2	1			1	2	3	1	2
Tennessee	87	1,635,052			102	14	107	7	2		111	5	116		64
Virginia	31	981,782		2	29	5	28	8			36		36	2	41
Washington	1	31,714				2	2				2		2		3
West Virginia	168	9,379,643		7	302	26	269	59	5	2	325	10	335	22	238
Wyoming	8	1,539,072	1	3	14	2	14	5	1		17	3	20	8	4
Total	1,516	115,092,769	10	315	2,603	337	2,381	550	223	111	2,592	673	3,265	187	2,106

TABLE 28.—Summary of operations at bituminous-coal and lignite strip mines using power drills in bank or overburden in the United States, 1946–55

Year	Number of mines	Production at mines using power drills		Number of power drills
		Quantity (net tons)	Percentage of total strip production	
1946	514	75,375,841	66.7	764
1947	598	95,915,346	68.8	875
1948	728	98,809,393	72.3	1,195
1949	756	78,146,655	73.7	1,256
1950	692	87,205,280	70.6	1,201
1951	650	85,331,204	72.5	1,125
1952	629	79,252,284	73.0	1,070
1953	603	80,259,365	76.1	1,048
1954	541	70,107,205	71.4	983
1955	563	85,623,050	74.4	953

TABLE 29.—Summary of operations at bituminous-coal and lignite strip mines using power drills in bank or overburden in the United States, 1954–55, by States

State	Number of mines		Production at mines using power drills				Number of power drills					
			Quantity (net tons)		Percentage of total strip production		Horizontal		Vertical		Total	
	1954	1955	1954	1955	1954	1955	1954	1955	1954	1955	1954	1955
Alabama	18	18	848,205	1,482,670	55.0	70.2	32	17	7	16	39	33
Alaska	5	5	374,001	398,824	95.2	99.7	4	5	7	10	11	15
Arkansas	2	5	120,404	225,992	53.8	86.7	6	9	1	1	7	10
California (lignite)	(1)		(1)		(1)		(1)		(1)		(1)	
Colorado	4	4	281,068	344,341	94.5	96.5	3	2	3	3	6	5
Illinois	33	34	13,094,891	16,092,686	79.6	86.2	40	33	26	24	66	57
Indiana	32	35	8,276,007	10,004,968	97.2	89.5	39	42	26	25	65	67
Iowa	22	24	673,145	859,366	78.4	89.4	20	24	21	17	41	41
Kansas	15	9	1,281,659	670,604	95.1	92.2	14	10	10	5	24	15
Kentucky:												
Eastern	16	14	916,780	940,430	78.1	49.4	13	14	14	8	27	22
Western	23	23	8,442,120	10,506,152	87.9	89.5	36	25	43	24	79	49
Total Kentucky	39	37	9,358,900	11,446,582	86.8	83.9	49	39	57	32	106	71
Maryland	2	1	25,029	13,649	12.9	5.8	2	1	2		4	1
Missouri	15	12	2,160,597	2,513,868	91.5	81.7	16	18	5	4	21	22
Montana (bituminous)	(2)	1	(2)	795,955	(2)	99.3	(2)		(2)	2	(2)	2
Montana (lignite)	(1)		(1)		(1)		(1)		(1)		(1)	
New Mexico	(2)	1	(2)	20,976	(2)	76.9	(2)		(2)	2	(2)	2
North Dakota (lignite)	(1)	2	(1)	388,603	(1)	12.6	(1)	2	(1)	1	(1)	3
Ohio	94	98	15,965,442	19,338,748	77.6	80.7	101	94	56	57	157	151
Oklahoma	10	7	838,928	878,165	71.4	59.8	11	10	2	3	13	13
Pennsylvania	144	169	7,546,820	10,818,270	45.1	52.7	126	160	97	98	223	258
South Dakota (lignite)	(1)	1	(1)	23,982	(1)	93.0	(1)	1	(1)		(1)	1
Tennessee	13	15	621,137	1,084,242	41.7	66.3	12	23	4	8	16	31
Texas (lignite)	(1)		(1)		(1)		(1)		(1)		(1)	
Virginia	11	5	832,067	732,993	91.2	74.7	10	9	7	5	17	14
Washington	1	1	16,266	31,714	27.6	100.0			3	2	3	2
West Virginia	70	75	4,974,615	6,108,210	66.4	65.1	91	77	49	53	140	130
Wyoming	(2)	5	(2)	1,347,642	(2)	87.6	(2)	6	(2)	3	(2)	9
Lignite [3]	5		503,964		12.0		10		2		12	
Other States	[4] 6		[4] 2,314,060		[4] 90.7		[4] 6		[4] 6		[4] 12	
Total	541	564	70,107,205	85,623,050	71.4	74.4	592	582	391	371	983	953

[1] Included in lignite total; not published to avoid disclosing individual operations.
[2] Included in "Other States;" not published to avoid disclosing individual operations.
[3] Includes lignite in California, Montana, North Dakota, South Dakota, and Texas.
[4] Includes Montana (bituminous), New Mexico, and Wyoming.

TABLE 30.—Summary of method of haulage from bituminous-coal and lignite strip mines to tipple or ramp, in the United States, 1948–55 [1]

Year	Strip mines reporting method of haulage							Strip mines not reporting method of haulage—production (net tons)	Total strip production (net tons)
	Strip mines using trucks				Strip mines using rail, rail and truck, truck and tram—production (net tons)	Production of strip mines reporting			
	Production (net tons)	Number of trucks	Average capacity per truck (net tons)	Average distance hauled (miles)		Quantity (net tons)	Percentage of total strip production		
1948	97,450,399	7,214	9.4	3.7	6,327,989	103,778,388	74.4	35,727,532	139,505,920
1949	73,229,556	6,694	10.1	3.7	5,365,432	78,594,988	74.1	27,450,311	106,045,299
1950	88,666,733	6,564	10.3	3.8	4,364,333	93,031,066	75.3	30,435,498	123,466,564
1951	87,427,029	6,173	10.6	4.0	2,424,994	89,852,023	76.4	27,765,653	117,617,676
1952	88,589,637	5,799	11.3	4.0	2,296,744	90,886,381	83.5	18,023,375	108,909,756
1953	84,764,694	5,287	12.2	4.0	2,104,609	86,869,303	82.4	18,579,266	105,448,569
1954	73,794,489	4,250	13.2	3.9	1,203,753	74,998,242	76.4	23,136,008	98,134,250
1955	94,150,171	4,798	13.3	3.9	2,290,600	96,440,771	83.9	18,651,998	115,092,769

[1] Excludes lignite in 1948 and 1949.

TABLE 31.—Summary of method of haulage from bituminous-coal and lignite strip mines to tipple or ramp, in the United States, 1955, by States

State	Strip mines reporting method of haulage							Strip mines not reporting method of haulage—production (net tons)	Total strip production (net tons)
	Strip mines using trucks				Strip mines using rail, rail and truck, truck and tram—production (net tons)	Production of strip mines reporting			
	Production (net tons)	Number of trucks	Average capacity per truck (net tons)	Average distance hauled (miles)		Quantity (net tons)	Percentage of total strip production		
Alabama	1,566,176	133	10.6	5.1	----------	1,566,176	74.2	544,803	2,110,979
Alaska	398,824	36	12.2	2.8	----------	398,824	99.7	1,301	400,125
Arkansas	225,992	31	8.4	5.4	----------	225,992	86.7	34,733	260,725
California (lignite)	7,650	3	12.0	5.0	----------	7,650	100.0	----------	7,650
Colorado	344,341	11	19.7	1.9	----------	344,341	96.5	12,464	356,805
Illinois	18,443,205	309	28.4	2.8	----------	18,443,205	98.8	232,414	18,675,619
Indiana	10,030,528	261	21.1	2.9	590,258	10,620,786	95.0	561,435	11,182,221
Iowa	897,913	74	9.1	3.5	----------	897,913	93.4	62,954	960,867
Kansas	630,709	31	16.0	1.8	42,779	673,488	92.6	53,975	727,463
Kentucky	10,633,215	244	16.6	2.1	861,608	11,494,823	84.3	2,148,417	13,643,240
Maryland	51,845	19	9.5	7.2	----------	51,845	21.9	185,170	237,015
Missouri	2,515,569	83	27.9	2.7	----------	2,515,569	81.8	559,813	3,075,382
Montana:									
Bituminous	----------	----------	----------	----------	795,955	795,955	99.3	5,600	801,555
Lignite	2,681	2	4.0	.1	----------	2,681	41.8	3,732	6,413
Total Montana	2,681	2	4.0	.1	795,955	798,636	98.8	9,332	807,968
New Mexico	27,280	6	5.0	2.8	----------	27,280	100.0	----------	27,280
North Dakota (lignite)	2,939,503	81	14.2	2.5	----------	2,939,503	95.4	141,227	3,080,730
Ohio	21,195,990	873	12.9	4.7	----------	21,195,990	88.5	2,762,339	23,958,329
Oklahoma	1,103,960	71	10.1	4.2	----------	1,103,960	75.1	365,253	1,469,213
Pennsylvania	13,944,221	1,719	10.0	5.4	----------	13,944,221	68.0	6,573,892	20,518,113
South Dakota (lignite)	23,982	4	6.0	1.0	----------	23,982	93.0	1,800	25,782
Tennessee	591,390	145	9.6	12.5	----------	591,390	36.2	1,043,662	1,635,052
Virginia	721,323	53	10.1	4.3	----------	721,323	73.5	260,459	981,782
Washington	31,714	4	7.0	.8	----------	31,714	100.0	----------	31,714
West Virginia	6,452,638	579	11.4	5.8	----------	6,452,638	68.8	2,927,005	9,379,643
Wyoming	1,369,522	26	14.7	2.1	----------	1,369,522	89.0	169,550	1,539,072
Total	94,150,171	4,798	13.3	3.9	2,290,600	96,440,771	83.9	18,651,998	115,092,769

TABLE 32.—Stripping operations in the bituminous-coal and lignite fields of the United States, 1955, by States and counties

State and county	Number of strip mines	Production (net tons)	Average number of men working daily	Average number of days mines worked	Number of man-days worked	Average tons per man per day
Alabama:						
Blount	2	187,526	110	131	14,392	13.03
Cullman	2	11,078	11	82	898	12.34
De Kalb	1	78,500	27	250	6,738	11.65
Jefferson	8	403,780	120	239	28,596	14.12
Marion	4	35,697	21	107	2,254	15.84
St. Clair	1	2,817	2	137	274	10.28
Tuscaloosa	8	648,816	189	212	40,075	16.19
Walker	13	742,765	250	204	50,979	14.57
Total Alabama	39	2,110,979	730	198	144,206	14.64
Alaska	7	400,125	107	221	23,620	16.94
Arkansas:						
Franklin	1	7,563	5	161	732	10.33
Johnson	6	231,369	88	200	17,675	13.09
Sebastian	1	21,793	21	186	3,977	5.48
Total Arkansas	8	260,725	114	196	22,384	11.65
California: Amador	1	7,650	2	250	500	15.30
Colorado:						
El Paso	1	4,697	1	213	213	22.05
Fremont	1	7,380	2	154	308	23.96
Jackson	1	1,329	4	77	308	4.31
Routt	4	343,399	88	156	13,786	24.91
Total Colorado	7	356,805	95	154	14,615	24.41
Illinois:						
Bureau	1	791,623	287	176	50,486	15.68
Clark	1	1,235	2	90	180	6.86
Fulton	14	5,320,277	820	253	207,580	25.63
Gallatin	3	57,331	21	122	2,566	22.34
Greene	1	5,811	3	240	720	8.07
Grundy	1	247,625	61	169	10,309	24.03
Hancock	1	30,387	11	176	1,938	15.68
Jackson	3	592,783	115	239	27,463	21.58
Kankakee	1	551,373	136	169	22,942	24.03
Knox	3	1,766,301	355	238	84,351	20.94
La Salle	1	2,654	13	254	3,277	.81
Livingston	1	3,394	4	129	516	6.58
Peoria	5	397,223	70	222	15,645	25.39
Perry	4	3,144,659	471	264	124,393	25.28
Randolph	2	335,463	33	294	9,717	34.52
St. Clair	3	1,363,914	197	249	49,097	27.78
Saline	6	798,614	271	210	56,956	14.02
Schuyler	2	7,843	14	86	1,229	6.38
Vermilion	5	817,101	137	263	35,980	22.71
Will	1	153,205	39	243	9,465	16.19
Williamson	9	2,286,803	273	248	67,717	33.77
Total Illinois	68	18,675,619	3,333	235	782,527	23.87
Indiana:						
Clay	9	839,011	191	224	42,829	19.59
Daviess	2	69,498	33	201	6,600	10.53
Fountain	2	53,132	28	150	4,217	12.60
Gibson	1	149,215	50	214	10,692	13.96
Greene	7	1,252,139	135	237	31,934	39.21
Knox	1	352,752	57	239	13,606	25.93
Martin	1	3,453	2	164	328	10.53
Owen	(1)	(1)	(1)	(1)	(1)	(1)
Parke	3	23,718	13	187	2,431	9.76
Pike	6	2,098,548	435	250	108,676	19.31
Spencer	(1)	(1)	(1)	(1)	(1)	(1)
Sullivan	5	794,477	111	221	24,476	32.46
Vermillion	2	178,534	43	222	9,555	18.68
Vigo	3	513,133	81	215	17,388	29.51
Warrick	11	4,607,418	557	218	121,408	37.95
Other counties	3	247,193	87	205	17,874	13.83
Total Indiana	56	11,182,221	1,823	226	412,014	27.14

For footnote, see end of table.

TABLE 32.—Stripping operations in the bituminous-coal and lignite fields of the United States, 1955, by States and counties—Continued

State and county	Number of strip mines	Production (net tons)	Average number of men working daily	Average number of days mines worked	Number of man-days worked	Average tons per man per day
Iowa:						
Appanoose	1	6,771	9	192	1,731	3.91
Davis	2	68,302	18	261	4,689	14.57
Mahaska	8	111,491	63	194	12,251	9.10
Marion	9	611,433	122	238	28,992	21.09
Monroe	2	30,559	5	284	1,453	21.03
Polk	1	9,889	5	246	1,126	8.78
Van Buren	2	26,594	16	190	3,047	8.73
Wapello	5	95,828	24	233	5,488	17.46
Total Iowa	30	960,867	262	224	58,777	16.35
Kansas:						
Bourbon	2	8,439	7	150	1,049	8.04
Cherokee	5	532,181	125	279	35,127	15.15
Coffey	2	3,481	5	125	624	5.58
Crawford	7	179,090	159	146	23,168	7.73
Franklin	1	1,048	1	80	80	13.10
Osage	2	3,224	9	78	728	4.43
Total Kansas	19	727,463	306	199	60,776	11.97
Kentucky, Eastern:						
Bell	8	249,290	97	138	13,400	18.60
Boyd	2	334,330	145	239	34,585	9.67
Clay	8	83,767	51	145	7,374	11.36
Harlan	4	104,032	50	155	7,793	13.35
Jackson	3	15,350	22	64	1,410	10.89
Knox	4	51,398	32	194	6,193	8.30
Lee	1	1,000	3	120	360	2.78
McCreary	10	442,835	195	193	37,697	11.75
Magoffin	1	59,707	19	240	4,489	13.30
Morgan	6	47,933	37	155	5,723	8.55
Perry	1	6,000	6	90	540	11.11
Pike	2	4,020	14	27	378	10.63
Pulaski	9	304,263	145	209	30,335	10.03
Rockcastle	5	19,600	16	145	2,274	8.62
Wayne	2	52,900	34	111	3,760	14.07
Whitley	6	126,068	41	138	5,666	22.25
Total Eastern Kentucky	72	1,902,493	907	178	161,977	11.75
Kentucky, Western:						
Butler	2	7,307	7	163	1,112	6.57
Christian	1	1,400	2	27	53	26.42
Daviess	(1)	(1)	(1)	(1)	(1)	(1)
Hopkins	25	5,901,016	773	237	183,148	32.22
Muhlenberg	5	2,392,880	334	230	76,695	31.20
Ohio	6	2,147,313	288	258	74,353	28.88
Webster	(1)	(1)	(1)	(1)	(1)	(1)
Other counties	7	1,290,831	159	256	40,712	31.71
Total Western Kentucky	46	11,740,747	1,563	241	376,073	31.22
Total Kentucky	118	13,643,240	2,470	218	538,050	25.36
Maryland:						
Allegany	12	101,067	48	185	8,858	11.41
Garrett	14	135,948	89	119	10,538	12.90
Total Maryland	26	237,015	137	142	19,396	12.22
Missouri:						
Barton	2	332,431	79	278	21,913	15.17
Bates	3	699,488	129	220	28,469	24.57
Boone	3	9,414	6	168	1,048	8.98
Callaway	1	129,092	41	300	12,284	10.51
Chariton	1	1,472	1	120	120	12.26
Dade	1	9,992	7	291	2,036	4.91
Henry	8	865,570	159	212	33,692	25.69
Johnson	1	1,715	2	180	360	4.76
Macon	1	643,013	108	234	25,255	25.46
Ralls	1	6,020	6	145	872	6.90
St. Clair	2	338,535	57	306	17,459	19.39
Vernon	4	38,640	22	233	5,129	7.53
Total Missouri	28	3,075,382	617	241	148,637	20.69

For footnote, see end of table.

TABLE 32.—Stripping operations in the bituminous-coal and lignite fields of the United States, 1955, by States and counties—Continued

State and county	Number of strip mines	Production (net tons)	Average number of men working daily	Average number of days mines worked	Number of man-days worked	Average tons per man per day
Montana (bituminous): Rosebud	2	801, 555	50	227	11, 334	70. 72
Montana (lignite):						
Dawson	2	3, 732	2	127	285	13. 05
Sheridan	1	2, 681	4	99	396	6. 77
Total Montana (lignite)	3	6, 413	6	113	681	9. 42
Total Montana	5	807, 968	56	215	12, 015	67. 25
New Mexico: McKinley	3	27, 280	9	209	1, 889	14. 44
North Dakota (lignite):						
Adams	1	41, 646	8	176	1, 390	29. 95
Bowman	2	183, 750	18	228	4, 138	44. 41
Burke	2	500, 078	63	239	15, 076	33. 17
Burleigh	1	17, 752	3	200	600	29. 59
Divide	1	287, 036	35	231	8, 098	37. 24
Dunn	3	12, 657	6	167	1, 026	12. 34
Grant	3	23, 769	8	143	1, 081	21. 98
Hettinger	3	13, 882	10	179	1, 773	7. 83
McLean	4	224, 697	37	197	7, 255	30. 97
Mercer	6	1, 037, 372	101	218	22, 048	47. 05
Morton	5	30, 754	10	166	1, 660	18. 53
Oliver	1	6, 352	3	180	540	11. 76
Stark	3	76, 535	15	147	2, 208	34. 67
Ward	4	618, 300	73	256	18, 665	33. 13
Williams	1	6, 150	1	250	250	24. 60
Total North Dakota (lignite)	40	3, 080, 730	391	219	85, 808	35. 90
Ohio:						
Athens	8	76, 661	48	106	5, 037	15. 22
Belmont	19	1, 567, 815	258	216	55, 675	28. 16
Carroll	12	523, 729	119	245	29, 210	17. 93
Columbiana	34	1, 330, 648	321	252	80, 890	16. 45
Coshocton	9	814, 621	195	277	54, 128	15. 05
Gallia	3	690, 964	118	277	32, 778	21. 08
Guernsey	3	508, 294	70	312	21, 796	23. 32
Harrison	13	6, 106, 992	693	278	192, 528	31. 72
Hocking	6	68, 594	34	123	4, 182	16. 40
Holmes	2	21, 810	9	197	1, 775	12. 29
Jackson	13	554, 223	121	226	27, 396	20. 23
Jefferson	18	2, 421, 041	422	245	103, 463	23. 40
Lawrence	7	415, 080	136	169	22, 945	18. 09
Mahoning	13	699, 487	153	243	37, 147	18. 83
Meigs	4	383, 433	86	222	19, 133	20. 04
Morgan	4	1, 294, 550	148	252	37, 275	34. 73
Muskingum	16	1, 045, 543	170	215	36, 468	28. 67
Noble	6	1, 156, 755	171	228	39, 053	29. 62
Perry	16	1, 532, 160	294	233	68, 431	22. 39
Portage	1	126, 203	25	314	7, 839	16. 10
Stark	20	861, 734	268	230	61, 596	13. 99
Tuscarawas	24	1, 316, 262	341	246	83, 785	15. 71
Vinton	5	136, 421	65	193	12, 608	10. 82
Washington	(1)	(1)	(1)	(1)	(1)	(1)
Wayne	(1)	(1)	(1)	(1)	(1)	(1)
Other counties	3	305, 309	82	175	14, 335	21. 30
Total Ohio	259	23, 958, 329	4, 347	241	1, 049, 473	22. 83
Oklahoma:						
Coal	1	11, 335	7	179	1, 315	8. 62
Craig	2	18, 326	9	309	2, 891	6. 34
Haskell	5	397, 561	82	230	18, 797	21. 15
Latimer	(1)	(1)	(1)	(1)	(1)	(1)
Le Flore	(1)	(1)	(1)	(1)	(1)	(1)
McIntosh	1	197, 160	34	286	9, 824	20. 07
Muskogee	1	1, 018	2	100	200	5. 09
Okmulgee	2	5, 483	4	219	879	6. 24
Rogers	2	341, 907	105	231	24, 317	14. 06
Sequoyah	1	83, 057	17	346	5, 958	13. 94
Wagoner	1	1, 794	6	145	930	1. 93
Other counties	5	411, 572	164	108	17, 680	23. 28
Total Oklahoma	21	1, 469, 213	430	193	82, 791	17. 75

For footnote, see end of table.

TABLE 32.—Stripping operations in the bituminous-coal and lignite fields of the United States, 1955, by States and counties—Continued

State and county	Number of strip mines	Production (net tons)	Average number of men working daily	Average number of days mines worked	Number of man-days worked	Average tons per man per day
Pennsylvania:						
Allegheny	36	657,359	220	185	40,703	16.15
Armstrong	39	1,134,747	388	185	71,729	15.82
Beaver	11	413,217	122	274	33,432	12.36
Bedford	2	41,169	47	39	1,841	22.36
Blair	4	124,598	35	278	9,614	12.96
Bradford	(1)	(1)	(1)	(1)	(1)	(1)
Butler	43	1,684,104	469	240	112,499	14.97
Cambria	23	616,707	312	170	53,073	11.62
Cameron	(1)	(1)	(1)	(1)	(1)	(1)
Centre	23	1,143,584	398	233	92,673	12.34
Clarion	28	2,115,684	528	267	140,952	15.01
Clearfield	111	4,770,666	1,580	208	328,558	14.52
Clinton	6	569,754	118	239	28,178	20.22
Elk	11	235,291	76	211	15,963	14.74
Fayette	22	305,094	131	148	19,458	15.68
Fulton	(1)	(1)	(1)	(1)	(1)	(1)
Greene	2	2,904	12	21	252	11.52
Huntingdon	(1)	(1)	(1)	(1)	(1)	(1)
Indiana	35	811,988	319	196	62,509	12.99
Jefferson	29	925,611	364	184	66,928	13.83
Lawrence	22	690,704	184	219	40,227	17.17
Lycoming	1	36,610	9	311	2,799	13.08
McKean	3	109,930	35	296	10,341	10.63
Mercer	8	544,972	132	224	29,650	18.38
Somerset	50	1,069,504	382	177	67,562	15.83
Tioga	3	37,330	16	198	3,202	11.66
Venango	7	701,942	111	272	30,308	23.16
Washington	27	1,275,123	360	191	68,703	18.56
Westmoreland	30	199,884	125	115	14,359	13.92
Other countries	9	299,637	133	174	23,136	12.95
Total Pennsylvania	585	20,518,113	6,606	207	1,368,649	14.99
South Dakota (lignite): Dewey	2	25,782	10	250	2,500	10.31
Tennessee:						
Anderson	5	50,662	24	144	3,501	14.48
Bledsoe	3	10,788	7	133	930	11.60
Campbell	12	180,339	76	153	11,672	15.45
Claiborne	6	128,810	58	206	11,982	10.75
Cumberland	14	100,396	75	60	4,510	22.26
Grundy	4	142,493	54	200	10,822	13.17
Hamilton	2	68,767	10	241	2,415	28.47
Marion	5	58,645	35	150	5,293	11.08
Morgan	18	352,227	122	148	18,063	19.50
Scott	11	363,017	127	159	20,190	17.98
Sequatchie	(1)	(1)	(1)	(1)	(1)	(1)
Van Buren	(1)	(1)	(1)	(1)	(1)	(1)
White	2	12,009	8	57	480	25.04
Other counties	5	166,899	38	209	7,928	21.05
Total Tennessee	87	1,635,052	634	154	97,786	16.72
Virginia:						
Buchanan	3	21,708	17	101	1,762	12.32
Dickenson	5	398,085	117	255	29,864	13.33
Lee	1	3,792	1	219	219	17.32
Russell	1	19,832	18	245	4,410	4.50
Scott	1	2,031	1	201	201	10.10
Wise	20	536,334	153	227	34,804	15.41
Total Virginia	31	981,782	307	232	71,260	13.78
Washington: Kittitas	1	31,714	6	204	1,236	25.66
West Virginia:						
Barbour	13	908,434	203	142	28,839	31.50
Boone	1	96,688	15	182	2,774	34.86
Brooke	9	320,979	98	152	14,971	21.44
Clay	1	2,574	2	150	257	10.00
Fayette	11	436,576	117	159	18,617	23.45
Gilmer	1	48,904	7	197	1,357	36.03
Grant	3	9,540	15	63	950	10.04
Greenbrier	9	362,781	106	224	23,696	15.31

For footnote, see end of table.

TABLE 32.—Stripping operations in the bituminous-coal and lignite fields of the United States, 1955, by States and counties—Continued

State and county	Number of strip mines	Production (net tons)	Average number of men working daily	Average number of days mines worked	Number of man-days worked	Average tons per man per day
West Virginia—Continued						
Hancock	1	4,093	1	210	210	19.49
Harrison	36	2,219,949	421	214	90,132	24.63
Kanawha	7	446,181	98	231	22,649	19.70
Lewis	7	688,718	151	177	26,705	25.79
Logan	1	67,330	85	43	3,645	18.47
Marion	3	87,495	29	149	4,335	20.18
Mason	1	1,526	2	45	90	16.96
McDowell	10	599,613	79	200	15,854	37.82
Mercer	5	233,463	99	192	18,935	12.33
Mineral	1	6,360	3	123	369	17.24
Mingo	4	240,639	69	137	9,418	25.55
Monongalia	3	5,601	19	19	365	15.35
Nicholas	4	599,603	207	198	41,069	14.60
Pocahontas	1	23,336	20	259	5,232	4.46
Preston	11	713,962	105	192	20,112	35.50
Raleigh	7	471,060	93	156	14,552	32.37
Randolph	6	339,718	93	231	21,528	15.78
Taylor	2	97,499	24	218	5,322	18.32
Tucker	1	34,931	19	127	2,409	14.50
Upshur	5	186,119	44	178	7,807	23.84
Wyoming	4	125,971	33	191	6,353	19.83
Total West Virginia	168	9,379,643	2,257	181	408,552	22.96
Wyoming:						
Campbell	1	349,566	25	317	7,925	44.11
Carbon	2	190,601	31	225	6,987	27.28
Converse	1	8,040	3	238	714	11.26
Lincoln	1	529,423	50	253	12,654	41.84
Sheridan	2	419,889	61	195	11,878	35.35
Sweetwater	1	41,553	10	227	2,214	18.32
Total Wyoming	8	1,539,072	180	235	42,372	36.32
Total United States	1,617	115,092,769	25,229	216	5,449,833	21.12

[1] Included in "Other counties"; not published to avoid disclosing individual operations.

MECHANICAL LOADING

In the past decade the mechanical loading of underground bituminous coal and lignite has increased from 56 to 85 percent of the total output. Higher wage rates probably were the most important factor that caused this rapid rate of progress in mechanization; however, the increased mechanization resulted in a 59-percent rise in productivity in 1955 over 1945. Although overall mechanization increased gradually during this period, the following changes occurred in the methods of loading: Mobile loading into mine cars decreased from 56 to 16 percent of the total mechanically loaded; mobile loading into shuttle cars increased from 17 to 63 percent; duckbills or other self-loading conveyors decreased from 8 to 2 percent; hand-loaded conveyors decreased from 15 to 6 percent; and continuous mining machines started in 1948 handled 10 percent of the total mechanically loaded output in 1955.

In tables 35 and 36 certain data on mechanical loading have been arranged into three groups: (1) Continuous mining machines, devices that mine and load the coal; (2) loading machines (mobile loading machines, scrapers, duckbills, or other self-loading conveyors), devices that eliminate hand shoveling; and (3) hand-loaded conveyors, devices that greatly reduce the labor in hand shoveling. Most of the

TABLE 33.—Growth of mechanical loading at underground bituminous-coal and lignite mines in the United States, 1923–55

(Production in thousand net tons)

Year	Underground production mechanically loaded									Underground production mechanically loaded, percent	Number of mechanical loading units					
	Loaded by machines				Continuous mining machines	Handled by conveyors			Total mechanically loaded		Mobile loading machines	Scrapers	Conveyors equipped with duckbills or other self-loading heads	Continuous mining machines	Pit-car loaders	Hand-loaded conveyors
	Mobile loading machines	Scrapers	Conveyors equipped with duckbills or other self-loading heads	Total		Pit-car loaders	Hand-loaded conveyors	Total								
1923	(1)	(1)	(1)	(1)	----------	(1)	(1)	(1)	[2] 1,880	[2] 0.3	(1)	(1)	(1)	----------	(1)	(1)
1924	(1)	(1)	(1)	(1)	----------	(1)	(1)	(1)	[2] 3,496	[2] .7	(1)	(1)	(1)	----------	(1)	(1)
1925	(1)	(1)	(1)	(1)	----------	(1)	(1)	(1)	[2] 6,243	[2] 1.2	(1)	(1)	(1)	----------	(1)	(1)
1926	7,786	1,554	682	10,022	----------	523	(1)	(1)	[2] 10,545	[2] 1.9	295	133	27	----------	(1)	(1)
1927	(1)	(1)	(1)	(1)	----------	(1)	(1)	(1)	16,500	3.3	(1)	(1)	(1)	----------	(1)	(1)
1928	11,811	1,548	1,200	14,559	----------	4,117	2,883	7,000	21,559	4.5	397	130	82	----------	1,040	(1)
1929	16,432	1,550	1,309	19,291	----------	14,979	3,592	18,571	37,862	7.4	488	126	99	----------	2,521	(1)
1930	20,073	1,637	1,628	23,338	----------	19,116	4,528	23,644	46,982	10.5	545	150	140	----------	2,876	(1)
1931	19,407	1,471	1,811	22,689	----------	19,172	5,701	24,873	47,562	13.1	583	146	165	----------	3,428	(1)
1932	14,825	1,132	1,630	17,587	----------	12,590	5,640	18,230	35,817	12.3	548	128	159	----------	3,112	(1)
1933	17,865	991	1,656	20,512	----------	11,413	5,896	17,309	37,821	12.0	523	93	132	----------	2,453	525
1934	20,750	1,004	2,082	23,836	----------	11,089	6,508	17,597	41,433	12.2	534	119	157	----------	2,288	574
1935	24,675	1,118	2,595	28,388	----------	11,098	7,691	18,789	47,177	13.5	657	78	179	----------	2,098	670
1936	40,970	1,273	3,240	45,483	----------	10,538	10,956	21,494	66,977	16.3	980	106	234	----------	1,851	936
1937	(1)	(1)	(1)	(1)	----------	(1)	(1)	(1)	83,500	20.2	(1)	(1)	(1)	----------	(1)	(1)
1938	57,824	1,031	4,248	63,103	----------	5,653	16,337	21,990	85,093	26.7	1,405	117	346	----------	1,392	1,526
1939	76,442	1,007	6,759	84,208	----------	5,038	21,466	26,504	110,712	31.0	1,573	131	559	----------	873	1,834
1940	100,962	1,255	10,362	112,579	----------	3,979	31,312	35,291	147,870	35.4	1,720	116	656	----------	697	2,263
1941	126,478	1,290	14,918	142,686	----------	3,447	40,534	43,981	186,667	40.7	1,985	109	788	----------	607	2,807
1942	160,301	1,405	20,683	182,389	----------	3,252	47,262	50,514	232,903	45.2	2,301	93	1,062	----------	481	3,041
1943	179,008	1,349	22,917	203,274	----------	2,669	43,862	46,531	249,805	48.9	2,525	83	1,226	----------	321	3,191
1944	202,875	1,341	23,164	227,380	----------	1,835	44,974	46,809	274,189	52.9	2,737	87	1,331	----------	241	3,236
1945	198,668	1,252	21,506	221,426	----------	986	40,100	41,086	262,512	56.1	2,950	87	1,383	----------	142	3,385
1946	186,975	917	19,678	207,570	----------	623	37,148	37,771	245,341	58.3	3,200	75	1,521	----------	93	3,470
1947	229,836	854	21,921	252,611	----------	353	45,193	45,546	298,157	60.7	3,569	67	1,531	----------	71	3,979
1948	[3] 232,667	743	19,634	253,044	(4)	184	42,578	42,762	295,806	64.3	[3] 3,980	56	1,632	(4)	37	4,125
1949	[3] 177,239	339	13,994	191,572	(4)	54	30,750	30,804	222,376	67.0	[3] 4,205	46	1,483	(4)	17	4,312
1950	[3] 222,976	318	13,985	237,279	(4)	39	35,407	35,446	272,725	69.4	[3] 4,318	39	1,329	(4)	12	4,434
1951	[5] 252,663	126	13,884	266,673	(4)	(6)	37,583	37,583	304,256	73.1	[5] 4,410	22	1,242	(4)	(6)	3,904
1952	218,982	77	10,590	229,649	8,215	(6)	31,130	31,130	268,994	75.5	4,083	19	1,049	152	(6)	3,569
1953	232,585	239	8,531	241,355	11,830	(6)	25,144	25,144	278,329	79.6	3,985	29	849	219	(6)	2,994
1954	206,546	411	4,672	211,629	16,336	(6)	15,005	15,005	242,970	84.0	4,314	48	633	325	(6)	2,162
1955	243,204	141	4,369	247,714	27,460	(6)	15,497	15,497	290,671	84.6	3,819	23	487	385	(6)	1,925

[1] Data not available.
[2] Exclusive of tonnage "Handled by conveyors."
[3] Includes continuous mining machines.
[4] Included with mobile loading machines.
[5] Includes continuous mining machines and augers.
[6] Canvas of pit-car loaders discontinued in 1951.

21 mines listed as using continuous mining machines only also used mobile loading machines in conjunction with the continuous mining machines. In 1955, 140 mobile loading machines were reported as used in this manner. All tonnage mined by continuous mining machines was credited to this category, even though it may have been mined and dumped on the floor and loaded out with a mobile loading machine.

Sales of mechanical loading equipment increased in 1955 over 1954 in all items except scrapers. Shuttle-car and "mother" conveyor sales also increased in 1955 over 1954; however, face and bridge conveyor sales decreased.

TABLE 34.—Bituminous coal and lignite mechanically loaded underground in the United States, 1954–55, by types of loading equipment

Type of equipment	1954		1955	
	Net tons	Percentage of total	Net tons	Percentage of total
Mobile loading machines:				
Loading direct into mine cars	41,588,639	17.1	47,396,995	16.3
Loading onto conveyors	11,348,416	4.7	12,504,662	4.3
Loading into shuttle cars	153,609,047	63.2	183,302,753	63.1
Continuous mining machines	16,335,739	6.7	27,460,204	9.5
Scrapers	411,045	.2	140,673	----------
Conveyors equipped with duckbills or other self-loading heads	4,671,672	1.9	4,369,008	1.5
Hand-load conveyors	15,005,091	6.2	15,497,019	5.3
Total mechanically loaded	242,969,649	100.0	290,671,314	100.0

TABLE 35.—Comparative changes in underground mechanical loading of bituminous coal and lignite, by principal types of loading devices in the United States, 1954–55, by States

State	Net tons by—						Total mechanically loaded (net tons)		Total production at mines using mechanical loading devices (net tons)		Handled by each class (percent)					
	Loading machines [1]		Continuous mining machines		Hand-loaded conveyors						Loading machines [1]		Continuous mining machines		Hand-loaded conveyors	
	1954	1955	1954	1955	1954	1955	1954	1955	1954	1955	1954	1955	1954	1955	1954	1955
Alabama	6,007,199	7,779,453	1,000,748	1,310,775	824,659	708,760	7,832,606	9,798,988	7,949,839	9,914,886	76.7	79.4	12.8	13.4	10.5	7.2
Alaska	139,926	24,250	9,150	16,213	----------	25,000	149,076	65,463	285,335	235,139	93.9	37.0	6.1	24.8	-----	38.2
Arkansas	----------	----------	----------	----------	242,227	287,840	242,227	287,840	242,227	287,840	----------	----------	----------	----------	100.0	100.0
Colorado	1,721,209	2,218,038	61,234	76,674	147,542	177,711	1,929,985	2,472,423	2,252,521	2,803,545	89.2	89.7	3.2	3.1	7.6	7.2
Illinois	23,003,431	24,269,159	1,946,140	2,538,950	6,856	----------	24,956,427	26,808,109	24,973,892	26,827,781	92.2	90.5	7.8	9.5	-----	-----
Indiana	4,435,428	4,727,592	295,478	101,010	----------	----------	4,730,906	4,828,602	4,736,138	4,828,602	93.8	97.9	6.2	2.1	-----	-----
Iowa	81,968	29,424	----------	----------	----------	----------	81,968	29,424	85,968	72,714	100.0	100.0	----------	----------	----------	----------
Kentucky	30,442,519	35,319,221	540,032	677,113	2,894,096	1,945,178	33,876,647	37,941,512	35,568,514	39,330,638	89.9	93.1	1.6	1.8	8.5	5.1
Maryland	41,487	20,538	----------	----------	38,728	75,059	80,215	95,597	80,215	95,597	51.7	21.5	-----	-----	48.3	78.5
Montana:																
Bituminous	361,510	392,195	----------	----------	10,277	----------	371,787	392,195	371,787	400,143	97.2	100.0	-----	-----	2.8	-----
Lignite	(2)	5,403	(2)	----------	(2)	----------	(2)	5,403	(2)	5,403	(2)	100.0	(2)	-----	(2)	-----
Total, Montana	----------	397,598	----------	----------	----------	----------	----------	397,598	----------	405,546	-----	100.0	-----	-----	-----	-----
New Mexico	52,839	59,206	----------	----------	1,000	500	53,839	59,706	60,229	67,011	98.1	99.2	-----	-----	1.9	.8
North Dakota (lignite)	(2)	13,169	(2)	----------	(2)	----------	(2)	13,169	(2)	15,265	(2)	100.0	(2)	-----	(2)	-----
Ohio	8,036,536	9,474,593	1,175,606	1,461,564	190,222	261,325	9,402,364	11,197,482	9,409,125	11,230,292	85.5	84.6	12.5	13.1	2.0	2.3
Oklahoma	50,614	37,195	----------	----------	665,037	630,796	715,651	667,991	715,651	667,991	7.1	5.6	-----	-----	92.9	94.4
Pennsylvania	36,491,372	41,894,628	7,911,010	13,163,968	3,045,727	3,476,673	47,448,109	58,535,269	49,040,310	59,502,586	76.9	71.6	16.7	22.5	6.4	5.9
Tennessee	1,554,441	1,725,576	----------	----------	198,715	179,637	1,753,156	1,905,213	1,889,159	1,905,213	88.7	90.6	-----	-----	11.3	9.4
Utah	4,675,406	5,722,492	283,571	530,947	8,403	9,404	4,967,380	6,262,843	4,967,754	6,262,843	94.1	91.4	5.7	8.5	.2	.1
Virginia	7,813,715	12,121,480	311,016	982,308	521,116	321,737	8,645,847	13,425,525	9,284,166	14,114,202	90.4	90.3	3.6	7.3	6.0	2.4
Washington	123,480	131,972	155,505	260,870	251,338	149,278	530,323	542,120	553,629	542,616	22.3	24.4	29.7	48.1	48.0	27.5
West Virginia	85,346,615	100,522,243	2,566,997	6,268,530	5,895,666	7,174,213	93,809,278	113,964,986	98,047,553	118,018,257	91.0	88.2	2.7	5.5	6.3	6.3
Wyoming	1,228,984	1,226,264	79,252	71,282	63,482	73,908	1,371,718	1,371,454	1,378,279	1,378,115	88.6	89.4	6.3	5.2	5.1	5.4
Lignite	[3] 20,140	----------	----------	----------	----------	----------	[3] 20,140	----------	[3] 20,140	----------	[3]100.0	-----	-----	-----	-----	-----
Total	211,628,819	247,714,091	16,335,739	27,460,204	15,005,091	15,497,019	242,969,649	290,671,314	251,912,431	298,506,679	87.1	85.2	6.7	9.5	6.2	5.3

[1] Includes mobile loading machines, scrapers, and conveyors equipped with duckbills or other self-loading heads.

[2] Included in lignite total; not published to avoid disclosing individual operations.

[3] Includes lignite in Montana and North Dakota.

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TABLE 36.—Number of underground bituminous-coal and lignite mines using mechanical loading devices and number of units in use in the United States, 1954–55, by States

State	Number of mines										Number of loading devices									
	Using loading machines only [1]		Using continuous mining machines only		Using hand-loaded conveyors only		Using more than one type of mechanical loading		Total		Loading machines						Continuous mining machines		Hand-loaded conveyors (number of units)	
											Mobile loading machines		Scrapers		Duckbills or other self-loading conveyors					
	1954	1955	1954	1955	1954	1955	1954	1955	1954	1955	1954	1955	1954	1955	1954	1955	1954	1955	1954	1955
Alabama	20	18	-------	-------	14	10	5	5	39	33	143	117	-------	-------	8	4	10	11	113	70
Alaska	3	2	-------	-------	-------	-------	2	2	5	4	11	5	14	2	-------	-------	2	2	-------	6
Arkansas	-------	-------	-------	-------	10	9	-------	-------	10	9	-------	-------	-------	-------	-------	-------	-------	-------	38	47
Colorado	31	33	1	1	18	15	7	7	57	56	57	40	2	1	109	124	4	5	64	59
Illinois	61	56	1	1	1	-------	3	2	66	59	274	215	-------	-------	11	8	22	27	4	-------
Indiana	24	24	-------	-------	-------	-------	2	1	26	25	92	86	-------	-------	-------	-------	4	3	-------	-------
Iowa	4	3	-------	-------	-------	-------	-------	-------	4	3	5	3	-------	-------	1	-------	-------	-------	-------	-------
Kentucky	130	126	1	3	28	20	15	13	174	162	585	512	-------	-------	31	28	14	15	286	192
Maryland	2	1	-------	-------	2	5	-------	1	4	7	2	1	-------	-------	2	1	-------	-------	6	10
Montana:																				
Bituminous	9	8	-------	-------	2	-------	-------	-------	11	8	17	15	-------	-------	8	6	-------	-------	3	-------
Lignite	(2)	1	(2)	-------	(2)	-------	(2)	-------	(2)	1	-------	2	(2)	-------	(2)	-------	(2)	-------	(2)	-------
Total Montana	-------	9	-------	-------	-------	-------	-------	-------	-------	9	17	17	-------	-------	-------	6	-------	-------	-------	-------
New Mexico	2	1	-------	-------	1	1	-------	-------	3	2	16	2	-------	-------	-------	-------	-------	-------	1	1
North Dakota (lignite)	(2)	2	(2)	-------	(2)	-------	(2)	-------	(2)	2	-------	2	(2)	-------	(2)	-------	(2)	-------	(3)	-------
Ohio	29	25	4	3	12	15	5	5	50	48	173	137	1	-------	18	7	12	16	40	39
Oklahoma	-------	1	-------	-------	6	4	2	1	8	6	7	6	-------	-------	-------	-------	-------	-------	117	102
Pennsylvania	93	80	7	7	102	79	47	48	249	214	972	853	12	5	81	74	153	182	531	397
Tennessee	11	10	-------	-------	5	5	2	-------	18	15	31	23	-------	-------	14	12	-------	-------	25	27
Utah	36	31	-------	-------	1	2	1	2	38	35	146	116	-------	1	37	4	6	9	3	2
Virginia	29	31	-------	1	6	7	11	7	46	46	168	193	1	-------	39	8	5	9	69	37
Washington	2	3	-------	-------	-------	1	5	2	7	6	4	4	11	8	6	2	7	5	78	85
West Virginia	225	240	2	4	62	79	66	54	355	377	1,564	1,457	3	-------	106	111	84	99	758	832
Wyoming	9	6	1	1	3	-------	2	3	15	10	44	30	4	6	162	98	2	2	26	19
Lignite	[3] 2	-------	-------	-------	-------	-------	-------	-------	[3] 2	-------	[3] 3	-------	-------	-------	-------	-------	-------	-------	-------	-------
Total	722	702	17	21	273	252	175	153	1,187	1,128	4,314	3,819	48	23	633	487	325	385	2,162	1,925

[1] Includes mobile loading machines, scrapers, and conveyors equipped with duckbills or other self-loading heads.

[2] Included in lignite total; not published to avoid disclosing individual operations.

[3] Includes lignite in Montana and North Dakota.

TABLE 37.—Underground production at bituminous-coal and lignite mines in the United States, 1954–55, by States and methods of loading

State	Hand-loaded (net tons)		Mechanically loaded (net tons)		Total underground production (net tons)		Underground output hand-loaded (percent)		Underground output mechanically loaded (percent)	
	1954	1955	1954	1955	1954	1955	1954	1955	1954	1955
Alabama	907,443	1,171,622	7,832,606	9,798,988	8,740,049	10,970,610	10.4	10.7	89.6	89.3
Alaska	124,516	174,108	149,076	65,463	273,592	239,571	45.5	72.7	54.5	27.3
Arizona	10,925	8,898			10,925	8,898	100.0	100.0		
Arkansas	11,135	29,161	242,227	287,840	253,362	317,001	4.4	9.2	95.6	90.8
Colorado	672,408	738,702	1,929,985	2,472,423	2,602,393	3,211,125	25.8	23.0	74.2	77.0
Georgia	8,090	12,471			8,090	12,471	100.0	100.0		
Illinois	560,223	448,386	24,956,427	26,808,109	25,516,650	27,256,495	2.2	1.6	97.8	98.4
Indiana	156,027	138,487	4,730,906	4,828,602	4,886,933	4,967,089	3.2	2.8	96.8	97.2
Iowa	255,751	268,066	81,968	29,424	337,719	297,490	75.7	90.1	24.3	9.9
Kansas	24,392	14,819			24,392	14,819	100.0	100.0		
Kentucky	11,710,881	16,498,632	33,876,647	37,941,512	45,587,528	54,440,144	25.7	30.3	74.3	69.7
Maryland	147,966	179,857	80,215	95,597	228,181	275,454	64.8	65.3	35.2	34.7
Missouri	153,150	157,103			153,150	157,103	100.0	100.0		
Montana:										
Bituminous	25,654	23,143	371,787	392,195	397,441	415,338	6.5	5.6	93.5	94.4
Lignite	(1)	18,544	(1)	5,403	(1)	23,947	(1)	77.4	(1)	22.6
Total Montana		41,687		397,598		439,285		9.5		90.5
New Mexico	48,260	114,593	53,839	59,706	102,099	174,299	47.3	65.7	52.7	34.3
North Dakota (lignite)	(1)	8,188	(1)	13,169	(1)	21,357	(1)	38.3	(1)	61.7
Ohio	1,533,757	1,434,683	9,402,364	11,197,482	10,936,121	12,632,165	14.0	11.4	86.0	88.6
Oklahoma	23,499	26,332	715,651	667,991	739,150	694,323	3.2	3.8	96.8	96.2
Pennsylvania	7,596,488	6,368,962	47,448,109	58,535,269	55,044,597	64,904,231	13.8	9.8	86.2	90.2
Tennessee	3,149,837	3,435,451	1,753,156	1,905,213	4,902,993	5,340,664	64.2	64.3	35.8	35.7
Utah	40,572	32,681	4,967,380	6,262,843	5,007,952	6,295,524	.8	.5	99.2	99.5
Virginia	6,661,643	8,815,737	8,645,847	13,425,525	15,307,490	22,241,262	43.5	39.6	56.5	60.4
Washington	29,958	35,956	530,323	542,120	560,281	578,076	5.4	6.2	94.6	93.8
West Virginia	12,239,990	12,623,276	93,809,278	113,964,986	106,049,268	126,588,262	11.5	10.0	88.5	90.0
Wyoming	22,985	16,067	1,371,718	1,371,454	1,394,703	1,387,521	1.6	1.2	98.4	98.8
Lignite	[2] 26,832		[2] 20,140		[2] 46,972		[2] 57.1		[2] 42.9	
Total	46,142,382	52,793,925	242,969,649	290,671,314	289,112,031	343,465,239	16.0	15.4	84.0	84.6

[1] Included in lignite total; not published to avoid disclosing individual operations.

[2] Includes lignite in Montana and North Dakota.

TABLE 38.—Units of mechanical loading equipment sold to bituminous-coal and lignite mines for underground use in the United States, as reported by manufacturers, 1948–55

Type of equipment	1948	1949	1950	1951	1952	1953	1954	1955	Change from 1954 (percent)
Mobile loading machines	[1] 723	[1] 286	[1] 289	[1] 287	[1] 206	180	92	120	+30.4
Continuous-mining machines	(1)	(1)	(1)	(1)	(1)	67	101	109	+7.9
Scrapers	17	8	1	4	8	11	5	----	----
Conveyors [2]	1,025	394	316	297	155	87	61	143	+134.4
Total	1,765	688	606	588	369	345	259	372	+43.6
Number of manufacturers reporting	22	22	20	21	22	25	23	22	----

[1] Continuous-mining machines included with mobile loading machines.
[2] Includes hand-loaded conveyors and those equipped with duckbills or other self-loading heads.

TABLE 39.—Units of mechanical loading equipment sold for use in bituminous-coal and lignite mines in the United States, as reported by manufacturers, 1954–55, by States

State	Mobile loading machines		Continuous mining machines		Scrapers		Room conveyors [1]	
	1954	1955	1954	1955	1954	1955	1954	1955
Alabama	12	2	2	----	----	----	1	4
Alaska	2	----	2	----	----	----	3	----
Colorado	1	----	----	----	1	----	----	----
Illinois	1	1	6	7	----	----	----	----
Indiana	1	1	----	----	----	----	----	----
Kentucky	17	27	----	6	----	----	15	28
Maryland	----	----	----	----	----	----	1	----
Ohio	----	----	1	4	----	----	1	7
Pennsylvania	5	17	38	50	2	----	----	12
Tennessee	----	3	----	----	----	----	----	----
Utah	5	3	3	5	----	----	----	----
Virginia	11	14	2	9	----	----	10	17
Washington	----	----	----	1	----	----	----	----
West Virginia	37	52	47	27	----	----	30	75
Wyoming	----	----	----	----	2	----	----	----
Total	92	120	101	109	5	----	61	143

[1] Includes hand-loaded conveyors and those equipped with duckbills or other self-loading heads.

TABLE 40.—Units of conveying equipment sold for use in bituminous-coal and lignite mines in the United States, as reported by manufacturers, 1954–55, by States

State	Face conveyors [1]		Shuttle cars		"Mother" conveyors [2]	
	1954	1955	1954	1955	1954	1955
Alabama	----	2	26	17	----	3
Colorado	----	----	----	2	1	----
Illinois	----	----	1	12	6	1
Indiana	----	----	2	3	2	1
Kentucky	23	24	36	45	----	8
Maryland	1	----	----	----	----	----
Ohio	----	----	----	----	1	7
Pennsylvania	----	14	42	96	3	27
Tennessee	----	----	----	2	----	----
Utah	----	----	8	13	1	2
Virginia	14	2	15	31	----	6
West Virginia	77	34	112	127	5	23
Total	115	76	242	348	19	78

[1] Includes "Bridge" conveyors and all other conveyors 10 to 100 feet long.
[2] Includes all haulage conveyors with capacity over 500 feet, except main-slope conveyors.

MECHANICAL CLEANING

Mechanical cleaning refers to cleaning with mechanical devices that generally effect separation of impurities from raw coal by differences in specific gravity; it does not include coal that is screened only. These mechanical devices are divided into two general classes—wet and pneumatic. About 93 percent of the coal cleaned in 1955 was cleaned by various wet methods. Approximately half of all the bituminous coal cleaned in the United States is cleaned with jigs. The various types of mechanical cleaning equipment are described in detail in Minerals Yearbook, volume II, Fuels, 1953, pp. 94–96.

In recent years the reporting of the movement of raw coal to cleaning plants has become so complicated that it is almost impossible to determine the total production of the mines that move coal to cleaning plants. A new table was introduced in 1954 to replace the various tables in previous chapters that showed the total production at mines served by cleaning plants. In this new arrangement the coal cleaned was tabulated, by types of mining, under the State from which the coal was mined. The cleaning plant has been credited to the State where the major portion of the coal was mined.

TABLE 41.—Growth of mechanical cleaning at bituminous-coal and lignite mines in the United States, 1927–55

Year	Total production (thousand tons)	Mechanical cleaning					Percentage of total production mechanically cleaned
		Number of cleaning plants	Raw coal (thousand tons)	Cleaned coal (thousand tons)	Refuse (thousand tons)	Percentage refuse is of raw coal	
1927	517,763	[1]	[1]	27,692	[1]	[1]	5.3
1928	500,745	236	[1]	28,783	[1]	[1]	5.7
1929	534,989	280	40,241	36,799	3,442	8.6	6.9
1930	467,526	297	42,645	38,800	3,845	9.0	8.3
1931	382,089	312	39,529	36,172	3,357	8.5	9.5
1932	309,710	309	32,903	30,278	2,625	8.0	9.8
1933	333,630	290	37,682	34,558	3,124	8.3	10.4
1934	359,368	293	43,556	39,827	3,729	8.6	11.1
1935	372,373	320	49,473	45,361	4,112	8.3	12.2
1936	439,088	342	67,162	61,095	6,067	9.0	13.9
1937	445,531	[1]	[1]	65,000	[1]	[1]	14.6
1938	348,545	374	71,207	63,455	7,752	10.9	18.2
1939	394,855	366	88,895	79,429	9,466	10.6	20.1
1940	460,771	387	115,692	102,270	13,422	11.6	22.2
1941	514,149	417	133,379	117,540	15,839	11.9	22.9
1942	582,693	438	162,598	142,187	20,411	12.6	24.4
1943	590,177	432	167,310	145,576	21,734	13.0	24.7
1944	619,576	439	182,071	158,727	23,344	12.8	25.6
1945	577,617	439	172,899	147,886	25,013	14.5	25.6
1946	533,922	445	163,633	138,670	24,963	15.3	26.0
1947	630,624	461	206,620	174,436	32,184	15.6	27.7
1948	599,518	502	215,217	180,880	34,337	16.0	30.2
1949	437,868	571	184,691	153,652	31,039	16.8	35.1
1950	516,311	612	238,391	198,699	39,692	16.7	38.5
1951	533,665	631	289,838	240,010	49,828	17.2	45.0
1952	466,841	625	274,246	227,265	46,981	17.1	48.7
1953	457,290	611	295,654	241,759	53,895	18.2	52.9
1954	391,706	613	287,004	232,764	54,240	18.9	59.4
1955	464,633	575	335,458	272,715	62,743	18.7	58.7

[1] Data not available.

TABLE 42.—Mechanical cleaning at bituminous-coal and lignite mines in the United States, 1955, by States

State	Total production (net tons)	Mechanical cleaning					Percentage of total production mechanically cleaned
		Number of cleaning plants	Raw coal (net tons)	Cleaned coal (net tons)	Refuse (net tons)	Percentage of refuse is of raw coal	
Alabama	13,088,477	46	18,155,716	11,468,818	6,686,898	36.8	87.6
Alaska	639,696	3	593,498	354,489	239,009	40.3	55.4
Arkansas	577,726	(1)	(1)	(1)	(1)	(1)	(1)
Colorado	3,567,930	[2] 4	[2] 1,592,390	[2] 1,366,318	[2] 226,072	[2] 14.2	[2] 33.0
Illinois	45,932,114	63	46,418,357	38,868,369	7,549,988	16.3	84.6
Indiana	16,149,310	23	13,078,310	11,316,568	1,761,742	13.5	70.1
Kansas	742,282	3	852,696	599,279	253,417	29.7	80.7
Kentucky	69,019,910	75	44,453,653	37,537,062	6,916,591	15.6	54.4
Missouri	3,232,485	11	4,187,251	3,039,761	1,147,490	27.4	94.0
Montana (bituminous)	1,247,253	2	14,429	12,987	1,442	10.0	1.0
New Mexico	201,579	1	40,907	33,916	6,991	17.1	16.8
Ohio	37,869,791	26	20,880,157	16,305,907	4,574,250	21.9	43.1
Oklahoma	2,163,536	4	765,119	652,966	112,153	14.7	30.2
Pennsylvania	85,713,456	88	66,444,620	53,588,151	12,856,469	19.4	62.5
Tennessee	7,052,844	4	642,300	591,248	51,052	7.9	8.4
Utah	6,295,524	6	3,102,194	2,598,914	503,280	16.2	41.3
Virginia	23,507,509	27	11,440,455	9,490,348	1,950,107	17.0	40.4
Washington	609,790	6	956,484	581,709	374,775	39.2	95.4
West Virginia	139,167,889	182	101,824,393	84,295,018	17,529,375	17.2	60.6
Wyoming	2,926,593	1	15,022	13,656	1,366	9.1	.5
Other States [3]	4,927,714						
Total	464,633,408	575	335,457,951	272,715,484	62,742,467	18.7	58.7

[1] Included in Colorado.
[2] Includes Arkansas.
[3] Includes Arizona, California lignite, Georgia, Iowa, Maryland, Montana lignite, North Dakota lignite, and South Dakota lignite

TABLE 43.—Mechanical cleaning of bituminous coal and lignite in the United States, 1927–55, by types of equipment

Year	Wet methods								Pneumatic methods	Total
	Jigs	Concentrating tables	Classifiers	Launders	Dense-medium processes	Jigs and tables	Other combinations	Total		
	THOUSAND NET TONS OF CLEAN COAL									
1927	18,741	3,200	(1)	[1] 1,000	(1)	300	800	24,041	3,651	27,692
1928	17,927	3,412	(1)	[1] 2,446	(1)	1,056	156	24,997	3,786	28,783
1929	18,915	3,532	(1)	[1] 7,103	(1)	1,214	191	30,955	5,844	36,799
1930	17,724	2,272	(1)	[1] 9,818	(1)	1,029	62	30,905	7,895	38,800
1931	13,957	1,551	(1)	[1] 11,213	(1)	926	11	27,658	8,514	36,172
1932	9,963	821	(1)	[1] 12,140	(1)	806	9	23,739	6,539	30,278
1933	11,895	1,119	(1)	[1] 13,272	(1)	693	5	26,984	7,574	34,558
1934	14,012	1,116	(1)	[1] 15,168	(1)	1,227	6	31,529	8,298	39,827
1935	15,735	1,118	(1)	[1] 18,454	(1)	1,549	----------	36,856	8,505	45,361
1936	23,417	1,843	(1)	[1] 22,631	(1)	2,613	----------	50,504	10,591	61,095
1937	(2)	(2)	(2)	(2)	(2)	(2)	(2)	(2)	(2)	65,000
1938	27,615	984	4,521	10,681	4,450	2,791	2,145	53,187	10,268	63,455
1939	37,056	1,402	5,917	12,809	4,683	3,256	2,611	67,734	11,695	79,429
1940	47,064	2,330	7,762	16,269	6,692	2,765	4,408	87,290	14,980	102,270
1941	53,287	2,510	8,177	16,954	9,344	4,364	5,742	100,378	17,162	117,540
1942	66,876	3,138	10,529	18,658	12,495	4,366	5,938	122,000	20,187	142,187
1943	66,092	2,929	11,854	17,424	13,388	4,322	8,366	124,375	21,201	145,576
1944	74,175	2,753	14,780	19,686	13,869	4,649	8,751	138,663	20,064	158,727
1945	68,609	2,594	14,203	18,980	12,875	4,754	8,455	130,470	17,416	147,886
1946	64,702	1,447	13,883	16,021	14,173	3,776	8,057	122,059	16,611	138,670
1947	85,931	2,980	14,648	17,902	17,702	4,303	12,617	156,083	18,353	174,436
1948	87,506	4,360	18,304	16,788	20,638	5,252	11,816	164,664	16,216	180,880
1949	72,423	4,040	14,865	11,238	17,821	3,288	17,033	140,708	12,944	153,652
1950	94,161	4,693	18,059	11,630	28,948	6,153	19,526	183,170	15,529	198,699
1951	101,746	5,811	23,174	10,362	33,840	7,613	38,884	221,430	18,580	240,010
1952	97,336	3,723	19,296	11,738	31,321	8,280	36,925	208,619	18,646	227,265
1953	101,001	4,002	18,312	11,988	36,805	8,647	41,739	222,494	19,265	241,759
1954	99,913	6,606	16,115	12,156	43,104	9,024	27,119	214,037	18,727	232,764
1955	114,538	7,443	17,656	11,400	49,332	13,953	38,098	252,420	20,295	272,715
	PERCENTAGE CLEANED BY EACH TYPE									
1927	67.6	11.6	(1)	[1] 3.6	(1)	1.1	2.9	86.8	13.2	100.0
1928	62.3	11.8	(1)	[1] 8.5	(1)	3.7	.5	86.8	13.2	100.0
1929	51.4	9.6	(1)	[1] 19.3	(1)	3.3	.5	84.1	15.9	100.0
1930	45.6	5.9	(1)	[1] 25.3	(1)	2.7	.2	79.7	20.3	100.0
1931	38.6	4.3	(1)	[1] 31.0	(1)	2.6	----------	76.5	23.5	100.0
1932	32.8	2.7	(1)	[1] 40.2	(1)	2.7	----------	78.4	21.6	100.0
1933	34.4	3.2	(1)	[1] 38.5	(1)	2.0	----------	78.1	21.9	100.0
1934	35.2	2.8	(1)	[1] 38.1	(1)	3.1	----------	79.2	20.8	100.0
1935	34.7	2.5	(1)	[1] 40.7	(1)	3.4	----------	81.3	18.7	100.0
1936	38.3	3.0	(1)	[1] 37.1	(1)	4.3	----------	82.7	17.3	100.0
1937	(2)	(2)	(2)	(2)	(2)	(2)	(2)	(2)	(2)	100.0
1938	43.5	1.6	7.1	16.8	7.0	4.4	3.4	83.8	16.2	100.0
1939	46.6	1.8	7.5	16.1	5.9	4.1	3.3	85.3	14.7	100.0
1940	46.0	2.3	7.6	15.9	6.5	2.7	4.3	85.3	14.7	100.0
1941	45.3	2.2	7.0	14.4	7.9	3.7	4.9	85.4	14.6	100.0
1942	47.0	2.2	7.4	13.1	8.8	3.1	4.2	85.8	14.2	100.0
1943	45.4	2.0	8.1	12.0	9.2	3.0	5.7	85.4	14.6	100.0
1944	46.7	1.8	9.3	12.4	8.8	2.9	5.5	87.4	12.6	100.0
1945	46.4	1.8	9.6	12.8	8.7	3.2	5.7	88.2	11.8	100.0
1946	46.7	1.0	10.0	11.6	10.2	2.7	5.8	88.0	12.0	100.0
1947	49.3	1.7	8.4	10.3	10.1	2.5	7.2	89.5	10.5	100.0
1948	48.4	2.4	10.1	9.3	11.4	2.9	6.5	91.0	9.0	100.0
1949	47.1	2.6	9.7	7.3	11.6	2.2	11.1	91.6	8.4	100.0
1950	47.4	2.4	9.1	5.8	14.6	3.1	9.8	92.2	7.8	100.0
1951	42.4	2.4	9.7	4.3	14.1	3.2	16.2	92.3	7.7	100.0
1952	42.8	1.6	8.5	5.2	13.8	3.6	16.3	91.8	8.2	100.0
1953	41.8	1.6	7.6	4.9	15.2	3.6	17.3	92.0	8.0	100.0
1954	42.8	3.0	5.7	3.9	21.8	3.5	14.4	95.1	4.9	100.0
1955	42.0	2.7	6.5	4.2	18.1	5.1	14.0	92.6	7.4	100.0

[1] Launders include classifiers and dense-medium processes for 1927–36, inclusive.
[2] Data not available.

TABLE 44.—Mechanical cleaning at bituminous-coal and lignite mines in the United States, 1953, 1954, and 1955, by underground, strip, and auger mining

Type of mining	1953	1954	1955
Underground mines:			
Total production, net tons	349, 550, 972	289, 112, 031	343, 465, 239
Mechanically cleaned, net tons	194, 934, 599	184, 372, 053	217, 199, 126
Percent cleaned	55.8	63.8	63.2
Strip mines:			
Total production, net tons	105, 448, 569	98, 134, 250	115, 092, 769
Mechanically cleaned, net tons	46, 202, 508	47, 772, 295	54, 423, 341
Percent cleaned	43.8	48.7	47.3
Auger mines:			
Total production, net tons	2, 290, 908	4, 460, 019	6, 075, 400
Mechanically cleaned, net tons	621, 470	619, 675	1, 093, 017
Percent cleaned	27.1	13.9	18.0
Total all mines:			
Total production, net tons	457, 290, 449	391, 706, 300	464, 633, 408
Mechanically cleaned, net tons	241, 758, 577	232, 764, 023	272, 715, 484
Percent cleaned	52.9	59.4	58.7

TABLE 45.—Mechanical cleaning at bituminous-coal and lignite mines in the United States, 1955, by States and by underground, strip, and auger mining

State	Underground mines			Strip mines			Auger mines			Total all mines		
	Total production	Mechanically cleaned	Percentage cleaned	Total production	Mechanically cleaned	Percentage cleaned	Total production	Mechanically cleaned	Percentage cleaned	Total production	Mechanically cleaned	Percentage cleaned
Alabama	10,970,610	10,306,235	93.9	2,110,979	1,155,695	54.7	6,888	6,888	100.0	13,088,477	11,468,818	87.6
Alaska	239,571	94,984	39.6	400,125	259,505	64.9				639,696	354,489	55.4
Arkansas	317,001	(1)	(1)	260,725	(1)	(1)				577,726	(1)	(1)
Colorado	3,211,125	[2] 1,073,920	[2] 30.4	356,805	[2] 292,398	[2] 47.3				3,567,930	[2] 1,366,318	[2] 33.0
Illinois	27,256,495	20,931,764	76.8	18,675,619	17,936,605	96.0				45,932,114	38,868,369	84.6
Indiana	4,967,089	3,785,235	76.2	11,182,221	7,531,333	67.4				16,149,310	11,316,568	70.1
Kansas	14,819			727,463	599,279	82.4				742,282	599,279	80.7
Kentucky	54,440,144	26,709,750	49.1	13,643,240	10,549,025	77.3	936,526	278,287	29.7	69,019,910	37,537,062	54.4
Missouri	157,103	44,715	28.5	3,075,382	2,995,046	97.4				3,232,485	3,039,761	94.0
Montana (bituminous)	439,285	12,987	3.0	807,968						1,247,253	12,987	1.0
New Mexico	174,299	33,916	19.5	27,280						201,579	33,916	16.8
Ohio	12,632,165	9,021,333	71.4	23,958,329	7,201,479	30.1	1,279,297	83,095	6.5	37,869,791	16,305,907	43.1
Oklahoma	694,323	381,320	54.9	1,469,213	271,646	18.5				2,163,536	652,966	30.2
Pennsylvania	64,904,231	49,875,555	76.8	20,518,113	3,693,847	18.0	291,112	18,749	6.4	85,713,456	53,588,151	62.5
Tennessee	5,340,664	557,138	10.4	1,635,052	29,110	1.8	77,128	5,000	6.5	7,052,844	591,248	8.4
Utah	6,295,524	2,598,914	41.3							6,295,524	2,598,914	41.3
Virginia	22,241,262	9,025,942	40.6	981,782	377,702	38.5	284,465	86,704	30.5	23,507,509	9,490,348	40.4
Washington	578,076	549,995	95.1	31,714	31,714	100.0				609,790	581,709	95.4
West Virginia	126,588,262	82,181,767	64.9	9,379,643	1,498,957	16.0	3,199,984	614,294	19.2	139,167,889	84,295,018	60.6
Wyoming	1,387,521	13,656	1.0	1,539,072						2,926,593	13,656	.5
Other States [3]	615,670			4,312,044						4,927,714		
Total	342,465,239	217,199,126	63.2	115,092,769	54,423,341	47.3	6,075,400	1,093,017	18.0	464,633,408	272,715,484	58.7

[1] Included in Colorado.
[2] Includes Arkansas.
[3] Includes Arizona, California lignite, Georgia, Iowa, Maryland, Montana lignite, North Dakota lignite, and South Dakota lignite.

MECHANICAL CRUSHING

TABLE 46.—Mechanical crushing of bituminous coal and lignite at mines in the United States, 1940 and 1944–55 [1]

Year	Number of mines crushing coal	Coal crushed (net tons)	Percentage of production crushed at mines where crushing is done	Percentage of total production crushed	Percentage of production mechanically cleaned at mines where crushing is done
1940	716	35, 251, 061	19.3	7.7	[2]
1944	814	66, 460, 564	29.6	10.8	[2]
1945	830	70, 936, 898	32.4	12.3	[2]
1946	851	66, 663, 732	31.8	12.5	39.9
1947	904	88, 985, 858	35.7	14.1	41.4
1948	995	91, 564, 311	36.6	15.3	42.1
1949	1, 120	77, 327, 691	39.0	17.7	47.3
1950	1, 210	101, 594, 731	40.1	19.7	50.6
1951	1, 374	118, 663, 712	39.6	22.2	54.8
1952	1, 325	108, 102, 158	40.5	23.2	59.6
1953	1, 239	116, 493, 415	42.5	25.5	62.7
1954 [3]	982	122, 288, 369	51.8	31.2	69.8
1955	1, 225	161, 470, 318	52.8	34.8	68.4

[1] Data not available for 1941–43, inclusive. Lignite and Virginia semianthracite mines are not included in 1940–49, inclusive.
[2] Data not available.
[3] Revised.

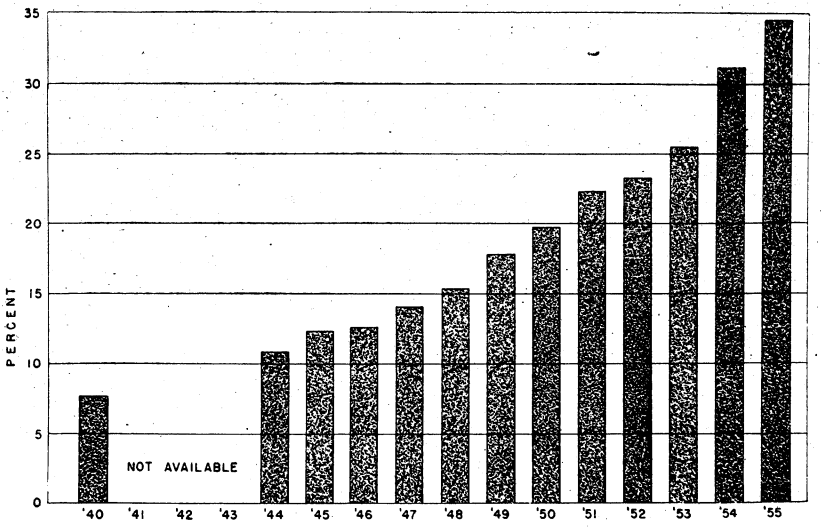

FIGURE 10.—Percentage of total production of bituminous coal and lignite crushed at mines in the United States, 1940 and 1944–55.

TABLE 47.—Mechanical crushing of bituminous coal and lignite at mines in the United States, 1954–55, by States

State	Number of mines crushing coal		Coal crushed (net tons)		Percentage of production crushed at mines where crushing is done		Percentage of total production crushed	
	1954	1955	1954	1955	1954	1955	1954	1955
Alabama	17	31	4,749,980	8,290,161	94.8	79.4	46.2	63.3
Alaska	5	9	292,454	406,048	64.8	63.9	43.9	63.5
Arizona		1		5,000		84.8		56.2
Arkansas	6	9	166,895	406,347	87.3	87.3	35.0	70.3
California (lignite)	(1)		(1)		(1)		(1)	
Colorado	32	45	371,905	1,849,272	29.9	62.3	12.8	51.8
Illinois	79	75	17,437,321	19,154,389	47.5	48.6	41.5	41.7
Indiana	29	27	4,479,438	6,337,377	47.3	54.5	33.4	39.2
Iowa	21	22	484,808	539,700	71.1	91.4	40.5	42.9
Kansas	6	3	1,061,757	610,648	100.0	100.0	77.4	82.3
Kentucky	130	132	18,624,039	23,803,984	51.8	56.5	32.7	34.5
Maryland	3	12	37,298	78,474	100.0	52.5	8.8	15.3
Missouri	10	11	1,753,204	2,622,452	98.1	95.8	69.7	81.1
Montana:								
Bituminous	7	8	115,650	169,704	36.6	14.4	7.8	13.9
Lignite	(1)	1	(1)	400	(1)	7.4	(1)	1.3
Total Montana	(2)	9	(2)	170,104	(2)	14.4	(2)	13.6
New Mexico	2	3	22,785	20,721	43.1	25.8	18.5	10.3
North Dakota (lignite)	(1)	19	(1)	2,835,171	(1)	95.3	(1)	91.4
Ohio	96	133	9,621,211	13,581,229	51.6	63.3	29.6	35.9
Oklahoma	14	10	939,014	697,149	74.9	60.6	49.0	32.2
Pennsylvania [3]	210	297	23,909,141	32,620,925	58.9	58.6	33.2	38.1
South Dakota (lignite)	(1)	1	(1)	1,000	(1)	4.2	(1)	3.9
Tennessee	14	13	605,638	469,218	61.9	41.3	9.4	6.7
Texas (lignite)	(1)	(2)	(1)	(2)	(1)	(2)	(1)	(2)
Utah	26	33	3,116,016	5,004,664	79.3	87.6	62.2	75.9
Virginia	43	44	2,247,446	2,994,166	28.3	31.4	13.7	12.7
Washington	10	6	134,027	175,979	23.4	36.9	21.6	28.9
West Virginia	201	269	28,772,915	37,231,652	44.0	40.3	24.8	26.8
Wyoming	10	11	1,330,587	1,564,488	87.6	73.4	47.0	53.5
Lignite	[4] 11		[4] 2,014,840		[4] 95.7		[4] 47.5	
Total [3]	982	1,225	122,288,369	161,470,318	51.8	52.8	31.2	34.8

[1] Included in lignite total; not published to avoid disclosing individual operations.
[2] Data not available.
[3] Date for 1954 revised.
[4] Includes lignite in California, Montana, North Dakota, South Dakota, and Texas.

TREATMENT FOR ALLAYING DUST

TABLE 48.—Summary data on treatment of bituminous-coal and lignite at mines for allaying dust in the United States, 1940–55 [1]

Year	Grand total production (net tons)	Total production at mines where coal was treated (net tons)	Percentage of production treated at mineswhere treating is done	Percentage of total production treated
1940	460, 771, 500	161, 089, 959	22. 1	7. 7
1941	514, 149, 245	197, 476, 343	20. 0	7. 7
1942	582, 692, 937	202, 973, 885	17. 3	6. 0
1943	590, 177, 069	153, 863, 052	17. 3	4. 5
1944	619, 576, 240	172, 955, 108	17. 8	5. 0
1945	577, 617, 327	166, 935, 955	20. 1	5. 8
1946	533, 922, 068	166, 814, 848	22. 2	6. 9
1947	630, 623, 722	195, 840, 059	26. 4	8. 2
1948	599, 518, 229	196, 600, 489	25. 6	8. 4
1949	437, 868, 036	160, 978, 742	26. 0	9. 5
1950	516, 311, 053	210, 083, 657	25. 9	10. 5
1951	533, 664, 732	228, 802, 637	25. 6	11. 0
1952	466, 840, 782	211, 437, 141	24. 4	11. 0
1953	457, 290, 449	206, 374, 498	23. 7	10. 7
1954	391, 706, 300	202, 098, 539	27. 9	14. 4
1955	464, 633, 408	236, 115, 318	26. 5	13. 5

Year	Net tons treated with—				
	Calcium chloride	Oil	Calcium chloride and oil	All other materials	Total
1940	2, 633, 291	25, 767, 651	4, 428, 113	2, 807, 728	35, 636, 783
1941	3, 957, 459	29, 258, 462	2, 482, 899	3, 844, 476	39, 543, 296
1942	10, 132, 809	11, 302, 020	6, 544, 658	7, 148, 064	35, 127, 551
1943	15, 049, 176	1, 720, 176	1, 947, 219	7, 966, 484	26, 683, 055
1944	7, 276, 702	13, 188, 883	4, 744, 580	5, 562, 565	30, 772, 730
1945	5, 115, 090	18, 875, 674	4, 647, 872	4, 910, 602	33, 549, 238
1946	4, 957, 622	24, 310, 109	3, 193, 070	4, 572, 360	37, 033, 161
1947	5, 822, 483	34, 667, 571	5, 571, 953	5, 732, 101	51, 794, 108
1948	6, 275, 121	34, 466, 534	4, 177, 987	5, 462, 054	50, 381, 696
1949	3, 670, 120	30, 448, 670	4, 380, 961	3, 275, 151	41, 774, 902
1950	4, 643, 186	41, 688, 159	4, 278, 212	3, 724, 314	54, 333, 871
1951	4, 694, 938	46, 142, 726	4, 587, 940	3, 172, 205	58, 597, 809
1952	4, 954, 080	41. 409, 886	3, 432, 199	1, 772, 111	51, 568, 276
1953	3, 362, 552	46, 671, 431	2, 769, 833	2, 154, 985	48, 958, 801
1954	2, 959, 979	47, 782, 165	3, 366, 955	2, 255, 872	56, 364, 971
1955	3, 160, 729	51, 157, 769	5, 696, 447	2, 513, 752	62, 528, 697

Year	Number of mines treating with—				
	Calcium chloride	Oil	Calcium chloride and oil	All other materials	Total [2]
1940	51	486	22	62	614
1941	67	564	15	58	668
1942	167	334	73	117	603
1943	212	67	28	101	393
1944	145	192	47	83	434
1945	105	296	43	67	487
1946	79	380	41	51	546
1947	67	384	58	45	546
1948	68	474	48	46	629
1949	91	586	62	34	769
1950	106	688	32	45	838
1951	98	764	40	27	898
1952	101	723	30	20	865
1953	81	681	28	26	785
1954	83	614	29	29	737
1955	63	650	33	28	757

Year	Percentage of tonnage treated with—				
	Calcium chloride	Oil	Calcium chloride and oil	All other materials	Total
1940	7. 4	72. 3	12. 4	7. 9	100. 0
1941	10. 0	74. 0	6. 3	9. 7	100. 0
1942	28. 8	32. 2	18. 6	20. 4	100. 0
1943	56. 4	6. 4	7. 3	29. 9	100. 0
1944	23. 6	42. 9	15. 4	18. 1	100. 0
1945	15. 2	56. 3	13. 9	14. 6	100. 0
1946	13. 4	65. 6	8. 6	12. 4	100. 0
1947	11. 2	66. 9	10. 8	11. 1	100. 0
1948	12. 5	68. 4	8. 3	10. 8	100. 0
1949	8. 8	72. 9	10. 5	7. 8	100. 0
1950	8. 5	76. 7	7. 9	6. 9	100. 0
1951	8. 0	78. 8	7. 8	5. 4	100. 0
1952	9. 6	80. 3	6. 7	3. 4	100. 0
1953	6. 8	83. 1	5. 7	4. 4	100. 0
1954	5. 2	84. 8	6. 0	4. 0	100. 0
1955	5. 1	81. 8	9. 1	4. 0	100. 0

[1] All items except "Grand total production" exclude lignite and semianthracite, 1940–49. Data for 1940–45 include all mines with an average daily production of 50 tons and all mines with rail or river connections regardless of size. Data for 1946–55 include all mines producing 1,000 tons and over. The figures are reasonably comparable for all years.

[2] Because some mines used more than 1 method of treatment this total is not the sum of the individual items.

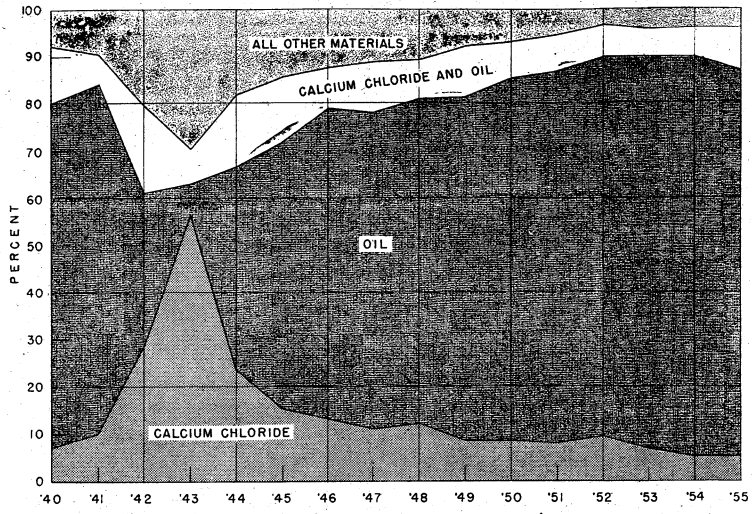

FIGURE 11.—Percentage of total bituminous coal and lignite treated for allaying dust at mines in the United States, 1940–55, by type of agent used.

TABLE 49.—Treatment of bituminous coal and lignite at mines for allaying dust, in the United States, 1954–55, by States

State	Number of mines treating coal		Coal treated (net tons)		Percentage of production treated at mines where treating is done		Percentage of total production treated	
	1954	1955	1954	1955	1954	1955	1954	1955
Alabama	11	6	98,368	70,572	16.5	14.1	1.0	0.5
Arkansas	6	4	33,035	33,500	24.0	19.2	6.9	5.8
California (lignite)	(1)		(1)		(1)		(1)	
Colorado	38	43	272,378	302,051	19.3	21.4	9.4	8.5
Illinois	80	80	6,179,525	5,544,987	17.5	13.5	14.7	12.1
Indiana	29	28	1,669,220	1,639,142	19.0	16.5	12.5	10.1
Iowa	5	3	8,947	10,300	12.8	19.7	.7	.8
Kansas	3	2	107,864	48,668	10.6	10.0	7.9	6.6
Kentucky	127	142	13,565,897	14,824,593	36.9	37.0	23.8	21.5
Maryland	1		25,000		90.6		5.9	
Missouri	9	10	165,605	203,974	10.1	7.4	6.6	6.3
Montana:								
Bituminous	12	8	33,141	39,003	18.1	9.9	2.2	3.2
Lignite	(1)	1	(1)	1,800	(1)	33.3	(1)	5.9
Total Montana	(2)	9	(2)	40,803	(2)	10.3	(2)	3.3
North Dakota (lignite)	(1)	15	(1)	518,517	(1)	18.3	(1)	16.7
Ohio	30	33	2,428,996	2,818,862	22.1	22.0	7.5	7.4
Oklahoma	7	7	176,269	154,462	25.6	16.8	9.2	7.1
Pennsylvania	94	96	6,617,980	7,642,068	32.3	30.4	9.2	8.9
South Dakota (lignite)	(1)		(1)		(1)		(1)	
Tennessee	8	6	295,954	183,324	32.1	32.5	4.6	2.6
Texas (lignite)	(1)		(1)	(2)	(1)	(2)	(1)	(2)
Utah	31	31	1,760,383	2,173,952	50.9	54.5	35.2	34.5
Virginia	39	34	3,272,478	3,593,208	34.1	30.2	20.0	15.3
West Virginia	179	192	19,162,813	22,419,396	29.0	28.4	16.5	16.1
Wyoming	17	16	284,907	306,318	18.5	13.7	10.1	10.5
Lignite	[3] 11		[3] 206,211		[3] 7.9		[3] 4.9	
Total	737	757	56,364,971	62,528,697	27.9	26.5	14.4	13.5

[1] Included in lignite total; not published to avoid disclosing individual operations.
[2] Data not available.
[3] Includes lignite in California, Montana, North Dakota, South Dakota, and Texas.

PRODUCTION BY STATES AND COUNTIES

Detailed production and employment statistics are given in table 50 for each coal-producing county in the United States from which three or more operators submitted reports for 1955. Statistics on counties with less than three reporting producers have been combined with data for other counties in the same State to avoid disclosing individual figures, unless the operators have granted permission to publish them separately. The production of mines on the border between two States has been credited to the State from which the coal was extracted rather than to that in which the tipple was situated. If the coal was mined from lands in both States, the tonnage was apportioned accordingly.

Bituminous coal and lignite were mined in 27 States and Alaska and 348 counties in 1955. Since soft coal accounts for a very large percentage of the economic activity in many counties, the key items pertaining to the industry are published by counties. These key items—(1) method of shipping the coal, (2) value, (3) number of men working daily, (4) days worked, and (5) tons per man per day—are very helpful in analyzing potential markets by counties.

The most striking thing about the following table is the wide variations among several counties in the same State; not only production, but even average value and average tons per man per day varied sharply. The differences in average value are due to quality of coal, method of transportation, or market conditions. The differences in output per man per day are caused largely by physical conditions, mining methods, and extent of mechanization.

TABLE 50.—Production, value, men working daily, days active, man-days, and output per man per day at bituminous-coal and lignite mines in the United States, 1955, by States and counties

(Exclusive of mines producing less than 1,000 tons)

County	Production (net tons)				Average value per ton [3]	Average number of men working daily	Average number of days mines worked	Number of man-days worked	Average tons per man per day [4]
	Shipped by rail or water [1]	Shipped by truck	Used at mine [2]	Total					
ALABAMA									
Bibb	48,977	36,471	100	85,548	$5.04	221	170	37,521	2.28
Blount	124,359	75,253		199,612	6.16	143	126	18,043	11.06
Cullman		29,260		29,260	6.44	30	162	4,851	6.03
De Kalb	75,325	3,175		78,500	5.15	27	250	6,738	11.65
Jackson		25,549		25,549	6.44	30	172	5,160	4.95
Jefferson	8,603,504	438,235	23,272	9,065,011	5.97	6,273	227	1,424,802	6.36
Marion	30,041	287,585		317,626	6.60	394	171	67,515	4.70
St. Clair		9,724		9,724	5.14	12	186	2,236	4.35
Shelby	12,360	71,882	52	84,294	6.65	147	205	30,213	2.79
Tuscaloosa	673,086	22,860	1,200	697,146	4.28	294	172	50,674	13.76
Walker	940,020	234,701	1,320,286	2,495,007	6.86	1,264	199	251,694	9.91
Winston		1,200		1,200	5.00	3	200	600	2.00
Total Alabama	10,507,672	1,235,895	1,344,910	13,088,477	6.06	8,838	215	1,900,047	6.89
ALASKA									
Total Alaska	620,887	12,463	6,346	639,696	$9.00	264	250	66,097	9.68
ARIZONA									
Navajo		8,898		8,898	$6.66	23	139	3,201	2.78

ARKANSAS									
Franklin	6,563	2,228		8,791	$4.38	8	130	1,039	8.46
Johnson	286,104		48	286,152	7.34	159	175	27,877	10.26
Logan	27,744		447	28,191	11.90	86	85	7,284	3.87
Sebastian	250,276	4,306	10	254,592	7.25	321	183	58,882	4.33
Total Arkansas	570,687	6,534	505	577,726	7.48	574	166	95,082	6.08
CALIFORNIA									
Amador			7,650	7,650	$10.00	2	250	500	15.30
COLORADO									
Boulder		24,406		24,406	$6.42	35	133	4,669	5.22
Delta	26,279	25,144	865	52,288	5.68	50	178	8,896	5.88
El Paso	5,577	50,067	17,740	73,384	4.73	37	234	8,670	8.46
Fremont	14,660	201,389	70	216,119	3.86	117	233	27,275	7.92
Garfield		33,750		33,750	5.12	29	192	5,564	6.07
Gunnison	256,006	53,987	16,180	326,173	5.24	229	182	41,764	7.81
Huerfano	23,529	40,287	87	63,903	5.82	67	192	12,884	4.96
Jackson		1,329		1,329	3.99	4	77	308	4.31
La Plata	22,372	32,313	43	54,728	3.98	48	210	10,079	5.43
Las Animas	1,271,310	32,953	13,140	1,317,403	7.11	1,519	205	311,443	4.23
Mesa	11,686	36,461	216	48,363	5.18	36	197	7,081	6.83
Moffat	87,458	13,096		100,554	5.38	35	202	7,053	14.26
Montezuma		1,108		1,108	3.98	3	178	535	2.07
Montrose		3,220		3,220	5.44	3	262	799	4.03
Pitkin	91,909			91,909	7.65	65	264	17,179	5.35
Rio Blanco	4,500	15,546		20,046	5.86	14	169	2,364	8.48
Routt	479,237	42,775	3,027	525,039	4.40	269	137	36,925	14.22
Weld	347,039	258,572	8,597	614,208	4.36	322	188	60,632	10.13
Total Colorado	2,641,562	866,403	59,965	3,567,930	5.63	2,882	196	564,120	6.32
GEORGIA									
Dade		1,200		1,200	$5.00	2	182	444	2.70
Walker		11,271		11,271	5.00	23	182	4,176	2.70
Total Georgia		12,471		12,471	5.00	25	182	4,620	2.70

For footnotes, see end of table.

TABLE 50.—Production, value, men working daily, days active, man-days, and output per man per day at bituminous-coal and lignite mines in the United States, 1955, by States and counties—Continued

(Exclusive of mines producing less than 1,000 tons)

County	Production (net tons)				Average value per ton [3]	Average number of men working daily	Average number of days mines worked	Number of man-days worked	Average tons per man per day [4]
	Shipped by rail or water [1]	Shipped by truck	Used at mine [2]	Total					
ILLINOIS									
Bureau	764,584	22,657	4,382	791,623	$4.04	287	176	50,486	15.68
Christian	5,971,251	184,355	7,299	6,162,935	3.14	1,281	237	304,081	20.27
Clark		1,235		1,235	4.00	2	90	180	6.86
Clinton	54,585	101,787	14,423	170,795	3.78	263	153	40,282	4.24
Douglas	158,039	166,916	1,225	326,180	4.22	78	232	18,087	18.03
Franklin	4,259,765	128,581	139,672	4,528,018	4.24	2,103	172	361,663	12.52
Fulton	5,082,585	304,938	8,857	5,396,380	3.72	908	243	220,545	24.47
Gallatin	183,114	12,587	1,112	196,813	2.74	104	204	21,263	9.26
Greene		5,806	5	5,811	5.28	3	240	720	8.07
Grundy	182,430	65,195		247,625	4.76	61	169	10,309	24.03
Hancock		30,299	88	30,387	6.15	11	176	1,938	15.68
Henry	17,874	21,961	627	40,462	5.07	44	137	6,003	6.74
Jackson	1,073,593	83,130	3,365	1,160,088	3.42	318	221	70,154	16.54
Jefferson	1,538,972	41,314	2,621	1,582,907	4.06	460	231	106,424	14.87
Kankakee	406,263	145,110		551,373	4.76	136	169	22,942	24.03
Knox	1,753,115	2,353	10,833	1,766,301	3.71	355	238	84,351	20.94
La Salle			2,654	2,654	2.15	13	252	3,277	.81
Livingston		3,394		3,394	6.13	4	129	516	6.58
Logan		27,536		27,536	6.97	20	191	3,828	7.19
Macoupin	271,118	64,561	6,148	341,827	3.73	247	170	41,897	8.16
Madison	343,586	677,160	14,615	1,035,361	3.82	554	181	100,325	10.32
Menard		15,133	452	15,585	6.14	30	149	4,466	3.49
Montgomery	1,453,350	265,213	5,412	1,723,975	4.09	550	204	112,174	15.37
Peoria	114,564	320,736	1,025	436,325	4.17	124	192	23,824	18.31
Perry	4,247,408	158,607	10,296	4,416,311	3.10	906	234	211,565	20.87
Randolph	1,118,286	75,717	2,478	1,196,481	3.00	350	172	60,187	19.88
St. Clair	1,595,807	1,642,038	8,044	3,245,889	3.32	765	209	159,867	20.30
Saline	2,847,643	26,305	8,815	2,882,763	3.81	1,019	194	197,587	14.58
Sangamon		77,540	817	78,357	5.49	132	86	11,389	6.88
Schuyler		21,256	150	21,406	5.31	40	132	5,290	4.05
Tazewell		3,011	500	3,511	4.82	12	119	1,481	2.37
Vermilion	681,096	191,909	3,095	876,100	3.98	198	237	47,028	18.63
Washington	6,322	13,067	680	20,069	5.00	50	104	5,193	3.86
Will	81,396	71,809		153,205	5.02	39	243	9,465	16.19
Williamson	6,171,634	300,336	20,462	6,492,432	3.70	1,955	194	378,784	17.14
Total Illinois	40,378,380	5,273,582	280,152	45,932,114	3.66	13,422	201	2,697,571	17.02

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INDIANA

Clay	543,338	292,792	2,881	839,011	$3.70	191	224	42,829	19.59
Daviess		69,498		69,498	4.30	33	201	6,600	10.53
Dubois		26,698		26,698	3.59	211	183	3,869	6.90
Fountain		53,132		53,132	5.96	28	150	4,217	12.60
Gibson	562,507	92,088	18,036	672,631	4.13	419	175	73,452	9.16
Greene	1,168,125	105,368	2,375	1,275,868	3.72	257	230	59,209	21.48
Knox	851,289	408,190	2,288	1,261,767	3.63	448	198	88,731	14.22
Martin		3,453		3,453	4.08	2	164	328	10.53
Owen	(5)	(5)	(5)	(5)	(5)	(5)	(5)	(5)	(5)
Parke		23,713	5	23,718	5.75	13	187	2,431	9.76
Pike	2,064,643	67,681	3,308	2,135,632	3.41	461	247	113,784	18.77
Spencer	(5)	(5)	(5)	(5)	(5)	(5)	(5)	(5)	(5)
Sullivan	1,154,830	130,343	2,740	1,287,913	3.67	341	205	69,954	18.41
Vermillion	156,956	52,074	1,083	210,113	3.82	89	168	14,962	14.04
Vigo	2,042,732	194,259	621,167	2,858,158	3.67	864	233	201,600	14.18
Warrick	4,762,395	414,847	2,435	5,179,677	3.43	921	193	177,457	29.20
Other counties	166,807	85,027	207	252,041	3.53	90	208	18,696	13.48
Total Indiana	13,473,622	2,019,163	656,525	16,149,310	3.59	4,368	201	878,119	18.39

IOWA

Appanoose	38,409	66,697	437	105,543	$4.99	233	161	37,518	2.81
Davis	11,322	67,172	55	78,549	3.63	27	230	6,218	12.63
Mahaska	49,771	64,720		114,491	3.51	68	195	13,251	8.64
Marion	513,551	194,703	493	708,747	3.22	182	236	43,034	16.47
Monroe	32,363	67,153	572	100,088	3.22	78	182	14,172	7.06
Polk		9,889		9,889	3.22	5	246	1,126	8.78
Van Buren		26,479	115	26,594	5.11	16	190	3,047	8.73
Wapello	16,872	92,169	50	109,091	3.55	61	126	7,695	14.18
Warren		5,365		5,365	4.45	7	209	1,460	3.67
Total Iowa	662,288	594,347	1,722	1,258,357	3.50	677	188	127,521	9.87

KANSAS

Bourbon		8,439		8,439	$3.99	7	150	1,049	8.04
Cherokee	405,703	126,275	203	532,181	4.16	125	279	35,127	15.15
Coffey		3,481		3,481	6.25	5	125	624	5.58
Crawford	142,960	47,306	493	190,759	4.48	189	139	26,247	7.27
Franklin		1,048		1,048	6.78	1	80	80	13.10
Osage		6,374		6,374	5.56	20	116	2,327	2.74
Total Kansas	548,663	192,923	696	742,282	4.27	347	189	65,454	11.34

For footnotes, see end of table.

TABLE 50.—Production, value, men working daily, days active, man-days, and output per man per day at bituminous-coal and lignite mines in the United States, 1955, by States and counties—Continued

(Exclusive of mines producing less than 1,000 tons)

County	Production (net tons)				Average value per ton [3]	Average number of men working daily	Average number of days mines worked	Number of man-days worked	Average tons per man per day [4]
	Shipped by rail or water [1]	Shipped by truck	Used at mine [2]	Total					
KENTUCKY									
Eastern Kentucky:									
Bell	978,400	202,752	2,553	1,183,705	$4.82	1,157	153	182,985	6.47
Boyd	330,552	66,376	----------	396,928	4.31	271	184	49,965	7.94
Breathitt	469,660	54,024	242	523,926	5.38	344	210	72,266	7.25
Carter	82,490	27,765	72	110,327	4.55	90	192	17,320	6.37
Clay	554,406	294,207	97	848,710	3.93	957	180	172,119	4.93
Clinton	----------	58,423	----------	58,423	4.36	149	122	18,144	3.22
Elliott	----------	17,610	----------	17,610	4.17	21	140	2,949	5.97
Floyd	5,014,216	591,057	3,103	5,608,376	5.25	3,820	200	764,050	7.46
Greenup	----------	9,480	----------	9,480	3.50	39	63	2,456	3.86
Harlan	7,803,502	561,019	48,936	8,413,457	5.64	6,381	193	1,230,106	6.84
Jackson	1,166	183,610	250	185,026	4.88	280	170	47,518	3.89
Johnson	127,800	409,792	----------	537,592	3.78	694	141	97,922	5.49
Knott	567,453	409,144	1,649	978,246	3.63	672	138	92,725	10.55
Knox	156,016	101,074	----------	257,090	3.56	438	118	51,700	4.97
Laurel	16,451	32,129	----------	48,580	4.57	60	139	8,361	5.81
Lawrence	----------	7,097	----------	7,097	5.36	8	146	1,211	5.86
Lee	66,500	41,250	----------	107,750	4.61	165	182	30,013	3.59
Leslie	2,091,753	228,497	3,008	2,323,258	4.47	1,827	171	312,418	7.44
Letcher	4,517,006	1,175,721	12,172	5,704,899	5.17	3,773	176	664,133	8.59
McCreary	708,261	70,916	1,828	781,005	3.73	442	193	85,529	9.13
Magoffin	99,174	4,700	----------	103,874	3.18	67	136	9,135	11.37
Martin	71,334	11,700	150	83,184	3.36	110	217	23,972	3.47
Morgan	----------	92,450	----------	92,450	4.66	92	161	14,808	6.24
Perry	4,566,429	312,784	9,705	4,888,918	4.45	3,080	173	531,864	9.19
Pike	6,644,156	1,634,809	264,860	8,543,825	4.83	5,939	176	1,045,412	8.17
Pulaski	272,000	180,762	----------	452,762	3.25	331	183	60,562	7.48
Rockcastle	17,100	70,630	----------	87,730	3.50	120	149	17,829	4.92
Wayne	42,500	45,850	----------	88,350	3.55	88	136	11,928	7.41
Whitley	194,829	61,237	139	256,205	4.02	310	125	38,696	6.62
Wolfe	----------	11,000	----------	11,000	3.50	18	147	2,638	4.17
Total Eastern Kentucky	35,393,154	6,967,865	348,764	42,709,783	4.91	31,743	178	5,660,734	7.54

Western Kentucky:									
Butler		118,538		118,538	3.51	105	189	19,806	5.98
Christian		1,400		1,400	3.00	2	27	53	26.42
Daviess	403,801	188,447		592,248	3.01	121	200	24,189	24.48
Henderson		228,523	385	228,908	2.80	170	213	36,217	6.50
Hopkins	13,935,475	546,918	8,466	14,490,859	3.05	3,515	216	758,875	19.10
Muhlenberg	5,523,962	148,021	4,865	5,676,848	2.90	1,646	197	324,729	17.48
Ohio	2,112,728	77,400	808	2,190,936	2.84	386	221	85,314	25.68
Union	2,205,254	24,780		2,230,034	3.23	627	227	142,312	15.67
Webster	775,456	4,900		780,356	2.79	111	255	28,326	27.55
Total Western Kentucky	24,956,676	1,338,927	14,524	26,310,127	3.00	6,683	212	1,419,821	18.53
Total Kentucky	60,349,830	8,306,792	363,288	69,019,910	4.18	38,426	184	7,080,555	9.75
MARYLAND									
Allegany	45,853	142,322	100	188,275	$4.05	143	182	26,025	7.24
Garrett	174,696	148,498	1,000	324,194	3.82	418	157	65,420	4.96
Total Maryland	220,549	290,820	1,100	512,469	3.91	561	163	91,445	5.60
MISSOURI									
Adair		54,338	1,009	55,347	$4.78	85	178	15,118	3.66
Barton	305,463	26,626	342	332,431	4.43	79	278	21,913	15.17
Bates	687,406	12,082		699,488	3.67	129	220	28,469	24.57
Boone		9,314	100	9,414	3.86	6	168	1,048	8.98
Callaway		129,092		129,092	4.63	41	300	12,284	10.51
Chariton		1,462	10	1,472	6.13	1	120	120	12.26
Clay		6,395	200	6,595	9.00	26	110	2,905	2.27
Dade		9,992		9,992	4.55	7	291	2,036	4.91
Harrison		3,676		3,676	7.05	10	187	1,870	1.97
Henry	816,347	49,223		865,570	3.74	159	212	33,692	25.69
Johnson		1,715		1,715	5.50	2	180	360	4.76
Lafayette		16,362		16,362	6.54	52	168	8,797	1.86
Macon	619,707	26,596		646,303	3.95	113	234	26,430	24.45
Putnam		10,561		10,561	5.00	36	108	3,926	2.69
Ralls		6,020		6,020	5.00	6	145	872	6.90
Randolph	1,298	58,772		60,070	4.39	87	203	17,985	3.34
Ray		1,202		1,202	5.00	10	80	800	1.50
St. Clair	334,963	3,371	201	338,535	3.81	57	306	17,459	19.39
Vernon	20,414	18,226		38,640	3.58	22	233	5,129	7.53
Total Missouri	2,785,598	445,025	1,862	3,232,485	3.95	928	217	201,213	16.66

For footnotes, see end of table.

TABLE 50.—Production, value, men working daily, days active, man-days, and output per man per day at bituminous-coal and lignite mines in the United States, 1955, by States and counties—Continued

(Exclusive of mines producing less than 1,000 tons)

County	Production (net tons)				Average value per ton [3]	Average number of men working daily	Average number of days mines worked	Number of man-days worked	Average tons per man per day [4]
	Shipped by rail or water [1]	Shipped by truck	Used at mine [2]	Total					
MONTANA									
Bituminous Coal:									
Blaine		6,930	100	7,030	$7.90	8	300	2,441	2.88
Carbon	9,283	11,626	111	21,020	7.50	20	223	4,454	4.72
Cascade		2,348		2,348	6.17	2	180	391	6.00
Hill		1,350		1,350	9.00	3	160	480	2.81
Musselshell	341,406	40,267	1,917	383,590	4.75	189	236	44,707	8.58
Rosebud	793,354	5,600	2,601	801,555	2.00	50	227	11,334	70.72
Total bituminous coal	1,144,043	68,121	4,729	1,216,893	3.01	272	235	63,807	19.07
Lignite:									
Custer		7,710		7,710	4.00	5	140	700	11.01
Dawson		3,732		3,732	3.50	2	127	285	13.05
Richland		8,687		8,687	4.13	10	96	955	9.10
Sheridan		10,130	101	10,231	3.53	10	152	1,515	6.75
Total lignite		30,259	101	30,360	3.82	27	128	3,455	8.79
Total Montana	1,144,043	98,380	4,830	1,247,253	3.03	299	225	67,262	18.54
NEW MEXICO									
Colfax	56,847	17,555	1,237	75,639	$6.08	53	228	12,025	6.29
McKinley	27,280	60,819	24	88,123	6.63	93	218	20,271	4.35
Rio Arriba	12,181	2,679		14,860	5.48	35	197	6,901	2.15
Sandoval		3,797		3,797	4.28	6	222	1,422	2.67
San Juan		16,032		16,032	4.68	29	179	5,190	3.09
Santa Fe		3,128		3,128	6.25	6	200	1,251	2.50
Total New Mexico	96,308	104,010	1,261	201,579	6.13	222	212	47,060	4.28

NORTH DAKOTA (LIGNITE)

Adams	21,970	19,626	50	41,646	$3.00	8	176	1,390	29.95
Bowman	182,600	1,150		183,750	1.70	18	228	4,138	44.41
Burke	412,042	29,582	58,454	500,078	2.33	63	239	15,076	33.17
Burleigh		17,752		17,752	3.29	3	200	600	29.59
Divide	256,585	29,876	575	287,036	2.49	35	231	8,098	37.24
Dunn		12,657		12,657	2.88	6	167	1,026	12.34
Grant		26,565		26,565	2.83	10	137	1,365	19.46
Hettinger	680	12,952	250	13,882	2.77	10	179	1,773	7.83
McLean	169,014	55,571	112	224,697	2.67	37	197	7,255	30.97
Mercer	954,569	22,803	60,000	1,037,372	2.24	101	218	22,048	47.05
Morton		31,937		31,937	2.53	11	169	1,860	17.17
Oliver		6,352		6,352	2.25	3	180	540	11.76
Stark		17,767	58,768	76,535	2.65	15	147	2,208	34.67
Ward	301,528	154,657	174,584	630,769	2.34	82	249	20,436	30.87
Williams		11,059		11,059	3.29	4	167	669	16.53
Total North Dakota	2,298,988	450,306	352,793	3,102,087	2.34	406	218	88,482	35.06

OHIO

Athens	233,115	440,351		673,466	$3.69	434	201	87,017	7.74
Belmont	7,004,569	224,464	19,426	7,248,459	3.81	2,648	228	604,645	11.99
Carroll	198,039	398,575	1,110	597,724	3.14	205	229	46,868	12.75
Columbiana	109,834	1,328,628	1,207	1,439,669	3.06	420	229	96,195	14.97
Coshocton	462,235	499,603	25	961,863	3.34	323	245	79,042	12.17
Gallia	837,626	69,812		907,438	3.55	261	225	58,680	15.46
Guernsey	648,630	53,448	347	702,425	2.90	145	275	39,894	17.61
Harrison	8,439,465	326,753	19,582	8,785,800	3.87	2,061	247	509,931	17.23
Hocking	656	96,012		96,668	3.71	82	123	10,077	9.59
Holmes		21,810		21,810	3.68	9	197	1,775	12.29
Jackson	399,162	177,665	6,517	583,344	3.90	168	197	33,051	17.65
Jefferson	2,864,088	1,250,874	3,447	4,118,409	3.58	1,132	229	259,247	15.89
Lawrence		442,623	259	442,882	3.47	189	168	31,827	13.92
Mahoning	12,972	679,622	6,893	699,487	3.80	153	243	37,147	18.83
Meigs	583,727	217,445		801,172	3.21	253	206	52,215	15.34
Morgan	348,482	65,573	1,241,274	1,655,329	2.91	379	246	93,297	17.74
Muskingum	635,640	711,696	40	1,347,376	2.41	326	222	72,443	18.60
Noble	1,026,792	142,288	4,593	1,173,673	2.35	181	226	40,921	28.68
Perry	1,266,090	530,771	39	1,796,900	3.79	591	188	111,071	16.18
Portage		120,684	5,519	126,203	3.79	25	314	7,839	16.10
Stark		948,146	4,044	952,190	2.94	313	239	74,780	12.73
Tuscarawas	259,172	1,938,633	33,273	2,231,078	3.57	847	226	191,283	11.66
Vinton	84,597	109,820		194,417	4.30	110	204	22,420	8.67
Washington	15,950	135,059		151,009	2.37	30	282	8,450	17.87
Wayne		161,000		161,000	4.00	55	118	6,516	24.71
Total Ohio	25,430,841	11,091,355	1,347,595	37,869,791	3.53	11,340	227	2,576,631	14.70

For footnotes, see end of table.

TABLE 50.—Production, value, men working daily, days active, man-days, and output per man per day at bituminous-coal and lignite mines in the United States, 1955, by States and counties—Continued

(Exclusive of mines producing less than 1,000 tons)

County	Production (net tons)				Average value per ton [3]	Average number of men working daily	Average number of days mines worked	Number of man-days worked	Average tons per man per day [4]
	Shipped by rail or water [1]	Shipped by truck	Used at mine [2]	Total					
OKLAHOMA									
Coal	8,635	2,700	----------	11,335	$5.00	7	179	1,315	8.62
Craig	----------	18,326	----------	18,326	5.00	9	309	2,891	6.34
Haskell	587,171	2,000	98	589,269	7.04	310	212	65,669	8.97
Latimer	94,688	----------	----------	94,688	2.91	24	158	3,780	25.05
Le Flore	342,519	2,776	----------	345,295	5.06	195	102	19,828	17.41
McIntosh	195,660	1,500	----------	197,160	2.98	34	286	9,824	20.07
Muskogee	----------	1,018	----------	1,018	5.00	2	100	200	5.09
Okmulgee	278,145	5,633	2	283,780	5.70	331	143	47,258	6.00
Pittsburg	193,861	----------	442	194,303	9.20	276	188	51,933	3.74
Rogers	335,938	5,969	----------	341,907	5.33	105	231	24,317	14.06
Sequoyah	83,057	----------	----------	83,057	6.13	17	346	5,958	13.94
Tulsa	----------	1,604	----------	1,604	5.00	6	103	660	2.43
Wagoner	----------	1,794	----------	1,794	5.00	6	145	930	1.93
Total Oklahoma	2,119,674	43,320	542	2,163,536	5.86	1,322	177	234,563	9.22
PENNSYLVANIA									
Allegheny	5,864,729	1,293,490	539,499	7,697,718	$5.55	4,095	228	931,888	8.26
Armstrong	1,640,465	410,772	2,577	2,053,814	3.55	1,075	181	194,126	10.58
Beaver	43,323	436,664	2,755	482,742	3.56	196	248	48,668	9.92
Bedford	26,364	50,858	----------	77,222	5.31	114	109	12,445	15.87
Blair	46,713	145,480	287	192,480	4.74	141	194	27,292	7.05
Bradford	(5)	(5)	(5)	(5)	(5)	(5)	(5)	(5)	(5)
Butler	899,463	1,049,634	6,748	1,955,845	3.40	787	215	169,480	11.54
Cambria	9,367,856	491,746	1,044,436	10,904,038	5.82	8,417	212	1,787,493	6.10
Cameron	(5)	(5)	(5)	(5)	(5)	(5)	(5)	(5)	(5)
Centre	738,449	482,673	5	1,221,127	3.57	512	225	114,955	10.62
Clarion	1,622,366	624,200	1,686	2,248,252	3.62	685	243	166,794	13.48
Clearfield	5,840,525	624,835	2,194	6,467,554	3.79	2,977	270	604,832	10.69
Clinton	453,735	236,977	25	690,737	3.05	178	241	42,883	16.11
Elk	260,311	179,201	792	440,304	3.81	215	204	43,902	10.03

Fayette	6,000,264	395,920	161,963	6,558,147	5.95	4,612	215	991,939	6.61
Fulton	(3)	(3)	(3)	(3)	(3)	(3)	(3)	(3)	(3)
Greene	11,750,655	34,117	26,668	11,811,440	5.52	6,676	235	1,566,371	7.54
Huntingdon	(3)	(3)	(3)	(3)	(3)	(3)	(3)	(3)	(3)
Indiana	5,075,082	319,501	521,796	5,916,379	4.79	3,050	229	699,886	8.45
Jefferson	1,409,592	152,857	2,346	1,564,795	3.97	960	198	190,273	8.22
Lawrence	----------	693,565	20	693,585	3.26	188	219	41,260	16.81
Lycoming	----------	50,890	----------	50,890	4.60	23	250	5,743	8.86
McKean	35,220	74,710	----------	109,930	3.55	35	296	10,341	10.63
Mercer	235,456	410,150	1,933	647,539	3.85	239	233	55,748	11.62
Somerset	2,677,310	387,696	16,343	3,081,349	4.67	2,550	173	440,925	6.99
Tioga	----------	82,182	----------	82,182	5.12	68	210	14,277	5.76
Venango	205,827	496,090	25	701,942	3.45	111	272	30,308	23.16
Washington	14,231,885	1,458,724	165,244	15,855,853	5.97	7,569	231	1,748,511	9.07
Westmoreland	2,552,362	691,519	658,450	3,902,331	4.76	2,355	193	453,504	8.60
Other counties	187,082	116,685	1,494	305,261	5.08	146	174	25,460	11.99
Total Pennsylvania	71,165,034	11,391,136	3,157,286	85,713,456	5.14	47,974	217	10,419,304	8.23
SOUTH DAKOTA (LIGNITE)									
Dewey	----------	25,782	----------	25,782	$3.50	10	250	2,500	10.31
TENNESSEE									
Anderson	344,778	388,895	2,031	735,704	$4.56	587	168	98.413	7.48
Bledsoe	1,509	30,612	2,100	34,221	3.05	54	163	8,820	3.88
Campbell	619,730	388,308	3,251	1,011,289	4.99	1,079	179	193,376	5.23
Claiborne	307,112	86,645	2,021	395,778	4.56	630	117	73,995	5.35
Cumberland	----------	111,473	----------	111,473	4.22	179	41	7,408	15.05
Fentress	19,716	49,208	----------	68,924	3.53	114	143	16,371	4.21
Grundy	218,049	79,164	----------	297,213	3.50	218	171	37,225	7.98
Hamilton	46,513	85,647	----------	132,160	3.64	96	153	14,653	9.02
Marion	1,469,510	530,113	1,680	2,001,303	4.03	1,698	170	288,067	6.95
Morgan	104,052	336,931	9,959	450,942	3.52	397	239	95,074	4.74
Overton	15,259	42,219	4,263	61,741	3.45	86	158	13,540	4.56
Pickett	----------	3,600	----------	3,600	4.40	3	200	600	6.00
Putnam	636,493	29,828	----------	666,321	4.02	251	237	59,493	11.20
Rhea	----------	53,668	465	54,133	3.90	48	228	10,958	4.94
Scott	378,758	260,917	200	639,875	3.22	581	114	66,354	9.64
Sequatchie	128,327	141,445	----------	269,772	3.67	304	140	42,652	6.32
Van Buren	82,153	20,233	----------	102,386	3.80	56	166	9,281	11.03
White	----------	16,009	----------	16,009	3.38	16	111	1,774	9.02
Total Tennessee	4,371,959	2,654,915	25,970	7,052,844	4.08	6,397	162	1,038,054	6.79

For footnotes, see end of table.

TABLE 50.—Production, value, men working daily, days active, man-days, and output per man per day at bituminous-coal and lignite mines in the United States, 1955, by States and counties—Continued

(Exclusive of mines producing less than 1,000 tons)

County	Production (net tons)				Average value per ton [3]	Average number of men working daily	Average number of days mines worked	Number of man-days worked	Average tons per man per day [4]
	Shipped by rail or water [1]	Shipped by truck	Used at mine [2]	Total					
UTAH									
Carbon	4,293,052	154,251	246,866	4,694,169	$6.87	2,071	228	472,250	9.94
Emery	1,284,757	197,186	10,059	1,492,002	4.86	679	240	163,060	9.15
Garfield		1,616	48	1,664	4.81	4	189	756	2.20
Iron		31,753		31,753	4.48	12	259	3,103	10.23
Kane		1,742		1,742	4.82	2	60	120	14.20
Sevier	27,319	27,319		54,638	4.97	12	258	3,090	17.68
Summit		18,450	56	18,506	3.84	13	229	2,977	6.22
Uintah		1,050		1,050	6.00	2	140	280	3.75
Total Utah	5,605,128	433,367	257,029	6,295,524	6.35	2,795	231	645,636	9.75
VIRGINIA									
Buchanan	7,187,731	1,713,309	12,027	8,913,067	$4.53	6,215	201	1,246,606	7.15
Dickenson	3,800,918	89,743	58	3,890,719	4.61	2,045	292	597,659	6.51
Lee	580,081	77,780	2,534	660,395	5.74	761	163	124,106	5.32
Montgomery	3,671	11,593	50	15,314	6.49	23	180	4,173	3.67
Russell	744,710	268,923		1,013,633	4.65	719	184	132,274	7.66
Scott		18,166		18,166	4.65	26	158	4,116	4.41
Tazewell	2,890,761	67,366	12,085	2,970,212	5.28	2,197	175	384,790	7.72
Wise	5,574,118	401,699	50,186	6,026,003	4.23	3,239	214	692,384	8.70
Total Virginia	20,781,990	2,648,579	76,940	23,507,509	4.60	15,225	209	3,186,108	7.38
WASHINGTON									
King	52,043	64,100		116,143	$7.49	81	245	19,807	5.86
Kittitas	435,240	18,667	9,406	463,313	6.90	425	219	93,066	4.98
Lewis		5,900		5,900	6.00	6	208	1,300	4.54
Pierce		1,602		1,602	7.55	2	181	362	4.43
Thurston		20,783		20,783	6.35	9	154	1,450	14.33
Whatcom	1,798	251		2,049	7.25	49	200	410	5.00
Total Washington	489,081	111,303	9,406	609,790	6.99	572	203	116,395	5.24

Barbour	3,342,172	121,145	4,394	3,467,711	$3.93	1,241	191	237,189	14.62
Boone	6,307,067	66,651	7,398	6,381,116	4.74	3,057	219	669,905	9.53
Braxton	123,904	2,228		126,132	3.18	82	173	14,156	8.91
Brooke	204,012	196,408	571,665	972,085	4.30	576	170	97,704	9.95
Clay	1,063,710	3,650	11,495	1,078,855	4.24	670	206	137,858	7.83
Fayette	6,968,054	240,829	201,873	7,410,756	4.79	5,071	230	1,165,994	6.36
Gilmer	148,469	2,222		150,691	3.25	58	212	12,272	12.28
Grant		65,353	50	65,403	4.56	105	206	21,640	3.02
Greenbrier	1,113,870	125,949	1,529	1,241,348	4.45	790	217	171,171	7.25
Hancock		24,803		24,803	3.33	65	290	18,868	13.15
Harrison	8,332,586	92,169	759	8,425,514	3.67	2,494	210	523,177	16.10
Kanawha	8,692,576	381,324	14,870	9,088,770	4.53	3,741	222	829,911	10.95
Lewis	901,655	2,900	12,615	917,170	3.12	194	172	33,284	27.56
Lincoln		1,234		1,234	4.83	3	228	682	1.81
Logan	20,812,543	66,363	60,643	20,939,549	4.53	8,663	245	2,120,598	9.87
Marion	8,914,077	118,164	8,484	9,040,725	4.90	3,846	215	828,758	10.91
Marshall	454,632	9,268	12,554	476,454	4.29	187	237	44,321	10.75
Mason	115,573	36,765		152,338	2.92	128	159	20,306	7.50
McDowell	18,316,332	94,234	437,763	18,848,329	5.62	9,890	232	2,293,782	8.22
Mercer	1,678,618	34,899	6,037	1,719,554	5.20	1,101	212	233,337	7.37
Mineral	17,177	18,874	25	36,076	3.56	54	131	7,062	5.11
Mingo	8,256,446	21,271	21,217	8,298,934	4.66	3,540	221	783,387	10.59
Monongalia	7,719,663	127,127	904	7,847,694	4.09	2,793	217	604,998	12.97
Nicholas	5,386,460	159,714	23,485	5,569,659	4.50	2,750	225	618,320	9.01
Ohio	1,077,024	43,254	3,689	1,123,967	4.12	413	228	94,056	11.95
Pocahontas	324,678	41,855		366,533	5.97	247	218	53,890	6.80
Preston	1,590,389	714,105	97,918	2,402,412	3.27	1,813	181	328,901	7.30
Putnam		28,640		28,640	3.99	24	179	4,230	6.77
Raleigh	8,367,715	144,012	36,904	8,548,631	5.33	5,144	229	1,176,510	7.27
Randolph	1,225,506	21,518	9,827	1,256,851	5.24	946	209	197,630	6.36
Summers		6,769		6,769	2.89	6	116	676	10.01
Taylor	275,204	12,376		287,580	2.97	166	177	29,383	9.79
Tucker		39,931		39,931	4.36	22	133	2,934	13.61
Upshur	1,290,775	30,521	151	1,321,447	3.71	555	221	122,835	10.76
Wayne	115,802	9,430	58	125,290	3.72	109	176	19,246	6.51
Webster	850,028	2,910	3,110	856,048	5.61	556	201	111,824	7.66
Wyoming	10,411,566	81,585	29,739	10,522,890	5.03	5,131	235	1,206,552	8.72
Total West Virginia	134,398,283	3,190,450	1,579,156	139,167,889	4.70	66,231	224	14,837,347	9.38

For footnotes, see end of table.

TABLE 50.—Production, value, men working daily, days active, man-days, and output per man per day at bituminous-coal and lignite mines in the United States, 1955, by States and counties—Continued

(Exclusive of mines producing less than 1,000 tons)

County	Production (net tons)				Average value per ton [3]	Average number of men working daily	Average number of days mines worked	Number of man-days worked	Average tons per man per day [4]
	Shipped by rail or water [1]	Shipped by truck	Used at mine [2]	Total					
WYOMING									
Campbell	283,975	28,245	37,346	349,566	$1.21	25	317	7,925	44.11
Carbon	188,157	1,892	2,444	192,493	3.54	34	219	7,452	25.83
Converse	8,025	----------	15	8,040	3.37	3	238	714	11.26
Fremont	----------	3,624	----------	3,624	6.57	9	152	1,372	2.64
Hot Springs	10,593	6,796	53	17,442	6.94	12	197	2,344	7.44
Johnson	----------	1,393	----------	1,393	4.50	1	181	181	7.70
Lincoln	640,656	2,497	2,567	645,720	2.87	144	203	29,229	22.09
Sheridan	391,567	45,655	----------	437,222	3.38	80	185	14,821	29.50
Sweetwater	1,215,832	8,814	46,447	1,271,093	5.69	655	194	126,743	10.03
Total Wyoming	2,738,805	98,916	88,872	2,926,593	4.05	963	198	190,781	15.34
UNITED STATES									
Total United States	403,399,872	51,607,135	9,626,401	464,633,408	$4.50	225,093	210	47,225,668	9.84

[1] Includes coal loaded at mines directly into railroad cars or river barges, hauled by trucks to railroad sidings, and hauled by trucks to waterways.

[2] Includes coal transported from mines to point of use by conveyor belts or trams, used by mine employees, taken by locomotive tenders at tipples, used at mines for power and heat, made into beehive coke at mines, and all other uses at mines.

[3] Value received or charged for coal f. o. b. mines. Includes a value for coal not sold but used by producers, such as mine fuel and coal coked, as estimated by producers at average prices that might have been received if such coal had been sold commercially.

[4] In certain counties the average tons per man per day is large due to auger mining, strip mining, or mechanical loading underground.

[5] Included in "Other counties;" not published to avoid disclosing individual operations.

TRANSPORTATION

Within recent years the methods of shipping bituminous coal and lignite from the mines have changed radically; shipments by rail have been declining, while shipments by water and by truck have been increasing. Generally, the cost or charge for shipping coal by water or truck, particularly for the shorter distances, is less than the rail freight rate.

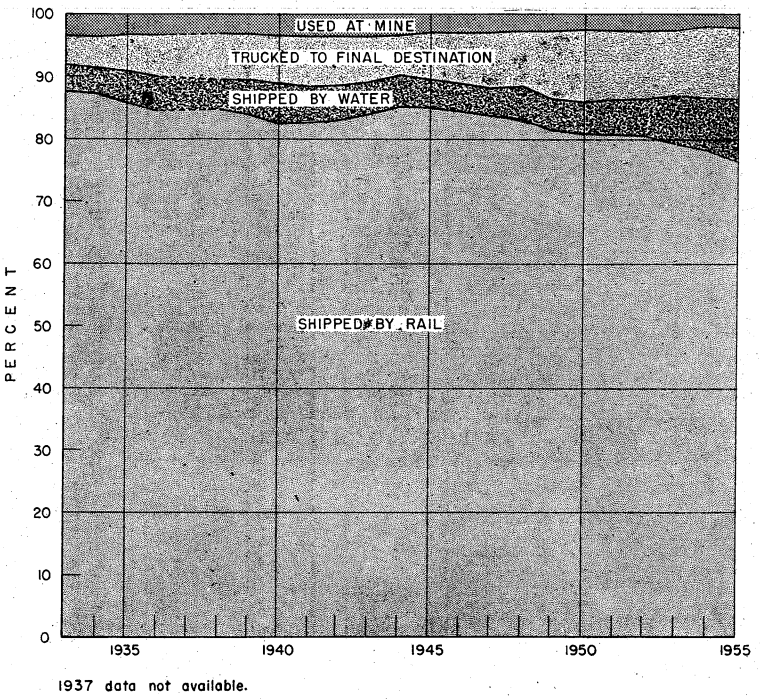

FIGURE 12.—Percentage of total production of bituminous coal and lignite, 1933–55, by method of shipment from mines and used at mines.

TABLE 51.—Method of shipment of bituminous coal and lignite from mines, and used at mines, in the United States, 1933–55

Year	Method of shipment from mines			Used at mines [1]	Total production
	Shipped by rail and trucked to rail	Shipped by water and trucked to water	Trucked to final destination		
	THOUSAND NET TONS				
1933	293,258	13,021	15,463	11,888	333,630
1934	313,304	15,128	18,739	12,197	359,368
1935	319,742	18,327	21,960	12,344	372,373
1936	370,763	24,868	27,929	15,528	439,088
1937	[2]	[2]	[2]	[2]	445,531
1938	295,336	16,903	25,592	10,714	348,545
1939	331,190	22,229	29,534	11,902	394,855
1940	380,388	29,493	35,540	15,350	460,771
1941	425,184	30,240	40,056	18,669	514,149
1942	482,814	34,018	45,154	20,707	582,693
1943	495,863	30,188	42,433	21,693	590,177
1944	527,136	31,518	40,123	20,799	619,576
1945	490,472	27,548	41,477	18,120	577,617
1946	450,615	24,642	42,731	15,934	533,922
1947	527,282	29,803	55,859	17,680	630,624
1948	498,194	26,735	58,260	16,329	599,518
1949	356,602	21,829	47,786	11,651	437,868
1950	417,225	27,583	58,286	13,217	516,311
1951	430,387	29,984	58,132	15,162	533,665
1952	375,911	27,746	50,231	12,953	466,841
1953	362,133	35,648	47,102	12,407	457,290
1954	305,918	32,912	44,689	8,187	391,706
1955	355,924	47,476	51,607	9,626	464,633
	PERCENTAGE OF TOTAL				
1933	87.9	3.9	4.6	3.6	100.0
1934	87.2	4.2	5.2	3.4	100.0
1935	85.9	4.9	5.9	3.3	100.0
1936	84.4	5.7	6.4	3.5	100.0
1937	[2]	[2]	[2]	[2]	100.0
1938	84.7	4.9	7.3	3.1	100.0
1939	83.9	5.6	7.5	3.0	100.0
1940	82.6	6.4	7.7	3.3	100.0
1941	82.7	5.9	7.8	3.6	100.0
1942	82.9	5.8	7.7	3.6	100.0
1943	84.0	5.1	7.2	3.7	100.0
1944	85.1	5.1	6.5	3.3	100.0
1945	84.9	4.8	7.2	3.1	100.0
1946	84.4	4.6	8.0	3.0	100.0
1947	83.6	4.7	8.9	2.8	100.0
1948	83.1	4.5	9.7	2.7	100.0
1949	81.4	5.0	10.9	2.7	100.0
1950	80.8	5.3	11.3	2.6	100.0
1951	80.7	5.6	10.9	2.8	100.0
1952	80.5	5.9	10.8	2.8	100.0
1953	79.2	7.8	10.3	2.7	100.0
1954	78.1	8.4	11.4	2.1	100.0
1955	76.6	10.2	11.1	2.1	100.0

[1] Includes coal used by mine employees, taken by locomotive tenders at tipples, used at mines for power and heat, transported from mines to point of use by conveyors or trams, made into beehive coke at mines, and all other uses at mines.

[2] Data not available.

TABLE 52.—Bituminous coal and lignite loaded for shipment by railroads and waterways in the United States, 1955, as reported by mine operators

Route	State	Net tons	
		By State	Total for route
RAILROAD			
Alabama Central	Alabama	105,791	105,791
Alaska	Alaska	620,887	620,887
Atchison, Topeka & Santa Fe	Colorado	159,926	541,567
	Illinois	297,514	
	New Mexico	84,127	
Baltimore & Ohio	Illinois	183,101	36,077,428
	Indiana	37,321	
	Maryland	57,030	
	Ohio	4,116,731	
	Pennsylvania	6,654,462	
	West Virginia	25,028,783	
Bessemer & Lake Erie	Pennsylvania	1,698,879	1,698,879
Buffalo Creek & Gauley	West Virginia	956,316	956,316
Cambria & Indiana	Pennsylvania	3,173,966	3,173,966
Campbell's Creek	West Virginia	508,288	508,288
Carbon County	Utah	1,563,009	1,563,009
Castleman River R. R.	Maryland	5,411	5,411
Central of Georgia	Alabama	89,165	89,165
Chesapeake & Ohio	Kentucky	10,388,763	54,880,572
	Ohio	219,328	
	Virginia	755,546	
	West Virginia	43,516,935	
Cheswick & Harmar	Pennsylvania	607,431	607,431
Chicago, Burlington & Quincy	Illinois	6,661,465	8,025,950
	Iowa	218,527	
	Missouri	459,823	
	Wyoming	686,135	
Chicago & Eastern Illinois	Illinois	1,892,733	2,557,496
	Indiana	664,763	
Chicago & Illinois Midland	Illinois	3,510,957	3,510,957
Chicago, Indianapolis & Louisville	Indiana	451,089	451,089
Chicago, Milwaukee, St. Paul & Pacific	Indiana	2,284,366	2,831,022
	Montana (bituminous)	341,406	
	North Dakota (lignite)	205,250	
Chicago & North Western	Illinois	489,092	489,092
Chicago, Rock Island & Pacific	Illinois	764,584	1,096,680
	Iowa	93,058	
	Missouri	141,659	
	Oklahoma	97,379	
Clinchfield	Kentucky	31,830	4,571,161
	Virginia	4,539,331	
Colorado & Southern	Colorado	8,014	8,014
Colorado & Wyoming	Colorado	1,119,171	1,119,171
Conemaugh & Black Lick	Pennsylvania	548,719	548,719
Denver & Rio Grande Western	Colorado	1,007,412	4,010,902
	New Mexico	12,181	
	Utah	2,991,309	
Detroit, Toledo & Ironton	Ohio	1,007	1,007
East Broad Top R. R. & Coal Co	Pennsylvania	169,204	169,204
Erie	Ohio	43,741	444,223
	Pennsylvania	400,482	
Fort Smith & Van Buren	Oklahoma	503,166	503,166
Galesburg & Great Eastern	Illinois	312,889	312,889
Great Northern	North Dakota (lignite)	668,627	670,425
	Washington	1,798	
Gulf, Mobile & Ohio	Alabama	248,374	1,273,724
	Illinois	1,025,350	
Illinois Central	Alabama	15,936	29,908,474
	Illinois	12,383,633	
	Indiana	33,715	
	Kentucky	17,475,190	
Illinois Terminal	Illinois	732,261	732,261
Interstate	Kentucky	158,568	3,642,497
	Virginia	3,483,929	
Johnstown & Stony Creek	Pennsylvania	251,560	251,560
Kansas City Southern	Missouri	687,406	783,023
	Oklahoma	95,617	
Kelley's Creek & Northwestern	West Virginia	489,331	489,331
Kentucky & Tennessee	Kentucky	273,587	273,587
Lake Erie, Franklin & Clarion	Pennsylvania	413,674	413,674
Litchfield & Madison	Illinois	337,628	337,628

TABLE 52.—Bituminous coal and lignite loaded for shipment by railroads and waterways in the United States, 1955, as reported by mine operators—Continued

Route	State	Net tons	
		By State	Total for route
RAILROAD—continued			
Louisville & Nashville	Alabama	2,123,142	26,763,219
	Kentucky	24,053,352	
	Tennessee	332,500	
	Virginia	254,225	
Mary Lee	Alabama	571,302	571,302
Midland Valley	Arkansas	159,076	556,637
	Oklahoma	397,561	
Minneapolis & St. Louis	Illinois	1,395,219	1,395,219
Minneapolis, St. Paul & Sault Ste. Marie	North Dakota (lignite)	470,542	470,542
Missouri-Illinois	Illinois	643,926	643,926
Missouri-Kansas-Texas	Kansas	387,422	1,391,439
	Missouri	617,187	
	Oklahoma	386,830	
Missouri-Pacific	Arkansas	320,411	3,404,715
	Illinois	3,026,019	
	Kansas	37,871	
	Missouri	20,414	
Monongahela	Pennsylvania	1,120,993	7,616,763
	West Virginia	6,495,770	
Montour	Pennsylvania	1,867,280	1,867,280
Nashville, Chattanooga & St. Louis	Tennessee	1,007,061	1,007,061
New York Central (includes coal shipped over Kanawha & Michigan, Kelley's Creek, Toledo & Ohio Central, and Zanesville & Western)	Illinois	4,717,710	20,130,550
	Indiana	4,005,209	
	Ohio	3,611,815	
	Pennsylvania	5,403,118	
	West Virginia	2,392,698	
New York, Chicago & St. Louis	Ohio	7,997,270	7,997,270
Nicolas, Fayette & Greenbrier	West Virginia	616,152	616,152
Norfolk & Western	Kentucky	3,993,832	42,216,658
	Virginia	11,062,784	
	West Virginia	27,160,042	
Northern Pacific	Montana (bituminous)	802,637	2,192,446
	North Dakota (lignite)	954,569	
	Washington	435,240	
Oklahoma City-Ada-Atoka	Oklahoma	8,635	8,635
Pacific Coast	Washington	52,043	52,043
Pennsylvania (includes Pittsburgh, Cincinnati, Chicago, & St. Louis)	Illinois	5,958	25,940,523
	Indiana	2,876,775	
	Ohio	4,458,316	
	Pennsylvania	18,558,716	
	West Virginia	40,758	
Pittsburgh & Lake Erie	Pennsylvania	964,687	964,687
Pittsburg & Shawmut	Pennsylvania	1,439,298	1,439,298
Pittsburgh, Chartiers & Youghiogheny	Pennsylvania	1,234	1,234
Pittsburgh & West Virginia	Ohio	887,057	894,698
	Pennsylvania	7,641	
Preston	West Virginia	19,998	19,998
St. Louis-San Francisco	Alabama	817,936	2,362,217
	Arkansas	91,200	
	Kansas	123,370	
	Missouri	699,225	
	Oklahoma	630,486	

TABLE 52.—Bituminous coal and lignite loaded for shipment by railroads and waterways in the United States, 1955, as reported by mine operators—Continued

Route	State	Net tons	
		By State	Total for route
RAILROAD—continued			
Southern	Alabama	611,311	4,104,181
	Indiana	764,128	
	Kentucky	1,149,453	
	Tennessee	893,114	
	Virginia	686,175	
Southern Iowa	Iowa	28,715	28,715
Tennessee	Tennessee	530,316	530,316
Tennessee Central	Tennessee	671,468	671,468
Tennessee Coal, Iron & Railroad Co	Alabama	3,657,752	3,657,752
Thomas & Sayreton	Alabama	255,011	255,011
Toledo, Peoria, & Western	Illinois	395,203	395,203
Union Pacific	Colorado	347,039	2,399,709
	Wyoming	2,052,670	
Unity	Pennsylvania	393,914	393,914
Utah	Utah	1,050,810	1,050,810
Virginian	West Virginia	14,139,602	14,139,602
Wabash	Iowa	321,988	481,872
	Missouri	159,884	
West Virginia Northern	West Virginia	413,174	413,174
Western Allegheny	Pennsylvania	199,679	199,679
Western Maryland	Maryland	158,108	4,940,078
	Pennsylvania	298,301	
	West Virginia	4,483,669	
Winifrede	West Virginia	275,493	275,493
Woodward Iron Co	Alabama	1,127,454	1,127,454
Youngstown & Southern	Ohio	79,065	79,065
Total railroad shipments		355,923,644	355,923,644
WATERWAY			
Allegheny River	Pennsylvania	2,045,396	2,045,396
Black Warrior River	Alabama	299,655	299,655
Green River	Kentucky	193,406	193,406
Illinois River	Illinois	1,355,261	1,355,261
Inland Water way	Alabama	584,843	584,843
Kanawha River	West Virginia	3,911,551	3,911,551
Kentucky River	Kentucky	41,226	41,226
Monongahela River	Pennsylvania	24,946,400	28,246,391
	West Virginia	3,299,991	
Ohio River	Illinois	247,877	9,860,999
	Indiana	2,356,256	
	Kentucky	2,590,623	
	Ohio	4,016,511	
	West Virginia	649,732	
Tennessee River	Tennessee	937,500	937,500
Total waterway shipments		47,476,228	47,476,228
Total loaded at mines for shipment by railroads and waterways		403,399,872	403,399,872
Shipped by truck from mine to final destination		51,607,135	51,607,135
Used at mine [1]		9,626,401	9,626,401
Total production, 1955		464,633,408	464,633,408

[1] Includes coal transported from mines to point of use by conveyor belts or trams, used by mine employees, taken by locomotive tenders at tipples, used at mines for power and heat, made into beehive coke at mines, and all other uses at mines.

CONSUMPTION

The statistics on consumption of bituminous coal and lignite, by major consumer classes, are based upon complete coverage of all consumers in each class with the exception of "Other industrials" and "Retail deliveries." The figures for each of these 2 categories are based upon a monthly sample approximating 35-percent coverage. In each instance a benchmark was established in 1943, based upon 95-percent coverage. Since 1943 data for each month have been determined by matching identical plants reporting for the last 2 months, calculating the percentage change of these identicals for the last month from the month previous, and applying this percentage change to the published figure for the month previous. The results obtained by this procedure have been reasonably reliable over a period of years. The total of classes shown approximates total consumption and is a much more reliable figure than "calculated" consumption based on production, imports, exports, and changes in stocks, because certain significant items of stocks are not included in year-end stocks.

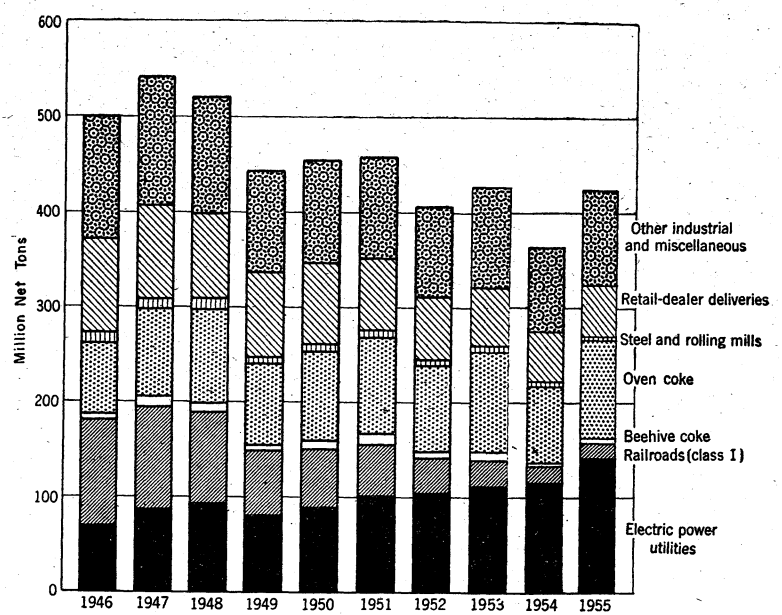

FIGURE 13.—Consumption of bituminous coal and lignite, by consumer class, and retail deliveries in the United States, 1946–55.

TABLE 53.—Consumption of bituminous coal and lignite, by consumer class, with retail deliveries in the United States, 1933–56, in thousand net tons

Year and month	Electric power utilities [1]	Bunker foreign trade [2]	Railroads [3] (class I)	Coke plants		Steel and rolling mills	Cement mills [4]	Other industrials [5]	Retail deliveries [6]	Total of classes shown [7]
				Beehive	Ovens					
1933	27,088	1,316	72,548	1,408	38,681	10,009	2,832	83,321	80,482	317,685
1934	29,707	1,321	76,037	1,635	44,343	10,898	3,500	89,448	86,925	343,814
1935	30,936	1,576	77,109	1,469	49,046	11,747	3,516	96,937	83,990	356,326
1936	38,104	1,622	86,391	2,698	63,244	13,471	4,771	113,792	84,200	408,293
1937	41,045	1,832	88,080	4,927	69,575	12,853	5,247	127,142	80,076	430,777
1938	36,440	1,352	73,921	1,360	45,266	8,412	4,483	96,527	68,520	336,281
1939	42,304	1,477	79,072	2,298	61,216	9,808	5,274	103,079	71,570	376,098
1940	49,126	1,426	85,130	4,803	76,583	10,040	5,633	110,469	87,700	430,910
1941	59,888	1,643	97,384	10,529	82,609	10,902	6,832	124,868	97,460	492,115
1942	63,472	1,585	115,410	12,876	87,974	10,434	7,570	135,979	104,750	540,050
1943	74,036	1,647	130,283	12,441	90,019	11,238	5,851	145,518	122,764	593,797
1944	76,656	1,559	132,049	10,858	94,438	10,734	3,789	134,610	124,906	589,599
1945	71,603	1,785	125,120	8,135	87,214	10,084	4,215	129,606	121,805	559,567
1946	68,743	1,381	110,166	7,167	76,121	8,603	7,009	120,610	100,586	500,386
1947	86,009	1,689	109,296	10,475	94,325	10,048	7,938	126,948	99,163	545,891
1948	95,620	1,057	94,838	10,322	96,984	10,046	8,554	112,741	89,747	519,909
1949	80,610	874	68,123	5,354	85,882	7,451	7,988	98,957	90,299	445,538
1950	88,262	717	60,969	9,088	94,757	7,698	7,943	98,164	86,604	454,202
1951	101,898	890	54,005	11,418	102,030	7,973	8,525	105,634	76,531	468,904
1952	103,309	723	37,962	6,912	90,702	6,820	8,073	95,863	68,393	418,757
1953	112,283	605	27,735	8,226	104,648	6,207	8,362	97,437	61,295	426,798
1954:										
January	10,620	5	1,939	258	8,049	566	735	9,268	8,336	39,776
February	8,798	4	1,610	104	6,904	476	624	8,045	6,402	32,967
March	9,614	5	1,601	58	7,302	532	679	8,189	6,165	34,145
April	8,438	29	1,347	61	6,661	411	628	6,952	3,471	27,998
May	8,435	52	1,356	54	6,814	381	641	6,160	2,646	26,539
June	9,029	62	1,254	55	6,594	339	576	5,416	2,279	25,604
July	9,133	55	1,278	56	6,581	315	675	4,809	2,101	25,003
August	9,568	47	1,384	73	6,427	306	693	5,155	2,868	26,521
September	9,456	47	1,233	68	6,395	320	674	5,356	3,622	27,171
October	10,076	54	1,375	55	7,245	360	740	5,940	4,397	30,242
November	10,435	47	1,449	66	7,444	432	719	6,469	4,542	31,603
December	11,633	20	1,544	72	7,995	506	740	7,194	5,787	35,491
Total	115,235	427	17,370	980	84,411	4,944	8,124	78,953	52,616	363,060
1955:										
January	11,756	2	1,415	102	8,252	506	755	7,316	6,233	36,337
February	10,907	3	1,271	108	7,625	504	670	6,892	5,853	33,833
March	11,216	11	1,278	176	8,749	511	707	7,578	4,862	35,088
April	9,871	44	1,203	207	8,519	417	672	7,411	2,839	31,183
May	10,504	35	1,240	228	8,922	387	714	7,093	2,355	31,478
June	10,807	55	1,159	257	8,515	365	687	6,887	2,640	31,372
July	11,460	49	1,154	238	8,613	342	707	6,508	2,358	31,429
August	12,286	56	1,253	273	8,879	357	710	7,003	3,400	34,217
September	11,791	52	1,228	269	8,849	364	703	7,283	4,311	34,850
October	12,377	60	1,351	300	9,147	407	732	8,339	4,820	37,533
November	13,053	56	1,435	320	9,014	486	768	9,281	6,194	40,607
December	14,522	22	1,486	391	9,424	575	903	10,265	7,897	45,485
Total	140,550	445	15,473	2,869	104,508	5,221	8,728	91,856	53,762	423,412

[1] Federal Power Commission. Represents latest available revised figures for bituminous coal and lignite consumed by public-utility powerplants in power generation, including a small quantity of coke.

[2] Bureau of Census, U. S. Department of Commerce.

[3] Association of American Railroads. Represents consumption of bituminous coal and lignite by class I railways for all uses, including locomotive, powerhouse, shop, and station fuel. The Interstate Commerce Commission reports that in 1955 consumption for all uses by class I line-haul railways, plus purchases for class II and class III railways, plus purchases by all switching terminal companies was 15,805,491 tons of bituminous coal and lignite.

[4] Includes a small amount of anthracite.

[5] Estimates based upon reports collected from a selected list of representative manufacturing plants.

[6] Estimates based upon reports collected from a selected list of representative retailers. Includes some coal shipped by trucks from mines to final destination.

[7] The total of classes shown approximates total consumption. It is not possible to calculate consumption closely from production, imports, exports, and changes in stocks because certain significant items of stocks are not included in year-end stocks. These items are: Stocks on Lake and Tidewater docks, stocks at other intermediate storage piles between mines and consumers, and coal in transit.

TABLE 54.—Fuel economy in consumption of coal at electric-utility powerplants in the United States, 1919–55

Year	Coal consumed per kilowatt-hour (pounds)	Index numbers based on 1919 as 100	Year	Coal consumed per kilowatt-hour (pounds)	Index numbers based on 1919 as 100	Year	Coal consumed per kilowatt-hour (pounds)	Index numbers based on 1919 as 100
1919	3.20	100.0	1932	1.49	46.6	1945	1.30	40.6
1920	3.00	93.8	1933	1.46	45.6	1946	1.29	40.3
1921	2.70	84.4	1934	1.45	45.3	1947	1.31	40.9
1922	2.50	78.1	1935	1.44	45.0	1948	1.30	40.6
1923	2.40	75.0	1936	1.44	45.0	1949	1.24	38.8
1924	2.20	68.8	1937	1.44	45.0	1950	1.19	37.2
1925	2.00	62.5	1938	1.40	43.8	1951	1.14	35.6
1926	1.90	59.4	1939	1.38	43.1	1952	1.10	34.4
1927	1.82	56.9	1940	1.34	41.9	1953	1.06	33.1
1928	1.73	54.1	1941	1.34	41.9	1954	.99	30.9
1929	1.66	51.9	1942	1.30	40.6	1955	.95	29.7
1930	1.60	50.0	1943	1.30	40.6			
1931	1.52	47.5	1944	1.29	40.3			

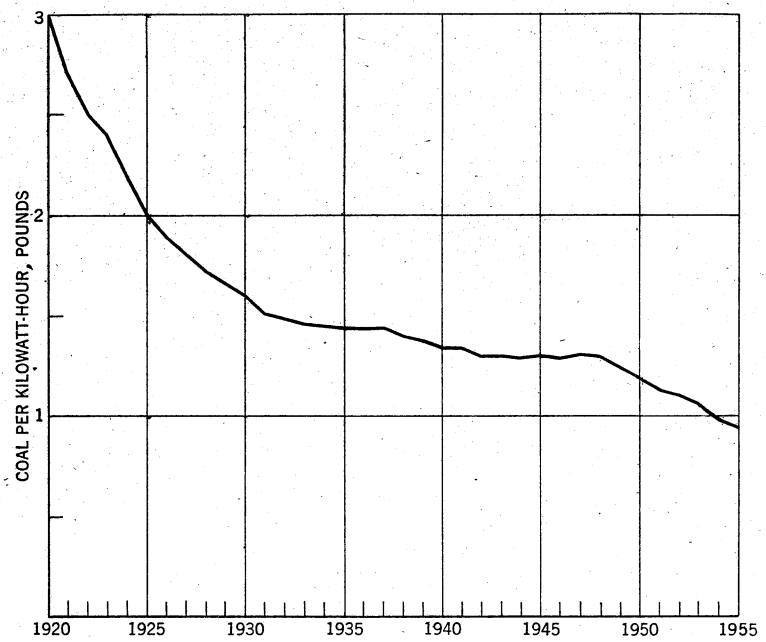

FIGURE 14.—Trend in fuel economy at electric-utility power plants in the United States, 1920–55.

RELATIVE RATE OF GROWTH OF MINERAL FUELS AND WATER-POWER

For discussion of the trends in consumption of the various energy fuels and waterpower which usually appears in this section, see the Review of the Mineral-Fuel Industries in 1955 chapter, Minerals Yearbook, volume II, 1955.

STOCKS

The figures on stocks are based on complete coverage for all categories except "Other industrials" and "Retail yards." Stocks for these two categories are based on samples, and the statistical procedure followed is the same as for calculating total consumption, as described above.

TABLE 55.—Stocks of bituminous coal and lignite in hands of commercial consumers and in retail dealers' yards in the United States, 1954–55

Date	Total stocks (net tons)	Days' supply at current rate of consumption on date of stock taking							
		Coke ovens	Steel plants	Other industrials	Electric utilities	Retail yards	Railroads	Cement mills	Total
1954									
January 31	75,741,000	57	51	57	111	4	39	54	59
February 28	75,194,000	60	52	59	121	5	41	53	64
March 31	72,033,000	59	48	60	121	4	42	49	65
April 30	70,595,000	58	58	66	133	9	46	51	76
May 31	69,432,000	57	60	71	141	10	42	53	81
June 30	69,646,000	58	63	74	130	11	43	60	82
July 31	67,186,000	52	63	83	132	13	40	52	84
August 31	68,566,000	56	63	78	129	10	37	53	80
September 30	69,690,000	56	57	73	128	8	39	55	77
October 31	70,349,000	52	53	68	126	6	34	54	72
November 30	71,032,000	50	41	61	118	6	32	57	68
December 31	69,201,000	48	37	56	106	4	30	52	60
1955									
January 31	65,869,000	43	34	53	101	3	31	47	56
February 28	63,751,000	41	28	50	95	3	30	45	53
March 31	63,664,000	38	31	51	102	4	30	42	56
April 30	64,001,000	38	38	50	113	8	30	43	62
May 31	66,356,000	40	45	56	113	12	30	44	65
June 30	69,452,000	45	46	58	109	13	32	50	66
July 31	68,042,000	44	50	63	104	16	30	51	67
August 31	70,988,000	48	49	61	99	12	29	54	64
September 30	71,700,000	47	48	56	102	9	28	55	62
October 31	71,747,000	47	43	50	101	8	26	55	59
November 30	70,325,000	45	33	42	92	5	23	52	52
December 31	68,423,000	44	31	39	82	4	23	45	47

PRICES

TABLE 56.—Average value per ton, f. o. b. mines, of bituminous coal and lignite produced in the United States, 1954–55, by States

State	1954				1955			
	Underground mines	Auger mines	Strip mines	Total all mines	Underground mines	Auger mines	Strip mines	Total all mines
Alabama	$6.79		$5.21	$6.55	$5.79	$4.57	$5.12	$5.68
Alaska	11.23		8.57	9.66	9.94		8.44	9.00
Arizona	6.23			6.23	6.66			6.66
Arkansas	8.12		6.84	7.52	7.56		7.37	7.48
California (lignite)			(1)	(1)			10.00	10.00
Colorado	5.73		3.92	5.54	5.82		3.99	5.63
Georgia	5.00			5.00	5.00			5.00
Illinois	3.87		3.74	3.82	3.71		3.57	3.66
Indiana	3.84		3.54	3.65	3.81		3.49	3.59
Iowa	4.38		3.52	3.76	4.06		3.33	3.50
Kansas	5.29		4.06	4.08	4.74		4.26	4.27
Kentucky	4.46	$3.12	2.94	4.16	4.50	3.39	2.99	4.18
Maryland	4.72		4.15	4.46	4.31		3.44	3.91
Missouri	5.17		3.91	3.99	5.07		3.89	3.95
Montana:								
Bituminous	4.95		(2)	2.79	4.97		2.00	3.01
Lignite	(1)		(1)	(1)	3.91		3.50	3.82
Total Montana					4.91		2.01	3.03
New Mexico	6.09		(2)	5.91	6.19		5.78	6.13
North Dakota (lignite)	(1)		(1)	(1)	3.45		2.33	2.34
Ohio	4.16	3.16	3.35	3.62	4.09	3.24	3.26	3.53
Oklahoma	7.46		4.89	5.88	7.66		5.00	5.86
Pennsylvania	5.73	3.45	3.73	5.26	5.63	3.10	3.62	5.14
South Dakota (lignite)			(1)	(1)			3.50	3.50
Tennessee	4.08	4.42	3.56	3.96	4.25	3.11	3.56	4.08
Texas (lignite)			(1)	(1)			(3)	(3)
Utah	5.94			5.94	6.35			6.35
Virginia	4.48	3.79	4.03	4.45	4.62	4.29	4.18	4.60
Washington	7.23		7.25	7.23	7.00		6.90	6.99
West Virginia	4.77	3.53	3.55	4.67	4.80	3.80	3.65	4.70
Wyoming	5.66		2.54	4.08	5.69		2.57	4.05
Lignite	[4] 3.38		[4] 2.42	[4] 2.43				
Other States [5]			2.06					
Total	4.87	3.41	3.52	4.52	4.85	3.60	3.48	4.49

[1] Included in lignite total; not published to avoid disclosing individual operations.
[2] Included in "Other States;" not published to avoid disclosing individual operations.
[3] Data not available.
[4] Includes lignite in California, Montana, North Dakota, South Dakota, and Texas.
[5] Includes Montana (bituminous) and New Mexico.

TABLE 57.—Production and average value per ton, f. o. b. mines, sold in open market and not sold in open market, 1955, by States

State	Production (net tons)			Average value per ton, f. o. b. mines		
	Sold in open market	Not sold in open market	Total	Sold in open market	Not sold in open market	Total
Alabama	4,308,048	8,780,429	13,088,477	$5.39	$6.39	$6.06
Alaska	639,696		639,696	9.00		9.00
Arizona	3,000	5,898	8,898	6.00	7.00	6.66
Arkansas	576,231	1,495	577,726	7.48	6.92	7.48
California (lignite)		7,650	7,650		10.00	10.00
Colorado	2,235,291	1,332,639	3,567,930	4.82	7.00	5.63
Georgia	12,471		12,471	5.00		5.00
Illinois	44,843,492	1,088,622	45,932,114	3.67	2.98	3.66
Indiana	16,144,462	4,848	16,149,310	3.59	3.43	3.59
Iowa	1,258,357		1,258,357	3.50		3.50
Kansas	742,282		742,282	4.27		4.27
Kentucky	63,626,840	5,393,070	69,019,910	4.09	5.22	4.18
Maryland	512,469		512,469	3.91		3.91
Missouri	3,232,375	110	3,232,485	3.95	2.27	3.95
Montana:						
Bituminous	423,539	793,354	1,216,893	4.91	2.00	3.01
Lignite	30,360		30,360	3.82		3.82
Total Montana	453,899	793,354	1,247,253	4.84	2.00	3.03
New Mexico	189,010	12,569	201,579	6.14	5.94	6.13
North Dakota (lignite)	2,720,927	381,160	3,102,087	2.34	2.32	2.34
Ohio	34,447,353	3,422,438	37,869,791	3.63	2.58	3.53
Oklahoma	1,597,873	565,663	2,163,536	5.03	8.19	5.86
Pennsylvania	49,682,642	36,030,814	85,713,456	4.51	6.01	5.14
South Dakota (lignite)	25,782		25,782	3.50		3.50
Tennessee	6,853,675	199,169	7,052,844	4.05	4.96	4.08
Utah	3,384,281	2,911,243	6,295,524	5.04	7.88	6.35
Virginia	23,507,509		23,507,509	4.60		4.60
Washington	570,128	39,662	609,790	6.92	8.05	6.99
West Virginia	121,870,515	17,297,374	139,167,889	4.61	5.27	4.70
Wyoming	1,490,809	1,435,784	2,926,593	3.52	4.60	4.05
Total	384,929,417	79,703,991	464,633,408	4.26	5.67	4.50

LIGNITE

TABLE 58.—Summary of number of mines, production, value, men working daily, days operated, man-days of labor, output per man per day, and detailed operations at underground and strip lignite mines in the United States, 1955, by States [1]

Item	California	Montana	North Dakota	South Dakota	Total
OPERATIONS AT UNDERGROUND MINES					
Number of mines		5	5		10
Shot from solid, net tons		23,947	6,092		30,039
Cut by machines, do.			15,265		15,265
Total production, do.		23,947	21,357		45,304
Number of cutting machines			2		2
Average output per machine, net tons			7,633		7,633
Percentage of total underground production cut by machine			71.5		33.7
Average value per ton		$3.91	$3.45		$3.69
Average number of men working daily		21	15		36
Average number of days worked		132	178		151
Number of man-days worked		2,774	2,674		5,448
Average tons per man per day		8.63	7.99		8.31
OPERATIONS AT STRIP MINES					
Number of strip mines	1	3	40	2	46
Production, net tons	7,650	6,413	3,080,730	25,782	3,120,575
Average value per ton	$10.00	$3.50	$2.33	$3.50	$2.36
Number of shovels and draglines	2	1	56	3	62
Average number of men working daily	2	6	391	10	409
Average number of days worked	250	113	219	250	219
Number of man-days worked	500	681	85,808	2,500	89,489
Average tons per man per day	15.30	9.42	35.90	10.31	34.87
TOTAL OPERATIONS AT ALL LIGNITE MINES					
Number of mines	1	8	45	2	56
Production (net tons):					
Shipped by rail [2]			2,298,988		2,298,988
Shipped by truck or wagon		30,259	450,306	25,782	506,347
Used at mines [3]	7,650	101	352,793		360,544
Total	7,650	30,360	3,102,087	25,782	3,165,879
Average value per ton	$10.00	$3.82	$2.34	$3.50	$2.38
Average number of men working daily	2	27	406	10	445
Average number of days worked	250	128	218	250	213
Number of man-days worked	500	3,455	88,482	2,500	94,937
Average tons per man per day	15.30	8.79	35.06	10.31	33.35

[1] Exclusive of small mines producing less than 1,000 tons. Exclusive of Texas (lignite).
[2] Includes coal loaded at mines directly into railroad cars and hauled by trucks to railroad sidings.
[3] Includes coal transported from mines to point of use by conveyor belts or trams, used by mine employees, taken by locomotive tenders at tipples, used at mines for power and heat, made into beehive coke at mines, and all other uses at mines.

FOREIGN TRADE [6]

Imports of bituminous coal and lignite are very small, although exports have been an important item of foreign trade for any years, particularly since the close of World War II. A detailed analysis of exports and imports of bituminous coal and lignite is shown in Minerals Yearbook, volume II, 1953, pp. 146–150.

[6] Figures on imports and exports compiled by M. B. Price and E. D. Page, of the Bureau of Mines, from records of the U. S. Department of Commerce.

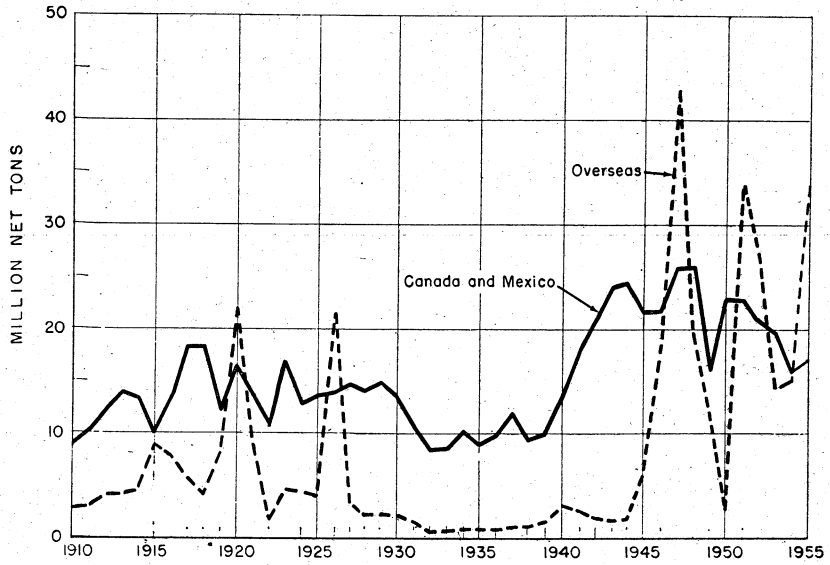

FIGURE 15.—Exports of bituminous coal and lignite from the United States, to Canada and Mexico and overseas, 1910–55.

TABLE 59.—Bituminous coal [1] imported for consumption in the United States, 1953–55, by countries and customs districts, in net tons

[U. S. Department of Commerce]

	1953	1954	1955
COUNTRY			
North America: Canada	226,900	198,799	337,145
Total	226,900	198,799	337,145
CUSTOMS DISTRICT			
Alaska	414		370
Buffalo		876	
Chicago	48		
Dakota	563		
Duluth and Superior	42	1,197	89
Hawaii		606	
Maine and New Hampshire	116,909	126,430	187,540
Michigan	58		53
Montana and Idaho	106,658	69,192	148,045
Ohio	(2)		
Washington	2,208	498	1,048
Total	226,900	198,799	337,145

[1] Includes slack, culm, and lignite.
[2] Less than 1 ton.

TABLE 60.—Exports of bituminous coal, by country groups, 1946–50 (average) and 1951–55, in thousand net tons

[U. S. Department of Commerce]

Year	Canada (including Newfoundland) and Mexico	West Indies and Central America [1]	Overseas (all other countries)							Grand total
			Miquelon, Bermuda, and Greenland	South America	Europe	Asia	Africa	Oceania	Total overseas	
1946–50 (average)	22,663	217	8	1,716	15,679	564	922	52	18,941	41,821
1951	22,823	125	13	3,016	27,926	1,889	919	11	33,774	56,722
1952	20,984	77	7	2,280	20,672	3,053	541	29	26,582	47,643
1953	19,626	69	2	1,747	8,312	3,915	89	----	14,065	33,760
1954	15,964	58	[2]	1,385	10,471	3,049	114	----	15,019	31,041
1955	17,221	51	6	1,447	28,666	3,726	139	----	33,984	51,256

[1] Includes Bahamas and Panama.
[2] Less than 1,000 tons.

TABLE 61.—Bituminous coal exported from the United States, 1952–55, by countries, in net tons [1]

[U. S. Department of Commerce]

Country	1952	1953	1954	1955
North America:				
Bermuda	2,460	1,779	595	1,911
Canada	20,956,569	19,584,135	15,910,572	17,174,396
Central America:				
British Honduras	20	15	----	----
Costa Rica	55	20	----	25
El Salvador	187	95	140	----
Guatemala	130	181	150	290
Honduras	287	253	25	90
Nicaragua	6	12	----	----
Panama	40	----	----	25
Greenland	4,627	----	----	4,485
Mexico	27,496	42,278	52,915	46,548
Miquelon and St. Pierre	----	315	----	----
West Indies:				
British:				
Jamaica	12,584	12,528	14,451	12,631
Trinidad and Tobago	18,774	15,325	2,566	3,398
Other British	5	5	----	----
Cuba	38,339	36,626	39,278	30,804
Dominican Republic	75	55	75	75
French	6,526	4,259	1,303	3,304
Haiti	15	15	----	150
Netherlands Antilles	50	----	----	----
Total North America	21,068,245	19,697,896	16,022,070	17,278,132

See footnote at end of table.

TABLE 61.—Bituminous coal exported from the United States, 1952–55, by countries, in net tons [1]—Continued

[U. S. Department of Commerce]

Country	1952	1953	1954	1955
South America:				
Argentina	1,073,938	553,693	8,795	64,743
Bolivia	3,763	14,123		13,538
Brazil	875,507	812,804	1,073,991	1,115,433
Chile	230,943	271,053	214,379	139,285
Surinam	3,615	1,969	4,413	2,689
Uruguay	92,286	93,278	83,066	111,433
Other South America	60	62	101	50
Total South America	2,280,112	1,746,982	1,384,745	1,447,171
Europe:				
Austria	720,804	67,069	421,543	809,807
Belgium-Luxembourg	711,519	644,303	265,118	1,142,452
Denmark	953,273	6,399	224,622	357,752
Finland	204,693		9,284	188,772
France	3,169,758	373,946	68,861	1,016,888
Germany, West	7,182,086	3,135,255	1,383,979	6,667,860
Gibraltar	46,025			22,355
Greece			30,849	151,934
Iceland		3,980		6,417
Ireland	220,228			
Italy	3,158,088	1,884,241	3,542,830	6,056,130
Netherlands	2,077,716	1,238,026	1,944,583	4,641,658
Norway	173,480	99,980	206,827	459,956
Portugal	27,265	10,336	41,849	76,317
Spain	209,164	46,417	275,236	433,096
Sweden	798,476	53,479	429,676	656,223
Switzerland	647,952	196,152	194,186	58,552
Trieste	49,027	105,767	242,511	378,709
United Kingdom	216,366		461,091	4,850,677
Yugoslavia	106,301	446,270	728,193	690,284
Total Europe	20,672,221	8,311,620	10,471,238	28,665,839
Asia:				
Indonesia	8,255	32,683	14,536	45,409
Japan	2,785,313	3,873,888	2,921,144	2,760,495
Korea, Republic of			111,608	919,129
Pakistan	255,740	6,273		
Other Asia	3,076	2,229	1,290	827
Total Asia	3,052,384	3,915,073	3,048,578	3,725,860
Africa:				
Algeria	192,942	10,916		
Angola	3,342		56,462	65,302
Belgian Congo	105,245	22,276	16,409	21,033
Canary Islands	16,271			12,830
Egypt	21,870	44,525	30,519	31,772
Ethiopia			10,543	
French Morocco	18,369			
French West Africa	33,525			
Gold Coast	74,859			
Madeira Island	4,046			1,680
Tunisia	49,383			
Other Africa	21,209	10,975		5,912
Total Africa	541,061	88,692	113,933	138,529
Oceania	29,127			
Grand total	47,643,150	33,760,263	31,040,564	51,255,531

[1] Amounts stated do not include fuel or bunker coal loaded on vessels engaged in foreign trade, which aggregated 723,372 tons in 1952, 605,019 tons in 1953, 427,072 tons in 1954, and 444,806 tons in 1955.

TABLE 62.—Bituminous coal exported from the United States, 1952–55, by customs districts, in net tons

[U. S. Department of Commerce]

Customs district	1952	1953	1954	1955
North Atlantic:				
Maine and New Hampshire	6,456	3,843	5,790	13,296
Massachusetts			3,608	47
New York	59	148	297	4,072
Philadelphia	390,073	24,636	17,787	201,844
Rhode Island	723			
South Atlantic:				
Georgia	176			
Maryland	2,981,228	1,621,147	627,921	3,633,040
South Carolina	344,351			
Virginia	22,563,456	12,384,828	14,262,824	29,398,609
Gulf Coast:				
Florida	588	17	49	
Galveston				119
Laredo		408	28	327
Mobile	126,975	147,701	234,389	648,862
New Orleans	3,382	970	260	43,473
Sabine	377		1,781	
Mexican border:				
Arizona	164	119	64	105
El Paso	27,266	27,131	9,263	272
Pacific Coast:				
Los Angeles	20,496	10,251	5,600	33,187
Oregon	58,228			20,157
San Diego	53	25	50	76
San Francisco	5			43,615
Washington	224,670	23,283	2,030	67,413
Northern border:				
Buffalo	853,663	850,784	603,415	460,188
Chicago	1,192,503	759,546	640,837	891,817
Dakota	43,283	44,705	43,675	30,967
Duluth and Superior	354,055	47,854	37,228	61,209
Michigan	3,033,863	2,676,464	2,064,034	1,995,191
Minnesota				53
Montana and Idaho	2,793	1,255	593	298
Ohio	11,057,815	11,629,093	9,538,246	10,675,374
Rochester	2,394,845	2,018,576	1,737,287	1,961,425
St. Lawrence	1,959,833	1,451,990	1,132,094	983,437
Vermont	1,762	1,835	1,444	1,326
Miscellaneous:				
Alaska	9	4		205
Pittsburgh				11,117
Total	47,643,150	[1] 33,760,263	[1] 31,040,564	[1] 51,255,531

[1] Includes 33,650 tons in 1953, 69,970 tons in 1954, and 74,410 tons in 1955, representing estimated data for which district breakdown not available.

TABLE 63.—Shipments of bituminous coal to possessions and other areas administered by the United States, 1953–55 [1]

[U. S. Department of Commerce]

Territory	1953		1954		1955 [2]	
	Net tons	Value	Net tons	Value	Net tons	Value
Guam					(2)	$104
Puerto Rico	3,311	$39,291	8,287	$105,492	(2)	80,980
Virgin Islands			4,507	37,228	(2)	100

[1] Data cover "coal and related fuels."
[2] Quantity not recorded.

WORLD PRODUCTION

The United States supplied 491 million tons of bituminous coal, anthracite, and lignite, or 21 percent of the world output, in 1955.

Most coal-producing countries in Europe enjoyed slightly increased production during 1955; however, consumption requirements of the principal coal-producing countries in Europe exceeded available supplies. Production from the United States made up a large part of the deficit.

TABLE 64.—World production of bituminous coal, anthracite, and lignite, by countries, 1951–55, in thousand short tons [1]

[Compiled by Pearl J. Thompson]

Country	1951	1952	1953	1954	1955 [2]
North America:					
Canada:					
Bituminous	16,364	15,495	13,879	12,798	12,524
Lignite	2,223	2,022	2,002	2,116	2,294
Greenland: Bituminous	9	8	[3] 8	[3] 8	[3] 8
Mexico: Bituminous	1,233	1,452	1,579	1,448	1,479
United States:					
Anthracite (Pennsylvania)	42,670	40,583	30,949	29,083	26,205
Bituminous	530,374	463,823	454,439	389,157	461,468
Lignite	3,291	3,017	2,851	2,843	3,166
Total	596,164	526,461	505,727	437,453	507,144
South America:					
Argentina: Bituminous	43	125	91	103	147
Brazil: Bituminous (incl. lignite)	2,164	2,161	2,232	2,265	2,488
Chile: Bituminous (raw coal)	2,438	2,701	2,575	2,499	2,544
Colombia: Bituminous	1,229	1,070	1,357	1,653	2,039
Peru: Bituminous and anthracite	205	248	231	216	93
Venezuela: Bituminous	31	28	32	35	33
Total	6,110	6,333	6,518	6,771	7,344
Europe:					
Albania: Lignite [3]	65	110	220	330	385
Austria:					
Bituminous	216	209	179	195	188
Lignite	5,517	5,709	6,144	6,928	7,296
Belgium: Bituminous and anthracite	32,685	33,493	33,135	32,241	33,045
Bulgaria:					
Anthracite [3]	31	33	33	33	33
Lignite (incl. bituminous) [3]	7,015	8,130	9,050	9,500	9,700
Czechoslovakia:					
Bituminous	20,283	22,377	22,377	23,700	25,574
Lignite	31,879	35,064	36,115	39,793	44,864
Denmark: Lignite	1,744	1,405	880	754	839
France:					
Bituminous and anthracite	58,395	61,029	57,968	59,971	60,996
Lignite	2,208	2,194	2,147	2,105	2,263
Germany:					
Bituminous and anthracite:					
East	3,767	3,886	3,417	3,470	[3] 3,200
West	132,195	137,570	138,509	142,233	145,250
Lignite:					
East	169,425	176,700	194,350	200,510	222,000
West	91,930	92,095	93,355	96,795	99,601
Pech coal: West	1,839	1,898	1,855	1,905	2,003
Greece: Lignite	211	279	489	885	862
Hungary:					
Bituminous	1,800	2,050	2,300	2,650	[3] 2,755
Lignite	15,000	18,595	21,150	22,000	[3] 22,000
Ireland: Bituminous and anthracite	197	183	184	215	217
Italy:					
Bituminous and anthractite	1,286	1,200	1,247	1,184	1,251
Lignite	969	940	836	703	459
Netherlands:					
Bituminous	13,695	13,814	13,555	13,306	13,112
Lignite	312	259	278	190	281

For footnotes, see end of table.

TABLE 64.—World production of bituminous coal, anthracite, and lignite, by countries, 1951–55, in thousand short tons [1]—Continued

Country	1951	1952	1953	1954	1955 [2]
Europe—Continued					
Poland:					
Bituminous	90,381	93,076	97,776	100,641	104,168
Lignite	6,500	6,800	7,600	7,900	6,600
Portugal:					
Bituminous and anthracite	461	487	527	476	455
Lignite	91	85	78	72	98
Rumania:					
Bituminous and anthracite [3]	330	440	440	440	550
Lignite [3]	3,850	5,300	5,500	5,600	6,300
Saar: Bituminous	17,945	17,896	18,098	18,539	19,103
Spain:					
Bituminous and anthracite	12,735	13,519	13,663	13,891	13,623
Lignite	1,650	1,764	1,974	1,933	2,011
Svalbard (Spitsbergen): Bituminous [4]	793	778	761	594	575
Sweden: Bituminous	308	383	314	294	311
Switzerland: Bituminous and anthracite (incl. lignite)	22	[3] 11	[3] 11	[3] 11	[3] 11
U. S. S. R.:					
Bituminous and anthracite [3]	223,100	237,000	247,200	268,600	304,300
Lignite [3]	87,600	94,700	105,900	114,000	126,700
United Kingdom: Bituminous and anthracite	249,615	253,669	251,110	250,942	248,188
Yugoslavia:					
Bituminous	1,093	1,114	1,020	1,089	1,253
Lignite	12,181	12,221	11,377	13,972	15,510
Total [3]	1,301,300	1,358,500	1,403,100	1,460,600	1,547,900
Asia:					
Afghanistan: Bituminous	14	13	18	17	[3] 17
China: Bituminous, anthracite, and lignite	47,675	[3] 57,300	[3] 62,800	[3] 73,900	102,850
India: Bituminous	38,564	40,659	40,297	41,306	42,797
Indonesia: Bituminous	957	1,057	989	992	897
Iran: Bituminous [5]	187	165	171	278	[3] 200
Japan:					
Bituminous and anthracite	47,743	47,795	51,292	47,088	46,726
Lignite	1,547	1,696	1,638	1,592	1,508
Korea:					
Anthracite:					
North [3]	1,100	850	1,100	1,200	1,300
Republic of	353	635	956	982	1,442
Lignite:					
North [3]	550	440	440	660	850
Republic of	7	2			
Malaya: Bituminous	429	353	321	251	230
Pakistan: Bituminous	565	671	654	621	608
Philippines: Bituminous	166	153	171	132	143
Taiwan (Formosa): Bituminous	1,827	2,520	2,638	2,335	2,600
Turkey (raw coal):					
Bituminous	5,214	5,342	6,232	6,299	6,070
Lignite	1,387	1,529	1,809	2,315	2,663
U. S. S. R., including Sakhalin, southern:					
Bituminous	[6]	[6]	[6]	[6]	[6]
Vietnam, North: Anthracite	708	948	917	[7] 1,068	[7] 1,213
Total [3]	149,000	162,100	172,400	181,000	212,100
Africa:					
Algeria: Bituminous and anthracite	272	297	325	334	333
Belgian Congo: Bituminous	240	279	347	418	529
French Morocco: Anthracite	434	507	623	536	515
Madagascar: Bituminous	6	4	6	1	
Mozambique: Bituminous	86	127	179	157	191
Nigeria: Bituminous	616	650	785	712	839
Rhodesia and Nyasaland, Federation of Southern Rhodesia: Bituminous	2,535	2,821	2,887	3,029	3,654
Tunisia: Lignite	9				
Union of South Africa: Bituminous (marketable)	29,357	30,935	31,371	32,314	35,436
Total	33,555	35,620	36,523	37,501	41,497

For footnotes, see end of table.

TABLE 64.—World production of bituminous coal, anthracite, and lignite, by countries, 1951–55, in thousand short tons[1]—Continued

Country	1951	1952	1953	1954	1955[2]
Oceania:					
Australia:					
Bituminous	19,721	21,734	20,620	22,133	21,598
Lignite	8,777	9,076	9,248	10,451	11,326
New Zealand:					
Bituminous and anthracite	759	966	868	912	886
Lignite	1,969	2,114	1,954	1,994	1,958
Total	31,226	33,890	32,690	35,490	35,768
Other countries (estimate)	110	110	110	110	110
World total all grades (estimate)	2,117,000	2,123,000	2,157,000	2,159,000	2,357,000
Lignite (total of items shown above) (estimate)	458,000	483,000	517,000	546,000	591,000
Bituminous and anthracite (by subtraction)	1,659,000	1,640,000	1,640,000	1,613,000	1,761,000

[1] This table incorporates a number of revisions of data published in previous coal chapters. Data do not add to totals shown due to rounding where estimated figures are included in the detail.
[2] Preliminary.
[3] Estimate.
[4] Includes the following quantities, in thousand short tons, produced in U. S. S. R.-controlled mines: 1951, 274; 1952, 279; 1953, 290; and in both 1954 and 1955, 220 (estimated).
[5] Year ended March 20 of year following that stated.
[6] Output from U. S. S. R. in Asia included with U. S. S. R. in Europe.
[7] Production took place in political area known since 1954 as Viet-Minh (Democratic Republic of Vietnam).

COAL TECHNOLOGY[7]

During 1955 research on coal was continued by the Bureau of Mines, Bituminous Coal Research, Inc., the Pennsylvania State University, the University of Kentucky, the Illinois State Geological Survey, the Southern Research Institute, and numerous other Government, private, and university research groups. In cooperation with the Bureau of Mines, the entrained- and fluidized-bed prototype commercial carbonizer, at the Rockdale plant of the Texas Power & Light Co., was operated intermittently to supply tar and light-oil products for test purposes. These materials were used by the Bureau of Mines and numerous private research organizations in studying low-temperature tars and products to determine characteristics and possible new coal chemicals. If such new chemicals or useful products can be obtained from this low-temperature tar derived by first drying and then carbonizing lignite in fluidized and entrained beds, a method of utilizing our very extensive reserves of low-rank coals in the West could provide an important stimulus to industry, population growth, and the prosperity of this region; however, the development of such new products and markets is critical to the economic success of this low-temperature carbonization. Until the results of this research are available, further development on a commercial scale of low-temperature carbonization of the low-rank coals probably will be held in abeyance. However, the significance of the present development lies in the fact that dried lignite is now being used at the Rockdale plant for thermal-power generation for an aluminum plant. When available, the char from the carbonization process is likewise being so used—this almost in the heart of the petroleum- and natural gas-producing regions of the South.

[7] Prepared by E. P. Carman.

The Pittsburgh Consolidation Coal Co. started to construct a 10-inch-diameter pipeline to transport coal hydraulically from its mine at Georgetown, Ohio, to the thermal-power plant of the Cleveland Electric Illuminating Co. on Lake Erie at Eastlake, Ohio, a distance of 108 miles. It is proposed that a 50–50 mixture of coal and water will constitute the feed to the pipeline, and three pumping stations will be used to transport the slurry. The pipeline is expected to deliver 18 million tons of coal over a 15-year period, and the estimated cost of the line is $10 million. Construction of the line is being planned with the complete cooperation of the 2 railroad systems serving the mine and the 1 railroad serving the site on which the utility plant is located. The three railroads are in position to acquire substantial ownership in this new means of coal transportation when construction is completed.

Extension of such pipeline transportation to very large users of coal, with a high load factor, such as thermal-power generating plants, could reduce even further the cost of coal for thermal-power generation and make coal more favorable pricewise as compared with thermal-power generation using oil or natural gas, thus relieving them of requirements which will improve supplies of motor gasoline. Such use is expected to widen the margin of power generation as the prime user of coal until more extensive uses of coal for chemicals production and production of synthetic liquid fuels are developed.

Concurrent with heavily expanding requirements for electric-power generation have been improvements in boiler design and the use of increased steam pressures in thermal-power generation. Increasing efficiencies at electric-utility powerplants reduced coal consumption to an average of 0.95 pound of coal per kilowatt-hour in 1955 from 0.99 pound in 1954. At some of the most modern plants the rate is well below 0.80 pound per kilowatt-hour (see table 54).

During the year a new automatic, coal-fired steam-generator, package-type unit was developed. The device uses a water-cooled, vibratory-grate, crossfeed stoker. During tests, satisfactory operation has been obtained using coal with extremes in coal-caking properties and ash-softening temperatures under completely automatic conditions.

Another interesting development in utilization of coal as railroad fuel was the coal-fired, steam-turbine electric locomotive put into service by the Norfolk & Western Railway. This locomotive was fitted with a standard locomotive stoker and traveling grate in a steam-generating boiler but was built to take higher pressures than have ever been used in the past for steam locomotives. If this steam-turbine locomotive can be developed to provide the necessary speed and to have electrical equipment suitably designed to take the heavy loads required by this railroad in moving its large tonnages of coal freight over mountainous terrain, it should have a definite promise for the future and should aid in recapturing for coal much of the railroad market that has been lost to diesel locomotives.

During 1955 development work on the coal-burning, gas turbine was continued, and it was reported that most of the major problems appeared to be solved. The date for appearance of a coal-burning, gas-turbine locomotive on the rails had not been determined at the end of the year.

Experimental decomposition of subbituminous coal at moderate temperatures and pressures, with low-cost reagents, highlighted research during 1955 directed toward converting coal to additional useful chemical compounds. Reactions with aqueous alkali at 350° C. yielded significant amounts of acids, such as acetic acid, in addition to phenols, bases, and other hydrocarbons. The significance of this development to the coal industry lies in the possibility of such conversion of bituminous and subbituminous coals and lignite, providing a vast market for coal as the source of chemicals to supplement or replace those now being made from liquid and gaseous fuels.

During 1955 the continued improvement in fuel efficiency at blast furnaces, through sintering of ores and increasing availability of cleaner coal (the latter as a result of the adoption of advanced coal preparation methods), reduced the relative consumption of coal in terms of steel output. Regardless of these advancements, however, the increasing demand for steel, which is expected to continue for some years, maintains this industry's position as the second largest coal-consuming industry in the Nation.

Though the "coal wheel" had been experimented with for more than 10 years, a larger and more efficient wheel, designed to operate in soft overburden, was developed in 1955. The principle involved is a rotary cutting wheel that discharges onto a conveyor-belt system that can deposit the overburden up to 350 feet from the cutting operation. The machine operates in conjunction with a shovel that removes the overburden immediately above the coal bed.

The use of augers to recover coal in areas where strip mining has become economically impracticable because of thick overburden increased in popularity during 1955. Production at auger mines in 1955 exceeded 6 million tons, a threefold increase since 1952. This method of mining has proven to be highly productive under favorable conditions.

A large aggregate plant capable of producing 40,000 tons of aggregate annually was erected in West Virginia. The feed to the new plant will be washery reject from a nearby coal-preparation plant.

To introduce the advantages of continuous mining to thin beds, a new continuous mining unit was developed having an overall height of 26 inches. The new machine uses dual augers for mining and is powered by a standard shortwall unit. It is adaptable to mining conditions where a shortwall cutter can be used.

Research and technologic work on coal by the Bureau of Mines in 1955, and related investigations are reported in Bureau of Mines Information Circular 7794.

Coal—Pennsylvania Anthracite

By J. A. Corgan, J. A. Vaughan, and Marian I. Cooke

GENERAL SUMMARY

PENNSYLVANIA anthracite produced in 1955 and reported to the Bureau of Mines, United States Department of the Interior, totaled 26.2 million net tons valued at 206.1 million dollars. This figure represents total output of prepared coal from underground mines, strip pits, culm and silt banks, and creeks and rivers that cross the anthracite fields. The tonnage reported was 10 percent less than in 1954, and the total value showed an even sharper decline of 17 percent.

Although production was curtailed, producers reduced stocks in ground storage at the mines 600,000 tons by the end of the year, and retail dealers reduced yard inventories by 300,000 tons. As in 1954, the drop in production was due entirely to lowered demand in American markets, since exports to Canada were relatively the same in both years and shipments to overseas destinations were approximately 300,000 tons greater.

On the basis of total reported shipments, the anthracite-producing region remained the most stable domestic market from the standpoint of tonnage and price, taking only about 17,000 tons (0.4 percent) less than in 1954—at a total value 3 percent less—while total shipments outside the region declined approximately 11 percent and total value 19 percent.

The factors that contributed to pronounced deterioration of f. o. b. mine prices in 1954 continued to affect the price structure in 1955. With the decline in demand, producers attempted to retain their share of the market by price cuts, and some producer stocks in ground storage reportedly were moved at "distress" prices, as were some sizes temporarily in "long" supply. Also, many retail dealers failed to follow the historic pattern of building up stocks during the summer, apparently preferring to keep stocks low to take advantage of any attractive "spot" prices proferred by producers or wholesalers. Consequently, average value per net ton (based on total production) fell from $8.52 in 1954 to $7.86 in 1955. Total breaker shipments of Buckwheat No. 1 and larger, the sizes used primarily for space-heating purposes, declined 9.4 percent from 1954, and shipments of Buckwheat No. 2 (Rice) and smaller, 9.6 percent. However, the total value of

breaker shipments of Buckwheat No. 1 and larger declined 16.8 percent from 1954, and Buckwheat No. 2 (Rice) and smaller declined 16.1 percent.

The industry continued throughout 1955 to curtail mining operations at high-cost deep mines and to place greater emphasis upon recovering a larger percentage of total output from surface sources. As a result, anthracite produced at underground operations fell to 55 percent of the total, compared with 58 percent in 1954. Output from strip pits increased from 27 percent of the 1954 total to 30 percent, while production from culm and silt banks and dredges equaled approximately 12 and 3 percent of the total, respectively, in both years.

As a direct result of the industry's efforts to keep only the most efficient mines in operation and to obtain maximum use of machines and equipment, the percentage of underground production loaded mechanically increased from 41 percent to 46. Other improvements were noted in the use of cutting machines, where the tonnage cut actually increased over the 1954 total, while the number of machines in use dropped from 96 to 70. Similarly, in stripping operations the reported number of machines in use fell sharply, although the tonnage stripped declined only about 3 percent.

There was a 24-percent decline in total employment, according to estimates of the Bureau of Mines, and a fall from the record high productivity rate of 4.02 tons per man-day in 1954 to 3.96 tons in 1955.

Owing to the large output of strip-pit and culm-bank coal, the Schuylkill region again led in production, with 43 percent of the year's total, followed by the Wyoming region, with 40 percent, and the Lehigh, with 17 percent. For purposes of comparison, in 1954 the Schuylkill region contributed 45 percent of the year's total, the Wyoming 41 percent, and the Lehigh 14 percent. The improvement in the Lehigh region was attributable to resumption of mining at several large collieries in the Panther Valley that had been idle during part of 1954. Employment in 1955 was divided as follows: Schuylkill region, 41 percent; Wyoming, 43 percent; and Lehigh, 16 percent.

In addition to shifting emphasis to surface sources in 1955, coal processors tended to increase their purchases of run-of-mine coal from lessees and small independent operators during the year. Several large operations were leased to contract miners, or small leaseholders, who sell their output to the company owning the coal lands.

Disastrous floods swept through parts of the anthracite region in August and again in October 1955, causing widespread damage to mining properties. Unfortunately, the August floods were caused by an exceedingly heavy rainfall in a relatively short period, causing particularly heavy damage at stripping operations. Although many

deep mines were affected seriously also, a few producers were able to meet contract commitments by shifting production to some high-cost deep mines that had been held in standby condition. Other producers temporarily supplied markets during this emergency with stored coal. Tables 1, 2, and 3 present summary data on the Pennsylvania anthracite industry.

TABLE 1.—Salient statistics of the Pennsylvania anthracite industry, 1951–55

	1951	1952	1953	1954	1955
Production:					
Loaded at mines for shipment outside producing region:					
Breakers net tons	36,204,268	33,807,596	25,074,456	22,576,353	20,031,981
Washeries do	923,610	1,309,061	1,242,306	1,445,514	1,218,363
Dredges do	379,460	310,964	299,799	654,410	752,580
Sold to local trade and used by employees net tons	4,125,495	4,228,430	3,711,235	3,798,919	3,782,366
Used at collieries for power and heat net tons	1,037,164	926,507	621,356	608,281	419,264
Total production do	42,669,997	40,582,558	30,949,152	[1] 29,083,477	26,204,554
Value at breaker, washery, or dredge	$405,817,963	$379,714,076	$229,139,687	$247,870,023	$206,096,662
Average sales realization per net ton on breaker shipments to points outside producing region:					
Pea and larger	$13.19	$13.07	$12.31	$11.67	$10.83
Buckwheat No. 1 and smaller	$5.48	$5.78	$6.60	$6.07	$5.24
Total all sizes	$9.94	$9.81	$10.15	$9.06	$8.27
Percentage of total breaker shipments to points outside producing region:					
Pea and larger	57.8	55.3	52.9	53.4	53.9
Buckwheat No. 1 and smaller	42.2	44.7	47.1	46.6	46.1
Producers' stocks at end of year [2] net tons	982,396	1,708,887	1,915,919	1,292,922	719,569
Exports [3] do	5,955,535	4,592,060	2,724,270	2,851,239	3,152,313
Imports [3] do	26,812	29,370	31,443	5,831	170
Consumption (apparent) do	37,000,000	35,300,000	28,000,000	26,900,000	23,600,000
Average number of days worked	208	201	163	164	197
Average number of men working daily	68,995	65,923	57,862	43,996	33,523
Output per man per day net tons	2.97	3.06	3.28	4.02	3.96
Output per man per year do	618	615	535	659	780
Quantity cut by machines do	496,085	386,128	318,699	381,424	393,932
Quantity mined by stripping do	11,135,990	10,696,705	8,606,482	7,939,680	7,703,907
Quantity loaded by machines underground net tons	10,847,787	10,034,464	6,838,769	6,978,035	6,660,939
Distribution:					
Total receipts in New England [4] do	3,174,473	2,887,640	2,106,343	1,897,283	1,718,404
Exports to Canada [3] do	3,484,800	3,606,618	2,601,818	2,456,747	2,434,961
Loaded into vessels at Lake Erie [5] net tons	460,776	478,534	263,705	283,922	467,886
Receipts at Duluth-Superior [6] do	156,917	226,956	81,678	94,835	170,754

[1] The Bureau of the Census, U. S. Department of Commerce, in Preliminary Report, Series: MI–11–1, December 1956, shows net shipments of 28,694,000 net tons for 1954. The difference is attributable to the fact that the Census data excludes colliery fuel, includes a small tonnage shipped for consumption without preparation, and to minor variations in coverage.
[2] Anthracite Committee.
[3] U. S. Department of Commerce.
[4] Commonwealth of Massachusetts, Division on the Necessaries of Life, and Association of American Railroads.
[5] Ore and Coal Exchange, Cleveland, Ohio.
[6] U. S. Engineer Office, Duluth, Minn.

TABLE 2.—Statistical summary of monthly developments in the Pennsylvania anthracite industry in 1955

(All tonnage figures represent net tons)

	January	February	March	April	May	June	July	August	September	October	November	December	Year 1955	Change from 1954 (percent)	Year 1954
Production (including mine fuel, local sales, and dredge coal)	2,454,000	2,568,000	2,007,000	1,723,000	1,985,000	2,130,000	1,845,000	1,904,000	2,453,000	2,244,000	2,385,000	2,507,000	26,205,000	−9.9	29,083,000
Shipments (breakers and washeries only, all sizes):															
By rail [1]	1,801,180	1,766,599	1,357,118	1,188,426	1,477,473	1,668,055	1,396,939	1,518,953	1,851,396	1,869,918	1,812,954	1,882,813	19,591,824	−5.9	20,822,844
By truck [2]	870,074	839,351	648,443	676,065	585,686	585,984	428,524	502,345	636,211	601,976	773,890	901,749	8,050,298	+10.5	7,284,073
Carloadings [3]	34,441	35,990	27,515	23,941	28,315	30,232	26,547	27,517	35,279	35,016	34,245	35,414	374,452	−9.9	415,383
Distribution:															
Lake Erie loadings [4]				30,024	94,887	50,522	89,490	56,046	46,043	63,284	32,207	5,383	467,886	+64.8	283,922
Lake Ontario loadings [5]						2,619			1,666				4,285	+119.5	1,952
Receipts at Duluth-Superior [6]				7,431	55,298	22,298	13,593	24,430	14,777	18,628	14,299		170,754	+80.1	94,835
Upper Lake dock trade: [7]															
Receipts:															
Lake Superior				7,430	31,852	14,768	16,197	12,002	4,888	18,665		2,043	107,845	+6.9	100,931
Lake Michigan	4,957	7,604	3,230	10,681	15,842	26,338	44,106	16,118	16,987	15,664	9,242	2,780	173,549	+6.0	163,690
Deliveries (reloadings):															
Lake Superior	11,642	9,449	5,374	2,272	10,893	11,964	8,207	11,021	12,320	18,950	20,267	21,573	143,932	+33.3	107,952
Lake Michigan	20,356	20,870	11,179	3,676	8,568	17,542	13,943	12,580	16,178	19,395	15,243	15,192	174,722	−2.0	178,343
New England receipts:															
Tidewater [8]						4,267					900		5,167	+29.3	3,997
Rail [8]	160,468	163,689	100,818	86,228	137,523	182,307	129,758	123,382	142,015	151,974	161,927	173,148	1,713,237	−9.5	1,893,286
Exports [9]	311,493	253,085	175,198	147,847	175,513	226,021	207,475	230,782	302,159	418,156	330,554	374,030	3,152,313	+10.6	2,851,239
Imports [9]										170			170	−97.1	5,831
Industrial consumption and stocks:															
Railroads (class 1 only): [3]															
Consumption	56,792	65,627	49,166	38,700	35,371	24,750	24,645	23,436	23,340	28,551	36,720	50,251	457,349	+2.6	445,943
Stocks	72,639	50,596	53,132	50,208	58,069	53,937	48,836	42,875	43,592	43,275	45,090	39,617	39,617	−48.6	77,020
Electric utilities: [10]															
Consumption	267,799	252,039	273,914	216,371	256,621	260,898	278,650	302,003	277,303	277,166	258,805	287,649	3,209,218	+1.4	3,166,105
Stocks	2,738,093	2,673,499	2,703,756	2,764,421	2,830,083	2,923,653	2,924,852	2,959,067	3,024,481	3,105,777	3,164,758	3,163,048	3,163,048	+20.0	2,635,834
Stocks on Upper Lake docks: [7]															
Lake Superior	64,522	55,021	49,563	54,542	75,458	76,816	84,127	85,083	77,544	77,258	56,880	54,067	54,067	−30.0	77,262
Lake Michigan	54,092	40,826	32,877	39,708	46,982	55,778	86,818	90,356	91,165	87,433	81,432	69,020	69,020	−.7	69,491
Stocks in retail dealer yards [11]	1,251,000	1,125,000	823,000	887,000	1,065,000	1,276,000	1,357,000	1,369,000	1,425,000	1,460,000	1,453,000	1,190,000	1,190,000	−20.4	1,495,000

TABLE 2.—Statistical summary of monthly developments in the Pennsylvania anthracite industry in 1955—Continued

(All tonnage figures represent net tons)

	January	February	March	April	May	June	July	August	September	October	November	December	Year 1955	Change from 1954 (percent)	Year 1954
Retail dealer deliveries [12]	1,637,000	1,525,000	1,261,000	646,000	672,000	891,000	780,000	833,000	1,014,000	1,016,000	1,138,000	1,606,000	13,019,000	−4.5	13,627,000
Producers' stocks [13]	1,276,090	1,163,777	1,131,729	1,144,946	1,080,799	999,695	1,007,665	1,048,119	942,114	966,430	885,938	719,569	719,569	−44.3	1,292,922
Wholesale price indexes (1947–49=100): [14]															
F. o. b. mines:															
Chestnut	120.2	120.2	120.2	120.2	103.6	103.6	107.4	107.4	109.9	116.4	116.9	119.7	113.8	−7.8	123.4
Pea	111.7	111.7	111.7	111.7	104.1	104.1	106.3	106.3	107.4	109.0	109.4	111.2	108.7	−5.3	114.8
Employee wages and hours: [14]															
Average weekly earnings	$76.88	$94.74	$80.07	$74.88	$77.62	$87.40	$86.27	$85.76	$85.77	$93.53	$83.90	$88.23	$84.50	+11.8	$75.60
Average hourly earnings	$2.41	$2.61	$2.51	$2.60	$2.52	$2.49	$2.43	$2.56	$2.53	$2.62	$2.55	$2.55	$2.53	+0.4	$2.52
Average number hours worked per week	31.9	36.3	31.9	28.8	30.8	35.1	35.5	33.5	33.9	35.7	32.9	34.6	33.6	+12.0	30.0

[1] Furnished by Anthracite Institute.
[2] Pennsylvania Department of Mines.
[3] Association of American Railroads.
[4] Ore and Coal Exchange, Cleveland, Ohio.
[5] Buffalo Branch, Ore and Coal Exchange, Cleveland, Ohio.
[6] U. S. Engineer Office, Duluth, Minn.
[7] Includes all commercial docks on Lake Superior and west shore of Lake Michigan as far south as Kenosha. Based on data courteously supplied by Maher Coal Bureau and direct reports to the Bureau of Mines.
[8] Furnished by Commonwealth of Massachusetts, Division on the Necessaries of Life.
[9] U. S. Department of Commerce.
[10] Federal Power Commission.
[11] Estimated from reports submitted by a selected list of retail dealers.
[12] Estimated from reports submitted by a selected list of retail dealers. Does not include local sales.
[13] Anthracite Committee. Represents coal in ground storage on nearest available date to end of month.
[14] Bureau of Labor Statistics.

TABLE 3.—Historical statistics of the Pennsylvania anthracite industry, 1890–1955

Year	Production (net tons)	Value of production	Average value per net ton	Exports [1] (net tons)	Imports [1] (net tons)	Apparent consumption [2] (net tons)	Average number of employees	Average number of days worked	Average tons per man per day	Average tons per man per year	Quantity cut by machines [3] (net tons)	Quantity produced by stripping [4] (net tons)	Quantity loaded mechanically underground [5] (net tons)
1890	46,468,641	$66,383,772	$1.43	889,655	16,962	45,596,000	126,000	200	1.85	369			
1891	50,665,431	73,944,735	1.46	964,601	42,120	49,743,000	126,350	203	1.98	401			
1892	52,472,504	82,442,000	1.57	953,836	72,865	51,592,000	129,050	198	2.06	407			
1893	53,967,543	85,687,078	1.59	1,493,281	60,220	52,534,000	132,944	197	2.06	406			
1894	51,921,121	78,488,063	1.51	1,613,500	100,876	50,408,000	131,603	190	2.08	395			
1895	57,999,337	82,019,272	1.41	1,647,195	158,297	56,510,000	142,917	196	2.07	406			
1896	54,346,081	81,748,651	1.50	1,512,000	113,892	52,948,000	148,991	174	2.10	365			
1897	52,611,681	79,301,954	1.51	1,454,620	27,478	51,185,000	149,884	150	2.34	351			
1898	53,382,645	75,414,537	1.41	1,513,062	3,527	51,873,000	145,504	152	2.41	367			
1899	60,418,005	88,142,130	1.46	1,912,732	68	58,505,000	139,608	173	2.50	433			
1900	57,367,915	85,757,851	1.49	1,853,163	132	55,515,000	144,206	166	2.40	398			
1901	67,471,667	112,504,020	1.67	2,232,504	320	65,239,000	145,309	196	2.37	464			
1902	41,373,595	76,173,586	1.84	1,016,934	190,636	40,547,000	148,141	116	2.40	279			
1903	74,607,068	152,036,448	2.04	2,249,920	196,837	72,554,000	150,483	206	2.41	496			
1904	73,156,709	138,974,020	1.90	2,495,799	81,232	70,742,000	155,861	200	2.35	469			
1905	77,659,850	141,879,000	1.83	2,497,581	38,350	75,201,000	165,406	215	2.18	470			
1906	71,282,411	131,917,694	1.85	2,483,005	36,236	68,836,000	162,355	195	2.25	439			
1907	85,604,312	163,584,056	1.91	3,021,841	11,085	82,594,000	167,234	220	2.33	512			
1908	83,268,754	158,178,849	1.90	3,082,641	18,462	80,205,000	174,174	200	2.39	478			
1909	81,070,359	149,181,587	1.84	3,183,840	3,574	77,890,000	[6] 171,195	205	[7] 2.31	[7] 474			
1910	84,485,236	160,275,302	1.90	3,384,222	9,180	81,110,000	169,497	229	2.17	498			
1911	90,464,067	175,189,392	1.94	3,980,479	2,759	86,486,000	172,585	246	2.13	524	69,907		
1912	84,361,598	177,622,626	2.11	4,131,444	1,870	80,232,000	174,030	231	2.10	485	246,216		
1913	91,524,922	195,181,127	2.13	4,652,912	1,004	85,474,000	175,745	257	2.02	520	555,776		
1914	90,821,507	188,181,399	2.07	4,289,873	17,696	84,041,000	179,679	245	2.06	505	916,596		
1915	88,995,061	184,653,498	2.07	3,965,255	814	88,144,000	176,552	230	2.19	504	1,307,756	1,121,603	
1916	87,578,493	202,009,561	2.31	4,665,530	6,000	87,118,000	159,869	253	2.16	548	1,839,506	1,987,800	
1917	99,611,811	283,650,723	2.85	6,007,306	13,000	94,068,000	154,174	285	2.27	646	1,955,223	2,301,588	
1918	98,826,084	336,480,347	3.40	4,967,808	37,272	92,775,000	147,121	293	2.29	672	1,857,514	2,360,183	
1919	88,092,201	364,926,950	4.14	4,976,598	82,818	81,518,000	154,571	266	2.14	570	1,575,205	2,006,879	
1920	89,598,249	434,252,198	4.85	5,403,749	31,748	85,786,000	145,074	271	2.28	618	938,073	2,054,441	
1921	90,473,451	452,304,903	5.00	4,677,368	8,894	81,950,000	159,499	271	2.09	567	979,145	2,027,790	
1922	54,683,022	273,700,125	5.01	2,649,457	233,528	56,799,000	156,849	151	2.31	349	502,793	949,745	
1923	93,339,009	506,786,768	5.43	5,090,138	300,360	86,914,000	157,743	268	2.21	592	1,208,542	2,263,098	
1924	87,926,862	477,230,852	5.43	4,017,785	117,951	80,717,000	160,009	274	2.00	550	1,423,884	1,865,677	
1925	61,817,149	327,664,512	5.30	3,179,006	382,894	64,061,000	160,312	182	2.12	386	941,189	1,578,478	
1926	84,437,452	474,164,252	5.62	4,029,683	813,956	77,221,000	165,386	244	2.09	511	931,650	2,401,356	
1927	80,095,564	420,941,726	5.26	3,325,507	119,030	74,672,000	165,259	225	2.15	485	1,171,888	2,153,156	[6] 2,223,281
1928	75,348,069	393,637,690	5.22	3,336,272	384,707	73,650,000	160,681	217	2.17	469	1,289,809	2,422,924	[6] 2,351,074
1929	73,828,195	385,642,751	5.22	3,406,369	487,172	71,457,000	151,501	225	2.16	487	1,159,910	1,911,766	3,470,158
1930	69,384,837	354,574,191	5.11	2,551,659	674,812	67,628,000	150,804	208	2.21	460	1,410,123	2,536,288	4,467,750

TABLE 3.—Historical statistics of the Pennsylvania anthracite industry, 1890–1955—Continued

Year	Production (net tons)	Value of production	Average value per net ton	Exports [1] (net tons)	Imports [1] (net tons)	Apparent consumption [2] (net tons)	Average number of employees	Average number of days worked	Average tons per man per day	Average tons per man per year	Quantity cut by machines [3] (net tons)	Quantity produced by stripping [4] (net tons)	Quantity loaded mechanically underground [5] (net tons)
1931	59,645,652	296,354,586	4.97	1,778,308	637,951	58,408,000	139,431	181	2.37	428	1,587,265	3,813,237	4,384,780
1932	49,855,221	222,375,129	4.46	1,303,355	607,097	50,500,000	121,243	162	2.54	411	1,674,223	3,980,973	5,433,340
1933	49,541,344	206,718,405	4.17	1,034,562	456,252	49,600,000	104,633	182	2.60	473	1,648,249	4,932,069	6,557,267
1934	57,168,291	244,152,245	4.27	1,297,610	478,118	55,500,000	109,050	207	2.53	524	1,981,088	5,798,138	9,284,486
1935	52,158,783	210,130,565	4.03	1,608,549	571,439	51,100,000	103,269	189	2.68	505	1,848,095	5,187,072	9,279,057
1936	54,579,535	227,003,538	4.16	1,678,024	614,639	53,200,000	102,081	192	2.79	535	2,162,744	6,203,267	10,827,946
1937	51,856,433	197,598,849	3.81	1,914,173	395,737	50,400,000	99,085	189	2.77	523	1,984,512	5,696,018	10,683,837
1938	46,099,027	180,600,167	3.92	1,908,911	362,895	45,200,000	96,417	171	2.79	478	1,588,407	5,095,341	10,151,669
1939	51,487,377	187,175,324	3.64	2,590,000	298,153	49,700,000	93,138	183	3.02	553	1,881,884	5,486,479	11,773,833
1940	51,484,640	205,489,814	3.99	2,667,632	135,436	49,000,000	91,313	186	3.02	562	1,816,483	6,352,700	12,326,000
1941	[6] 56,368,267	240,275,126	4.26	3,380,189	74,669	52,700,000	88,054	203	[9] 3.04	617	1,855,422	7,316,574	13,441,987
1942	[6] 60,327,729	271,673,380	4.50	4,438,588	140,115	56,500,000	82,121	239	[9] 2.95	705	2,285,640	9,070,933	14,741,459
1943	[6] 60,643,620	306,816,018	5.06	4,138,680	166,020	57,100,000	79,153	270	[9] 2.78	751	1,624,883	8,989,387	14,745,793
1944	[6] 63,701,363	354,582,884	5.57	4,185,933	11,847	59,400,000	77,591	292	[9] 2.79	815	1,336,082	10,953,030	14,975,146
1945	[6] 54,933,909	323,944,435	5.90	3,691,247	149	51,600,000	72,842	269	[9] 2.79	751	1,210,171	10,056,325	13,927,955
1946	[6] 60,506,873	413,417,070	6.83	6,497,245	9,556	53,900,000	78,145	271	[9] 2.84	770	1,232,828	12,858,930	15,619,162
1947	[6] 57,190,009	413,019,486	7.22	8,509,995	10,350	48,200,000	78,600	259	[9] 2.78	720	1,209,983	12,603,545	16,054,011
1948	[6] 57,139,948	467,051,800	8.17	6,675,914	945	50,200,000	76,215	265	[9] 2.81	745	1,016,757	13,352,874	15,742,368
1949	[6] 42,701,724	358,008,451	8.38	4,942,670	----------	37,700,000	75,377	195	[9] 2.87	560	557,599	10,376,808	11,858,088
1950	[6] 44,076,703	392,398,006	8.90	3,891,569	18,289	39,900,000	72,624	211	[9] 2.83	597	611,734	11,833,934	12,335,650
1951 [10]	42,669,997	405,817,963	9.51	5,955,535	26,812	37,000,000	68,995	208	2.97	618	496,085	11,135,990	10,847,787
1952	40,582,558	379,714,076	9.36	4,592,060	29,370	35,300,000	65,923	201	3.06	615	386,128	10,696,705	10,034,464
1953	30,949,152	299,139,687	9.67	2,724,270	31,443	28,000,000	57,862	163	3.28	535	318,699	8,606,482	6,838,769
1954	29,083,477	247,870,023	8.52	2,851,239	5,831	26,900,000	43,996	164	4.02	659	381,424	7,939,680	6,978,035
1955	26,204,554	206,096,662	7.86	3,152,313	170	23,600,000	33,523	197	3.96	780	393,932	7,703,907	6,660,939

[1] U. S. Department of Commerce.
[2] Before 1913 the figures of consumption take no account of producers' stocks, there being no data available for this item.
[3] Data first collected in 1911.
[4] Data first collected in 1915.
[5] Data first collected in 1929.
[6] As reported by the Commonwealth of Pennsylvania, Department of Mines.
[7] Calculated on basis of Pennsylvania Department of Mines employment data.
[8] Includes some "bootleg" coal purchased by authorized operators and prepared at their breakers.
[9] Output per man calculated on authorized tonnages only; bootleg purchases excluded.
[10] Figures for 1951 and subsequent years are not strictly comparable with previous years. *See* Production and Employment sections, Coal—Pennsylvania Anthracite, Minerals Yearbook, 1951.

SCOPE OF REPORT

The canvasses on production of Pennsylvania anthracite are designed to obtain 100-percent coverage; over a period of many years the final nonresponse rate has seldom exceeded 2 percent of total production. This outstanding record is due entirely, of course, to the splendid cooperation of the producing companies, to whom the Bureau of Mines extends its thanks and sincere appreciation.

The 1 or 2 percent of production on which no reports are received is estimated by the Bureau of Mines on the basis of collateral data released by the Anthracite Committee and the Pennsylvania Department of Mines. In addition to the Anthracite Committee and the Pennsylvania Department of Mines, the Anthracite Institute, Association of American Railroads, Commonwealth of Massachusetts, Ore and Coal Exchange, and other trade and government groups have cooperated effectively with the entire anthracite statistical program of the Bureau of Mines. Free use has been made of data released by these agencies, not only in the preparation of Weekly Anthracite Reports and monthly estimates of production but in this chapter as well. Therefore, the Bureau of Mines should like to extend to them its sincere thanks for their continued cooperation.

As prepared anthracite is produced at breakers, washeries, and dredges and run-of-mine coal at some mines and strip pits that are not affiliated directly with a preparation plant, separate schedules are used to cover the activities of each. All returned schedules are reviewed for completeness and arithmetic balance, after which the reports filed by washeries and preparation plants are checked against those submitted by run-of-mine suppliers and stripping contractors to ascertain whether adequate data have been received on production, equipment, source, mining methods, and shipments. Conflicts in reported data, duplications, and inadequacies are resolved either by correspondence or telephone. As dredges are not connected with other producing segments of the industry, all data relevant to dredging operations are processed as a separate canvass.

The production data for 1955 were collected, edited, and tabulated by Ruth A. Cooper and Kathryn S. Huling under the supervision of C. S. Kuebler, director, Anthracite Experiment Station, Schuylkill Haven, Pa.

The Pennsylvania anthracite deposits are in 10 counties in the northeastern corner of the State and underlie a surface area of approximately 484 square miles. By coal-trade usage, the area is divided into 3 regions—the Wyoming, Lehigh, and Schuylkill; and by geologic conditions into 4 fields—the Northern (176 square miles), Eastern Middle (33 square miles), Western Middle (94 square miles), and Southern (181 square miles). The Wyoming region is coextensive with

the Northern field; the Lehigh region is composed of the entire Eastern Middle field, plus that part of the Southern field lying east of Tamaqua; and the Schuylkill region includes all of the Western Middle field, plus that portion of the Southern field west of Tamaqua. Although fresh-mined coal was produced in each region and field in 1955, only 7 of the 10 counties contributed to the year's output—Carbon, Columbia, Dauphin, Lackawanna, Luzerne, Northumberland, and Schuylkill. Berks, Lancaster, Lebanon, Northampton, and Snyder Counties produced only dredge or river coal. A total of 9,903 tons of semianthracite produced in Sullivan County is also included to conform with the procedure followed in previous years. Most of the tabulated data in this chapter are presented by regions, fields, counties, source (underground, culm banks, dredge), and type of preparation plant to portray as clearly as possible for the reader the complex operations of the industry.

The energy series covering supplies, indexes, and percentages contributed by coal, oil, natural gas, and waterpower to the national fuel economy, which formerly was included in the Bituminous Coal and Lignite chapter of the Bureau of Mines Minerals yearbook, will be found in the Review of the Mineral-Fuel Industries chapter. Also incorporated with this chapter are the data that appeared in previous Minerals Yearbooks as chapters entitled "Statistical Summary of Mineral-Fuels Production."

As the technique employed in collecting and processing data on the distribution of Pennsylvania anthracite differs widely from that used in the annual production canvasses, a short discussion of the methods used is included in the Distribution section. The net or short ton of 2,000 pounds is used throughout this chapter.

PRODUCTION, MINING METHODS, AND EQUIPMENT [1]

In 1955 total production of Pennsylvania anthracite from all sources, including underground mines, strip pits, culm banks, and dredges was 26.2 million net tons—10 percent less than 1954. Also included in the total are 9,903 tons of semianthracite produced in the Bernice Basin of Sullivan County. Data on production and shipments by type of preparation plant, field, region, and county of origin are presented in tables 4 to 9, inclusive. Shipments by size of coal and region of origin, expressed in percentages of total shipments, are shown in tables 10 and 11. The historic record of shipments from the Wyoming, Lehigh, and Schuylkill regions is depicted graphically in figure 1.

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[1] The reader is referred to the Coal—Pennsylvania Anthracite chapter of the Minerals Yearbook 1953 for a detailed description of the underground-mining, strip-pit, culm-bank, and dredging methods employed in producing Pennsylvania anthracite.

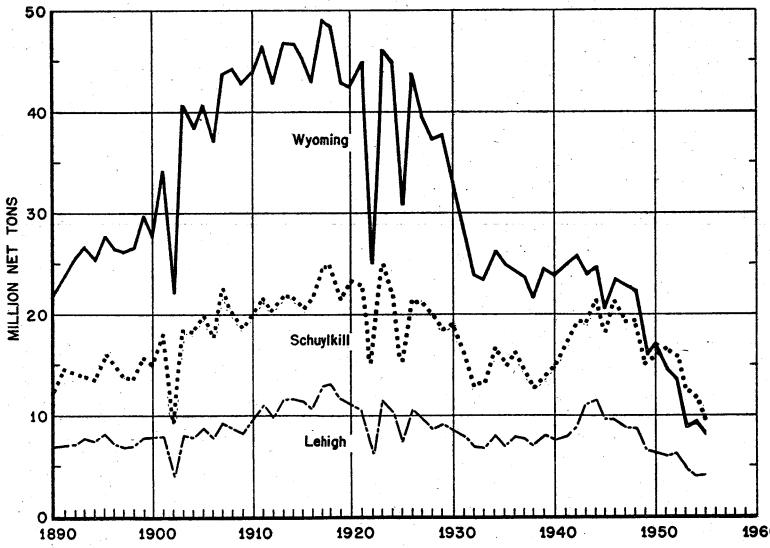

FIGURE 1.—Anthracite shipped from the Lehigh, Schuylkill, and Wyoming regions, 1890–1955.

TABLE 4.—Pennsylvania anthracite produced, 1951–55, by fields and types of plant in net tons

(The figures of breaker product include a certain quantity of culm-bank coal, which amounted to 1,931,224 tons in 1955)

Field and type of plant	1951	1952	1953	1954	1955
Eastern Middle:					
Breakers	3,063,131	2,615,151	2,182,139	2,193,070	2,095,653
Washeries	243,744	330,354	359,236	321,803	314,141
Total Eastern Middle	3,306,875	2,945,505	2,541,375	2,514,873	2,409,794
Western Middle:					
Breakers	12,371,387	11,720,646	8,876,979	7,857,114	6,317,418
Washeries	11,709	62,447	5,150	54,680	210,511
Dredges	122,732	62,696	46,884	83,547	52,169
Total Western Middle	12,505,828	11,845,789	8,929,013	7,995,341	6,580,098
Southern:					
Breakers	8,245,800	8,102,147	6,562,386	4,919,413	5,263,766
Washeries	556,142	876,982	790,584	1,033,202	695,010
Dredges	431,836	304,243	380,339	635,371	712,724
Total Southern	9,233,778	9,283,372	7,733,309	6,587,986	6,671,500
Northern:					
Breakers	17,366,517	16,318,695	11,589,838	11,803,909	10,430,156
Washeries	221,237	160,027	127,432	158,005	79,153
Dredges	7,000	5,115	10,958	6,989	23,950
Total Northern	17,594,754	16,483,837	11,728,228	11,968,903	10,533,259
Total, excluding Sullivan County:					
Breakers	41,046,835	38,756,639	29,211,342	26,773,506	24,106,993
Washeries	1,032,832	1,429,810	1,282,402	1,567,690	1,298,815
Dredges	561,568	372,054	438,181	725,907	788,843
Total, excluding Sullivan County	42,641,235	40,558,503	30,931,925	29,067,103	26,194,651
Sullivan County: [1] Breakers	28,762	24,055	17,227	16,374	9,903
Grand total	42,669,997	40,582,558	30,949,152	29,083,477	26,204,554

[1] For purposes of historical comparison and statistical convenience, the mines of Sullivan County are grouped with the Pennsylvania anthracite region, although the product is classified as semianthracite according to the American Society for Testing Materials Tentative Standard.

TABLE 5.—Pennsylvania anthracite shipped outside producing region, sold locally, and used as colliery fuel in 1955, by regions and types of plant

Region and type of plant	Shipments outside region		Local sales		Colliery fuel		Total	
	Net tons	Value [1]	Net tons	Value	Net tons	Value	Net tons	Value [1]
Lehigh:								
Breakers	3,692,985	$29,592,460	322,570	$3,485,161	60,410	$378,228	4,075,965	$33,455,849
Washeries	362,066	1,202,442	50,895	168,275			412,961	1,370,717
Dredges	29,935	101,877					29,935	101,877
Total Lehigh	4,084,986	30,896,779	373,465	3,653,436	60,410	378,228	4,518,861	34,928,443
Schuylkill:								
Breakers	8,211,490	61,827,546	1,352,214	10,824,769	37,168	218,317	9,600,872	72,870,632
Washeries	797,666	3,060,381	8,805	33,742	230	1,210	806,701	3,095,333
Dredges	698,695	1,564,967	33,688	127,516	2,575	2,575	734,958	1,695,058
Total Schuylkill	9,707,851	66,452,894	1,394,707	10,986,027	39,973	222,102	11,142,531	77,661,023
Wyoming:								
Breakers	8,127,306	74,201,742	1,983,969	17,523,365	318,881	1,412,514	10,430,156	93,137,621
Washeries	58,631	176,161	20,522	82,088			79,153	258,249
Dredges	23,950	47,900					23,950	47,900
Total Wyoming	8,209,887	74,425,803	2,004,491	17,605,453	318,881	1,412,514	10,533,259	93,443,770
Total, excluding Sullivan County:								
Breakers	20,031,781	165,621,748	3,658,753	31,833,295	416,459	2,009,059	24,106,993	199,464,102
Washeries	1,218,363	4,438,984	80,222	284,105	230	1,210	1,298,815	4,724,299
Dredges	752,580	1,714,744	33,688	127,516	2,575	2,575	788,843	1,844,835
Total	22,002,724	171,775,476	3,772,663	32,244,916	419,264	2,012,844	26,194,651	206,033,236
Sullivan County:								
Breakers	200	1,800	9,703	61,626			9,903	63,426
Grand total:								
1955	22,002,924	171,777,276	3,782,366	32,306,542	419,264	2,012,844	26,204,554	206,096,662
1954	24,676,277	211,870,401	3,798,919	33,216,854	608,281	2,782,768	29,083,477	247,870,023
Change, percent	−10.8	−18.9	−0.4	−2.7	−31.1	−27.7	−9.9	−16.9

[1] Value given for shipments is value at which coal left possession of producing company and does not include margins of separately incorporated sales companies.

TABLE 6.—Pennsylvania anthracite produced in 1955, classified as fresh-mined, culm-bank, and river coal, and as breaker, washery, and dredge product, by regions and types of plant, in net tons

Region and type of plant	From mines			From culm banks	From river dredging	Total
	Underground		Strip pits			
	Mechanically loaded	Hand loaded				
Lehigh:						
Breakers	171,937	1,657,002	1,797,448	449,578	----------	4,075,965
Washeries	----------	----------	----------	412,961	----------	412,961
Dredges	----------	----------	----------	----------	29,935	29,935
Total Lehigh	171,937	1,657,002	1,797,448	862,539	29,935	4,518,861
Schuylkill:						
Breakers	523,439	3,981,896	3,950,753	1,144,784	----------	9,600,872
Washeries	----------	16,993	----------	789,708	----------	806,701
Dredges	----------	----------	----------	----------	734,958	734,958
Total Schuylkill	523,439	3,998,889	3,950,753	1,934,492	734,958	11,142,531
Wyoming:						
Breakers	5,962,863	2,181,928	1,948,503	336,862	----------	10,430,156
Washeries	----------	----------	----------	79,153	----------	79,153
Dredges	----------	----------	----------	----------	23,950	23,950
Total Wyoming	5,962,863	2,181,928	1,948,503	416,015	23,950	10,533,259
Total, excluding Sullivan County:						
Breakers	6,658,239	7,820,826	7,696,704	1,931,224	----------	24,106,993
Washeries	----------	16,993	----------	1,281,822	----------	1,298,815
Dredges	----------	----------	----------	----------	788,843	788,843
Total	6,658,239	7,837,819	7,696,704	3,213,046	788,843	26,194,651
Sullivan County: Breakers	2,700	----------	7,203	----------	----------	9,903
Grand total	6,660,939	7,837,819	7,703,907	3,213,046	788,843	26,204,554

TABLE 7.—Pennsylvania anthracite produced in 1955, classified as fresh-mined, culm-bank, and river coal, and as breaker, washery, and dredge product, by fields and types of plant, in net tons

Field and type of plant	From mines			From culm banks	From river dredging	Total
	Underground		Strip pits			
	Mechanically loaded	Hand loaded				
Eastern Middle:						
Breakers	168,854	399,463	1,188,071	339,265	----------	2,095,653
Washeries	----------	----------	----------	314,141	----------	314,141
Total Eastern Middle	168,854	399,463	1,188,071	653,406	----------	2,409,794
Western Middle:						
Breakers	251,431	2,265,288	2,976,803	823,896	----------	6,317,418
Washeries	----------	----------	----------	210,511	----------	210,511
Dredges	----------	----------	----------	----------	52,169	52,169
Total Western Middle	251,431	2,265,288	2,976,803	1,034,407	52,169	6,580,098
Southern:						
Breakers	275,091	2,974,147	1,583,327	431,201	----------	5,263,766
Washeries	----------	16,993	----------	678,017	----------	695,010
Dredges	----------	----------	----------	----------	712,724	712,724
Total Southern	275,091	2,991,140	1,583,327	1,109,218	712,724	6,671,500
Northern:						
Breakers	5,962,863	2,181,928	1,948,503	336,862	----------	10,430,156
Washeries	----------	----------	----------	79,153	----------	79,153
Dredges	----------	----------	----------	----------	23,950	23,950
Total Northern	5,962,863	2,181,928	1,948,503	416,015	23,950	10,533,259
Total, excluding Sullivan County:						
Breakers	6,658,239	7,820,826	7,696,704	1,931,224	----------	24,106,993
Washeries	----------	16,993	----------	1,281,822	----------	1,298,815
Dredges	----------	----------	----------	----------	788,843	788,843
Total	6,658,239	7,837,819	7,696,704	3,213,046	788,843	26,194,651
Sullivan County: Breakers	2,700	----------	7,203	----------	----------	9,903
Grand total	6,660,939	7,837,819	7,703,907	3,213,046	788,843	26,204,554

TABLE 8.—Pennsylvania anthracite shipped in 1955, by regions and sizes

Size	Breaker shipments [1]								
	Lehigh region			Schuylkill region			Wyoming region		
	Outside region	Local sales	Total	Outside region	Local sales	Total	Outside Region	Local Sales	Total
NET TONS									
Lump [2] and Broken	8,450		8,450	18,317	625	18,942	12,503	38,105	50,608
Egg	43,602	173	43,775	103,388	2,031	105,419	143,254	5,245	148,499
Stove	659,770	5,366	665,136	1,378,794	181,957	1,560,751	2,177,716	50,063	2,227,779
Chestnut	725,209	57,001	782,210	1,554,411	304,190	1,858,601	2,252,341	261,078	2,513,419
Pea	386,682	110,463	497,145	770,713	254,365	1,025,078	610,555	659,012	1,269,567
Total Pea and larger	1,823,713	173,003	1,996,716	3,825,623	743,168	4,568,791	5,196,369	1,013,503	6,209,872
Buckwheat No. 1	462,607	49,497	512,104	1,058,391	196,947	1,255,338	961,983	364,572	1,326,555
Buckwheat No. 2 (Rice)	288,548	78,175	366,723	763,387	151,660	915,047	598,693	244,678	843,371
Buckwheat No. 3 (Barley)	376,376	20,306	396,682	999,677	170,097	1,169,774	790,428	211,557	1,001,985
Buckwheat No. 4	287,894	1,585	289,479	550,041	77,158	627,199	291,514	29,091	320,605
Other (including silt)	453,847	4	453,851	1,014,371	13,184	1,027,555	288,319	120,568	408,887
Total Buckwheat No. 1 and smaller	1,869,272	149,567	2,018,839	4,385,867	609,046	4,994,913	2,930,937	970,466	3,901,403
Grand total	3,692,985	322,570	4,015,555	8,211,490	1,352,214	9,563,704	8,127,306	1,983,969	10,111,275
VALUE									
Lump [2] and Broken	$99,719		$99,719	$202,077	$6,859	$208,936	$139,466	$413,865	$553,331
Egg	485,555	$2,494	488,049	1,142,583	22,413	1,164,996	1,562,542	58,921	1,621,463
Stove	7,719,585	71,188	7,790,773	15,353,243	1,990,298	17,343,541	24,954,466	628,763	25,583,229
Chestnut	8,563,993	815,737	9,379,730	17,122,431	3,300,417	20,422,848	25,796,873	3,334,505	29,131,378
Pea	3,142,353	1,258,719	4,401,072	6,090,457	2,186,394	8,276,851	5,116,036	6,651,984	11,768,020
Total Pea and larger	20,011,205	2,148,138	22,159,343	39,910,791	7,506,381	47,417,172	57,569,383	11,088,038	68,657,421
Buckwheat No. 1	3,056,130	499,947	3,556,077	6,717,672	1,264,365	7,982,037	6,337,437	3,055,423	9,392,860
Buckwheat No. 2 (Rice)	1,926,522	690,847	2,617,369	4,790,581	933,732	5,724,313	3,960,047	1,755,419	5,715,466
Buckwheat No. 3 (Barley)	1,992,554	137,734	2,130,288	5,111,276	809,326	5,920,602	4,312,791	1,163,347	5,476,138
Buckwheat No. 4	1,134,343	8,478	1,142,821	2,085,629	278,095	2,363,724	1,130,912	114,056	1,244,968
Other (including silt)	1,471,706	17	1,471,723	3,211,597	32,870	3,244,467	891,172	347,082	1,238,254
Total Buckwheat No. 1 and smaller	9,581,255	1,337,023	10,918,278	21,916,755	3,318,388	25,235,143	16,632,359	6,435,327	23,067,686
Grand total	29,592,460	3,485,161	33,077,621	61,827,546	10,824,769	72,652,315	74,201,742	17,523,365	91,725,107

TABLE 8.—Pennsylvania anthracite shipped in 1955, by regions and sizes—Continued

Size	Breaker shipments [1]								
	Lehigh region			Schuykill region			Wyoming region		
	Outside region	Local sales	Total	Outside region	Local sales	Total	Outside region	Local sales	Total
AVERAGE VALUE PER TON									
Lump [2] and Broken	$11.80		$11.80	$11.03	$10.97	$11.03	$11.15	$10.86	$10.93
Egg	11.14	$14.42	11.15	11.05	11.04	11.05	10.91	11.23	10.92
Stove	11.70	13.27	11.71	11.14	10.94	11.11	11.46	12.56	11.48
Chestnut	11.81	14.31	11.99	11.02	10.85	10.99	11.45	12.77	11.59
Pea	8.13	11.39	8.85	7.90	8.60	8.07	8.38	10.09	9.27
Total Pea and larger	10.97	12.42	11.10	10.43	10.10	10.38	11.08	10.94	11.06
Buckwheat No. 1	6.61	10.10	6.94	6.35	6.42	6.36	6.59	8.38	7.08
Buckwheat No. 2 (Rice)	6.68	8.84	7.14	6.28	6.16	6.26	6.61	7.17	6.78
Buckwheat No. 3 (Barley)	5.29	6.78	5.37	5.11	4.76	5.06	5.46	5.50	5.47
Buckwheat No. 4	3.94	5.35	3.95	3.79	3.60	3.77	3.88	3.92	3.88
Other (including silt)	3.24	4.25	3.24	3.17	2.49	3.16	3.09	2.88	3.03
Total Buckwheat No. 1 and smaller	5.13	8.94	5.41	5.00	5.45	5.05	5.67	6.63	5.91
Grand total	8.01	10.80	8.24	7.53	8.01	7.60	9.13	8.83	9.07

For footnotes, see end of table.

Size	Breaker shipments [1]—Continued								
	Sullivan County			Total					
				Excluding Sullivan County			Including Sullivan County		
	Outside region	Local sales	Total	Outside region	Local sales	Total	Outside region	Local sales	Total
NET TONS									
Lump [2] and Broken				39,270	38,730	78,000	39,270	38,730	78,000
Egg				290,244	7,449	297,693	290,244	7,449	297,693
Stove				4,216,280	237,386	4,453,666	4,216,280	237,386	4,453,666
Chestnut	150	1,383	1,533	4,531,961	622,269	5,154,230	4,532,111	623,652	5,155,763
Pea		1,650	1,650	1,767,950	1,023,840	2,791,790	1,767,950	1,025,490	2,793,440
Total Pea and larger	150	3,033	3,183	10,845,705	1,929,674	12,775,379	10,845,855	1,932,707	12,778,562
Buckwheat No. 1	50	1,954	2,004	2,482,981	611,016	3,093,997	2,483,031	612,970	3,096,001
Buckwheat No. 2 (Rice)		4,716	4,716	1,650,628	474,513	2,125,141	1,650,628	479,229	2,129,857
Buckwheat No. 3 (Barley)				2,166,481	401,960	2,568,441	2,166,481	401,960	2,568,441
Buckwheat No. 4				1,129,449	107,834	1,237,283	1,129,449	107,834	1,237,283
Other (including silt)				1,756,537	133,756	1,890,293	1,756,537	133,756	1,890,293
Total Buckwheat No. 1 and smaller	50	6,670	6,720	9,186,076	1,729,079	10,915,155	9,186,126	1,735,749	10,921,875
Grand total	200	9,703	9,903	20,031,781	3,658,753	23,690,534	20,031,981	3,668,456	23,700,437
VALUE									
Lump [2] and Broken				$441,262	$420,724	$861,986	$441,262	$420,724	$861,986
Egg				3,190,680	83,828	3,274,508	3,190,680	83,828	3,274,508
Stove				48,027,294	2,690,249	50,717,543	48,027,294	2,690,249	50,717,543
Chestnut	$1,500	$13,830	$15,330	51,483,297	7,450,659	58,933,956	51,484,797	7,464,489	58,949,286
Pea		14,850	14,850	14,348,846	10,097,097	24,445,943	14,348,846	10,111,947	24,460,793
Total Pea and larger	1,500	28,680	30,180	117,491,379	20,742,557	138,233,936	117,492,879	20,771,237	138,264,116

TABLE 8.—Pennsylvania anthracite shipped in 1955, by regions and sizes—Continued

Size	Breaker shipments [1]—Continued								
	Sullivan County			Total					
				Excluding Sullivan County			Including Sullivan County		
	Outside region	Local sales	Total	Outside region	Local sales	Total	Outside region	Local sales	Total
Buckwheat No. 1	300	11,724	12,024	16,111,239	4,819,735	20,930,974	16,111,539	4,831,459	20,942,998
Buckwheat No. 2 (Rice)		21,222	21,222	10,677,150	3,379,998	14,057,148	10,677,150	3,401,220	14,078,370
Buckwheat No. 3 (Barley)				11,416,621	2,110,407	13,527,028	11,416,621	2,110,407	13,527,028
Buckwheat No. 4				4,350,884	400,629	4,751,513	4,350,884	400,629	4,751,513
Other (including silt)				5,574,475	379,969	5,954,444	5,574,475	379,969	5,954,444
Total Buckwheat No. 1 and smaller	300	32,946	33,246	48,130,369	11,090,738	59,221,107	48,130,669	11,123,684	59,254,353
Grand total	1,800	61,626	63,426	165,621,748	31,833,295	197,455,043	165,623,548	31,894,921	197,518,469
AVERAGE VALUE PER TON									
Lump [2] and Broken				$11.24	$10.86	$11.05	$11.24	$10.86	$11.05
Egg				10.99	11.25	11.00	10.99	11.25	11.00
Stove				11.39	11.33	11.39	11.39	11.33	11.39
Chestnut	$10.00	$10.00	$10.00	11.36	11.97	11.43	11.36	11.97	11.43
Pea		9.00	9.00	8.12	9.86	8.76	8.12	9.86	8.76
Total Pea and larger	10.00	9.46	9.48	10.83	10.75	10.82	10.83	10.75	10.82
Buckwheat No. 1	6.00	6.00	6.00	6.49	7.89	6.77	6.49	7.88	6.76
Buckwheat No. 2 (Rice)		4.50	4.50	6.47	7.12	6.61	6.47	7.10	6.61
Buckwheat No. 3 (Barley)				5.27	5.25	5.27	5.27	5.25	5.27
Buckwheat No. 4				3.85	3.72	3.84	3.85	3.72	3.84
Other (including silt)				3.17	2.84	3.15	3.17	2.84	3.15
Total Buckwheat No. 1 and smaller	6.00	4.94	4.95	5.24	6.41	5.43	5.24	6.41	5.43
Grand total	9.00	6.35	6.40	8.27	8.70	8.33	8.27	8.69	8.33

For footnotes, see end of table.

Size	Washery shipments			Dredge shipments			Grand total		
	Outside region	Local sales	Total	Outside region	Local sales	Total	Outside region	Local sales	Total
NET TONS									
Lump [2] and Broken							39,270	38,730	78,000
Egg							290,244	7,449	297,693
Stove							4,216,280	237,386	4,453,666
Chestnut							4,532,111	623,652	5,155,763
Pea		112	112	99	165	264	1,768,049	1,025,767	2,793,816
Total Pea and larger		112	112	99	165	264	10,845,954	1,932,984	12,778,938
Buckwheat No. 1	8,233	701	8,934	1,388	353	1,741	2,492,652	614,024	3,106,676
Buckwheat No. 2 (Rice)	28,653	705	29,358	335		335	1,679,616	479,934	2,159,550
Buckwheat No. 3 (Barley)	136,663	3,551	140,214	15,298	945	16,243	2,318,442	406,456	2,724,898
Buckwheat No. 4	336,928	5,220	342,148	51,937	11,969	63,906	1,518,314	125,023	1,643,337
Other (including silt)	707,886	69,933	777,819	683,523	20,256	703,779	3,147,946	223,945	3,371,891
Total Buckwheat No. 1 and smaller	1,218,363	80,110	1,298,473	752,481	33,523	786,004	11,156,970	1,849,382	13,006,352
Grand total	1,218,363	80,222	1,298,585	752,580	33,688	786,268	22,002,924	3,782,366	25,785,290
VALUE									
Lump [2] and Broken							$441,262	$420,724	$861,986
Egg							3,190,680	83,828	3,274,508
Stove							48,027,294	2,690,249	50,717,543
Chestnut							51,484,797	7,464,489	58,949,286
Pea		$842	$842	$495	$623	$1,118	14,349,341	10,113,412	24,462,753
Total Pea and larger		842	842	495	623	1,118	117,493,374	20,772,702	138,266,076
Buckwheat No. 1	$44,768	4,608	49,376	6,001	1,675	7,676	16,162,308	4,837,742	21,000,050
Buckwheat No. 2 (Rice)	164,222	4,510	168,732	1,340		1,340	10,842,712	3,405,730	14,248,442
Buckwheat No. 3 (Barley)	692,517	16,683	709,200	58,262	4,725	62,987	12,167,400	2,131,815	14,299,215
Buckwheat No. 4	1,321,771	19,836	1,341,607	178,174	43,446	221,620	5,850,829	463,911	6,314,740
Other (including silt)	2,215,706	237,626	2,453,332	1,470,472	77,047	1,547,519	9,260,653	694,642	9,955,295
Total Buckwheat No. 1 and smaller	4,438,984	283,263	4,722,247	1,714,249	126,893	1,841,142	54,283,902	11,533,840	65,817,742
Grand total	4,438,984	284,105	4,723,089	1,714,744	127,516	1,842,260	171,777,276	32,306,542	204,083,818

TABLE 8.—Pennsylvania anthracite shipped in 1955, by regions and sizes—Continued

Size	Washery shipments			Dredge shipments			Grand total		
	Outside region	Local sales	Total	Outside region	Local sales	Total	Outside region	Local sales	Total
AVERAGE VALUE PER TON									
Lump [2] and Broken							$11.24	$10.86	$11.05
Egg							10.99	11.25	11.00
Stove							11.39	11.33	11.39
Chestnut							11.36	11.97	11.43
Pea		$7.52	$7.52	$5.00	$3.78	$4.23	8.12	9.86	8.76
Total Pea and larger		7.52	7.52	5.00	3.78	4.23	10.83	10.75	10.82
Buckwheat No. 1	$5.44	6.57	5.53	4.32	4.75	4.41	6.48	7.88	6.76
Buckwheat No. 2 (Rice)	5.73	6.40	5.75	4.00		4.00	6.46	7.10	6.60
Buckwheat No. 3 (Barley)	5.07	4.70	5.06	3.81	5.00	3.88	5.25	5.24	5.25
Buckwheat No. 4	3.92	3.80	3.92	3.43	3.63	3.47	3.85	3.71	3.84
Other (including silt)	3.13	3.40	3.15	2.15	3.80	2.20	2.94	3.10	2.95
Total Buckwheat No. 1 and smaller	3.64	3.54	3.64	2.28	3.79	2.34	4.87	6.24	5.06
Grand total	3.64	3.54	3.64	2.28	3.79	2.34	7.81	8.54	7.91

[1] Figures of shipments from breakers include some culm-bank coal handled in breakers.
[2] Quantity of Lump included is insignificant.

TABLE 9.—Pennsylvania anthracite produced in 1955, by counties

County	Shipments outside producing regions		Sold to local trade		Colliery fuel		Total production	
	Net tons	Value [1]	Net tons	Value	Net tons	Value	Net tons	Value [1]
Berks, Lancaster, Lebanon, Northampton, and Snyder [2]	671,006	$1,466,530	1,816	$8,138			672,822	$1,474,668
Carbon	1,718,998	12,926,731	141,224	1,136,733	11,066	$100,662	1,871,288	14,164,126
Columbia	776,341	6,320,918	18,821	191,923	1,362	10,217	796,524	6,523,058
Dauphin	141,265	613,736	89,178	578,701			230,443	1,192,437
Lackawanna	1,744,445	15,271,948	622,595	6,302,672	111,779	442,883	2,478,819	22,017,503
Luzerne	7,947,639	71,534,865	1,593,069	13,595,395	249,518	1,199,309	9,790,226	86,329,569
Northumberland	2,543,583	16,801,581	536,095	4,349,623	8,613	43,083	3,088,291	21,194,287
Schuylkill	6,459,447	46,839,167	769,865	6,081,731	36,926	216,690	7,266,238	53,137,588
Sullivan	200	1,800	9,703	61,626			9,903	63,426
Total	22,002,924	171,777,276	3,782,366	32,306,542	419,264	2,012,844	26,204,554	206,096,662

[1] Value given for shipments is value at which coal left possession of producing company and does not include margins of separately incorporated sales companies.
[2] Counties producing dredge coal only.

Underground Mines.—Of the 2.9-million-ton loss in total output between 1954 and 1955, approximately 2.4 million occurred at underground mines. However, owing to resumption of mining at several large mines in the Panther Valley, which were closed for several months in 1954, the Lehigh region increased its share of underground production from 10 percent in 1954 to 13 percent of the 14.5 million tons produced undergound in 1955. As the Lehigh region also registered an actual tonnage increase, the combined loss for the Wyoming and Schuylkill regions totaled about 2.5 million tons. Although the Wyoming region contributed the same percentage to the underground total in both years (56 percent), the Schuylkill region declined from 34 percent in 1954 to 31 percent.

Many high-cost underground mines were abandoned during the year as producers continued to place greater reliance upon lower cost surface sources. At other underground mines mining activities were either curtailed severely, or the actual mining operations were turned over to contract miners and small lessees. The trend toward purchasing more run-of-mine coal for preparation also gained momentum, leading to creation of many new small mining companies producing only run-of-mine material for sale to preparation plants. This latter trend was noted particularly in the Schuylkill region, where, despite the sharp decline in underground output, the number of small independent operations had increased materially by the end of the year. Detailed data on undergound production may be found in tables 6 and 7.

Strip Pits.—Output from strip pits totaled 7.7 million tons in 1955—30 percent of the total production, compared with 27 percent in 1954. 47 percent of the fresh-mined coal produced in the Schuylkill region originated at strip pits, 50 percent of the Lehigh's, and 19 percent of

TABLE 10.—Sizes of Pennsylvania anthracite shipped from breakers to points outside producing region, 1951–55, by regions, in percent of total

(Does not include shipments of dredge and washery coal)

Size	Percent of total shipments									
	Lehigh region					Schuylkill region				
	1951	1952	1953	1954	1955	1951	1952	1953	1954	1955
Lump [1] and Broken	1.0	0.3	0.4	0.5	0.2	0.4	0.2	0.1	0.2	0.2
Egg	3.7	1.9	1.3	1.1	1.2	3.6	1.9	1.5	1.4	1.3
Stove	20.1	19.9	20.0	21.4	17.9	16.2	16.6	15.6	16.4	16.8
Chestnut	22.4	21.3	21.6	22.1	19.6	19.6	19.6	17.8	18.3	18.9
Pea	7.7	7.0	8.0	8.8	10.5	8.0	7.7	8.5	9.4	9.4
Total Pea and larger	54.9	50.4	51.3	53.9	49.4	47.8	46.0	43.5	45.7	46.6
Buckwheat No. 1	13.2	13.3	13.3	13.7	12.5	14.1	14.7	15.4	14.2	12.9
Buckwheat No. 2 (Rice)	8.0	7.5	8.0	8.3	7.8	8.9	9.2	9.6	8.8	9.3
Buckwheat No. 3 (Barley)	9.3	8.9	9.7	9.6	10.2	13.2	14.1	14.3	13.6	12.2
Buckwheat No. 4	7.3	8.2	8.7	6.8	7.8	7.5	7.9	8.1	6.9	6.7
Other (including silt)	7.3	11.7	9.0	7.7	12.3	8.5	8.1	9.1	10.8	12.3
Total Buckwheat No. 1 and smaller	45.1	49.6	48.7	46.1	50.6	52.2	54.0	56.5	54.3	53.4

Size	Wyoming region					Sullivan County				
Lump [1] and Broken	0.9	0.3	0.3	0.3	0.1	------	------	------	------	------
Egg	3.9	2.4	2.0	2.7	1.8	------	------	------	------	------
Stove	27.8	28.3	27.5	25.6	26.8	9.9	4.7	4.2	2.2	------
Chestnut	30.7	29.8	28.4	24.9	27.7	20.0	21.1	24.9	22.3	75.0
Pea	6.6	7.2	7.7	8.2	7.5	15.4	16.2	21.3	18.5	------
Total Pea and larger	69.9	68.0	65.9	61.7	63.9	45.3	42.0	50.4	43.0	75.0
Buckwheat No. 1	13.0	14.5	14.1	12.9	11.8	12.5	11.6	11.5	15.2	25.0
Buckwheat No. 2 (Rice)	6.6	7.3	7.5	9.1	7.4	42.2	------	------	------	------
Buckwheat No. 3 (Barley)	7.7	7.5	8.4	10.2	9.7	------	------	------	41.8	------
Buckwheat No. 4	1.6	1.4	2.6	3.2	3.6	------	------	------	------	------
Other (including silt)	1.2	1.3	1.5	2.9	3.6	------	46.4	38.1	------	------
Total Buckwheat No. 1 and smaller	30.1	32.0	34.1	38.3	36.1	54.7	58.0	49.6	57.0	25.0

Size	Total									
	Excluding Sullivan County					Including Sullivan County				
Lump [1] and Broken	0.7	0.3	0.2	0.3	0.2	0.7	0.3	0.2	0.3	0.2
Egg	3.7	2.1	1.7	1.9	1.5	3.7	2.1	1.7	1.9	1.5
Stove	21.5	21.7	20.6	20.9	21.0	21.5	21.7	20.6	20.8	21.0
Chestnut	24.5	23.8	22.3	21.5	22.6	24.5	23.8	22.3	21.6	22.6
Pea	7.4	7.4	8.1	8.8	8.8	7.4	7.4	8.1	8.8	8.8
Total Pea and larger	57.8	55.3	52.9	53.4	54.1	57.8	55.3	52.9	53.4	54.1
Buckwheat No. 1	13.5	14.4	14.6	13.6	12.4	13.5	14.4	14.6	13.6	12.4
Buckwheat No. 2 (Rice)	7.9	8.2	8.6	8.8	8.3	7.9	8.2	8.6	8.8	8.3
Buckwheat No. 3 (Barley)	10.3	10.7	11.3	11.7	10.8	10.3	10.7	11.3	11.7	10.8
Buckwheat No. 4	5.1	5.4	6.2	5.4	5.6	5.1	5.4	6.2	5.4	5.6
Other (including silt)	5.4	6.0	6.4	7.1	8.8	5.4	6.0	6.4	7.1	8.8
Total Buckwheat No. 1 and smaller	42.2	44.7	47.1	46.6	45.9	42.2	44.7	47.1	46.6	45.9

[1] Quantity of Lump is insignificant.

TABLE 11.—Sizes of Pennsylvania anthracite shipped from breakers to points outside and inside producing region in 1955, by regions, in percent of total

(Does not include shipments of dredge and washery coal)

Size	Percent of total shipments								
	Lehigh region			Schuylkill region			Wyoming region		
	Shipped outside region	Local sales	Total	Shipped outside region	Local sales	Total	Shipped outside region	Local sales	Total
Lump [1] and Broken	0.2	------	0.1	0.2	(2)	0.2	0.1	1.9	0.5
Egg	1.2	0.1	1.1	1.3	0.2	1.1	1.8	.3	1.5
Stove	17.9	1.6	16.6	16.8	13.5	16.3	26.8	2.5	22.0
Chestnut	19.6	17.7	19.5	18.9	22.5	19.5	27.7	13.2	24.9
Pea	10.5	34.2	12.4	9.4	18.8	10.7	7.5	33.2	12.5
Total Pea and larger	49.4	53.6	49.7	46.6	55.0	47.8	63.9	51.1	61.4
Buckwheat No. 1	12.5	15.4	12.8	12.9	14.5	13.1	11.8	18.4	13.1
Buckwheat No. 2 (Rice)	7.8	24.2	9.1	9.3	11.2	9.6	7.4	12.3	8.3
Buckwheat No. 3 (Barley)	10.2	6.3	9.9	12.2	12.6	12.2	9.7	10.7	9.9
Buckwheat No. 4	7.8	.5	7.2	6.7	5.7	6.6	3.6	1.4	3.2
Other (including silt)	12.3	(2)	11.3	12.3	1.0	10.7	3.6	6.1	4.1
Total Buckwheat No. 1 and smaller	50.6	46.4	50.3	53.4	45.0	52.2	36.1	48.9	38.6

Size	Sullivan County			Total					
				Excluding Sullivan County			Including Sullivan County		
Lump [1] and Broken	------	------	------	0.2	1.0	0.3	0.2	1.0	0.3
Egg	------	------	------	1.5	.2	1.3	1.5	.2	1.3
Stove	------	------	------	21.0	6.5	18.8	21.0	6.5	18.8
Chestnut	75.0	14.3	15.5	22.6	17.0	21.7	22.6	17.0	21.7
Pea	------	17.0	16.6	8.8	28.0	11.8	8.8	28.0	11.8
Total Pea and larger	75.0	31.3	32.1	54.1	52.7	53.9	54.1	52.7	53.9
Buckwheat No. 1	25.0	20.1	20.3	12.4	16.7	13.1	12.4	16.7	13.1
Buckwheat No. 2 (Rice)	------	43.6	47.6	8.3	13.0	9.0	8.3	13.1	9.0
Buckwheat No. 3 (Barley)	------	------	------	10.8	11.0	10.8	10.8	11.0	10.8
Buckwheat No. 4	------	------	------	5.6	2.9	5.2	5.6	2.9	5.2
Other (including silt)	------	------	------	8.8	3.7	8.0	8.8	3.6	8.0
Total Buckwheat No. 1 and smaller	25.0	68.7	67.9	45.9	47.3	46.1	45.9	47.3	46.1

[1] Quantity of Lump included is insignificant.
[2] Less than 0.05 percent.

the Wyoming region's. These data indicate relative gains of 5 percentage points for the Schuylkill, 2 points, for the Lehigh, and no change in the Wyoming. However, because of the decline in overall production, the Lehigh was the only region to show an actual increase in strip tonnage, producing 1.8 million tons as against 1.6 million in 1954.

Of the 1955 strip total, the Lehigh region accounted for 23 percent, the Wyoming 26 percent, and the Schuylkill 51 percent—representing a slight proportionate gain in the Lehigh and small declines in the Wyoming and Schuylkill regions. Table 12 presents data on stripping for selected years in the period 1915–55 and figure 2 the trend in strip production, by regions, for 1928–55.

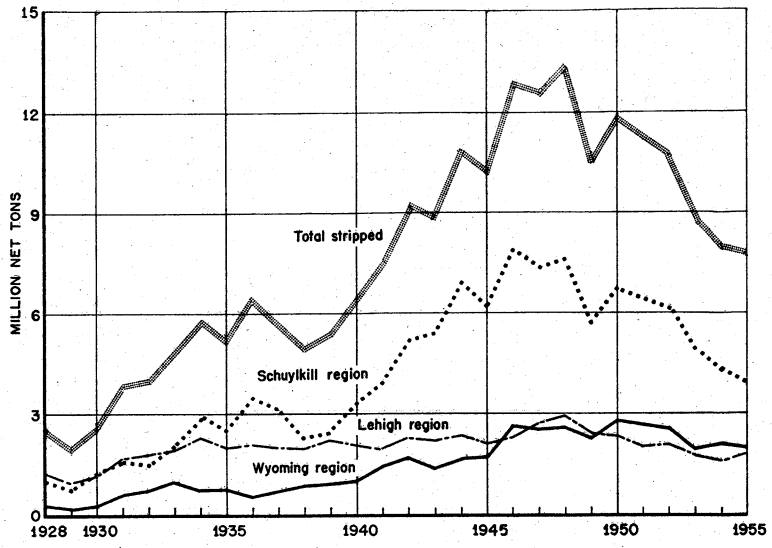

FIGURE 2.—Pennsylvania anthracite mined from strip pits, by regions, 1928–55

TABLE 12.—Production of Pennsylvania anthracite from strip pits, 1915, 1920, 1925, 1930, and 1949–55

	Mined by stripping (net tons)	Percent of fresh-mined total that was stripped	Number of men employed	Average number of days worked
1915	1,121,603	[1]	[1]	[1]
1920	2,054,441	2.5	[1]	[1]
1925	1,578,478	2.7	[1]	[1]
1930	2,536,288	3.7	[1]	[1]
1949	10,376,808	27.7	7,386	198
1950	11,833,934	29.6	7,949	212
1951	11,135,990	29.7	7,647	220
1952	10,696,705	30.2	7,100	212
1953	8,606,482	32.5	6,168	193
1954	7,939,680	32.0	4,837	202
1955:				
Lehigh region	1,797,448	49.6	[2] 1,193	[2] 184
Schuylkill region	3,950,753	46.6	[2] 2,532	[2] 204
Wyoming region	1,948,503	19.3	[2] 911	[2] 234
Total, excluding Sullivan County	7,696,704	34.7	[2] 4,636	[2] 205
Sullivan County	7,203	72.7	[2] 6	[2] 131
Total	7,703,907	34.7	[2] 4,642	[2] 205

[1] Data not available.
[2] Estimated.

Culm-Bank Coal.—Pennsylvania anthracite produced from culm and silt banks totaled 3.2 million tons in 1955—10 percent less than in 1954 and the same percentage decrease recorded for total production. Of the coal recovered from banks in 1955, 60 percent was obtained in the Schuylkill region, 27 percent in the Lehigh, and 13 percent in the Wyoming. As was the case in underground and strip-pit production, the Lehigh was the only region to show an increase over 1954 in the production of bank coal, probably because of reactivation of several large preparation plants that handled substantial quantities of bank

TABLE 13.—Culm-bank coal put through breakers, 1950–55, by fields, in net tons

Year	Northern	Eastern Middle	Western Middle	Southern	Total
1950	[1] 213, 577	35, 270	1, 388, 760	840, 253	2, 477, 860
1951	263, 555	107, 064	2, 526, 144	700, 605	3, 597, 368
1952	406, 070	93, 543	2, 158, 009	679, 932	3, 337, 554
1953	376, 599	146, 884	1, 705, 773	499, 342	2, 728, 598
1954	289, 710	192, 507	1, 163, 751	351, 824	1, 997, 792
1955	336, 862	339, 265	823, 896	431, 201	1, 931, 224

[1] A small quantity of culm-bank coal was put through breakers in Sullivan County.

TABLE 14.—Production of Pennsylvania anthracite from culm banks, by regions, 1935–55, in net tons

Year	Lehigh	Schuylkill	Wyoming	Sullivan County	Total
1935	192, 790	1, 748, 960	760, 718	----------	2, 702, 468
1936	136, 058	2, 532, 116	525, 798	----------	3, 193, 972
1937	101, 239	2, 178, 482	442, 878	----------	2, 722, 599
1938	53, 037	1, 941, 896	345, 511	----------	2, 340, 444
1939	64, 180	2, 159, 548	360, 086	----------	2, 583, 814
1940	192, 878	2, 109, 557	480, 603	----------	2, 783, 038
1941	326, 755	2, 881, 049	449, 062	----------	3, 656, 866
1942	745, 934	3, 529, 757	459, 373	----------	4, 735, 064
1943	1, 944, 047	4, 577, 917	1, 041, 841	19, 893	7, 583, 698
1944	2, 125, 317	5, 787, 036	1, 673, 994	13, 833	9, 600, 180
1945	2, 086, 864	4, 936, 907	1, 728, 440	34, 448	8, 786, 659
1946	1, 875, 590	4, 752, 141	1, 780, 874	22, 487	8, 431, 092
1947	1, 044, 501	3, 947, 016	1, 409, 217	2, 912	6, 403, 646
1948	796, 114	3, 729, 542	1, 098, 123	----------	5, 623, 779
1949	694, 763	2, 778, 131	956, 250	----------	4, 429, 144
1950	366, 069	2, 533, 535	565, 829	1, 877	3, 467, 310
1951	566, 613	3, 578, 795	484, 792	----------	4, 630, 200
1952	791, 445	3, 407, 974	566, 097	----------	4, 765, 516
1953	714, 646	2, 792, 323	504, 031	----------	4, 011, 000
1954	797, 761	2, 320, 006	447, 715	----------	3, 565, 482
1955	862, 539	1, 934, 492	416, 015	----------	3, 213, 046

TABLE 15.—Pennsylvania anthracite produced by dredges in 1955, by rivers (including tributaries)

River	Production (net tons)	Value	
		Total	Average
Lehigh	29, 935	$101, 877	$3. 40
Schuylkill	60, 256	184, 140	3. 06
Susquehanna	698, 652	1, 558, 818	2. 23
Total	788, 843	1, 844, 835	2. 34

material and were shut down for part of 1954. Details on the production of anthracite from banks are shown, by fields and regions, in tables 13 and 14.

Dredge Coal.—Production of dredge coal totaled approximately 789,000 tons in 1955, a 9-percent increase over 1954. The Susquehanna River and its tributaries contributed the preponderant part of the total, as only 30,000 tons was produced from the Lehigh River and 60,000 tons from the Schuylkill, the last-named returning to the production picture after a lapse in 1954. The resurgence of river-coal

output in 1954 and 1955 was due to the efforts of a large industrial anthracite consumer to obtain a larger part of its boiler-fuel requirements by stepping up production along the Susquehanna. As this industrial consumer is also the largest producer of river coal and reports a per-ton value based on cost rather than on market value, it was responsible for lowering the average value, both in 1954 and 1955. Production of river or dredge coal, by rivers, is shown in tables 15 and 16.

TABLE 16.—Pennsylvania anthracite produced by dredges, 1909–55, by rivers (including tributaries)

Year	Net tons				Value	
	Lehigh River	Schuylkill River	Susquehanna River	Total	Total	Average per ton
1909	(1)	(1)	(1)	107,788	(1)	(1)
1910				102,853		
1911				106,005		
1912				96,009		
1913				150,064		
1914				115,257		
1915				138,421	$100,744	$0.73
1916				160,507	110,831	.69
1917				170,672	206,754	1.21
1918				282,930	366,565	1.30
1919				693,093	868,746	1.25
1920				740,453	862,296	1.16
1921				623,329	650,654	1.04
1922				904,108	989,709	1.09
Total, 1909–22 [2]	(1)	(1)	(1)	4,391,489	[2] 4,156,299	1.12
1923	106,092	97,254	753,022	956,368	811,065	.85
1924	80,301	74,359	670,734	825,394	681,181	.83
1925	99,614	173,639	742,455	1,015,708	929,292	.91
1926	58,544	131,654	724,566	914,764	828,398	.91
1927	85,177	127,705	758,935	971,817	794,807	.82
1928	89,304	157,449	696,648	943,401	821,530	.87
1929	87,241	133,720	495,983	716,944	626,187	.87
1930	60,219	138,236	444,836	643,291	538,268	.84
1931	33,014	90,855	334,881	458,750	379,682	.83
1932	42,091	105,990	331,969	480,050	445,799	.93
1933	51,083	106,004	381,837	538,924	452,153	.84
1934	91,346	100,873	459,961	652,180	636,038	.98
1935	78,578	73,326	438,563	590,467	517,304	.88
1936	63,327	31,669	451,688	546,684	581,679	1.06
1937	[3] 95,065	([3])	665,409	760,474	842,052	1.11
1938	[3] 123,452	([3])	447,572	571,024	570,579	1.00
1939	62,134	67,539	574,187	703,860	746,000	1.06
1940	[3] 78,947	([3])	863,997	942,944	1,097,000	1.16
1941	47,838	396,522	1,073,203	1,517,563	1,839,784	1.21
1942	9,385	268,919	1,006,729	1,285,033	1,478,719	1.15
1943	37,452	342,815	954,470	1,334,737	1,972,777	1.48
1944	40,894	494,371	837,472	1,372,737	2,084,431	1.52
1945	41,409	366,161	797,656	1,205,226	1,924,148	1.60
1946	37,441	247,757	847,196	1,132,394	2,091,324	1.85
1947	46,478	158,102	1,015,126	1,219,706	2,480,068	2.03
1948	54,284	67,871	865,849	988,004	2,291,752	2.32
1949	22,131	52,012	790,979	865,122	2,131,096	2.46
1950	21,877	34,222	563,465	619,564	1,677,508	2.71
1951	25,344	27,454	508,770	561,568	1,576,576	2.81
1952	17,402	30,407	324,245	372,054	1,109,778	2.98
1953	31,391	20,643	386,147	438,181	1,449,149	3.31
1954	16,015	----------	709,892	725,907	1,810,026	2.49
1955	29,935	60,256	698,652	788,843	1,844,835	2.34
Total, 1923–55	1,864,805	4,177,784	21,617,094	27,659,683	40,060,985	1.45
Grand total	(1)	(1)	(1)	32,051,172	(1)	(1)

[1] Data not available.
[2] Figures for value cover 1915–22.
[3] Schuylkill included with Lehigh in 1937, 1938, and 1940.

Weekly and Monthly Data.—Current statistical data on the Pennsylvania anthracite industry are presented in a series of Weekly Anthracite Reports published by the Bureau of Mines, copies of which may be obtained by writing to the Bureau of Mines, Washington 25, D. C. The weekly estimates of production are based on carloading data courteously supplied by the Association of American Railroads, supplemented by estimates of truck shipments, colliery fuel, and dredge output.

Monthly data included in the reports cover estimated production, producer and retail-dealer stocks, retail deliveries, rail and truck shipments from breakers and washeries, exports, imports, wholesale price indexes, earnings, consumption, and tidewater and Lake loadings and receipts.

The weekly and monthly estimates of production (see tables 17 and 18) are adjusted to reflect the actual total figure obtained annually by the mail canvass of producing companies.

Mechanical Loading.—Of the 14.5 million tons of Pennsylvania anthracite produced at underground mines in 1955, 46 percent was mechanically loaded, as compared with only 41 percent of the underground total in 1954. Since underground output declined over 2 million tons between the 2 years, it appeared that the efforts of

TABLE 17.—Estimated weekly production of Pennsylvania anthracite in 1955 [1]

Week ended—	Thousand net tons	Week ended—	Thousand net tons	Week ended—	Thousand net tons	Week ended—	Thousand net tons
Jan. 8	515	Apr. 16	405	July 23	426	Oct. 29	502
15	580	23	407	30	552	Nov. 5	478
22	628	30	416	Aug. 6	479	12	594
29	639	May 7	414	13	462	19	605
Feb. 5	641	14	415	20	384	26	479
12	688	21	515	27	320	Dec. 3	578
19	629	28	538	Sept. 3	466	10	591
26	597	June 4	433	10	453	17	610
Mar. 5	419	11	528	17	591	24	552
12	464	18	566	24	633	31	503
19	422	25	638	Oct. 1	607		
26	394	July 2	86	8	565	Total	26,205
Apr. 2	478	9	363	15	526		
9	430	16	486	22	515		

[1] Estimated from weekly carloadings as reported by the Association of American Railroads. Adjusted to annual production total from Bureau of Mines canvass.

TABLE 18.—Estimated monthly production of Pennsylvania anthracite, 1948–55, in thousand net tons [1]

Month	1948	1949	1950	1951 [2]	1952	1953	1954	1955
January	4,929	3,725	2,893	4,316	4,221	2,707	2,874	2,454
February	4,682	2,930	2,563	3,621	3,362	2,438	2,525	2,568
March	4,935	2,375	4,847	2,244	3,140	2,354	2,364	2,007
April	4,445	3,725	3,331	2,675	3,384	2,048	2,100	1,723
May	4,874	4,407	4,228	3,723	3,400	2,869	2,013	1,985
June	4,597	3,406	4,166	3,848	3,293	2,975	2,387	2,130
July	4,372	3,925	2,855	2,847	2,522	2,551	2,080	1,845
August	5,129	3,710	4,386	3,612	2,704	2,452	2,270	1,904
September	5,015	2,114	3,835	3,267	3,761	2,732	2,416	2,453
October	4,969	4,979	4,282	4,675	4,213	2,994	2,353	2,244
November	4,687	4,657	3,355	4,129	3,405	2,386	2,681	2,385
December	4,506	2,749	3,336	3,713	3,178	2,443	3,020	2,507
Total	57,140	42,702	44,077	42,670	40,583	30,949	29,083	26,205

[1] Production is estimated from weekly carloadings as reported by the Association of American Railroads and includes mine fuel, coal sold locally, and dredge coal.
[2] See footnote 10, table 3.

producers to concentrate production at the most efficient mines met with some success. As the coal measures are relatively flatter in the Northern field than in the others, this field again led in mechanical loading, with 90 percent of the total, followed by the Western Middle and Southern fields, with 4 percent each, and the Eastern Middle, with 2 percent.

On a tonnage basis the quantity loaded mechanically underground decreased 4 percent in the Northern field, 17 percent in the Western Middle, and 14 percent in the Southern. However, the tonnage mechanically loaded in the Eastern Middle field increased 20 percent because mining was resumed late in 1954 at several large mechanized mines in the Panther Valley. Tables 19–21 include detailed data on underground mechanical loading and figure 3 shows graphically the tonnages mechanically loaded, hand-loaded, and stripped for 1928–55.

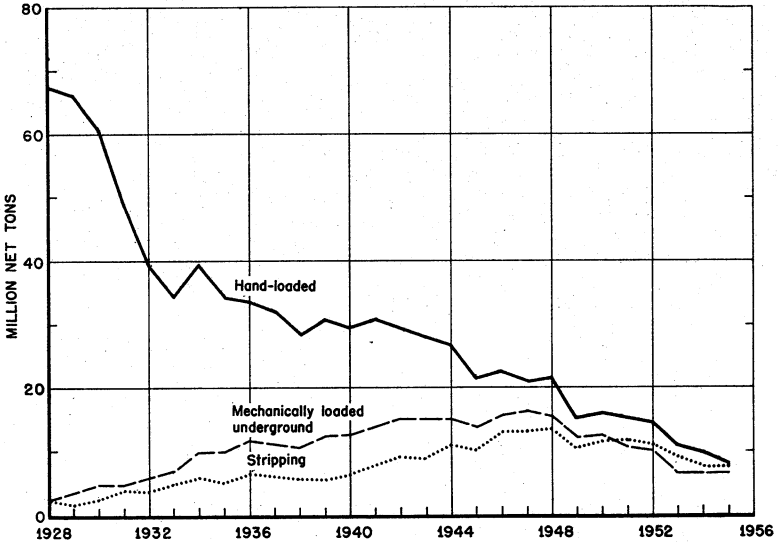

FIGURE 3.—Pennsylvania anthracite mechanically loaded, hand loaded, and stripped, 1928–55.

TABLE 19.—Pennsylvania anthracite loaded mechanically underground, 1954–55, by fields, in net tons

Field	Scraper loaders [1]		Pit-car loaders		Hand-loaded face conveyors, all types [2]		Total mechanically loaded	
	1954	1955	1954	1955	1954	1955	1954	1955
Northern	1,148,761	1,227,314	27,328	45,525	5,041,507	4,692,724	6,217,596	5,965,563
Eastern Middle	40,475	18,082	-------	-------	99,686	150,772	140,161	168,854
Western Middle	113,388	61,913	208	-------	187,533	189,518	301,129	251,431
Southern	102,629	37,162	-------	4,340	216,520	233,589	319,149	275,091
Total	1,405,253	1,344,471	27,536	49,865	5,545,246	5,266,603	6,978,035	6,660,939

[1] Includes mobile loaders.
[2] Shaker chutes, etc., including those equipped with duckbills.

TABLE 20.—Pennsylvania anthracite loaded mechanically underground, 1951–55

Year	Scraper loaders		Mobile loaders		Conveyors [1] and pit-car loaders		Total loaded mechanically	
	Number of units	Net tons loaded	Number of units	Net tons loaded	Number of units	Net tons loaded	Number of units	Net tons loaded
1951	528	1,693,656	43	79,032	3,282	9,075,099	3,853	10,847,787
1952	456	1,321,930	54	85,843	3,232	8,626,691	3,742	10,034,464
1953	489	1,206,241	39	22,252	2,784	5,610,276	3,312	6,838,769
1954	359	959,532	68	445,721	2,277	5,572,782	2,704	6,978,035
1955	279	761,945	79	582,526	1,940	5,316,468	2,298	6,660,939

[1] Includes duckbills and other self-loading conveyors.

TABLE 21.—Trends in mechanical loading, hand loading, and stripping of Pennsylvania anthracite, 1927–55

(Mechanical loading includes coal handled on pit-car loaders and hand-loaded face conveyors)

Year	Fresh-mined coal							Total
	Underground					From strip pits		
	Mechanical loading (net tons)	Percent of total underground	Hand loading (net tons)	Percent of total underground	Total (net tons)	Net Tons	Percent of total fresh mined	
1927	[1] 2,223,281	3.0	71,434,537	97.0	73,657,818	2,153,156	2.8	75,810,974
1928	[1] 2,351,074	3.4	67,373,788	96.6	69,724,862	2,422,924	3.4	72,147,786
1929	3,470,158	5.0	66,493,690	95.0	69,963,848	1,911,766	2.7	71,875,614
1930	4,467,750	6.9	60,458,344	93.1	64,926,094	2,536,288	3.8	67,462,382
1931	4,384,780	8.2	49,074,722	91.8	53,459,502	3,813,237	6.7	57,272,739
1932	5,433,340	12.4	38,400,820	87.6	43,834,160	3,980,973	8.3	47,815,133
1933	6,557,267	16.0	34,474,844	84.0	41,032,111	4,932,069	10.7	45,964,180
1934	9,284,486	19.1	39,290,255	80.9	48,574,741	5,798,138	10.7	54,372,879
1935	9,279,057	21.2	34,503,819	78.8	43,782,876	5,187,072	10.6	48,969,948
1936	10,827,946	24.2	33,898,560	75.8	44,726,506	6,203,267	12.2	50,929,773
1937	10,683,837	25.1	31,882,514	74.9	42,566,351	5,696,018	11.8	48,262,369
1938	10,151,669	26.6	27,990,628	73.4	38,142,297	5,095,341	11.8	43,237,638
1939	11,773,833	27.7	30,797,715	72.3	42,571,548	5,486,479	11.4	48,058,027
1940	12,326,000	29.7	29,190,837	70.3	41,516,837	6,352,700	13.3	47,869,537
1941	13,441,987	30.6	30,435,277	69.4	43,877,264	7,316,574	14.3	51,193,838
1942	14,741,459	32.6	30,495,240	67.4	45,236,699	9,070,933	16.7	54,307,632
1943	14,745,793	34.5	27,990,005	65.5	42,735,798	8,989,387	17.4	51,725,185
1944	14,975,146	35.8	26,800,270	64.2	41,775,416	10,953,030	20.8	52,728,446
1945	13,927,955	39.9	20,957,744	60.1	34,885,699	10,056,325	22.4	44,942,024
1946	15,619,162	41.0	22,465,295	59.0	38,084,457	12,858,930	25.2	50,943,387
1947	16,054,011	43.4	20,909,101	56.6	36,963,112	12,603,545	25.4	49,566,657
1948	15,742,368	42.3	21,432,923	57.7	37,175,291	13,352,874	26.4	50,528,165
1949	11,858,088	43.9	15,172,562	56.1	27,030,650	10,376,808	27.7	37,407,458
1950	12,335,650	43.8	15,820,245	56.2	28,155,895	11,833,934	29.6	39,989,829
1951	10,847,787	41.2	15,494,452	58.8	26,342,239	11,135,990	29.7	37,478,229
1952	10,034,464	40.5	14,713,819	59.5	24,748,283	10,696,705	30.2	35,444,988
1953	6,838,769	38.2	11,054,720	61.8	17,893,489	8,606,482	32.5	26,499,971
1954	6,978,035	41.4	9,874,373	58.6	16,852,408	7,939,680	32.0	24,792,088
1955	6,660,939	45.9	7,837,819	54.1	14,498,758	7,703,907	34.7	22,202,665

[1] As reported by Commonwealth of Pennsylvania, Department of Mines.

Cutting Machines.—Only a relatively minor part of the anthracite mined underground is cut or sheared before blasting; hence, the major part is shot directly from the solid. This procedure is necessitated by the physical and mechanical difficulties encountered in mining the thick, steeply pitching anthracite beds. Of the 70 machines re-

ported for 1955, 67 were employed in the Wyoming region, where, as previously mentioned, the coal measures are relatively flat. One cutting machine was reported in use in the Schuylkill and 2 in the Lehigh region—the first time in many years that either has reported the use of such machines. All machines used in 1955 were the "permissile" type—that is, they conformed to safety standards established by the Bureau of Mines. Apparently the machines available were used more effectively in 1955 than in the preceding year, because the tonnage reported cut exceeded that in 1954 by 3 percent, while the number of machines reported in use declined from 96 to 70.

Power Equipment.—In 1955, 440 power shovels and draglines were reported used in stripping anthracite and for reclaiming culm and silt banks. Of this total, 191 were power shovels and 249 draglines. Stripping operations reported 158 shovels and 237 draglines, while 35 shovels and 19 draglines were used for bankwork. Of this count, 2 shovels and 7 draglines were used both for stripping and bank recovery. Details are given in table 22.

TABLE 22.—Power shovels and draglines used in stripping Pennsylvania anthracite, 1953–55, by type of power

Type of power	1953			1954			1955		
	Number of power shovels	Number of draglines	Total	Number of power shovels	Number of draglines	Total	Number of power shovels	Number of draglines	Total
Gasoline	45	7	52	43	13	56	19	6	25
Electric	54	56	110	93	79	172	45	48	93
Diesel	180	232	412	185	205	390	127	195	322
Steam					3	3			
Total	279	295	574	321	300	621	191	249	440

PRICES AND VALUE OF SALES

The price structure of Pennsylvania anthracite was marked by wide fluctuations in 1955 owing to the pressures of a falling market. Despite strenuous efforts of some major producers to hold the price line, the early part of the year was marked by "spot" sales from producers' stocks at less than listed prices. Owing to weak demand, most of the coal sold at "distress" prices was the larger sizes; however, demand for the smaller coals also began to show definite signs of slackening near the end of the summer. As a result, prices for the small coals began to soften and were unstable throughout the early fall months. However, because November and December were the coldest in many years and stocks in retail yards reached a low level, prices of most sizes were holding firm at or near published quotations at the end of the year.

According to Saward's Journal, f. o. b. mine prices in effect at the close of 1955 were within the following limits: Broken, $13.45–$13.70; Egg, $13.25–$13.70; Stove, $13.50–$14.20: Chestnut, $13.50–$14.20; Pea, $9.75–$11.00; Buckwheat No. 1, $8.25–$9.75; Buckwheat No. 2 (Rice), $7.50–$8.55; and Buckwheat No. 3 (Barley), $6.00–$6.25. Prices quoted were for "standard" prepared anthracite, specifications for which are shown in table 23. Compared with prices at the end of

TABLE 23.—Standard anthracite specifications approved and adopted by the Anthracite Committee, effective July 28, 1947

Size	Round test mesh (inches)	Percent					
		Oversize, maximum	Undersize		Maximum impurities [1]		
			Maximum	Minimum	Slate	Bone or ash [2]	
Broken	Through 4¾				1½	2	11
	Over 3¼ to 3		15	7½			
Egg	Through 3¼ to 3	5			1½	2	11
	Over 2⅞		15	7½			
Stove	Through 2⅞	7½			2	3	11
	Over 1⅝		15	7½			
Chestnut	Through 1⅝	7½			3	4	11
	Over 1⅜		15	7½			
Pea	Through 1⅜	10			4	5	12
	Over ⅝		15	7½			
Buckwheat No. 1	Through ⅝	10					13
	Over 5/16		15	7½			
Buckwheat No. 2 (Rice)	Through 5/16	10					13
	Over 3/16		17	7½			
Buckwheat No. 3 (Barley)	Through 3/16	10					15
	Over 3/32		20	10			
Buckwheat No. 4	Through 3/32	20					15
	Over 3/64		30	10			
Buckwheat No. 5	Through 3/64	30	No limit				16

[1] When slate content in the sizes from Broken to Chestnut, inclusive, is less than above standards, bone content may be increased by 1½ times the decrease in the slate content under the allowable limits, but slate content specified above shall not be exceeded in any event.

A tolerance of 1 percent is allowed on the maximum percentage of undersize and the maximum percentage of ash content.

The maximum percentage of undersize is applicable only to anthracite as it is produced at the preparation plant. Slate is defined as any material that has less than 40 percent fixed carbon.

Bone is defined as any material that has 40 percent or more, but less than 75 percent, fixed carbon.

[2] Ash determinations are on a dry basis.

1954 the above prices for the larger sizes show changes ranging from $0.10 more per ton for Chestnut to $0.65 less for Egg. Prices for the smaller sizes ranged from $0.15 less for Barley to as much as $1.15 less for Buckwheat No. 1, when compared with prices in 1954.

As a result of the weak price situation, the average value received f. o. b. mine on total production decreased from $8.52 per ton in 1954 to $7.86 per ton, the lowest since 1947. In recent years, the greater part of the market loss to competitive fuels has been in the space-heating field, where the larger sizes are used almost exclusively. Consequently, both demand and the revenue received from the larger sizes have tended downward in sharper degree than the market for, and the value of, the smaller sizes. However, in 1954 and 1955 shipments and dollar revenue from sales of the various sizes trended downward at essentially the same rate. For example, breaker shipments of Buckwheat No. 1 and larger sizes were 9.4 percent less than 1954, and the total value received was 16.8 percent less, while breaker shipments of Buckwheat No. 2 (Rice) and smaller declined 9.6 percent and the value 16.1 percent.

Detailed data on average prices received per ton, by type of preparation plant, regions, local sales, etc., are presented in tables 24 through 26. Data compiled monthly from reports of the Bureau of Labor Statistics, United States Department of Labor, on retail prices of Pennsylvania anthracite and other fuels are shown in table 27 for certain selected cities.

TABLE 24.—Average sales realization per net ton of Pennsylvania anthracite shipped from breakers to points outside producing region, 1951–55, by regions and sizes

(Value does not include margins of separately incorporated sales companies)

Size	Lehigh region					Schuylkill region				
	1951	1952	1953	1954	1955	1951	1952	1953	1954	1955
Lump [1] and Broken	$13.26	$13.43	$14.52	$13.05	$11.80	$13.31	$13.44	$14.12	$12.24	$11.03
Egg	13.51	13.53	14.11	12.80	11.14	13.40	13.30	13.53	12.09	11.05
Stove	13.98	13.77	14.31	13.03	11.70	13.48	13.39	13.48	12.08	11.14
Chestnut	13.96	13.77	14.28	12.74	11.81	13.31	13.25	13.37	11.70	11.02
Pea	10.91	10.32	10.79	9.74	8.13	10.00	9.88	10.12	8.87	7.90
Total Pea and larger	13.50	13.28	13.74	12.37	10.97	12.83	12.74	12.78	11.27	10.43
Buckwheat No. 1	7.68	8.03	9.47	8.47	6.61	7.38	7.85	9.15	7.86	6.35
Buckwheat No. 2 (Rice)	6.05	6.49	7.77	7.56	6.68	5.77	6.20	7.32	6.84	6.28
Buckwheat No. 3 (Barley)	4.75	5.01	5.56	5.79	5.29	4.58	4.81	5.25	5.31	5.11
Buckwheat No. 4	3.73	3.98	4.21	4.16	3.94	3.43	3.58	3.72	3.77	3.79
Other (including silt)	3.10	3.47	3.69	3.37	3.24	3.21	3.21	3.78	3.36	3.17
Total Buckwheat No. 1 and smaller	5.40	5.51	6.40	6.26	5.13	5.15	5.46	6.21	5.64	5.00
Total all sizes	9.85	9.43	10.17	9.55	8.01	8.82	8.81	9.07	8.21	7.53

Size	Wyoming region					Sullivan County				
Lump [1] and Broken	$12.96	$13.33	$14.08	$12.06	$11.15					
Egg	13.27	13.19	13.62	11.88	10.91					
Stove	13.79	13.63	14.07	12.30	11.46	$12.56	$13.55	$14.27	$13.00	
Chestnut	13.62	13.60	13.91	12.04	11.45	13.14	13.47	14.18	13.00	$10.00
Pea	10.62	10.42	10.69	9.37	8.38	10.33	10.55	11.24	11.00	
Total Pea and larger	13.37	13.26	13.59	11.79	11.08	12.06	12.35	12.94	12.14	10.00
Buckwheat No. 1	7.55	8.01	9.52	8.40	6.59	7.39	7.77	9.03	8.00	6.00
Buckwheat No. 2 (Rice)	6.04	6.43	7.76	7.32	6.61	3.80				
Buckwheat No. 3 (Barley)	4.89	5.05	5.67	5.72	5.46				3.05	
Buckwheat No. 4	3.94	4.20	4.76	4.15	3.88					
Other (including silt)	3.00	3.07	3.59	3.30	3.09		3.81	4.27		
Total Buckwheat No. 1 and smaller	6.17	6.58	7.56	6.69	5.67	4.62	4.60	5.38	4.37	6.00
Total all sizes	11.20	11.12	11.53	9.84	9.13	7.99	7.86	9.19	7.71	9.00

Size	Total									
	Excluding Sullivan County					Including Sullivan County				
Lump [1] and Broken	$13.12	$13.39	$14.21	$12.39	$11.24	$13.12	$13.39	$14.21	$12.39	$11.24
Egg	13.36	13.29	13.65	12.02	10.99	13.36	13.29	13.65	12.02	10.99
Stove	13.72	13.57	13.90	12.32	11.39	13.72	13.57	13.90	12.32	11.39
Chestnut	13.56	13.49	13.77	12.01	11.36	13.56	13.49	13.77	12.01	11.36
Pea	10.38	10.16	10.43	9.18	8.12	10.38	10.16	10.43	9.18	8.12
Total Pea and larger	13.19	13.07	13.31	11.67	10.83	13.19	13.07	13.31	11.67	10.83
Buckwheat No. 1	7.49	7.94	9.33	8.15	6.49	7.49	7.94	9.33	8.15	6.49
Buckwheat No. 2 (Rice)	5.91	6.33	7.53	7.13	6.47	5.90	6.33	7.53	7.13	6.47
Buckwheat No. 3 (Barley)	4.69	4.91	5.41	5.51	5.27	4.69	4.91	5.41	5.50	5.27
Buckwheat No. 4	3.56	3.74	3.99	3.93	3.85	3.56	3.74	3.99	3.93	3.85
Other (including silt)	3.17	3.28	3.74	3.35	3.17	3.17	3.29	3.74	3.35	3.17
Total Buckwheat No. 1 and smaller	5.48	5.78	6.60	6.08	5.24	5.48	5.78	6.60	6.07	5.24
Total all sizes	9.94	9.81	10.15	9.06	8.27	9.94	9.81	10.15	9.06	8.27

[1] Quantity of Lump included is insignificant.

TABLE 25.—Average sales realization per net ton of Pennsylvania anthracite shipped from breakers to points outside and inside producing region in 1955, by regions and sizes

(Value does not include margins of separately incorporated sales companies)

Size	Lehigh region			Schuylkill region			Wyoming region		
	Shipped outside region	Local sales	Total	Shipped outside region	Local sales	Total	Shipped outside region	Local sales	Total
Lump [1] and Broken	$11.80		$11.80	$11.03	$10.97	$11.03	$11.15	$10.86	$10.93
Egg	11.14	$14.42	11.15	11.05	11.04	11.05	10.91	11.23	10.92
Stove	11.70	13.27	11.71	11.14	10.94	11.11	11.46	12.56	11.48
Chestnut	11.81	14.31	11.99	11.02	10.85	10.99	11.45	12.77	11.59
Pea	8.13	11.39	8.85	7.90	8.60	8.07	8.38	10.09	9.27
Total Pea and larger	10.97	12.42	11.10	10.43	10.10	10.38	11.08	10.94	11.06
Buckwheat No. 1	6.61	10.10	6.94	6.35	6.42	6.36	6.59	8.38	7.08
Buckwheat No. 2 (Rice)	6.68	8.84	7.14	6.28	6.16	6.26	6.61	7.17	6.78
Buckwheat No. 3 (Barley)	5.29	6.78	5.37	5.11	4.76	5.06	5.46	5.50	5.47
Buckwheat No. 4	3.94	5.35	3.95	3.79	3.60	3.77	3.88	3.92	3.88
Other (including silt)	3.24	4.25	3.24	3.17	2.49	3.16	3.09	2.88	3.03
Total Buckwheat No. 1 and smaller	5.13	8.94	5.41	5.00	5.45	5.05	5.67	6.63	5.91
Total all sizes	8.01	10.80	8.24	7.53	8.01	7.60	9.13	8.83	9.07

Size	Sullivan County			Total					
				Excluding Sullivan County			Including Sullivan County		
Lump [1] and Broken				$11.24	$10.86	$11.05	$11.24	$10.86	$11.05
Egg				10.99	11.25	11.00	10.99	11.25	11.00
Stove				11.39	11.33	11.39	11.39	11.33	11.39
Chestnut	$10.00	$10.00	$10.00	11.36	11.97	11.43	11.36	11.97	11.43
Pea		9.00	9.00	8.12	9.86	8.76	8.12	9.86	8.76
Total Pea and larger	10.00	9.46	9.48	10.83	10.75	10.82	10.83	10.75	10.82
Buckwheat No. 1	6.00	6.00	6.00	6.49	7.89	6.77	6.49	7.88	6.76
Buckwheat No. 2 (Rice)		4.50	4.50	6.47	7.12	6.61	6.47	7.10	6.61
Buckwheat No. 3 (Barley)				5.27	5.25	5.27	5.27	5.25	5.27
Buckwheat No. 4				3.85	3.72	3.84	3.85	3.72	3.84
Other (including silt)				3.17	2.84	3.15	3.17	2.84	3.15
Total Buckwheat No. 1 and smaller	6.00	4.94	4.95	5.24	6.41	5.43	5.24	6.41	5.43
Total all sizes	9.00	6.35	6.40	8.27	8.70	8.33	8.27	8.69	8.33

[1] Quantity of Lump included is insignificant.

TABLE 26.—Average value per net ton of Pennsylvania anthracite from all sources, 1954–55, by regions [1]

(Data include washery and dredge coal)

	1954				1955			
	Shipped outside region	Local sales	Colliery fuel	Total production	Shipped outside region	Local sales	Colliery fuel	Total production
Lehigh	$8.66	$10.90	$6.43	$8.80	$7.56	$9.78	$6.26	$7.73
Schuylkill	7.62	7.65	5.92	7.61	6.85	7.85	5.56	6.97
Wyoming	9.75	9.11	4.02	9.42	9.07	8.78	4.43	8.87
Total, excluding Sullivan County	8.59	8.74	4.57	8.52	7.81	8.56	4.80	7.87
Sullivan County	7.71	8.59		8.11	9.00	6.35		6.40
Grand total	8.59	8.74	4.57	8.52	7.81	8.54	4.80	7.86

[1] Value given for shipments is value at which coal left possession of producing company and does not include margins of separately incorporated sales companies.

TABLE 27.—Retail prices of selected fuels in 1955, by months, for various cities [1]

(Coal and coke, per net ton; heating oil, per 100 gallons; gas per 25 therms)

City and fuel	January	February	March	April	May	June	July	August	September	October	November	December
Baltimore, Md.:												
Anthracite:												
Stove	$21.34	$21.34	$21.34	$21.34	$19.98	$19.98	$19.98	$19.98	$19.98	$20.14	$20.48	$21.16
Buckwheat No. 1	17.60	17.60	17.60	17.60	17.21	16.83	16.83	16.83	16.83	17.08	17.08	17.60
Heating oil: Fuel oil No. 2	14.02	14.02	14.02	14.02	13.44	13.44	13.44	13.58	13.58	13.69	13.69	14.13
Gas: Natural	4.22	4.23	4.24	4.23	4.22	4.23	4.22	4.21	4.23	4.22	4.22	4.22
Boston, Mass.:												
Anthracite:												
Stove	27.76	27.76	27.76	27.76	25.95	25.95	26.95	26.95	27.70	27.95	27.95	27.95
Buckwheat No. 1	21.11	21.11	21.11	21.11	19.89	19.89	20.80	20.80	21.18	21.30	21.30	21.30
Heating oil: Fuel oil No. 2	14.00	14.00	14.00	14.00	13.38	13.38	13.38	13.63	13.70	13.70	13.70	14.30
Gas: Mixed	6.85	6.85	6.85	6.85	6.85	6.85	6.85	6.85	6.85	6.85	6.85	6.85
New York, N. Y.:												
Anthracite:												
Stove	24.29	24.68	24.68	24.59	22.95	22.95	23.32	23.26	23.26	23.87	23.87	24.90
Pea	18.58	18.82	18.82	18.63	18.06	18.06	18.35	18.32	18.32	18.46	18.46	18.46
Buckwheat No. 1	17.68	17.68	17.97	17.68	16.68	16.68	16.64	16.62	16.62	16.68	16.68	16.64
Heating oil: Fuel oil No. 2	14.50	14.42	14.42	14.42	13.82	13.82	13.82	14.07	14.13	14.13	14.13	14.54
Gas:												
Manufactured: Co. 1.1	5.86	5.86	5.91	5.91	5.93	5.94	5.91	5.92	5.92	6.02	6.05	6.04
Natural:												
Co. 4	5.95	5.98	5.98	6.05	6.00	6.03	6.03	6.00	6.00	6.02	6.02	6.02
Co. 5	6.71	6.71	6.75	6.75	6.78	6.78	6.50	6.50	6.50	6.50	6.50	6.50
Co. 6	6.40	6.43	6.46	6.44	6.48	6.48	6.41	6.41	6.43	6.44	6.44	6.43
Co. 12	6.78	6.78	6.78	6.78	6.78	6.78	6.78	6.78	6.78	6.78	6.78	6.78
Philadelphia, Pa:												
Anthracite:												
Chestnut	22.72	22.72	22.72	22.72	19.64	19.64	19.98	20.15	20.95	21.62	21.95	22.95
Buckwheat No. 1	18.11	18.13	18.13	18.13	16.61	16.61	16.61	16.78	16.95	17.28	17.38	17.75
Heating oil: Fuel oil No. 2	13.76	13.76	13.76	13.76	13.13	13.13	13.13	13.24	13.14	13.30	13.20	13.70
Gas: Mixed	4.49	4.49	4.49	4.49	4.49	4.49	4.49	4.49	4.49	4.45	4.45	4.45
Washington, D. C.:												
Anthracite:												
Chestnut	25.19	25.19	25.19	25.19	23.17	23.66	24.17	24.68	25.19	25.70	25.70	25.70
Buckwheat No. 1	18.93	18.93	18.93	18.93	18.44	18.65	18.88	19.02	19.05	19.05	19.05	19.05
Heating oil: Fuel oil No. 2	14.48	14.48	14.48	14.48	13.99	14.00	13.87	14.17	14.17	14.17	14.17	14.68
Gas: Natural	4.08	4.07	4.19	4.11	4.10	4.10	4.10	4.19	4.19	4.19	4.16	4.19

[1] Compiled from reports of Bureau of Labor Statistics. Prices are as of the 15th of each month. Data are preliminary. Sales tax included where applicable.

EMPLOYMENT

The Bureau of Mines changed its method of collecting employment data on the Pennsylvania anthracite industry, effective with the calendar year 1955. To reduce the reporting burden of respondents, it was decided to eliminate from the schedules dealing with production all questions on employment and to utilize for purposes of this chapter the employment data reported on the Bureau's accident-analysis questionnaires.

The correlation between the two canvasses was not accomplished in time, however, to make a complete detailed analysis of employment for 1955; therefore, it was necessary to estimate the employment data for the year. Employment was calculated using as benchmarks 1954 productivity rates for regions, counties, types of preparation plants, underground mines (union and nonunion), strip pits, culm banks, and dredges and combining these data with pertinent information for 1955. The estimates were corroborated by comparing them with employment data released by the Pennsylvania Department of Mines, the Anthracite Committee, and other collateral sources.

Although the estimates of employment for 1955 were adjusted to reflect recent changes in employment practices and working conditions, it should be pointed out that, because of such variables as the number of days worked, changes in mining methods or equipment and shifts of operations to higher sources of output, fluctuations in production are not always accompanied by immediate or comparable variations in total employment.

For example, in 1955, the average number of men working daily was 24 percent under that in the preceding year, but total output dropped only 10 percent, owing primarily to a 20-percent increase in the number of days the mines operated. This was accompanied by a decline in the productivity rate from the record high of 4.02 tons per man-day in 1954 to 3.96 tons in 1955.

Of the total labor force of 33,523 men in 1955, 59 percent were employed at underground operations; 27 percent at culm banks, preparation plants, and other surface installations; and 14 percent at strip pits. Between 1954 and 1955 underground employment declined 27 percent; strip pits, 4 percent; and all other surface installations, 25 percent. By regions, the total labor force was divided as follows: Wyoming 43 percent, Schuylkill 41 percent, and, Lehigh 16 percent compared with 46, 38, and 16 percent, respectively, in 1954. The most severe decline in employment occurred in the Wyoming region (27 percent), followed by the Lehigh (25 percent), and the Schuylkill (19 percent). Detailed statistics on employment are shown in tables 28 and 29.

TABLE 28.—Estimated number of men employed and days worked at operations producing Pennsylvania anthracite in 1955, by regions and types of plant

(Includes operations of strip contractors)

Region and type of plant	Average number of men working daily								Average number of days plant operated	Man-days of labor	Average tons per man per day
	Underground			Surface				Grand total			
	Miners and their laborers	Other	Total underground	In strip pits	In preparation plants	Other	Total surface				
Lehigh:											
Breaker	1,470	1,160	2,630	1,193	691	635	2,519	5,149	183	941,544	4.33
Washery [1]	------	------	------	------	60	78	138	138	144	19,824	20.83
Dredge	------	------	------	------	5	11	16	16	209	3,344	8.95
Total Lehigh	1,470	1,160	2,630	1,193	756	724	2,673	5,303	182	964,712	4.68
Schuylkill:											
Breaker	4,792	2,054	6,846	2,532	1,762	1,987	6,281	13,127	190	2,493,550	3.85
Washery [1]	------	------	------	------	162	166	328	328	183	59,938	13.46
Dredge	------	------	------	------	85	158	243	243	205	49,862	14.74
Total Schuylkill	4,792	2,054	6,846	2,532	2,009	2,311	6,852	13,698	190	2,603,350	4.28
Wyoming:											
Breaker	7,009	3,461	10,470	911	1,045	2,004	3,960	14,430	210	3,027,609	3.45
Washery [1]	------	------	------	------	20	41	61	61	167	10,194	7.76
Dredge	------	------	------	------	8	4	12	12	161	1,932	12.40
Total Wyoming	7,009	3,461	10,470	911	1,073	2,049	4,033	14,503	210	3,039,735	3.47
Total, excluding Sullivan County:											
Breaker	13,271	6,675	19,946	4,636	3,498	4,626	12,760	32,706	198	6,462,703	3.73
Washery [1]	------	------	------	------	242	285	527	527	171	89,956	14.44
Dredge	------	------	------	------	98	173	271	271	203	55,138	14.31
Total	13,271	6,675	19,946	4,636	3,838	5,084	13,558	33,504	197	6,607,797	3.96
Sullivan County:											
Breaker	4	2	6	6	6	1	13	19	123	2,346	4.22
Grand total	13,275	6,677	19,952	4,642	3,844	5,085	13,571	33,523	197	6,610,143	3.96

[1] Represents washeries for which production and employment are shown separately.

TABLE 29.—Men employed at operations producing Pennsylvania anthracite, 1954–55, by counties

(Includes operations of strip contractors)

County	1954	1955 [1]	County	1954	1955 [1]
Berks, Lancaster, Lebanon, Northampton, and Snyder [2]	118	130	Luzerne	15,649	13,442
Carbon	2,336	2,375	Northumberland	4,431	3,017
Columbia	903	1,515	Schuylkill	13,722	9,004
Dauphin	199	180	Sullivan	51	19
Lackawanna	6,587	3,841	Total	43,996	33,523

[1] Estimated.
[2] Counties producing dredge coal only.

DISTRIBUTION

The Bureau of Mines has collected and published detailed data on the distribution of Pennsylvania anthracite since the 1942–43 coal year (ended March 31). The data show rail shipments, by sizes, to approximately 353 individual cities in 20 States and Canadian Provinces and truck shipments, by sizes and States of destination. As the distribution data are intended to reflect all coal-year shipments to points of final destination, they include shipments from current production, as well as producers' stocks. In measuring production, however, tonnages are counted only upon entering storage. The distribution data are published by the Bureau as Mineral Market Reports, free copies of which may be obtained by writing to the Bureau of Mines, Washington 25, D. C.

In contrast to the method of obtaining basic production data, each concern engaged in shipping anthracite to a final destination must be contacted for distribution and marketing data. Producing companies are requested to supply data on tonnages sold within the "local sales" area, truck shipments, and coal shipped to, or for, the account of sales agents, exporters, dock operators, and wholesalers. These final distributors, in turn, are requested to furnish the city, State, or country of destination for all anthracite handled.

This reporting method is believed to be the most effective yet devised for tracing shipments to final market, as the opportunity provided for crosschecking all reports insures a high degree of accuracy, regardless of whether shipments are moved all rail, rail-lake, rail-tidewater, or ex-dock rail or are reconsigned while in transit.

Shipments reported to the Bureau for the 1955–56 coal year totaled 26,486,257 net tons (table 30). Of the total anthracite reported distributed during the 1955–56 coal year, 88.2 percent was shipped to points in the United States, 8.7 percent to Canada, and 3.1 percent overseas.

The demand in American markets was relatively consistent compared with shipments for the 1954–55 coal year. For example, the tonnage shipped to the New England States was only 3 percent under the 1954–55 coal-year figure. The Middle Atlantic States area declined 2.5 percent, reflecting decreases of 5, 3, and 1 percent in New Jersey, New York, and Pennsylvania, respectively.

The total reported shipped to the South Atlantic States (Delaware, District of Columbia, Maryland, and Virginia only) was up 2 percent due primarily to a rise of 8 percent in shipments to Maryland, while shipments to the Lake States rose 27 percent. The increased shipments to the Lakes area were due entirely to stepped-up demand for Buckwheat No. 4 and smaller sizes for use in metallurgical operations, as the combined total of all other sizes was considerably lower than for the 1954–55 coal year. Shipments to unspecified States increased 5 percent over the 1954–55 coal year.

Exports to Ontario fell 4 percent below the 1954–55 coal-year level and those to the Province of Quebec dropped 13 percent. However, the Maritime Provinces increased imports of Pennsylvania anthracite by more than 100 percent, apparently because of difficulty in obtaining adequate quantities of Welsh anthracite from Great Britain. The sharp rise in overseas exports was attributable largely to in-

TABLE 30.—Distribution of Pennsylvania antracite, April 1, 1955, to March 31, 1956, by States, Provinces, and countries of destination, in net tons

Destinations	Pea and larger						Buckwheat No. 1 and smaller					Total all sizes	Percent of total
	Broken	Egg	Stove	Chestnut	Pea	Total	Buckwheat No. 1	Buckwheat No. 2 (Rice)	Buckwheat No. 3 (Barley)	All other sizes	Total		
United States:													
New England States:													
Connecticut	-------	3,046	115,031	128,714	10,327	257,118	25,884	19,109	27,930	418	73,341	330,459	1.25
Maine	-------	4,845	62,883	54,914	1,828	124,470	13,444	11,251	109	1,254	26,058	150,528	.57
Massachusetts	871	51,867	457,744	222,570	18,108	751,160	78,941	59,300	19,778	24,534	182,553	933,713	3.52
New Hampshire	-------	3,104	45,557	28,209	1,923	78,793	10,452	11,999	39,254	1,645	63,350	142,143	.54
Rhode Island	-------	3,144	49,980	34,138	2,395	89,657	9,414	7,021	-------	277	16,712	106,369	.40
Vermont	314	2,282	55,539	37,273	6,708	102,116	24,112	23,779	56	313	48,260	150,376	.57
Total	1,185	68,288	786,734	505,818	41,289	1,403,314	162,247	132,459	87,127	28,441	410,274	1,813,588	6.85
Middle Atlantic States:													
New Jersey	4,426	14,200	353,108	836,883	252,740	1,461,357	328,679	309,860	684,999	561,098	1,884,636	3,345,993	12.63
New York	1,743	104,893	1,275,252	1,133,936	911,518	3,427,342	1,500,687	541,696	550,918	705,861	3,299,162	6,726,504	25.40
Pennsylvania [1]	56,622	35,741	676,928	1,636,278	1,507,569	3,913,138	1,134,559	1,072,066	1,439,462	2,153,692	5,799,779	9,712,917	36.67
Total	62,791	154,834	2,305,288	3,607,097	2,671,827	8,801,837	2,963,925	1,923,622	2,675,379	3,420,651	10,983,577	19,785,414	74.70
South Atlantic States: [2]													
Delaware	3,867	2,091	27,651	84,065	4,180	121,854	4,305	4,110	13,764	5,194	27,373	149,227	.56
District of Columbia	-------	2,823	27,681	32,761	3,471	66,736	17,645	1,607	319	1,413	20,984	87,720	.33
Maryland	547	4,110	100,159	114,375	24,428	243,619	38,641	6,320	199	78,565	123,725	367,344	1.39
Virginia	-------	811	15,243	22,942	4,281	43,277	16,718	666	-------	738	18,122	61,399	.23
Total	4,414	9,835	170,734	254,143	36,360	475,486	77,309	12,703	14,282	85,910	190,204	665,690	2.51
Lake States: [3]													
Illinois	60	2,596	9,385	19,983	15,822	47,846	32,854	4,645	6,390	19,054	62,943	110,789	.42
Michigan	-------	2,591	34,667	18,206	1,245	56,709	3,934	11,870	183	70,233	86,220	142,929	.54
Minnesota	-------	-------	1,779	3,234	240	5,253	-------	34	-------	123,735	123,769	129,022	.49
Ohio	-------	1,707	1,321	8,504	4,372	15,904	27,784	10,260	1,852	82,730	122,626	138,530	.52
Wisconsin	-------	45	59,487	86,421	6,932	152,885	7,503	3,774	-------	132,218	143,495	296,380	1.12
Total	60	6,939	106,639	136,348	28,611	278,597	72,075	30,583	8,425	427,970	539,053	817,650	3.09
All other States	4,616	485	4,494	24,195	1,028	34,818	34,493	4,998	6,771	200,231	246,493	281,311	1.06
Total United States	73,066	240,381	3,373,889	4,527,601	2,779,115	10,994,052	3,310,049	2,104,365	2,791,984	4,163,203	12,369,601	23,363,653	88.21
Canada:													
Ontario	-------	20,746	886,032	584,476	66,661	1,557,915	66,988	75,986	17,949	16,829	177,752	1,735,667	6.55
Quebec	-------	7,120	160,714	94,206	14,210	276,250	84,698	67,148	65,871	21,345	239,062	515,312	1.95
Other Provinces	331	2,633	19,065	16,622	420	39,071	2,719	10,621	49	1,585	14,974	54,045	.20
Total Canada	331	30,499	1,065,811	695,304	81,291	1,873,236	154,405	153,755	83,869	39,759	431,788	2,305,024	8.70
Other countries: [4]	-------	2,889	16,349	61,157	52,174	132,569	133,315	74,058	20,233	457,405	685,011	817,580	3.09
Grand total	73,397	273,769	4,456,049	5,284,062	2,912,580	12,999,857	3,597,769	2,332,178	2,896,086	4,660,367	13,486,400	26,486,257	100.00

[1] Includes "Local sales."
[2] Shipments to other states generally referred to as being in the South Atlantic area are included in "All other States."
[3] Shipments to Indiana are included in "All other States."
[4] According to data of the U. S. Department of Commerce, exports of Pennsylvania anthracite to non-Canadian destinations totaled 1,000,558 net tons.

creased demands for energy in Western Europe. The Netherlands, France, and Italy, in that order, were the largest importers during the 1955–56 coal year, accounting for approximately 83 percent of the American anthracite shipped to non-Canadian countries. However, it should be pointed out that the Netherlands forwards or transships a large percentage of its coal imports to Belgium, France, Luxembourg, and West Germany; hence, export data showing countries of destination on coal exports to Europe should be studied with that fact in mind.

Truck shipments (including "local sales") reported to the Bureau of Mines totaled 7,568,000 tons for the 1955–56 coal year, an increase of about one-half million tons or 7 percent. The largest relative increases reported for trucked coal were Maryland, 111 percent; Delaware, 41 percent; New York, 25 percent; and New Jersey, 18 percent. In Pennsylvania the total trucked to points outside the producing region fell 5 percent, but "local sales" rose more than 9 percent to account for a net 3-percent increase for the State. Rail shipments totaled 18,919,000 tons, a decrease of over 600,000 tons, or 3 percent.

During the 1955–56 coal year, the smaller sizes of anthracite were again in a relatively stronger market position than the larger coals; Buckwheat No. 1 and smaller sizes comprised 51 percent of the year's shipments. On a tonnage basis, shipments of Pea and larger sizes declined approximately 5 percent (4 percent in the United States and 8 percent in Canada), and shipments of Buckwheat No. 1 and smaller increased almost an equivalent amount (1 percent in the United States and 10 percent in exports to Canada). From the size data reported to the Bureau of Mines, it appeared that approximately 84 percent of exports to countries other than Canada consisted of Buckwheat No. 1 and smaller sizes.

Monthly data published by the Pennsylvania Department of Mines indicate that during the 1955 calendar year approximately 18 million tons of anthracite was shipped via rail and 8 million by truck. Com-

TABLE 31.—Rail shipments of Pennsylvania anthracite, 1952–55, by destinations, in net tons [1]

[Pennsylvania Department of Mines]

Destination	1952	1953	1954	1955
New England States	2,725,609	2,067,189	1,809,622	1,771,427
New York	8,889,094	6,889,624	5,646,750	5,411,825
New Jersey	3,927,830	3,487,560	3,169,972	2,849,526
Pennsylvania	6,260,242	5,846,542	4,999,277	4,381,062
Delaware	200,389	184,665	152,644	138,733
Maryland	358,567	290,852	250,372	257,795
District of Columbia	123,322	101,911	87,690	73,543
Virginia	71,820	66,482	56,663	59,094
Ohio	118,378	97,346	118,520	300,246
Indiana	47,206	30,969	29,545	41,660
Illinois	143,085	107,618	96,928	107,852
Wisconsin	275,058	155,481	161,271	145,939
Minnesota	34,295	25,052	11,646	22,024
Michigan	138,440	93,024	80,566	75,239
Other States	144,762	160,971	156,176	129,210
Total United States	23,458,097	19,605,286	16,827,642	15,765,175
Canada	3,175,125	2,541,269	2,271,981	2,203,474
Other foreign countries	667,213	73,206	250,808	388,621
Grand total	27,300,435	22,219,761	19,350,431	18,357,270

[1] Does not include dredge coal.

pared with 1954, these data indicate an 11-percent increase in truck movement and a 5-percent decline in rail shipments. The greatest losses in rail traffic occurred in New York, New Jersey, and Pennsylvania; and, as in 1954, it was in these same States that trucking made its largest tonnage gains, lending some credence to the belief that the various increases in rail freight rates over the past few years have in effect, extended the radius of the territory in which over-the-road truckers can compete successfully with rail carriers. (See tables 31 and 32.)

Data compiled from reports of the Association of American Railroads and the Massachusetts Division on the Necessaries of Life on rail and tidewater receipts of Pennsylvania anthracite in the New England States are shown in table 33. According to these data, the tonnage received by rail declined 10 percent between 1954 and 1955, and the total tidewater movement was only 5,000 tons. Imports into the area amounted to 170 tons.

According to data released by the Ore and Coal Exchange, Cleveland, Ohio, loadings over Lake Erie docks increased 65 percent over the 1954 volume, totaling 468,000 tons for the year. Although the tonnage shipped over Lake Ontario docks more than doubled, the total remained insignificant. The principal reason for the sharp rise in shipments via Lake Erie docks was the increased demand for the smaller sizes of anthracite in the upper Lakes region. As a result, receipts at Duluth-Superior climbed 80 percent over the figure for 1954. Receipts at Lake Superior docks were up 7 percent and at Lake Michigan points 6 percent, while year-end stocks declined 30 percent at Lake Superior docks and 1 percent on Lake Michigan.

TABLE 32.—Truck shipments of Pennsylvania anthracite in 1955, by months and by States of destination, in net tons [1]

Destination	January	February	March	April	May	June	July
Pennsylvania:							
Within region	495,585	477,334	362,833	361,720	322,260	303,382	176,145
Outside region	212,075	202,133	152,923	168,336	137,106	136,168	122,928
New York	72,458	75,857	73,981	77,163	64,247	81,887	75,455
New Jersey	74,048	71,316	49,960	63,588	57,431	59,876	49,431
Delaware	1,340	1,381	822	1,413	1,122	1,113	1,160
Maryland	10,015	7,352	4,916	2,935	1,943	2,694	2,653
District of Columbia	1,107	672	529	179	554	215	231
Other States	3,446	3,306	2,479	731	1,023	649	521
Total: 1955	870,074	839,351	648,443	676,065	585,686	585,984	428,524
1954	827,603	692,635	678,931	640,751	562,727	394,041	388,190

Destination	August	September	October	November	December	Total	Percent of total trucked
Pennsylvania:							
Within region	239,136	299,617	284,933	426,734	520,793	4,270,472	53.1
Outside region	134,800	163,924	153,041	184,293	198,821	1,966,548	24.4
New York	70,453	84,306	84,542	89,414	98,022	947,785	11.8
New Jersey	51,101	78,825	66,972	60,116	69,497	752,161	9.3
Delaware	988	1,329	1,762	2,564	3,217	18,211	0.2
Maryland	4,755	6,657	8,688	8,458	8,999	70,065	0.9
District of Columbia	427	563	691	770	1,290	7,228	0.1
Other States	685	990	1,347	1,541	1,110	17,828	0.2
Total: 1955	502,345	636,211	601,976	773,890	901,749	8,050,298	100.0
1954	446,592	548,582	546,330	688,695	868,996	7,284,073	100.0

[1] Compiled from reports of Pennsylvania Department of Mines. Does not include dredge coal.

TABLE 33.—Receipts of anthracite in New England, 1917, 1920, 1923, 1927, and 1941–55, in thousand net tons

Year	Receipts by tidewater	Receipts by rail [1]	Imports [2]	Total receipts of Pennsylvania anthracite [3]	Year	Receipts by tidewater [4]	Receipts by rail [1]	Imports [2]	Total receipts of Pennsylvania anthracite [3]
1917	[1] 4,421	7,259	1	11,679	1947	240	4,498	----------	4,738
1920	[1] 3,521	7,804	1	11,324	1948	217	4,646	----------	4,863
1923	[1] 4,082	8,102	145	12,039	1949	110	3,336	----------	3,446
1927	[1] 2,421	6,725	106	9,040	1950	81	3,615	18	3,678
1941	[1] 682	4,870	75	5,477	1951	66	3,135	27	3,174
1942	[4] 581	5,393	139	5,835	1952	70	2,847	29	2,888
1943	[4] 575	5,310	164	5,721	1953	49	2,088	31	2,106
1944	[4] 398	5,836	12	6,222	1954	10	1,893	6	1,897
1945	[4] 331	4,750	([5])	5,081	1955	5	1,713	([5])	1,718
1946	[4] 399	5,244	----------	5,643					

[1] Commonwealth of Massachusetts, Division on the Necessaries of Life.
[2] U. S. Department of Commerce.
[3] Total receipts by rail and by tidewater less imports.
[4] Association of American Railroads.
[5] Less than 500 tons.

CONSUMPTION

The apparent consumption of Pennsylvania anthracite in the United States (production, plus imports, minus exports, and plus or minus changes in producers' stocks) in 1955 fell 12 percent below 1954. Detailed data are not available on the consumption of all fuels in the primary anthracite market area; however, table 34 includes information on the apparent consumption of anthracite, domestic coke, briquets, heating and range oils, and natural gas. For purposes of comparison, the data on consumption of oil and natural gas have been converted to coal equivalent on the basis of British thermal units content (B. t. u.), while domestic coke and briquets are included on a ton-for-ton basis as equaling anthracite in heating value.

After showing substantial declines in consumption of anthracite during 1954, public utilities and class I railroads gained slightly in 1955, the former stepping up consumption about 1 percent and the latter 3 percent. After going through a minor recession in 1954, when coke production dropped to 59 million tons because of decreased demand by the iron and steel industries, the oven-coke output increased 27 percent in 1955. However, the amount of anthracite charged to coke ovens as an admix with bituminous coal increased from 229,000 tons to 366,000 in 1955, or 60 percent, indicating that the trend toward using authracite as an admix in cokemaking gained real momentum in 1955, since the percentage increase noted could not be attributed entirely to companies already using anthracite for this purpose.

Although definitive use data on anthracite are scarce, the increased shipment of anthracite over the Lakes, particularly into the Mesabi iron-range area, indicates that a possible large market may develop there for the smaller sizes of anthracite for sintering and pelletizing iron-ore fines. The quantity of anthracite used in manufacturing fuel briquets remained steady, totaling 264,000 tons in 1955.

TABLE 34.—Apparent consumption of anthracite and selected competitive fuels in the principal anthracite markets, 1952–55

(Thousand net tons)

Fuel	New England	New York	New Jersey	Pennsylvania	Delaware	Maryland	District of Columbia	Total	Percent of total fuels
Anthracite (all users): [1]									
1952	2,726	[2] 9,279	[2] 4,347	11,575	219	379	126	28,651	27.4
1953	2,067	[2] 7,502	[2] 3,968	11,405	204	333	102	25,581	25.0
1954	1,809	[2] 6,361	[2] 3,743	10,878	169	320	90	23,370	21.6
1955	1,771	[2] 6,359	[2] 3,602	10,618	157	328	81	22,916	19.9
Imported: [3]									
1952	29							29	(5)
1953	31							31	(5)
1954	6							6	(5)
1955	(4)							(4)	(5)
Briquets (domestic use):									
1952	31	12	11	22	(4)	14	1	91	.1
1953	27	9	22	16	(4)	12	1	87	.1
1954	21	8	8	13		9	1	60	.1
1955	19	6	1	10	(4)	7	1	44	(5)
Coke (domestic use):									
1952	525	264	298	134	(4)	1		1,222	1.2
1953	439	200	259	126	(4)	(4)		1,024	1.0
1954	379	179	241	102	(4)	(4)		901	.8
1955	384	122	235	96	(4)			837	.7
Imported: [3]									
1952	(4)	159						159	.2
1953	1	18						19	(5)
1954	1	1						2	(5)
1955	2	3						5	(5)
Oil (heating and range): [6]									
1952	21,367	16,957	8,666	6,990	606	3,115	1,104	58,805	56.3
1953	21,354	17,099	8,655	7,130	630	3,136	1,162	59,166	57.7
1954	23,199	18,051	9,034	8,030	725	3,897	1,217	64,153	59.2
1955	24,564	20,028	9,808	8,810	812	4,234	1,284	69,540	60.3
Natural gas: [7]									
1952	435	5,609	1,014	6,970	[8]	[8]	[8] 1,439	15,467	14.8
1953	837	5,934	1,272	7,028	[8]	[8]	[8] 1,542	16,613	16.2
1954	1,604	7,045	1,608	7,824	[8]	[8]	[8] 1,784	19,865	18.3
1955	1,873	7,761	1,971	8,518	[8]	[8]	[8] 1,965	22,088	19.1
Total:									
1952	25,113	32,280	14,336	25,691	[9] 825	[9] 3,509	[9] 2,670	104,424	100.0
1953	24,756	30,762	14,176	25,705	[9] 834	[9] 3,481	[9] 2,807	102,521	100.0
1954	27,019	31,645	14,634	26,847	[9] 894	[9] 4,226	[9] 3,092	108,357	100.0
1955	28,613	34,279	15,617	28,052	[9] 969	[9] 4,569	[9] 3,331	115,430	100.0

[1] Pennsylvania Department of Mines.
[2] An important but undetermined part of anthracite shown as shipped to New Jersey is reshipped to New York City.
[3] U. S. Department of Commerce.
[4] Less than 500 tons.
[5] Less than 0.05 percent.
[6] Converted to coal equivalent upon basis of 4 barrels of fuel oil equaling 1 ton of coal.
[7] Converted to coal equivalent upon basis of 24,190 M cubic feet of natural gas equaling 1 ton of coal.
[8] Delaware and Maryland included with District of Columbia.
[9] Natural gas for Delaware and Maryland included with District of Columbia.

STOCKS

The year 1955 was characterized by rather sharp drawdowns in anthracite stocks at each point of measurement except for electric utilities, which increased total stocks to a point 20 percent above 1954. On the basis of 1954 consumption, stocks of Pennsylvania anthracite held by public utilities at the end of December represented almost an entire year's supply.

Although the producing companies could move coal to retail yards at a relatively higher rate during the summer months than in 1954, the total in retail-yard storage at the end of October (1,460,000 tons) was considered unsatisfactory in view of the 1,642,000 tons held on the similar date of 1954.

According to estimates of the Bureau of Mines, retail stocks reached a seasonal low of 823,000 tons at the close of March compared with 1,507,000 tons on the corresponding date of 1954, thus prompting a fairly good movement to retail dealers during the summer. However, by the end of December, which was one of the coldest months on record, retailers had reduced yard stocks over 270,000 tons from October and spot shortages of certain sizes were beginning to appear.

At the close of 1954 producers had 1,293,000 tons in ground storage. While not as large as the tonnages held at the close of 1952 and 1953, they nevertheless exerted a deterring effect on production and were an unsettling influence upon the stability of the price structure. As mining and storing this substantial tonnage involved large sums, many companies continued the 1954 practice of liquidating stocks to recover investments. Consequently, producer stocks declined 573,000 tons by the end of the year, with the sharpest monthly decline in December in response to heavy calls for tonnage above current output.

Loadings of Pennsylvania anthracite over Lake Erie and Lake Ontario docks increased 65 percent over the 1954 movement, while stocks at the Upper Lake docks were considerably lower at the end of December 1955 than at the end of 1954, indicating an abrupt increase in demand for anthracite. The sharpest increases occurred in receipts at Duluth-Superior (80 percent) and in reloadings from Lake Superior docks (33 percent). Despite almost equal consumption in both 1954 and 1955, Class I railroads permitted stockpiles of anthracite to reach an extremely low point at the end of 1955—40,000 tons, or 49 percent less than in December 1954.

TECHNOLOGY

A coordinated and aggressive research program on mining, preparation, and utilization practices of the industry has been recognized as a primary step in recapturing old or creating new markets for anthracite. To centralize the Federal Government's work on anthracite, the Federal Bureau of Mines created the Division of Anthracite in September 1955 and delegated to it full responsibility for all technologic, economic, and research work.

Under the division, planned research will be aimed primarily at improving old methods or devising new mining methods, and developing new uses requiring large annual tonnages. Headquarters of the division are in Washington, D. C., but the field and laboratory work will be supervised from the Anthracite Experiment Station, Schuylkill Haven, Pa., and from a field office in Wilkes-Barre, Pa. The health and safety work was the only phase of the Bureau's operations excluded from the responsibilities of the new division.

An anthracite mine-drainage program was authorized in July 1955 by joint action of the Pennsylvania General Assembly (act of July 7, 1955) and the United States Congress (Public Law 162, 84th Congress, 69 Stat. 352, 30 U. S. C., chap. 14). These measures provided a total of $17 million (one-half to be contributed by the Commonwealth and one-half by the Federal Government) to be used for the control and drainage of water in the anthracite formations to conserve natural resources and promote national security. Offices of the Branch of Mine Drainage, Division of Anthracite, were estab-

lished at Schuylkill Haven and Wilkes-Barre to administer field responsibilities of the Bureau under Public Law 162. By the close of 1955 key maps had been prepared, and the mine-water problems of the producing region were being reviewed in detail. The growing magnitude of the mine-water problem is illustrated by the greatly increased burden of pumping mine water. In 1920, 8 tons of water was pumped to the surface for each ton of anthracite mined, but by 1954 the ratio had increased to 56 tons of water per ton of coal.

A Bureau-designed, vibrating-blade coal planer for mining and loading coal in one continuous operation without blasting was tested on a longwall face in a mine in the Northern field. The test demonstrated that the hardest types of anthracite could be planed with this type of equipment and that the method warranted further detailed investigation.

Continued tests of the Bureau-owned, yielding roof supports (Becorit steel props) showed that better roof control could be obtained than with wood timbering. When used in mining pillars, some improvement was made in production per man-shift and in the overall coal-recovery rate, as compared with rates obtained with regular wood timbering.

It has been reported that a mining method [2] employing drill holes up to 115 feet long has been used successfully in pitching beds in the Southern anthracite field. This method is claimed to increase output per man-shift, lower timber costs, simplify the ventilation system, increase coal recovery, and improve safety.

A new type of borer that may be applicable to anthracite operations has been used in pitching-seam coal mines (45°–90°) in western Canada. Those large-diameter, lightweight borers, 20 and 36 inches in diameter, have been used [3] to bore ventilation raises and connecting holes between workings. Holes up to 100 feet in length have been drilled. It was reported that the borer materially reduced costs of driving such openings and improved safety conditions.

Advantages [4] of the new large vertical rotary drills used in overburden work at anthracite strippings in 1955 include a drilling rate of 66 feet per hour for a 12¼-inch-diameter bit, compared with a rate of 9.7 feet per hour with a 9-inch-diameter bit used in churn drilling.

Investigations were continued at the Anthracite Experiment Station to determine which type of crusher (impact, jaw, ring, or gyrator) would yield the maximum of Buckwheat and Rice sizes when the larger sizes of anthracite are crushed. The overall results of comparable tests showed that the gyratory and ring crushers yielded a maximum amount of the desired small sizes.

During 1955 preparation facilities having a total capacity of 1,260 tons per hour [5] were installed at 17 anthracite plants (both old and new). Much of the equipment installed has been for cleaning and sizing the finer sizes, as the demand for the smaller size coal is increasing steadily.

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[2] Schnee, Garfield A., Mechanical Mining and Long Hole Drilling in Pitching Seams: Am. Min. Cong., Coal-Mine Modernization, 1955, pp. 73–82.
[3] Aschacher, Martin, and Dupret, Louis, The Martin Borer: Coal Age, Vol. 60, No. 8, Aug. 1955, pp. 58–59.
[4] Bazley, J. Robert, Latest Anthracite Strip-Drilling Practices: Am. Min. Cong., Coal-Mine Modernization: 1955, pp. 194–201.
[5] Coal Age, Vol. 61, No. 2, Feb. 1956, p. 70.

A new development [6] in cleaning minus ¼-inch coal is the modern feldspar jig. This type of machine has not been used for coal cleaning in the United States during the past 50 years; however, the design has been greatly improved through continued development in France and Belgium and now is said to have good possibilities. A new type of coal-treating equipment—the "sieve band"—reportedly has been applied successfully in separating far smaller sizes (down to 100-mesh or finer) than is now possible. This gravity-bar screen was developed by the Mining Research Laboratory of the Netherlands State Mines.

Considerable research was conducted on use of the large sizes of anthracite in blast furnaces and cupolas. Experiments with the Bureau's 3-foot-diameter blast furnace, in which 60 percent of the coke charge was replaced with Egg-size anthracite, produced acceptable metal, with a fairly satisfactory operating experience. In other investigations the Bureau replaced part of the coke in the fuel charge of a commercial size cupola (7-foot-diameter) with Egg-size anthracite. The results indicated that such substitution may be done without any loss in capacity of the cupola and without increased fuel consumption.

Bureau of Mines experiments with briquets made from calcined anthracite fines and coal-tar pitch showed briquet strengths equal to or better than foundry coke. The use of physically reconstituted or agglomerated anthracite by briquetting appears to be a promising method of processing anthracite for use in metallurgical furnaces. Anthracite briquets, 2 by 2½ inches, had ASTM stability factors of 42 to 69, compared with factors of 37½ to 55 for coke and 7 to 9 for raw anthracite of the same size. High-pressure auger extrusion is indicated as the most acceptable method of producing pilot quantities of briquets.

The possible gasification of anthracite to synthesis or high-heat-value gas continued to interest many research groups. An improved catalytic process for converting synthesis gas to methane was under investigation by the Bureau of Mines for producing a high-heat-value gas. A study was initiated by the Bureau, in cooperation with the Atomic Energy Commission, to investigate the use of a nuclear reactor as a source of heat for gasifying coal with steam. Suitable construction materials for use at the high temperatures (over 2,000° F.) of the heat exchange are a difficult problem.

The Bureau's investigation of flyash from anthracite-burning industrial plants as a source of germanium showed negative results. None of the ash contained more than 170 parts per million, or only about one-third of the assay necessary for economic recovery of germanium under current competitive conditions.

Results of a technical and economic investigation [7] demonstrated that anthracite is a satisfactory fuel for use in frost control and for heating orchards to prevent crop damage.

FOREIGN TRADE

According to data of the United States Department of Commerce, no anthracite was imported by the United States from Great Britain in 1955, the only tonnage entering the country being 170 tons received

[6] Yancey, H. F., Coal; Min. Eng., vol. 8, No. 2, February 1956, p. 196.
[7] Clendenin, J. D., Frost-Control Practices and the Prospective Use of Anthracite: Bureau of Mines Inf Circ. 7714, 1955, 45 pp.

from Canada. Cessation of trade with the United States was undoubtedly the result of the decision of the National Coal Board of Great Britain to restrict coal exports because of the British coal industry's inability to keep pace with increased domestic and foreign demand. It is not expected, therefore, that Great Britain will be able to reenter the American market for many years and might continue to decrease exports to Canada as well. (See table 35.)

Canada again imported less anthracite in 1955 than in the preceding year. Imports from all sources totaled 2,646,000 net tons compared with 2,755,000 tons in 1954. Of the 1955 total, 2,379,450 tons was imported for consumption from the United States and 267,035 tons from Great Britain, according to data released by the Dominion Bureau of Statistics. These data indicate a decline of approximately 4 percent in receipts from the United States and relatively no change in the quantity of anthracite received from Great Britain.

TABLE 35.—Anthracite imported for consumption in the United States, 1954–55, by countries and customs districts, in short tons

[U. S. Department of Commerce]

Country	1954	1955	Customs district	1954	1955
North America: Canada	132	170	Maine and New Hampshire	-------	170
Europe: United Kingdom	5,699	-------	Massachusetts	5,699	-------
			Michigan	132	-------
Total	5,831	170	Total	5,831	170

After averaging only 216,000 tons monthly for the first 8 months of 1955, exports of Pennsylvania anthracite started a sharp rise in September that continued throughout the remainder of the year. The average for the last 4 months was 356,000 tons. As a result, total exports for the calendar year 1955 exceeded 1954 by 11 percent, according to monthly data of the United States Department of Commerce. As exports to Canada were down slightly, the improvement was due almost entirely to a 270,000-ton increase in shipments to Western Europe and 47,000 tons to Asia. Asian shipments were confined to Israel, Vietnam, Laos, and Cambodia, while the largest European importers were, in order, the Netherlands, Italy, and France. As the increased demand for anthracite in Europe was generally attributed to a widening gap between European coal production and demand, fostered by an upward spiraling economy, exports to Europe in 1956 were expected to reach the highest level in several years. (See table 36.)

Although U. S. S. R. does not publish data on coal exports, examination of import data released by several countries indicate that Russia is again engaging in the anthracite export trade to a considerable extent. For example, the import statistics published by France, the Netherlands, Italy, Belgium, and West Germany show that these countries as a group imported 1,197,000 tons of Russian anthracite in 1955, an increase of 408,000 tons over 1954. Aside from West Germany, which imported 88,000 tons in 1955 and none in 1954, the largest increases in imports of Russian anthracite were recorded by France;

TABLE 36.—Anthracite exported from the United States, 1954–55, by countries and customs districts, in net tons

[U. S. Department of Commerce]

Country	1954	1955
North America:		
Bermuda		334
Canada	2,456,747	2,434,981
Cuba	59,491	62,125
Jamaica		229
Mexico	538	1,692
Total	2,516,776	2,499,361
South America: Brazil	392	840
Europe:		
Denmark		2,843
France	22,068	119,164
Germany, West	5,261	18,081
Greece	34,273	
Italy	78,015	150,511
Netherlands	151,382	300,696
Norway		15
Yugoslavia	29,512	
Total Europe	320,511	591,310
Asia:		
Israel		28,061
Japan	2,713	
Vietnam, Laos, and Cambodia [3]	10,847	32,741
Total	13,560	60,802
Grand total	2,851,239	3,152,313

Customs district	1954	1955
North Atlantic:		
Maine and New Hampshire	7,851	3,751
Massachusetts	60	63
New York	[1] 4,795	11,153
Philadelphia	[1] 398,238	709,509
South Atlantic:		
Maryland	392	548
Virginia	1,000	229
Gulf coast: Sabine		292
Mexican border:		
Arizona		55
Laredo	538	1,337
Northern border:		
Buffalo	1,621,553	1,568,602
Dakota	81	437
Duluth and Superior		5,019
Michigan	726	790
Ohio	24,717	10,106
Rochester	1,952	4,285
St. Lawrence	753,490	796,663
Vermont	34,796	37,704
Miscellaneous [2]	1,050	1,770
Total	2,851,239	3,152,313

[1] Revised figure.
[2] Estimated data; district breakdown not available.
[3] Formerly Indochina.

445,000 tons in 1954 to 606,000 tons in 1955; Italy, 121,000 tons to 225,000; and Belgium, 69,000 tons to 137,000. The Netherlands increased imports only by approximately 13,000 tons.

WORLD PRODUCTION

After increasing more than 3 million net tons, between 1953 and 1954, world production of anthracite declined more than 1 million tons in 1955. As in 1954, the United States showed the largest drop in output among major producing countries—a loss of approximately 2.9 million tons. Of the countries reporting increased production, the most significant were increases of 7 percent in West Germany and 47 percent in the Republic of Korea. Minor improvement was noted in the production of Belgium, France, Japan, North Korea, and North Vietnam.

In Great Britain production of Welsh anthracite declined about 2 percent under 1954, despite efforts of the National Coal Board to rehabilitate some of the older workings and replace many of the older, high-cost mines with more efficient collieries. However, the worked-out condition of the anthracite mines, difficulties in retaining an adequate labor force, and the complex problem of underground transportation are among the factors that are expected to keep British output relatively low for the next few years.

Based on the most reliable information available, it appears that anthracite production in U. S. S. R. has remained fixed at about 75 million net tons for the last 5 years. Whether this figure represents the goal established under the various 5-year development plans or marks the effective productive capacity is a matter of conjecture; however, from the information available on the output of bituminous coal, brown coal, and lignite over the same period, it would seem logical to assume that the anthracite production has probably been pegged at the 75-million-ton figure to place more emphasis upon increasing output of the other coals, particularly coking coal. (For details on world production of anthracite, 1951–55, see table 37.)

TABLE 37.—World production of anthracite, 1951–55 by countries, in thousand short tons [1]

[Compiled by Pearl J. Thompson]

Country	1951	1952	1953	1954	1955
Belgium	[2] 7,200	7,572	7,893	7,781	7,947
Bulgaria [2]	31	33	33	33	33
China [2]	4,400	4,400	4,400	5,000	5,000
France	8,934	9,223	8,855	11,928	12,077
French Morocco	434	507	623	536	515
Germany:					
East [2]	260	260	270	270	275
West	[2] 9,100	9,776	10,692	11,556	12,378
Ireland	117	121	127	170	151
Italy	90	89	75	71	53
Japan	1,045	1,111	1,204	1,376	1,495
Korea:					
North [2]	1,100	850	1,100	1,200	1,300
Republic of	353	635	956	982	1,442
New Zealand	1	1	2	2	[2] 2
Peru	71	88	76	86	18
Portugal	460	487	527	476	455
Rumania [2]	40	55	55	55	55
Spain	1,765	2,024	2,150	2,165	2,164
Switzerland [2]	11	11	11	11	11
U. S. S. R. [2]	74,700	75,000	75,000	75,000	75,000
United Kingdom	4,871	4,686	4,705	5,013	4,890
United States (Pennsylvania)	42,670	40,583	30,949	29,083	26,205
Vietnam, North	708	948	917	1,068	1,213
World total (estimate)	158,400	158,500	150,600	153,900	152,700

[1] This table incorporates a number of revisions of data published in previous anthracite tables.
[2] Estimate.

NOTE: An undetermined amount of semianthracite is inc ded in the figures for some countries.

Coke and Coal Chemicals

By J. A. DeCarlo, T. W. Hunter, and Maxine M. Otero

GENERAL SUMMARY

THE COKE INDUSTRY made a significant contribution to the industrial economy of the United States in 1955 by increasing its output 26 percent over 1954. The gain in coke output was less than the 33-percent rise in pig-iron production but was higher than the 11-percent advance in physical volume of industrial production reported by the Federal Reserve Board. The substantial rise in industrial activity, particularly at blast-furnace operations, increased metallurgical-coke requirements, which, in turn, influenced coke production. Production of oven coke in 1955 was only 9,314 tons less than in 1953, when output reached an alltime high. The operating rate of slot-type coke ovens rose steadily throughout the year, reaching the highest point on record in December, when daily output averaged 214,500 tons.

The production of beehive coke in 1955 was only about one-third the average of 1947–49 but was nearly three times higher than in 1954. Lack of satisfactory coking coal caused most of the beehive plants with serviceable ovens in the famous Connellsville district of western Pennsylvania to remain idle in 1955. Virtually all beehive ovens that had enough high-grade coal were in blast on December 31, and the rate of production was over five times greater than in December 1954.

Metallurgical-coke requirements rose steadily throughout the year and kept demand slightly ahead of production. Consequently, stocks of coke at producers' plants decreased 1.2 million tons during the year. The withdrawal of coke from producers' inventories and the favorable coke-to-pig ratio kept coke shortages at a minimum. Although pig-iron production exceeded the previous maximum in 1953 by nearly 2 million tons, approximately 1.6 million tons less coke was charged into the blast furnaces. This savings was due to a reduction in coke-to-metal ratio from 1,834.9 pounds of coke per ton of pig iron (including ferroalloys) in 1953 to 1,761.3 pounds in 1955. Although this reduction appeared small, it was equivalent to a savings of nearly 2.9 million tons of coke in 1955. Despite the favorable coke-to-pig rate, blast furnaces used the second largest quantity of coke on record, and shipments of furnace coke were 21 percent above the 1947–49 average. Shipments to iron foundries increased 27 percent over 1954 but were 139,249 tons (4 percent) below 1947–49. The surge in industrial activity raised coke requirements in virtually every other industrial application except gas manufacture. The quantity of coke used in manufacturing producer

gas and water gas declined, but the drop was more than offset by the rise in tonnage used by other industrial consumers in 1955. Consequently, total disposal for all other industrial purposes (including producer gas and water gas) increased 11 percent over 1954 but was only about half of the volume distributed to the same class of consumers in 1947–49 (table 1). Shipments of coke for domestic heating decreased for the 10th consecutive year and were the smallest on record. According to data obtained from coke-producing companies, blast-furnace coke used and sold by producers represented 89 percent of the total distribution; 4 percent was destined to iron foundries; 2 percent to producer- and water-gas plants; 3 percent to miscellaneous other industrial plants; and 2 percent for residential heating.

Construction of coke ovens and related facilities continued at a high rate in 1955, but the net gain in carbonizing capacity of slot-type coke ovens was small because most of the new ovens installed were replacements. The industry gained only 148 additional ovens, which raised the total number of active slot-type ovens in existence on December 31 to 16,039, with an annual coke capacity of 79.7 million tons. In addition, 5 batteries, consisting of 261 ovens with a potential annual coke capacity of 1.5 million tons, were under construction at the end of the year. Virtually all of the new coke ovens placed in operation since January 1, 1950, were built under By-Product Coke Expansion Goal No. 4, promulgated by the Defense Production Administration December 5, 1951. The Office of Defense Mobilization (successor to DPA) issued Supplement 1 to Defense Mobilization Order VII–6 on August 11, which closed 19 expansion goals and suspended 38 others. Among the 38 expansion goals suspended was Expansion Goal No. 4—Byproduct Coke. This action was taken by ODM to review the goal and determine whether adequate productive capacity existed to meet mobilization needs. The goal was officially closed on September 29, 1955, under terms described in Supplement 3 to DMO–VII–6.

The substantial rise in the quantity of coal carbonized in slot-type coke ovens (24 percent) caused the output of the primary coal-chemical materials (coke-oven gas, ammonia, crude tar, and crude light oil) to increase proportionately. Coke-oven gas advanced 25 percent over 1954; ammonia, 18 percent; crude tar, 19 percent; and crude light oil, 21 percent. These increases were due entirely to the greater quantity of coal charged into ovens, as yields per ton of coal of all products except gas were lower than in 1954. The increased supply of crude tar and light oil, however, resulted in increases in output of tar and light-oil derivatives ranging from 17 percent for creosote oil to 84 percent for crude naphthalene.

Sales of all coal chemicals, except ammonium sulfate, paced production, and stocks did not change greatly from the preceding year. Despite a price drop of about $1.25 per ton, ammonium sulfate sales dropped 109 million pounds below production and caused producers' stocks to increase to 418 million pounds by December 31. Naphthalene production rose substantially in 1955 as increased requirements of the industrial grades for making phthalic anhydride kept demand high and influenced an increase of $0.01 per pound during the year. Benzene, the principal light-oil derivative, moved well after prices were lowered in January, and supply and demand were in close balance throughout the year.

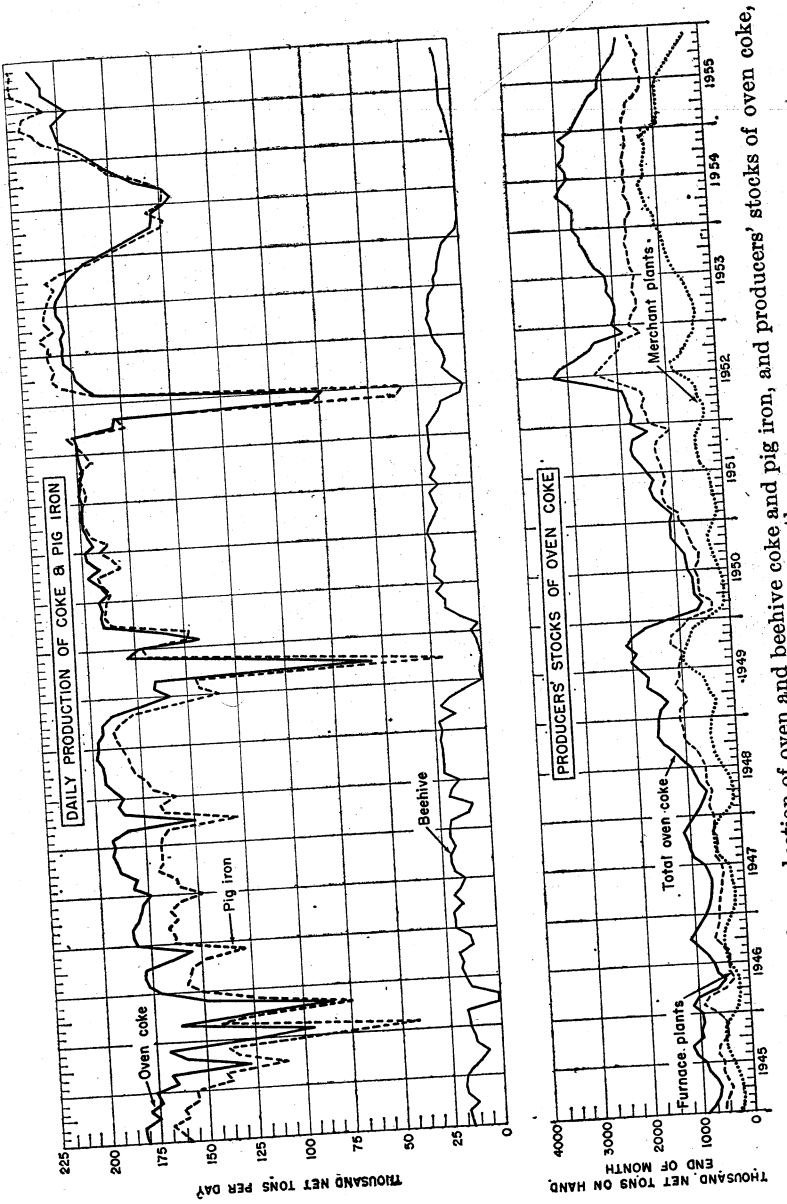

FIGURE 1.—Average daily production of oven and beehive coke and pig iron, and producers' stocks of oven coke, 1945–55, by months.

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TABLE 1.—Salient statistics of the coke industry in the United States, 1947–49 (average) and 1954–55

	1947–49 (average)	1954	1955
Coke produced:			
Oven—net tons	65,088,462	59,061,442	73,584,214
Beehive—do	5,559,940	601,054	1,717,612
Total—do	70,648,402	59,662,496	75,301,826
Distribution, all coke sold or used:			
To blast-furnace plants—do	56,145,621	51,973,401	68,171,966
To foundries—do	3,393,176	2,568,561	3,253,927
To other industrial plants (including producer and water gas)—do	7,391,615	3,472,132	3,848,674
For residential heating—net tons	3,392,826	1,266,722	1,126,065
Imports, all coke—do	181,000	115,781	126,342
Exports, all coke—do	696,502	[1] 387,575	530,505
Apparent consumption, all coke—do	69,852,671	[1] 59,121,570	76,145,732
Producers' stocks of coke, Dec. 31—do	[2] 1,769,456	2,948,840	1,700,771
Value of coal-chemical materials sold or used	$254,681,622	$308,357,211	$388,437,984
Value of coke and breeze produced	867,047,809	969,419,194	1,247,020,919
Total value of all products	1,121,729,431	1,277,776,405	1,635,458,903

[1] Revised figure.
[2] 1949.

TABLE 2.—Statistical summary of the coke industry in the United States in 1955

	Slot-type ovens	Beehive ovens	Total
Coke produced—			
At merchant plants:			
Net tons	9,094,527	(2)	(2)
Value	$152,119,485		
At furnace plants: [1]			
Net tons	64,489,687		
Value	$1,047,510,688		
Total:			
Net tons	73,584,214	1,717,612	75,301,826
Value	$1,199,630,173	$22,231,455	$1,221,861,628
Breeze produced:			
Net tons	4,862,225	88,795	4,951,020
Value	$24,849,962	$309,329	$25,159,291
Coal carbonized:			
Bituminous:			
Net tons	104,507,705	2,869,212	107,376,917
Value	$924,499,614	$16,048,701	$940,548,315
Average per ton	$8.85	$5.59	$8.76
Anthracite:			
Net tons	366,168		366,168
Value	$2,873,095		$2,873,095
Average per ton	$7.85		$7.85
Total:			
Net tons	104,873,873	2,869,212	107,743,085
Value	$927,372,709	$16,048,701	$943,421,410
Average per ton	$8.84	$5.59	$8.76
Average yield in percent of total coal carbonized:			
Coke	70.16	59.86	69.89
Breeze (at plants actually recovering)	4.66	5.54	4.67
Ovens:			
In existence Jan. 1	15,891	12,216	28,107
In existence Dec. 31	16,039	10,104	26,143
Dismantled during year	417	[3] 2,665	3,082
In course of construction Dec. 31	261	31	292
Annual coke capacity Dec. 31—net tons	79,675,500	6,285,300	85,960,800
Coke used by producing companies:			
In blast-furnace plants:			
Net tons	62,195,976	126,988	62,322,964
Value	$1,013,377,890	$1,744,621	$1,015,122,511
In foundries:			
Net tons	311,475		311,475
Value	$7,662,602		$7,662,602
For producer-gas manufacture:			
Net tons	237,300		237,300
Value	$3,412,830		$3,412,830

See footnotes at end of table.

TABLE 2.—Statistical summary of the coke industry in the United States in 1955—Continued

	Slot-type ovens	Beehive ovens	Total
Coke used by producing companies—Continued			
For water-gas manufacture:			
Net tons	908,675		908,675
Value	$9,257,381		$9,257,381
For other industrial purposes:			
Net tons	590,723		590,723
Value	$9,696,706		$9,696,706
Coke sold (commercial sales):			
To blast-furnace plants:			
Net tons	4,686,067	1,162,935	5,849,002
Value	$67,130,433	$14,618,029	$81,748,462
To foundries:			
Net tons	2,899,488	42,964	2,942,452
Value	$68,877,334	$646,711	$69,524,045
To water-gas plants:			
Net tons	86,430		86,430
Value	$1,399,244		$1,399,244
To other industrial plants:			
Net tons	1,645,592	379,954	2,025,546
Value	$21,069,515	$5,173,538	$26,243,053
For residential heating:			
Net tons	1,119,466	6,599	1,126,065
Value	$16,906,354	$70,949	$16,977,303
Disposal of breeze:			
Used by producing companies:			
For steam raising:			
Net tons	2,581,803		2,581,803
Value	$12,626,112		$12,626,112
For sintering iron ore:			
Net tons	453,055		453,055
Value	$2,160,636		$2,160,636
For other industrial purposes:			
Net tons	579,408		579,408
Value	$3,008,074		$3,008,074
Sold (commercial sales):			
Net tons	1,170,507	89,048	1,259,555
Value	$6,661,075	$309,899	$6,970,974
Average receipts per ton (commercial sales):			
Blast-furnace coke	$14.33	$12.57	$13.98
Foundry coke	$23.75	$15.05	$23.63
Water-gas coke	$16.19		$16.19
Other industrial coke	$12.80	$13.62	$12.96
Residential heating coke	$15.10	$10.75	$15.08
Breeze	$5.69	$3.48	$5.53
Producers' stocks, Dec. 31:			
Blast-furnace coke—net tons	1,460,252	2,842	1,463,094
Foundry coke—do	47,506	20	47,526
Residential heating and other coke—do	189,442	709	190,151
Breeze—do	759,103	187	759,290
Coal-chemical materials produced:			
Tar, crude—gallons	852,922,817		852,922,817
Ammonium sulfate or equivalent—pounds	2,091,596,851		2,091,596,851
Gas—M cubic feet	1,083,624,595		1,083,624,595
Burned in coking process—percent	34.48		34.48
Surplus sold or used—do	63.61		63.61
Wasted—do	1.91		1.91
Crude light oil—gallons	297,497,792		297,497,792
Yield of coal-chemical materials per ton of coal:			
Tar, crude—gallons	8.13		8.13
Ammonium sulfate or equivalent—pounds	20.06		20.06
Gas—M cubic feet	10.33		10.33
Crude light oil—gallons	2.91		2.91
Value of coal-chemical materials sold or used:			
Tar, crude:			
Used by producers as fuel [4]	$40,058,345		$40,058,345
Sold	$45,999,007		$45,999,007
Ammonia (sulfate and liquor)	$36,951,251		$36,951,251
Gas (surplus)	$156,139,766		$156,139,766
Crude light oil and derivatives	$78,446,316		$78,446,316
Other coal-chemical materials [5]	$30,843,299		$30,843,299

[1] Plants associated with iron blast furnaces (refer to definition given in Scope of Report).
[2] Not separately recorded.
[3] Idle and not expected to resume production; removed from list of available ovens.
[4] Includes pitch-of-tar.
[5] Naphthalene, tar derivatives, and miscellaneous materials.

TABLE 3.—Summary of coke-oven operations in the United States in 1955, by States

State	Oven coke						
	In existence Dec. 31 [1]		Coal carbonized (net tons)	Yield of coke from coal (percent)	Coke produced (net tons)	Value of coke at ovens	
	Plants	Ovens				Total	Per ton
Alabama	7	1,394	8,539,610	73.13	6,245,253	$121,633,886	$19.48
California	1	225	1,356,513	60.06	814,687	(2)	(2)
Colorado	1	257	1,184,889	66.55	788,558	(2)	(2)
Illinois	8	711	4,322,907	70.34	3,040,900	51,975,561	17.09
Indiana	5	2,003	13,240,028	71.62	9,482,233	175,815,764	18.54
Maryland	1	687	4,478,535	72.25	3,235,527	(2)	(2)
Massachusetts	1	108	778,998	70.71	550,868	(2)	(2)
Michigan	4	691	4,579,840	74.70	3,421,141	63,567,315	18.58
Minnesota	3	241	1,425,899	72.18	1,029,228	20,353,909	19.78
New Jersey	2	341	1,376,630	72.10	992,566	(2)	(2)
New York	4	862	5,746,871	70.21	4,035,076	57,288,441	14.20
Ohio	16	2,544	16,831,990	69.52	11,701,266	178,656,563	15.27
Pennsylvania	14	4,149	28,512,180	68.35	19,488,993	291,575,557	14.96
Tennessee	1	44	259,239	80.54	208,789	(2)	(2)
Texas	2	140	1,042,481	71.25	742,781	(2)	(2)
Utah	2	308	2,044,300	65.29	1,334,760	(2)	(2)
West Virginia	5	772	6,127,655	70.58	4,324,863	57,182,169	13.22
Connecticut, Kentucky, Missouri, and Wisconsin	4	562	3,025,308	70.96	2,146,725	33,793,195	15.74
Undistributed						147,787,813	17.05
Total 1955	81	16,039	104,873,873	70.16	73,584,214	1,199,630,173	16.30
At merchant plants	23	2,482	12,682,370	71.71	9,094,527	152,119,485	16.73
At furnace plants	58	13,557	92,191,503	69.95	64,489,687	1,047,510,688	16.24
Total 1954	81	15,891	84,639,973	69.78	59,061,442	940,769,073	15.93

State	Beehive coke						Total	
	Ovens in existence Dec. 31	Coal carbonized (net tons)	Yield of coke from coal (percent)	Coke produced (net tons)	Value of coke at ovens		Coke produced (net tons)	Value of coke at ovens
					Total	Per ton		
Alabama							6,245,253	$121,633,886
California							814,687	(2)
Colorado							788,558	(2)
Illinois							3,040,900	51,975,561
Indiana							9,482,233	175,815,764
Maryland							3,235,527	(2)
Massachusetts							550,868	(2)
Michigan							3,421,141	63,567,315
Minnesota							1,029,228	20,353,909
New Jersey							992,566	(2)
New York							4,035,076	57,288,441
Ohio							11,701,266	178,656,563
Pennsylvania	8,426	2,124,733	61.83	1,313,694	$16,226,852	$12.35	20,802,687	307,802,409
Tennessee							208,789	(2)
Texas							742,781	(2)
Utah	297	213,038	52.33	111,476	(2)	(2)	1,446,236	(2)
Virginia	483	273,968	51.30	140,555	1,995,647	14.20	140,555	1,995,647
West Virginia	703	188,708	60.47	114,107	1,512,241	13.25	4,438,970	58,694,410
Connecticut, Kentucky, Missouri, and Wisconsin	195	68,765	54.94	37,780	(2)	(2)	2,184,505	(2)
Undistributed					2,496,715	16.73		184,077,723
Total 1955	10,104	2,869,212	59.86	1,717,612	22,231,455	12.94	75,301,826	1,221,861,628
Total 1954	12,216	979,646	61.35	601,054	8,511,488	14.16	59,662,496	949,280,561

[1] Excludes plants retired permanently during year.
[2] Included with "Undistributed" to avoid disclosure of individual company figures.

The value of coke, breeze, gas, and coal chemicals used and sold by producing companies in 1955 totaled about $1,635 million. The dollar value of coal delivered to coke plants amounted to about $943 million. Thus the value of products made by carbonizing coal at coke plants was about $692 million greater than the value of the coal from which they were obtained.

SCOPE OF REPORT

Data in this chapter, except where otherwise noted, are based on those voluntarily supplied to the Bureau of Mines by coke-producing companies operating within the continental limits of the United States. These data are confined to products made in high-temperature slot-type and beehive coke ovens and do not include products made by other carbonization processes (coal-gas retorts, low-temperature carbonization of coal, and carbonization of residues from refining crude tar and petroleum). Separate statistics on the production of coke in coal-gas retorts and low- and medium-temperature carbonization equipment are not shown in this chapter, as less than three operating companies employed these processes in the United States in 1955. Production of petroleum coke (including catalyst coke) totaled 5.7 million tons in 1955, and the United States Tariff Commission reported that 26 thousand tons of coal-tar-pitch coke was produced.

For convenience, most of the statistical tables herein include comparable data for 4 or 5 preceding years. Four new tables are incorporated in this report for the first time. Table 22 is included to show the trend in the use of washed coal in coke ovens during the past 65 years. Table 55 shows the production of benzene, by classes of producers, for 1950–55. Tables 58 and 59 show the production of crude naphthalene by States and by grades.

The coke industry in 1955 consisted of 46 companies that operated 81 oven-coke plants and 49 companies that owned 66 beehive-coke plants. Reports were received from each oven-coke plant and from all but three beehive-coke producers. As submission of these reports is not mandatory, the Bureau of Mines was unable to obtain reports from several small beehive plants that operated spasmodically during the year. Production of coke at these plants was estimated from railroad reports on their carloadings, and coverage of the beehive industry is believed to be complete.

The terms "merchant" and "furnace" plants in this chapter apply only to oven-coke plants. Furnace plants are those that are owned, or are financially affiliated with, iron and steel companies whose main business is production of coke for use in their own blast furnaces. All other oven-coke plants are classified as merchant and include those that manufacture metallurgical, industrial, and domestic grades of coke for sale on the open market; coke companies associated with chemical plants or gas utilities; and those affiliated with local iron works, where only a minor part (less than 50 percent of their output) is used in affiliated blast furnaces.

The Bureau of Mines does not collect data on manufacturing costs of coke and coal chemicals. The values and prices of coal, coke, and other products shown in this chapter were obtained from annual reports submitted to the Bureau of Mines by producing companies.

For commercial sales of coke, gas, and coal chemicals, the dollar values are the amounts received for the products f. o. b. ovens. The values for coke, breeze, crude tar, pitch, and surplus gas used as fuel are the market values of these products assigned to them by the producing companies.

The term "coke," as used in this chapter, refers only to the large sizes (usually one-half inch plus) from which the smaller sizes, which are known as breeze, have been screened. Metallurgical coke refers to the grades used for smelting and casting ferrous metals in blast furnaces and foundries. The standard unit of measurement in the coke industry is the net or short ton of 2,000 pounds, which is employed throughout this chapter.

OVEN AND BEEHIVE COKE AND BREEZE

MONTHLY PRODUCTION

TABLE 4.—Coke produced in the United States and average per day, 1947–49 (average) and 1953–55, by months, in net tons [1]

Month	1947–49 (average)		1953		1954		1955	
	Total	Daily average	Total	Daily average	Total	Daily average	Total	Daily average
Oven coke:								
January	5,875,300	189,500	6,316,600	203,800	5,643,100	182,000	5,757,300	185,700
February	5,393,400	192,600	5,703,600	203,700	4,831,300	172,500	5,338,200	190,700
March	5,775,800	186,300	6,326,900	204,100	5,117,500	165,100	6,143,300	198,200
April	5,231,600	174,400	6,059,500	202,000	4,667,600	155,600	6,025,900	200,900
May	5,707,400	184,100	6,310,300	203,500	4,782,100	154,300	6,299,500	203,200
June	5,409,700	180,300	6,154,500	205,200	4,618,000	153,900	6,008,500	200,300
July	5,355,900	172,800	6,369,400	205,500	4,600,600	148,400	6,048,600	195,100
August	5,564,400	179,500	6,340,700	204,500	4,485,800	144,700	6,240,600	201,300
September	5,394,700	179,800	6,061,100	202,000	4,464,900	148,800	6,245,100	208,200
October	4,519,000	145,800	6,210,500	200,300	5,063,400	163,300	6,462,200	208,500
November	5,003,500	166,800	5,915,300	197,200	5,207,200	173,600	6,364,100	212,100
December	5,857,800	189,000	5,825,200	187,900	5,579,900	180,000	6,650,900	214,500
Total	65,088,500	178,300	73,593,600	201,600	59,061,400	161,800	73,584,200	201,600
Beehive coke:								
January	623,500	20,100	483,400	15,600	164,900	5,400	61,800	2,000
February	574,900	20,600	466,400	16,700	63,200	2,300	65,000	2,300
March	461,900	14,900	557,000	18,000	35,600	1,100	106,200	3,400
April	445,000	14,800	524,500	17,500	36,800	1,200	122,700	4,100
May	582,300	18,800	551,000	17,800	32,800	1,000	138,200	4,500
June	432,500	14,400	504,100	16,800	34,500	1,200	153,500	5,100
July	304,500	9,800	413,600	13,300	33,700	1,100	143,600	4,600
August	425,000	13,700	421,000	13,600	44,000	1,400	164,300	5,300
September	413,500	13,800	371,700	12,400	40,200	1,400	162,000	5,400
October	428,800	13,800	363,600	11,800	32,500	1,100	178,300	5,700
November	411,700	13,700	307,300	10,200	39,700	1,300	190,600	6,400
December	456,300	14,700	279,700	9,000	43,200	1,400	231,400	7,500
Total	5,559,900	15,300	5,243,300	14,400	601,100	1,700	1,717,600	4,700
Total:								
January	6,498,800	209,600	6,800,000	219,400	5,808,000	187,400	5,819,100	187,700
February	5,968,300	213,200	6,170,000	220,400	4,894,500	174,800	5,403,200	193,000
March	6,237,700	201,200	6,883,900	222,100	5,153,100	166,200	6,249,500	201,600
April	5,676,600	189,200	6,584,000	219,500	4,704,400	156,800	6,148,600	205,000
May	6,289,700	202,900	6,861,300	221,300	4,814,900	155,300	6,437,700	207,700
June	5,842,200	194,700	6,658,600	222,000	4,652,500	155,100	6,162,000	205,400
July	5,660,400	182,600	6,783,000	218,800	4,634,300	149,500	6,192,200	199,700
August	5,989,400	193,200	6,761,700	218,100	4,529,800	146,100	6,404,900	206,600
September	5,808,200	193,600	6,432,800	214,400	4,505,100	150,200	6,407,100	213,600
October	4,947,800	159,600	6,574,100	212,100	5,095,900	164,400	6,640,500	214,200
November	5,415,200	180,500	6,222,600	207,400	5,246,900	174,900	6,554,700	218,500
December	6,314,100	203,700	6,104,900	196,900	5,623,100	181,400	6,882,300	222,000
Grand total	70,648,400	193,600	78,836,900	216,000	59,662,500	163,500	75,301,800	206,300

[1] Daily average calculated by dividing monthly production by number of days in month.

PRODUCTION BY FURNACE AND MERCHANT PLANTS

Production of oven coke in 1955 at both furnace and merchant plants increased substantially over 1954, rising 25 percent at furnace operations and 24 percent at merchant works. A new coke-production record was established by furnace plants, which exceeded the previous maximum in 1953 by 1,861,511 tons (3 percent). The principal factors in achieving the new record for furnace plants were (1) expansion in carbonizing capacity and (2) heavy demand for blast-furnace coke. The production rate at furnace plants rose steadily during the year, advancing from 162,900 tons per day in January to an all-time peak of 186,700 tons in December. Merchant plants also accelerated their oven operations during the year, but the total annual production was 31 percent below 1947–49. The proportion of oven coke produced by merchant plants in 1955 was the lowest on record.

The steady decline in markets for coke in the residential-heating and gas-manufacturing fields, particularly since the end of World War II, has drastically curtailed production at merchant plants. Lack of an assured outlet for coke caused a number of merchant plants, especially those owned by gas-utility companies, to discontinue operation. In 1929 there were 41 active merchant plants as compared with 23 at the end of 1955. It appeared that the number of active merchant plants would drop further, as several gas-utility companies that operated slot-type coke ovens in 1955 announced plans to shut down their coking operations in the near future. This

TABLE 5.—Monthly and average daily production of oven coke in the United States, 1947–49 (average) and 1954–55, by types of plant, in net tons

Month	1947–49 (average)		1954		1955	
	Furnace plants	Merchant plants	Furnace plants	Merchant plants	Furnace plants	Merchant plants
Monthly production:						
January	4,700,600	1,174,700	4,827,700	815,400	5,050,000	707,300
February	4,323,300	1,070,100	4,135,000	696,300	4,695,100	643,100
March	4,618,000	1,157,800	4,396,600	720,900	5,411,900	731,400
April	4,188,600	1,043,000	4,032,800	634,800	5,306,900	719,000
May	4,578,100	1,129,300	4,163,800	618,300	5,552,200	747,300
June	4,329,000	1,080,700	4,097,800	520,200	5,288,500	720,000
July	4,273,800	1,082,100	4,107,900	492,700	5,314,700	733,900
August	4,466,700	1,097,700	3,987,800	498,000	5,472,600	768,000
September	4,321,900	1,072,800	3,972,600	492,300	5,454,900	790,200
October	3,471,600	1,047,400	4,510,300	553,100	5,620,000	842,200
November	3,977,500	1,026,000	4,574,400	632,800	5,534,500	829,600
December	4,725,000	1,132,800	4,891,800	688,100	5,788,400	862,500
Total	51,974,100	13,114,400	51,698,500	7,362,900	64,489,700	9,094,500
Average daily production:						
January	151,600	37,900	155,700	26,300	162,900	22,800
February	154,400	38,200	147,700	24,800	167,700	23,000
March	149,000	37,300	141,800	23,300	174,600	23,600
April	139,600	34,800	134,400	21,200	176,900	24,000
May	147,700	36,400	134,300	20,000	179,100	24,100
June	144,300	36,000	136,600	17,300	176,300	24,000
July	137,900	34,900	132,500	15,900	171,400	23,700
August	144,100	35,400	128,600	16,100	176,500	24,800
September	144,100	35,700	132,400	16,400	181,800	26,400
October	112,000	33,800	145,500	17,800	181,300	27,200
November	132,600	34,200	152,500	21,100	184,500	27,600
December	152,400	36,600	157,800	22,200	186,700	27,800
Average for year	142,400	35,900	141,600	20,200	176,700	24,900

indicated that the production of coke from merchant plants would continue to shrink unless new markets could be developed for coke and gas to permit economic operation of the affected plants.

TABLE 6.—Number and production of oven-coke plants in the United States, 1929, 1939, 1947–49 (average) and 1951–55, by types of plant

Year	Number of active plants [1]		Coke produced (net tons)		Percent of production	
	Furnace plants	Merchant plants	Furnace plants	Merchant plants	Furnace plants	Merchant plants
1929	46	41	41,224,387	12,187,439	77.2	22.8
1939	45	39	31,811,807	11,070,506	74.2	25.8
1947–49 (average)	[2] 55	[2] 31	51,974,089	13,114,373	79.9	20.1
1951	56	28	58,796,622	13,190,550	81.7	18.3
1952	57	27	52,128,906	11,721,209	81.6	18.4
1953	58	25	62,628,176	10,965,352	85.1	14.9
1954	58	24	51,698,475	7,362,967	87.5	12.5
1955	58	23	64,489,687	9,094,527	87.6	12.4

[1] Includes plants operating any part of year.
[2] On Dec. 31, 1949.

PRODUCTION BY STATES AND DISTRICTS

Coke was produced in 22 States in 1955, the same number as in 1954. Oven coke was made in 21 States and beehive coke in 5 (Kentucky, Pennsylvania, Utah, and West Virginia produce both oven and beehive coke). Coke-oven operators in Pennsylvania continued to lead in coke production and supplied 26 percent of the total oven coke produced and 76 percent of the beehive. The output of oven coke in Pennsylvania was 22 percent higher in 1955 than in the 1947–49 base period. Expansion in carbonizing capacity at existing coke plants and completion of the new Fairless works of the United States Steel Corp. at Morrisville, Pa., in 1953 were the principal contributing factors in maintaining this State's supremacy in oven-coke production. As in previous years, Ohio ranked second and Indiana third in oven-coke output. Gains in oven-coke output in these 2 States since the base period 1947–49 were 19 and 14 percent, respectively. Significant gains were also made in Alabama, California, Maryland, Michigan, Minnesota, Texas, Utah, and West Virginia. The largest percentage gains over 1947–49 occurred in California and Texas, where production increased 151 and 59 percent, respectively. The States that showed a downward trend in production were Illinois, Massachusetts, New Jersey, and New York.

The Pittsburgh-Youngstown steel-producing district was the greatest coke-producing area in the United States in 1955, followed by the Eastern and Chicago districts. Production since 1947–49 advanced 26 percent in the Pittsburgh-Youngstown district but declined in the Eastern. The Chicago, Cleveland-Detroit, Southern, and Western districts reported increased production in the same period.

TABLE 7.—Coke produced in the United States, 1947–49 (average) and 1952–55, by States, in net tons

State	1947–49 (average)	1952	1953	1954	1955
Oven coke:					
Alabama	5,682,198	5,712,102	6,278,239	5,301,550	6,245,253
California	325,182	610,080	749,381	627,577	814,687
Colorado	851,906	816,140	967,074	662,282	788,558
Illinois	3,558,768	3,390,773	3,513,142	2,248,206	3,040,900
Indiana	8,301,067	7,611,090	8,886,502	8,200,262	9,482,233
Maryland	2,054,315	2,490,859	3,268,655	3,078,371	3,235,527
Massachusetts	1,048,037	1,055,529	849,535	516,344	550,868
Michigan	2,717,650	2,862,873	3,220,133	2,308,924	3,421,141
Minnesota	841,976	868,523	862,151	803,860	1,029,228
New Jersey	1,396,082	1,472,245	1,175,416	929,768	992,566
New York	5,507,449	4,342,583	4,589,609	3,578,703	4,035,076
Ohio	9,847,621	9,638,904	11,717,556	8,228,873	11,701,266
Pennsylvania	15,964,464	15,100,698	18,747,300	15,566,002	19,488,993
Tennessee	235,577	254,319	231,330	154,194	208,789
Texas	468,083	652,179	751,926	699,536	742,781
Utah	978,701	1,125,729	1,407,818	997,749	1,334,760
West Virginia	3,101,109	3,798,215	4,203,360	3,708,905	4,324,863
Connecticut, Kentucky, Missouri, Rhode Island, and Wisconsin	2,208,277	2,047,274	2,174,401	[1] 1,450,336	[1] 2,146,725
Total	65,088,462	63,850,115	73,593,528	59,061,442	73,584,214
Beehive coke:					
Colorado	7,163	600			
Kentucky	81,871	81,407	62,500		37,780
Pennsylvania	4,848,550	3,750,606	4,635,513	432,061	1,313,694
Utah	129,680	85,111	83,863	58,558	111,476
Virginia	190,200	202,328	188,033	72,092	140,555
West Virginia	302,476	283,942	273,420	38,343	114,107
Total	5,559,940	4,403,994	5,243,329	601,054	1,717,612
Grand total	70,648,402	68,254,109	78,836,857	59,662,496	75,301,826

[1] Excludes Rhode Island.

TABLE 8.—Oven coke produced in the United States in 1955, by steel-producing districts [1]

District	In existence Dec. 31		Coal carbonized (net tons)	Yield of coke from coal (percent)	Coke produced (net tons)	Value of coke at ovens	
	Plants	Ovens				Total	Per ton
Eastern	17	3,492	21,703,436	71.46	15,509,616	$223,766,063	$14.43
Pittsburgh-Youngstown	22	5,001	36,787,140	68.12	25,057,744	371,112,438	14.81
Cleveland-Detroit	10	1,927	11,998,693	71.66	8,598,274	141,038,423	16.40
Chicago	18	3,251	19,957,572	71.57	14,283,752	262,970,596	18.41
Southern	10	1,578	9,841,330	73.13	7,196,823	138,047,572	19.18
Western	4	790	4,585,702	64.07	2,938,005	62,695,081	21.34
Total	81	16,039	104,873,873	70.16	73,584,214	1,199,630,173	16.30

[1] As defined by American Iron and Steel Institute.

COKE BREEZE

TABLE 9.—Coke breeze recovered at coke plants in the United States in 1955, by States

State	Yield per ton of coal [1] (percent)	Produced		Sold	
		Net tons	Value	Net tons	Value
Oven coke:					
Alabama	3.98	339,751	$3,324,971	189,879	$1,438,780
California	4.95	67,142	(2)	16,170	(2)
Colorado	5.59	66,195	(2)	141	(2)
Illinois	4.98	215,174	973,248	99,860	502,447
Indiana	4.77	632,206	3,144,943	218,680	1,102,496
Maryland	5.40	241,960	(2)	24	(2)
Massachusetts	6.08	47,335	(2)		
Michigan	4.85	222,131	1,230,208	52,799	322,234
Minnesota	3.51	50,059	216,709	27,776	(2)
New Jersey	7.18	98.800	(2)	259	(2)
New York	3.99	229,473	1,133,338	20	(2)
Ohio	5.02	845,284	3,869,385	277,342	1,390,995
Pennsylvania	4.25	1,213,055	4,721,304	116,728	531,415
Tennessee	1.32	3,429	(2)		
Texas	4.66	48,555	(2)	23,085	(2)
Utah	5.65	115,475	(2)	25,017	(2)
West Virginia	4.52	254,652	921,075	59,258	241,228
Connecticut, Kentucky, Missouri, and Wisconsin	5.67	171,549	1,227,962	63,469	500,137
Undistributed			4,086,819		631,343
Total 1955	4.66	4,862,225	24,849,962	1,170,507	6,661,075
At merchant plants	5.26	640,661	4,222,889	204,304	1,512,190
At furnace plants	4.58	4,221,564	20,627,073	966,203	5,148,885
Total 1954	4.65	3,930,553	19,964,416	841,845	4,582,858
Beehive coke:					
Pennsylvania	5.73	53,636	102,832	53,673	102,854
Utah	4.45	9,486	(2)	9,486	(2)
Virginia	8.05	21,289	165,787	21,505	166,335
West Virginia	2.32	4,384	(2)	4,384	(2)
Undistributed			40,710		40,710
Total 1955	5.54	88,795	309,329	89,048	309,899
Total 1954	6.72	27,523	174,217	56,734	312,630

See footnotes at end of table.

TABLE 9.—Coke breeze recovered at coke plants in the United States in 1955, by States—Continued

State	Used by producers— For steam raising		For other purposes [3]		Wasted (net tons)	On hand Dec. 31 (net tons)
	Net tons	Value	Net tons	Value		
Oven coke:						
Alabama	98,976	(2)	53,361	$572,755		37,403
California			50,972	(2)		
Colorado			69,401	(2)		2,327
Illinois	66,660	$261,733	31,264	134,281		54,162
Indiana	332,435	1,618,997	128,781	651,020		202,425
Maryland	205,519	(2)	28,279	(2)		32,429
Massachusetts	47,335	(2)				
Michigan	91,829	486,471	71,362	390,050		12,688
Minnesota	21,669	(2)	14,193	(2)		7,154
New Jersey	102,954	(2)				17,540
New York	176,456	857,090	46,542	(2)		82,992
Ohio	271,290	1,242,923	239,195	1,008,411		102,731
Pennsylvania	967,332	3,636,621	120,307	497,110		119,560
Tennessee	2,145	(2)	294	(2)		2,450
Texas			24,680	(2)		1,031
Utah			72,327	(2)		21,486
West Virginia	104,451	(2)	80,446	(2)		21,311
Connecticut, Kentucky, Missouri, and Wisconsin	92,752	651,894	1,059	5,293		41,414
Undistributed		3,870,383		1,909,790		
Total 1955	2,581,803	12,626,112	1,032,463	5,168,710		[4] 759,103
At merchant plants	407,085	2,545,196	14,065	71,374		111,893
At furnace plants	2,174,718	10,080,916	1,018,398	5,097,336		647,210
Total 1954	2,480,581	11,912,234	1,010,565	5,226,011	2,255	663,645
Beehive coke:						
Pennsylvania						
Utah						
Virginia						187
West Virginia						
Total 1955						187
Total 1954						440

[1] Computed by dividing production of breeze by coal carbonized at plants actually recovering breeze.
[2] Included with "Undistributed" to avoid disclosure of individual company figures.
[3] Includes 453,055 net tons valued at $2,160,636 used for sintering iron ore.
[4] Includes some breeze resulting from the screening of coke at blast furnaces.

NUMBER AND TYPE OF OVENS

Slot-Type Coke Ovens.—There were 16,039 slot-type coke ovens in operation in the United States on December 31, 1955—the largest number of ovens ever active in the United States, representing a gain of 148 ovens over 1954. New ovens completed and placed in operation totaled 565; but the loss of 417 ovens, which were dismantled for rebuilding or permanently abandoned, held the net gain low. The number of ovens completed in 1955 was the smallest since the coke-oven-expansion program was begun in January 1950. Since that date, 4,555 new slot-type coke ovens were constructed and put in operation through December 31, 1955. Despite the large number of ovens completed, the industry actually gained only 935, because some coke plants closed and also because a large proportion of the new construction was replacement of ovens originally built during World War I. Roughly 67 percent or 1,585 out of 2,360 of the ovens built in the last 3 years (1953–55) were replacements, mostly at iron and steel plants.

Table 11 lists slot-type ovens according to age groups. As coke ovens are not permanent structures and serviceable life is limited by a number of variable factors, such as kind and quality of refractory material used in building, operating conditions, and kind of coal carbonized, the average age of ovens in existence is quite important. The high replacement rate of ovens at furnace plants reduced the average age of ovens at these plants from 18.6 years at the end of 1949 to 15.8 years at the end of 1955. The average age of ovens at merchant plants, however, increased considerably during the same period—from 22.2 years to 26.4 years at the end of 1955. It appeared that this trend would continue for several years, as all of the new ovens under construction at the end of the year were at furnace plants.

Beehive Ovens.—Tables 12 and 13 show the capacity and number of ovens active in 1955. In all 10,104 beehive ovens were in existence at 66 plants on December 31, 1955, a decrease of 2,112 ovens and 9 plants from 1954. This change was not significant, however, as operators may report certain ovens in existence one year and not the next, according to industrial activity and general business conditions. Unlike slot-type ovens, which cannot be operated intermittently without damage to brickwork, beehive ovens can easily be started or taken out of production with a minimum of damage; therefore the number of beehives in existence has fluctuated widely in recent years, depending upon activity in the iron and steel industry.

TABLE 10.—Slot-type coke ovens completed and abandoned in the United States in 1955 and number in existence at end of year, by States

State	Plants in existence Dec. 31	Ovens						
		In existence Dec. 31		New		Abandoned during year [1]	Under construction Dec. 31	
		Number	Annual coke capacity (net tons)	Number	Annual coke capacity (net tons)		Number	Annual coke capacity (net tons)
Alabama	7	1,394	6,521,000	[2] 5	15,900		30	164,000
California	1	225	1,055,000					
Colorado	1	257	1,220,000					
Connecticut	1	70	410,000					
Illinois	8	711	3,073,500				50	279,000
Indiana	5	2,003	9,457,100				162	905,000
Kentucky	1	196	1,158,300					
Maryland	1	687	3,764,000					
Massachusetts	1	108	665,000					
Michigan	4	691	3,763,700					
Minnesota	3	241	1,074,600					
Missouri	1	96	360,000					
New Jersey	2	341	1,506,000					
New York	4	862	4,783,000					
Ohio	16	2,544	12,704,900	308	1,587,600	297		
Pennsylvania	14	4,149	20,915,600	252	1,220,100	120	19	144,000
Tennessee	1	44	205,900					
Texas	2	140	756,000					
Utah	2	308	1,345,700					
West Virginia	5	772	4,366,100					
Wisconsin	1	200	570,100					
Total 1955	81	16,039	79,675,500	565	2,823,600	417	261	1,492,000
At merchant plants	23	2,482	11,220,200	24	148,600			
At furnace plants	58	13,557	68,455,300	541	2,675,000	417	261	1,492,000
Total 1954	81	15,891	78,595,600	768	4,034,300	866	490	2,279,000

[1] Includes ovens dismantled for rebuilding.
[2] Idle ovens repaired and placed in operation.

TABLE 11.—Age of slot-type coke ovens in the United States on Dec. 31, 1955 [1]

Age	Merchant plants		Furnace plants		Total			
	Number of ovens	Annual coke capacity (net tons)	Number of ovens	Annual coke capacity (net tons)	Number of ovens	Percent of total	Annual coke capacity (net tons)	Percent of total
Under 5 years	165	875,000	3,072	16,219,100	3,237	20.2	17,094,100	21.4
From 5 to 10 years	253	1,191,000	2,669	14,795,100	2,922	18.2	15,986,100	20.1
From 10 to 15 years	252	1,113,700	2,149	11,438,100	2,401	15.0	12,551,800	15.7
From 15 to 20 years	184	1,213,700	1,434	7,781,300	1,618	10.1	8,995,000	11.3
From 20 to 25 years	60	223,000	214	1,023,300	274	1.7	1,246,300	1.6
From 25 to 30 years	463	2,459,800	622	3,462,300	1,085	6.8	5,922,100	7.4
From 30 to 35 years	155	503,600	404	1,771,600	559	3.5	2,275,200	2.9
From 35 to 40 years	470	2,024,200	2,377	9,677,500	2,847	17.7	11,701,700	14.7
40 years and over	480	1,616,200	616	2,287,000	1,096	6.8	3,903,200	4.9
Total 1955	2,482	11,220,200	13,557	68,455,300	16,039	100.0	79,675,500	100.0

[1] Age dates from first entry into operation or from last date of rebuilding.

TABLE 12.—Beehive-coke ovens reconstructed and abandoned in the United States in 1955 and number in existence at end of year, by States

State	Plants in existence Dec. 31	Ovens								
		In existence Dec. 31		In operating condition Dec. 31		Not in operating condition Dec. 31		Rebuilt or repaired	Abandoned or dismantled during year	In course of reconstruction Dec. 31
		Number	Annual coke capacity (net tons)	Number	Annual coke capacity (net tons)	Number	Annual coke capacity (net tons)			
Kentucky	1	195	120,000	180	110,700	15	9,300			
Pennsylvania	55	8,426	5,489,300	7,492	4,913,000	934	576,300	552	2,533	31
Utah	1	297	120,000	289	116,800	8	3,200			
Virginia	4	483	242,000	431	215,600	52	26,400	1		
West Virginia	5	703	314,000	398	160,600	305	153,400		132	
Total 1955	66	10,104	6,285,300	8,790	5,516,700	1,314	768,600	553	[1] 2,665	31
Total 1954	75	12,216	8,077,800	10,736	7,204,800	1,480	873,000	33	[1] 2,972	23

[1] Idle and not expected to resume production; removed from list of available ovens.

TABLE 13.—Average number of beehive-coke ovens active in the United States in 1955, by months

Month	Number	Month	Number	Month	Number
January	1,829	May	3,210	September	3,836
February	1,854	June	3,391	October	4,199
March	2,479	July	3,907	November	4,587
April	3,110	August	3,559	December	5,310

The number of active beehive coke ovens rose steadily in 1955 in accordance with increased activity at iron blast furnaces. Although the number of active ovens in December was the highest in 22 months, the number of ovens producing coke amounted to only 60 percent of the serviceable ovens in existence. One of the most important factors that kept some idle ovens from going into blast in western Pennsylvania was the lack of satisfactory coking coal accessible to the ovens.

CAPACITY OF OVEN-COKE PLANTS

The potential annual coke capacity of oven-coke plants in the United States was slightly less than 80 million tons at the end of 1955. This was 1 percent higher than in 1954 and 8 percent higher than on January 1, 1950. In the 6 years after the Defense Production Act of 1950 became effective, the industry increased capacity at an average annual rate of slightly more than 1 percent. Annual growth was small because of the steady decline in capacity at merchant oven-coke plants. The capacity at furnace plants gained about 15 percent, or almost 3 percent per year. Oven-coke plants are usually huge enterprises, particularly those connected with iron and steel plants. The average size of furnace plants amounted to 1,180 thousand tons capacity in 1955, whereas the annual coke capacity for merchant plants averaged 488 thousand tons. The trend in the past three decades has been to build larger plants because the unit cost of production of coke declines as the size of the plant increases. Also, the high initial construction costs of slot-type coke ovens make it difficult for small plants to operate profitably, and all of the plants constructed since 1940 have had a capacity of at least 480 thousand tons.

The potential annual coke capacity reported to the Bureau of Mines by the operating companies is based on the minimum coking time necessary to produce a coke with qualities suitable for its intended use. For this reason, the potential capacity of a plant may change from year to year, depending on the age and condition of ovens, the character and quality of coal carbonized, the grade of coke required, and other economic factors. Thus the capacity reported to the Bureau of Mines may differ from the designed or rated capacity estimated by the coke-oven builder at the time of construction. For example, if the generally accepted standard coking rate of 1 inch per hour were used to calculate the capacity of slot-type coke ovens on December 31, 1955, it would have been 82,657,600 tons, which is 4 percent higher than the potential capacity reported to the Bureau of Mines. However, because of factors previously mentioned, the maximum potential capacity shown in table 14 is probably a reliable measure of the practical operating capacity for the years given.

The monthly rate of coke-oven operations in table 15 was compiled from the production data obtained from the producing companies through a monthly survey. The production rate in 1955 showed a steady increase throughout the year, rising from 85.6 percent of capacity in January to a peak of 99.5 percent in December. This figure was somewhat higher than the actual production rate, because some capacity was added during the year for which no adjustments could be made. The Bureau of Mines does not collect monthly data on new or abandoned oven-coke capacity. However, even if it had been possible to adjust coke capacity, the production rate would still have been near capacity.

TABLE 14.—Potential maximum annual coke capacity of all oven-coke plants in existence in the United States, 1949 and 1951–55

Year	Merchant plants				Furnace plants				Total			
	In existence Dec. 31		Potential maximum annual coke capacity (net tons)	Change from 1949 (percent)	In existence Dec. 31		Potential maximum annual coke capacity (net tons)	Change from 1949 (percent)	In existence Dec. 31		Potential maximum annual coke capacity (net tons)	Change from 1949 (percent)
	Plants	Ovens			Plants	Ovens			Plants	Ovens		
1949	30	3,057	14,209,200	------	55	12,047	59,500,900	------	85	15,104	73,710,100	------
1951	27	2,958	13,535,500	− 4.7	56	12,361	60,692,900	+2.0	83	15,319	74,228,400	+0.7
1952	25	2,781	12,779,700	−10.1	57	12,827	63,648,300	+7.0	82	15,608	76,428,000	+3.7
1953	24	2,693	12,090,900	−14.9	58	13,296	66,167,100	+11.2	82	15,989	78,258,000	+6.2
1954	23	2,458	10,686,300	−24.8	58	13,433	67,909,300	+14.1	81	15,891	78,595,600	+6.6
1955	23	2,482	11,220,200	−21.0	58	13,557	68,455,300	+15.0	81	16,039	79,675,500	+8.1

TABLE 15.—Relationship of production to potential maximum capacity[1] at oven-coke plants in the United States, 1951–55, by months, in percent

Month	1951	1952	1953	1954	1955	Month	1951	1952	1953	1954	1955
January	97.8	97.7	96.8	82.6	85.6	August	96.5	90.2	93.5	67.9	93.3
February	95.5	97.7	96.4	78.4	87.9	September	96.2	92.9	92.5	69.8	96.5
March	96.2	97.7	95.8	75.0	91.4	October	95.4	94.3	91.8	76.6	96.7
April	96.7	86.5	93.9	70.6	92.6	November	95.3	95.0	89.6	81.4	98.4
May	97.6	86.1	93.8	70.0	93.7	December	95.8	95.7	85.0	84.4	99.5
June	97.9	38.1	94.3	70.4	92.9						
July	97.3	36.1	93.9	69.6	90.5	Year	96.5	84.0	93.1	74.7	93.3

[1] Capacity of all ovens in existence, whether active or idle, based upon maximum daily capacity times days in month.

QUANTITY AND VALUE OF COAL CARBONIZED

The coke industry carbonized about one-fifth of the bituminous coal produced in the United States in 1955 and ranked second to the electric-power utilities among the major coal-consuming groups. The combined total quantity of bituminous coal and anthracite converted into coke increased 26 percent over 1954 but failed to equal the 1951 quantity carbonized by 5,942,797 tons. Slot-type coke ovens carbonized the largest quantity on record, but the beehive ovens carbonized 8 million tons less than in 1951.

Tables 16 and 17 show the consumption of bituminous coal and anthracite, by months, for 1955. Because of the continuous nature of the carbonizing process, coal utilization at coke plants is rather uniform and does not vary greatly with seasonal changes. Consumption of coal in beehive ovens, although small in comparison with the quantity carbonized in slot-type ovens, rose steadily during 1955 and in December was being charged into ovens at three times the rate of January. Slot-type ovens showed a more uniform pattern of coal utilization, with consumption in December reaching a new all-time monthly record.

Pennsylvania, the perennial leader in coking-coal consumption, utilized 27 percent of all coal carbonized in slot-type coke ovens and 74 percent of the total charged into beehive ovens. Following Pennsyl-

vania were Ohio, Indiana, and Alabama, which together carbonized 37 percent of the total. These four States therefore carbonized almost two-thirds of the Nation's total. The use of coal for making coke continued to decline in the States along the east coast. For example, the annual consumption in New York in 1955 was 2,889,916 tons less than the quantity used in 1944 because of the closing of all but one merchant oven-coke plant. Notable decreases also occurred in Massachusetts and New Jersey in the same period. States that have had the largest increases in the use of coal in coke ovens in the past decade are Pennsylvania, Ohio, West Virginia, and Indiana.

The average value per ton of coal delivered to oven-coke plants decreased for the second consecutive year in 1955. The average value of coal at beehive plants also decreased after rising for 14 consecutive years. Although the Bureau of Mines does not collect manufacturing costs of coke, it is generally agreed that coal costs represent between 80 and 85 percent of coke-manufacturing costs. Delivered costs of coal are therefore of utmost importance to coke-plant operators and have a definite influence on the manufacturing costs of coke and coal chemicals. As indicated in table 18, average value of coal per ton varies widely among the coke-producing States. One of the major factors governing coal costs is transportation. The cost of coal that must be transported great distances will naturally be higher than for coal transported relatively short distances. Thus Minnesota, Indiana, New York, and Illinois had the highest unit costs in 1955, whereas in West Virginia, where coal was obtained from nearby mines, the average per ton was the lowest.

Table 19 shows the average value of coal, by States, for 1955 and several previous years. Since the base period 1947–49, coal costs for oven-coke plant operators have risen more in Alabama than in any other State (19 percent). Other States showing substantial increases in coal costs were West Virginia, Indiana, Pennsylvania, and Minnesota, where costs advanced 17, 16, 14, and 12 percent, respectively.

Table 20 shows the trend in coal costs and value of coke-oven products per ton of coal. In 1947–49 the value of coke-oven products obtained from 1 ton of coal, valued at $7.79, averaged $11.53. This

TABLE 16.—Bituminous coal carbonized in coke ovens in the United States, 1947–49 (average) and 1954–55, by months, in net tons

Month	1947–49 (average)			1954			1955		
	Slot type	Beehive	Total	Slot type	Beehive	Total	Slot type	Beehive	Total
Jan.	8,320,100	987,400	9,307,500	8,048,400	257,800	8,306,200	8,252,100	101,800	8,353,900
Feb.	7,647,600	906,500	8,554,100	6,903,900	104,000	7,007,900	7,625,200	107,800	7,733,000
Mar.	8,195,000	726,000	8,921,000	7,301,700	57,900	7,359,600	8,748,900	176,100	8,925,000
Apr.	7,448,200	700,900	8,149,100	6,661,200	61,400	6,722,600	8,518,800	207,400	8,726,200
May	8,096,100	905,800	9,001,900	6,813,800	53,500	6,867,300	8,922,200	228,500	9,150,700
June	7,697,200	673,900	8,371,100	6,593,600	54,800	6,648,400	8,515,300	256,600	8,771,900
July	7,631,400	482,200	8,113,600	6,581,300	56,100	6,637,400	8,612,700	238,000	8,850,700
Aug.	7,901,400	665,500	8,566,900	6,427,300	72,700	6,500,000	8,878,800	272,900	9,151,700
Sept.	7,617,700	645,000	8,262,700	6,395,200	68,000	6,463,200	8,849,100	269,000	9,118,100
Oct.	6,397,800	669,100	7,066,900	7,245,400	54,800	7,300,200	9,147,000	300,400	9,447,400
Nov.	7,118,300	641,900	7,760,200	7,443,700	66,300	7,510,000	9,013,600	320,000	9,333,600
Dec.	8,326,100	712,700	9,038,800	7,995,100	72,300	8,067,400	9,424,000	390,700	9,814,700
Total	92,396,900	8,716,900	101,113,800	84,410,600	979,600	85,390,200	104,507,700	2,869,200	107,376,900

was a gain of $3.74 over the coal costs. In 1955 the value of products obtained averaged $15.38, which was $6.54 over the cost of 1 ton of coal. In beehive coking the value added by converting coal to coke declined from $2.32 for 1947–49 to $2.16 in 1955.

TABLE 17.—Anthracite carbonized at oven-coke plants in the United States, 1947–49 (average) and 1952–55, by months, in net tons

Month	1947–49 (average)	1952	1953	1954	1955
January	17,600	18,400	18,900	24,900	20,000
February	16,600	16,800	17,500	21,600	21,300
March	19,300	16,600	21,500	20,900	28,900
April	21,500	16,600	22,800	19,400	31,700
May	18,800	18,100	26,300	18,800	33,700
June	19,800	16,400	24,300	16,700	31,200
July	18,200	14,400	24,500	15,600	27,600
August	18,900	14,900	24,500	17,300	29,100
September	20,100	15,200	20,800	16,600	36,700
October	22,000	18,000	22,900	19,100	38,700
November	20,900	23,400	23,700	18,700	32,900
December	16,700	18,100	26,900	19,800	34,400
Total	230,400	206,900	274,600	229,400	366,200

TABLE 18.—Quantity and value at ovens of coal carbonized in the United States in 1955, by States

State	Coal carbonized (net tons)	Value of coal		Coal per ton of coke	
		Total	Per ton	Net tons	Value
Oven coke:					
Alabama	8,539,610	$63,861,567	$7.48	1.37	$10.23
California	1,356,513	(1)	(1)	1.67	(1)
Colorado	1,184,889	(1)	(1)	1.50	(1)
Illinois	4,322,907	42,062,853	9.73	1.42	13.83
Indiana	13,240,028	138,220,007	10.44	1.40	14.58
Maryland	4,478,535	(1)	(1)	1.38	(1)
Massachusetts	778,998	(1)	(1)	1.41	(1)
Michigan	4,579,840	39,868,685	8.71	1.34	11.65
Minnesota	1,425,899	14,961,662	10.49	1.39	14.54
New Jersey	1,376,630	(1)	(1)	1.39	(1)
New York	5,746,871	56,553,882	9.84	1.42	14.02
Ohio	16,831,990	144,413,024	8.58	1.44	12.34
Pennsylvania	28,512,180	223,496,664	7.84	1.46	11.47
Tennessee	259,239	(1)	(1)	1.24	(1)
Texas	1,042,481	(1)	(1)	1.40	(1)
Utah	2,044,300	(1)	(1)	1.53	(1)
West Virginia	6,127,655	41,643,100	6.80	1.42	9.63
Connecticut, Kentucky, Missouri, and Wisconsin	3,025,308	27,204,360	8.99	1.41	12.67
Undistributed		135,086,905	10.79		15.58
Total 1955	104,873,873	927,372,709	8.84	1.43	12.60
At merchant plants	12,682,370	115,841,836	9.13	1.39	12.74
At furnace plants	92,191,503	811,530,873	8.80	1.43	12.58
Total 1954	84,639,973	761,516,255	9.00	1.43	12.89
Beehive coke:					
Kentucky	68,765	(1)	(1)	1.82	(1)
Pennsylvania	2,124,733	11,564,523	5.44	1.62	8.80
Utah	213,038	(1)	(1)	1.91	(1)
Virginia	273,968	1,315,252	4.80	1.95	9.36
West Virginia	188,708	999,999	5.30	1.65	8.76
Undistributed		2,168,927	7.70		14.53
Total 1955	2,869,212	16,048,701	5.59	1.67	9.34
Total 1954	979,646	6,304,656	6.44	1.63	10.49

[1] Included with "Undistributed" to avoid disclosure of individual company figures.

TABLE 19.—Average value per net ton of coal carbonized at oven-coke plants in the United States, 1947–49 (average) and 1952–55, by States

State	1947–49 (average)	1952	1953	1954	1955
Alabama	$6.27	$7.06	$6.93	$6.69	$7.48
Illinois	9.00	10.59	10.62	10.03	9.73
Indiana	8.99	11.33	10.54	10.50	10.44
Michigan	7.98	9.52	9.71	9.03	8.71
Minnesota	9.40	10.61	10.76	10.33	10.49
New York	9.00	10.33	10.63	10.49	9.84
Ohio	7.75	8.96	9.21	8.85	8.58
Pennsylvania	6.88	8.06	8.11	8.05	7.84
West Virginia	5.79	7.13	7.28	6.96	6.80
Other States [1]	8.58	10.58	10.89	[2] 10.59	[2] 10.44
United States average	7.79	9.23	9.24	9.00	8.84
Value of coal per ton of coke	11.09	13.14	13.17	12.89	12.60

[1] California, Colorado, Connecticut, Kentucky, Maryland, Massachusetts, Missouri, New Jersey, Rhode Island, Tennessee, Texas, Utah, and Wisconsin.
[2] Excludes Rhode Island.

TABLE 20.—Value of coal and products per net ton of coal carbonized in the United States, 1947–49 (average) and 1951–55

Year	Oven coke					Beehive coke	
	Value of coal per ton	Value per ton of coal				Value of coal per ton	Value per ton of coal
		Coke produced	Breeze produced	Coal-chemical materials used or sold [1]	Total		
1947–49 (average)	$7.79	$8.49	$0.19	$2.85	$11.53	$4.90	$7.22
1951	8.94	9.95	.19	3.41	13.55	6.15	8.97
1952	9.23	10.18	.21	3.45	13.84	6.26	8.87
1953	9.24	10.30	.21	3.58	14.09	6.36	9.27
1954	9.00	11.12	.23	3.83	15.18	6.44	8.69
1955	8.84	11.44	.24	3.70	15.38	5.59	7.75

[1] Includes value of surplus gas and of tar and pitch-of-tar burned. Data for years before 1955 have been revised to include value of pitch-of-tar burned.

PREPARATION AND SOURCE OF COAL

Washed and Unwashed Coal.—In 1955, 70 percent of all coal carbonized at oven- and beehive-coke plants was washed before carbonization. This was the highest percentage of washed coal carbonized on record and indicated the importance coke-oven operators attached to coal cleaning. Although the washing or cleaning of coal predates the construction of the first slot-type coke oven in the United States, it did not become an important factor in cokemaking until recent years. From the year of earliest record until the end of World War II, the percentage of coal carbonized that was washed ranged from 7 to 25. In this period, much of the coal used was of high quality that did not require any upgrading or cleaning. Depletion of reserves of some of these high-quality coals has made it necessary to use inferior coals, which require some preparation before coking. Also, the rapid rise in coal-mine mechanization has increased productivity but has also resulted in increased refuse content of the coal. These factors have necessitated the cleaning of coal in

many areas, and cleaning and preparation facilities have been installed at many coal-mining operations since the end of World War II.

Table 22 shows the tremendous increase in the use of washed coal at 10-year intervals from 1890 to 1950 and 1951–55, inclusive. The rise in the use of washed coal for carbonization has been general, and virtually all sections of the United States that produced oven coke in 1955 used varying proportions of washed coal. Virtually all coals mined and used for cokemaking originating in Alabama and Colorado are washed. Although only minor quantities of the Pennsylvania, West Virginia, and Kentucky coals were washed in the 1920's and 1930's, much larger proportions originating in these States were washed in 1955. Although precise figures on the amount of washed coals carbonized originating in each State are not available, it is estimated that 79 percent of the Pennsylvania coal was washed and 60 and 76 percent, respectively, of the West Virginia and Kentucky coals were washed. Coal for making beehive coke was rarely washed in the first quarter of the century. In recent years, however, beehive ovens have been using larger proportions of cleaned or washed coal. Clean coal is advantageous to coke-plant operators, because coke quality depends more on coal quality than on oven design and operating technique.

Blending.—Oven-coke plant operators mix or blend coking coals before carbonization to obtain and maintain uniformity in the chemical and physical characteristics of the coke produced. As virtually all coke plants obtain coal from more than one mine and from different fields, the quality of coal varies from field to field and even from mine to mine in the same field, so that mixing or blending is necessary. Mixing also enables the coke-producing companies to use varying proportions of inferior coal that could not be used by themselves. Thus, in addition to permitting the coke-plant operators to control the quality of coke, blending also increases the range of coal that can be used in slot-type coke ovens. Although all oven-coke plants have facilities for mixing or blending coal, usually only two types are mixed, such as high- and low-volatile coals. A few plants can, however, mix or blend all 3 types (high-, medium-, and low-volatile coals) while several mix or blend coals of only 1 type, that is all high- or all medium-volatile.

In 1955, 76 of the 81 active oven-coke plants used coals of different volatile content. Of these, 55 used high- and low-volatile coals; 18, high-, medium-, and low-; 1, high- and medium-; and 2, low- and medium-volatile. Of those that did not mix coals of different volatile content, 1 plant used only high- and 4 used only medium-volatile.

Table 23 shows the types of coal carbonized in each State in 1955. Alabama used the largest amount of medium-volatile coal, largely because this type of coal is mined there. Indiana was the greatest consumer of low-volatile coal, accounting for 26 percent of the total consumption of this type, while Pennsylvania led all States in the use of high-volatile coal, carbonizing one-third of the total national consumption.

Source.—The largest reserves of coking coal in the United States, and possibly in the world, occur in the Appalachian region, extending from Alabama northeastward to Pennsylvania. In 1955, States

comprising this region (Alabama, Tennessee, Kentucky, Virginia, West Virginia, and Pennsylvania) supplied 96 percent of all bituminous coal carbonized in slot-type ovens in the United States. High-, medium-, and low-volatile coals are mined in this region. The low-volatile coals are extremely important because of their strong caking or coking characteristics and are in great demand by the metallurgical-coke producers.

West Virginia shipped the largest quantity of coking coal to oven-coke plants in 1955. More important, mines in this State supplied 72 percent of all low-volatile coal shipped to coke plants. West Virginia coking coal is widely distributed and was shipped to oven-coke plants in 19 States in 1955. Indiana was the leading consumer of West Virginia coal, obtaining 57 percent of its requirements from this State in 1955. Other States that used large tonnages of West Virginia coal were Ohio, Pennsylvania, Maryland, Michigan, and Illinois. West Virginia coal shipped to Ohio represented 44 percent of the total amount of coal obtained by coke-plant operators in that State, 21 percent of the Pennsylvania total, 86 percent of the Maryland total, 53 percent of the Michigan total, and 43 percent of the Illinois total. Pennsylvania ranked second to West Virginia as a source of coal for oven-coke plants and, if coal charged into beehive ovens were added, would just about equal West Virginia's total. However, Pennsylvania coal is not distributed as widely as that of West Virginia, and 61 percent was used at oven-coke plants within the State. The third largest producer of coking coal in 1955 was Kentucky, with 11,818,814

TABLE 21.—Washed and unwashed coal carbonized in the United States in 1955, by States in which used, in net tons

State	Slot-type ovens				Beehive ovens		
	Bituminous		Anthracite	Total	Bituminous		
	Washed	Unwashed			Washed	Unwashed	Total
Alabama	8,125,160	406,777	7,673	8,539,610			
California	1,247,686	108,827		1,356,513			
Colorado	1,184,889			1,184,889			
Illinois	2,355,961	1,948,955	17,991	4,322,907			
Indiana	11,380,482	1,828,340	31,206	13,240,028			
Maryland		4,478,535		4,478,535			
Massachusetts		763,048	15,950	778,998			
Michigan	4,009,944	505,636	64,260	4,579,840			
Minnesota	678,802	728,445	18,652	1,425,899			
New Jersey	757,689	595,364	23,577	1,376,630			
New York	3,309,507	2,418,593	18,771	5,746,871			
Ohio	13,372,005	3,429,325	30,660	16,831,990			
Pennsylvania	19,923,411	8,518,774	69,995	28,512,180	1,257,714	867,019	2,124,733
Tennessee		255,349	3,890	259,239			
Texas	705,041	337,440		1,042,481			
Utah	75,312	1,968,988		2,044,300	213,038		213,038
Virginia					160,847	113,121	273,968
West Virginia	3,989,398	2,138,257		6,127,655		188,708	188,708
Connecticut, Kentucky, Missouri, and Wisconsin	2,620,471	341,294	63,543	3,025,308	39,165	29,600	68,765
Total 1955	73,735,758	30,771,947	366,168	104,873,873	1,670,764	1,198,448	2,869,212
At merchant plants	7,753,118	4,635,685	293,567	12,682,370			
At furnace plants	65,982,640	26,136,262	72,601	92,191,503			
Total 1954	57,318,895	27,091,705	229,373	84,639,973	386,443	593,203	979,646

tons moving to oven-coke plants in 10 States. Alabama was also a large producer of coking coal, and its mines supplied 95 percent of the total coal carbonized within the State.

As mentioned previously in this chapter, the average oven-coke plant in the United States is large, and daily requirements of coal are substantial. For this reason many coke-producing companies own and operate their own coal mines. These mines are referred to in industry as "captive" mines and usually sell little if any of their coal production on the open market. Coke-producing companies reported that 64 percent of their coal was obtained from captive mines in 1955. Furnace plants usually receive a greater proportion of their requirements from captive mines than do the merchant plants. In 1955 furnace plants obtained 67 percent of their total receipts from captive mines, whereas merchant plants obtained only 43 percent of their coal from captive mines.

TABLE 22.—Quantity and percent of bituminous coal carbonized in the United States that was washed for selected years, 1890–1955

Year	Unwashed coal (net tons)			Washed coal (net tons)			Total coal carbonized (net tons)	Percent of total washed
	At coke ovens	At beehive ovens	Total	At coke ovens	At beehive ovens	Total		
1890	----------	16,735,399	16,735,399	----------	1,269,810	1,269,810	18,005,209	7.1
1900	(1)	26,739,096	26,739,096	(1)	5,374,447	5,374,447	32,113,543	16.7
1910	(1)	(1)	49,396,402	(1)	(1)	13,691,925	63,088,327	21.7
1920	36,664,169	26,102,972	62,767,141	7,540,827	5,882,864	13,423,691	76,190,832	17.6
1930	54,538,391	3,315,902	57,854,293	10,982,930	968,242	11,951,172	69,805,465	17.1
1940	56,915,518	4,122,071	61,037,589	19,667,262	680,925	20,348,187	81,385,776	25.0
1950	56,964,709	7,491,549	64,456,258	37,792,326	1,596,836	39,389,162	103,845,420	37.9
1951	50,976,539	9,428,324	60,404,863	51,053,742	1,990,141	53,043,883	113,448,746	46.8
1952	41,296,504	4,534,222	45,830,726	49,406,131	2,377,425	51,783,556	97,614,282	53.0
1953	41,441,432	4,982,089	46,423,521	63,206,898	3,244,008	66,450,906	112,874,427	58.9
1954	27,091,705	593,203	27,684,908	57,318,895	386,443	57,705,338	85,390,246	67.6
1955	30,771,947	1,198,448	31,970,395	73,735,758	1,670,764	75,406,522	107,376,917	70.2

[1] Not available.

TABLE 23.—Origin of coal shipped to oven-coke plants in the United States in 1955, by producing fields and volatile content, in net tons

State and field [1] where coal was produced	Volatile content [2]			Total
	High	Medium	Low	
Alabama	580, 918	7, 760, 584		8, 341, 502
Arkansas			221, 306	221, 306
Colorado	1, 397, 227	91, 486		1, 488, 713
Illinois	619, 527			619. 527
Indiana	2, 182		6, 174	8, 356
Kentucky:				
Elkhorn	6, 270, 107			6, 270, 107
Harlan	4, 952, 366			4, 952, 366
Kenova-Thacker	596, 341			596, 341
New Mexico	12, 366			12, 366
Oklahoma	524, 502	479, 947	480, 670	1, 485, 119
Pennsylvania:				
Anthracite			386, 169	386, 169
Bituminous:				
Central Pennsylvania	1, 057, 480		5, 353, 254	6, 410, 734
Connellsville	13, 553, 940			13, 553, 940
Freeport	3, 449, 047			3, 449, 047
Pittsburgh	12, 709, 308	600, 000		13, 309, 308
Somerset			181, 552	181, 552
Westmoreland	257, 020			257, 020
Tennessee		285, 306		285, 306
Utah	2, 538, 055			2, 538, 055
Virginia:				
Buchanan	530, 155	120, 746		650, 901
Clinch Valley		82, 297		82, 297
Pocahontas			296, 343	296, 343
Southwestern	1, 687, 619			1, 687, 619
West Virginia:				
Coal River	414, 373			414, 373
Fairmont	6, 736, 238			6, 736, 238
Kanawha	6, 378, 525	278, 639		6, 657, 164
Kenova-Thacker	549, 424			549, 424
Logan	3, 613, 810	165, 392		3, 779, 202
New River	114, 173	398, 500	872, 794	1, 385, 467
Panhandle	37, 853			37, 853
Pocahontas			14, 207, 378	14, 207, 378
Randolph-Barbour	509, 383	165, 808		675, 191
Tug River			416, 012	416, 012
Webster-Gauley	914, 848	965, 121		1, 879, 969
Winding Gulf		47, 142	2, 719, 347	2, 766, 489
Canada		79, 103		79, 103
Total	70, 006, 787	11, 520, 071	25, 140, 999	106, 667, 857

[1] As defined by the United States Coal Commission of 1922.
[2] High-volatile—dry volatile matter over 31 percent; medium-volatile—dry volatile matter 31 percent or less and over 22 percent; low-volatile—dry volatile matter 22 percent or less and over 14 percent.

TABLE 24.—Coal shipped to oven-coke plants in the United States in 1955, by consuming States and volatile content,[1] in net tons

Coal consumed in—	High-volatile		Medium-volatile		Low-volatile		Total coal received (net tons)
	Net tons	Percent of total	Net tons	Percent of total	Net tons	Percent of total	
Alabama:							
Merchant plants	297,034	31.0	435,693	45.5	224,741	23.5	957,468
Furnace plants	188,900	2.4	7,493,139	96.9	53,820	.7	7,735,859
Total Alabama	485,934	5.6	7,928,832	91.2	278,561	3.2	8,693,327
California: Furnace plant	1,136,782	83.0			232,765	17.0	1,369,547
Colorado: Furnace plant	1,261,599	89.9			141,926	10.1	1,403,525
Illinois:							
Merchant plants	121,988	42.6	27,993	9.8	136,169	47.6	286,150
Furnace plants	2,959,298	73.1			1,088,077	26.9	4,047,375
Total Illinois	3,081,286	71.1	27,993	0.6	1,224,246	28.3	4,333,525
Indiana:							
Merchant plants	316,258	37.1	112,516	13.2	424,488	49.7	853,262
Furnace plants	6,569,008	51.8			6,101,324	48.2	12,670,332
Total Indiana	6,885,266	50.9	112,516	0.8	6,525,812	48.3	13,523,594
Maryland: Furnace plant	3,060,435	66.6			1,533,006	33.4	4,593,441
Massachusetts: Merchant plant	415,576	53.5	193,556	24.9	167,861	21.6	776,993
Michigan:							
Merchant plants	458,522	47.6			505,725	52.4	964,247
Furnace plants	2,657,687	73.3			969,725	26.7	3,627,412
Total Michigan	3,116,209	67.9			1,475,450	32.1	4,591,659
Minnesota:							
Merchant plant	57,798	23.8	75,167	30.9	110,367	45.3	243,332
Furnace plants	798,992	65.8	75,651	6.2	339,957	28.0	1,214,600
Total Minnesota	856,790	58.8	150,818	10.3	450,324	30.9	1,457,932
New Jersey: Merchant plants	975,730	71.7			384,656	28.3	1,360,386
New York:							
Merchant plant	588,655	74.0			207,030	26.0	795,685
Furnace plants	2,632,344	55.6	258,083	5.4	1,846,377	39.0	4,736,804
Total New York	3,220,999	58.2	258,083	4.7	2,053,407	37.1	5,532,489
Ohio:							
Merchant plants	819,748	56.5	120,746	8.3	510,767	35.2	1,451,261
Furnace plants	11,610,182	74.7	244,366	1.6	3,689,997	23.7	15,544,545
Total Ohio	12,429,930	73.1	365,112	2.2	4,200,764	24.7	16,995,806
Pennsylvania:							
Merchant plants	323,820	40.3	293,936	36.6	185,760	23.1	803,516
Furnace plants	23,256,629	81.7	1,207,801	4.2	3,999,774	14.1	28,464,204
Total Pennsylvania	23,580,449	80.6	1,501,737	5.1	4,185,534	14.3	29,267,720
Tennessee: Furnace plant	73,956	27.6	152,879	57.2	40,554	15.2	267,389
Texas: Furnace plants	619,486	60.6	275,617	27.0	126,439	12.4	1,021,542
Utah: Furnace plants	1,549,267	72.9	375,338	17.7	200,846	9.4	2,125,451
West Virginia:							
Merchant plants	1,085,609	93.1			81,045	6.9	1,166,654
Furnace plants	4,219,249	83.7			824,619	16.3	5,043,868
Total West Virginia	5,304,858	85.4			905,664	14.6	6,210,522
Connecticut, Kentucky, Missouri, and Wisconsin: Merchant plants	1,952,235	62.1	177,590	5.7	1,013,184	32.2	3,143,009
Grand total	70,006,787	65.6	11,520,071	10.8	25,140,999	23.6	106,667,857
At merchant plants	7,412,973	57.9	1,437,197	11.2	3,951,793	30.9	12,801,963
At furnace plants	62,593,814	66.7	10,082,874	10.7	21,189,206	22.6	93,865,894

[1] High-volatile—dry volatile matter over 31 percent; medium-volatile—dry volatile matter 31 percent or less and over 22 percent; low-volatile—dry volatile matter 22 percent or less and over 14 percent.

TABLE 25.—Origin and destination of coal shipped to oven-coke plants in the United States in 1955, by States, in net tons

Coal consumed in—	Coal produced in—														
	Alabama	Arkansas	Colorado	Illinois	Indiana	Kentucky	New Mexico	Oklahoma	Pennsylvania	Tennessee	Utah	Virginia	West Virginia	Canada	Total
Alabama:															
Merchant plants	732,727								7,629				217,112		957,468
Furnace plants	7,513,791								13,251	168,248			40,569		7,735,859
Total Alabama	8,246,518								20,880	168,248			257,681		8,693,327
California: Furnace plant		9,174	2,673				12,366	223,591			1,121,743				1,369,547
Colorado: Furnace plant		141,926	1,261,599												1,403,525
Illinois:															
Merchant plants						58			11,748			15,708	258,636		286,150
Furnace plants				593,393		1,699,573						166,510	1,587,899		4,047,375
Total Illinois				593,393		1,699,631			11,748			182,218	1,846,535		4,333,525
Indiana:															
Merchant plants					2,182				38,248			46,326	766,506		853,262
Furnace plants				26,134		5,234,956			220,958			187,029	7,001,255		12,670,332
Total Indiana				26,134	2,182	5,234,956			259,206			233,355	7,767,761		13,523,594
Maryland: Furnace plant									584,638			52,914	3,955,889		4,593,441
Massachusetts: Merchant plant						673			13,945				762,375		776,993
Michigan:															
Merchant plants									53,658			17,440	893,149		964,247
Furnace plants						1,218,342			119,804			761,098	1,528,168		3,627,412
Total Michigan						1,218,342			173,462			778,538	2,421,317		4,591,659
Minnesota:															
Merchant plant									19,700				223,632		243,332
Furnace plants						460,040							754,560		1,214,600
Total Minnesota						460,040			19,700				978,192		1,457,932
New Jersey: Merchant plants									23,367			84,786	1,252,233		1,360,386
New York:															
Merchant plant						308,607			172,849			33,030	281,199		795,685
Furnace plants						232,968			2,954,736			392,251	1,156,849		4,736,804
Total New York						541,575			3,127,585			425,281	1,438,048		5,532,489

Ohio:															
Merchant plants						37,148			25,930			190,751	1,197,432		1,451,261
Furnace plants						2,198,743			6,430,655			551,676	6,363,471		15,544,545
Total Ohio						2,235,891			6,456,585			742,427	7,560,903		16,995,806
Pennsylvania:															
Merchant plants									47,888				755,628		803,516
Furnace plants						261,311			22,709,277			29,964	5,463,652		28,464,204
Total Pennsylvania						261,311			22,757,165			29,964	6,219,280		29,267,720
Tennessee: Furnace plant									3,924	117,058		109,777	36,630		267,389
Texas: Furnace plants	94,984							926,558							1,021,542
Utah: Furnace plants		70,206	224,441					334,970			1,416,312	150	269	79,103	2,125,451
West Virginia:															
Merchant plants									81,045				1,085,609		1,166,654
Furnace plants									3,947,586				1,096,282		5,043,868
Total West Virginia									4,028,631				2,181,891		6,210,522
Connecticut Kentucky, Missouri, and Wisconsin: Merchant plants					6,174	166,395			66,934			77,750	2,825,756		3,143,009
Grand total	8,341,502	221,306	1,488,713	619,527	8,356	11,818,814	12,366	1,485,119	37,547,770	285,306	2,538,055	2,717,160	39,504,760	79,103	106,667,857
At merchant plants	732,727				8,356	512,881			562,941			465,791	10,519,267		12,801,963
At furnace plants	7,608,775	221,306	1,488,713	619,527		11,305,933	12,366	1,485,119	36,984,829	285,306	2,538,055	2,251,369	28,985,493	79,103	93,865,894

TABLE 26.—Quantity and percentage of captive coal received by oven-coke plants in the United States, 1947–49 (average) and 1951–55

Year	At merchant plants			At furnace plants			Total		
	Total coal received	Captive coal		Total coal received	Captive coal		Total coal received	Captive coal	
		Quantity	Percent		Quantity	Percent		Quantity	Percent
1947–49 (average)	18, 321, 004	5, 286, 361	28. 9	76, 138, 301	48, 371, 093	63. 5	94, 459, 305	53, 657, 454	56. 8
1951	18, 043, 398	6, 057, 169	33. 6	84, 536, 657	52, 471, 260	62. 1	102, 580, 055	58, 528, 429	57. 1
1952	15, 747, 658	5, 542, 423	35. 2	75, 452, 183	47, 290, 610	62. 7	91, 199, 841	52, 833, 033	57. 9
1953	15, 365, 899	5, 923, 998	38. 6	90, 710, 334	60, 121, 968	66. 3	106, 076, 233	66, 045. 966	62. 3
1954	9, 670, 190	4, 049. 080	41. 9	73, 615, 703	51, 828, 722	70. 4	83, 285, 893	55, 877, 802	67. 1
1955	12, 801, 963	5, 467. 619	42. 7	93, 865, 894	62, 205, 881	67. 3	106, 667, 857	68, 673, 500	64. 4

CONSUMPTION OF COKE

Coke is used chiefly as an industrial fuel, and the sharp upturn in industrial activity in 1955 caused consumption of coke to increase 29 percent over 1954. The apparent consumption of the country was determined by adding imports of coke to production, subtracting exports, and adjusting for changes in producers' stocks. The principal use of coke in the United States is for smelting iron ore in blast furnaces. The quantity consumed for this purpose was 31 percent higher than in 1954 but was 1,556,534 tons less than the record quantity used in 1953. Blast-furnace-coke requirements have increased substantially in the past 5 years owing to expansion of iron- and steel-making facilities, and it was expected that requirements would continue to rise because of the proposed expansion program over the next 5 years announced by various officials of iron and steel companies during 1955. Notwithstanding increased use of coke for foundry and miscellaneous other industrial purposes, the requirements of coke for gas manufacture and residential heating continued to drop in 1955; as a result, the proportion of coke used for all other purposes was the smallest on record.

Table 28 shows the amount of coke and coal equivalent used to make 1 ton of pig iron and ferroalloys in blast furnaces in 1955 and several prior years. The amount of coke required per ton of metal produced in a blast furnace decreased 2 pounds from 1954 and was the smallest on record. Better coke from cleaner coal, richer ores, and advancements in blast-furnace operating techniques were responsible for this improvement in fuel efficiency. Although the reduction in the coke rate appears small and insignificant, it is, on the contrary, quite important, as a savings of a few pounds of coke on every ton of metal amounts to a sizable figure when the tonnages of coke and iron currently handled in the iron and steel industry are considered.

Tables 29 and 30 show the principal end uses of oven and beehive coke consumed and sold by producing companies in 1955. Table 29 shows that the bulk (87 percent) of the production was used by the producing companies, whereas table 30 indicates that the preponderance of the beehive-coke supply was sold on the open market (commercial sales). Iron foundries, various industrial plants, and the residential heating market, as shown in table 29, are supplied almost wholly from merchant oven-coke plants. Some beehive coke is shipped to the same class of consumers, but over 73 percent was destined to iron blast furnaces.

TABLE 27.—Apparent consumption of coke in the United States, 1947–49 (average) and 1951–55, in net tons

Year	Total production	Imports	Exports	Net change in stocks	Apparent United States consumption [1]	Consumption			
						Iron furnaces [2]		All other purposes	
						Quantity	Percent	Quantity	Percent
1947–49 (average)	70,648,402	181,000	696,699	+280,230	69,852,473	55,877,463	80.0	13,975,010	20.0
1951	79,330,702	161,639	1,026,730	+372,258	78,093,353	66,623,205	85.3	11,470,148	14.7
1952	68,254,109	312,519	792,072	+418,685	67,355,871	57,969,044	86.1	9,386,827	13.9
1953	78,836,857	157,318	520,252	+778,051	77,695,872	69,596,514	89.6	8,099,358	10.4
1954	59,662,496	115,781	[3] 387,575	+269,132	[3] 59,121,570	51,741,260	87.5	[3] 7,380,310	12.5
1955	75,301,826	126,342	530,505	−1,248,069	76,145,732	68,506,721	90.0	7,639,011	10.0

[1] Production plus imports minus exports, plus or minus net change in stocks.
[2] American Iron and Steel Institute; figures include coke consumed in manufacture of ferroalloys.
[3] Revised figure.

TABLE 28.—Coke and coking coal consumed per net ton of pig iron produced in the United States, 1913, 1918, 1929, 1939, 1947–49 (average), and 1954–55

Year	Coke per net ton of pig iron and ferroalloys [1] (pounds)	Yield of coke from coal (percent)	Coking coal per net ton of pig iron and ferroalloys (pounds calculated)	Year	Coke per net ton of pig iron and ferroalloys [1] (pounds)	Yield of coke from coal (percent)	Coking coal per net ton of pig iron and ferroalloys (pounds calculated)
1913	2,172.6	66.9	3,247.5	1947–49 (av.)	1,919.7	69.7	2,754.2
1918	2,120.7	66.4	3,193.8	1954	1,763.3	69.7	2,529.8
1929	1,838.0	69.0	2,663.8	1955	1,761.3	69.9	2,519.7
1939	1,778.0	69.8	2,547.3				

[1] American Iron and Steel Institute; consumption per ton of pig iron only, excluding furnaces making ferroalloys, was 2,172.6 pounds in 1913, 2,120.7 in 1918, 1,813.3 in 1929, 1,760.0 in 1939, 1,892.8 in 1947–49 (average), 1,745.7 in 1954, and 1,745.8 in 1955.

TABLE 29.—Oven coke produced, used by producers, and sold in the United States in 1955, by States

State	Produced		Used by producing companies—				Commercial sales	
			In blast furnaces		For other purposes [1]		To blast-furnace plants	
	Net tons	Value	Net tons	Value	Net tons	Value	Net tons	Value
Alabama	6,245,253	$121,633,886	5,369,764	$104,878,681	66,773	$1,505,168	51,242	(2)
California	814,687	(2)	805,566	(2)	523	(2)		
Colorado	788,558	(2)	773,017	(2)	4,966	(2)		
Illinois	3,040,900	51,975,561	2,691,406	45,712,229	75,299	1,335,979	145,823	(2)
Indiana	9,482,233	175,815,764	8,781,255	162,684,186	20,825	344,315	165,138	(2)
Maryland	3,235,527	(2)	3,254,134	(2)	9,085	(2)		
Massachusetts	550,868	(2)	139,576	(2)	66,290	(2)	57,983	(2)
Michigan	3,421,141	63,567,315	2,445,751	(2)	311,688	6,848,112	107,693	$1,615,420
Minnesota	1,029,228	20,353,909	748,854	(2)	2,446	38,642	110,105	(2)
New Jersey	992,566	(2)			127,195	(2)	348,562	(2)
New York	4,035,076	57,288,441	3,327,444	45,944,502	34,466	477,447	566,402	(2)
Ohio	11,701,266	178,656,563	10,459,554	158,133,504	187,331	3,445,000	630,715	8,893,826
Pennsylvania	19,488,993	291,575,557	17,951,748	268,983,650	223,566	3,145,632	909,134	12,685,449
Tennessee	208,789	(2)	131,636	(2)	31,580	(2)		
Texas	742,781	(2)	672,747	(2)	15,409	(2)	35,149	(2)
Utah	1,334,760	(2)	1,227,788	(2)	20,751	(2)		
West Virginia	4,324,863	57,182,169	3,415,736	48,508,054	761,620	6,991,585	85,003	(2)
Connecticut, Kentucky, Missouri, and Wisconsin	2,146,725	33,793,195			88,360	1,452,978	1,473,118	19,420,341
Undistributed		147,787,813		178,533,084		4,444,661		24,515,397
Total 1955	73,584,214	1,199,630,173	62,195,976	1,013,377,890	2,048,173	30,029,519	4,686,067	67,130,433
At merchant plants	9,094,527	152,119,485	139,576	(2)	1,506,044	18,875,251	3,568,949	51,163,105
At furnace plants	64,489,687	1,047,510,588	62,056,400	(2)	542,129	11,154,268	1,117,118	15,967,328
Total 1954	59,061,442	940,769,073	50,056,776	792,018,934	2,149,047	28,636,370	1,597,560	22,092,110

State	Commercial sales—Continued							
	To foundries		To other industrial plants [4]		For residential heating		Total	
	Net tons	Value	Net tons	Value	Net tons	Value	Net tons	Value
Alabama	584,549	$13,231,595	249,919	$3,165,859	50,158	(2)	935,868	$17,904,914
California			2,275	(2)			2,275	(2)
Colorado	2,700	(2)	13,332	(2)	141	(2)	16,173	(2)
Illinois	104,833	(2)	48,759	564,290	16,442	$247,934	315,857	5,899,443
Indiana	405,713	(2)	191,607	2,491,734	55,111	684,104	817,569	15,518,780
Maryland								
Massachusetts	96,203	(2)	44,096	(2)	265,828	(2)	464,110	(2)
Michigan	376,089	(2)	82,911	1,159,589	76,705	(2)	643,398	13,020,242
Minnesota	139,198	(2)	52,060	885,892	13,913	(2)	315,276	6,190,660
New Jersey	81,830	(2)	304,429	(2)	341,864	(2)	1,076,685	(2)
New York	40,733	(2)	62,302	638,627	16,151	(2)	685,588	11,081,112
Ohio	289,000	6,918,363	156,100	1,875,076	30,147	382,019	1,105,962	18,069,284
Pennsylvania	218,559	5,155,213	276,444	3,066,591	97,722	1,354,268	1,501,859	22,261,521
Tennessee	33,381	(2)	3,712	(2)			37,093	(2)
Texas	512	(2)	21,114	(2)			56,775	(2)
Utah			34,159	(2)	2,994	(2)	37,153	(2)
West Virginia			51,473	389,584	138	(2)	136,614	1,562,784
Connecticut, Kentucky, Missouri, and Wisconsin	526,188	12,715,507	137,330	1,976,540	152,152	2,390,630	2,288,788	36,503,018
Undistributed		30,856,656		6,254,977		11,847,399		27,371,122
Total 1955	2,899,488	68,877,334	1,732,022	22,468,759	1,119,466	16,906,354	10,437,043	175,382,880
At merchant plants	2,668,446	63,448,306	1,044,961	15,731,727	1,025,776	15,933,163	8,308,132	146,276,301
At furnace plants	231,042	5,429,028	687,061	6,737,032	93,690	973,191	2,128,911	29,106,579
Total 1954	2,296,200	53,742,508	1,311,981	16,655,772	1,263,414	18,742,119	6,469,155	111,232,509

[1] Comprises 311,475 tons valued at $7,662,602 used in foundries; 237,300 tons, $3,412,830 to make producer gas; 908,675 tons, $9,257,381 to make water gas; and 590,723 tons, $9,696,706 for other purposes.
[2] Included with "Undistributed" to avoid disclosure of individual company figures.
[3] Concealed to avoid disclosure of individual company figures.
[4] Includes 86,430 tons valued at $1,399,244 sold to water-gas plants.

TABLE 30.—Beehive-coke produced, used by producers, and sold in the United States in 1955, by States

State	Produced		Used by producing companies—				Commercial sales	
			In blast furnaces		For other purposes		To blast-furnace plants	
	Net tons	Value	Net tons	Value	Net tons	Value	Net tons	Value
Kentucky	37,780	(1)					36,657	(1)
Pennsylvania	1,313,694	$16,226,852	126,988	$1,744,621			978,269	$12,164,329
Utah	111,476	(1)						
Virginia	140,555	1,995,647					87,233	1,264,044
West Virginia	114,107	1,512,241					60,776	(1)
Undistributed		2,496,715						1,189,656
Total 1955	1,717,612	22,231,455	126,988	1,744,621			1,162,935	14,618,029
Total 1954	601,054	8,511,488	204,878	3,172,449	121	$1,646	114,187	1,641,900

State	Commercial sales—Continued							
	To foundries		To other industrial plants		For residential heating		Total	
	Net tons	Value	Net tons	Value	Net tons	Value	Net tons	Value
Kentucky	1,123	(1)					37,780	(1)
Pennsylvania	23,519	$347,140	181,173	$1,939,000	4,567	$40,484	1,187,528	$14,490,953
Utah			111,411	(1)			111,411	(1)
Virginia	4,026	59,610	47,619	646,824	2,032	30,465	140,910	2,000,943
West Virginia	14,296	(1)	39,751	(1)			114,823	1,522,328
Undistributed		239,961		2,587,714				2,495,003
Total 1955	42,964	646,711	379,954	5,173,538	6,599	70,949	1,592,452	20,509,227
Total 1954	32,254	495,010	251,090	3,216,040	3,308	42,311	400,839	5,395,261

[1] Included with "Undistributed" to avoid disclosure of individual company figures.

DISTRIBUTION OF OVEN AND BEEHIVE COKE

Table 31 summarizes data on the geographic distribution, by principal end uses, of oven and beehive coke in 1955. In this section the terms "consumption" and "distribution" are used synonymously, as it is presumed that all of the coke destined to the States indicated in the table is ultimately consumed therein.

Pennsylvania, with its large concentration of heavy industry around the Pittsburgh district, led all coke-consuming States, with 26 percent of the national total. This State was also the ranking breeze-consuming State, using 24 percent of all breeze distributed. Ohio retained its rank as the second largest coke- and coke-breeze-consuming State, with deliveries to consumers amounting to 18 percent of all large coke and 14 percent of breeze. These 2 States therefore consumed nearly half of all the coke and 38 percent of the total breeze moved in 1955. Other States that were large consumers of coke were Indiana, Illinois, Alabama, New York, Michigan, and Maryland, which together utilized 41 percent of the United States total. The remainder of the coke destined to consumers within the United

TABLE 31.—Distribution of oven and beehive coke and breeze in 1955, in net tons

[Based upon reports from producers showing destination and principal end use of coke used or sold. Does not include imported coke, which totaled 126,342 tons in 1955]

Consuming State	Coke							Breeze
	To blast-furnace plants	To foundries	To producer-gas plants	To water-gas plants	To other industrial plants	For residential heating	Total	
Alabama	5,420,971	211,349			81,414	20,374	5,734,108	259,800
Arizona		1,748			35		1,783	36
Arkansas		2,958			2,093		5,051	783
California	805,566	78,016			66,632		950,214	55,629
Colorado	773,017	15,161			22,445	141	810,764	69,463
Connecticut		35,693	59,294	9,695	19,055	85,074	208,811	42,225
Delaware		1,844			248	211	2,303	1,817
District of Columbia		28			43		71	
Florida		2,212		20,861	8,200	686	31,959	36,389
Georgia		11,841			5,081	8,599	25,521	3,714
Idaho		457		6,321	84,422	86	91,286	27,058
Illinois	5,388,088	292,902			57,210	47,918	5,786,118	259,986
Indiana	7,385,448	184,946		7,484	103,625	39,307	7,720,810	532,228
Iowa		55,618			21,668	1,987	79,273	9,367
Kansas		14,294			1,172		15,466	188
Kentucky	673,380	46,662			166,303	6,567	892,912	46,188
Louisiana		6,662			68,227	344	75,233	169
Maine		3,359		16,625	66	10,862	30,912	
Maryland	3,254,442	24,486			15,549		3,294,477	234,653
Massachusetts	149,677	54,140	59,392	20,443	13,643	253,090	550,385	52,257
Michigan	2,937,258	716,823			178,735	72,682	3,905,498	243,002
Minnesota	630,751	30,910	513	556	24,408	11,825	698,963	69,609
Mississippi		847			65		912	92
Missouri		76,094			15,903	319	92,316	1,770
Montana		1,013			14,662		15,675	23,197
Nebraska		5,191			4,967	106	10,264	57
Nevada		42			10,326		10,368	946
New Hampshire		2,811		74	70	10,426	13,381	
New Jersey		82,292	62,036	62,914	70,855	234,591	512,688	113,046
New Mexico		996			491	40	1,527	13
New York	4,432,393	144,264		1,502	180,375	121,956	4,880,490	239,209
North Carolina		15,631		1,702	7,182	2,354	26,869	23,775
North Dakota		172			156	320	648	
Ohio	13,019,817	403,131		60,745	302,713	24,817	13,811,223	665,487
Oklahoma		5,696			1,717		7,413	12,245
Oregon		5,902			17,298		23,200	1,505
Pennsylvania	19,244,101	199,998	56,029	13,474	475,744	96,298	20,085,644	1,177,899
Rhode Island		11,804			47	21,327	33,178	
South Carolina		5,504			14,699	700	20,903	329
South Dakota		413			433	58	904	
Tennessee	172,851	96,053			100,432	2,449	371,785	227,770
Texas	672,791	66,452			80,371	123	819,737	106,038
Utah	1,227,788	12,181			42,317	2,908	1,285,194	80,175
Vermont		5,059			290	2,785	8,134	
Virginia	94,348	56,214		12,067	33,237	1,704	197,570	14,682
Washington		7,249			10,265		17,514	4,211
West Virginia	1,873,477	9,868		760,642	47,077	168	2,691,232	193,574
Wisconsin		151,397	36		13,149	30,664	195,246	20,407
Wyoming		247			1,483		1,730	3
Total	68,156,164	3,158,630	237,300	995,105	2,386,598	1,113,866	76,047,663	4,850,992
Exported	15,802	95,297			229,671	12,199	352,969	22,829
Grand total	68,171,966	3,253,927	237,300	995,105	2,616,269	1,126,065	76,400,632	4,873,821

States was distributed among the other 40 States and the District of Columbia.

Foundry coke had the widest distribution, with varying quantities consumed in every State, as well as the District of Columbia in 1955. Michigan, as usual, used the largest tonnage of foundry coke, followed by Ohio, Illinois, and Alabama. The quantity of coke used in manufacturing producer gas and water gas continued to decrease while shipments for other industrial applications increased substantially over 1954. The only State that showed increased consump-

tion of water-gas coke was West Virginia, where increased activity of the 2 synthetic ammonia plants raised coke consumption for synthesis gas (water gas) 10 percent over 1954. The market for domestic coke continued to decline, and total shipments for residential heating were 11 percent lower than in the preceding year.

STOCKS OF COKE AND COKING COAL

Coke.—Producers' stocks of coke decreased 42 percent at oven-coke plants and 51 percent at beehive plants in 1955. Changes in stocks of beehive coke, however, are not significant, because it is rarely stocked and inventories are small. Although oven-coke producers generally attempt to keep stocks at a minimum because some degradation occurs in stocking and reclaiming it, stocks usually increase when coke demand slackens and drop when demand increases. Merchant oven-coke plants started in 1955 with higher than normal inventories because of the recession in industrial activity in 1954. The acceleration at blast-furnace and other industrial operations, beginning with the second quarter of 1955, however, increased coke requirements, and demand exceeded the prevailing production rate for the remainder of the year. Consequently, stocks of coke at merchant plants began to decline, and by year's end had fallen 1 million tons to 310,714 tons. In terms of days' production, coke reserves held by merchant producers amounted to but 11 days' production compared with 59 days at the end of 1954.

Furnace plants also were forced to use stocked coke, and inventories at the end of the year were 15 percent below those at the beginning. In other words, the furnace-coke plants' stock, in terms of days' production, dropped from 10 days at the beginning of the year to 7 days on December 31, 1955. Virtually all reserves held by furnace plants were blast-furnace grade, whereas merchant plants' reserves consisted of 34 percent blast-furnace grade, 13 percent foundry, and 53 percent all other grades.

Coking Coal.—Stocks of bituminous coal at oven-coke plants increased 8 percent (986,354 tons) during 1955 and at the end of the year were sufficient for 44 days' supply based on the prevailing rate of consumption. Stocks of anthracite also increased, but changes in anthracite stocks are not significant because the practice of mixing or blending anthracite with bituminous coal is not universal, as only 20 of the active oven-coke plants reported the use of anthracite. Stocks of bituminous coal are extremely important to oven-coke plant operators because of the continuous nature of the carbonizing process. To safeguard against any interruption in the flow of coal from mines to coke plants, a minimum of 30 days' supply at normal operating rates is generally considered essential.

In terms of days' supply, stocks of bituminous coal ranged from a high of 48 days in August to a low of 38 days in April. The low figure in April may be attributed to the reduction in stocks of coal at plants along the Great Lakes that obtain most of their supply by boat. Stocks at these plants are built up during the shipping season and naturally decline during the winter, when Lake shipping stops. The highest quantity of bituminous coal in stock was on September 30, when 13,993,102 tons was on hand at producing plants.

TABLE 32.—Producers' stocks of coke and breeze in the United States on Dec. 31, 1955, by States, in net tons

State	Coke				Breeze
	Blast furnace	Foundry	Residential heating and other	Total	
Oven coke:					
Alabama	264,784	9,675	16,838	291,297	37,403
California	13,038			13,038	
Colorado	24,299			24,299	2,327
Illinois	76,160		1,138	77,298	54,162
Indiana	117,031	1,826	5,377	124,234	202,425
Maryland	43,987			43,987	32,429
Massachusetts	69,128	650	26,761	96,539	
Michigan	40,828	1,687	5,368	47,883	12,688
Minnesota	5,611	731	2,243	8,585	7,154
New Jersey	4,659	265	8,616	13,540	17,540
New York	129,213	8	551	129,772	82,992
Ohio	209,335	1,358	13,231	223,924	102,731
Pennsylvania	247,009	3,217	20,725	270,951	119,560
Tennessee	22,316	1,156	2,811	26,283	2,450
Texas	9,779	25		9,804	1,031
Utah	153,585			153,585	21,486
West Virginia	13,824		19,851	33,675	21,311
Connecticut, Kentucky, Missouri, and Wisconsin	15,666	26,908	65,932	108,506	41,414
Total 1955	1,460,252	47,506	189,442	1,697,200	759,103
At merchant plants	104,137	40,989	165,588	310,714	111,893
At furnace plants	1,356,115	6,517	23,854	1,386,486	647,210
Total 1954	2,063,468	140,556	737,547	2,941,571	663,645
Beehive coke:					
Pennsylvania	2,219		173	2,392	
Utah			414	414	
Virginia	436	20	122	578	187
West Virginia	187			187	
Total 1955	2,842	20	709	3,571	187
Total 1954	2,011	808	4,450	7,269	440

TABLE 33.—Producers' month-end stocks of oven coke in the United States, 1954–55, in net tons

[Includes blast-furnace, foundry, and domestic coke]

Month	Furnace plants		Merchant plants		Total	
	1954	1955	1954	1955	1954	1955
January	1,702,096	1,653,676	1,048,913	1,093,962	2,751,009	2,747,638
February	1,648,676	1,632,095	1,095,701	981,426	2,744,377	2,613,521
March	1,525,059	1,579,178	1,193,797	946,484	2,718,856	2,525,662
April	1,579,319	1,529,245	1,280,870	955,934	2,860,189	2,485,179
May	1,657,007	1,373,176	1,354,989	972,865	3,011,996	2,346,041
June	1,608,801	1,226,880	1,364,236	960,757	2,973,037	2,187,637
July	1,619,475	1,197,727	1,223,564	914,264	2,843,039	2,111,991
August	1,624,393	1,249,569	1,231,481	806,226	2,855,874	2,055,795
September	1,693,152	1,291,359	1,223,635	683,772	2,916,787	1,975,131
October	1,638,135	1,239,855	1,212,560	541,649	2,850,695	1,781,504
November	1,597,262	1,318,911	1,206,854	428,625	2,804,116	1,747,536
December	1,624,239	1,386,486	1,317,332	310,714	2,941,571	1,697,200

TABLE 34.—Month-end stocks of bituminous coal at oven-coke plants in the United States, 1951–55, in net tons

Month	1951	1952	1953	1954	1955
January	16, 960, 185	14, 827, 371	13, 400, 118	14, 885, 244	11, 506, 274
February	16, 366, 139	15, 786, 416	13, 381, 865	14, 729, 885	11, 065, 243
March	16, 751, 447	16, 726, 606	13, 278. 027	13, 886, 998	10, 776, 055
April	16, 464, 045	16, 652, 421	13, 408, 394	12, 856, 055	10, 693, 689
May	16, 179, 877	16, 799, 063	13, 898, 342	12, 595, 826	11, 515, 962
June	16, 254, 127	16, 894, 290	14, 537, 894	12, 659, 445	12, 745, 576
July	14, 034, 705	16, 135, 572	13, 220, 760	11, 125, 064	12, 342, 332
August	14, 448, 916	16, 066, 471	14, 698, 394	11, 571, 296	13, 665, 828
September	14, 426, 401	15, 728, 472	15, 910, 098	11, 869, 082	13, 993, 102
October	14, 953, 056	14, 436, 545	16, 609, 099	12, 192, 655	13, 892, 194
November	15, 123, 117	13, 637, 219	16, 719, 776	12, 484, 403	13, 603, 970
December	15, 257, 762	14, 429, 783	16, 485, 527	12, 356, 618	13, 342, 972

TABLE 35.—Month-end stocks of anthracite at oven-coke plants in the United States, 1951–55, in net tons

Month	1951	1952	1953	1954	1955
January	31, 618	46, 933	44, 803	72, 594	46, 725
February	26, 094	38, 495	35, 389	63, 369	37, 982
March	22, 634	34, 719	32, 513	54, 288	26, 745
April	24, 406	30, 506	33, 480	48, 211	31, 861
May	32, 971	29, 399	44, 524	37, 244	40, 726
June	44, 193	42, 216	58, 561	45, 822	53, 248
July	44, 036	41, 583	57, 989	44, 525	55, 974
August	46, 191	45, 300	60, 010	47, 788	55, 529
September	39, 280	43, 865	61, 559	44, 858	59, 886
October	51. 656	50, 148	70, 066	50, 736	63, 243
November	58, 903	58, 422	74, 386	56, 856	73, 281
December	57, 122	54, 720	79, 381	54, 130	80, 464

ASSIGNED VALUE AND PRICE

The average values, at the ovens, of oven and beehive coke produced, which include values of coke consumed by producing companies as well as coke sold, are based on reports from the producing companies showing receipts f. o. b. plant for coke sold and market values assigned by producers for coke consumed by the producing companies. The assigned value per ton of the total coke produced and the average price f. o. b. for coke sold are listed in tables 36 and 37. The average monthly prices of furnace and foundry beehive coke and foundry oven coke in certain markets, quoted by Steel Magazine in 1955, are shown in table 38.

Before 1954 the producing companies were requested to assign only a bookkeeping value to the coke consumed by the producing companies. In 1954 the producers were requested to assign a market value to the portion of their production that they used. As a consequence, the average values of coke produced at oven-coke plants, beginning in 1954, are not comparable with those of preceding years. The average price of all oven and beehive coke sold (commercial sales only) dropped for the second consecutive year in 1955 (table 36).

In table 37 average prices of oven and beehive coke are given by grades and by States. The average prices of all grades of oven coke increased over 1954, notwithstanding the fact that the weighted average price of all oven coke sold was less (table 36). For beehive coke, prices of all grades, except that sold "to other industrial plants," were lower than in 1954.

TABLE 36.—Average value per net ton of coke produced and average receipts per net ton from coke sold (commercial sales) in the United States, 1947–49 (average) and 1951–55

Year	Value per ton produced [1]			Receipts per ton sold		
	Oven coke	Beehive coke	Total	Oven coke	Beehive coke	Total
1947–49 (average)	$12.08	$11.32	$12.02	$13.87	$11.95	$13.41
1951	14.13	13.95	14.11	17.04	14.33	16.25
1952	14.49	13.92	14.45	17.26	14.43	16.72
1953	14.68	14.54	14.67	17.75	14.76	17.07
1954	15.93	14.16	15.91	17.19	13.46	16.98
1955	16.30	12.94	16.23	16.80	12.88	16.28

[1] Beginning in 1954, figures based on market values and are not comparable to values shown for preceding years.

TABLE 37.—Average receipts per net ton of coke sold (commercial sales) in the United States in 1955, by States

State	Oven coke				Beehive coke			
	To blast-furnace plants	To foundries	To other industrial plants [1]	For residential heating	To blast-furnace plants	To foundries	To other industrial plants [1]	For residential heating
Alabama	(2)	$22.64	$12.67	$11.91				
California, Colorado, Texas, and Utah	$13.48	23.25	16.55	14.94			(2)	
Connecticut, Massachusetts, New Jersey, and New York	15.19	23.65	13.83	15.99				
Illinois	(2)	(2)	11.57	15.08				
Indiana	(2)	(2)	13.00	12.41				
Kentucky, Missouri, and Tennessee	12.44	23.72	14.10	(2)	(2)	(2)		
Michigan, Minnesota, and Wisconsin	16.06	24.56	15.13	13.85				
Ohio	14.10	23.94	12.01	12.67				
Pennsylvania	13.95	23.59	11.09	13.86	$12.43	$14.76	$10.70	(2)
Virginia					14.49	(2)	13.58	(2)
West Virginia	(2)		7.57	(2)	(2)	15.84	(2)	
Undistributed	16.40	23.85		12.40	12.21	14.19	17.12	$10.75
United States average, 1955	14.33	23.75	12.97	15.10	12.57	15.05	13.62	10.75
At merchant plants	14.34	23.78	15.05	15.53				
At furnace plants	14.29	23.50	9.81	10.39				
United States average, 1954	13.83	23.40	12.70	14.83	14.38	15.35	12.81	12.79

[1] Includes coke sold to water-gas plants.
[2] Included with "Undistributed" to avoid disclosure of individual company figures.

TABLE 38.—Average monthly prices per net ton of furnace and foundry beehive coke and foundry oven coke in the United States in 1955 [1]

	January	February	March	April	May	June
Beehive coke, at ovens:						
Connellsville furnace	$13.50–14.00	$13.50–14.00	$13.50–14.00	$13.50–14.00	$13.50–14.00	$13.50–14.00
Connellsville foundry	16.50–17.00	16.50–17.00	$16.50–17.00	$16.50–17.00	16.50–17.00	16.50–17.00
Oven foundry coke, at ovens:						
Birmingham	22.65	22.65	22.65	22.65	22.65	22.65
Chicago	24.50	24.50	24.50	24.50	24.50	24.50
Detroit	25.50	25.50	25.50	25.50	25.50	25.50
Erie	25.00	25.00	25.00	25.00	25.00	25.00
Everett [2]	26.05	26.05	26.05	26.05	26.05	26.05
Indianapolis	24.25	24.25	24.25	24.25	24.25	24.25
Kearny	24.00	24.00	24.00	24.50	24.50	24.50
Lone Star	18.50	18.50	18.50	18.50	18.50	18.50
Milwaukee	25.25	25.25	25.25	25.25	25.25	25.25
Painesville	25.50	25.50	25.50	25.50	25.50	25.50
Philadelphia	23.00	23.00	23.00	24.00	24.00	24.00
Portsmouth	24.00	24.00	24.00	24.00	24.00	24.00
St. Paul	23.75	23.75	23.75	23.75	23.95	24.25
Swedeland	23.00	23.00	23.00	24.00	24.00	24.00
Terre Haute	24.05	24.05	24.05	24.05	24.05	24.05

	July	August	September	October	November	December
Beehive coke, at ovens:						
Connellsville furnace	$13.50–14.00	$13.25–14.00	$13.25–14.00	$13.25–14.00	$13.25–14.00	$13.25–14.00
Connellsville foundry	16.50–17.00	16.00–17.00	16.00–17.00	16.00–17.00	16.00–17.00	16.00–17.00
Oven foundry coke, at ovens:						
Birmingham	22.65	22.65	22.65	23.70	24.40	24.40
Chicago	24.50	25.75	25.75	25.75	25.75	25.75
Detroit	25.50	26.25	26.25	26.25	26.25	26.25
Erie	25.00	25.00	25.00	25.00		
Everett [2]	26.05	27.05	27.05	27.05	27.05	27.43
Indianapolis	24.25	25.50	25.50	25.50	25.50	25.50
Kearny	24.50	25.50	25.50	25.50	25.50	25.81
Lone Star	18.50	18.50	19.50	19.50	19.50	19.50
Milwaukee	25.25	26.25	26.25	26.25	26.25	26.25
Painesville	25.50	26.25	26.25	26.25	26.25	26.25
Philadelphia	24.00	25.00	25.00	25.00	25.00	25.38
Portsmouth	24.00	24.00	24.75	24.75	24.75	24.75
St. Paul	24.25	25.00	25.00	25.00	25.00	25.00
Swedeland	24.00	25.00	25.00	25.00	25.00	25.38
Terre Haute	24.05	25.50	25.50	25.50	25.50	25.50

[1] Average of weekly quotations by Steel Magazine.
[2] New England delivered or within $4.55 freight zone from works.

FOREIGN TRADE [1]

Imports.—Coke imports increased slightly in 1955. The total quantity imported, however, was small compared with United States production and requirements, but it was important to certain areas where it serves a definite need. All but a few hundred tons was imported from Canada. Most of the Canadian shipments (63 percent) entered the United States through the Montana-Idaho customs district. A substantial tonnage also came in through Michigan. Although little information is available on the purposes for which the imported coke was used, it may be presumed that the coke that

[1] Figures on imports and exports compiled by Mae B. Price and Elsie D. Page, of the Bureau of Mines, from records of the U. S. Department of Commerce.

entered through the Montana-Idaho gateway was used for nonferrous smelting and in the electrochemical industries of the northwest and that coke coming through Michigan was used in the Detroit area for metallurgical purposes.

TABLE 39.—Coke imported for consumption in the United States, 1953–55, by countries and customs districts

	1953		1954		1955	
	Net tons	Value	Net tons	Value	Net tons	Value
COUNTRY						
North America: Canada	157,318	$1,714,540	114,635	$1,229,671	125,955	$1,393,530
Europe:						
France	(1)	2				
Germany, West			1,102	26,911	387	11,720
United Kingdom			44	1,872		
Total	(1)	2	1,146	28,783	387	11,720
Grand total	157,381	1,714,542	115,781	[2] 1,258,454	126,342	[2] 1,405,250
CUSTOMS DISTRICT						
Buffalo	15,796	255,557	720	5,780	2,513	25,290
Connecticut					33	393
Dakota	12,279	57,040	4,045	49,272	7,177	56,985
Hawaii					387	11,720
Laredo					75	1,096
Maine and New Hampshire	250	4,207	237	3,612	2,188	11,886
Michigan	47,093	464,254	12,000	103,417	32,474	362,451
Montana and Idaho	67,397	835,417	95,148	1,044,029	79,846	924,773
New York	(1)	2	44	1,872		
Puerto Rico			1,102	26,911		
St. Lawrence	2,790	43,495				
Vermont	357	5,791	758	14,362	161	2,637
Washington	11,356	48,779	1,727	9,199	1,488	8,019
Total	157,318	1,714,542	115,781	[2] 1,258,454	126,342	[2] 1,405,250

[1] Less than 1 ton.
[2] Due to changes in tabulating procedures by the U.S. Department of Commerce, data known not to be comparable to years prior to 1954.

Exports.—Coke exports in 1955 increased 37 percent over 1954 and were the highest in 3 years. Canada continued to be the principal outside market for American coke, although increases in tonnage were made to all other continental groups. Canadian shipments represented 68 percent of our total exports, most of which entered Canada through the Michigan customs district. Exports to South America increased markedly over 1954, mainly because of the substantial tonnage that was destined for Argentina. Shipments to Europe rose 48 percent and went to Denmark, Greece, and Spain. Exports to Asia and Oceania also increased. Exports to Asia were small, but for the second consecutive year the tonnage exported to Oceania, French Pacific Islands, was substantial.

TABLE 40.—Coke exported from the United States, 1953–55, by countries and customs districts

	1953		1954		1955	
	Net tons	Value	Net tons	Value	Net tons	Value
COUNTRY						
North America:						
Canada	369,745	$6,500,463	264,019	$4,574,437	361,114	$5,749,270
Mexico	8,044	154,137	18,746	284,724	18,806	266,543
Panama	56	2,770	85	6,057	25	1,803
West Indies:						
Cuba	18,644	342,719	23,246	348,854	21,014	393,602
Trinidad and Tobago					229	5,535
Other West Indies					62	3,538
Other North America	877	34,147	187	6,243	207	7,434
Total	397,366	7,034,236	306,283	5,220,315	401,457	6,427,725
South America:						
Argentina	15,946	391,435	[1] 3,198	[1] 54,614	21,141	350,187
Bolivia	187	7,254	236	8,671	199	8,086
Brazil	12,097	271,502	21	1,992	187	4,890
Chile	389	8,483	175	6,063	791	21,053
Ecuador	28	1,014	120	9,252	164	11,548
Peru	36	1,377			50	1,725
Uruguay			205	5,006	234	5,483
Venezuela	233	9,300	126	6,008	147	8,684
Other South America	20	827	24	2,315	12	1,147
Total	28,936	691,192	[1] 4,105	[1] 93,921	22,925	412,803
Europe:						
Denmark					17,258	274,629
Greece			2,246	35,937	5,539	84,711
Spain	92,008	1,473,108	35,071	455,134	32,336	352,931
Total	92,008	1,473,108	37,317	491,071	55,133	712,271
Asia:						
Israel					1,130	19,334
Pakistan					7,390	110,846
Philippines	1,942	70,366	200	2,316	100	4,750
Total	1,942	70,366	200	2,316	8,620	134,930
Oceania: French Pacific Islands			39,670	494,837	42,370	550,350
Grand total	520,252	9,268,902	[1] 387,575	[1] 6,302,460	530,505	8,238,079
CUSTOMS DISTRICT						
Buffalo	128,743	2,335,216	83,976	1,551,539	68,491	1,229,846
Dakota	12,709	291,355	12,496	298,938	23,449	471,927
Duluth and Superior	4,845	104,986	4,523	102,982	6,650	178,322
El Paso	57	1,404	28	674		
Florida	1,717	52,236	1,910	60,755	2,397	75,131
Laredo	6,791	126,759	7,391	137,133	4,150	106,920
Los Angeles	480	3,345	2,466	17,263	7,723	58,467
Maryland	4,244	88,440	9	945	561	12,462
Michigan	193,835	3,550,450	130,590	2,336,721	199,968	3,340,223
Mobile	1,384	34,760	2,031	50,769	1,808	44,808
New Orleans	3,758	118,052	1,044	47,018	827	41,988
New York	105,502	1,731,609	11,586	182,738	20,053	312,731
Ohio	9,530	47,346	17,317	91,096	36,416	263,930
Philadelphia	22,259	527,242	[1] 67,186	[1] 846,657	124,632	1,725,892
Rhode Island	3,500	57,750	21,029	256,211		
St. Lawrence	17,082	102,481	1,230	14,375	15,516	107,540
San Diego	231	5,889	848	25,559	777	19,693
San Francisco	44	2,310			100	4,750
Virginia	82	2,280	205	5,006	245	5,871
Washington	1,844	55,083	1,387	35,276	2,240	61,112
Other districts	1,615	29,909	20,323	240,805	14,502	176,466
Total	520,252	9,268,902	[1] 387,575	[1] 6,302,460	530,505	8,238,079

[1] Revised figure.

TECHNOLOGY

Research by the Federal Bureau of Mines on coal carbonization in 1955 included studies relating to coal expansion, bulk density, preheating, petrography, and blending. Studies conducted at Bureau of Mines laboratories indicated that the coking behavior of weakly coking coals could be improved by preheating the coal before coking in an essentially inert atmosphere at temperatures below the fusion point of the coal. Results of investigative work on this problem will be published in future. Considerable work on coal expansion was done to determine the effects of common variables (bulk density, moisture content, and particle size). Research on coal petrography centered on the development and application of new techniques to improve carbonizing behavior of marginal-type coking-coal blends by selective mining or preparation. For more rapid plant-control analysis, a study was made of the method of making petrographic comparisons, using reflected light instead of the thin-section technique developed by Thiessen.[2] Continuing work with the process for the low-temperature carbonization of low-rank coals, using an entrained and fluidized bed, included pilot-plant tests on Wyoming coals and studies of the tar produced in these tests and from the prototype commercial-scale carbonizer at Rockdale, Tex.

The removal of hydrogen sulfide from coke-oven gas has received a great deal of attention and study in recent years, not only in the United States but also in other parts of the world. Several processes developed in Germany in recent years were reported to have gone into commercial production. A process using ammonia liquor as the scrubbing medium was claimed to be economical and efficient.[3] Early attempts to wash out hydrogen sulfide from the gas stream with ammonia liquor were unsuccessful because the hydrogen sulfide could not be separated preferentially without absorption of carbon dioxide. The absorption of carbon dioxide caused low-percentage recoveries of hydrogen sulfide. Experimentation and development work proved that a much higher percentage of hydrogen sulfide could be obtained by shortening the contact time between the gas and the washing medium. It was claimed that, by shortening the contact time, a recovery of 85 percent of the hydrogen sulfide was obtained. During 1952–54, 18 plants using this process were reported to have been erected in Germany.

Nearly complete removal of hydrogen sulfide from coke-oven gas was reported to have been accomplished in Germany in 1955 using a cyclic-pressure process.[4] In this process cooled and electrically detarred gas is compressed to 5–10 atmospheres in the final coolers; ammonia condensates containing 10–15 percent ammonia are obtained, and some benzene hydrocarbons are also condensed. The gas then passes in counterflow through a washer, with a fine spray of 4–6 percent ammonia solution to remove the hydrogen sulfide, a water washer to remove the residual ammonia, a benzene scrubber, and a final dry

[2] Parks, B. C., O'Donnell, H. J., and Darakes, W. E., Petrographic Composition and Free-Swelling Property of the Chillon Coal, Boone County No. 2 Mine, Logan County, W. Va.: Bureau of Mines Report of Investigations 5294, 1957, 22 pp.

[3] Sansam, W. and Gigiel, J., Recent Developments in Byproduct Recovery Plant: Gas World, vol. 141, May 1955, suppl., pp. 91–100.

[4] Klempt, W. and Huck, G., [Removal of Hydrogen Sulfide from Coke-Oven Gas by the Cyclic-Pressure Process]: Glückauf (spec. issue), August 1955, pp. 215–220 (in German).

purifier to remove the residual hydrogen sulfide. Ammonia removal is 100 percent and hydrogen sulfide removal 95–100 percent. The ammonia-washing solution is regenerated by treatment with steam. A washing plant with a capacity of 14,500 cubic meters of gas per hour compressed to 8–10 atmospheres came in operation at the beginning of 1955.

The Illinois Geological Survey conducted numerous studies using a new pilot-scale movable-wall test oven. This was a modified form of an earlier Illinois oven also used in developing the Bureau of Mines Tuscaloosa oven. This 17-inch-wide, electrically heated, movable-wall coke oven has a capacity of approximately 700 pounds of coal. Tests included measurement of expansion pressures, an evaluation of the effect of coal size, and comparative tests of Appalachian region and Illinois coals. Pressure measurements obtained in this 17-inch oven were reported to be about 20 percent lower than those obtained on similar blends in the Russell 12-inch, movable-wall oven used in other laboratories. It was reported that properties and yields of coke produced in the new oven correlated well with those obtained by carbonizing analogous blends in either the Survey's 14-inch, experimental, slot-type oven or the usual commercial coke oven.[5]

Studies were also conducted on the use of low-temperature char as a substitute for low-volatile coal in the production of metallurgical coke. Char made from Illinois coal was produced in a pilot-scale vibrating retort designed and built on the Storr principle in the Survey's laboratories. Good-quality cokes were produced, using char made from Illinois coal. Results of the work were reported recently.[6]

Considerable investigative and test work on the blending of coal and iron ore before charging into slot-type coke ovens for the production of ferro (iron) coke has been done in Germany and Great Britain in recent years (see Coke and Coal Chemicals chapter, 1953 preprint, Technology, p. 43). Results of recent studies conducted in Germany were published in 1955 summarizing (1) the influence of coal size, of oil addition, and of mixing time on the strength of the coke at high temperatures; (2) the influence of carbonizing time on ore reduction and gas yield; and (3) the thermal balance of the combined ferro-coke production and subsequent blast-furnace process.[7]

Interest in iron-coke manufacture increased because of the rapid decline of proved reserves of the easily strip-mined, lumpy, high-grade iron ores of the Lake Superior district. The threatened depletion of these reserves has caused the iron and steel industry to turn to the upgrading or concentration of the low-grade ores, particularly taconite in the Mesabi range, where reserves of this mineral are tremendous. Large-scale pilot plants have been built to test different methods of nodulizing, pelletizing, and sintering. The production of iron coke offers an alternative to these methods of upgrading fine ores and at the same time gives additional benefits in blast-furnace operation. To determine the feasibility of making and using iron coke in present-day blast-furnace operations in the United States, the Koppers

[5] Jackman, H. W., Helfinstine, H. J., Eissler, R. L., and Reed, F. H., Coke Oven to Measure Expansion Pressure: Blast-Furnace, Coke-Oven, and Raw-Material Conference, Philadelphia, Pa., Apr. 18–20, 1955. AIME, preprint.

[6] Reed, F. H., Jackman, H. W., and Henline, P. W., Char for Metallurgical Coke: Illinois State Geol. Survey Rep. of Investigation 187, Urbana, Ill., 1955, 38 pp.

[7] Barking, H., and Eymann, C., [The Production of Ferro-Coke from High-Volatile Coal]: Stahl u. Eisen, vol. 75, Apr. 7, 1955, pp. 386–391.

Co., Inc., and the Republic Steel Corp. conducted a joint commercial-scale study of this problem.

Iron coke was made at the Cleveland plant of the Republic Steel Corp., using a coal-taconite mixture consisting of 60 percent coal and 40 percent taconite concentrate. The yield of iron coke averaged about 70 percent, and it contained about 35 percent iron. The coke had a shatter index of 90 percent on a 2-inch screen. Tests were carried out in blast furnaces using about 50 percent of unscreened, crudely crushed iron coke in the coke charge, with resultant overall savings of coke. For charges containing 18 percent of iron coke, the savings were 81 pounds of coke per ton of iron produced.[8]

WORLD REVIEW [9]

Coke production increased generally in all coke-producing countries of the world in 1955, and the output of metallurgical coke (oven and beehive) increased 14 percent to 266 million tons while production of all other types of coke increased 4 percent to 49 million tons. The United States continued to be the leading country in coke production, with 28 percent of the world total of metallurgical coke. United States production was, however, about 4 million tons less than the record output in 1951 because of the decline in demand for coke in residential heating and gas manufacture. Increased supplies of natural gas and fuel oil have displaced coke for these uses. However, requirements for metallurgical applications have increased, and about 95 percent of the oven- and beehive-coke production in 1955 was utilized as blast-furnace and cupola fuel.

The production of metallurgical coke in the Soviet Union and West Germany, the second and third largest coke-producing countries, increased 4 and 16 percent, respectively, over 1954. The production of coke in the U. S. S. R. between 1951 and 1955 increased at an average rate of 9 percent per year, or 45 percent for the period. This increase, in terms of tonnage, was the largest in the world and was attributable to the reported expansion of heavy industry which depends on coke in its smelting operations. Coke-oven operations in West Germany recovered satisfactorily from the slight recession in 1954, and output in the Ruhr district was the highest on record, exceeding its maximum output during World War II by over 2 million tons.

From 1951–55 production of metallurgical coke in Poland increased 58 percent, and Poland ranked sixth in world production in 1955.

The United Kingdom ranked fourth in metallurgical coke output but led all countries by a good margin in production of gashouse coke.

Although the United States was the largest single producing country, the other countries in the Western Hemisphere could not equal production in the European countries, and the total production for North and South America was only 48 percent of European total output. Production in Asia rose 11 percent, largely because of the advancements made in China and Japan. Production in Africa and Oceania showed slight increases in coke output, but totals for each of these continental groups were less than 1 percent of the world total.

[8] Russell, C. C., Whitstone, P. E., and Liggett, R. P., The Production and Use of Iron Coke: Blast-Furnace, Coke Oven, and Raw Material Conference, Philadelphia, Pa., Apr. 18-20, 1955. AIME preprint.

[9] Figures on world production compiled by Pearl J. Thompson, of the Foreign Statistics unit, Division of Foreign Activities, Bureau of Mines.

TABLE 41.—World production of oven and beehive coke (excluding breeze), 1951–55, by countries, in thousand net tons [1]

Country	1951	1952	1953	1954	1955
North America:					
Canada	3,402	3,594	3,808	3,082	3,714
Mexico	429	510	429	440	498
United States	79,331	68,254	78,837	59,662	75,302
Total	83,162	72,358	83,074	63,184	79,514
South America:					
Brazil	315	331	366	504	[2] 525
Chile	274	256	268	292	260
Colombia [2]	22	22	22	22	179
Peru [2]		6	6	6	12
Total [2]	610	615	660	825	975
Europe:					
Austria	1,194	1,356	1,342	1,490	1,598
Belgium	6,731	7,076	6,562	6,776	7,275
Bulgaria [2]	11	17	23	28	28
Czechoslovakia	5,595	6,151	6,518	6,600	[2] 6,834
France	8,906	10,494	9,514	10,153	11,822
Germany:					
East [2]	390	440	440	460	460
West [3]	37,074	41,081	41,699	38,602	44,773
Italy	2,404	2,723	2,689	2,889	3,251
Netherlands	3,277	3,558	3,532	3,699	4,300
Poland	6,984	8,111	8,678	9,373	11,023
Rumania [2]	165	290	345	340	550
Saar	4,151	4,285	3,956	4,041	4,342
Spain	1,097	1,311	1,301	1,362	1,601
Sweden		73	111	123	137
U. S. S. R. [2]	33,000	37,000	42,000	46,000	48,000
United Kingdom	18,027	19,143	19,579	19,996	20,276
Yugoslavia		17	326	445	806
Total [2]	129,000	143,000	149,000	152,000	167,000
Asia:					
China	[2] 1,400	3,153	[2] 3,900	[2] 4,400	[2] 5,000
India	2,406	2,289	2,252	2,643	2,908
Iran [4]	8	4	3	7	[2] 7
Japan	4,254	4,402	5,258	4,840	5,198
Korea:					
North [2]	300	300	350	400	440
Republic of	[5] 3	1	1	[5] 1	(6)
Taiwan (Formosa)	126	142	132	154	143
Turkey	337	441	605	561	603
Total [2]	9,000	10,700	12,500	13,000	14,000
Africa:					
Rhodesia and Nyasaland, Federation of: Southern Rhodesia	115	134	150	160	[2] 207
Union of South Africa	1,382	1,491	1,593	1,526	1,544
Total	1,497	1,625	1,743	1,686	[2] 1,750
Oceania:					
Australia	1,716	1,940	2,277	2,295	2,240
New Caledonia [2]	88	88	77	77	80
New Zealand	7	8	7	7	[2] 7
Total [2]	1,810	2,035	2,360	2,380	2,330
World total [2]	225,000	[7] 230,000	[7] 249,000	[7] 233,000	266,000

[1] Includes revisions of data published previously. Data do not add to totals shown owing to rounding.
[2] Estimate.
[3] Includes electrode coke.
[4] Year ended Mar. 20 of year following that stated.
[5] Includes gashouse coke.
[6] Negligible.
[7] Revised figure.

TABLE 42.—World production of gashouse, low-, and medium-temperature coke (excluding breeze), 1951–55, by countries, in thousand net tons [1]

Country	1951	1952	1953	1954	1955
North America:					
Canada	245	175	158	132	71
Mexico	(2)	(2)	(2)	(2)	(2)
United States	127	45	237	256	(3)
Total [4]	480	330	500	500	470
South America:					
Argentina [4]	55	55	55	55	55
Chile	131	125	121	118	119
Peru, medium-temperature	[4] 22	22	[4] 22	[4] 22	22
Uruguay	37	40	40	39	[4] 39
Total [4]	245	240	240	235	235
Europe:					
Austria	504	500	451	504	442
Belgium	25	23	22	20	10
Czechoslovakia: [4]					
Gashouse	695	760	810	815	840
Lignite	840	930	1,000	1,000	1,000
Denmark	450	460	414	459	445
Finland	84	127	131	117	96
France:					
Gashouse	1,733	1,642	1,450	1,264	1,036
Low-temperature	300	308	295	315	353
Germany:					
East: [4]					
Gashouse	1,550	1,900	2,100	2,300	2,500
Lignite	6,000	6,400	6,500	6,800	7,200
West:					
Gashouse	4,074	4,633	4,443	4,725	5,581
Lignite	762	774	798	764	685
Greece	34	33	34	34	[4] 34
Hungary	130	130	130	130	[4] 140
Ireland (Eire)	197	197	195	214	212
Italy	1,204	1,227	1,187	1,136	1,074
Luxembourg	36	35	34	36	40
Netherlands	1,056	1,023	908	947	958
Norway [5]	67	72	71	68	[4] 65
Poland: [4]					
Gashouse	450	450	450	475	500
Low-temperature	100	105	105	110	110
Portugal	30	31	37	39	42
Rumania	(2)	(2)	(2)	(2)	(2)
Saar, low-temperature	96	104	91	100	128
Spain	238	245	250	270	282
Sweden	670	740	680	751	771
Switzerland	[4] 330	[4] 330	330	330	330
U. S. S. R.	(2)	(2)	(2)	(2)	(2)
United Kingdom:					
Great Britain	13,803	14,036	13,781	13,730	14,275
Northern Ireland	194	191	191	193	183
Yugoslavia	34	29	28	26	26
Total [4]	37,900	39,700	39,100	39,900	41,600
Asia:					
Ceylon	17	[4] 17	[4] 17	[4] 13	[4] 13
China	(2)	(2)	(2)	(2)	(2)
India:					
Gashouse	84	99	110	101	[4] 105
Low-temperature	1,409	1,617	1,857	1,951	2,073
Japan:					
Gashouse	1,862	2,076	2,361	2,429	2,616
Low-temperature	[4] 210	[4] 130	[4] 130	[4] 85	76
Korea, Republic of	[4] 3	1	1	1	1
Malaya	15	[4] 17	[4] 17	[4] 19	[4] 19
Taiwan (Formosa):					
Gashouse	[4] 1	[4] 1	4	6	13
Low-temperature	42	37	49	41	[4] 45
Turkey:					
Gashouse	66	66	69	122	181
Low-temperature	79	46	45	[4] 35	[4] 35
Total [4]	4,000	4,300	4,800	5,000	5,300

See footnotes at end of table.

TABLE 42.—World production of gashouse, low-, and medium-temperature coke (excluding breeze), 1951–55, by countries, in thousand net tons [1]—Continued

Country	1951	1952	1953	1954	1955
Africa:					
Algeria	106	101	104	98	52
Egypt	30	[4] 30	[4] 30	[4] 28	[4] 28
Tunisia	14	18	17	12	[4] 13
Union of South Africa	[4] 85	[4] 85	104	99	88
Total [4]	235	235	255	235	180
Oceania:					
Australia [6]	1,246	1,348	1,199	940	[4] 992
New Zealand	67	[4] 65	[4] 65	84	[4] 65
Total	1,313	[4] 1,415	[4] 1,265	1,024	[4] 1,055
World total [4]	44,000	46,000	46,000	47,000	49,000

[1] Gashouse coke unless otherwise specified. Includes revisions of data published previously.
[2] Estimates included in total.
[3] Concealed to avoid disclosure of individual company figures; but included in total.
[4] Estimate.
[5] Includes breeze.
[6] Year ended June 30 of year stated.

COAL-CHEMICAL MATERIALS

GENERAL SUMMARY

In recent years coke-oven operators have directed more attention to the recovery and processing of coal-chemical materials. The coal-chemical materials are widely used industrially and afford the operators a means of reducing the costs of converting coal to coke, the main product. The emphasis on securing more revenue from the coal-chemical materials may be attributed to the steadily rising carbonizing costs due to the increases in costs of (1) construction materials for coke ovens and related equipment, (2) coal, and (3) labor. Another important factor that has given impetus to the research and development work underway in the coke industry is the tremendous increase in requirements for chemical raw materials by the growing chemical industry.

Benzene and naphthalene are but two of the coal chemicals produced at oven-coke plants that have had a phenomenal growth since the end of World War II. Relative yields of the principal or basic coal-chemical materials—crude tar, light oil, ammonia, and coke-oven gas—have not changed substantially over the past three decades (fig. 2). Yields were highest during the depression years of the 1930's because of the generally lower oven temperatures and longer coking cycles. Yields began to decline at the beginning of the defense program immediately preceding the entry of the United States into World War II and continued to drop during the war years and in the immediate postwar period. Yields increased slightly in 1952 and 1953 and increased sharply in 1954, when oven operations slowed up. In 1955, however, as oven temperatures were increased and operating rates were raised steadily throughout the year, yields again tended to decrease. The largest drop was for ammonium sulfate equivalent yield, which fell from 21.09 to 20.06 pounds per ton of coal carbonized.

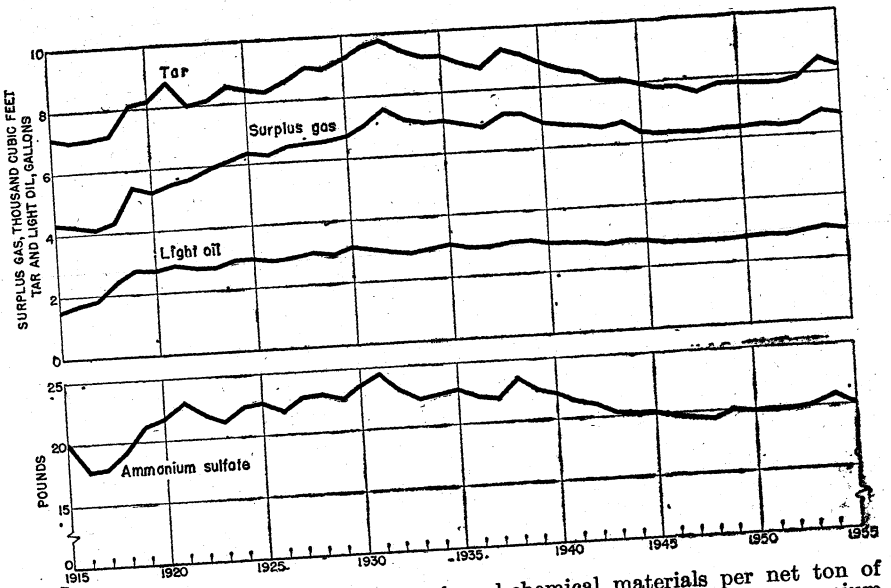

FIGURE 2.—Average yield of principal coal-chemical materials per net ton of coal carbonized in coke ovens, 1915–55. Yields of light oil and ammonium sulfate equivalent represent average for plants recovering these products.

The economic importance of the coal-chemical materials to the coke-producing companies is shown in tables 44 and 45. Table 44 shows the average value, by groups, of the individual coal-chemical materials per ton of coal carbonized. Surplus gas continued to rank second to coke in terms of value, but its margin in recent years has been steadily narrowed by the gains made by light oil and its derivatives, as well as by the tar group. The percentages of the value of coal recovered by the coal-chemical materials are given in table 45 and show that the dollar value of surplus gas (used and sold) was equivalent to almost 17 percent of the value of coal at the ovens. Since gas represents such a large part of the value of the coal, coke-plant operators must have an assured outlet for this product under favorable economic conditions. Steel companies have such an outlet, because the coke plant is integrated with iron and steel melting and annealing furnaces. For merchant-coke plants, however, loss of revenue from gas makes continued operations difficult and has resulted in the closing of a large number of these plants in recent years.

Light oil and its derivatives in the past 4 years have substantially increased the amount of revenue they contribute and have risen from 5.8 percent in 1947–49 to 9.5 percent in 1955. This gain was due largely to the increased selling price of benzene since 1950. The increased tar revenue was due to the gain in refining capacity at coke plants. Processing of the tar increases its economic value, as crude chemical oil, naphthalene, and creosote can be recovered, leaving a residual tar that is a satisfactory fuel for metallurgical operations. In previous years no value was assigned to the residual tar or pitch

used by the coke-oven operators, which resulted in underestimating the value of tar products. In this chapter a value, based on the estimated market value at the producing plant, has been assigned to the tar and pitch burned. This has changed the proportion of value contributed by tar and derived products considerably.

Ammonia products (sulfate and liquor) supplied a greater proportion of income to coke-plant operators in 1919 than any other coal chemicals because of the high unit value of nitrogen prevailing at that time. It lost its leadership to gas in 1920, fell behind light oil and derivatives in 1929, and contributed less income than tar just before World War II. In 1955 ammonia products furnished only 4 percent of the revenue derived from the commercial sales of coal-chemical materials.

The total value of coal-chemical materials sold was about $348 million, the highest figure ever reported.

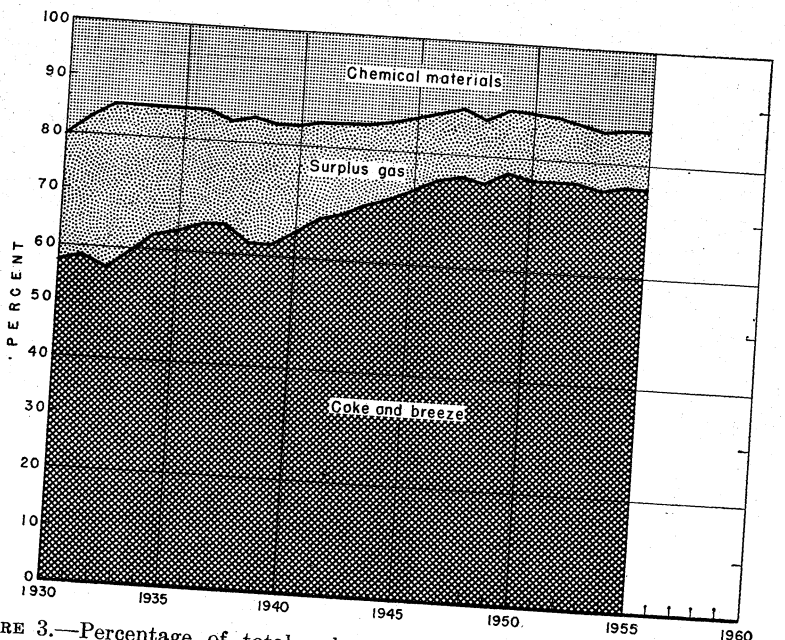

FIGURE 3.—Percentage of total value of coke-oven products from slot-type ovens supplied by coke and breeze, surplus gas, and chemical materials, 1930–55.

TABLE 43.—Coal-chemical materials produced at coke-oven installations in the United States in 1955[1]

[Exclusive of breeze]

Product	Produced	Sold			On hand Dec. 31
		Quantity	Value		
			Total	Average	
Tar, crude—gallons	852,922,817	[2] 398,380,071	$45,999,007	$0.115	37,831,031
Tar derivatives:					
Creosote oil:					
Distillate as such (100 percent creosote)—gallons	26,157,675	26,152,644	5,157,465	.197	1,506,936
Creosote-coal tar solution (100 percent solution basis)—gallons	4,861,419	4,669,936	831,688	.178	178,153
Creosote content of solution (100 percent creosote basis)—gallons	3,802,829	3,635,204			
Crude chemical oil—do	26,919,335	27,181,376	6,572,340	.242	897,790
Phenol—pounds	13,347,203	11,367,546	1,473,058	.130	341,961
Pitch of tar:					
Soft [3]—net tons	689,656	49,169	1,283,406	26.102	11,663
Hard [4]—do	433,083	44,527	1,105,109	24.817	2,357
Other coal tar derivatives [5]			2,703,216		
Ammonia:					
Sulfate [6]—pounds	1,962,652,237	1,853,959,657	36,116,705	.019	418,042,234
Liquor (NH_3 content)—do	33,241,715	20,009,869	834,546	.042	3,302,719
Total			36,951,251		
Sulfate equivalent of all forms—pounds	2,091,596,851	1,931,577,939			
NH_3 equivalent of all forms—do	539,213,462	497,960,669			
Gas:					
Used under boilers, etc.—M cubic feet	[7] 1,083,624,595	57,216,555	9,920,113	.173	
Used in steel or allied plants—do		472,551,419	100,351,821	.212	
Distributed through city mains—do		70,461,742	27,757,664	.394	
Sold for industrial use—do		89,118,224	18,110,168	.203	
Total	1,083,624,595	689,347,940	156,139,766	.227	
Crude light oil—gallons	[8] 297,497,792	16,143,851	3,474,210	.215	5,412,336
Light-oil derivatives:					
Benzene:					
Specification grades (1°, 2°, and 90 percent)—gallons	173,375,369	168,075,176	58,436,051	.348	7,923,545
Other industrial grades—do	844,973	675,175	226,820	.336	74,223
Motor grade—do	[9]	[9]	[9]		[9]
Toluene (all grades)—do	38,205,443	36,651,693	10,962,817	.299	2,794,262
Xylene (all grades)—do	11,294,085	10,856,948	3,483,848	.321	817,815
Solvent naphtha (crude and refined)—do	5,511,382	5,380,357	1,383,294	.257	329,297
Other light-oil products—do	6,344,931	3,308,653	479,276	.145	295,519
Total	235,576,183	224,948,002	74,972,106	.333	12,234,661
Intermediate light oil—gallons	3,344,913	3,361,386	648,665	.193	122,110
Naphthalene (crude):					
Solidifying at less than 74° C—pounds	38,199,282	37,678,838	1,318,973	.035	2,109,798
At 74° and less than 76° C—do	17,888,009	8,126,342	404,404	.050	912,257
At 76° and less than 79° C—do	128,135,747	127,983,604	7,811,795	.061	1,036,209
Pyridine:					
Crude bases (dry basis)—gallons	226,325	217,513	242,817	1.116	125,345
Refined (2° C.)—pounds	701,408	722,664	534,186	.739	257,453
Picolines—do	511,176	434,427	168,012	.387	98,783
Sodium phenolate—gallons	3,684,157	3,799,130	490,998	.129	436,178
Sulfur—pounds	7,740,040	7,566,840	97,257	.013	676,690
Value of all coal-chemical materials sold			348,379,639		

[1] Includes products of tar distillation conducted by coke-oven operators under same corporate name.
[2] Includes 38,634,114 gallons sold to affiliated companies for refining.
[3] Water-softening point, less than 110° F. Includes some medium pitch-of-tar reported by 2 producers.
[4] Water-softening point, over 160° F.
[5] Cresols, cresylic acid, pitch coke, resin and red oil, road tar, tar paint, and topped or refined tar.
[6] Includes diammonium phosphate and ammonium thiocyanate.
[7] Includes gas used for heating ovens and gas wasted.
[8] 281,200,190 gallons refined by coke-oven operators to make derived products shown.
[9] Included with "Other light oil products" to avoid disclosure of individual company figures.

TABLE 44.—Average value of coal-chemical materials used and sold and of coke and breeze produced per ton of coal carbonized in the United States, 1947–49 (average) and 1951–55

Product	1947–49 (average)	1951	1952	1953	1954	1955
Ammonia and its compounds	$0.356	$0.352	$0.391	$0.375	$0.422	$0.352
Light oil and its derivatives (including naphthalene)	.451	.830	.808	.875	.871	.839
Surplus gas sold or used	1.291	1.353	1.353	1.408	1.519	1.489
Tar and its derivatives:						
Sold	.501	.597	.594	.609	.622	.621
Tar burned by producers [1]	.228	.243	.271	.278	.372	.382
Other products	.020	.036	.036	.035	.019	.021
Total	2.847	3.411	3.453	3.580	3.825	3.704
Coke produced	8.488	9.945	10.178	10.296	11.115	11.439
Breeze produced	.191	.194	.204	.216	.236	.237
Grand total	11.526	13.550	13.835	14.092	15.176	15.380

[1] Includes pitch-of-tar. Data for years before 1955 have been revised accordingly.

TABLE 45.—Percentage of value of coal recovered by coal-chemical materials in the United States, 1947–49 (average) and 1951–55 [1]

	1947–49 (average)	1951	1952	1953	1954	1955
Product:						
Ammonia and its compounds	4.6	4.0	4.2	4.1	4.7	4.0
Light oil and its derivatives (including naphthalene)	5.8	9.3	8.8	9.5	9.7	9.5
Surplus gas sold or used	16.6	15.1	14.7	15.2	16.9	16.9
Tar and its derivatives sold or used	9.3	9.4	9.3	9.6	11.0	11.3
Other products	.2	.4	.4	.4	.2	.2
Total	36.5	38.2	37.4	38.8	42.5	41.9
Value of coal per net ton	$7.79	$8.94	$9.23	$9.24	$9.00	$8.84

[1] Data for years before 1955 have been revised to include value of pitch-of-tar burned.

TABLE 46.—Coal equivalent of the thermal materials, except coke, produced at oven-coke plants in the United States, 1913, 1918, 1929, 1939, 1947–49 (average), and 1951–55

Year	Materials produced				Estimated equivalent in heating value [1] (billion B. t. u.)					Coal equivalent (thousand net tons)
	Coke breeze (thousand net tons)	Surplus gas (billion cubic feet)	Tar (thousand gallons)	Light oil (thousand gallons)	Coke breeze	Surplus gas	Tar	Light oil	Total	
1913	735	64	115,145	3,000	14,700	35,200	17,272	390	67,562	2,600
1918	1,999	158	263,299	87,562	39,980	86,900	39,495	11,383	177,758	6,785
1929	4,853	508	680,864	200,594	97,060	279,400	102,130	26,077	504,667	19,262
1939	3,354	434	554,406	170,963	67,080	238,700	83,161	22,225	411,166	15,693
1947–49 (av.)	5,390	582	715,779	246,607	107,800	320,100	107,367	32,059	567,326	21,654
1951	5,126	653	795,311	284,497	102,520	359,150	119,297	36,985	617,952	23,586
1952	4,639	576	703,890	249,284	92,780	316,800	105,584	32,407	547,571	20,900
1953	5,253	673	828,729	295,725	105,060	370,150	124,309	38,444	637,963	24,350
1954	3,931	558	715,840	246,019	78,620	306,900	107,376	31,982	524,878	20,034
1955	4,862	689	852,923	297,498	97,240	378,950	127,938	38,675	642,803	24,534

[1] Breeze, 10,000 B. t. u. per pound; gas, 550 B. t. u. per cubic foot; tar, 150,000 B. t. u. per gallon; and light oil, 130,000 B. t. u. per gallon.

COKE-OVEN GAS

When coal is carbonized at high temperatures (above 1,000° C.) in slot-type coke ovens approximately 17 percent by weight is recovered as coke-oven gas. Roughly one-third of this gas is used for underfiring or heating the coke ovens, and the remainder (surplus gas) is (1) used by the producing companies as fuel under boilers and/or in metallurgical operations, (2) sold for industrial use, and (3) sold for distribution through city mains for commercial and residential heating. Usually about 2 percent of the total output is unaccounted for or wasted. Steel plants that use coke-oven gas to heat their open hearths or annealing furnaces frequently have to flare or burn their gas in the atmosphere on weekends when the finishing mills do not operate on 24-hour schedules.

The distribution of coke-oven gas has changed substantially since the end of World War II. For example, in 1948 approximately 28 percent of the surplus coke-oven gas was distributed through city mains for commercial and residential heating and cooking. According to statistics compiled by the American Gas Association, approximately 3 percent of all gas sold in 1948 by the gas-utility industry on a therm basis was coke-oven gas. In 1955, however, coke-oven operators distributed only 10 percent of their surplus gas through city mains, which accounted for less than 1 percent of the total amount of gas distributed by the gas-utility industry. Further, the quantity of coke-oven gas pumped through city mains in 1955 was only 42 percent as much as in 1948, although the quantity of surplus gas available at coke plants had risen 13 percent. The tremendous decline in volume of coke-oven gas distributed through city mains has had little effect on furnace plants but has had a profound influence on merchant plants. At furnace plants loss of a gas contract with a gas utility has meant only diverting the gas to metallurgical operations. Merchant plants, however, did not have this flexibility of operation, and loss of an assured outlet for gas generally forced the plant to discontinue operations. Thus, whereas merchant plants produced 24 percent of all surplus coke-oven gas available in 1948, the proportion had dropped to 11 percent in 1955.

In 1955 furnace plants used 7 percent of their surplus gas under boilers and 76 percent in steel or allied plants, 5 percent was distributed through city mains, and 12 percent was sold for industrial use. Merchant plants had a different distribution pattern, as follows: 15 percent was used as boiler fuel, 9 percent was used in allied plants, 52 percent was distributed through city mains, and 24 percent was sold for industrial use. The average unit values of coke-oven gas consumed for the purposes indicated above did not change appreciably from 1954.

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TABLE 47.—Production and disposal of coke-oven gas in the United States in 1955, by States, in thousand cubic feet

State	Produced		Used in heating ovens	Surplus sold or used			Wasted
	Total	Per ton of coal coked		Quantity	Value		
					Total	Average	
Alabama	85, 269, 595	9. 99	39, 834, 777	41, 278, 908	$5, 130, 672	$0. 124	4, 155, 910
California	15, 570, 471	11. 48	1, 388, 538	13, 758, 652	(1)	(1)	423, 281
Colorado	13, 986, 791	11. 80	6, 898, 860	7, 048, 926	(1)	(1)	39, 005
Illinois	43, 150, 627	9. 98	14, 485, 393	27, 912, 493	5, 377, 803	. 193	752, 741
Indiana	133, 764, 109	10. 10	42, 686, 334	89, 533, 015	20, 447, 287	. 228	1, 544, 760
Maryland	49, 113, 160	10. 97	10, 934, 710	37, 845, 500	(1)	(1)	332, 950
Massachusetts	8, 094, 634	10. 39	1, 152, 765	6, 941, 869	(1)	(1)	
Michigan	44, 982, 284	9. 82	6, 986, 511	36, 970, 179	10, 186, 585	. 276	1, 025, 594
Minnesota	15, 785, 955	11. 07	6, 436, 036	8, 864, 628	2, 183, 678	. 246	485, 291
New Jersey	13, 874, 141	10. 08	1, 778, 867	12, 095, 274	(1)	(1)	
New York	61, 472, 332	10. 70	18, 631, 519	42, 410, 271	11, 658, 506	. 275	430, 542
Ohio	170, 891, 208	10. 15	66, 065, 505	99, 951, 629	22, 518, 212	. 225	4, 874, 074
Pennsylvania	292, 503. 951	10. 26	112, 507, 797	177, 863, 195	41, 203, 635	. 232	2, 132, 959
Tennessee	2, 374, 922	9. 16	976, 790	1, 393, 132	(1)	(1)	
Texas	11, 177, 329	10. 72	4, 472, 797	4, 409, 125	(1)	(1)	2, 295, 407
Utah	24, 609, 425	12. 04	5, 780, 013	17, 642, 074	(1)	(1)	1, 187, 338
West Virginia	67, 216, 899	10. 97	20, 793, 384	46, 145, 365	8, 341, 782	. 181	278, 150
Connecticut, Kentucky, Missouri, and Wisconsin	29, 786, 762	9. 85	11, 781, 643	17, 278, 705	5, 720, 196	. 331	726, 414
Undistributed					23, 371, 410	. 231	
Total 1955	1, 083, 624, 595	10. 33	373, 592, 239	689, 347, 940	156, 139, 766	. 227	20, 684, 416
At merchant plants	123, 130, 728	9. 71	40, 258, 489	79, 257, 514	27, 964, 462	. 353	3, 614, 725
At furnace plants	960, 493, 867	10. 42	333, 333, 750	610, 090, 426	128, 175, 304	. 210	17, 069, 691
Total 1954	869, 874, 515	10. 28	298, 490, 561	558, 343, 147	128, 565, 914	. 230	13, 040, 807

[1] Included with "Undistributed" to avoid disclosure of individual company figures.

TABLE 48.—Surplus coke-oven gas used by producers and sold in the United States in 1955, by States, in thousand cubic feet

State	Used by producers—					
	Under boilers			In steel or allied plants		
	Quantity	Value		Quantity	Value	
		Total	Average		Total	Average
Alabama	12,487,982	$1,446,507	$0.116	24,720,154	$3,255,403	$0.132
California				12,177,607	(1)	(1)
Colorado				7,048,926	(1)	(1)
Illinois	3,303,604	395,551	.120	12,315,234	(1)	(1)
Indiana	7,304,181	1,360,498	.186	63,752,848	13,712,584	.215
Maryland				37,845,500	(1)	(1)
Massachusetts				741	(1)	(1)
Michigan	2,190,376	(1)	(1)	32,651,518	9,193,843	.282
Minnesota	1,157,753	92,097	.080	4,297,518	(1)	(1)
New Jersey	70	(1)	(1)			
New York	3,063,115	1,068,033	.349	31,288,195	(1)	(1)
Ohio	8,950,700	1,954,960	.218	79,986,769	18,717,642	.234
Pennsylvania	11,490,172	2,096,275	.182	105,893,630	23,544,010	.222
Tennessee	427,090	(1)	(1)			
Texas				2,804,623	(1)	(1)
Utah	13,775	(1)	(1)	17,628,299	(1)	(1)
West Virginia	4,213,503	(1)	(1)	40,139,857	7,745,404	.193
Connecticut, Kentucky, Missouri, and Wisconsin	2,614,234	399,534	.153			
Undistributed		1,106,658	.162		24,182,935	.193
Total 1955	57,216,555	9,920,113	.173	472,551,419	100,351,821	.212
At merchant plants	12,218,034	2,134,910	.175	6,945,209	1,482,886	.214
At furnace plants	44,998,521	7,785,203	.173	465,606,210	98,868,935	.212
Total 1954	45,961,044	7,735,574	.168	408,635,974	83,931,014	.205

State	Sold					
	Distributed through city mains			For industrial purposes		
	Quantity	Value		Quantity	Value	
		Total	Average		Total	Average
Alabama	2,526,906	(1)	(1)	1,543,866	(1)	(1)
California				1,581,045	(1)	(1)
Colorado						
Illinois	11,422,573	$2,160,212	$0.189	871,082	(1)	(1)
Indiana	4,676,057	(1)	(1)	13,799,929	(1)	(1)
Maryland						
Massachusetts	6,941,128	(1)	(1)			
Michigan				2,128,285	(1)	(1)
Minnesota	2,467,690	(1)	(1)	941,667	(1)	(1)
New Jersey	12,095,204	(1)	(1)			
New York	7,987,885	(1)	(1)	71,076	(1)	(1)
Ohio	5,738,773	(1)	(1)	5,275,387	(1)	(1)
Pennsylvania	10,020,484	(1)	(1)	50,458,909	(1)	(1)
Tennessee	971,042	(1)	(1)			
Texas				1,604,502	(1)	(1)
Utah						
West Virginia				1,792,005	(1)	(1)
Connecticut, Kentucky, Missouri, and Wisconsin	5,614,000	4,058,922	.723	9,050,471	$1,261,740	$0.139
Undistributed		21,538,530	.403		16,848,428	.210
Total 1955	70,461,742	27,757,664	.394	89,118,224	18,110,168	.203
At merchant plants	41,449,877	21,198,502	.511	18,644,394	3,148,164	.169
At furnace plants	29,011,865	6,559,162	.226	70,473,830	14,962,004	.212
Total 1954	76,732,276	31,352,649	.409	27,013,853	5,546,677	.205

[1] Included with "Undistributed" to avoid disclosure of individual company figures.

TABLE 49.—Coke-oven gas and other gases used in heating coke ovens in 1955, by States, in thousand cubic feet [1]

State	Coke-oven gas	Producer gas	Blue-water gas	Blast-furnace gas	Natural gas	Other gases [2]	Total coke-oven gas equivalent
Alabama	39,834,777				266,532		40,101,309
California	1,388,538			5,327,706			6,716,244
Colorado	6,898,860						6,898,860
Illinois	14,485,393			4,715,734	814,255		20,015,382
Indiana	42,686,334			14,996,228	2,498,492		60,181,054
Maryland	10,934,710			8,347,700			19,282,410
Massachusetts	1,152,765	2,036,183					3,188,948
Michigan	6,986,511			12,375,505			19,362,016
Minnesota	6,436,036	153,604	9,920				6,599,560
New Jersey	1,778,867	2,414,686			1,465,126		5,658,679
New York	18,631,519			9,010,098	369,736		28,011,353
Ohio	66,065,505			6,972,675	327		73,038,507
Pennsylvania	112,507,797	1,470,045		4,825,776		379	118,803,997
Tennessee	976,790						976,790
Texas	4,472,797						4,472,797
Utah	5,780,013			3,410,583			9,190,596
West Virginia	20,793,384			5,028,293		1,867,885	27,689,562
Connecticut, Kentucky, Missouri, and Wisconsin	11,781,643	1,756,799				100	13,538,542
Total 1955	373,592,239	7,831,317	9,920	75,010,298	5,414,468	1,868,364	463,726,606
At merchant plants	40,258,489	7,831,317			5,044,405	1,868,364	55,002,575
At furnace plants	333,333,750		9,920	75,010,298	370,063		408,724,031
Total 1954	298,490,561	11,350,989	155,876	56,370,151	6,107,184	1,847,282	374,322,043

[1] Adjusted to an equivalent of 550 B. t. u. per cubic foot.
[2] Butane, liquefied-petroleum, and spillage gases.

CRUDE COAL TAR AND DERIVATIVES

Crude coal-tar production in 1955 increased 19 percent over 1954 and was 3 percent higher than the previous maximum output in 1953. The yield of tar per ton of coal carbonized declined, however, from the 1954 average but was still better than in any year since 1944. The yield of tar varies widely among the various coke plants, depending on the rank and grade of coal carbonized, oven temperature, completeness of tar recovery, and other factors. Yield of tar among plants in 1955 ranged from 4 to 11 gallons per ton of coal. The high-volatile coals usually contain higher tar yields than medium- and low-volatile coals, which accounted for the high tar yields in Utah, Colorado, and West Virginia (table 5). The yield of tar was lowest in Indiana, where nearly 50 percent of the quantity of coal carbonized was low volatile.

Crude coke-oven tar has a high calorific content and may be used as fuel, or it may be fractionally distilled into numerous tar products. Merchant plants generally sell their tar to tar distilleries for refining. Steel companies operating coke plants, however, can burn, distill, or sell their tar, according to prevailing economic conditions. The tendency among furnace plants in recent years has been to process a greater proportion of their tar to obtain the tar-acid oil fractions and then burn the soft pitch. This development caused a decline in the proportion of crude tar burned to the total output, although 137 million gallons was burned in 1955. The amount of tar distilled by coke-plant operators in 1955 was nearly 100 million gallons higher than in 1954 and the greatest quantity ever processed in the coke industry proper.

TABLE 50.—Coke-oven tar produced, used by producers, and sold in the United States in 1955, by States, in gallons

State	Produced		Used by producers—		
	Total	Per ton of coal coked	For refining or topping [1]	Burned as fuel	Used otherwise
Alabama	64,829,542	7.59	15,634,934	10,262,243	42,461
California	12,391,563	9.13			
Colorado	12,501,000	10.55	9,275,033	3,196,309	70,731
Illinois	30,301,973	7.01	8,946,800		270,500
Indiana	71,853,777	5.43	49,739,050		253,271
Maryland	38,331,795	8.56		35,631,991	
Massachusetts	6,333,854	8.13			
Michigan	34,703,348	7.58			
Minnesota	10,315,823	7.23		3,500	
New Jersey	11,030,949	8.01			
New York	44,285,742	7.71	25,599,261		112,536
Ohio	129,160,173	7.67	2,288,858	18,269,870	234,998
Pennsylvania	275,506,155	9.66	179,218,652	53,998,977	537,830
Tennessee	2,032,459	7.84			
Texas	6,459,839	6.20		37,245	22,064
Utah	20,792,654	10.17		15,662,284	99
West Virginia	59,962,021	9.79	19,436,825		
Connecticut, Kentucky, Missouri, and Wisconsin	22,130,150	7.32	1,535,329		
Total 1955	852,922,817	8.13	311,674,742	137,062,419	1,544,490
At merchant plants	92,358,531	7.28	2,414,104		
At furnace plants	760,564,286	8.25	309,260,638	137,062,419	1,544,490
Total 1954	715,840,473	8.46	218,169,472	146,782,926	2,415,739

State	Sold for refining into tar products [2]			On hand Dec. 31
	Quantity	Value		
		Total	Average	
Alabama	38,218,079	$4,280,348	$0.112	3,053,428
California	12,444,011	[3]	[3]	458,453
Colorado	117,230	[3]	[3]	425,335
Illinois	21,341,690	2,466,584	.116	1,813,710
Indiana	26,036,619	3,079,179	.118	3,596,796
Maryland	1,360,197	[3]	[3]	3,119,703
Massachusetts	6,246,547	[3]	[3]	173,684
Michigan	33,331,409	3,858,869	.116	2,131,657
Minnesota	10,134,189	1,018,690	.101	860,230
New Jersey	10,835,554	[3]	[3]	507,395
New York	18,267,933	2,152,013	.118	1,819,000
Ohio	104,682,777	11,937,731	.114	6,720,851
Pennsylvania	40,537,432	4,756,983	.117	9,840,938
Tennessee	2,041,501	[3]	[3]	40,200
Texas	6,496,884	[3]	[3]	202,857
Utah	5,199,259	[3]	[3]	1,179,444
West Virginia	40,499,434	4,948,804	.122	1,360,204
Connecticut, Kentucky, Missouri and Wisconsin	20,589,326	2,473,483	.120	527,146
Undistributed		5,026,323	.112	
Total 1955	398,380,071	45,999,007	.115	37,831,031
At merchant plants	89,351,584	10,456,178	.117	3,808,830
At furnace plants	309,028,487	35,542,829	.115	34,022,201
Total 1954	355,878,669	38,487,182	.108	30,823,791

[1] Includes 3,766,861 gallons also shown under "Sold for refining into tar products."
[2] Comprises 38,634,114 gallons valued at $4,520,095 sold to affiliated companies and 359,745,957 gallons valued at $41,478,912 sold to other purchasers.
[3] Included with "Undistributed" to avoid disclosure of individual company figures.

In distilling or topping tar the principal tar products obtained are creosote oil, tar-acid oil (crude chemical oil), and pitch. Production of creosote oil increased 17 percent over 1954 but was about 13 million gallons short of the peak output in 1944. Crude chemical oil, however, reached a new peak, exceeding the previous maximum in 1951 by about 2 million gallons (8 percent). Sales of pitch by coke-plant operators reached an alltime peak in 1955, as several plants started marketing a roofing material. The quantity sold, however, was only 8 percent of the total produced, as most of the pitch was used as open-hearth fuel.

Prices on tar derivatives did not vary much from those obtained in preceding years.

COKE-OVEN AMMONIA

Production of coke-oven ammonia in 1955 set a new record, reaching 539 million pounds. This was slightly higher than in 1953, due to the greater quantity of coal carbonized, as the average yield of ammonia per ton of coal declined. Most of the ammonia (93 percent) evolved in the coking process is recovered as ammonium sulfate, and the balance as an aqueous solvent known as ammonia liquor. In 1955, 79 of the 81 active plants recovered ammonia in one form or another; 63 made ammonium sulfate only, 12 made ammonia liquor only, 2 plants made both sulfate and liquor, 1 plant made ammonium thiocyanate and ammonium sulfate, and 1 plant made diammonium phosphate and ammonium sulfate. In addition, three plants that produce ammonium sulfate made trial runs on diammonium phosphate. Production data on diammonium phosphate could not be published separately for 1955; but as soon as more than two producers go into commercial production, separate figures will be shown for this commodity.

Coke-oven ammonium sulfate is used almost exclusively for agricultural purposes as fertilizer material. Sales of sulfate lagged behind production during 1955, and stocks increased over 52 thousand tons, reaching an alltime peak on December 31. Although coke ovens were the only source of supply of ammonium sulfate in the United States in the 1920's, only 44 percent of the national production of this material came from coke ovens in 1955. Synthetic ammonium sulfate output exceeded the coke-oven material for the second consecutive year.

Construction was begun in 1955 on two new synthetic ammonia plants that are going to use coke-oven gas as a source of hydrogen (see Coke and Coal Chemicals chapter preprint, 1954 Technology section, p. 42). The Ketona Chemical Co. plant at Ketona, Ala., was nearing completion at the end of 1955, and the U. S. Steel plant at Geneva, Utah, was well underway.

Prices of ammonium sulfate declined in 1955 and averaged $0.019 per pound compared with $0.021 in 1954. The average unit value for ammonia liquor also declined slightly to $0.042.

TABLE 51.—Coke-oven ammonia produced and sold in the United States in 1955, by States, in pounds

State	Active plants [1]	Produced			
		Sulfate equivalent	Pounds per ton of coal coked	As sulfate [2]	As liquor (NH_3 content)
Alabama	7	190,756,357	22.34	182,065,426	2,240,508
California	1	32,378,846	23.87	32,378,846	
Colorado	1	26,997,464	22.78	26,997,464	
Illinois	7	82,475,338	19.49	[3] 107,086,181	
Indiana	5	202,835,554	15.32	[3] 175,543,655	691,172
Maryland	1	95,071,291	21.23	95,071,291	
Massachusetts	1	15,759,465	20.23	15,759,465	
Michigan	4	90,519,371	19.76	72,050,979	4,761,122
Minnesota	3	24,170,092	16.95	24,170,092	
New Jersey	2	26,682,480	19.38	26,682,480	
New York	4	130,539,375	22.71	110,648,410	5,127,859
Ohio	16	315,438,149	18.74	276,246,722	10,103,487
Pennsylvania	14	604,782,818	21.21	603,689,052	281,971
Tennessee	1	5,667,014	21.86	5,667,014	
Texas	2	24,413,252	23.42	24,413,252	
Utah	2	53,463,900	26.15	53,463,900	
West Virginia	4	114,373,708	20.30	114,373,708	
Connecticut, Kentucky, Missouri, and Wisconsin	4	55,272,377	18.27	16,344,300	10,035,596
Total 1955	79	2,091,596,851	20.06	1,962,652,237	33,241,715
At merchant plants	21	238,630,015	19.72	130,298,439	27,027,707
At furnace plants	58	1,852,966,836	20.10	1,832,353,798	5,314,008
Total 1954	80	1,774,464,664	21.09	1,645,636,400	32,207,066

State	Sold—				On hand Dec. 31	
	As sulfate [2]		As liquor (NH_3 content)		Sulfate [2]	Liquor (NH_3 content)
	Quantity	Value	Quantity	Value		
Alabama	183,618,860	$3,411,968	2,269,093	[4]	25,854,209	22,603
California	25,730,400	[4]			14,973,240	
Colorado	18,535,955	[4]			12,820,005	
Illinois	97,691,179	1,969,322			26,080,520	
Indiana	174,479,779	3,624,494	572,322	[4]	41,889,738	811,138
Maryland	89,399,810	[4]			14,097,981	
Massachusetts	14,742,805	[4]			1,219,280	
Michigan	52,995,614	[4]	191,427	[4]	20,719,505	537,581
Minnesota	19,465,082	428,228			7,791,107	
New Jersey	26,761,540	[4]			2,816,620	
New York	107,151,130	2,034,682			12,516,000	54,442
Ohio	248,185,454	4,839,618	8,170,613	$335,458	58,335,401	1,231,801
Pennsylvania	580,195,040	10,291,715	263,012	[4]	140,771,278	47,339
Tennessee	3,612,200	[4]			2,127,294	
Texas	24,057,850	[4]			1,833,554	
Utah	49,208,354	[4]			23,685,428	
West Virginia	122,582,565	2,178,933			8,636,734	
Connecticut, Kentucky, Missouri, and Wisconsin	15,546,040	320,189	8,543,402	346,448	1,874,340	597,815
Undistributed		7,017,556		152,640		
Total 1955	1,853,959,657	36,116,705	20,009,869	834,546	418,042,234	3,302,719
At merchant plants	122,321,367	2,589,081	14,829,348	604,814	15,556,464	2,280,706
At furnace plants	1,731,638,290	33,527,624	5,180,521	229,732	402,485,770	1,022,013
Total 1954	1,638,967,393	34,644,877	19,596,259	1,066,242	312,592,422	3,069,361

[1] Number of plants that recovered ammonia.
[2] Includes a small amount of diammonium phosphate and ammonium thiocyanate.
[3] Difference between actual production of sulfate and sulfate equivalent due to transfer of liquor from Indiana for conversion into sulfate in Illinois by same producing company.
[4] Included with "Undistributed" to avoid disclosure of individual company figures.

CRUDE LIGHT OIL AND DERIVATIVES

Coke-plant operators usually recover crude light oil from the gas stream and process it into benzene, toluene, xylene, and other aromatic chemical materials. All but 6 of the active oven-coke plants recovered crude light oil in 1955, and 95 percent of the total output was processed (distilled) by coke-oven operators. The total output of crude light oil reached a new high and exceeded 1954 output by about 51 million gallons (21 percent). The yield of light oil declined slightly from 1954, principally because of the higher oven temperatures and shorter coking cycles maintained during the last three-quarters of the year. The yield of light oil usually declines when coking temperatures increase, although other factors influence yield, such as rank and grade of coal and scrubbing or recovery equipment. The highest yields in 1955 were obtained in Utah, Colorado, Maryland, and California, where high-volatile coals are carbonized. Table 52 summarizes production, yield, quantities refined, and stocks of light oil, by States, for 1955.

The composition of crude light oil is influenced by the type of coal carbonized and coking temperatures. Usually high-temperature coke-oven crude light oil contains 60 to 65 percent benzene, 10 to 15 percent toluene, 2 to 5 percent xylene, 2 to 4 percent solvent naphtha, and small percentages of naphthalene. Salable derivatives normally amount to approximately 75 to 90 percent of the light oil distilled, and the remainder consists of forerunning and washing losses, still residue, and handling losses. Yields of light-oil derivatives for 1955 and certain previous years are shown in table 53.

Benzene is the most important derivative obtained from crude light oil; it furnishes coke-plant operators with 17 percent of all revenue obtained from the commercial sales of chemical materials. Hundreds of finished chemical products are derived from benzene, and new uses and products are constantly being developed. In the past 4 or 5 years the major uses for benzene were for manufacturing styrene, phenol, synthetic detergents, and synthetic fibers, from which are made our synthetic rubber, plastics, dyes, insecticides, and nylon. Some of these uses require a benzene of extremely high purity. Benzene, which was considered a pure product and satisfactory for chemical synthesis a few years ago, is considered only a semipure material for several of the newer applications. To meet the exacting specifications for these new uses, coke-oven benzene must be upgraded. Consequently, new processes and improved techniques in light-oil refining have been studied by a number of coke-oven operators. An interesting and informative presentation of the research and development work done by one of the leading coal-chemical producers of the United States was given recently at the winter meeting of the Eastern States Blast-Furnace and Coke-Oven Association.[10]

[10] Volmer, R. W. and Simmat, W. E., Light-Oil Purification by Modern Techniques: Koppers Co., Inc. Engineering and Construction Division, Pittsburgh 19, Pa., 15 pp.

Coke-plant operators produced 57 percent of the total quantity of benzene made in the United States in 1955. The production of benzene from petroleum sources has increased tremendously in the past 4 years, while output by tar distillers has varied according to the volume of imports. Table 55 shows the quantities of benzene produced by each of the three major producing groups in the United States during 1950–55.

Although precise data on the consumption of benzene, by major uses, are not available for 1955, estimates made by the Coal-Chemicals Committee of the American Coke and Coal Chemicals Institute are shown in table 56. Data compiled by the Business and Defense Services Administration of the United States Department of Commerce on consumption of benzene by uses in 1953 and estimated use in 1954 are also shown for comparative purposes in the table. The large increase in the consumption of benzene in manufacturing phenol and styrene in 1955 over 1953 and 1954 was due largely to the increased use of phenol for plastics and styrene for synthetic rubber and plastics.

Prices of benzene declined slightly in 1955. The weighted average unit value of all benzene sold by coke-oven operators, exclusive of motor grade, was $0.35 compared with $0.39 in 1954. Prices of toluene, xylene, and solvent naphtha varied slightly from the 1954 averages.

TABLE 52.—Coke-oven crude light oil produced in the United States and derived products produced and sold in 1955, by States, in gallons

State	Active plants[1]	Crude light oil				Derived products		
		Produced	Per ton of coal coked	Refined on premises[2]	On hand Dec. 31	Produced	Sold[3]	
							Quantity	Value
Alabama	7	21,878,780	2.56	21,296,544	452,786	17,472,481	17,877,596	$6,166,059
California	1	4,530,667	3.34	4,511,107	30,360	3,506,791	3,575,604	(4)
Colorado	1	4,308,957	3.64	4,319,153	24,045	3,669,692	3,729,881	(4)
Illinois	7	11,662,704	2.76	8,577,400	191,866	7,239,105	7,572,512	2,538,170
Indiana	4	28,108,653	2.23	28,140,050	940,079	22,191,944	22,891,632	7,749,213
Maryland	1	15,433,822	3.45	15,445,417	164,578	13,153,520	13,385,275	(4)
Massachusetts	1	2,214,534	2.84	3,390,948	104,945	2,779,394	3,104,998	(4)
Michigan	4	12,819,195	2.80	7,270,026	234,246	6,299,793	5,764,874	1,971,089
New Jersey	1	2,673,122	2.87	----------	20,687	----------	----------	----------
New York	4	17,170,932	2.99	26,776,160	280,733	23,444,812	14,836,434	5,135,263
Ohio	16	47,704,689	2.83	44,401,973	579,362	35,788,024	35,631,151	11,599,071
Pennsylvania	14	91,386,465	3.21	87,248,968	1,854,783	74,123,851	73,091,665	24,115,603
Tennessee	1	652,557	2.52	649,960	8,897	527,108	544,177	(4)
Texas	2	2,863,174	2.75	2,862,473	6,123	2,403,644	2,416,938	(4)
Utah	2	7,527,280	3.68	7,554,246	101,908	6,864,851	6,236,089	(4)
West Virginia	5	18,514,044	3.02	16,600,929	87,007	14,219,780	12,461,276	4,190,034
Connecticut, Kentucky, Missouri, and Wisconsin	4	8,048,217	2.66	2,154,836	329,931	1,891,393	1,827,900	586,707
Undistributed	----------	----------	----------	----------	----------	----------	----------	10,920,897
Total 1955	75	297,497,792	2.91	281,200,190	5,412,336	235,576,183	224,948,002	74,972,106
At merchant plants	19	28,302,210	2.51	22,312,218	1,225,744	19,578,309	8,791,226	2,925,631
At furnace plants	56	269,195,582	2.96	258,887,972	4,186,592	215,997,874	216,156,776	72,046,475
Total 1954	77	246,018,627	2.98	233,983,106	4,081,771	194,759,732	182,452,276	65,866,998

[1] Number of plants that recovered crude light oil.
[2] Includes small quantity of material also shown under "Sold as crude light oil."
[3] Excludes 16,143,851 gallons of crude light oil valued at $3,474,210 sold as such.
[4] Included with "Undistributed" to avoid disclosure of individual company figures.

TABLE 53.—Yield of light-oil products from refining crude light oil at oven-coke plants in the United States, 1929, 1939, 1947–49 (average), and 1951–55, in percent

Year	Benzene		Toluene, crude and refined	Xylene, crude and refined	Solvent naphtha	Other light-oil products
	Motor	All other grades				
1929	54.4	12.8	9.4	[1]	3.7	3.4
1939	48.6	15.4	12.1	2.5	2.9	3.8
1947–49 (average)	6.5	59.2	11.7	3.1	2.3	3.3
1951	1.9	63.9	12.7	3.4	2.2	2.6
1952	[2]	65.4	12.9	3.4	2.0	2.6
1953	.4	63.7	12.9	3.6	2.3	2.2
1954	1.4	59.6	14.3	4.3	2.0	1.7
1955	[2]	62.0	13.6	4.0	2.0	2.3

[1] Included with solvent naphtha.
[2] Included with "Other light-oil products" to avoid disclosure of individual company figures.

TABLE 54.—Benzene and toluene produced at oven-coke plants in the United States, 1941, 1947–49 (average), and 1951–55, by grades, in gallons

Year	Benzene				Toluene		
	Motor	Nitration or 1° C.	Pure commercial or 2° C.	All other	Nitration or 1° C.	Pure commercial or 2° C.	All other
1941	106,372,000	15,414,500	18,286,400	4,182,600	14,689,800	13,268,500	1,378,900
1947–49 (average)	15,246,900	38,335,100	98,395,100	2,535,900	21,407,400	5,529,200	568,600
1951	5,103,700	45,057,500	123,315,700	4,476,100	24,772,500	8,689,700	839,300
1952	[1]	46,211,300	104,030,800	4,872,200	21,342,000	7,613,400	1,567,100
1953	1,160,000	51,566,400	120,939,500	5,086,900	26,834,400	8,330,500	871,600
1954	3,327,100	44,383,000	92,336,600	2,718,200	24,718,800	7,775,600	888,600
1955	[1]	87,642,000	84,125,700	2,452,600	30,037,900	8,167,500	[2]

[1] Withheld to avoid disclosure of individual company figures.
[2] Combined with "Pure commercial or 2° C." to avoid disclosure of individual company figures.

TABLE 55.—Production of benzene (excluding motor grade) in the United States, 1950–55, in thousand gallons [1]

Year	From tar distilleries [2]					From coke-oven operations				
	Produced	Percent of total	Sold			Produced	Percent of total	Sold		
			Quantity	Value				Quantity	Value	
				Total	Average				Total	Average
1950	21,557	11.6	14,763	$4,153	$0.28	154,466	83.0	150,957	$38,513	$0.26
1951	60,310	22.7	45,422	17,081	.38	172,849	65.0	171,024	57,589	.34
1952	61,035	24.3	37,489	18,552	.49	155,114	61.6	152,859	51,870	.34
1953	32,108	11.8	19,224	8,496	.44	177,593	65.1	172,405	66,479	.39
1954	25,460	9.9	18,344	7,413	.40	139,438	54.3	131,857	50,958	.39
1955	34,671	11.3	24,948	7,970	.32	174,220	56.6	168,750	58,663	.35

Year	From petroleum refineries					Total				
	Produced	Percent of total	Sold			Produced	Percent of total	Sold		
			Quantity	Value				Quantity	Value	
				Total	Average				Total	Average
1950	10,129	5.4	6,802	$2,475	$0.36	186,152	100.0	172,522	$45,141	$0.26
1951	32,572	12.3	17,589	8,280	.47	265,731	100.0	234,035	82,950	.35
1952	35,518	14.1	26,650	12,788	.48	251,667	100.0	216,998	83,210	.38
1953	63,043	23.1	41,071	20,790	.51	272,744	100.0	232,700	95,765	.41
1954	91,912	35.8	51,714	24,631	.48	256,810	100.0	201,915	83,002	.41
1955	98,588	32.1	71,110	30,901	.43	307,479	100.0	264,808	97,534	.37

[1] U. S. Tariff Commission.
[2] Includes benzene made from imported crude light oil.

TABLE 56.—Consumption of commercial benzene (excluding motor grade) in the United States, 1953–56, by uses, in thousand gallons [1]

Use	1953	1954 [2]	1955 [2]	1956 [2]
Styrene	97,301	84,800	120,000	125,000
Phenol	47,832	51,300	63,000	63,000
Synthetic detergents	23,631	24,600	24,000	24,000
Aniline	13,888	11,900	16,500	16,500
DDT	8,589	9,400	12,000	10,000
Dichlorobenzene [3]	6,559	5,900	9,500	9,500
Maleic anhydride	6,376	6,000	7,500	8,000
Benzene hexachloride	5,029	5,000	4,500	4,000
Exports	[4] 1,240	6,100	2,500	2,500
Miscellaneous [5]	[6] 40,533	39,200	41,500	41,500
Total	250,978	244,200	301,000	304,000

[1] 1953–54 from Chemical and Rubber Division, Business and Defense Services Administration, and 1955–56 from American Coke and Coal Chemicals Institute.
[2] Estimated.
[3] Chlorobenzene (di and mono) for uses other than as an intermediate for phenol, aniline, and DDT.
[4] As reported by the U. S. Department of Commerce.
[5] Several end uses of benzene combined to avoid disclosure of individual company figures such as: Synthetic fibers, nitrobenzene for uses other than as an intermediate for aniline and DDT, diphenyls, solvents, paint removers, denaturant for ethyl alcohol, and other miscellaneous uses.
[6] Partly estimated.

TABLE 57.—Production and sales of light-oil derivatives at coke ovens in the United States in 1955, by States, in gallons

State	Benzene (all grades except motor)				Toluene (all grades)			
	Production	Yield from crude light oil refined (percent)	Sales		Production	Yield from crude light oil refined (percent)	Sales	
			Quantity	Value			Quantity	Value
Alabama	13,557,896	63.7	14,065,688	$5,010,250	2,689,511	12.6	2,608,295	$834,685
California	2,490,376	55.2	2,542,573	(1)	722,583	16.0	745,518	(1)
Colorado	2,701,648	62.6	2,689,426	(1)	570,762	13.2	601,644	(1)
Illinois and Missouri	6,240,733	66.7	6,552,044	2,281,340	1,095,395	11.7	1,137,861	370,426
Indiana	18,417,065	65.4	19,115,200	6,653,037	2,628,773	9.3	2,826,772	878,733
Maryland	10,044,765	65.0	10,436,121	(1)	2,302,637	14.9	2,182,541	(1)
Massachusetts	2,080,889	61.4	2,383,449	(1)	500,780	14.8	528,751	(1)
Michigan and Wisconsin	5,784,688	67.0	5,302,054	1,874,125	1,114,370	12.9	1,088,527	336,740
New York	17,854,556	66.7	11,783,459	4,116,459	3,478,085	13.0	2,280,375	720,649
Ohio	27,465,707	61.9	27,651,598	9,236,630	5,211,769	11.7	5,401,530	1,642,222
Pennsylvania	50,935,498	58.4	50,559,497	17,789,661	13,539,363	15.5	13,402,529	3,812,923
Tennessee	389,667	60.0	401,596	(1)	98,916	15.2	101,013	(1)
Texas	1,883,399	65.8	1,900,205	(1)	335,488	11.7	341,817	(1)
Utah	4,402,197	58.3	4,745,207	(1)	1,214,449	16.1	978,939	(1)
West Virginia	9,971,258	60.1	8,622,234	3,048,191	2,702,562	16.3	2,425,581	804,426
Undistributed				8,653,178				1,562,013
Total 1955	174,220,342	62.0	168,750,351	58,662,871	38,205,443	13.6	36,651,693	10,962,817
At merchant plants	13,771,443	61.7	5,917,191	2,049,235	3,167,187	14.2	1,723,139	587,488
At furnace plants	160,448,899	62.0	162,833,160	56,613,636	35,038,256	13.5	34,928,554	10,375,329
Total 1954	139,437,786	59.6	131,857,424	50,957,711	33,383,028	14.3	30,547,931	9,663,976

State	Xylene (all grades)				Solvent naphtha (crude and refined)			
	Production	Yield from crude light oil refined (percent)	Sales		Production	Yield from crude light oil refined (percent)	Sales	
			Quantity	Value			Quantity	Value
Alabama	696,109	3.3	672,307	$224,187	315,740	1.5	310,777	$78,996
California	169,963	3.8	168,400	(1)	123,869	2.7	119,113	(1)
Colorado	193,264	4.5	233,280	(1)	204,018	4.7	205,531	(1)
Illinois and Missouri	236,558	2.5	227,502	76,345	99,931	1.1	93,248	22,961
Indiana	461,176	1.6	447,518	143,248	500,019	1.8	502,142	74,195
Maryland	806,118	5.2	766,613	(1)				
Massachusetts	116,680	3.4	117,805	(1)	81,045	2.4	74,993	(1)
Michigan and Wisconsin	256,440	3.0	232,005	77,838	1,866	0.0	231	(1)
New York	827,402	3.1	663,245	266,082	110,378	0.4	109,355	(1)
Ohio	2,050,962	4.6	1,908,261	548,146	644,747	1.5	669,762	172,073
Pennsylvania	4,331,511	5.0	4,354,941	1,415,064	2,922,540	3.3	2,819,573	795,423
Tennessee	38,525	5.9	41,568	(1)				
Texas	102,134	3.6	94,441	(1)	82,623	2.9	80,475	(1)
Utah	261,000	3.5	269,276	(1)	244,035	3.2	242,667	(1)
West Virginia	746,243	4.5	659,786	205,723	180,571	1.1	152,490	29,016
Undistributed				527,215				210,630
Total 1955	11,294,085	4.0	10,856,948	3,483,848	5,511,382	2.0	5,380,357	1,383,294
At merchant plants	871,369	3.9	630,253	216,539	232,142	1.0	208,769	47,755
At furnace plants	10,422,716	4.0	10,226,695	3,267,309	5,279,240	2.0	5,171,588	1,335,539
Total 1954	9,956,303	4.3	9,527,187	3,120,709	4,582,782	2.0	4,559,895	1,197,206

[1] Included with "Undistributed" to avoid disclosure of individual company figures.

CRUDE NAPHTHALENE

One of the outstanding developments in the coke industry in 1955 was the 84-percent increase in production of crude naphthalene at coke plants. This coal chemical was considered a nuisance by many coke-plant operators a few years ago but has recently become one of the most important raw materials in our organic-chemical industry. Its importance in the chemical industry is due to its many essential products and not its direct application. Coal carbonization is the only domestic source of supply, and output therefore depends on coke-oven operations. Coke-plant operators may recover naphthalene from (1) final coolers, (2) refining of crude light oil, and (3) topping or refining crude coal tar. Although precise data on the quantities of naphthalene produced from each source are not available, estimates indicated that nearly three-quarters of the total coke-plant output was obtained by processing crude tar and the balance from benzene still-residue and from final coolers. The amount of naphthalene that can be obtained from light-oil refining and from the final coolers is much smaller than the potential from tar. High-temperature coke-oven tar theoretically contains 8 to 11 percent by weight of naphthalene on a dry basis. Although the yield of naphthalene from current operations is not that high, and in some tar-distillation operations the naphthalene is left in the creosote oil, the potential supply from coke-oven tar is considerably higher than actual current output. Increased requirements of naphthalene have stimulated coke-plant operators to attempt a greater production, and several large tar-distillation plants have recently gone on stream to recover naphthalene from the crude tar. In topping or processing tar to remove naphthalene, the naphthalene fraction can be removed for later processing, leaving a residual tar, or soft pitch, that is fully satisfactory as fuel in open-hearth operations.

The commercial grades of naphthalene are defined in terms of melting points. The crude grades range from 74° to 79° C. and are suitable for some industrial applications without further refining. The crude grade that has a melting point below 74° C. has virtually no direct commercial use and is sold by the coke-plant operators to tar refiners for upgrading or refining. Refined naphthalene has a melting point of 79° or greater, but none of this grade is produced as yet in the coke industry. Table 58 shows the production of crude naphthalene, by grades, at coke plants. These data show that 21 percent of the production of naphthalene at coke plants solidified at less than 74° C. and required further processing.

In an effort to obtain information on production, capacity, planned expansion of facilities, and consumption of naphthalene, the Chemical and Rubber Division, Business and Defense Services Administration, United States Department of Commerce, conducted a special survey in 1954. The results of this survey were published early in 1956.[11]

[11] Business and Defense Services Administration, Naphthalene Report; Chemical and Rubber Industry Report: U. S. Department of Commerce, vol. 3, No. 2, February 1956, pp. 27–31.

TABLE 58.—Crude naphthalene produced and sold by coke-plant operators in the United States, 1951–55, by grades, in pounds

Year	Solidifying under 74° C.				From 74° to 79° C.			
	Produced	Sold			Produced	Sold		
		Quantity	Value			Quantity	Value	
			Total	Average			Total	Average
1951	[1]125, 579, 578	[1]130, 200, 785	[1]$6, 849, 831	$0. 053	(2)	(2)	(2)	
1952	46, 979, 403	47, 306, 112	1, 831, 714	. 039	59, 924, 103	49, 151, 700	$3, 129, 943	$0. 064
1953	56, 676, 867	52, 974, 072	1, 938, 497	. 037	56, 260, 347	38, 568, 039	2, 448, 929	. 063
1954	22, 857, 876	24, 675, 886	642, 887	. 026	77, 201, 155	72, 625, 985	3, 726, 375	. 051
1955	39, 199, 282	37, 678, 838	1, 318, 973	. 035	146, 023, 756	136, 109, 946	8, 216, 199	. 060

[1] Includes material solidifying from 74° to 79° C.
[2] Included with material solidifying under 74° C.

TABLE 59.—Crude naphthalene produced and sold by coke-plant operators in the United States in 1955, by States

State	Active plants [1]	Produced (pounds)	Sold			On hand Dec. 31 (pounds)
			Pounds	Value		
				Total	Average	
Alabama	6	24, 258, 373	24, 208, 361	$1, 418, 412	$0. 059	666, 107
Colorado	1	1, 084, 910	882, 945	(2)	(2)	95, 197
Illinois	5	7, 483, 530	7, 184, 480	386, 145	. 054	309, 287
Indiana	3	49, 637, 325	49, 978, 698	3, 137, 907	. 063	315, 055
Maryland	1	3, 413, 132	3, 512, 570	(2)	(2)	213, 030
Massachusetts	1	696, 600	696, 600	(2)	(2)	
New York	3	3, 315, 457	3, 347, 288	127, 624	. 038	118, 334
Ohio	10	15, 618, 679	15, 534, 103	638, 435	. 041	519, 308
Pennsylvania	8	71, 727, 729	61, 595, 594	3, 396, 824	. 055	1, 430, 814
Tennessee	1	132, 389	128, 700	(2)	(2)	16, 725
Utah	1	1, 971, 380	1, 984, 000	(2)	(2)	42, 440
Kentucky, Michigan, New Jersey, and West Virginia	5	4, 883, 534	4, 735, 445	159, 556	. 034	331, 967
Undistributed				270, 269	. 038	
Total 1955	45	184, 223, 038	173, 788, 784	9, 535, 172	. 055	4, 058, 264
Merchant plants	6	1, 770, 718	1, 696, 305	72, 984	. 043	188, 570
Furnace plants	39	182, 452, 320	172, 092, 479	9, 462, 188	. 055	3, 869, 694
Total 1954	42	100, 059, 031	97, 301, 871	4, 369, 262	. 045	3, 238, 186

[1] Number of plants that recovered naphthalene.
[2] Included with "Undistributed" to avoid disclosure of individual company figures.

COKE OVENS OWNED BY CITY GAS COMPANIES

(PUBLIC UTILITIES)

In 1955 only 4 oven-coke plants were operated by gas utilities, and production of coke from these plants amounted to less than 2 percent of the national output. Production of coke from this source has dropped substantially since 1934, when 11 percent of the total oven-coke output of the nation was made in ovens owned by gas utilities. The decline in carbonizing capacity and, of course, coke production by the gas utilities, has been due principally to substitution of natural gas for coke-oven gas. Although some utilities operating coke ovens have been mixing the output of gas from their ovens with natural gas, it appeared that this procedure might be discontinued in at least one large metropolitan area in the near future in favor of straight natural gas. This changeover is becoming necessary because of the increasing load factor. The distribution of straight natural gas permits the distribution of more British thermal units during periods of peak loads in the heavy burning seasons. Details on coal consumption and production of coke, gas, and other coal-chemical materials in 1955, by gas utilities, are shown in table 60.

TABLE 60.—Coke, breeze, and coal-chemical materials produced in the United States at oven-coke plants owned by city gas companies (public utilities)[1] compared with all other oven-coke plants, 1954–55

Product	1954			1955		
	Plants not owned by city gas companies	Plants owned by city gas companies (public utilities)	Total	Plants not owned by city gas companies	Plants owned by city gas companies (public utilities)	Total
Number of active plants	77	5	82	77	4	81
Coke:						
Produced—net tons	57,924,327	1,137,115	59,061,442	72,578,092	1,006,122	73,584,214
Value	$920,458,615	$20,310,458	$940,769,073	$1,181,289,636	$18,340,537	$1,199,630,173
Average per ton	$15.89	$17.86	$15.93	$16.28	$18.23	$16.30
Breeze:						
Produced—net tons	3,844,927	85,626	3,930,553	4,788,353	73,872	4,862,225
Sold—do	825,934	15,911	841,845	1,157,418	13,089	1,170,507
Value of sales	$4,485,269	$97,589	$4,582,858	$6,582,511	$78,564	$6,661,075
Average per ton	$5.43	$6.13	$5.44	$5.69	$6.00	$5.69
Coal carbonized:						
Bituminous—net tons	82,840,459	1,570,141	84,410,600	103,150,763	1,356,942	104,507,705
Anthracite—do	190,509	38,864	229,373	317,461	48,707	366,168
Total—do	83,030,968	1,609,005	84,639,973	103,468,224	1,405,649	104,873,873
Value	$744,523,287	$16,992,968	$761,516,255	$913,290,147	$14,082,562	$927,372,709
Average per ton	$8.97	$10.56	$9.00	$8.83	$10.02	$8.84
Coke—						
Used by producing companies:						
Net tons	51,906,717	299,106	52,205,823	64,169,201	74,948	64,244,149
Value	$816,450,721	$4,204,583	$820,655,304	$1,042,281,498	$1,125,911	$1,043,407,409
Commercial sales:						
Net tons	5,761,044	708,111	6,469,155	9,261,043	1,176,000	10,437,043
Value	$97,399,805	$13,832,704	$111,232,509	$153,682,831	$21,700,049	$175,382,880
Coal-chemical materials:						
Tar:						
Produced—gallons	703,333,107	12,507,366	715,840,473	843,003,635	9,919,182	852,922,817
Sold—do	344,048,229	11,830,440	355,878,669	388,676,714	9,703,357	398,380,071
Value of sales	$37,158,654	$1,328,528	$38,487,182	$44,834,435	$1,164,572	$45,999,007
Ammonia:						
Produced (NH_3 equivalent of all forms)—pounds	435,404,307	8,211,859	443,616,166	532,480,273	6,733,189	539,213,462
Liquor (NH_3 content):						
Produced—do	31,706,259	500,807	32,207,066	32,959,744	281,971	33,241,715
Sold—do	19,154,706	441,553	19,596,259	19,746,857	263,012	20,009,869
Value of sales	$1,050,260	$15,982	$1,066,242	$825,735	$8,811	$834,546
Sulfate:[2]						
Produced—pounds	1,614,792,192	30,844,208	1,645,636,400	1,937,628,118	25,024,119	1,962,652,237
Sold—do	1,604,380,353	34,587,040	1,638,967,393	1,831,982,035	21,977,622	1,853,959,657
Value of sales	$33,881,689	$763,188	$34,644,877	$35,639,088	$477,617	$36,116,705

Gas:						
Produced—M cubic feet	853,352,703	16,521,812	869,874,515	1,069,638,913	13,985,682	1,083,624,595
Disposal of surplus:						
Used under boilers:						
M cubic feet	45,868,537	92,507	45,961,044	57,141,504	75,051	57,216,555
Value	$7,720,134	$15,440	$7,735,574	$9,877,034	$43,079	$9,920,113
Average per M cubic feet	$0.168	$0.167	$0.168	$0.173	$0.574	$0.173
Used in steel or allied plants:						
M cubic feet	408,635,974	----------	408,635,974	472,551,419	----------	472,551,419
Value	$83,931,014	----------	$83,931,014	$100,351,821	----------	$100,351,821
Average per M cubic feet	$0.205	----------	$0.205	$0.212	----------	$0.212
Distributed through city mains:						
M cubic feet	62,443,930	14,288,346	76,732,276	59,044,361	11,417,381	70,461,742
Value	$23,732,979	$7,619,670	$31,352,649	$22,347,621	$5,410,043	$27,757,664
Average per M cubic feet	$0.380	$0.533	$0.409	$0.378	$0.474	$0.394
Sold for industrial use:						
M cubic feet	25,717,498	1,296,355	27,013,853	87,395,097	1,723,127	89,118,224
Value	$5,087,985	$458,692	$5,546,677	$17,516,142	$594,026	$18,110,168
Average per M cubic feet	$0.198	$0.354	$0.205	$0.200	$0.345	$0.203
Crude light oil:						
Produced—gallons	244,490,397	1,528,230	246,018,627	296,875,772	622,020	297,497,792
Sold—do	13,087,039	1,560,482	14,647,521	15,521,122	622,729	16,143,851
Value of sales	$3,173,306	$322,150	$3,495,456	$3,364,748	$109,462	$3,474,210
Light-oil derivatives:						
Produced—gallons	194,759,732	----------	194,759,732	235,576,183	----------	235,576,183
Sold—do	182,452,276	----------	182,452,276	224,948,002	----------	224,948,002
Value of sales	$65,866,998	----------	$65,866,998	$74,972,106	----------	$74,972,106
Naphthalene (crude):						
Produced—pounds	100,059,031	----------	100,059,031	184,223,038	----------	184,223,038
Sold—do	97,301,871	----------	97,301,871	173,788,784	----------	173,788,784
Value of sales	$4,369,262	----------	$4,369,262	$9,535,172	----------	$9,535,172
All other coal-chemical materials, value	$15,707,044	$40,780	$15,747,824	$21,294,534	$13,593	$21,308,127

[1] Coke ovens built by city gas companies, some of which are operated in conjunction with coal- and water-gas plants. Does not include independent oven-coke plants that may sell gas to public-utility companies for distribution.

[2] Includes diammonium phosphate and ammonium thiocyanate.

Fuel Briquets and Packaged Fuel

By Eugene T. Sheridan and Maxine M. Otero

GENERAL SUMMARY

THE PRODUCTION of fuel briquets, after falling steadily since 1950, increased slightly in 1955 and was 0.3 percent higher than in 1954. Only 23 fuel-briquet plants reported production in 1955, the smallest number of active plants since 1928. Briquets are used principally for space heating in the United States; in the past several years, production has gradually declined, owing to the increased use of fuel oil and natural gas for domestic heating. However, in 1955, consumption of briquets was slightly higher, possibly because of colder weather and the unavailability of other fuels, especially in the Northern Pacific States. Wisconsin had the highest production of briquets and West Virginia ranked second. Wisconsin also led in consumption, using 16 percent of the total production. West Virginia, however, consumed less than 0.1 percent of the national output of briquets.

Production of packaged fuel decreased 11 percent from 1954 and was less than half the average annual production for 1947–49. Like fuel briquets, packaged fuel is used for space heating, and production has declined appreciably during the past decade, owing to the substitution of other fuels. Convenience in use of fuel oil and natural gas, the so-called automatic fuels, and increases in consumer prices of briquets and packaged fuel have weakened their competitive positions and are the chief cause for their decreased use.

Low-volatile bituminous coal was the principal raw material used in both fuel-briquet and packaged-fuel manufacture in 1955. Other fuels used were: High-volatile bituminous coal, anthracite, semi-anthracite, petroleum coke, residual carbon from the manufacture of oil gas, and anthracite other than Pennsylvania anthracite.

Briquets and packaged fuel differ widely in the amount and kind of binding material used. Briquets, which are designed for rough handling and weathering, contain a water-insoluble binder, whereas packaged fuel, which is wrapped and designed for local use, has a water-soluble one. Petroleum asphalt was the principal binder used for briquets, and starch was the most widely-used binder in packaged-fuel manufacture during 1955. In the manufacture of briquets an average of 150 pounds of asphalt was used per ton of raw fuel, whereas only about 13 pounds of starch was used per ton of raw material in making packaged fuel.

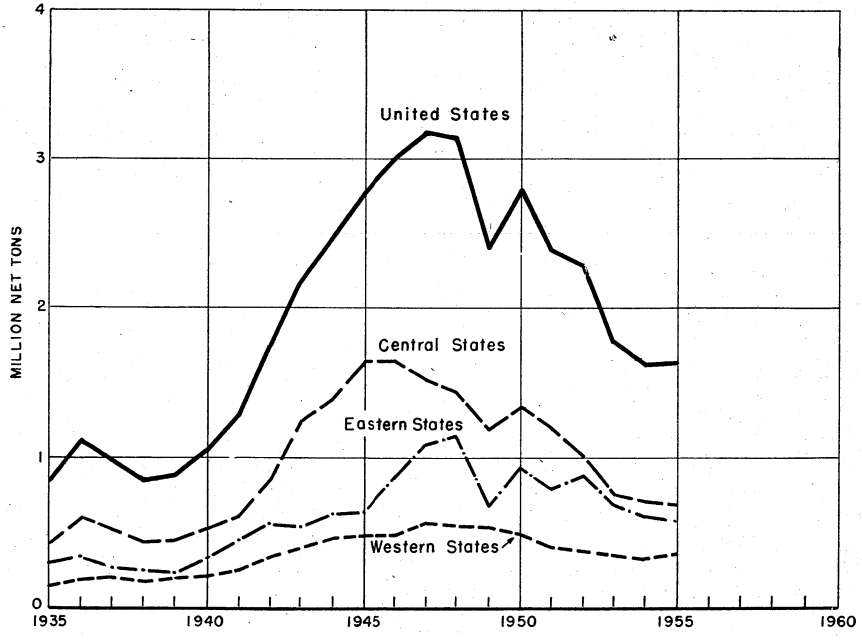

FIGURE 1.—Production of fuel briquets in the United States, 1935–55, by regions.

Briquets are usually produced as small, pillow-shaped forms, 2 to 4 inches long, and weigh 2 to 4 ounces each. Packaged fuel is usually produced as 3- or 4-inch cubes, 6 or 8 of which are wrapped together in heavy paper to form a package, which weighs 10 to 15 pounds.

TABLE 1.—Salient statistics of the fuel-briquetting and packaged-fuel industry in the United States, 1947–49 (average) and 1952–55

	1947–49 (average)	1952	1953	1954	1955
FUEL BRIQUETS					
Production.....net tons	2,901,348	2,279,756	1,780,061	1,624,462	1,629,542
Value of production	$31,805,000	$26,743,120	$21,111,293	$19,161,635	$19,037,987
Average value per net ton f. o. b. plant	$10.96	$11.73	$11.86	$11.80	$11.68
Imports [1].....net tons	360	168	97	239	----------
Exports [1].....do	207,928	132,786	102,907	98,908	106,294
Apparent consumption [2].....do	2,693,780	2,147,138	1,677,251	1,525,793	1,523,248
World production.....do	62,000,000	112,000,000	118,000,000	[3] 123,000,000	125,000,000
PACKAGED FUEL					
Production.....net tons	155,281	96,267	79,732	77,360	69,212
Value of production	$2,618,238	$1,780,471	$1,492,119	$1,416,606	$1,194,045
Average value per net ton, f. o. b. plant	$16.86	$18.50	$18.71	$18.31	$17.25

[1] Compiled from the records of the U. S. Department of Commerce. Excludes exports of briquets made from petroleum coke and residual carbon from the manufacture of oil gas.
[2] Production plus imports minus exports.
[3] Revised figure.

The average unit value of $17.25 per ton for packaged fuel was considerably higher than the $11.68 per ton for briquets because of higher material and manufacturing costs and because of a difference in marketing methods. Nearly all packaged fuel is sold by retailers to ultimate customers in small lots, whereas a substantial part of the fuel-briquet output is sold by producers to wholesalers and retailers. A small amount of packaged fuel is sold in the mid-West from vending machines.

SCOPE OF REPORT

All statistics in this chapter, except where noted, have been based upon producers' reports, supplied voluntarily to the Bureau of Mines by the manufacturers of fuel briquets and packaged fuel in the United States. The annual collection and publication of data on fuel briquets has been continuous since 1907, when the Federal Geological Survey made the first annual canvass of the industry. Packaged-fuel statistics have been continuous since 1935.

Thirty fuel-briquet plants were canvassed, and replies were received from all. However, only 23 reported production for 1955. Of the plants canvassed, 1 plant was reported as an experimental plant with no production in 1955; 3 plants were permanently abandoned; 1 plant was idle but not abandoned; and 2 plants, which had been erected by the Government, were idle during the year and were returned to the Government in December. Forty-four packaged-fuel plants were canvassed, and replies were received from 38. Thirty-one plants reported production, and 7 were reported permanently abandoned. No attempt was made to estimate for nonreporting plants. The plants that did not reply were small and operated intermittently in previous years and were assumed to be idle in 1955.

The average of the 3 years, 1947–49, is used as a base for measuring production and consumption trends and the standard unit of measurement is the short ton of 2,000 pounds.

FUEL BRIQUETS

CAPACITY

The productive capacity of the fuel-briquet industry decreased 8 percent in 1955, owing principally to 2 plants discontinuing operations. Thirteen plants have ceased operations since 1948. Virtually all plants that have gone out of production have been small, with a designed capacity of less than 25,000 tons per year, and all plants in operation at the end of 1955 had a capacity greater than this amount. The production rate of the industry was 3.4 points higher than in 1954 and about equaled 1953.

The rate of operation is generally higher in the larger plants than in the smaller ones. Of the 11 plants reporting increased production in 1955, only 2 had a rated capacity of less than 100,000 tons per year; however, the decline in demand for fuel briquets in the past 5 years has caused the rate of production of all plants to decrease steadily.

TABLE 2.—Annual capacity and production of briquetting plants in the United States, 1951–55

	Active plants	Annual capacity (net tons)	Production	
			Net tons	Percent of annual capacity
1951	28	4,406,680	2,387,219	54.2
1952	28	4,442,500	2,279,756	51.3
1953	26	4,216,000	1,780,061	42.2
1954	25	4,161,000	1,624,462	39.0
1955:				
Plants with capacity of—				
Less than 25,000 tons				
25,000 to less than 100,000 tons	8	405,000	143,121	35.3
100,000 to less than 200,000 tons	8	876,000	352,249	40.2
200,000 to less than 400,000 tons	4	1,060,000	465,131	43.9
400,000 or more tons	3	1,500,000	669,041	44.6
Total	23	3,841,000	1,629,542	42.4
Plants with production of—				
Less than 5,000 tons	3	[1] 205,000	[1] 15,006	7.3
5,000 to less than 10,000 tons	1			
10,000 to less than 25,000 tons	4	345,000	79,211	23.0
25,000 to less than 100,000 tons	9	931,000	436,006	46.8
100,000 or more tons	6	2,360,000	1,099,319	46.6
Total	23	3,841,000	1,629,542	42.4

[1] Combined to avoid disclosure of individual company figures.

PRODUCTION

Production of fuel briquets increased slightly (0.3 percent) in 1955, despite the fact that 2 plants discontinued operations.

The principal centers of production are the mining districts in southwestern West Virginia, where large quantities of low-volatile bituminous-coal fines are available, and in the dock areas of eastern Wisconsin, where considerable quantities of fine coals accumulate from ship unloadings. The culm banks in the anthracite region of Pennsylvania also provide raw material for briquets.

TABLE 3.—Production and value of fuel briquets in the United States, 1954–55, by regions

Region [1]	1954				1955			
	Active plants	Production (net tons)	Value		Active plants	Production (net tons)	Value	
			Total	Average			Total	Average
Eastern States	5	600,864	$5,835,735	$9.71	4	587,572	$5,681,413	$9.67
Central States	12	699,711	9,133,808	13.05	12	686,743	9,118,863	13.28
Western States	8	323,887	4,192,092	12.94	7	355,227	4,237,711	11.93
Total	25	1,624,462	19,161,635	11.80	23	1,629,542	19,037,987	11.68

[1] Eastern States include Pennsylvania and West Virginia; Central States—Illinois, Indiana, Michigan, and Wisconsin; Western States (west of the Mississippi River)—Arkansas, Minnesota, Missouri, North Dakota, Oregon, and Washington.

Wisconsin had the greatest production, with 36 percent of the total, and West Virginia ranked second, with 29 percent, followed by Missouri, Pennsylvania, and Oregon. Eighty-nine percent of the total national output was produced in these 5 States.

Production of briquets is highest during the winter, and most plants operate at a reduced rate or close entirely between May and September.

TABLE 4.—Production of fuel briquets in the United States in 1955, by months

Month	Net tons	Month	Net tons	Month	Net tons
January	195,124	May	60,693	September	147,773
February	191,538	June	92,362	October	182,887
March	84,140	July	72,391	November	229,652
April	56,437	August	81,286	December	235,259

Raw Fuels.—Bituminous coal, the principal raw material used for briquets in 1955, constituted 57 percent of the total raw fuels used. Pennsylvania anthracite ranked second in quantity used and amounted to 17 percent of the total. Other solid fuels, in order of their importance in use, were petroleum coke, residual carbon and lignite char, and semianthracite and anthracite from States other than Pennsylvania.

The use of petroleum coke as a source of raw fuel increased from 162,744 tons in 1954 to 209,840 tons in 1955, an increase of 29 percent. This increase occurred in the Central States bordering the large petroleum-refining center of Chicago and is the only area in which petroleum coke is used for briquet manufacture.

Substantial quantities of residual carbon were converted into briquets by two plants on the west coast. One plant in Washington and one in Oregon used this type of raw fuel, which is available in this area from the manufacture of oil gas. However, since only 2 plants used residual carbon, the quantities cannot be shown separately but are included with lignite char used by 1 plant in North Dakota.

Thirteen percent of the raw fuels used was yard screenings; however, the major portion of the raw fuels came from other sources and consisted chiefly of screened slack direct from low-volatile bituminous mines and anthracite from the culm banks in Pennsylvania. No plants used yard screenings exclusively. Eight plants used yard screenings in addition to raw materials from other sources, and 15 plants used only raw fuels from other sources.

Binders.—Petroleum asphalt is used almost exclusively in the United States as a binder in manufacturing fuel briquets. It makes an ideal binder, for it is relatively inexpensive and water insoluble and has a low ash content. In 1955, 21 operators used 105,583 tons of asphaltic binders, valued at $2,576,462; 2 plants used a small quantity of spray oil, and 1 plant used some coal-tar-pitch in addition to asphalt. However, the spray oil was used for dustproofing purposes and was applied to the finished briquet. The two plants that manufactured briquets from residual carbon used no binding material. Approximately 150 pounds of asphalt per ton of raw fuel was used by the plants that employed a binder in their manufacturing process.

TABLE 5.—Raw fuels used in making fuel briquets in the United States in 1955

Type	Number of plants	Used		
		Net tons	Value	
			Total	Average
Anthracite:				
Pennsylvania	11	264,326	$1,549,838	$5.86
Other than Pennsylvania	1	[1] 22,589	[1] 150,901	6.68
Semianthracite	3			
Bituminous coal:				
Low-volatile	14	[1] 890,290	[1] 6,120,413	6.87
High-volatile	2			
Petroleum coke	5	209,840	1,724,268	8.22
Residual carbon from manufacture of oil gas	2	[1] 162,520	[1] 1,043,917	6.42
Semicoke (lignite char)	1			
Total	[2] 23	1,549,565	10,589,337	6.83

[1] Combined to avoid disclosure of individual company figures.
[2] Some plants used more than 1 type of raw fuel; hence, the sum of the plants exceeds the total shown.

TABLE 6.—Quantity and value of raw materials used in making fuel briquets in the United States and quantity and value of sales in 1955, by regions

Region [1]	Raw materials					
	Fuels			Binders		
	Net tons	Value		Net tons	Value	
		Total	Average		Total	Average
Eastern States	549,306	$2,707,088	$4.93	40,610	$1,131,716	$27.87
Central States	665,354	5,642,960	8.48	48,202	1,134,843	23.54
Western States	334,905	2,239,289	6.69	18,034	341,651	18.94
Total	1,549,565	10,589,337	6.83	106,846	2,608,210	24.41

Region [1]	Total raw materials			Sales of fuel briquets		
	Net tons	Value		Net tons	Value	
		Total	Average		Total	Average
Eastern States	589,916	$3,838,804	$6.51	587,785	$5,682,514	$9.67
Central States	713,556	6,777,803	9.50	688,668	9,139,804	13.27
Western States	352,939	2,580,940	7.31	356,970	4,251,655	11.91
Total	1,656,411	13,197,547	7.97	1,633,423	19,073,973	11.68

[1] Eastern States include Pennsylvania and West Virginia; Central States—Illinois, Indiana, Michigan, and Wisconsin; Western States (west of the Mississippi River)—Arkansas, Minnesota, Missouri, North Dakota, Oregon, and Washington.

SHIPMENTS

Fuel briquets were used in 35 States and the District of Columbia in 1955. Since it may be safely assumed that fuel briquets are ultimately consumed in the States where shipments terminate, the terms "distribution" and "consumption" are used synonymously in this chapter. Unlike packaged fuel, briquets withstand rough handling and weathering and can be shipped long distances.

Wisconsin, the largest producer in 1955, was also the largest consumer, using 16 percent of the total quantity distributed. Virtually

all briquets consumed in Wisconsin were manufactured in that State; however, it shipped 57 percent of its production to 7 other States and Canada. Minnesota received 43 percent of the briquets shipped from Wisconsin. West Virginia, the second largest producer, shipped over 99 percent of its production to 16 other States, the District of Columbia, and Canada. Michigan, Indiana, and Ohio received 68 percent of the briquets produced in West Virginia. Missouri ranked second after Wisconsin in briquet consumption, and Michigan ranked third. Where Missouri produced the greater portion of the briquets it consumed, Michigan received 78 percent of its requirements from other States, the greater part of which came from West Virginia. Other leading consuming States were Minnesota, Indiana, and Illinois, which together consumed 22 percent of the total distributed. According to reports from producers, 144,161 tons or 9 percent of total shipments was exported. Data collected by the Bureau of Mines on exports of briquets (table 7) differ from those compiled by the United States Department of Commerce, Bureau of the Census (table 9), largely because the Bureau of Mines includes briquets made from residual carbon and petroleum coke, whereas the Bureau of the Census excludes these data.

TABLE 7.—Destination of shipments of fuel briquets, 1954–55, in net tons

[Based on reports from producers showing destination of briquets used or sold]

Destination	1954	1955	Destination	1954	1955
Arkansas	2,365	2,312	North Carolina	30,699	32,682
California		1,612	North Dakota	61,831	65,901
Connecticut	1,740	1,511	Ohio	81,703	83,595
Delaware		52	Oklahoma	139	72
District of Columbia	767	688	Oregon	37,599	59,031
Florida	306	356	Pennsylvania	12,806	9,836
Illinois	102,332	89,670	Rhode Island	796	403
Indiana	114,675	120,044	South Carolina	3,274	4,469
Iowa	41,868	44,984	South Dakota	56,092	57,679
Kansas	5,251	5,865	Tennessee	2,407	1,893
Kentucky	5,046	5,685	Texas	79	
Maine	4,853	5,464	Vermont	1,517	1,217
Maryland	9,301	7,136	Virginia	38,068	40,185
Massachusetts	10,319	8,980	Washington	17,318	26,783
Michigan	191,589	180,322	West Virginia	1,538	1,241
Minnesota	148,793	147,363	Wisconsin	262,235	267,114
Missouri	192,822	196,277			
Montana	2		Total	1,466,839	1,489,262
Nebraska	8,878	9,663	Exported	159,789	144,161
New Hampshire	2,091	2,045			
New Jersey	7,801	1,033	Grand total	1,626,628	1,633,423
New York	7,939	6,099			

TABLE 8.—Shipments of fuel briquets in the United States, 1954–55, by methods of transportation, in net tons [1]

Origin	1954			1955		
	Rail	Truck [2]	Total	Rail	Truck [2]	Total
Eastern States	589,620	11,183	600,803	577,098	10,687	587,785
Central States	515,963	181,163	697,126	513,443	172,519	685,962
Western States	115,058	213,641	328,699	142,386	213,636	356,022
Total	1,220,641	405,987	[3] 1,626,628	1,232,927	396,842	[3] 1,629,769

[1] Includes shipments destined for export as reported by producers directly to Bureau of Mines.
[2] Includes small quantity shipped by barge.
[3] An additional 2,718 tons was used by 2 producers as fuel at their plants in 1954 and 3,654 tons by 2 producers in 1955.

VALUE

The total sales value, f. o. b. plants, of briquets manufactured in 1955 amounted to slightly more than $19 million. This value decreased approximately 0.5 percent from 1954. However, the "sales value," as reported by the producing companies, varies widely because of different local conditions under which briquets are produced and sold. Cost of raw materials and labor and the price of competing fuels are the principal factors that affect value per ton.

The average value per ton, f. o. b. plant, for all briquets produced in the United States in 1955 was $11.68 (table 1). This was about 1 percent less than the average value per ton ($11.80) reported for 1954. The Eastern States region, where most of the output came from plants in the anthracite region of Pennsylvania and the bituminous low-volatile fields of southern West Virginia, had the lowest average value per ton f. o. b. plant. This was due primarily to a readily available supply of raw fuels which did not involve transportation costs. The Central States region, which used large quantities of Pennsylvania anthracite and bituminous low-volatile coals, had the highest average value per ton f. o. b. plant. Although these fuels are readily available, especially in Wisconsin and Michigan, their costs necessarily include the cost of transportation.

Since values on raw fuels and binders were collected for the first time during 1955, no comparisons can be made with previous years. These values, however, indicate that marked differences exist in the cost of raw materials in different sections of the country. For example, the average cost per ton of low-volatile bituminous coal in some areas in Wisconsin was 87 percent greater than in West Virginia, and Pennsylvania anthracite cost almost 3 times more in Wisconsin than in Pennsylvania. Petroleum coke, which was used by 5 plants, has the highest unit value, with an average of $8.22 per ton; lignite char, used by 1 plant, had the lowest unit value.

FOREIGN TRADE [1]

No fuel briquets were imported by the United States in 1955. For many years imports have been small and have played an insignificant part in our fuel economy.

Exports are considerably larger, however, and in recent years averaged about 6 percent of production. In 1955, 106,294 tons of fuel briquets, amounting to 7 percent of production, was exported. Canada was the principal market for United States briquets and received 89 percent of the total exported in 1955. Japan received 10 percent, and the remaining 1 percent was distributed in Mexico, Chile, Argentina, and Honduras. Export data on fuel briquets are compiled and published by the United States Department of Commerce and include only those briquets made from coal and coke.

[1] Figures on imports and exports compiled by Mae B. Price and Elsie D. Page, Division of Foreign Activities, Bureau of Mines, from records of the U. S. Department of Commerce.

TABLE 9.—Fuel briquets (coal and coke) exported from the United States, 1953–55, by countries of destination and customs districts

	1953		1954		1955	
	Net tons	Value	Net tons	Value	Net tons	Value
COUNTRY						
North America:						
Canada	102,753	$1,674,367	96,221	$1,596,426	94,179	$1,454,304
Honduras					25	594
Mexico			2,029	23,840	534	4,272
Total	102,753	1,674,367	98,250	1,620,266	94,738	1,459,170
South America:						
Argentina					50	1,980
Bolivia	154	2,379				
Chile			658	6,266	343	3,331
Total	154	2,379	658	6,266	393	5,311
Asia: Japan					11,163	99,666
Grand total	102,907	1,676,746	98,908	1,626,532	106,294	1,564,147
CUSTOMS DISTRICT						
Buffalo	51,847	896,361	47,470	822,732	38,809	653,677
Dakota	19,714	232,891	18,919	243,355	19,083	251,106
Duluth and Superior	12,139	165,049	10,719	143,240	13,015	184,358
Laredo			169	2,100		
Los Angeles					534	4,272
Maine and New Hampshire	994	18,850	1,300	25,509	794	15,877
Maryland			658	6,266	343	3,331
Massachusetts			44	732		
Michigan	3,814	49,709	1,718	23,247	2,523	32,815
Minnesota			45	593		
New Orleans					25	594
New York					50	1,980
Ohio	75	1,012			45	283
Rochester					2,062	15,918
St. Lawrence	13,820	306,255	15,366	328,188	15,464	271,563
Virginia	154	2,379			11,163	99,666
Washington					34	717
Other [1]	350	4,240	2,500	30,570	2,350	27,990
Total	102,907	1,676,746	98,908	1,626,532	106,294	1,564,147

[1] Estimated from sample data; district data not available.

TECHNOLOGY

The Fourth Biennial Briquetting Conference was held at Estes Park, Colo., September 1–3, 1955. Representatives of producers, equipment manufacturers, asphalt suppliers, and research organizations attended. Papers were presented from the United States, Canada, Mexico, and France. Several of the papers were of special interest to fuel-briquet manufacturers. W. A. Lang, senior research chemist, Research Council of the University of Alberta, Canada, reported on the characteristics of asphalt binders and their effect on briquet quality.[2] Asphalt binders prepared from the same crude and having the same softening point and penetration gave the same strength and properties to briquets, regardless of whether the stock had been cracked or was straight run. Although this was shown for

[2] Lang, W. A., Asphalt Characteristics and Briquette Quality: Proc. 4th Biennial Briquetting Conference, Univ. of Wyoming Natural Resources Research Institute, Inf. Circ. No. 8, November 1955, pp. 2–10.

only one crude, it indicated that perhaps industry might have been wrong in considering that marked differences in binding qualities existed between asphalts from cracked and straight-run stock. The importance of either softening point or penetration as a criterion of binder quality was discussed, and it was brought out that the wetting angle between asphalt and coal particles may be more fundamental in selecting briquetting asphalts.

Dr. N. Berkowitz, also senior research chemist, Research Council of the University of Alberta, presented a paper on the production of coke from self-bonded, brown-coal briquets.[3] He found that when brown coal is compressed without binder and the porosity reduced from 25 percent to 8 percent and heated rapidly, some coking can be induced. Studies were made at both high and low pressures, and it was found that heating by nonlinear schedules improved coking quality. Higher pressures improved coking quality when lignite and brown coal are briquetted. Hard xylitic lignites and some subbituminous coals can be softened by spraying with 0.5 percent residual fuel oil and briquetted without additional binder.

Several papers were presented on developments in physical testing methods of coal briquets. R. P. Charbonnier, engineer, Department of Mines, Calgary, Alberta, Canada, outlined an operating procedure for using the Komarek-Greaves compression strength test for coal briquets.[4] He also discussed factors of variability that were found to affect results when the ASTM D441–45 tumbler test was applied to coal briquets.

According to Edward Prostel, coal-research engineer, Natural Resources Institute, University of Wyoming, the major problems in briquetting appear to be the shape of the briquet, deaeration of the mixes before pressing, and wear on the rolls.[5] He determined that the oyster-shaped briquet appears to be the best. The effect of deaerating is to increase the specific gravity of briquets and, therefore, improve their strength. Komarek-Greaves Co. announced development of a deaerating feeder.

PACKAGED FUEL

CAPACITY

The productive capacity of the packaged-fuel industry decreased 18 percent in 1955, because 6 plants with a total annual capacity of 44,900 tons discontinued operations. Thirty-one plants produced packaged fuel in 1955, compared with 37 plants in 1954. Packaged-fuel plants are generally small, and 22 of the active plants had a rated capacity of less than 5,000 tons. The total annual capacity for the industry in 1955 was 198,400 tons.

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[3] Berkowitz, N., Coking of Self-Bonded Lignite Briquettes: A Laboratory Study: Proc. 4th Biennial Briquetting Conference, Univ. of Wyoming Natural Resources Research Institute, Inf. Circ. No. 8, November 1955, pp. 24–32.

[4] Charbonnier, R. P. and Rozenhart, C. F. J., Factors of Variability of the ASTM D441–45 Tumbler Test Applied to Coal Briquets: Proc. 4th Biennial Briquetting Conference, Univ. of Wyoming Natural Resources Research Institute, Info. Circ. No. 8, November 1955, pp. 41–43.

[5] Prostel, Edward, Briquetting Problems: Proc. 4th Biennial Briquetting Conference, Univ. of Wyoming Natural Resources Research Institute, Info. Circ. No. 8, November 1955, pp. 54–55.

TABLE 10.—Annual capacity and production of packaged-fuel plants in the United States, 1951–55

	Active plants	Annual capacity (net tons)	Production	
			Net tons	Percent of annual capacity
1951	53	277,010	119,535	43.2
1952	43	358,858	96,267	26.8
1953	37	232,850	79,732	34.2
1954	37	243,300	77,360	31.8
1955:				
Plants with capacity of—				
Less than 5,000 tons	22	54,100	12,575	23.2
5,000 to less than 10,000 tons	4	26,300	6,497	24.7
10,000 to less than 15,000 tons	2	[1] 118,000	[1] 50,140	42.5
15,000 to less than 25,000 tons	2			
25,000 or more tons	1			
Total	31	198,400	69,212	34.9
Plants with production of—				
Less than 1,000 tons	21	57,100	10,309	18.1
1,000 to less than 3,000 tons	6	[1] 43,300	[1] 13,998	32.3
3,000 to less than 5,000 tons	1	[1] 98,000	[1] 44,905	45.8
5,000 to less than 10,000 tons	1			
10,000 or more tons	2			
Total	31	198,400	69,212	34.9

[1] Combined to avoid disclosure of individual company figures.

PRODUCTION

Production of packaged fuel in general followed the decrease in capacity and declined 11 percent from 1954. However, the production rate was 3.1 points higher than in 1954 and was even slightly higher than in 1953. The total packaged-fuel production in 1955 was 69,212 tons and, in terms of capacity, amounted to 34.9 percent of the total capacity of the 31 plants in operation. Michigan, Wisconsin, Ohio, and Indiana were the largest producing States and together supplied 91 percent of the output. Michigan alone produced 46 percent of the total. Like fuel briquets, production of packaged fuel is seasonal, with top production during the winter and little or none between May and September.

Raw Fuels.—Low-volatile bituminous coal was used almost exclusively to manufacture packaged fuel in 1955. Small quantities of high-volatile bituminous coal, semianthracite, and petroleum coke were also used, but the quantity was only 6 percent of the total. Three-fourths of the plants used yard screenings as a raw material, but yard screenings accounted for the smaller portion of the raw fuels used. Almost 80 percent of the total raw fuels came from other sources and consisted mainly of coal fines, which were screened out at the mines or accumulated at loading and unloading points.

Binders.—Starches in the form of wheat and corn flour were the most widely-used binding materials for packaged-fuel manufacture in 1955. Thirty plants used 376 tons of starch, with an average value of $101.81 per ton. This amounted to about 13 pounds of starch per ton of raw fuel and was worth approximately $0.66. One

plant reported using petroleum asphalt as a binding material. Starch is substantially more expensive than petroleum asphalt, but it is the preferred binding material in the packaged-fuel industry because it apparently makes a stronger block and does not add any ash or volatile matter to the product. Most of the starch used was obtained from cereal mills.

TABLE 11.—Production and value of packaged fuel in the United States, 1954–55, by States

State	1954				1955			
	Active plants	Production (net tons)	Value		Active plants	Production (net tons)	Value	
			Total	Average			Total	Average
Indiana	3	10,081	$201,580	$20.00	2	(1)	(1)	(1)
Michigan	11	34,060	559,900	16.44	8	31,725	$504,288	$15.90
Minnesota	3	4,221	102,564	24.30	3	3,594	85,369	23.75
Ohio	12	13,567	258,786	19.07	11	10,420	155,259	14.90
Wisconsin	3	12,767	236,546	18.53	2	(1)	(1)	(1)
Other States [2]	5	2,664	57,230	21.48	5	23,473	449,129	19.13
Total	37	77,360	1,416,606	18.31	31	69,212	1,194,045	[3] 17.25

[1] Combined with "Other States" to avoid disclosure of individual company figures.
[2] Comprises 2 plants in Illinois and 1 plant each in Iowa, Nebraska, and Virginia.
[3] Differs from average unit value of sales (table 14) because of different values and variance in quantities produced and sold at individual plants.

TABLE 12.—Production of packaged fuel in the United States in 1955, by months

Month	Net tons	Month	Net tons	Month	Net tons
January	11,243	May	1,126	September	3,673
February	10,591	June	213	October	7,236
March	9,377	July	143	November	10,786
April	2,746	August	749	December	11,329

TABLE 13.—Raw fuels used in making packaged fuel in the United States in 1955

Type	Number of plants	Used		
		Net tons	Value	
			Total	Average
Bituminous coal:				
Low-volatile	27	64,814	$599,799	$9.25
High-volatile	1	[1] 2,703	[1] 26,055	9.64
Semianthracite	2			
Petroleum coke	3	1,519	17,564	11.56
Total	[2] 31	69,036	643,418	9.32

[1] Combined to avoid disclosure of individual company figures.
[2] Some plants used more than 1 type of raw fuel; hence, the sum of the plants exceeds the total shown.

TABLE 14.—Quantity and value of raw materials used in making packaged fuel in the United States and quantity and value of sales in 1955, by regions

Region [1]	Raw materials					
	Fuels			Binders		
	Net tons	Value		Net tons	Value	
		Total	Average		Total	Average
Eastern States	11,158	$93,405	$8.37	75	$8,782	$117.09
Central States	52,644	489,587	9.30	[2] 1,054	[2] 43,912	41.66
Western States	5,234	60,426	11.54	42	5,481	130.50
Total	69,036	643,418	9.32	1,171	58,175	49.68

Region [1]	Total raw materials			Sales of packaged fuel		
	Net tons	Value		Net tons	Value	
		Total	Average		Total	Average
Eastern States	11,233	$102,187	$9.10	11,222	$171,299	$15.26
Central States	53,698	533,499	9.94	52,744	901,025	17.08
Western States	5,276	65,907	12.49	5,244	122,119	23.29
Total	70,207	701,593	9.99	69,210	1,194,443	17.26

[1] Eastern States include Ohio and Virginia; Central States—Illinois, Indiana, Michigan, and Wisconsin; Western States (west of the Mississippi River)—Iowa, Minnesota, and Nebraska.
[2] Includes petroleum asphalt.

SHIPMENTS

Because of its physical characteristics, most packaged fuel is used locally and not shipped long distances. Although listed as shipped by truck, a large part of the packaged-fuel local sales was called for in automobiles by consumers. No packaged fuel was shipped by rail in 1955, but 18 percent of the total was shipped by truck to other than local destinations. Although complete data on these shipments are not available, it may be assumed that this packaged fuel was consumed within the producing States or in nearby States. Some packaged-fuel manufacturers have adopted a new method of merchandising by providing self-service from vending machines. This method permits packaged fuel to be sold at times when retail coalyards are normally closed and, according to one manufacturer, substantially reduces labor costs. No packaged fuel is imported or exported.

TABLE 15.—Shipments of packaged fuel in the United States, 1951–55, by methods of transportation, in net tons

Year	Shipped by truck			Shipped by rail	Total
	Local sales	Other than local sales	Total		
1951	98,324	13,566	111,890	7,950	119,840
1952	76,874	9,698	86,572	6,864	93,436
1953	68,275	8,254	76,529	3,582	80,111
1954	78,464	----------	78,464	----------	78,464
1955	57,051	12,159	69,210	----------	69,210

VALUE

The total value, f. o. b. plants, of packaged fuel manufactured in 1955 decreased 16 percent and amounted to $1,194,045. This was in accord with the decrease of 8,148 tons in production. However, the average value per ton also decreased in 1955 and was 6 percent lower than in 1954. The average values for packaged fuel are always considerably higher than for fuel briquets because of higher manufacturing costs and different marketing methods. Most packaged fuel is sold in small quantities by producers, and values include the costs of raw materials, manufacturing, and profits and are the equivalent of retail prices.

Since values on raw fuels and binders were collected for the first time during 1955, no comparisons can be made with previous years.

WORLD REVIEW [6]

The combined production of fuel briquets and packaged fuel for the entire world was estimated at 125 million tons in 1955.

As in previous years, production was greatest in Europe, where large supplies of low-grade coals are available, especially in the central and eastern parts of Germany and in the Soviet Republic. East Germany, which has extensive reserves of brown coal, had an estimated production of 67 million tons, equal to 54 percent of the total world production. West Germany produced 25 million tons, and both zones of Germany together produced 74 percent of the world total. Briquetting of brown coal in Germany has been practiced on a large scale for many years; and briquets have been used for a variety of purposes, including residential heating, railroad fuel, and electric-power generation. The Soviet Republic ranked second in briquet production, with an amount estimated at 9.4 million tons, equal to 8 percent of the world total. France produced about 7.4 million tons of briquets in 1955. These 3 European countries together produced 87 percent of the total world output of fuel briquets and packaged fuel.

Japan produced 2.9 million tons of fuel briquets which were used mainly for residential heating and cooking and for railroad fuel.

Whereas in Europe the briquetting process is primarily a means of utilizing low-grade coals, it serves a somewhat different purpose in the United States. In the United States briquetting is basically a salvaging process which transforms valuable but unmarketable fine materials into a product that can be transported and utilized efficiently.

[6] Figures on world production compiled by Pearl J. Thompson, Foreign Statistics Unit, Division of Foreign Activities, Bureau of Mines.

TABLE 16.—World production of fuel briquets and packaged fuel, 1951–55, by countries, in thousand net tons [1]

Country	1951	1952	1953	1954	1955
North America:					
Canada	396	711	709	831	654
United States:					
Briquets	2,387	2,280	1,780	1,624	1,630
Packaged fuel	120	96	80	77	69
Total	2,903	3,087	2,569	2,532	2,353
Europe:					
Austria	88	55	19	9	[2] 11
Belgium	1,995	1,635	1,469	1,446	1,712
Bulgaria [2]	220	250	250	250	250
Czechoslovakia:					
Bituminous [2]	435	440	440	450	455
Lignite [2]	440	470	470	495	495
Denmark [3]	56	97	86	97	[2] 110
Finland (capacity) [2]	88	88	88	88	88
France	8,900	8,753	7,697	7,416	[2] 7,380
Germany:					
East, lignite	[2] 48,100	[2] 56,100	62,080	66,528	[2] 67,000
West:					
Bituminous	4,876	5,906	5,783	6,647	7,134
Lignite	17,553	18,081	18,275	18,372	18,123
Hungary [2]	165	175	195	220	220
Ireland [3]	30	35	40	40	39
Italy, anthracite	(4)			24	[2] 29
Netherlands:					
Bituminous	1,171	1,041	996	1,012	1,076
Lignite	80	80	93	90	94
Poland:					
Bituminous [2]	685	700	700	700	730
Lignite [2]	175	180	185	195	200
Portugal	100	104	91	100	106
Rumania [2]	275	285	285	285	285
Spain	1,280	1,265	1,283	1,226	1,283
Sweden [3]	120	84	67	60	[2] 66
Switzerland [2]	110	110	110	110	110
U. S. S. R. [2 3]	8,000	8,000	9,300	9,400	9,400
United Kingdom	1,957	1,990	1,765	1,884	1,887
Yugoslavia:					
Bituminous	[2] 24	18	[2] 18	[2] 22	28
Lignite [2]	195	195	195	200	200
Total	97,000	106,000	112,000	117,000	119,000
Asia:					
Indochina	46	77	51	55	[2] 55
Indonesia	30	42	37	37	[2] 39
Japan	1,801	1,882	2,281	2,724	2,905
Korea, Republic of	30	52	52	46	101
Pakistan [2]	9	11	13	13	13
Turkey	33	41	88	99	103
Total	1,949	2,105	2,522	2,974	[2] 3,215
Africa:					
Algeria	74	57	45	32	26
French Morocco	28	18	20	17	4
Tunisia	42	15	15	9	[2] 9
Total	144	90	80	58	[2] 39
Oceania:					
Australia	[5] 573	627	627	688	712
New Zealand	12	12	13	14	[2] 14
Total	585	639	640	702	[2] 725
World total [2]	103,000	112,000	118,000	123,000	125,000

[1] Includes revisions of data published previously. Data do not add to totals shown owing to rounding.
[2] Estimate.
[3] Includes peat briquets.
[4] Negligible.
[5] Year ended June 30 of year stated.

Peat

By Eugene T. Sheridan and Maxine M. Otero

GENERAL SUMMARY

PRODUCTION of peat in the United States established a new record in 1955, with a total of 273,669 net tons valued at $2,282,865. The 1955 output was 12 percent higher than 1954's and over twice the average production for the base years 1947–49. Within the past decade peat production has increased more than 2½ times, and apparent consumption has almost tripled. Imports, which had increased steadily for 7 consecutive years, decreased 5 percent in 1955 to 229,310 tons valued at $9,261,820.

The substantial increase in the demand for peat in the United States was due chiefly to expanding markets in agriculture and horticulture, especially in the eastern parts of the United States, where the trend has been toward suburban living and much emphasis has been placed on the cultivation of lawns and home gardens. Although peat is used as a fuel in many European countries, none is used for this purpose in the United States, primarily because we have ample supplies of superior fuels. In this country peat is used primarily as a source of organic matter for improving the physical condition of mineral soils.

For the purposes of collecting and compiling the data presented in this report, peat was classified into three general types—moss peat, reed or sedge peat, and peat humus. Peats that do not fall into these categories are listed as "other types." Moss peat consists chiefly of the poorly decomposed remains of several species of sphagnum, hypnum, or other mosses and is the type that occurs in the largest quantities in the United States. Reed or sedge peat consists chiefly of the poorly or moderately decomposed remains of reeds and sedges and other swamp plants and is found mainly on the borders of lakes and ponds and in swamps and salt marshes.

Peat humus designates peat so decomposed that its biological identity is lost. Humus is fine-grained in texture and very dark and is formed when peat deposits have undergone cultivation or have been subjected to periods of prolonged dryness. Humus ranked first in production in 1955, reed or sedge peat was second, and moss peat third. About one-tenth of the production fell into the category "other types" and consisted predominantly of muck.

Recent developments in packaging materials, particularly plastic products and other materials treated with synthetic resins, have added greatly to development of the domestic peat industry. Whereas a few years ago most peat was sold in bulk to ultimate customers, it can now be packed in bags and shipped long distances to be marketed through normal retail channels.

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TABLE 1.—Salient statistics of the peat industry in the United States, 1947–49 (average) and 1952–55

	1947–49 (average)	1952	1953	1954	1955
Number of operations	45	62	68	85	82
Production.....net tons	131,782	210,582	204,209	[1] 244,163	273,669
Imports.....do	88,462	167,404	199,887	240,940	229,310
Apparent consumption.....do	220,244	377,986	404,096	485,103	502,979
Value of production	$939,518	$1,729,511	$1,617,947	[1] $2,257,591	$2,282,865
Average per net ton	$7.13	$8.21	$7.92	[1] $9.25	$8.34
World production.....net tons	50,000,000	60,000,000	59,000,000	[1] 58,000,000	59,000,000

[1] Revised figure.

GOVERNMENT REGULATIONS

No national standards have as yet been established for the peat industry in the United States. However, the industry is governed by trade-practice rules, established by the Federal Trade Commission in 1950, which were designed to eliminate and prevent unfair or deceptive trade practices in marketing industry products. The rules contain provisions designed to inhibit specific kinds of misrepresentations and the deceptive use of trade or corporate names. Included, also, are provisions that prohibit other forms of misrepresentation as well as practices that lessen competition. One significant section of the rules defines the requirements for labeling a product "peat" and also states the manner in which the terms "moss peat" and "peat moss" can be used. In accord with the rules, peat is defined as partly decomposed vegetable matter that is accumulated under water or in a water-saturated environment, and a product cannot be called peat unless 75 percent of its composition, on a dry basis, is made up of peat and the remainder consists of normally associated soil materials. Peat may be labeled either "moss peat" or "peat moss" if at least 75 percent of its composition is derived from sphagnum, hypnum, minium, and/or other moss and the remainder consists of associated soil substances. A product may also be labeled "peat moss" though not so qualified, if it fulfills the requirements for the term peat and states, in immediate conjunction, the kind or kinds of peat of which the product is composed. Under this provision, peat formed from reeds and sedges may be labeled "Peat Moss—Reed and Sedge."

Federal Specification Q–P–166 (sec. IV, pt. 5, of the Federal Standard Stock Catalog) lists the requirements for all peat purchased by the Federal Government. This specification defines the different types of peat, lists detailed requirements for each type, and provides other pertinent information, such as sampling, inspection and testing procedures, and packaging and marketing requirements.

SCOPE OF REPORT

All statistical data presented in this report, unless otherwise specified, were submitted voluntarily to the Bureau of Mines by the producers of peat in the United States.

The Bureau of Mines has made a continuous annual canvass of the peat industry since 1934, when it resumed the survey that had been conducted by the Federal Geological Survey from 1908 to 1926.

Statistical data are normally collected on the location of operations, size of deposits, production by types, methods of preparation, and quantity and value of bulk and packaged sales, according to use. No information is collected on stocks, since producers normally do not stock peat. However, a difference of 9,309 net tons between reported production and sales indicates that some peat was stocked in 1955.

The Bureau of Mines attempts to obtain complete coverage of all commercial producers of peat; but, undoubtedly, a few small producers operate part time and fail to submit data. No attempt was made to estimate for these operations, but the reports received probably represent almost complete coverage of the industry. To keep mailing lists current, companies canvassed were asked to provide the names and addresses of other producers in their area, and lists of producers compiled by various State departments are checked periodically.

The average of the 3-year period 1947–49 is used as a base for measuring production and consumption trends and the production figures shown are not adjusted for moisture but are on an air-dried basis only. Although peat is usually sold by the cubic yard, the unit of measurement in this chapter is the net ton of 2,000 pounds.

In the section entitled "Consumption and Uses," data on sales of peat by uses include only peat that is produced in the United States, since no information is available on the ultimate uses of imported peat; however, figures on apparent consumption also include imports and apparent consumption is considered equivalent to production plus imports, since no peat is exported and only minor quantities are stocked.

RESERVES

It is estimated that peat and muck lands in the United States total about 79 million acres[1] and contain about 13.8 billion net tons of air-dried peat. The northern region, which includes 16 States and consists of the New England States, those bordering on the Great Lakes, and Iowa, contains 80 percent of the total deposits of the country. The Atlantic Coast region, which is composed of 7 States, holds 19 percent of the total reserves, while the Pacific and Gulf Coast States contain about 1 percent.

Peat is found in 30 States, the principal deposits occurring in Minnesota, Wisconsin, Florida, Michigan, New York, Virginia, and North Carolina. Minnesota contains the largest reserves, with peat lands covering approximately 5 million acres or about one-tenth of the area of the State. Wisconsin has the second largest deposits, and Florida deposits rank third in size.

The deposits of Minnesota, Wisconsin, and Michigan occur mostly in basins of glacial origin and consist principally of moss peat. This type is formed from the poorly decomposed remains of several species of sphagnum, hypnum, or other mosses and is light in weight, porous, and spongy. It is rather free from the woody material of shrubs and trees and other impurities. Deposits of moss peat in the United States are confined chiefly to the cool and humid northern region of

[1] Anderson, M. S., Blake, S. F., and Mehring, A. L., Peat and Muck in Agriculture: U. S. Dept. of Agriculture Circ. 888, October 1951, 31 pp.

New England and the Great Lakes States, and States along the northern Pacific coast.

The Atlantic Coast region contains many workable deposits of peat, the largest of which are in Virginia, North Carolina, and Florida. This region is characterized by many salt and fresh-water marshes and swamps, and the deposits are formed largely from trees, reeds, sedges, and marsh grasses. The most extensive deposits in Virginia and North Carolina occur in the Dismal Swamp area. Peat deposits are distributed over almost the entire State of Florida.

Some peat is found in California, and small amounts occur in Washington and Oregon. Small deposits are also found in a narrow belt adjoining the Gulf coast. Very little peat of any type occurs in the Appalachian and Rocky Mountain regions, due to the rapid runoff of surface waters.

TABLE 2.—Known original reserves of peat in the United States, estimated on an air-dried basis, by regions and States, in thousand net tons [1]

Region and State	Reserves	Region and State	Reserves
Northern region:		Atlantic Coast region:	
Minnesota	6,835,000	Virginia and North Carolina	700,000
Wisconsin	2,500,000	Florida	2,000,000
Michigan	1,000,000	Other States [2]	2,000
Iowa	22,000		
Illinois	10,000	Total	2,702,000
Indiana	13,000		
Ohio	50,000	Other regions:	
Pennsylvania	1,000	Gulf Coast [3]	2,000
New York	480,000	California	72,000
New Jersey	15,000	Oregon and Washington	1,000
Maine	100,000		
New Hampshire	1,000	Total	75,000
Vermont	8,000		
Massachusetts	12,000		
Connecticut	2,000		
Rhode Island	1,000		
Total	11,050,000	Total all regions	13,827,000

[1] Geological Survey, Coal Resources of the United States (Progress Report): Circ. 293, Oct. 1, 1953, p. 38.
[2] Includes Delaware, Maryland, South Carolina, and Georgia.
[3] Exclusive of Florida.

PRODUCTION

Eighty-two producers in 18 States reported commercial production of peat in 1955. Although this was 3 less than the number of producing companies in 1954, production increased 12 percent owing principally to increased production in California, Florida, and New Jersey. Washington had the largest number of producing companies, Florida ranked second, and Ohio was third. Florida had the highest production with 22 percent of the total, Washington was second with 14 percent, and Michigan was third with 9 percent. Although ranking third on a weight basis, value of output was higher in Michigan than in other producing States. New Jersey, Pennsylvania, and Ohio also produced substantial quantities. The combined production of the 6 States above amounted to 73 percent of the total.

Almost half of the production in 1955 was reported as humus. Reed and sedge peat composed 31 percent; moss peat 12 percent, and "other types" 11 percent. Twenty-two percent of the peat produced was cultivated before being excavated, and 50 percent was processed further by shredding or artificial drying.

TABLE 3.—Peat produced in the United States, 1953–55, by States

State	1953		1954		1955	
	Net tons	Value	Net tons	Value	Net tons	Value
California, Colorado, and Idaho	15,263	$126,985	17,618	$194,453	20,207	$208,784
Florida	27,678	185,524	37,449	168,004	61,098	231,829
Georgia and Texas	3,680	54,560	[1] 7,456	[1] 83,979	5,554	49,410
Illinois, Indiana, and Iowa	26,303	198,786	33,457	362,149	31,520	252,617
Michigan, Minnesota, and Wisconsin	25,805	259,026	28,797	438,016	29,793	466,637
New England	11,964	119,976	8,918	130,369	10,116	210,474
New Jersey and New York	25,481	260,826	22,173	229,241	31,980	280,805
Ohio	27,696	260,474	29,540	356,970	22,484	249,427
Pennsylvania	8,232	47,516	15,621	141,352	23,277	219,628
Washington	32,107	104,274	43,134	153,058	37,640	113,254
Total	204,209	1,617,947	[1] 244,163	[1] 2,257,591	273,669	2,282,865

[1] Revised figure.

TABLE 4.—Peat produced in the United States in 1955, by kinds

Kind	Raw			Shredded and kiln-dried			Cultivated		
	Net tons	Value		Net tons	Value		Net tons	Value	
		Total	Average		Total	Average		Total	Average
Moss	2,772	$19,757	$7.13	22,859	$336,206	$14.71	6,818	$68,180	$10.00
Reed or sedge	5,951	41,256	6.93	32,098	313,589	9.77	45,645	621,391	13.61
Humus	42,261	144,415	3.42	82,174	643,165	7.83	4,051	19,967	4.93
Other	25,000	30,000	1.20	950	10,944	11.52	3,090	33,995	11.00
Total	75,984	235,428	3.10	138,081	1,303,904	9.44	59,604	743,533	12.47

CONSUMPTION AND USES

The apparent consumption of peat in the United States increased 4 percent in 1955 but the increase was substantially lower than the 20-percent increase in consumption of the previous year. The amounts used for soil improvement and for "other uses" increased over 1954 but considerably less peat was used in mixed fertilizers.

Peat is utilized principally as a soil conditioner in the United States, and large amounts are used each year for lawns, gardens, golf courses, and nurseries and in greenhouses. Although peat has a relatively high nitrogen content, it is not used as a direct fertilizer, for the nitrogen is not readily available as plant food. The benefits derived from the use of peat result largely from improved physical conditions in the soil medium. The effect of adding peat to mineral soils is to change their structural characteristics and improve soil texture and water-holding properties. Eighty-five percent of the domestic peat sold in 1955 was marketed for soil-improvement purposes.

Because of its moisture-absorbing properties, peat makes an excellent conditioner or filler for mixed fertilizers. When added to a fertilizer formula, dry, finely ground peat will absorb any moisture normally absorbed by the fertilizer particles and thus allow the fertilizer to remain free-flowing. Reed or sedge peat is the type that is normally used as a fertilizer ingredient and 1 ton of commercial fertilizer may contain 100 to 200 pounds of peat. Eight percent of the peat sold in 1955 was used in mixed fertilizers.

Smaller amounts of peat are also used for a number of miscellaneous purposes. Because of its moisture-absorbing qualities and deodorizing capacity, peat is used for stock bedding and as litter for poultry and livestock. Peat is also employed as a seed-germinating medium and as a packing material for plants that must be kept moist during shipment. Moss peat is commonly utilized for packing cut flowers, and reed or sedge peat is used rather extensively for protecting the roots of rose bushes and other plants while in shipment. Seven percent of the peat sold in 1955 was listed as sold for "other uses."

TABLE 5.—Peat sold in the United States in 1955, by uses

Use	In bulk			In packages		
	Net tons	Value		Net tons	Value	
		Total	Average		Total	Average
Soil improvement	198,790	$1,212,184	$6.10	25,719	$594,788	$23.13
Mixed fertilizers	20,976	218,999	10.44			
Other uses	10,774	67,052	6.22	8,101	110,067	13.59
Total	230,540	1,498,235	6.50	33,820	704,855	20.84

VALUE AND PRICE

All values in this report are based upon producers' selling prices at the plant. Although production increased in 1955, the average value per ton of the total peat produced decreased 10 percent from 1954. Reed or sedge peat, which had the highest value per ton, was 13 percent lower than the previous year; moss peat, which was second in value per ton, declined 22 percent; and humus declined 12 percent.

TABLE 6.—Average value per ton of peat produced, by types, and sold, by uses, 1947–49 (average) and 1951–55

Year	Average value per ton produced			Average value per ton sold		
	Moss [1]	Reed or sedge	Humus	Soil improvement	Mixed fertilizers	Other uses
1947–49 (average)	$12.20	$7.64	$6.86	$6.33	$9.13	$7.43
1951	5.87	9.93	7.15	6.94	9.78	9.55
1952	10.38	9.92	7.15	7.47	10.57	8.74
1953	11.87	8.82	6.65	7.36	10.89	12.97
1954	10.22	13.38	[2] 7.23	[2] 8.69	9.93	35.49
1955	7.98	11.66	6.33	8.05	10.44	9.38

[1] Includes value of "other types" of peat.
[2] Revised figure.

Peat sold for soil improvement had the lowest value per ton, and eat sold as a fertilizer ingredient had the highest. The average sales value of the former decreased 7 percent from 1954 and the latter increased 5 percent. The average value of peat sold for "other uses" was substantially lower in 1955 than in 1954. However, this value was influenced by the quantity of sales, which were more than 5 times greater in 1955.

Packaged and bulk sales were reported for the first time during 1955, and no comparisons can be made with previous years.

FOREIGN TRADE [2]

Imports of peat decreased 5 percent in 1955 after increasing each year since 1947. Increased production of domestic peat and more efficient marketing methods were the chief causes for the decline in

TABLE 7.—Peat moss imported for consumption in the United States, 1953–55, by kinds and by countries

Country	1953					
	Poultry and stable grade		Fertilizer grade		Total	
	Net tons	Value	Net tons	Value	Net tons	Value
North America:						
Canada	8,490	$487,040	61,669	$2,716,835	70,159	$3,203,875
Mexico	3	125	57	2,966	60	3,091
Total	8,493	487,165	61,726	2,719,801	70,219	3,206,966
Europe:						
Belgium-Luxembourg			(1)	12	(1)	12
Denmark			9	489	9	489
France			4	188	4	188
Germany, West	9,965	343,482	106,922	3,361,039	116,887	3,704,521
Ireland	45	1,407	1,965	79,338	2,010	80,745
Netherlands	388	12,775	10,286	325,090	10,674	337,865
United Kingdom			84	2,963	84	2,963
Total	10,398	357,664	119,270	3,769,119	129,668	4,126,783
Grand total	18,891	844,829	180,996	6,488,920	199,887	7,333,749
	1954					
North America: Canada	10,321	623,895	80,028	3,739,524	90,349	4,363,419
Europe:						
Germany, West	9,640	294,130	130,956	3,830,626	140,596	4,124,756
Ireland			865	29,350	865	29,350
Netherlands	211	7,341	8,712	305,428	8,923	312,769
Sweden			70	1,536	70	1,536
United Kingdom			137	4,495	137	4,495
Total	9,851	301,471	140,740	4,171,435	150,591	4,472,906
Grand total	20,172	[3] 925,366	220,768	[3] 7,910,959	240,940	[3] 8,836,325
	1955					
North America: Canada	6,661	419,745	97,323	4,841,882	103,984	5,261,627
Europe:						
Denmark			280	13,488	280	13,488
Finland			50	1,372	50	1,372
Germany, West	4,882	154,210	112,873	3,530,749	117,755	3,684,959
Ireland			166	5,991	166	5,991
Netherlands	111	4,348	6,923	288,665	7,034	293,013
Sweden			9	381	9	381
United Kingdom	32	989			32	989
Total	5,025	159,547	120,301	3,840,646	125,326	4,000,193
Grand total	11,686	579,292	217,624	8,682,528	229,310	9,261,820

[1] Less than 1 ton.
[2] Owing to changes in tabulating procedures by the U. S. Department of Commerce, data known not to be strictly comparable to those for earlier years.

[3] Figures on imports compiled by Mae B. Price and Elsie D. Page, Division of Foreign Activities, Bureau of Mines, from records of the U. S. Department of Commerce.

imports. All imported peat was of the moss-peat type and was classified by the United States Department of Commerce into two grades, according to use, (1) poultry and stable grade and (2) fertilizer grade. Approximately 95 percent of the total imports in 1955 were classified as fertilizer grade and were either used in mixed fertilizers or for soil-improvement purposes. Imports of fertilizer-grade peat were only slightly lower (1 percent) in 1955, but imports of poultry and stable grade decreased 42 percent.

The principal sources of imports were West Germany, Canada, and the Netherlands. Germany supplied over half of the total, furnishing 51 percent. Canada shipped 45 percent and 6 other countries supplied the remaining 4 percent. Imports of German peat decreased 16 percent in 1955 but imports from Canada increased 15 percent.

The average value per ton of imported peat is more than 4 times greater than the value of domestic peat, because most imported peat is packaged or sold in bales and marketed through retail channels, whereas most of the peat produced in the United States is sold in bulk and, to a great extent, in the areas where it is produced.

A duty of $0.25 per ton is levied on all imported peat classified as poultry and stable grade; however, peat imported for agricultural purposes is duty free.

TECHNOLOGY

Most technological developments in peat utilization have occurred in Europe, where large quantities are used for energy purposes and much effort has been directed toward its development as an industrial fuel for steam-raising, primarily for generating electric power. Two methods are now possible by which peat can be used to generate electric power. One method is burning peat to complete combustion under boilers, and the other is complete gasification of peat in producers, with or without the recovery of byproducts, followed by combustion of the gas in gas-fired steam boilers. Experience in Ireland, Germany, and the U. S. S. R. has unquestionably shown that direct burning of peat under boilers is a sure, efficient, and economic method of producing steam for power generation. The gas turbine is the newest development in generating electrical energy, and the possible use of peat for producing gas for gas turbines is being studied earnestly in England.

Extensive development work on peat has been conducted in the U. S. S. R. A recent bulletin reports the use of low-temperature peat coke as a component in a coke-oven charge.[3] Peat was carbonized at 550°–600° C., and the coke produced was used to provide 10 to 15 percent, respectively, of 2 blends with Soviet coals. These blends were then carbonized in 600-gram batches in laboratory furnaces with the temperature rising to 750° C., then in 60-kilogram batches at 1,325°–1,384° C. It was established that the cokes in which peat coke was used were stronger than normal coke, and there was evidence to show that higher proportions of peat coke could be used.

[3] Taits, E. M. and Friedman, G. E. [Use of Low-Temperature Peat Coke as a Component in a Coke-Oven Charge]: Izv. Akad. Nauk SSSR, Otdel, Tekh. Nauk (Bull. Acad. Sci. USSR, Sec. Tech. Sci.), April 1954, pp. 100–106; Fuel Abs., vol. 17, No. 3, Abs. 2211, March 1955.

Another Soviet report discussed the development of a peat classification, based upon its spontaneous heating.[4] S. S. Dragunov and E. D. Gruzinova of the Moscow Peat Institute found that peroxides, which were not identified, were found to be present in spontaneously heated peat. Bottom peats, which have a strong spontaneous heating tendency, are rapidly oxidized with hydrogen peroxide, with a large thermal effect. Top peats do not, as a general rule, evolve heat when treated in the same manner. The heat effect of most peats, when acted upon by hydrogen peroxide, is connected with a high iron content, which can be extracted with 0.8–0.5 N hydrochloric acid. The intensity of interaction of peat with hydrogen peroxide can therefore be used as a basis for classifying peats.

Engineers H. P. Hudson and T. R. Skerry of the Fuels Division, Department of Mines and Technical Surveys, Ottawa, Canada, recently completed an investigation on the utilization of peat as a domestic fuel in the rural areas of Canada.[5] Their study describes the designing and testing of a simple peat burner and also contains recommendations for the most effective preparation of peat for such a burner. They concluded that properly prepared peat can be efficiently and economically burned in the type of burner designed and that it is possible to adapt the principle to either stoves or furnaces; however, use of the burner is restricted to areas in the vicinity of peat bogs, for it is not economical to transport peat for fuel considerable distances in Canada.

WORLD REVIEW[6]

The estimated world production of peat increased 1 million tons in 1955. Ireland and West Germany furnished the major portion of this increase, but significant increases in production were also reported in Denmark, Finland, Canada, and the United States.

The U. S. S. R. has a highly mechanized peat industry, with an annual production in 1955 that was estimated to be 50 million tons. This was 86 percent of the total estimated production for the world. The major part of the peat produced in the Soviet Union is consumed for generating electric power. This is followed in turn by peat used for gasification purposes and for briquetting.

The first large-scale effort to burn peat for the production of electric power in the U. S. S. R. dates back to 1914, when a district power station was installed about 70 miles east of Moscow. The northwest and central areas of Russia, the Volga region, and the Urals, where large industrial developments have taken place, are far removed from the bituminous-coal and anthracite fields in the Ukraine and the oil fields on the Caspian Sea. For economic and, probably, strategic reasons it was considered necessary to make these industrial areas independent of fuel supplies from the Ukraine and the Caucasus. Since no coal or hydroelectric power was available in those regions, peat, which was available in vast quantities, was used as a source of

[4] Dragunov, S. S. and Gruzinova, E. D. (Moscow Peat Institute), The Problem of Developing a Classification of Peat Based Upon its Spontaneous Heating: Chem. Abs., vol. 49, No. 22, Nov. 25, 1955, p. 16395.
[5] Hudson, H. P. and Skerry, T.R., Preparation and Burning of Peat as a Domestic Fuel: Canadian Dept. of Mines and Technical Surveys, Mem. Ser. 127, 1954.
[6] Figures on world production compiled by Pearl J. Thompson, Foreign Statistics Unit, Division of Foreign Activities, Bureau of Mines.

energy. Today, powerhouses generating several hundred thousand kilowatts of electric power are operating on peat in these areas.

Illustrative of the importance attached to peat resources in the U.S.S.R. is the fact that a special institute for "peat techniques" is housed in Moscow. The Peat Institute in Moscow trains 300 engineers annually, and the course of instruction covers 5 years.

Ireland is another European country where peat is utilized on a large scale for generating electric power. In 1946 the Irish Government established a Peat Board—Bord Na Mona—for developing the mechanization of the peat industry. In 1955 over 1 million tons of peat was consumed industrially, of which 640,000 tons was sod peat, used for power generation and other industrial uses; and 400,000 tons was milled peat, which was made into briquets.

In Scotland, also, peat resources are being developed to generate electric power. Workable deposits of peat in Scotland are estimated at 600 million tons, and an experimental power station, equipped with a closed-cycle gas turbine, is being constructed.

TABLE 8.—World production of peat, 1951–55, by countries, in thousand net tons[1]

Country	1951	1952	1953	1954	1955
Austria[2]	55	55	55	55	45
Canada, agricultural use[3]	77	75	82	99	126
Denmark	2,220	1,792	633	701	785
Finland:					
Agricultural use	8	[2] 220	4	2	1
Fuel	220		287	132	176
France (fuel only)	73	88	[2] 88	[2] 88	[2] 88
Germany:					
East[2]	550	550	550	550	550
West:					
Agricultural use	308	371	485	480	492
Fuel	1,264	897	992	1,041	1,153
Hungary[2]	9	55	55	60	65
Iceland[2]	2	3	1	(4)	(4)
Ireland:					
Agricultural use	3	4	6	6	[2] 6
Fuel	4,408	4,254	4,255	3,025	3,605
Italy	6	1	1	1	[2] 1
Japan[2]	(4)	33	55	65	77
Korea, Republic of	352	89	83	[2] 110	[2] 110
Netherlands	708	766	499	[2] 500	[2] 500
Norway:					
Agricultural use	28	29	23	23	[2] 23
Fuel	362	366	279	261	[2] 275
Spain	4	2	1	[2] 1	[2] 1
Sweden:					
Agricultural use	114	100	[2] 100	[2] 70	[2] 70
Fuel	269	288	[2] 275	[2] 275	[2] 275
U.S.S.R.[2]	49,000	50,000	50,000	50,000	50,000
United States, agricultural use	194	211	204	244	274
World total[2]	60,000	60,000	59,000	58,000	59,000

[1] Includes revisions of data published previously. Data do not add to totals shown due to rounding.
[2] Estimate.
[3] In addition, Canada produces a negligible amount of peat fuel.
[4] Negligible.

B. Petroleum and Related Products

Petroleum Asphalt

By Albert T. Coumbe, Ivan F. Avery, and Mildred C. Putman

SCOPE OF REPORT

SCHEDULES for reporting sales of asphalt and road oil in 1955 were sent to 97 asphalt-producing companies; of these, 91 replied. Sales reports were also requested from 24 asphalt-emulsion manufacturers, and 23 of these companies cooperated in the survey. No attempt was made to estimate the distribution of the sales made by the nonrespondents, as it was not believed that the total for their products was of very great volume.

TABLE 1.—Salient statistics of petroleum asphalt in the United States, 1954–55, by months and districts

(Thousand short tons)[1]

Month and district	Production		Imports [2] (including natural)		Exports [3]		Stocks (end of period)		Apparent domestic consumption [4]	
	1954	1955 [5]	1954	1955 [5]	1954	1955 [5]	1954	1955 [5]	1954	1955 [5]
By months:										
January	627	772	27	30	14	16	1,522	1,568	447	523
February	719	769	43	46	9	17	1,743	1,798	531	568
March	890	921	35	97	51	22	1,994	1,976	623	818
April	980	1,141	35	55	49	15	2,095	2,141	865	1,016
May	1,252	1,423	52	41	34	42	2,069	2,095	1,296	1,468
June	1,414	1,600	63	49	35	16	1,741	1,808	1,770	1,920
July	1,609	1,728	56	90	44	25	1,553	1,656	1,810	1,946
August	1,587	1,720	73	51	20	25	1,300	1,258	1,893	2,144
September	1,454	1,646	85	63	20	31	1,075	1,053	1,745	1,882
October	1,348	1,469	62	59	21	28	1,037	1,031	1,428	1,522
November	976	1,095	55	32	17	18	1,121	1,183	930	956
December	764	829	31	51	26	30	1,305	1,413	585	621
Total	13,620	15,113	617	664	340	285	1,305	1,413	13,923	15,384
By districts:										
East Coast	3,237	3,448	------	------	------	------	214	251	--------	--------
Appalachian	546	551	------	------	------	------	64	53	--------	--------
Indiana, Illinois, Kentucky, etc	2,372	2,903	------	------	------	------	271	252	--------	--------
Oklahoma, Kansas, etc	1,552	1,690	------	------	------	------	224	237	--------	--------
Texas Inland	696	809	(6)	(6)	(6)	(6)	50	82	(6)	(6)
Texas Gulf Coast	994	1,048	------	------	------	------	83	80	--------	--------
Louisiana Gulf Coast	796	920	------	------	------	------	77	86	--------	--------
Arkansas, Louisiana, Inland, etc	720	836	------	------	------	------	65	59	--------	--------
Rocky Mountain	827	889	------	------	------	------	131	144	--------	--------
California	1,880	2,019	------	------	------	------	126	169	--------	--------
Total	13,620	15,113	617	664	340	285	1,305	1,413	13,923	15,384

[1] Converted from barrels to short tons (5.5 barrels=1 short ton).
[2] Imports into continental United States only.
[3] Includes shipments to noncontiguous Territories.
[4] Production, plus imports, less exports, plus or minus change in stocks.
[5] Preliminary figures.
[6] Figures not available.

TABLE 2.—Salient statistics of road oil in the United States, 1954–55, by months and districts

(Short tons)[1]

Month and district	Production		Stocks, end of period		Apparent domestic consumption [2]	
	1954	1955 [3]	1954	1955 [3]	1954	1955 [3]
By months:						
January	40,182	35,818	98,364	85,818	21,273	28,909
February	47,091	42,364	118,545	97,091	26,910	31,091
March	47,273	64,182	139,818	116,364	26,000	44,909
April	75,818	86,909	162,727	148,000	52,909	55,274
May	119,636	155,636	178,909	164,909	103,454	138,727
June	178,182	207,455	162,545	157,818	194,546	214,546
July	248,000	275,636	135,273	140,364	275,272	293,091
August	244,000	286,727	131,818	107,273	247,455	319,818
September	153,636	190,727	107,636	100,364	177,818	197,636
October	87,091	106,909	95,818	93,455	98,909	113,818
November	46,000	53,273	85,455	98,000	56,363	48,727
December	24,545	36,546	78,909	101,818	31,091	32,727
Total	1,311,454	1,542,182	78,909	101,818	1,312,000	1,519,273
By districts:						
East Coast	22,545	21,091	1,454	1,091	----------	----------
Appalachian	5,818	12,182	364	5,454	----------	----------
Indiana, Illinois, Kentucky, etc.	253,273	295,818	10,182	20,181	----------	----------
Oklahoma, Kansas, etc.	178,545	210,545	11,818	7,091	----------	----------
Texas Inland	4,909	2,727	182	----------	(4)	(4)
Texas Gulf Coast	2,000	1,818	364	364	----------	----------
Louisiana Gulf Coast	364	182	----------	182	----------	----------
Arkansas, Louisiana Inland, etc.	364	182	182	364	----------	----------
Rocky Mountain	322,545	420,364	19,818	20,909	----------	----------
California	521,091	577,273	34,545	46,182	----------	----------
Total	1,311,454	1,542,182	78,909	101,818	1,312,000	1,519,273

[1] Converted from barrels to short tons (5.5 barrels=1 short ton).
[2] Production, plus or minus change in stocks.
[3] Preliminary figures.
[4] Figures not available.

SALES

Asphalt companies reported sales of 15.5 million short tons of petroleum asphalt and products in 1955 compared with 14.7 million in 1954. Sales of road oil were 1.5 million short tons in 1955 and 1.3 million in 1954. Asphalt, including cements, cutbacks, and emulsified products sold for paving purposes, totaled 10.6 million short tons in 1955 compared with 10.0 million in 1954 and represented about 68 percent of the total demand in both years. This material was used for paving public highways, roads on private property, sidewalks, automobile parking areas, and airfield runways. The comparable quantity of portland cement used for paving is not available; however, statistics compiled by the Bureau of Public Roads, United States Department of Commerce, indicate that about 8.4 million short tons of asphaltic products and about 9.6 million short tons of portland cement were used for paving and maintaining public highways in 1955 and that an additional 3.2 million short tons of portland cement was used for bridges, culverts, and other structures on public highways. Asphalt reported sold for roofing purposes increased from 3.3 million short tons in 1954 to 3.5 million in 1955 and represented about 23 percent of the total sales in 1955, compared with 22 percent in 1954. Quantities sold for manufacturing miscellaneous products dropped slightly from 1.5 million short tons in 1954 (10 percent of sales) to 1.4 million in 1955 (9 percent of sales).

TABLE 3.—Sales of petroleum asphalt paving products in the United States, 1954–55, by districts and States

(Short tons)

District [1] and State	Asphalt cements		Cutback asphalts		Emulsified asphalts		Total	
	1954	1955	1954	1955	1954	1955	1954	1955
District 1:								
Connecticut	36,200	52,034	33,614	37,574	7,317	5,705	77,131	95,313
Delaware	9,971	13,652	9,357	10,743	6	602	19,334	24,997
Florida	215,698	215,655	148,149	155,444	14,034	22,529	377,881	393,628
Georgia	141,121	184,292	65,635	81,047	33,508	3,350	240,264	268,689
Maine	23,265	61,148	47,473	40,903	11,876	18,413	82,614	120,464
Maryland and D. C	149,573	132,121	88,999	96,417	21,263	19,969	259,835	248,507
Massachusetts	150,515	185,696	72,398	68,045	1,971	1,706	224,884	255,447
New Hampshire	8,043	18,294	31,226	33,424	77	204	39,346	51,922
New Jersey	196,293	205,752	81,142	78,805	1,964	3,752	279,399	288,309
New York	371,668	358,128	177,557	195,528	81,501	108,095	630,726	661,751
North Carolina	149,183	164,028	107,801	116,381	35,955	22,957	292,939	303,366
Pennsylvania	348,482	330,623	126,147	124,481	42,039	44,759	516,668	499,863
Rhode Island	49,469	32,346	34,851	21,953	3,122	1,178	87,442	55,477
South Carolina	68,117	75,588	53,974	31,897	39,500	64	161,591	107,549
Vermont	9,229	7,620	19,550	19,855	562	294	29,341	27,769
Virginia	84,045	107,025	107,514	111,062	5,724	3,060	197,283	221,147
West Virginia	41,794	40,072	29,938	36,111	19,882	4,076	91,614	80,259
Total	2,052,666	2,184,074	1,235,325	1,259,670	320,301	260,713	3,608,292	3,704,457
District 2:								
Illinois	174,322	143,786	84,995	103,649	4,155	9,799	263,472	257,234
Indiana	57,182	109,142	100,472	125,049	74,567	66,934	232,221	301,125
Iowa	34,310	59,286	73,268	127,671	28,951	370	136,529	187,327
Kansas	48,953	51,818	161,389	173,962	58	3,567	210,400	229,347
Kentucky	66,585	75,710	76,667	65,800	17,081	17,530	160,333	159,040
Michigan	105,303	123,532	75,631	76,201	12,887	42,454	193,821	242,187
Minnesota	113,316	121,302	212,212	295,745	4,573	6,346	330,101	423,393
Missouri	95,139	121,450	95,973	94,878	7,867	4,496	198,979	220,824
Nebraska	56,996	31,909	63,957	77,967	55	960	121,008	110,836
North Dakota	60,673	70,255	40,509	37,601	801	1,034	101,983	108,890
Ohio	229,309	302,544	248,280	256,601	94,606	102,926	572,195	662,071
Oklahoma	53,962	77,272	204,635	137,406	1,761	4,812	260,358	219,490
South Dakota	41,264	39,839	35,673	31,017	81	4,462	77,018	75,318
Tennessee	147,420	156,571	64,752	78,329	12,807	17,639	224,979	252,539
Wisconsin	99,373	91,324	61,633	117,286	6,185	9,026	167,191	217,636
Total	1,384,107	1,575,740	1,600,046	1,799,162	266,435	292,355	3,250,588	3,667,257
District 3:								
Alabama	79,494	109,670	97,263	76,443	19,655	27,656	196,412	213,769
Arkansas	46,903	39,308	41,627	40,542	26,065	11,053	114,595	90,903
Louisiana	121,123	129,587	25,251	46,407	10,184	18,386	156,558	194,380
Mississippi	23,743	15,519	7,301	8,232	12,875	17,160	43,919	40,911
New Mexico	95,122	92,111	93,183	64,483	639	2,352	188,944	158,946
Texas	409,537	432,233	173,435	181,155	20,836	28,031	603,808	641,419
Total	775,922	818,428	438,060	417,262	90,254	104,638	1,304,236	1,340,328
District 4:								
Colorado	71,369	73,733	81,725	71,170	439	351	153,533	145,254
Idaho	29,160	13,245	49,252	32,541	1,486	2,333	79,898	48,119
Montana	18,286	10,499	63,792	48,355	3,787	6,435	85,865	65,289
Utah	47,680	55,734	40,260	41,335	----------	4	87,940	97,073
Wyoming	14,510	27,883	39,330	47,919	----------	----------	53,840	75,802
Total	181,005	181,094	274,359	241,320	5,712	9,123	461,076	431,537
District 5:								
Arizona	11,526	26,382	26,114	25,350	7,021	11,555	44,661	63,287
California	734,604	748,356	67,602	86,735	111,633	142,190	913,839	977,281
Nevada	20,724	12,842	6,703	4,160	1,255	2,847	28,682	19,849
Oregon	132,281	155,208	43,667	45,693	4,892	10,225	180,840	211,126
Washington	81,761	94,703	92,878	101,634	1,220	764	175,859	197,101
Total	980,896	1,037,491	236,964	263,572	126,021	167,581	1,343,881	1,468,644
Total United States	5,374,596	5,796,827	3,784,754	3,980,986	808,723	834,410	9,968,073	10,612,223

[1] States are grouped according to petroleum-marketing districts rather than geographic regions.

TABLE 4.—Sales of petroleum-asphalt roofing products in the United States, 1954–55, by districts and States

(Short tons)

District [1] and State	Asphalts cements and fluxes		Emulsified Asphalts		Total	
	1954	1955	1954	1955	1954	1955
District 1:						
Connecticut	16,901	15,532	21	24	16,922	15,556
Delaware	21,369	23,382	10	12	21,379	23,394
Florida	90,076	134,658	7	-------	90,083	134,658
Georgia	37,797	49,078	6	12	37,803	49,090
Maine	69	12,674	-------	-------	69	12,674
Maryland and D. C	55,891	60,880	140	176	56,031	61,056
Massachusetts	109,075	94,884	31	25	109,106	94,909
New Hampshire	357	320	-------	1	357	321
New Jersey	336,697	424,943	96	105	336,793	425,048
New York	85,754	85,097	44	115	85,798	85,212
North Carolina	50,399	67,636	1,503	2	51,902	67,638
Pennsylvania	155,064	161,365	56	188	155,120	161,553
Rhode Island	66,679	73,441	1	3	66,680	73,444
South Carolina	3,409	24,383	1	-------	3,410	24,383
Vermont	350	431	3	8	353	439
Virginia	2,411	3,279	44	13	2,455	3,292
West Virginia	1,839	27,956	1	-------	1,840	27,956
Total	1,034,137	1,259,939	1,964	684	1,036,101	1,260,623
District 2:						
Illinois	514,203	501,147	2,097	53	516,300	501,200
Indiana	94,162	92,835	11	28	94,173	92,863
Iowa	6,869	7,361	130	3	6,999	7,364
Kansas	7,786	8,268	23	-------	7,809	8,268
Kentucky	3,504	4,201	3	17	3,507	4,218
Michigan	53,349	71,739	31	46	53,380	71,785
Minnesota	98,716	49,982	4	5	98,720	49,987
Missouri	187,829	152,712	4	-------	187,833	152,712
Nebraska	3,708	2,333	-------	-------	3,708	2,333
North Dakota	614	759	-------	-------	614	759
Ohio	69,328	70,573	1,858	1,541	71,186	72,114
Oklahoma	3,986	4,146	-------	-------	3,986	4,146
South Dakota	887	1,302	-------	-------	887	1,302
Tennessee	27,699	35,984	1	12	27,700	35,996
Wisconsin	8,451	8,855	18	16	8,469	8,871
Total	1,081,091	1,012,197	4,180	1,721	1,085,271	1,013,918
District 3:						
Alabama	84,492	105,559	5	11	84,497	105,570
Arkansas	42,560	42,966	-------	9,475	42,560	52,441
Louisiana	177,598	167,466	5	4	177,603	167,470
Mississippi	3,241	5,241	-------	4	3,241	5,245
New Mexico	2,682	12,564	-------	-------	2,682	12,564
Texas	224,190	302,876	19	1	224,209	302,877
Total	534,763	636,672	29	9,495	534,792	646,167
District 4:						
Colorado	30,810	19,726	17	-------	30,827	19,726
Idaho	802	1,023	-------	-------	802	1,023
Montana	905	2,019	-------	-------	905	2,019
Utah	4,623	1,703	-------	-------	4,623	1,703
Wyoming	2,373	1,162	-------	-------	2,373	1,162
Total	39,513	25,633	17	-------	39,530	25,633
District 5:						
Arizona	129	2,653	-------	-------	129	2,653
California	425,968	449,646	90	64	426,058	449,710
Nevada	371	3,269	-------	-------	371	3,269
Oregon	120,880	100,104	10	9	120,890	100,113
Washington	6,955	12,804	35	19	6,990	12,823
Total	554,303	568,476	135	92	554,438	568,568
Total United States	3,243,807	3,502,917	6,325	11,992	3,250,132	3,514,909

[1] States are grouped according to petroleum-marketing districts rather than geographic regions.

TABLE 5.—Sales of all other petroleum-asphalt products in the United States, 1954–55, by districts and States

(Short tons)

District [1] and State	Asphalt cements and fluxes		Emulsified asphalts		Total	
	1954	1955	1954	1955	1954	1955
District 1:						
Connecticut	10,660	14,163	357	74	11,017	14,237
Delaware	1,034	802	19	42	1,053	844
Florida	19,421	31,197	1,852	2,619	21,273	33,816
Georgia	54,230	50,145	486	1,561	54,716	51,706
Maine	4,973	4,500	57	3	5,030	4,503
Maryland and D. C.	29,125	25,233	1,290	1,725	30,415	26,958
Massachusetts	25,929	27,356	1,488	850	27,417	28,206
New Hampshire	473	3,056	32	25	505	3,081
New Jersey	140,016	118,957	2,581	1,750	142,597	120,707
New York	37,437	44,032	1,185	385	38,622	44,417
North Carolina	16,407	16,704	1,719	1,727	18,126	18,431
Pennsylvania	164,656	169,660	1,581	2,036	166,237	171,696
Rhode Island	21,518	22,613	229	26	21,747	22,639
South Carolina	713	850	19	67	732	917
Vermont	2,722	3,021	9	13	2,731	3,034
Virginia	13,139	14,875	149	202	13,288	15,077
West Virginia	2,994	39,355	42	52	3,036	39,407
Total	545,447	586,519	13,095	13,157	558,542	599,676
District 2:						
Illinois	190,289	209,276	2,140	6,862	192,429	216,138
Indiana	107,773	40,739	270	309	108,043	41,048
Iowa	7,006	5,281	322	167	7,328	5,448
Kansas	17,733	11,015		49	17,733	11,064
Kentucky	3,519	3,096	128	7	3,647	3,103
Michigan	35,114	41,678	15,867	3,398	50,981	45,076
Minnesota	52,147	39,783	1,253	395	53,400	40,178
Missouri	65,593	63,930	439	1,640	66,032	65,570
Nebraska	4,483	2,869	8	23	4,491	2,892
North Dakota	2,961	1,631			2,961	1,631
Ohio	84,077	91,442	1,441	2,303	85,518	93,745
Oklahoma	7,079	11,054		52	7,079	11,106
South Dakota	2,203	1,017			2,203	1,017
Tennessee	11,087	13,347	134	83	11,221	13,430
Wisconsin	59,539	29,097	1,409	774	60,948	29,871
Total	650,603	565,255	23,411	16,062	674,014	581,317
District 3:						
Alabama	6,238	3,177	206	228	6,444	3,405
Arkansas	14,670	11,334		88	14,670	11,422
Louisiana	29,382	30,382	277	319	29,659	30,701
Mississippi	7,781	3,644	393	150	8,174	3,794
New Mexico	7,859	4,536	19	12	7,878	4,548
Texas	50,046	58,124	4,725	4,520	54,771	62,644
Total	115,976	111,197	5,620	5,317	121,596	116,514
District 4:						
Colorado	20,916	18,637	37	15	20,953	18,652
Idaho	1,815	2,309	15	10	1,830	2,319
Montana	3,022	3,735	6	11	3,028	3,746
Utah	10,079	7,420	48	56	10,127	7,476
Wyoming	16,227	2,487			16,227	2,487
Total	52,059	34,588	106	92	52,165	34,680
District 5:						
Arizona	613	902	43	69	656	971
California	32,397	55,460	5,990	5,185	38,387	60,645
Nevada	1,020	382	10	94	1,030	476
Oregon	3,916	2,552	2,749	3,044	6,665	5,596
Washington	7,746	9,566	1,976	2,201	9,722	11,767
Total	45,692	68,862	10,768	10,593	56,460	79,455
Total United States	1,409,777	1,366,421	53,000	45,221	1,462,777	1,411,642

[1] States are grouped according to petroleum-marketing districts rather than geographic regions.

TABLE 6.—Sales of petroleum asphalt and road oil in the United States, 1954–55, by districts and States

(Short tons)

Districts[1] and State	Asphalt cements and fluxes	Emulsified asphalts	Cutback asphalts	Total		Change, percent	Road oil		Change, percent
				1955	1954		1955	1954	
District 1:									
Connecticut	81,729	5,803	37,574	125,106	105,070	19.1		2	
Delaware	37,836	656	10,743	49,235	41,766	17.9	48		
Florida	381,510	25,148	155,444	562,102	489,237	14.9	2	2	
Georgia	233,515	4,923	81,047	369,485	332,783	11.0	47	1	
Maine	78,322	18,416	40,903	137,641	87,713	56.9			
Maryland and D. C.	218,234	21,870	96,417	336,521	346,281	−2.8	168	92	82.6
Massachusetts	307,936	2,581	68,045	378,562	361,407	4.7	146	21	595.2
New Hampshire	21,670	230	33,424	55,324	40,208	37.6		12	
New Jersey	749,652	5,607	78,805	834,064	758,789	9.9	1,085	3,699	−70.7
New York	487,257	108,595	195,528	791,380	755,146	4.8	7,515	6,628	13.4
North Carolina	248,368	24,686	116,381	389,435	362,967	7.3	3	1	200.0
Pennsylvania	661,648	46,983	124,481	833,112	838,025	−.6	13,195	9,428	40.0
Rhode Island	128,400	1,207	21,953	151,560	175,869	−13.8	159	152	4.6
South Carolina	100,821	131	31,897	132,849	165,733	−19.8			
Vermont	11,072	315	19,855	31,242	32,425	−3.6			
Virginia	125,179	3,275	111,062	239,516	213,026	12.4			
West Virginia	107,383	4,128	36,111	147,622	96,490	53.0	281	303	−7.3
Total 1955	4,030,532	274,554	1,259,670	5,564,756		7.0	22,649		11.3
Total 1954	3,632,250	335,360	1,235,325		5,202,935			20,341	
District 2:									
Illinois	854,209	16,714	103,649	974,572	972,201	0.2	201,431	178,407	12.9
Indiana	242,716	67,271	125,049	435,036	434,437	0.1	23,001	26,569	−13.4
Iowa	71,928	540	127,671	200,139	150,856	32.6	38,822	34,039	14.1
Kansas	71,101	3,616	173,962	248,679	235,942	5.4	1,591	1,763	−9.8
Kentucky	83,007	17,554	65,800	166,361	167,487	−0.7	13,269	11,391	16.5
Michigan	236,949	45,898	76,201	359,048	298,182	20.4	33,689	32,091	5.0
Minnesota	211,067	6,746	295,745	513,558	482,221	6.5	48,424	54,785	−11.6
Missouri	338,092	6,136	94,878	439,106	452,844	−3.0	90,943	58,518	55.4
Nebraska	37,111	983	77,967	116,061	129,207	−10.2	7,081	6,079	16.5
North Dakota	72,645	1,034	37,601	111,280	105,558	5.4	3,070	4,261	−28.0
Ohio	464,559	106,770	256,601	827,930	728,899	13.6	25,286	31,651	−20.1
Oklahoma	92,472	4,864	137,406	234,742	271,423	−13.5	6,114	6,336	−3.5
South Dakota	42,158	4,462	31,017	77,637	80,108	−3.1	32,315	57,506	−43.8
Tennessee	205,902	17,734	78,329	301,965	263,900	14.4	248		
Wisconsin	129,276	9,816	117,286	256,378	236,608	8.4	248,113	160,207	54.9
Total 1955	3,153,192	310,138	1,799,162	5,262,492		5.0	773,397		16.5
Total 1954	3,115,801	294,026	1,600,046		5,009,873			663,603	
District 3:									
Alabama	218,406	27,895	76,443	322,744	287,353	12.3	182	14,544	−98.7
Arkansas	93,608	20,616	40,542	154,766	171,825	−9.9	2,857	6,618	−43.2
Louisiana	327,435	18,709	46,407	392,551	363,820	7.9	2,646		
Mississippi	24,404	17,314	8,232	49,950	55,334	−9.7			
New Mexico	109,211	2,364	64,483	176,058	199,504	−11.8	5,208	6,925	−24.8
Texas	793,233	32,552	181,155	1,006,940	882,788	14.1	22,634	28,652	−21.0
Total 1955	1,566,297	119,450	417,262	2,103,009		7.3	33,527		−40.9
Total 1954	1,426,661	95,903	438,060		1,960,624			56,739	
District 4:									
Colorado	112,096	366	71,170	183,632	205,313	−10.6	18,782	17,451	7.6
Idaho	16,577	2,343	32,541	51,461	82,530	−37.6	22,472	31,924	−29.6
Montana	16,253	6,446	48,355	71,054	89,798	−20.9	13,768	11,964	15.1
Utah	64,857	60	41,335	106,252	102,690	3.5	22,765	24,744	−8.0
Wyoming	31,532		47,919	79,451	72,440	9.7	26,950	25,224	6.8
Total 1955	241,315	9,215	241,320	491,850		−11.0	104,737		−5.9
Total 1954	272,577	5,835	274,359		552,771			111,307	

See footnote at end of table

TABLE 6.—Sales of petroleum asphalt and road oil in the United States, 1954-55, by districts and States—Continued

(Short tons)

Districts [1] and State	Asphalt cements and fluxes	Emulsified asphalts	Cutback asphalts	Total		Change percent	Road oil		Change percent
				1955	1954		1955	1954	
District 5:									
Arizona	29,937	11,624	25,350	66,911	45,446	47.2	15,398	8,938	72.3
California	1,253,462	147,439	86,735	1,487,636	1,378,284	7.9	488,605	457,051	6.9
Nevada	16,493	2,941	4,160	23,594	30,083	−21.6	6,632	14,823	−55.3
Oregon	257,864	13,278	45,693	316,835	308,395	2.7	11,087	9,923	11.7
Washington	117,073	2,984	101,634	221,691	192,571	15.1	4,418	3,575	23.6
Total 1955	1,674,829	178,266	263,572	2,116,667		8.3	526,140		6.4
Total 1954	1,580,891	136,924	236,964		1,954,779			494,310	
Total United States 1955	10,666,165	891,623	3,980,986	15,538,774		5.8	1,460,450		8.5
Total United States 1954	10,028,180	868,048	3,784,754		14,680,982			1,346,300	

[1] States are grouped according to petroleum-marketing districts rather than geographic regions.

The apparent domestic consumption of asphalt and road oil (tables 1 and 2) is calculated from the production and stocks reported by the petroleum refineries and from import and export data compiled by the Bureau of the Census, United States Department of Commerce and is only roughly comparable with the sales of asphalt and road oil by States and uses, reported each year to the Bureau of Mines by the sales departments of the asphalt companies and the asphalt-emulsion manufacturers. Furthermore, sales, which include emulsified asphalts can be slightly more than the apparent domestic consumption, as the emulsified asphalts may contain some water or other liquids.

FOREIGN TRADE

IMPORTS [1]

Imports of asphalts, including solid and liquid petroleum asphalts and a small quantity of natural asphalts, declined slightly from 622,000 short tons, valued at $6.6 million, in 1954 to 609,000 short tons, valued at $7.7 million, in 1955. Most of the petroleum asphalts came from Netherland Antilles and Venezuela, whereas most of the natural asphalts were from Trinidad and Tobago. These import figures represent quantities received in the continental United States and the noncontiguous Territories; the monthly imports shown in table 1, taken from the Monthly Petroleum Statement of the Bureau of Mines, are for continental United States only.

[1] Figures on imports and exports compiled by Mae B. Price and Elsie D. Page, of the Bureau of Mines, from the records of the U. S. Department of Commerce.

EXPORTS

Table 7.—Petroleum asphalt and products exported from the United States, 1954–55, by countries of destination

[U. S. Department of Commerce]

Country	1954		1955	
	Thousand short tons	Thousand dollars	Thousand short tons	Thousand dollars
North America:				
Canada	35	$1,215	38	$1,313
Canal Zone	2	45	1	29
Mexico	15	281	27	442
Other North America	7	182	10	290
Total	59	1,723	76	2,074
South America:				
Bolivia	(1)	7	9	209
Brazil	20	836	2	72
Chile	8	[2] 280	4	130
Colombia	17	510	8	219
Ecuador	9	279	16	268
Other South America	2	[2] 145	3	184
Total	56	[2] 2,057	42	1,082
Europe:				
Azores			4	97
Turkey	3	101	1	16
Other Europe	2	116	2	183
Total	5	217	7	296
Asia:				
Burma	8	211		
India	18	516	37	1,005
Indonesia	12	323	15	396
Korea, Republic of			13	370
Malaya	4	[2] 132	1	42
Philippines	26	1,000	29	1,076
Thailand	1	30	8	227
Vietnam, Laos, and Cambodia [3]	65	2,534	1	23
Other Asia	3	117	3	157
Total	137	[2] 4,863	107	3,296
Africa:				
Belgian Congo	5	170	6	206
Federation of Rhodesia and Nyasaland	3	73	4	118
Union of South Africa	17	574	18	571
Other Africa	5	208	8	321
Total	30	1,025	36	1,216
Oceania:				
New Zealand	4	128	1	40
Other Oceania	(1)	12	(1)	20
Total	4	140	1	60
Grand total	291	[2] 10,025	269	8,024

[1] Less than 1,000.
[2] Revised figure.
[3] Formerly Indochina.

TECHNOLOGY

The recent development of economical and highly portable equipment for constructing hot-mix asphalt curbs led to a rapid rise in use of asphalt for this purpose in 1955. Equipment is now commercially available for rapid placement of hot-mix asphalt curbs in a variety of shapes and at very low cost. This development has been received enthusiastically by contractors and builders.

An asphalt-slurry seal coat has been developed that provides an expeditious and economical means of filling cracks and providing a thin, smooth resurfacing over cracked and abraded pavements. A slurry mix is prepared in a conventional concrete mixer with emulsified asphalt, sand, mineral filler, and water. The mixture is dumped into a rectangular spreader box having a strip of rubber belting as a screed along the rear side of the box. The slurry mix is screeded into cracks and leaves a smooth surface course of about ⅛- to ¼-inch thickness over the pavement.

Experimental work on the lining of atomic-waste ponds with buried asphalt membranes progressed markedly in 1955. This potential development promises economical solution of a costly problem in the atomic energy field.

The use of asphalt in soil-erosion control increased rapidly in 1955. Cutback and emulsified asphalts in thin applications are used to bind a straw mulch together, preventing it from being blown or washed away until grass growth has begun. In some applications liquid asphalts are applied directly on seeded areas.

Increasing worldwide interest in the uses of asphalt and asphaltic materials has been reflected in the numerous visits of foreign officials and engineers to the laboratories of The Asphalt Institute, College Park, Md. Here the asphalt industry, utilizing the most modern facilities and testing equipment, is conducting a broad program of research and development.

Carbon Black

By Donald S. Colby and Ann C. Mahoney

GENERAL SUMMARY

SHIPMENTS of carbon black were 22 percent higher in 1955 than in 1954. Sales made large gains in the last months of 1954, and this high level was exceeded in most of the months of 1955. Shipments to rubber companies, which generally fluctuate with the volume of automobiles produced, were 26 percent ahead of 1954 and composed 94 percent of the domestic sales.

Production reached the record high of 1,744 million pounds in 1955. Nearly 50 percent of this was produced from oil.

Eight plants shut down during 1955 following the decline in demand for carbon black in 1954. At the end of 1955, 11 producers operated 42 plants with a combined daily capacity of 5,425,100 pounds. Owing to the expansion of existing plants, this operating capacity was 133,600 pounds per day larger than at the end of 1954, despite the number of plants that closed during the year.

SCOPE OF REPORT

Annual statistics of the carbon-black industry were obtained from reports submitted to the Bureau of Mines from all operating plants in the United States by producers who represent 100 percent of commercial production. Carbon black is a very pure grade of quasi-graphitic carbon, with particle diameters ranging from 50 to 5,000 Angstrom units.

Export and import figures are compiled by the United States Department of Commerce. Monthly figures are based on reports prepared by the National Gas Products Association and adjusted to agree with the annual reports received by the Bureau of Mines.

Data are obtained on furnace and contact blacks, the two general types produced commercially. Substantially all contact blacks are made by the channel process. Furnace blacks are broken down into seven grades: Semireinforcing Furnace (SRF), High-Modulus Furnace (HMF), Fast-Extrusion Furnace (FEF), High-Abrasion Furnace (HAF), combined Superabrasion Furnace and Intermediate-Abrasion Furnace (SAF and ISAF), Thermal, and Other. The production and uses of the various grades are described in Minerals Yearbooks, 1948 and 1949.

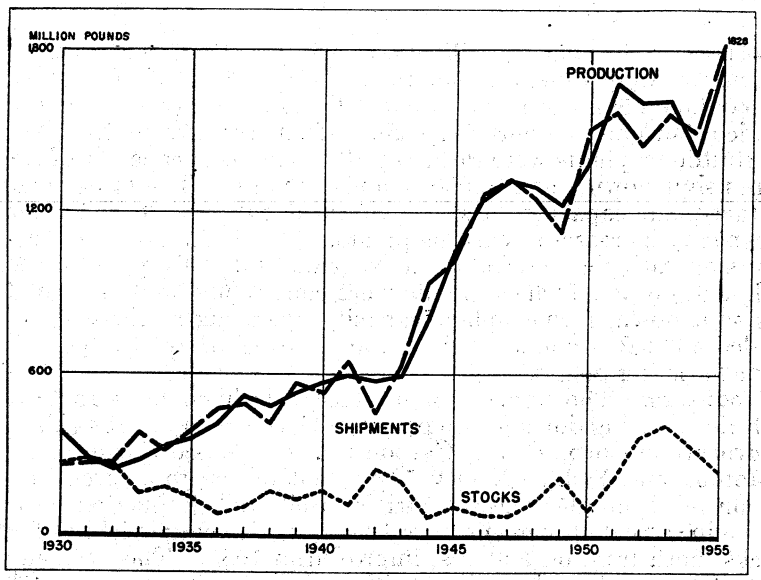

FIGURE 1.—Production, stocks, and shipments of carbon black, 1930–55.

TABLE 1.—Salient statistics of carbon black produced from natural gas and liquid hydrocarbons in the United States, 1951–55, in thousand pounds

	1951	1952	1953	1954	1955
Production:					
Contact process (chiefly channel)	645,881	563,597	453,345	378,741	359,487
Furnace processes	1,031,482	1,040,505	1,157,092	1,030,806	1,384,025
Total	1,677,363	1,604,102	1,610,437	1,409,547	1,743,512
Shipments:					
Domestic sales	1,129,645	1,154,274	1,200,871	1,095,256	1,373,777
Exports	433,493	292,908	358,620	402,777	454,181
Total	1,563,138	1,447,182	1,559,491	1,498,033	1,827,958
Losses	534	804	12	413	15
Stocks of producers Dec. 31	203,234	359,350	410,284	321,385	236,924
VALUE					
Production thousand dollars	107,436	101,988	104,868	91,375	117,587
Average per pound cents	6.41	6.36	6.51	6.48	6.74

PRODUCTION

Number and Capacity of Plants.—Eight plants—7 contact-type and 1 furnace—were shut down in 1955. The furnace plant and four of the contact plants were in Texas. Two of the plants were in New Mexico and one in Louisiana. Aside from the two in New Mexico, the shutdown plants were rather small. The total capacity of contact plants shut down was 210,000 pounds per day. The total operating contact-plant capacity, however, declined only 98,000 pounds owing to capacity increases at existing plants. The capacity of contact-type plants operating at the end of the year was 1,035,900 pounds per day. Although no new furnace plants were constructed and one small one was shut down, furnace-plant capacity operating at the end of 1955 totaled 4,389,200 pounds per day, an increase of 231,700 pounds per day at existing plants.

Producers.—The number of producers declined by 4 to total 11, with the shutting down of the plants of Carbon Blacks, Inc., Barnhart Hydrocarbon Corp., Crown Carbon Co., and Witco Chemical Co.

Method and Yield.—Nearly 50 percent of the total production of carbon black in 1955 was derived from oil, and production from this source increased 46 percent over 1954. The average yield of furnace blacks, both from oil and gas, improved in 1955. The average yield depends upon the relative quantities of the various grades of black produced. Lower yields are obtained when the highly reinforcing grades are produced.

Production of contact blacks declined 5 percent in 1955, while furnace-black output was 34 percent greater than in 1954. The production of all grades of furnace blacks was higher in 1955 than in 1954. The Intermediate-Abrasion Furnace and Super-Abrasion Furnace grades, which are the newest and most highly reinforcing furnace grades, showed the largest increases and composed 8 percent of total furnace-black production.

TABLE 2.—Carbon black produced from natural gas and liquid hydrocarbons in the United States, 1951–55, by States and districts, in thousand pounds

State and district	1951	1952	1953	1954	1955	Change from 1954 (percent)
Louisiana	258,989	255,939	376,818	368,233	502,793	36.5
Texas:						
Panhandle district	700,659	613,298	542,006	420,798	545,060	29.5
Rest of State	449,287	460,462	444,421	393,622	406,416	3.3
Total Texas	1,149,946	1,073,760	986,427	814,420	951,476	16.8
Other States	268,428	274,403	247,192	226,894	289,243	27.5
Grand total	1,677,363	1,604,102	1,610,437	1,409,547	1,743,512	23.6

TABLE 3.—Carbon black produced in the United States in 1955, by States and districts, and natural gas and liquid hydrocarbons used in its manufacture

State	Producers reporting [1]	Number of plants	Production					
			Furnace black			Contact black		
			Thousand pounds	Value at plant		Thousand pounds	Value at plant	
				Total (thousand dollars)	Cents per pound		Total (thousand dollars)	Cents per pound
Louisiana	5	9	502,298	31,567	6.28	495	103	20.80
Texas:								
Panhandle district	7	12	437,283	26,851	6.14	107,777	10,501	9.74
Rest of State	5	13	247,369	17,033	6.89	159,047	11,951	7.51
Total Texas	8	25	684,652	43,884	6.41	266,824	22,452	8.41
Arkansas	1	1						
Oklahoma	1	1						
California	1	1	197,075	12,530	6.36			
Kansas	2	2						
New Mexico	3	3				92,168	7,051	7.65
Grand total:								
1955	11	42	1,384,025	87,981	6.36	359,487	29,606	8.23
1954	15	50	1,030,806	63,697	6.18	378,741	27,678	7.31

State	Natural gas used					Liquid hydrocarbons used			
	Million cubic feet	Average yield [2] (pounds per M cubic feet)		Value		Thousand gallons	Average yield (pounds per gallon)	Value	
		Furnace	Contact	Total (thousand dollars)	Average (cents per M cu. ft.)			Total (thousand dollars)	Average (cents per gallon)
Louisiana	28,674	8.96	0.82	2,101	7.33	61,418	4.08	4,667	7.60
Texas:									
Panhandle district	74,894	7.86	1.84	7,331	9.78	86,521	3.56	4,690	5.42
Rest of State	79,688	6.18	2.26	4,985	6.26	46,763	4.07	2,942	6.29
Total Texas	154,582	7.26	2.07	12,316	7.97	133,284	3.74	7,632	5.73
Arkansas									
Oklahoma									
California	11,694	6.73		1,566	13.39	26,399	4.49	1,405	5.32
Kansas									
New Mexico	49,844		1.85	3.415	6.85				
Grand total:									
1955	244,794	7.89	2.00	19,398	7.92	221,101	3.92	13,704	6.19
1954	251,176	6.96	2.01	17,510	6.97	154,919	3.83	10,320	6.66

[1] Detail will not add to totals, because some producers operate in more than 1 area.
[2] Partly estimated.

TABLE 4.—Production and shipments of carbon black in the United States in 1955, by months and grades, in thousand pounds

PRODUCTION [1]

Month	Furnace								Contact	Total
	Thermal	SRF [2]	HMF [3]	FEF [4]	HAF [5]	ISAF and SAF [6]	Other	Total		
January	9,315	24,914	10,013	12,478	36,185	10,472	998	104,375	29,301	133,676
February	8,269	25,995	8,469	11,671	32,040	13,354	884	100,682	26,799	127,481
March	10,317	26,073	9,491	15,026	36,997	12,984	1,104	111,992	30,358	142,350
April	10,620	25,455	8,565	17,118	38,229	12,212	1,136	113,335	31,297	144,632
May	12,094	24,789	8,618	19,279	39,235	10,543	1,294	115,852	30,167	146,019
June	12,077	26,382	7,936	19,092	40,126	9,505	1,292	116,410	29,859	146,269
July	12,189	28,186	9,652	19,021	42,577	7,105	1,304	120,034	30,074	150,108
August	12,879	28,628	8,820	20,207	43,682	5,053	1,378	120,647	29,749	150,396
September	12,164	29,136	10,519	20,130	39,560	5,797	1,302	118,608	29,338	147,946
October	12,499	29,976	10,504	20,358	40,692	7,400	1,341	122,770	30,332	153,102
November	12,365	29,520	9,667	18,548	35,274	9,542	1,323	116,239	30,418	146,657
December	12,119	30,456	10,751	19,925	39,310	9,223	1,297	123,081	31,795	154,876
Total	136,907	329,510	113,005	212,853	463,907	113,190	14,653	1,384,025	359,487	1,743,512

SHIPMENTS (INCLUDING EXPORTS) [1]

January	8,209	26,209	9,397	15,806	35,845	8,917	535	104,918	43,015	147,933
February	9,756	26,668	9,373	16,870	35,302	9,100	636	107,705	34,913	142,618
March	11,957	27,452	11,167	19,213	38,406	10,279	779	119,253	41,719	160,972
April	10,659	28,526	9,878	18,205	37,902	10,735	694	116,599	39,452	156,051
May	12,150	27,306	10,208	18,710	38,748	9,956	792	117,870	36,685	154,555
June	12,426	27,612	10,576	17,134	38,686	9,505	810	116,749	36,322	153,071
July	11,490	26,540	9,366	16,248	37,115	9,008	749	110,516	32,840	143,356
August	11,121	25,192	9,320	17,172	40,108	6,473	725	110,111	39,942	150,053
September	11,986	27,928	9,862	18,020	37,299	9,389	780	115,264	37,706	152,970
October	12,663	27,944	10,321	19,672	40,104	10,099	825	121,628	38,947	160,575
November	12,295	29,229	9,552	20,033	41,198	11,447	800	124,554	37,549	162,103
December	11,617	27,337	9,380	18,600	37,742	7,813	756	113,245	30,471	143,716
Total	136,329	327,943	118,400	215,683	458,455	112,721	8,881	1,378,412	449,561	1,827,973

[1] Compiled from reports of the National Gas Products Association and of producing companies not included in the association figures. Figures adjusted to agree with annual reports of individual producers.
[2] Semireinforcing Furnace.
[3] High-Modulus Furnace.
[4] Fast-Extrusion Furnace.
[5] High-Abrasion Furnace.
[6] Intermediate-Abrasion Furnace and Superabrasion Furnace.

TABLE 5.—Natural gas and liquid hydrocarbons used in the manufacture of carbon black in the United States and average yield, 1951–55

	1951	1952	1953	1954	1955
Natural gas used—million cubic feet	426,423	368,399	300,942	251,176	244,794
Average yield of carbon black per thousand cubic feet—pounds	2.67	2.87	3.06	[1] 3.25	3.58
Average value of natural gas used per thousand cubic feet—cents	5.21	5.46	5.87	6.89	7.92
Liquid hydrocarbons used—thousand gallons	182,343	163,392	187,207	154,919	221,101
Average yield of carbon black per gallon—pounds	2.96	3.35	3.68	3.83	3.92
Average value of liquid hydrocarbons used per gallon—cents	-------	8.15	7.69	6.66	6.19
Number of producers reporting	20	18	16	15	11
Number of plants	58	59	52	50	42

[1] Revised.

TABLE 6.—Number and capacity of carbon-black plants operated in the United States, 1955

State or district	County or parish	Number of plants				Total daily capacity (pounds)	
		1954		1955			
		Contact	Furnace	Contact	Furnace	1954	1955
Texas:							
Panhandle district	Carson	1		1		1,648,200	1,530,000
	Gray	3	1	3	1		
	Hutchinson	2	4	1	4		
	Moore	2	1		1		
	Wheeler		1		1		
Total Panhandle district		8	7	5	7	1,648,200	1,530,000
Rest of State	Aransas	1	2	1	1	1,318,300	1,344,300
	Brazoria	1		1			
	Brooks	1		1			
	Ector	1		1			
	Gaines	1		1			
	Harris		2		1		
	Howard		1		1		
	Montgomery		1		1		
	Nueces	1		1			
	Reagan	1					
	Terry		1		1		
	Ward						
	Winkler	1		1			
Total, rest of State		8	7	7	6	1,318,300	1,344,300
Total Texas		16	14	12	13	2,966,500	2,874,300
Louisiana	Avoyelles		1		1	1,339,700	1,530,800
	Calcasieu		1		1		
	Evangeline		1		1		
	Ouachita		2		2		
	Richland	2		1			
	St. Mary		3		3		
Total Louisiana		2	8	1	8	1,339,700	1,530,800
Arkansas	Union		1		1	654,000	748,000
California	Contra Costa		1		1		
Kansas	Grant		2		2		
Oklahoma	Texas		1		1		
New Mexico	Lea	5		3		331,300	272,000
Total United States		23	27	16	26	5,291,500	5,425,100

CONSUMPTION AND USES

Sales of carbon black to rubber companies increased 26 percent in 1955; the consumption of rubber rose 24 percent. The ratio of synthetic to natural rubber consumption again swung toward synthetic, which accounted for 58 percent of the total virgin rubber consumed in 1955. In 1954 it was 52 percent of the total. Accompanying this swing was an increase in the average carbon-black loading of virgin rubber to 822 pounds per long ton of rubber from 807 pounds in 1954. Sales of carbon black to rubber companies also were more predominantly furnace black. These blacks composed 86 percent of the sales in 1955, compared with 83 percent in 1954.

Sales to paint companies showed an unusually large increase in 1955, advancing 78 percent over 1954.

TABLE 7.—Carbon-black producers of the United States, as of December 31, 1955

State and company	County or parish	Nearest town	Process
Arkansas: Columbian Carbon Co	Union	El Dorado	Furnace.
California: Shell Chemical Corp	Contra Costa	Pittsburgh	Do.
Kansas:			
Columbian Carbon Co	Grant	Hickok	Do.
United Carbon Co., Inc	do	Ryus	Do.
Louisiana:			
Cabot Carbon Co	Evangeline	Ville Platte	Do.
	St. Mary	Franklin	Do.
Columbian Carbon Co	Avoyelles	Eola	Do.
	Ouachita	Hancock	Do.
	St. Mary	Franklin	Do.
Continental Blacks, Inc	Calcasieu	West Lake	Do.
Thermatomic Carbon Co	Ouachita	Sterlington	Do.
United Carbon Co	Richland	Rayville	Contact.
	St. Mary	Franklin	Furnace.
New Mexico:			
Columbian Carbon Co	Lea	Eunice	Contact.
Continental Carbon Co	do	do	Do.
United Carbon Co., Inc	do	do	Do.
Oklahoma: Continental Blacks, Inc	Kay	Ponca City	Furnace.
Texas:			
Cabot Carbon Co	Carson	Skellytown	Contact.
	Gray	Pampa	Furnace.
	Howard	Big Spring	Do.
	Winkler	Kermit	Contact.
Coltexo Corp	Gray	Lefors	Do.
	do	do	Do.
Columbian Carbon Co	Brazoria	Sweeney	Do.
	Gaines	Seagraves	Do.
	Gray	Lefors	Do.
	Montgomery	Conroe	Furnace.
	Nueces	Corpus Christi	Contact.
	Terry	Seagraves	Furnace.
Continental Carbon Co	Moore	Sunray	Do.
J. M. Huber Corp	Harris	Baytown	Do.
	Hutchinson	Borger	Do.
	do	do	Contact.
Phillips Chemical Co	do	do	Furnace.
	do	do	Do.
	do	do	Do.
Sid Richardson Carbon Co	Ector	Odessa	Contact.
United Carbon Co	Aransas	Aransas Pass	Furnace.
	do	do	Do.
	do	do	Contact.
	Brooks	Falfurrias	Do.
	Wheeler	Shamrock	Furnace.

TABLE 8.—Sales of carbon black for domestic consumption in the United States, 1951–55, by uses, in thousand pounds

Use	1951	1952	1953	1954	1955	Change from 1954 (percent)
Rubber	1,061,229	1,074,545	1,133,594	1,023,626	1,286,861	25.7
Ink	45,496	44,116	45,801	48,797	55,313	13.4
Paint	11,366	10,628	8,464	7,681	13,661	77.8
Miscellaneous	11,554	24,985	13,012	15,152	17,942	18.4
Total	1,129,645	1,154,274	1,200,871	1,095,256	1,373,777	25.4

STOCKS

Stocks of contact black were again reduced sharply, declining 90 million pounds in 1955. In 1954 they dropped 49 million pounds. Furnace-black stocks increased 6 million.

TABLE 9.—Producers' stocks of contact- and furnace-type blacks in the United States, December 31, 1951–55, in thousand pounds

Year	Furnace							Contact	Total
	SRF[1]	HMF[1]	FEF[1]	HAF[1]	ISAF and SAF[1]	Other	Total		
1951	15,340	15,119	19,729	23,642	-------	6,105	79,935	123,299	203,234
1952	31,220	33,375	23,211	31,509	-------	4,464	123,779	235,571	359,350
1953	30,861	25,801	38,638	57,757	-------	20,875	173,932	236,352	410,284
1954	18,113	22,949	27,895	48,130	-------	[2]16,850	133,937	187,448	321,385
1955	19,680	17,554	25,065	53,582	14,108	[2]9,561	139,550	97,374	236,924

[1] For explanation, see table 4.
[2] Includes thermal grade.

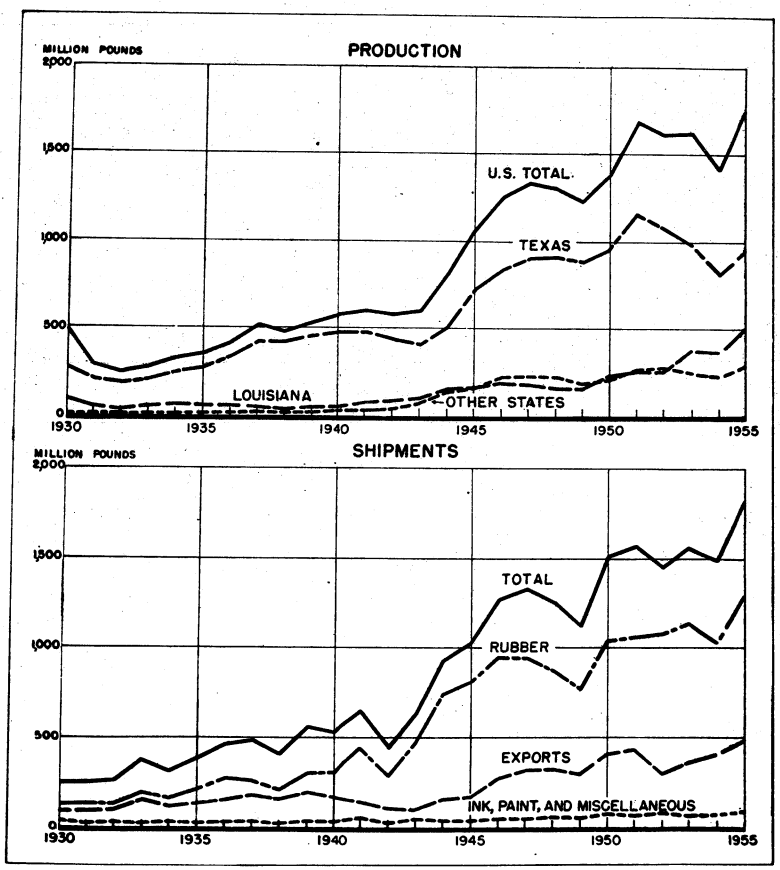

FIGURE 2.—Production and shipments of carbon black, 1930–55.

VALUE

There were no open-market price changes in carbon black during 1955. The average value of contact blacks rose sharply in Texas, from 7.15 cents per pound in 1954 to 8.41 cents in 1955. This was due partly to the rising value of natural gas consumed, which went from 6.75 cents per thousand cubic feet to 7.97 cents in Texas. The average value of furnace blacks increased more moderately from 6.18 to 6.36 cents per pound. The average value of the liquid-hydrocarbon feedstock for furnace plants again declined, as it has each year since its value was first reported in 1952.

TABLE 10.—Prices of carbon black in carlots, f. o. b. plant, 1951–55, in cents per pound

[Oil, Paint and Drug Reporter]

Date	Channel blacks		Furnace blacks			
	Ordinary rubber grades [1]		Semireinforcing grades (SRF)	High-Modulus grades (HMF)	Fast-Extrusion grades (FEF)	High-Abrasion grades (HAF)
	Bags	Bulk	Bags	Bags	Bags	Bags
Jan. 5, 1951	7.40	7.00	4.00	5.50	6.00	7.90
Jan. 1, 1952	7.40	7.00	4.00	5.50	6.00	7.90
Jan. 1, 1953	7.40	7.00	4.00	5.50	6.00	7.90
July 1, 1953	7.40	7.00	4.50	5.50	6.00	7.90
Jan. 1, 1954	7.40	7.00	4.50	5.50	6.00	7.90
Jan. 1, 1955	7.40	7.00	4.50	5.50	6.00	7.90

[1] Chiefly Easy-Processing (EPC) and Medium-Processing (MPC), but also includes Hard-Processing (HPC) and Conductive (CC) channel blacks.

FOREIGN TRADE [1]

Imports.—Imports of acetylene black from Canada increased from 7.7 million pounds in 1954 to 8.1 [2] million in 1955. The average value in 1955 was 16.4 cents per pound compared with 16.6 cents in 1954.

Small quantities of carbon black totaling 54,000 pounds were imported from Canada and West Germany.

[1] Figures on exports compiled by Mae B. Price and Elsie D. Page, of the Bureaus of Mines, from records of the U. S. Department of Commerce.

[2] Due to changes in tabulating procedures by the U. S. Department of Commerce, data are known to be not comparable to years before 1954.

TABLE 11.—Carbon black exported from the United States, 1953–55, by countries of destination

[U. S. Department of Commerce]

Country	1953		1954		1955	
	Thousand pounds	Thousand dollars	Thousand pounds	Thousand dollars	Thousand pounds	Thousand dollars
North America:						
Canada	57,465	$4,301	37,812	$2,825	45,939	$3,475
Cuba	862	72	1,268	111	1,316	108
Mexico	11,932	867	13,999	1,044	15,583	1,230
Other North America	19	2	76	8	85	8
Total	70,278	5,242	53,155	3,988	62,923	4,821
South America:						
Argentina	10,872	1,147	10,997	1,167	19,557	2,035
Brazil	15,987	1,507	31,411	2,869	25,320	2,265
Chile	1,670	136	2,985	248	3,555	291
Colombia	3,737	343	3,794	321	6,702	573
Ecuador	196	19	16	2	24	4
Peru	1,821	158	1,642	139	1,917	160
Uruguay	2,128	216	1,380	130	2,306	204
Venezuela	1,613	128	3,598	300	4,040	352
Other South America	5	1	20	3	70	7
Total	38,029	3,655	55,843	5,179	63,491	5,891
Europe:						
Austria	2,929	249	1,077	91	1,932	159
Belgium-Luxembourg	10,086	920	9,821	880	13,921	1,247
Denmark	748	68	888	94	822	87
Finland	748	71	853	75	1,192	111
France	66,360	5,949	73,606	6,680	83,581	7,510
Germany, West	1,570	201	9,987	1,071	13,411	1,368
Greece	313	28	402	36	379	33
Ireland	772	66	681	66	551	51
Italy	30,621	2,703	38,678	3,444	43,766	3,750
Netherlands	4,616	406	5,843	544	7,721	741
Norway	1,662	150	1,784	151	1,838	161
Portugal	1,065	86	2,009	163	1,479	119
Spain	5,008	474	5,570	511	8,054	696
Sweden	11,077	970	11,464	1,038	9,344	848
Switzerland	3,173	364	4,462	500	4,303	444
Trieste			230	16		
Turkey	1,397	107	500	41	520	55
United Kingdom	31,739	3,346	32,981	3,479	32,613	3,453
Yugoslavia	874	87	533	55	811	82
Other Europe	26	2				
Total	174,784	16,247	201,369	18,935	226,238	20,915
Asia:						
India	9,181	832	12,733	1,086	13,743	1,145
Indonesia	3,790	362	4,556	409	5,147	475
Israel and Palestine	1,610	132	[1] 2,815	[1] 229	[1] 2,979	[1] 245
Japan	17,846	1,723	13,322	1,290	20,042	1,947
Malaya	442	41	748	64	824	74
Pakistan	299	34	358	39	458	39
Philippines	292	25	302	17	300	29
Taiwan	74	8	140	13	106	10
Vietnam, Laos, and Cambodia [2]	181	17	50	5	22	3
Other Asia	213	27	678	73	961	89
Total	33,928	3,201	35,702	3,225	44,582	4,056
Africa:						
Union of South Africa	18,864	1,763	18,542	1,634	22,321	2,024
Other Africa	230	20	215	17	390	31
Total	19,094	1,783	18,757	1,651	22,711	2,055
Oceania:						
Australia	20,187	1,720	34,319	2,872	29,164	2,534
New Zealand	2,320	206	3,632	313	5,072	463
Total	22,507	1,926	37,951	3,185	34,236	2,997
Grand total	358,620	32,054	402,777	36,163	454,181	40,735

[1] Israel. [2] Formerly Indochina.

Exports.—Exports of carbon black increased 51 million pounds in 1955 and reached the record high of 454 million pounds. The previous high had been 433 million in 1951. Exports of contact blacks increased only slightly in 1955, the major rise taking place in the export of furnace blacks.

Increased shipments to most countries were the general rule in 1955. The major increases were in exports to France, Argentina, and Japan. The United Kingdom, now a producer itself, held steady at nearly 33 million pounds, mostly contact blacks.

TABLE 12.—Carbon black exported from the United States in 1955, by months, in thousand pounds

[U. S. Department of Commerce]

Month	Contact	Furnace	Total	Month	Contact	Furnace	Total
January	15,973	18,318	34,291	September	17,369	20,728	38,097
February	15,584	21,137	36,721	October	16,501	19,282	35,783
March	19,083	23,392	42,475	November	15,952	22,173	38,125
April	19,175	22,234	41,409	December	15,071	22,831	37,902
May	16,256	21,165	37,421				
June	15,973	20,805	36,778	Total:			
July	15,252	20,413	35,665	1955	201,718	252,463	454,181
August	19,529	19,985	39,514	1954	199,679	203,098	402,777

WORLD PRODUCTION

Carbon-black production in the United Kingdom reached 170 million pounds in 1955, 23 million more than during 1954. Production in Japan increased 1 million pounds to 17 million. Yugoslavia produced 3 million pounds in 1955. West Germany produced 123 million pounds.

Canada was producing at the rate of approximately 55 million pounds per year at the end of 1955.

Natural Gas

By Ivan F. Avery and Ann C. Mahoney

GENERAL SUMMARY

AS IN PREVIOUS YEARS, the domestic gas-utility and pipeline industry continued to set new records in almost all phases of operation. The increase of 663 billion cubic feet in marketed production of natural gas was the greatest since 1951 and the average price at the wellhead in 1955 reached a new high of 10.4 cents per thousand cubic feet. Sales advances were greatest in the residential and commercial categories, where increases of 12 and 8 percent, respectively, were attained. The average value of natural gas at the point of consumption in 1955 also established a new high of 40 cents per thousand cubic feet.

The American Gas Association stated that, at the end of 1955, the Nation's network of gas-company mains of all types exceeded 497 thousand miles, with over 28 thousand miles added during the year, representing the largest annual gain in history. Of this composite, over 145 thousand miles represented transmission pipelines; the Nation's distribution network now aggregates almost 306 thousand miles, plus 46 thousand miles of field and gathering lines.

TABLE 1.—Salient statistics of natural gas in the United States, 1951–55

	1951	1952	1953	1954	1955
Million cubic feet					
Supply:					
Marketed production [1]	7,457,359	8,013,457	8,396,916	8,742,546	9,405,351
Withdrawn from storage	209,428	221,909	246,802	330,177	437,251
Imports		7,807	9,225	6,847	10,888
Total supply	7,666,787	8,243,173	8,652,943	9,079,570	9,853,490
Disposition:					
Consumption	7,102,562	7,613,478	7,979,338	8,402,852	9,070,343
Exports	24,163	27,456	28,322	28,726	31,029
Stored	347,690	398,593	404,838	432,283	505,185
Lost in transmission	192,372	203,646	240,445	215,709	246,933
Total disposition	7,666,787	8,243,173	8,652,943	9,079,570	9,853,490
Value					
Production (at wells)...thousand dollars	542,964	623,649	774,966	882,501	978,357
Average per M cubic feet...cents	7.3	7.8	9.2	10.1	10.4

[1] Comprises gas sold or consumed by producers, including losses in transmission, amounts added to storage, and increases in gas in pipelines.

SCOPE OF REPORT

Data on natural-gas production, consumption, and value are collected by annual questionnaires sent to producers of oil and gas,

natural-gasoline-plant operators, gas-pipeline companies, and gas-utility companies. A separate report is filed by the respondent for each State in which he operates.

Volumes are reported at the pressure base selected by the reporting company; however, if the reported pressure base deviates more than 5 percent from 14.65 pounds per square inch absolute at 60° F., it is corrected to this base.

Reports are received covering approximately 75 percent of gross natural-gas production. The large number of respondents and the difficulty of contacting each small producer make direct compilation of total production impractical. The output of nonreporting producers in most instances is accounted for in the purchases of reporting companies. Marketed production for each State equals consumption in the State, plus gas placed in storage, plus shipments to other States, less gas withdrawn from storage, less receipts from other States.

GOVERNMENT REGULATIONS

The Federal Power Commission in 1954 authorized Pacific Northwest Pipeline Corp. to import 303 million cubic feet of natural gas daily from Canada. It will be used in Oregon, Washington, and Idaho to supplement supplies from the line the company is building into the region from San Juan Basin of New Mexico and Colorado. Pacific Northwest will receive the Canadian gas from Westcoast Transmission Co., Ltd., at a point near Sumas, Wash.

The largest project to receive FPC authorization in 1955 was El Paso Natural Gas Co.'s looping of present facilities and new connections with Pacific Northwest System at an estimated cost of $184,600,000.

RESERVES

At the end of 1955 proved recoverable domestic natural-gas reserves totaled 223.7 trillion cubic feet. The increase of 12.0 trillion cubic feet over the previous year represents the second greatest annual increase since the American Gas Association Committee on Natural-Gas Reserves began compiling consistent estimates in 1946. This gain was achieved despite record net production of 10.1 trillion cubic feet during 1955, up from 9.4 trillion in the previous year.

GROSS WITHDRAWAL

Gross production equals marketed production, plus the quantity used for repressuring, plus the partly estimated quantity vented and wasted. Quantity of gas vented and wasted is compiled from data given on the reporting forms, supplemented by estimates of waste derived from figures published by Natural Gas Reserves Committee of the American Gas Association and State conservation bodies.

TABLE 2.—Estimated proved recoverable reserves of natural gas in the United States, 1954–55, in million cubic feet [1]

[Committee on Natural-Gas Reserves, American Gas Association]

State	Reserves [2] as of Dec. 31, 1954	Changes in reserves during 1955			
		Extensions and revisions [2]	Discoveries of new fields and new pools in old fields [2]	Net change in underground storage [3]	Net production [4]
Arkansas	1,165,379	7,763	30,861	−1,755	37,881
California [5]	9,026,603	305,096	72,564	2,165	513,478
Colorado	1,932,913	317,290	72,666	0	69,307
Illinois	253,756	5,306	2,120	662	28,279
Indiana	36,049	264	0	1,280	4,482
Kansas	15,758,332	834,214	214,995	1,629	516,090
Kentucky	1,286,607	41,404	8,480	−1,221	73,000
Louisiana [5]	36,799,986	4,875,622	2,450,107	0	1,690,123
Michigan	330,100	8,464	5,000	−7,106	10,584
Mississippi	2,772,683	25,340	20,945	130	210,758
Montana	723,731	11,401	17,048	57	32,518
Nebraska	192,946	24,802	5,200	0	19,527
New Mexico	17,240,669	1,620,564	254,287	13,567	544,175
New York	69,362	−2,514	1,000	11,064	3,152
North Dakota	164,025	130,188	3,077	0	16,594
Ohio	774,741	46,601	7,952	15,661	35,081
Oklahoma	12,396,148	1,388,178	293,842	5,269	878,698
Pennsylvania	732,163	43,529	67,048	35,253	123,604
Texas [5]	105,129,062	6,164,388	1,974,608	1,511	4,982,021
Utah	387,375	1,912	49,870	0	18,261
West Virginia	1,607,290	91,634	39,725	9,989	183,739
Wyoming	2,855,071	351,472	112,546	−1,438	121,548
Other States [6]	75,741	5,207	15,128	920	5,218
Total	211,710,732	16,298,125	5,719,069	87,637	10,118,118

State	Reserves as of Dec. 31, 1955				
	Nonassociated [7]	Associated [8]	Dissolved [9]	Underground storage [10]	Total
Arkansas	522,670	332,906	303,643	5,148	1,164,367
California [5]	2,209,179	2,093,669	4,535,558	54,544	8,892,950
Colorado	1,471,797	85,687	696,078	0	2,253,562
Illinois	7,501	1,000	204,600	20,464	233,565
Indiana	2,402	2,100	21,865	6,744	33,111
Kansas	15,687,980	197,016	354,493	53,591	16,293,080
Kentucky	1,184,289	0	57,883	20,098	1,262,270
Louisiana [5]	33,721,943	5,845,406	2,868,243	0	42,435,592
Michigan	46,764	18,400	54,613	206,097	325,874
Mississippi	1,835,169	479,619	292,610	942	2,608,340
Montana	563,626	40,066	85,684	30,343	719,719
Nebraska	105,882	15,049	82,490	0	203,421
New Mexico	15,218,048	1,635,380	1,646,840	84,644	18,584,912
New York	34,354	0	345	41,061	75,760
North Dakota	6,689	0	274,007	0	280,696
Ohio	518,456	0	37,222	254,196	809,874
Oklahoma	6,513,510	2,909,723	3,694,555	86,951	13,204,739
Pennsylvania	427,175	0	34,029	293,185	754,389
Texas [5]	67,744,032	24,815,726	15,712,978	14,812	108,287,548
Utah	418,599	1,636	661	0	420,896
West Virginia	1,332,676	0	56,116	176,107	1,564,899
Wyoming	2,416,351	197,816	563,518	18,418	3,196,103
Other States [6]	66,071	0	24,787	920	91,778
Total	152,055,163	38,671,199	31,602,818	1,368,265	223,697,445

[1] Volumes are reported at a pressure base of 14.65 pounds per square inch absolute and at a standard temperature of 60° F.

[2] Excludes gas loss from recovery of natural-gas liquids.

[3] Net difference between gas stored in and gas withdrawn from underground storage reservoirs, including adjustments.

[4] Net production equals gross withdrawals less gas injected into underground reservoirs; changes in underground storage and gas loss from recovery of natural-gas liquids are excluded. December production partly estimated.

[5] Includes offshore reserves.

[6] Includes Alabama, Florida, Iowa, Maryland, Missouri, Nevada, and Virginia.

[7] Nonassociated gas is free gas not in contact with crude oil in the reservoir.

[8] Associated gas is free gas in contract with crude oil in the reservoir.

[9] Dissolved gas is gas in solution with crude oil in the reservoir.

[10] Net gas placed in underground reservoirs for storage purposes only.

TABLE 3.—Gross withdrawals and disposition of natural gas in the United States, 1954–55, by States, in million cubic feet

State	Gross withdrawals [1]			Disposition		
	From gas wells	From oil wells	Total	Marketed production [2]	Repressuring	Vented and wasted [3]
1954						
Arkansas	36,000	20,000	56,000	33,471	18,568	3,961
California	190,000	569,000	759,000	507,289	242,422	9,289
Colorado	26,000	50,000	76,000	45,705	19,335	10,960
Illinois	300	36,000	36,300	9,475	443	26,382
Indiana	100	6,000	6,100	735	50	5,315
Kansas	390,000	72,000	462,000	412,369	2,203	47,428
Kentucky	71,000	3,700	74,700	72,713		1,987
Louisiana	1,325,000	375,000	1,700,000	1,399,222	215,491	85,287
Maryland	1,394		1,394	1,394		
Michigan	4,500	5,600	10,100	6,962	1,876	1,262
Mississippi	167,000	70,000	237,000	140,448	58,645	37,907
Montana	27,000	3,700	30,700	30,252	178	270
Nebraska	5,500	3,500	9,000	6,801		2,199
New Mexico	277,000	216,000	493,000	449,346	4,043	39,611
New York	2,500	500	3,000	2,598		402
North Dakota	400	8,000	8,400	1,093		7,307
Ohio	29,000	2,000	31,000	28,824	57	2,119
Oklahoma	503,000	410,000	913,000	616,355	106,119	190,526
Pennsylvania	144,400	2,300	146,700	145,934	214	552
Texas	4,020,000	1,600,000	5,620,000	4,551,232	840,070	228,698
Utah	16,000	400	16,400	16,024		376
Virginia	1,401		1,401	1,401		
West Virginia	189,000	4,000	193,000	191,601	137	1,262
Wyoming	39,400	61,000	100,400	71,068	8,886	20,446
Other States [4]	112	143	255	234		21
Total	7,466,007	3,518,843	10,984,850	8,742,546	1,518,737	723,567
1955						
Arkansas	19,000	36,000	55,000	32,123	16,649	6,228
California	215,000	587,000	802,000	538,178	255,496	8,326
Colorado	27,000	70,000	97,000	49,152	28,137	19,711
Illinois	400	40,000	40,400	8,033	637	31,730
Indiana	100	4,400	4,500	1,226	37	3,237
Kansas	461.000	64,000	525,000	471,041	2,174	51,785
Kentucky	73,000	3,000	76,000	73.214	79	2,707
Louisiana	1,523,000	425,000	1,948,000	1,680,032	201,764	66,204
Maryland	3,116		3,116	3,116		
Michigan	6,300	5,800	12,100	8,300	2,170	1,630
Mississippi	193,000	73,000	266,000	163,167	62,598	40,235
Montana	25,000	4,000	29,000	28,255	127	618
Nebraska	12,000	6,000	18,000	12,515	355	5,130
New Mexico	328,000	237,000	565,000	540,664	2,773	21,563
New York	3,500	500	4,000	3,637		363
North Dakota	500	15,000	15,500	5,256		10,244
Ohio	32,000	3,000	35,000	33,756	55	1,189
Oklahoma	460,000	495,000	955,000	614,976	125,945	214,079
Pennsylvania	97,600	2,200	99,800	99,172	147	481
Texas	4,100,000	1,736,000	5,836,000	4,730,798	834,677	270,525
Utah	17,300	600	17,900	17,163		737
Virginia	968		968	968		
West Virginia	209,000	5,000	214,000	212,403	116	1,481
Wyoming	35,000	65,000	100,000	77,819	6,868	15,313
Other States [5]	174	336	510	387		123
Total	7,841,958	3,877,836	11,719,794	9,405,351	1,540,804	773,639

[1] Marketed production plus quantities used in repressuring, vented, and wasted.
[2] Gas sold or consumed by producers (see table 1, footnote 1).
[3] Partly estimated. Includes direct waste on producing properties and residue blown to air.
[4] Alabama, Florida, Missouri, South Dakota, and Tennessee.
[5] Alabama, Arizona, Florida, Missouri, and Tennessee.

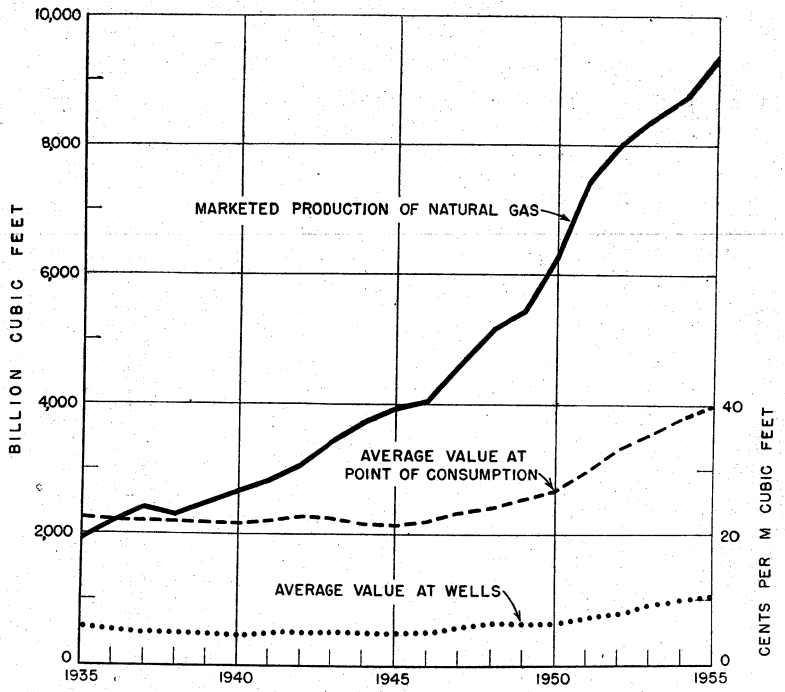

FIGURE 1.—Production and average value of natural gas in the United States, 1935–55.

[Source: Bureau of Mines Information Circular 7644 for 1936–50. Mineral Yearbooks for 1935, 51–55.]

TABLE 4.—Natural gas stored underground in and withdrawn from storage fields, 1954–55, by State of location, in million cubic feet

State	1954			1955		
	Total stored	Total withdrawn	Net stored	Total stored	Total withdrawn	Net stored
Arkansas						
California	19,708	15,334	4,374	18,499	17,242	1,257
Colorado						
Illinois	8,511	1,574	6,937	12,682	1,978	10,704
Indiana	2,487	1,534	953	3,377	1,798	1,579
Iowa	27	6	21	41	238	−197
Kansas	28,697	19,929	8,768	24,289	20,954	3,335
Kentucky	7,543	6,555	988	7,244	7,246	−2
Louisiana	66	81	−15	232	24	208
Maryland						
Michigan	61,430	58,421	3,009	69,189	76,281	−7,092
Mississippi	303	158	145	131	214	−83
Missouri				602		602
Montana	2,804	1,676	1,128	2,766	2,701	65
Nebraska				504	96	408
New Mexico	6,287	5,659	628	6,789	7,264	−475
New York	10,164	9,711	453	18,592	12,417	6,175
North Dakota						
Ohio	63,912	49,469	14,443	77,797	64,796	13,001
Oklahoma	20,636	13,203	7,433	19,141	14,456	4,685
Pennsylvania	105,966	67,310	38,656	138,256	108,068	30,188
Texas	9,322	8,047	1,275	14,030	18,184	−4,154
Virginia						
West Virginia	79,933	69,784	10,149	88,695	79,412	9,283
Wisconsin	140		140	129		129
Wyoming	4,347	1,726	2,621	2,200	3,882	−1,682
Total	432,283	330,177	102,106	505,185	437,251	67,934

TABLE 5.—Marketed production of natural gas in the United States, 1951–55, by States [1]

State	Quantity (million cubic feet)					Change from 1954 (percent)	Estimated value at wells (thousand dollars)	
	1951	1952	1953	1954	1955		1954	1955
Alabama	1	4	41	87	282	224.1	5	20
Arizona					15			1
Arkansas	44,656	42,325	41,510	33,471	32,123	−4.0	1,841	1,799
California	566,751	517,450	531,346	507,289	538,178	6.1	104,502	119,476
Colorado	14,128	34,260	28,509	45,705	49,152	7.5	3,976	4,866
Florida	10	15	34	35	36	2.9	3	4
Illinois	11,425	10,183	9,282	9,475	8,033	−15.2	1,345	1,036
Indiana	845	836	701	735	1,226	66.8	44	152
Kansas	417,538	412,544	420,607	412,369	471,041	14.2	43,711	52,286
Kentucky	76,097	73,427	71,405	72,713	73,214	0.7	16,579	17,352
Louisiana	1,054,199	1,237,143	1,293,644	1,399,222	1,680,032	20.1	124,531	189,844
Maryland	3,422	2,372	1,408	1,394	3,116	123.5	282	626
Michigan	11,194	9,052	7,774	6,962	8,300	19.2	1,239	955
Mississippi	158,845	174,100	154,254	140,448	163,167	16.2	11,657	15,664
Missouri	14	16	15	16	15	6.3	3	3
Montana	36,424	28,714	27,889	30,252	28,255	−6.6	2,057	1,724
Nebraska	3,895	5,568	6,748	6,801	12,515	84.0	796	2,553
New Mexico	300,169	359,377	399,086	449,346	540,664	20.3	35,049	48,119
New York	3,214	3,627	2,347	2,598	3,637	39.9	847	1,073
North Dakota	456	369	498	1,093	5,256	380.9	69	405
Ohio	38,879	30,993	37,542	28,824	33,756	17.1	6,111	7,595
Oklahoma	538,756	554,033	599,955	616,355	614,976	−0.2	43,145	45,508
Pennsylvania	128,715	108,684	105,558	145,934	99,172	−31.9	43,634	29,652
South Dakota	7	6	5	7			(2)	
Tennessee	132	107	89	89	39	−56.2	10	5
Texas	3,781,136	4,147,805	4,383,158	4,551,232	4,730,798	3.9	386,855	378,464
Utah	3,733	3,006	7,075	16,024	17,163	7.1	2,259	2,386
Virginia	64	1,133	3,697	1,401	968	−30.9	380	259
West Virginia	191,146	180,995	186,477	191,601	212,403	10.9	45,601	49,915
Wyoming	71,508	75,313	76,262	71,068	77,819	9.5	5,970	6,615
Total	7,457,359	8,013,457	8,396,916	8,742,546	9,405,351	7.6	882,501	978,357

[1] Comprises gas either sold or consumed by producers, including losses in transmission, amounts added to storage, and increases of gas in pipelines.
[2] Less than $500.

TABLE 6.—Gas wells in the United States, 1954–55, by States

State	Drilled during 1954 [1]	Producing Dec. 31, 1954	Drilled during 1955 [1]	Producing Dec. 31, 1955
Arkansas	10	240	10	240
California	47	460	64	470
Colorado	72	75	84	100
Illinois	4	25	16	30
Indiana	12	425	22	400
Kansas	381	4,800	362	5,100
Kentucky	214	4,000	162	4,100
Louisiana	288	3,500	282	3,600
Michigan	10	250	19	260
Mississippi	8	235	1	230
Missouri [2] / Nebraska [2]	20	37	4	32
Montana	17	1,050	16	1,060
New Mexico	392	1,800	564	2,200
New York	2	1,250	2	1,180
Ohio	251	6,100	246	6,200
Oklahoma	383	4,000	359	4,200
Pennsylvania	483	16,500	214	16,300
Tennessee		28	1	28
Texas	912	11,200	603	11,400
West Virginia	427	13,900	460	14,000
Wyoming	29	200	46	220
Alabama, Maryland, North Dakota, South Dakota, Utah and Virginia	15	117	36	125
Total	3,977	70,192	3,573	71,475

[1] From Oil and Gas Journal.
[2] Combined to avoid disclosing individual company operations.

DEVELOPMENT AND PRODUCTION BY STATES

Colorado.—The Pacific Northwest pipeline, which begins in the San Juan Basin of northwest New Mexico and extends northwest to Seattle, Wash., was about complete in Colorado and Utah at the end of 1955. This line will provide an additional outlet for gas from northwestern New Mexico, southwest Colorado, eastern Utah, as well as from previously unconnected fields, such as Rangely and Piceance Creek in western Colorado and Big Piney and Tiptop in southwestern Wyoming.

The Kansas-Nebraska Natural Gas Co. and/or Colorado Interstate Gas Co. completed a gasline from gas plants in the Little Beaver and Adena fields and additional new lines to several more fields in the Julesburg Basin.

Kansas.—The State Geological Survey of Kansas reported that 31 new gasfields (25 gas and 6 oil and gas) were discovered in Kansas during 1955. Fourteen of the new fields produced gas from the Mississippian rocks, 5 from the Morrowan strata, and 4 from the Pennsylvanian basal conglomerate. The Hugoton Gas area of southwestern Kansas supplied about 85 percent of the total gas produced in Kansas.

North Dakota.—Wilson M. Laird, State geologist, North Dakota Geological Survey, reported completion of pipelines from the Tioga natural-gasoline plant east to Minot and west to Williston and into storage in eastern Montana. By the end of the year flaring had virtually ceased as a result of providing this market for gas from the North Dakota oil fields.

Pennsylvania.—There was a major change in legislation that affected the gas industry—passage of the "Gas Operations, Well Drilling, Petroleum and Coal Mining Act of 1955." The act relates to coal mining and the drilling and plugging of wells, regulates the underground storage of gas under workable coal seams, prescribes the duties of coal operators in relation to wells and underground storage, grants a limited right of eminent domain in connection with underground storage, and creates an Oil and Gas Division of the Department of the Interior of the State.

Wyoming.—The waste of sour (hydrogen sulfide) gas in the Big Horn Basin has been greatly reduced by sulfur-extraction plants serving eight fields. About 125,000 long tons of sulfur was produced during the past year. The sweet marketable gas recovered was for delivery to the Montana-Dakota Utilities Co.

INTERSTATE SHIPMENTS AND EXPORTS

Interstate shipments, including exports, increased 10 percent in 1955. The shipments composed 54 percent of marketed production in 1955 compared with 53 percent in 1954.

Imports were received in Montana from Canada. Exports to Mexico decreased 13 percent in 1955, and exports to Canada increased 87 percent as the relatively even balance between exports to and receipts from Canada was maintained.

TABLE 7.—Marketed production, interstate shipments, and total consumption of natural gas in 1955 in the United States, in million cubic feet

Census regions	Marketed production		Interstate movements		Transmission loss and unaccounted for	Change in storage	Consumption
	Quantity	Average value at wellhead	Quantity shipped	Quantity received			
New England:							
Connecticut				15,035	848		14,187
Maine							
Massachusetts				45,741	1,809		43,932
New Hampshire				1,277	71		1,206
Rhode Island				5,661	286		5,375
Vermont							
Total				67,714	3,014		64,700
Middle Atlantic:							
New Jersey				81,397	6,796		74,601
New York	3,637	29.5	1,000	260,829	13,778	6,175	243,513
Pennsylvania	99,172	29.9	68,133	404,793	15,364	30,188	390,280
Total	102,809	29.9	69,133	747,019	35,938	36,363	708,394
East North Central:							
Illinois	8,033	14.2		413,885	12,496	10,704	398,718
Indiana	1,226	12.4	1,173	138,050	9,627	1,579	126,897
Michigan	8,300	11.5		199,399	7,786	−7,092	207,005
Ohio	33,756	22.5		499,439	19,329	13,001	500,865
Wisconsin				44,449	3,699	129	40,621
Total	51,315	19.0	1,173	1,295,222	52,937	18,321	1,274,106
West North Central:							
Iowa				141,960	3,496	−197	138,661
Kansas	471,041	11.1	382,881	239,887	15,684	3,335	309,028
Minnesota				125,900	2,166		123,734
Missouri	15	20.0		208,344	8,485	602	199,272
Nebraska	12,515	20.4		93,358	3,288	408	102,177
North Dakota	5,256	7.7	43	4,500	393		9,320
South Dakota				16,459	352		16,107
Total	488,827	12.0	382,924	830,408	33,864	4,148	898,299
South Atlantic:							
Delaware				4,540	260		4,280
District of Columbia				15,856	814		15,042
Florida	36	10.0		27,000	634		26,402
Georgia				135,895	2,851		133,044
Maryland	3,116	20.1	1,394	40,270	2,103		39,889
North Carolina				13,876	1,232		12,644
South Carolina				23,934	891		23,043
Virginia	968	26.8	921	41,294	2,457		38,884
West Virginia	212,403	23.5	161,981	123,424	6,557	9,283	158,006
Total	216,523	23.8	164,296	426,089	17,799	9,283	451,234
East South Central:							
Alabama	282	6.8		153,172	2,129		151,325
Kentucky	73,214	23.7	53,708	102,071	4,083	−2	117,496
Mississippi	163,167	9.6	130,671	106,692	1,085	−83	138,186
Tennessee	39	12.8		121,077	3,064		118,052
Total	236,702	14.0	184,379	483,012	10,361	−85	525,059
West South Central:							
Arkansas	32,123	5.6	803	176,378	10,324		197,374
Louisiana	1,680,032	11.3	1,001,289	102,469	6,684	208	774,320
Oklahoma	614,976	7.4	285,436	20,709	11,507	4,685	334,057
Texas	4,730,798	8.0	2,564,598	103,934	37,748	−4,154	2,236,540
Total	7,057,929	8.7	3,852,126	403,490	66,263	739	3,542,291
Mountain:							
Arizona	15			90,625	1,657		88,983
Colorado	49,152	9.4	29,276	121,906	−1,236		143,018
Idaho							
Montana	28,255	6.7	4,426	22,498	−1,229	65	47,491
Nevada				2,514	30		2,484
New Mexico	540,664	8.6	374,626	51,287	2,519	−475	215,281
Utah	17,163	13.9		31,447	−293		48,903
Wyoming	77,819	8.5	41,687	3,517	1,626	−1,682	39,705
Total	713,068	8.9	450,015	323,794	3,074	−2,092	585,865
Pacific:							
California	538,178	22.2		507,157	23,683	1,257	1,020,395
Oregon							
Washington							
Total	538,178	22.2		507,157	23,683	1,257	1,020,395
Total United States	9,405,351	10.4	5,104,046	5,083,905	246,933	67,934	9,070,343

TABLE 8.—Regional production and consumption of natural gas moving interstate with imports and exports, in 1955, in million cubic feet

Consuming region and country or State	Quantity received	Producing region							
		Middle Atlantic	East North Central	West North Central	South Atlantic	East South Central	West South Central	Mountain	Foreign
New England:									
Connecticut	15,035	626	10	15		603	13,781		
Massachusetts	45,741	1,876	33	41		1,739	42,052		
New Hampshire	1,277	38					1,239		
Rhode Island	5,661	253	5	8		288	5,107		
Total	67,714	2,793	48	64		2,630	62,179		
Middle Atlantic:									
New Jersey	81,397	2,067	58	64	30	2,987	76,191		
New York	260,829	48,781	38	83	5,519	4,166	202,242		
Pennsylvania	404,793	2,933	308	351	54,599	20,967	325,635		
Total	747,019	53,781	404	498	60,148	28,120	604,068		
East North Central:									
Illinois	413,885		222	30,849		27	382,787		
Indiana	138,050			23,596		125	114,329		
Michigan	199,399			48,019			151,380		
Ohio	499,439	11,867	497	22,573	75,503	33,088	355,911		
Wisconsin	44,449			74			44,375		
Total	1,295,222	11,867	719	125,111	75,503	33,240	1,048,782		
West North Central:									
Iowa	141,960			47,127			88,599	6,234	
Kansas	239,887			190			231,774	7,923	
Minnesota	125,900			56,441			61,729	7,730	
Missouri	208,344			57,331			151,013		
Nebraska	93,358			45,214			36,189	11,955	
North Dakota	4,500			5				4,495	
South Dakota	16,459			4,456			4,863	7,140	
Total	830,408			210,764			574,167	45,477	
South Atlantic:									
Delaware	4,540					15	4,525		
District of Columbia	15,856	90			5,175	1,605	8,986		
Florida	27,000					6,140	20,860		
Georgia	135,895					43,101	92,794		
Maryland	40,270	336			11,552	4,123	24,259		
North Carolina	13,876					42	13,834		
South Carolina	23,934					5,192	18,742		
Virginia	41,294	40			11,507	4,056	25,691		
West Virginia	123,424	5	2	8	396	13,353	109,660		
Total	426,089	471	2	8	28,630	77,627	319,351		
East South Central:									
Alabama	153,172					41,791	111,381		
Kentucky	102,071					408	101,663		
Mississippi	106,692						106,692		
Tennessee	121,077				15	273	120,789		
Total	483,012				15	42,472	440,525		
West South Central:									
Arkansas	176,378						176,378		
Louisiana	102,469					273	102,196		
Oklahoma	20,709			1,723			18,801	185	
Texas	103,934						88,949	14,978	7
Total	403,490			1,723		273	386,324	15,163	7
Mountain:									
Arizona	90,625						50,873	39,752	
Colorado	121,906			41,751			79,118	1,037	
Montana	22,498			28				11,589	10,881
Nevada	2,514							2,514	
New Mexico	51,287						39,633	11,654	
Utah	31,447							31,447	
Wyoming	3,517			983			1,937	597	
Total	323,794			42,762			171,561	98,590	10,881
Pacific: California	507,157						217,936	289,221	
Total, United States	5,083,905	68,912	1,173	380,930	164,296	184,362	3,824,893	448,451	10,888
Canada	11,467	221		1,994		17	9,204	31	
Mexico	19,562						18,029	1,533	
Total	5,114,934	69,133	1,173	382,924	164,296	184,379	3,852,126	450,015	10,888

PIPELINES

Certificates of public convenience and necessity for natural-gas facilities issued by the Federal Power Commission in 1955 include 5,706 miles of transmission and gathering lines that will require 1,366,924 estimated net tons of line pipe, together with 318,074 installed compressor horsepower. The total cost of all the facilities is estimated at $668 million.

The American Standards Association completed the work on the piping code applicable to gas transmission and distribution systems. This is known as the American Standard Gas-Transmission and Distribution Piping System (ASC B31.1.8–1955), Section 8 of American Standards Code for Pressure Piping (ASA B31.1–1955).

CONSUMPTION

Processed for Natural-Gas Liquids.—The volume of natural gas processed for the extraction of natural-gas liquids again increased to a new high in 1955, 10 percent above 1954. Construction of new plants has increased the natural-gasoline and cycling-plant productive capacity 7.5 million gallons per day in the last 2-year period.

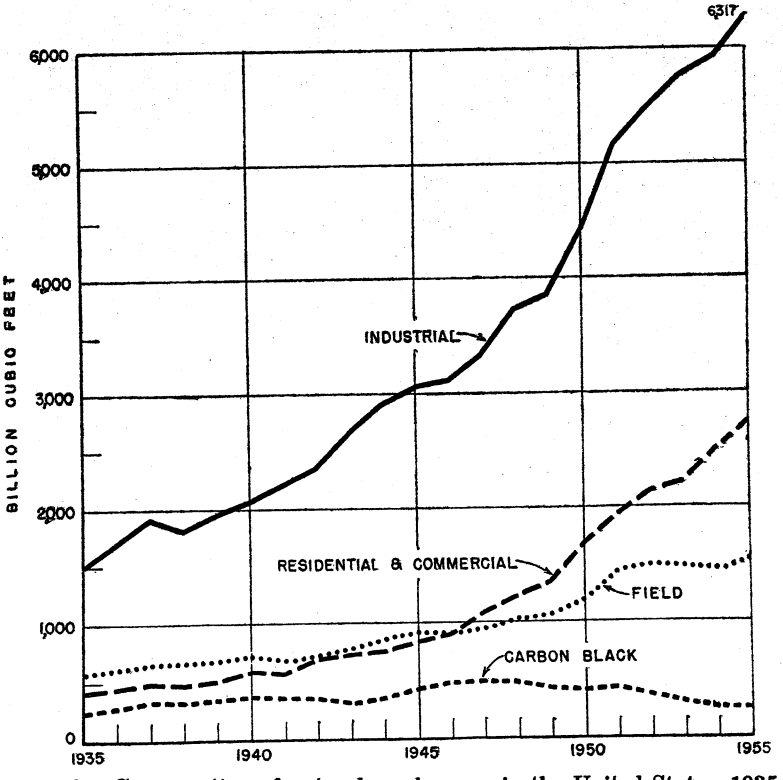

FIGURE 2.—Consumption of natural gas by uses in the United States, 1935–55

[Source: Bureau of Mines Information Circular 7644 for 1936–50. Minerals Yearbooks for 1935, 51–55.]

Portland Cement.—The portland-cement industry consumed 131.4 billion cubic feet of natural gas in 1955, compared with 125.3 billion in 1954, reflecting the increased production of cement to meet the needs of the building program.

TABLE 9.—Consumption of natural gas in the United States, 1951–55, by States [1]

State	Quantity (million cubic feet)					Change from 1954 (percent)	Estimated value at points of consumption (thousand dollars)	
	1951	1952	1953	1954	1955		1954	1955
Alabama	111,030	125,874	136,825	139,551	151,325	8.4	48,884	56,226
Arizona	62,046	63,111	71,210	75,568	88,983	17.8	27,471	33,623
Arkansas	155,524	165,603	176,489	192,378	197,374	2.6	36,943	42,621
California	787,848	792,520	862,243	933,934	1,020,395	9.3	377,162	445,181
Colorado	102,769	101,835	115,922	126,048	143,018	13.5	42,103	54,657
Connecticut		1,039	5,833	11,415	14,187	24.3	25,756	23,241
Delaware	1,679	2,276	1,972	2,980	4,280	43.6	3,937	4,899
District of Columbia	11,904	12,782	13,134	14,261	15,042	5.5	18,749	20,687
Florida	13,044	16,001	19,577	23,159	26,402	14.0	4,816	7,067
Georgia	94,596	108,329	122,742	132,069	133,044	1.0	48,322	53,841
Illinois	250,812	344,705	350,980	391,408	398,718	1.9	213,394	226,874
Indiana	69,177	96,124	103,444	116,308	126,897	9.1	76,135	86,499
Iowa	79,640	94,951	106,755	119,876	138,661	42.3	52,413	65,132
Kansas	278,892	279,632	283,604	293,784	309,028	5.2	73,608	100,035
Kentucky	74,386	87,006	104,781	110,039	117,496	6.8	45,025	51,446
Louisiana	549,305	599,312	594,656	636,704	774,320	21.6	98,366	124,392
Maryland	22,286	26,468	29,470	35,010	39,889	13.9	43,353	49,463
Massachusetts	1,783	11,386	17,683	35,486	43,932	23.8	64,218	76,444
Michigan	154,283	163,991	178,307	188,922	207,005	10.0	155,564	166,341
Minnesota	84,205	97,591	104,508	115,140	123,734	7.5	59,356	67,353
Mississippi	97,786	119,638	118,617	136,797	138,186	1.0	32,927	35,820
Missouri	156,922	168,992	173,674	188,349	199,272	5.8	87,821	99,102
Montana	37,481	40,771	39,934	40,624	47,491	16.9	15,135	17,452
Nebraska	72,386	78,544	83,384	93,189	102,177	9.6	39,953	47,547
Nevada				982	2,484	152.9	676	1,220
New Hampshire	3	316	857	1,065	1,206	13.2	2,230	1,976
New Jersey	30,887	40,409	58,685	65,718	74,601	13.5	93,522	109,341
New Mexico	174,808	194,748	200,039	177,221	215,281	21.5	25,853	33,142
New York	144,920	180,747	197,878	225,844	243,513	7.8	287,134	241,628
North Carolina	1,631	2,945	6,172	9,436	12,644	34.0	7,000	9,675
North Dakota	3,408	3,342	3,559	4,820	9,320	93.4	2,392	3,147
Ohio	375,820	393,250	420,809	442,523	500,865	13.2	265,830	300,938
Oklahoma	307,887	319,908	333,972	327,936	334,057	1.9	64,434	72,733
Pennsylvania	311,937	324,187	335,457	353,185	390,280	10.5	239,188	286,823
Rhode Island			670	4,423	5,375	21.5	12,272	13,125
South Carolina	853	2,896	8,772	16,573	23,043	38.0	10,632	12,301
South Dakota	11,447	11,701	13,688	15,564	16,107	3.5	7,424	8,319
Tennessee	88,078	99,817	106,130	114,869	118,052	2.8	46,539	51,044
Texas	2,130,377	2,175,100	2,194,172	2,198,175	2,236,540	1.7	296,345	350,247
Utah	29,014	30,929	34,592	41,073	48,903	19.1	16,236	19,676
Virginia	14,853	18,630	27,716	35,604	38,884	9.2	33,701	38,563
West Virginia	139,608	146,153	148,017	138,846	158,006	13.8	49,829	61,070
Wisconsin	28,382	33,632	36,339	39,287	40,621	26.3	43,972	45,450
Wyoming	38,865	36,287	36,070	36,709	39,705	8.2	8,735	9,685
Total	7,102,562	7,613,478	7,979,338	8,402,852	9,070,343	7.9	3,205,355	3,626,046

[1] Includes natural gas mixed with manufactured gas.

TABLE 10.—Residential and commercial consumption of natural gas in the United States in 1955 by States [1]

State	Residential				Commercial				Total			
	Number of consumers (thousand)	Quantity (million cubic feet)	Value at point of consumption		Number of consumers (thousand)	Quantity (million cubic feet)	Value at point of consumption		Number of consumers (thousand)	Quantity (million cubic feet)	Value at point of consumption	
			Total (thousand dollars)	Average (cents per M cubic feet)			Total (thousand dollars)	Average (cents per thousand feet)			(thousand dollars)	Average (cents per M cubic feet)
Alabama	324	27,040	24,479	90.5	29	9,300	5,039	54.2	353	36,340	29,518	81.2
Arizona and Nevada	204	12,491	11,633	93.1	23	7,578	3,883	51.2	227	20,069	15,516	77.3
Arkansas	226	21,568	12,436	57.7	33	10,950	4,607	42.1	259	32,518	17,043	52.4
California	3,487	283,691	222,755	78.5	278	91,029	51,066	56.1	3,765	374,720	273,821	73.1
Colorado	270	32,415	24,742	76.3	36	17,149	10,788	62.9	306	49,564	35,530	71.7
Connecticut	338	8,287	16,319	196.9	19	1,814	3,245	178.9	357	10,101	19,564	193.7
Delaware, District of Columbia and Maryland	663	39,611	56,746	143.3	50	7,912	10,473	132.4	713	47,523	67,219	141.4
Florida	25	1,863	1,583	84.9	243	353	264	74.8	268	2,216	1,847	83.3
Georgia	321	32,240	24,917	77.3	30	12,281	6,058	49.3	351	44,521	30,975	69.6
Illinois	1,888	130,774	131,209	100.3	83	24,151	19,007	78.7	1,971	154,925	150,216	96.9
Indiana	638	43,602	43,117	98.9	47	10,887	9,457	86.9	685	54,489	52,574	96.5
Iowa	318	38,830	32,162	82.8	34	15,572	9,180	58.9	352	54,402	41,342	75.9
Kansas	421	54,613	31,536	57.7	71	34,121	12,885	37.7	492	88,734	44,421	50.1
Kentucky	324	40,719	26,885	66.0	32	12,558	6,999	55.7	356	53,277	33,884	63.6
Louisiana	518	37,862	23,835	62.9	45	15,660	5,476	34.9	563	53,522	29,311	54.8
Massachusetts	914	24,376	56,006	229.7	53	5,055	10,540	208.5	967	29,431	66,546	226.1
Michigan	1,254	128,169	119,376	93.1	71	16,522	14,292	86.5	1,325	144,691	133,668	92.4
Minnesota	346	47,438	41,772	88.1	24	9,912	5,218	52.6	370	57,350	46,990	81.9
Mississippi	200	17,883	12,441	69.6	28	9,380	4,093	43.6	228	27,263	16,534	60.6
Missouri	691	85,677	64,652	75.5	34	10,960	7,557	68.9	725	96,637	72,209	74.7
Montana	85	15,419	8,991	58.3	10	9,479	3,896	41.1	95	24,898	12,887	51.8
Nebraska	223	30,570	23,947	78.3	29	16,073	8,652	53.8	252	46,643	32,599	69.8
New Hampshire	25	882	1,520	172.3	1	262	360	137.4	26	1,144	1,880	164.3
New Jersey	1,268	41,563	83,654	201.3	86	6,104	9,680	158.6	1,354	47,667	93,334	195.8
New Mexico	121	12,604	8,506	67.5	14	5,751	2,747	47.8	135	18,355	11,253	61.3
New York	3,426	154,930	172,575	111.4	302	32,802	35,464	108.1	3,728	187,732	208,039	110.8
North Carolina	47	2,605	4,587	176.1	7	1,258	1,907	151.6	54	3,863	6,494	168.1
North Dakota and South Dakota	51	7,206	5,730	79.5	6	5,280	2,826	53.5	57	12,486	8,556	68.5
Ohio	1,803	267,749	179,965	67.2	147	66,273	42,352	63.9	1,950	334,022	222,317	66.5
Oklahoma	496	49,548	30,105	60.8	56	23,535	8,989	38.2	552	73,083	39,094	53.4
Pennsylvania	1,824	171,067	170,028	99.4	123	34,997	19,959	57.0	1,947	206,064	189,987	92.1
Rhode Island	156	3,637	9,695	266.6	5	1,001	2,147	214.4	161	4,638	11,842	255.3

South Carolina	47	1,797	3,616	201.2	6	862	1,469	170.4	53	2,659	5,085	191.2
Tennessee	245	23,187	20,200	87.1	33	15,757	9,010	57.2	278	38,944	29,210	75.0
Texas	1,745	124,379	88,838	71.4	196	53,245	22,677	42.6	1,941	177,624	111,515	62.7
Utah	109	13,497	8,494	62.9	14	6,000	3,100	51.7	123	19,497	11,594	59.4
Virginia	281	15,874	24,423	153.8	21	5,871	6,098	103.9	302	21,745	30,521	140.3
West Virginia	303	43,403	23,681	54.6	30	12,478	6,165	49.4	333	55,881	29,846	53.4
Wisconsin	409	25,003	32,851	131.3	25	4,723	5,416	114.7	434	29,726	38,267	128.7
Wyoming	50	9,883	4,939	49.9	7	4,324	1,749	40.4	57	14,207	6,688	47.1
Total: 1955	26,084	2,123,952	1,884,946	88.7	2,381	629,219	394,790	62.7	28,465	2,753,171	2,279,736	82.8
1954	25,327	1,894,248	1,692,447	89.3	2,076	584,957	378,242	64.7	27,403	2,479,205	2,070,689	83.5

[1] Includes natural gas mixed with manufactured gas.

TABLE 11.—Industrial consumption of natural gas in the United States in 1955, by States and uses

(Volume in million cubic feet, value in thousand dollars, and average value in cents per thousand cubic feet)

	Field, pumping, drilling			Carbon black			Fuel volume						Total industrial			Fuel used at electric utility plants[1]
	Volume	Value	Average value	Volume	Value at point of consumption		Refinery fuel	Natural gas pipeline	Other industrial	Total fuel	Value at point of consumption		Volume	Value at point of consumption		
					Value	Average value					Value	Average value		Value	Average value	
Alabama	42	5	11.9					6,326	108,617	114,943	26,703	23.2	114,985	26,708	23.2	17,414
Arizona and Nevada	28	3	10.7					8,542	62,828	71,370	19,324	27.1	71,398	19,327	27.1	26,681
Arkansas	16,467	966	5.9				10,665	9,307	128,417	148,389	24,612	16.6	164,856	25,578	15.5	46,297
California	171,163	24,602	14.4	(2)	(2)	(2)	72,062	8,988	393,462	474,512	146,758	30.9	645,675	171,360	26.5	183,664
Colorado	12,339	761	6.2				1,173	1,237	78,705	81,115	18,366	22.6	93,454	19,127	20.5	35,550
Connecticut								57	4,029	4,086	3,677	90.0	4,086	3,677	90.0	852
Delaware, District of Columbia, and Maryland	24	11	45.8				7	886	10,771	11,664	7,819	67.0	11,688	7,830	67.0	1,745
Florida	36	4	11.1						24,150	24,150	5,216	21.6	24,186	5,220	21.6	7,935
Georgia									88,523	88,523	22,866	25.8	88,523	22,866	25.8	34,880
Illinois	24,213	6,424	26.5				12,708	9,062	197,810	219,580	70,234	32.0	243,793	76,658	31.4	55,525
Indiana	419	50	11.9				1,889	3,977	66,123	71,989	33,875	47.1	72,408	33,925	46.9	6,564
Iowa								6,611	77,648	84,259	23,790	28.2	84,259	23,790	28.2	40,317
Kansas	34,410	5,101	14.8	(2)	(2)	(2)	12,228	34,584	139,072	185,884	50,513	27.2	220,294	55,614	25.2	60,071
Kentucky	13,075	1,978	15.1				(3)	10,631	40,513	51,144	15,584	30.5	64,219	17,562	27.3	6,043
Louisiana	153,311	13,206	8.6	28,674	2,101	7.3	98,260	19,358	421,195	538,813	79,774	14.8	720,798	95,081	13.2	70,813
Massachusetts								1,202	13,299	14,501	9,898	68.3	14,501	9,898	68.3	8,532
Michigan	2,014	523	26.0				702	1,808	57,790	60,300	32,150	53.3	62,314	32,673	52.4	332
Minnesota							(3)	128	66,256	66,384	20,363	30.7	66,384	20,363	30.7	31,232
Mississippi	12,972	1,424	11.0				(3)	16,950	81,001	97,951	17,862	18.2	110,923	19,286	17.4	33,298
Missouri	996	149	15.0				(3)	7,261	94,378	101,639	26,744	26.3	102,635	26,893	26.2	22,679
Montana	3,123	304	9.7				2,920	497	16,053	19,470	4,261	21.9	22,593	4,565	20.2	633
Nebraska	1,347	136	10.1				(3)	4,222	49,965	54,187	14,812	27.3	55,534	14,948	26.9	21,046
New Hampshire									62	62	96	154.8	62	96	154.8	
New Jersey								177	26,757	26,934	16,007	59.4	26,934	16,007	59.4	14,064
New Mexico	98,316	9,574	9.7	49,844	3,415	6.9	1,759	8,559	38,448	48,766	8,900	18.3	196,926	21,889	11.1	21,663
New York	415	151	36.4				11	954	54,401	55,366	33,438	60.4	55,781	33,589	60.2	25,497
North Carolina								2,024	6,757	8,781	3,181	36.2	8,781	3,181	36.2	
North Dakota and South Dakota	4,707	478	10.2				(3)	43	8,191	8,234	2,432	29.5	12,941	2,910	22.5	3,630

Ohio	1,585	458	28.9				1,949	4,653	158,656	165,258	78,163	47.3	166,843	78,621	47.1	4,403
Oklahoma	146,162	14,512	9.9				43,531	6,587	64,694	114,812	19,127	16.7	260,974	33,639	12.9	64,780
Pennsylvania	2,405	987	41.0				16,935	8,956	155,920	181,811	95,849	52.7	184,216	96,836	52.6	3,260
Rhode Island							[3]	83	654	737	1,283	174.1	737	1,283	174.1	111
South Carolina								1,066	19,318	20,384	7,216	35.4	20,384	7,216	35.4	15,487
Tennessee	8	1	12.5				[3]	7,648	71,452	79,100	21,833	27.6	79,108	21,834	27.6	2,184
Texas	772,338	63,042	8.2	154,582	12,316	8.3	328,741	41,714	761,541	1,131,996	163,374	14.4	2,058,916	238,732	11.6	273,280
Utah	340	24	7.1				311		28,755	29,066	8,058	27.7	29,406	8,082	27.5	9,758
Virginia	72	24	33.3					2,172	14,895	17,067	8,018	47.0	17,139	8,042	46.9	662
West Virginia	36,180	8,356	23.1				1,014	7,348	57,583	65,945	22,868	34.7	102,125	31,224	30.6	1,367
Wisconsin							[3]	404	10,491	10,895	7,183	65.9	10,895	7,183	65.9	56
Wyoming	10,858	907	8.4				11,542	1,224	1,874	14,640	2,090	14.2	25,498	2,997	11.8	975
Total: 1955	[2] 1,507,671	152,595	10.1	[2] 244,794	19,398	7.7	[3] 625,243	245,246	[3] 3,694,218	4,564,707	1,174,317	25.7	6,317,172	1,346,310	19.6	1,153,280
1954	1,456,883	120,668	8.3	251,176	17,510	6.9	563,315	230,615	[4] 3,421,658	4,215,588	996,488	23.6	5,923,647	1,134,666	19.2	1,165,498

[1] Federal Power Commission. Includes gas other than natural impossible to segregate and therefore shown separately.
[2] 11,694 million cubic feet and $1,566 in value included in field use to avoid disclosure included in total carbon black.
[3] 6,836 million cubic feet included in other industrial to avoid disclosure included in total refinery fuel; also includes gas used by portland-cement industry which in previous years was shown separately.
[4] Includes gas used at portland-cement plants.

TABLE 12.—Natural gas treated at natural-gasoline and cycle plants in the United States, 1951–55, by States, in million cubic feet

States	1951	1952	1953	1954	1955
Arkansas	71,145	77,317	71,257	64,561	56,092
California	553,821	523,115	580,191	571,702	570,806
Colorado	11,739	[1]	[2]	[3] 36,169	[3] 43,911
Illinois	11,856	[4] 12,317	[4] [5] 73,157	[5] [6] 159,225	[6] 165,739
Kansas	397,294	403,376	[7] 431,998	[7] 400,791	426,533
Kentucky	86,950	268,096	[5] 277,145	[5] 370,111	[5] 389,696
Louisiana	598,420	607,564	591,626	627,006	775,761
Michigan	382	[4]	[4]	[6]	[6]
Mississippi	46,468	53,050	135,935	120,533	140,040
Montana	17,000	[1]	[2]	[3]	[3]
Nebraska	2,662	[1]	[7]	[7]	[7] 18,397
New Mexico	242,759	279,286	324,721	439,556	467,505
New York	20				
Ohio	23,837	9,011	[8]	[8]	[8]
Oklahoma	419,868	444,425	476,094	540,822	562,749
Pennsylvania	37,386	32,235	[8] 20,935	20,201	17,316
Texas	3,406,670	3,420,398	3,619,335	3,843,718	4,187,003
Utah		[1]	[2]	[3]	[3]
West Virginia	229,654	215,485	160,170	205,151	225,307
Wyoming	45,139	46,848	[3] 74,718	60,372	139,098
Other States		26,074			
Total	6,203,070	6,418,597	6,837,282	7,459,918	8,185,953

[1] Colorado, Montana, Nebraska, and Utah combined under "Other States" to avoid disclosing individual State data.
[2] Colorado, Montana, and Utah included in Wyoming.
[3] Montana and Utah included in Colorado.
[4] Michigan included in Illinois.
[5] Includes gas from transmission lines previously treated in other States.
[6] Michigan and Ohio included in Illinois.
[7] Nebraska included in Kansas in 1953; Nebraska and North Dakota included in Kansas in 1954; North Dakota included in Nebraska in 1955.
[8] Ohio included in Pennsylvania.

TABLE 13.—Consumption of natural gas used with manufactured gas in the United States in 1955, by States [1]

State	Residential		Commercial		Industrial	Total	
	Number of consumers (thousand)	Quantity (million cubic feet)	Number of consumers (thousand)	Quantity (million cubic feet)	Quantity (million cubic feet)	Quantity (million cubic feet)	Value at point of consumption (thousand dollars)
Connecticut	77	1,190	5	248	1,123	2,561	3,824
Delaware and Maryland							
Illinois	926	47,520	41	10,136	23,107	80,763	65,386
Indiana	191	10,064	13	2,394	24,755	37,213	26,118
Massachusetts	292	4,370	22	1,590	980	6,940	16,540
New Jersey	926	31,210	68	4,070	6,390	41,670	68,808
New York	1,053	57,323	108	9,884	8,254	75,461	56,515
Pennsylvania	907	46,835	45	5,068	8,094	59,997	80,541
Tennessee							
Virginia							
Total: 1955	4,372	198,512	302	33,390	72,703	304,605	317,732
1954	4,792	188,592	345	33,989	68,651	291,232	345,791

[1] Included in tables for the consumption of natural gas (tables 9–12).

VALUE AND PRICE

The increase in the average value of natural gas at the wellhead in 1955 was less than in 1954. In 1955 the larger producing States—Oklahoma and Texas—reported an average value that was less than the national average.

The decrease in the average price at the wellhead in Texas was due to the larger increase in the production of oil-well gas which averaged 6.2 cents per thousand cubic feet compared with 8.8 cents for gas-well gas. It is possible that a low value was placed on a part of this production, as a large part of this gas is used for repressuring.

The average values of natural gas at its point of consumption increased in 1955 but at a lower rate than in previous years. Increases were general, except for the New England States, where average value decreased as availability of gas in this area improved and its use by industry increased.

TABLE 14.—Average value of natural gas in the United States, 1954–55, by States, in cents per thousand cubic feet

State	At wells (estimated)		At point of consumption		State	At wells (estimated)		At point of consumption	
	1954	1955	1954	1955		1954	1955	1954	1955
Alabama	6.0	7.1	35.0	37.2	Nebraska	11.7	20.4	42.9	46.5
Arizona	------	------	36.4	37.8	Nevada	------	------	68.8	49.1
Arkansas	5.5	5.6	19.2	21.6	New Hampshire	------	------	209.4	163.8
California	20.6	22.2	40.4	43.6	New Jersey	------	------	142.3	146.6
Colorado	8.7	9.9	33.4	38.2	New Mexico	7.8	8.9	14.6	15.4
Connecticut	------	------	225.6	163.8	New York	32.6	29.5	127.1	99.2
Delaware	------	------	132.1	114.5	North Carolina	------	------	74.2	76.5
District of Columbia	------	------	130.4	137.5	North Dakota	6.3	7.7	49.6	33.8
Florida	8.3	10.4	20.8	26.8	Ohio	21.2	22.5	60.1	60.1
Georgia	------	------	36.6	40.5	Oklahoma	7.0	7.4	19.6	21.8
Illinois	14.2	12.9	54.5	56.9	Pennsylvania	29.9	29.9	67.7	73.5
Indiana	6.0	12.4	65.5	68.2	Rhode Island	------	------	277.5	244.2
Iowa	------	------	43.7	47.0	South Carolina	------	------	64.2	53.4
Kansas	10.6	11.1	25.1	32.4	South Dakota	5.0	------	47.7	51.6
Kentucky	22.8	23.7	40.9	43.8	Tennessee	11.5	12.9	40.5	43.2
Louisiana	8.9	11.3	15.4	16.1	Texas	8.5	8.0	13.5	15.7
Maryland	20.2	20.1	128.9	124.0	Utah	14.1	13.9	39.5	40.2
Massachusetts	------	------	180.9	174.1	Virginia	27.1	26.8	94.7	99.2
Michigan	17.8	11.5	82.3	80.4	West Virginia	23.8	23.5	35.9	38.7
Minnesota	------	------	51.6	54.4	Wisconsin	------	------	111.9	111.9
Mississippi	8.3	9.6	24.1	25.9	Wyoming	8.4	8.5	23.8	24.4
Missouri	18.8	20.0	46.6	49.7					
Montana	6.8	6.1	37.5	36.7	Total	10.1	10.4	38.1	40.0

TABLE 15.—Consumption of natural gas,[1] 1950–54 by countries, in million cubic meters

[United Nations Statistical Yearbook]

Country	1950	1951	1952	1953	1954
Western Hemisphere:					
Argentina	755	830	898	932	(2)
Barbados	2	3	4	4	3
Canada	1,921	2,250	2,511	2,860	3,425
Chile	(2)	(2)	(2)	36	96
Colombia [3]	510	489	204	484	545
Ecuador [4]	132	752	(2)	(2)	(2)
Mexico [5]	1,266	1,411	1,532	(2)	(2)
Trinidad	475	471	478	501	515
United States	177,889	211,170	226,917	237,775	247,563
Venezuela	1,117	1,440	1,756	2,168	2,342
Europe:					
Austria [6]	50	49	49	56	75
Czechoslovakia	(2)	(2)	(2)	(2)	(2)
Denmark	(2)	(2)	(2)	(2)	(2)
France	246	282	266	244	259
Germany [7]	68	84	96	104	150
Italy	510	966	1,433	2,280	2,982
Poland	(2)	(2)	(2)	(2)	(2)
Rumania	(2)	(2)	(2)	(2)	(2)
Yugoslavia	15	13	14	73	90
Asia:					
Brunei	754	1,039	1,094	1,173	1,098
China	41	30	28	31	29
Indonesia	621	785	1,069	1,366	1,582
Japan	69	83	91	111	141
Pakistan	7	11	29	44	(2)
Africa: Morocco	(2)	(2)	(2)	4	8

[1] The data relate, as far as possible, to natural gas actually collected and utilized as fuel or raw material. Thus they exclude gas used for repressuring, as well as gas flared, vented, or otherwise wasted, whether or not it has first been processed for extracting natural gasoline. Natural gas is produced also in Czechoslovakia, Hungary, Poland, Rumania, the U. S. S. R., Peru, and other countries.

[2] Data not available.

[3] Includes gas repressured.

[4] Total production, including gas repressured and waste.

[5] Includes gas repressured and gas delivered to absorption plants.

[6] Vienna only.

[7] Figures represent virtually total German production.

Natural-Gas Liquids

By I. F. Avery, A. T. Coumbe, and Lulie V. Harvey

GENERAL SUMMARY

THE PRODUCTION of natural-gas liquids in 1955 increased 12 percent to 11.8 billion gallons. Output of liquefied-petroleum (LP-) gases was 15 percent greater than in 1954. Stocks of natural-gas liquids at plants, terminals, and refineries decreased 20 million gallons during the year. Of this, 9 million gallons of LP-gas was from underground storage. No outstanding change in the various products was apparent.

Sales of LP-gases, including liquefied-refinery (LR-) gases, for all uses other than blending in gasoline increased 17 percent in 1955.

SCOPE OF REPORT

Statistics on the production of natural-gas liquids are collected on both monthly and annual questionnaires from all natural-gasoline plants, cycling plants, and fractionators handling natural-gas liquids. Reports are not received for the liquids recovered at pipeline compressor stations and at gas-dehydration plants. Reports are received on the production of field condensate where this material is not commingled with the crude oil. Field condensate delivered to a plant and fractionated into finished products is reported as output of finished products.

The monthly reports provide data on production, stocks, and the distribution of production. The annual reports provide data on type of plant, production, value of production, and gas processed. Data on sales of LP-gases for fuel and chemical uses include propane, propylene, butanes, butylenes, ethane, and ethane mixtures, produced at natural-gasoline plants and at petroleum refineries but do not include LP-gas that is blended into gasoline motor fuel. Information is collected on an annual questionnaire received from all producers and distributors and from 90 percent of the dealers selling over 100,000 gallons of LP-gases a year. Data on smaller or nonreporting dealers are indirectly included in the reporting, as the sales figures of producers or distributors will reflect the operations of these dealers.

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RESERVES

The American Gas Association Reserves Committee estimated the proved recoverable reserves of natural-gas liquids on December 31, 1955, at 5.4 billion barrels. This increase of 0.2 billion barrels for the year was due primarily to liquids associated with oil. The largest increased reserves were reported in Texas and Louisiana.

TABLE 1.—Salient statistics of the natural-gas-liquids industry in the United States, 1951–55, in thousand gallons

	1951	1952	1953	1954	1955
Production:					
Natural gasoline and natural-gasoline mixtures	3,522,960	3,665,760	3,858,918	[1] 4,104,828	[1] 4,457,079
LP-gases	3,627,834	4,285,386	4,692,870	5,204,304	5,972,698
Finished gasoline and naphtha	968,016	900,312	904,176	733,068	823,103
Other products	480,858	536,172	564,354	547,386	564,722
Total	8,599,668	9,387,630	10,020,318	10,589,586	11,817,602
Receipts from outside sources (refineries)	67,200	83,916	98,826	[2]	[2]
Shipments for use in gasoline:					
To refineries and jobbers	5,441,394	5,943,630	6,104,070	[2] 6,134,771	[2] 7,059,737
Exports	85,218	[3]	[3]	[3]	[3]
Losses	46,158	[3]	[3]	[3]	
Transfers to nongasoline uses:					
LP-gases	2,931,642	[4] 3,347,736	[4] 3,717,504	[4] [5] 4,132,536	[4] [5] 4,549,681
Other products	143,262	172,620	177,912	200,427	220,107
Stocks at plants, terminals, and refineries:					
Natural gasoline	206,178	153,888	187,236	171,671	165,799
LP-gases	64,974	107,142	171,150	308,528	300,129
Other products	72,660	66,864	79,590	109,407	103,775
Total	343,812	327,894	437,976	589,606	569,703
Value of natural-gas liquids at plants, thousand dollars	508,161	533,160	597,840	581,412	619,006
Average value per gallon, cents	5.9	5.7	6.0	5.5	5.2
Natural gas processed, million cubic feet	6,203,070	6,418,597	6,837,282	7,458,485	8,185,953
Average yield, all light products, gallons per M cubic feet	1.39	1.46	1.47	1.42	1.44
Sales to consumers for fuel and chemical uses:					
LP-gases	2,904,384	3,215,184	3,590,067	3,785,781	4,227,711
LR-gases [6]	1,322,874	1,262,184	1,341,942	1,339,752	1,768,772
Total	4,227,258	4,477,368	4,932,009	5,125,533	[7] 5,996,483
Exports of natural gasoline, LP-gases, and LR-gases	156,156	[8] 168,402	164,557	189,216	183,155

[1] Includes isopentane. Isopentane included in LP-gases in previous years.
[2] "Receipts from outside sources" has been eliminated from supply and shipments.
[3] Natural-gasoline exports and losses included in "Shipments for use in gasoline: To refineries and jobbers."
[4] Includes ethane.
[5] Includes LP-gas exports.
[6] Liquefied-refinery gases.
[7] Ethane is excluded from "Sales to consumers for fuel and chemical uses" before 1955; 419,534,000 gallons of ethane and 62,703,000 gallons of methane-ethane mixtures included in 1955.
[8] Revised figure.

TABLE 2.—Estimated proved recoverable reserves of natural-gas liquids [1] in the United States, 1954–55 in thousand barrels

[Committee on Natural Gas Reserves, American Gas Association]

State	Reserves as of Dec. 31, 1954	Changes in reserves during 1955			Reserves as of Dec. 31, 1955			
		Extensions and revisions	Discoveries of new fields and new pools in old fields	Net production	Non-associated with oil	Associated with oil	Dissolved in oil	Total
Arkansas	46,919	307	7	2,109	18,618	12,052	14,454	45,124
California [2]	330,249	24,213	1,319	30,840	----------	101,761	223,180	324,941
Colorado	12,747	446	50	732	2,864	80	9,567	12,511
Illinois	22,220	−1,416	181	2,528	38	5	18,414	18,457
Indiana	151	3	----------	22	11	12	109	132
Kansas	175,197	920	2,150	5,031	167,739	1,952	3,545	173,236
Kentucky	10,740	267	133	2,465	[3] 8,675	----------	----------	8,675
Louisiana [2]	884,046	65,840	24,954	38,890	733,203	153,505	49,242	935,950
Michigan	913	16	25	82	234	92	546	872
Mississippi	60,420	283	416	3,243	31,124	20,607	6,145	57,876
Montana	7,179	−33	----------	289	----------	----------	6,857	6,857
Nebraska	2,268	4,516	1	349	5,079	945	412	6,436
New Mexico	339,991	16,264	1,288	15,336	228,226	25,082	88,899	342,207
Ohio	1,439	131	14	27	[3] 1,557	----------	----------	1,557
Oklahoma	333,911	43,250	6,558	29,365	122,057	53,378	178,919	354,354
Pennsylvania	2,869	188	94	127	[3] 3,024	----------	----------	3,024
Texas [2]	2,928,137	268,695	28,661	180,132	1,249,794	561,792	1,233,775	3,045,361
Utah	47	49	17	5	92	16	----------	108
West Virginia	33,994	655	218	4,341	30,526	----------	----------	30,526
Wyoming	50,686	2,089	1,260	3,687	17,065	1,021	32,262	50,348
Alabama, Florida, and North Dakota	334	20,477	2	800	----------	----------	20,013	20,013
Total	5,244,457	447,160	67,348	320,400	2,619,926	932,300	1,886,339	5,438,565

[1] Comprises natural gasoline, LP-gases, and condensate.
[2] Includes offshore reserves.
[3] Not allocated by types, but occurring principally in column shown.

PRODUCTION

The production of natural-gas liquids increased 12 percent in 1955 compared with 6 percent in 1954. LP-gas production continued to show the highest rate of growth of the various natural-gas liquids. In 1955 it increased 15 percent. Natural gasoline and natural-gasoline mixtures increased 9 percent over 1954.

TABLE 3.—Natural-gas liquids produced and natural gas treated in the United States, 1955, by States

State	Number of operators [3]	Production										Natural gas treated		
		Natural gasoline [1]		LP-gases		Finished gasoline and naphtha		Other products [2]		Total			Average yield (gallons per M cubic feet)	
		Thousand gallons	Thousand dollars	Thousand gallons	Thousand dollars	Thousand gallons	Thousand dollars	Thousand gallons	Thousand dollars	Thousand gallons	Thousand dollars	Million cubic feet	Natural gas liquids except LP-gases	All natural-gas liquids
Arkansas	9	43,951	2,901	57,088	2,169	----------	----------	3,532	338	104,571	5,408	56,092	0.85	1.86
California	27	847,066	81,906	260,902	19,379	----------	----------	82,583	7,097	1,290,551	108,382	570,806	1.63	2.26
Colorado [4]	8	33,584	2,802	37,768	1,770	----------	----------	82	5	71,434	4,577	43,911	.77	1.63
Illinois [5]	9	27,247	1,991	323,432	10,706	----------	----------	----------	----------	350,679	12,697	[6] 165,739	.16	2.12
Kansas	12	118,599	6,318	92,596	2,643	----------	----------	----------	----------	211,195	8,961	426,533	.28	.50
Kentucky	5	34,991	2,492	189,247	6,451	----------	----------	----------	----------	224,238	8,943	[6] 389,696	.09	.58
Louisiana	31	231,347	14,439	291,138	10,323	345,713	29,544	205,268	15,175	1,073,466	69,481	775,761	1.01	1.38
Mississippi	2	15,592	1,086	12,242	396	----------	----------	6,790	487	34,624	1,969	140,040	.16	.25
Nebraska [7]	3	14,685	1,085	33,160	1,489	----------	----------	----------	----------	47,845	2,574	18,397	.80	2.60
New Mexico	12	255,073	15,252	278,403	6,767	----------	----------	5,950	173	539,426	22,192	467,505	.56	1.15
Oklahoma	38	503,576	28,696	512,320	14,297	84	8	1,032	66	1,017,012	43,067	562,749	.90	1.81
Pennsylvania	8	4,305	281	995	90	----------	----------	----------	----------	5,300	371	17,316	.25	.31
Texas	110	2,253,680	148,985	3,450,430	110,414	476,676	42,557	257,452	14,964	6,438,238	316,920	4,187,003	.71	1.54
West Virginia	9	33,288	2,078	286,871	6,376	630	83	1,838	191	322,627	8,728	225,307	.16	1.43
Wyoming	9	40,095	2,763	46,106	1,961	----------	----------	195	12	86,396	4,736	139,098	.29	.62
Total	221	4,457,079	313,075	5,972,698	195,231	823,103	72,192	564,722	38,508	11,817,602	619,006	8,185,953	.71	1.44

[1] Includes isopentane.
[2] Includes condensate, kerosine, distillate fuel, etc.
[3] A producer operating in more than 1 State is counted but once in arriving at total for United States.
[4] Montana and Utah, with 1 operator each, included in Colorado.
[5] Michigan and Ohio, with 2 operators each, included in Illinois.
[6] Includes gas from transmission lines, previously treated in another State.
[7] North Dakota, with 1 operator, included in Nebraska.

TABLE 4.—Monthly production of natural-gas liquids in the United States, 1955, by States and districts,[1] in thousand gallons

State and district	January	February	March	April	May	June	July
West Pennsylvania	597	537	637	419	345	363	397
West Virginia	25,151	23,504	26,623	25,314	27,593	25,115	25,308
Illinois, Michigan, and Ohio	28,090	23,943	26,175	32,152	29,388	23,091	23,916
Kentucky	20,751	18,639	19,561	17,776	12,985	19,829	18,045
Kansas	23,385	21,728	20,620	15,114	14,096	14,464	12,324
Nebraska and North Dakota	3,975	4,067	3,105	2,315	2,861	2,490	2,591
Oklahoma	87,143	80,354	83,596	76,985	75,912	75,958	79,272
Texas:							
Gulf	123,900	109,676	117,256	102,583	111,451	103,347	115,351
East Texas	35,844	35,337	39,425	38,378	38,920	35,868	36,250
Panhandle	88,406	78,787	80,217	71,777	70,806	67,316	72,051
West Texas	178,233	168,647	172,374	163,675	167,782	161,088	172,819
Rest of State	138,462	125,951	134,087	120,870	117,595	117,901	118,776
Total Texas	564,845	518,398	543,359	497,283	506,554	485,520	515,247
Arkansas	9,330	8,300	8,806	8,273	8,709	8,651	8,054
Louisiana:							
Gulf	39,076	34,448	39,035	36,574	36,123	43,663	45,148
Inland	50,063	45,709	48,428	46,819	47,302	45,825	45,854
Total Louisiana	89,139	80,157	87,463	83,393	83,425	89,488	91,002
Mississippi	3,478	3,069	3,155	2,974	2,885	2,890	2,766
New Mexico	44,305	40,007	43,904	42,843	41,539	43,493	46,819
Colorado, Montana, and Utah	6,119	5,770	7,701	5,042	4,583	4,527	4,346
Wyoming	8,343	6,989	6,488	6,728	6,953	6,688	6,852
California	115,592	102,061	112,191	100,604	109,539	102,327	105,901
Total United States	1,030,243	937,523	993,384	917,215	927,367	904,894	942,840
Daily average	33,234	33,483	32,045	30,574	29,915	30,163	30,414

State and district	August	September	October	November	December	Total
West Pennsylvania	366	349	367	443	480	5,300
West Virginia	25,165	28,365	28,948	30,132	31,409	322,627
Illinois, Michigan, and Ohio	23,487	31,469	35,551	36,944	36,473	350,679
Kentucky	18,138	18,052	19,525	20,120	20,817	224,238
Kansas	13,230	15,449	16,915	21,112	22,758	211,195
Nebraska and North Dakota	3,064	4,621	4,365	6,966	7,425	47,845
Oklahoma	82,214	84,181	92,524	96,114	102,759	1,017,012
Texas:						
Gulf	120,091	118,028	131,219	130,496	134,684	1,418,082
East Texas	35,806	35,350	35,804	34,330	35,739	437,051
Panhandle	76,341	74,837	82,503	90,868	91,855	945,764
West Texas	175,036	173,370	182,958	183,193	195,210	2,094,385
Rest of State	127,816	131,287	134,619	134,494	141,098	1,542,956
Total Texas	535,090	532,872	567,103	573,381	598,586	6,438,238
Arkansas	8,960	8,575	9,012	9,407	8,494	104,571
Louisiana:						
Gulf	45,011	44,802	47,226	45,397	49,273	505,776
Inland	45,909	44,679	46,223	48,948	51,931	567,690
Total Louisiana	90,920	89,481	93,449	94,345	101,204	1,073,466
Mississippi	2,659	2,639	2,714	2,706	2,689	34,624
New Mexico	46,743	44,900	48,690	47,878	48,305	539,426
Colorado, Montana, and Utah	5,420	6,382	6,876	6,976	7,692	71,434
Wyoming	7,226	7,381	7,500	7,153	8,095	86,396
California	106,344	104,818	109,058	108,992	113,124	1,290,551
Total United States	969,026	979,534	1,042,597	1,062,669	1,110,310	11,817,602
Daily average	31,259	32,651	33,632	35,422	35,816	32,377

[1] West Pennsylvania separated from east part of State to allow grouping either in a Bureau of Mines refinery district or Petroleum Administration for War district. Districts shown for Texas and Louisiana are Bureau of Mines production districts.

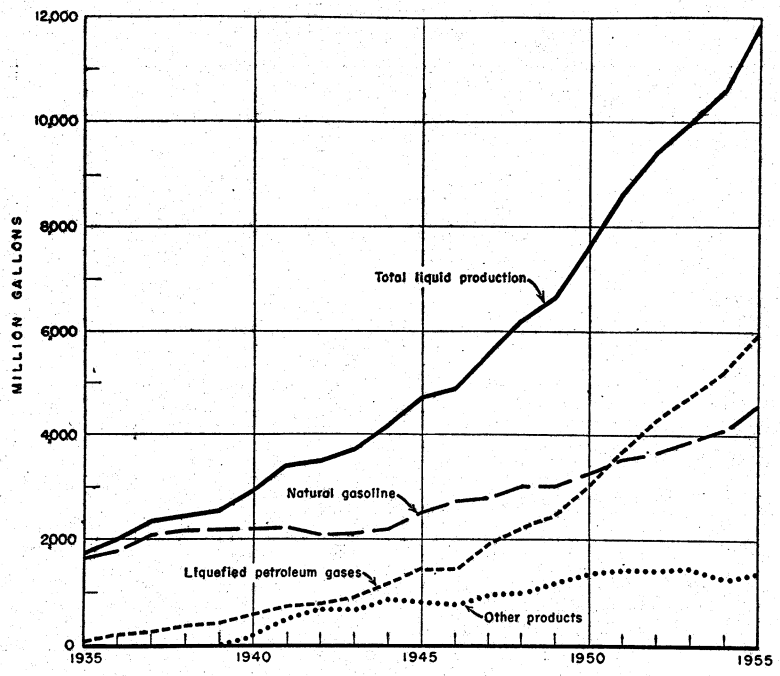

FIGURE 1.—Production of the natural-gas-liquids industry in the United States, 1935–55.

YIELDS, PROCESSES, AND NUMBER OF PLANTS

The overall yield of natural-gas liquids recovered increased from 1.42 gallons per thousand cubic feet of gas processed in 1954 to 1.44 gallons in 1955. Texas, which processed 51 percent of the natural gas, increased yields from 1.49 gallons in 1954 to 1.54 gallons in 1955.

Plants operating at the end of 1955 totaled 571. The number of absorption plants decreased by 4; however, the production increased 11 percent. The number of compression and cycling plants and the quantity of liquids produced by them increased in 1955.

TABLE 5.—Natural-gas liquids produced in the United States in 1955, by States and by methods of manufacture

State	Number of plants operating				Production (thousand gallons)			
	Compression [1]	Absorption [2]	Cycling [3]	Total	Compression	Absorption	Cycling	Total
Arkansas		8	1	9		(4)	(4)	104,571
California		74	2	76		1,117,310	173,241	1,290,551
Colorado [5]	3	5		8	22,957	[6] 48,477		71,434
Illinois [7]	4	7		11	3,253	347,426		350,679
Kansas	2	13		15	5,213	205,982		211,195
Kentucky	2	4		6	146,579	77,659		224,238
Louisiana	3	36	12	51	10,411	439,353	623,702	1,073,466
Mississippi		1	2	3		(4)	(4)	34,624
Nebraska [8]	2	2		4	(4)	(4)		47,845
New Mexico	2	19		21	8,015	531,411		539,426
Oklahoma	10	62	2	74	30,269	834,558	152,185	1,017,012
Pennsylvania	5	6		11	414	4,886		5,300
Texas	28	174	31	233	253,678	5,039,850	1,144,710	6,438,238
West Virginia	30	9		39	241,661	80,966		322,627
Wyoming	1	9		10	(4)	(4)		86,396
Total: 1955	92	429	50	571	735,231	8,941,135	2,141,236	11,817,602
1954	80	433	42	555	515,980	8,059,708	2,013,898	10,589,586

[1] Includes 36 plants manufacturing LP-gases; 1 refrigeration-type plant each in Kansas and Nebraska, 2 refrigeration-type plants each in Colorado and New Mexico, and 10 refrigeration-type plants in Texas.
[2] Includes combination of absorption with compression process. Includes 287 plants manufacturing LP-gases and 1 charcoal-type plant each in Ohio and West Virginia.
[3] Includes 45 plants manufacturing LP-gases.
[4] Included in State total production and United States total production to avoid disclosure of individual plant operations.
[5] Montana, with 1 absorption plant, and Utah, with production of a small amount of drip gasoline, included with Colorado.
[6] Includes some drip gasoline.
[7] Michigan, with 2 compression plants, and Ohio, with 2 absorption plants, included with Illinois.
[8] North Dakota, with 1 absorption plant, included with Nebraska.

SHIPMENTS OF NATURAL-GAS LIQUIDS FROM PLANTS AND TERMINALS

Shipments of natural-gas liquids from plants and terminals in 1955 increased 13 percent compared with a 5-percent increase in 1954. Demand for each of the natural-gas liquids was higher than in the previous year.

For Motor-Fuel Use.—Total natural-gas liquids shipped for blending into motor fuel in 1955 increased 15 percent compared with only a 5-percent increase in 1954. The production of motor fuel was 9 percent above the 1954 figure. The proportion of natural-gas liquids in refinery gasoline in 1955 remained the same as in 1954 at 9.5 percent. However, Texas Inland continued to increase from 31.5 percent in motor fuel in 1954 to 33.8 percent in 1955.

For Non-Motor-Fuel Uses.—Shipments of LP-gases[1] from plants and terminals for fuel and chemical uses continued to expand. Greater quantities of ethane with other LP-gas mixtures were shipped for uses as a chemical raw material. Other LP-gas mixtures in 1955 increased 43 percent over 1954 production. The production of liquefied gases at refineries increased 28 percent in 1955.

[1] For a discussion of sales of LP-gases for fuel and chemical uses, see p. 10.

TABLE 6.—Supply and distribution at plants and terminals [1] of natural-gas liquids in the United States, 1955, by months, in thousand gallons

	January	February	March	April	May	June	July	August	September	October	November	December	Total
Production:													
Natural gasoline and natural-gasoline mixtures	355,715	326,525	366,998	351,728	374,566	361,234	379,119	386,091	373,006	379,116	364,735	361,900	4,380,793
LP-gases:													
Propane	254,715	230,361	228,893	192,429	185,920	175,076	181,544	190,852	202,214	236,859	256,646	282,363	2,617,872
Butane, normal	133,396	114,492	106,734	93,640	100,620	97,841	99,602	103,041	120,064	131,989	137,212	143,250	1,381,881
Isobutane	38,706	35,164	39,793	38,241	38,452	37,568	37,456	37,229	36,583	39,810	39,861	43,356	462,219
Butane-propane mixture	61,904	64,688	76,828	78,114	68,570	56,219	66,094	68,150	54,585	56,937	59,440	62,088	773,617
Other LP-gas mixtures	49,789	45,743	50,241	46,811	48,713	60,575	61,770	61,503	75,493	74,466	79,556	82,449	737,109
Isopentane	6,944	6,245	7,001	6,979	5,162	6,126	5,882	6,257	5,665	6,788	6,332	6,905	76,286
Finished gasoline and naphtha	74,969	65,765	70,455	68,855	65,093	66,013	65,119	66,498	65,165	66,259	71,692	77,220	823,103
Condensate, raw	32,972	29,630	29,290	24,131	21,670	27,355	27,765	28,466	28,866	30,784	32,903	32,268	346,100
Other products	21,133	18,910	17,151	16,287	18,601	16,887	18,489	20,939	17,833	19,589	14,292	18,511	218,622
Total	1,030,243	937,523	993,384	917,215	927,367	904,894	942,840	969,026	979,534	1,042,597	1,062,669	1,110,310	11,817,602
Stock change at plants and terminals	−30,070	−43,732	36,604	22,734	56,455	38,470	67,063	26,091	−15,641	22,037	−69,409	−122,525	−11,923
Shipments:													
For use in gasoline:													
Natural gasoline and natural-gasoline mixtures	343,517	323,570	355,815	348,568	379,372	382,430	360,706	387,292	384,439	380,464	374,296	364,438	4,384,907
LP-gases:													
Propane													
Butane, normal	76,681	64,944	56,205	46,210	42,625	47,552	54,208	52,370	57,250	85,990	90,955	98,092	773,082
Isobutane	36,998	34,117	38,837	36,825	39,106	37,995	37,518	40,511	37,692	40,398	37,642	44,671	462,310
Butane-propane mixture	15,271	14,015	11,905	9,796	9,996	8,791	9,142	7,535	6,329	12,709	8,389	7,735	121,613
Other LP-gas mixtures	9,995	3,516	1,958	4,470	5,374	4,822	5,474	7,584	7,885	6,630	5,373	7,634	70,715
Isopentane	6,126	5,870	6,697	6,345	6,087	5,664	7,663	5,440	6,397	6,408	5,903	6,546	75,146
Finished gasoline and naphtha	69,293	67,543	65,262	77,982	72,195	68,712	68,391	66,247	69,588	65,024	67,578	66,140	823,955
Condensate	34,099	30,346	29,603	27,928	26,628	25,605	26,197	27,119	28,863	29,949	33,390	28,282	348,009
For other uses:													
LP-gases: [2]													
Propane	298,334	287,997	215,746	170,671	137,975	133,484	147,091	161,229	200,424	212,181	296,469	390,307	2,651,908
Butane, normal	54,578	35,265	40,834	44,078	35,736	32,421	37,933	57,786	59,506	52,563	64,258	59,507	574,465
Isobutane													
Butane-propane mixture	53,565	52,789	64,649	64,323	54,601	45,906	49,590	56,292	53,979	42,222	54,522	64,664	657,102
Other LP-gas mixtures	39,779	42,049	48,370	42,182	44,300	54,708	56,406	53,852	67,758	67,653	74,434	74,715	666,206
Other products	22,077	19,234	20,899	15,103	16,917	18,334	15,458	19,678	15,065	18,369	18,869	20,104	220,107
Total demand at plants and terminals	1,060,313	981,255	956,780	894,481	870,912	866,424	875,777	942,935	995,175	1,020,560	1,132,078	1,232,835	11,829,525

[1] Terminals owned by producers. [2] Includes LP-gas exports.

TABLE 7.—Natural-gas liquids utilized at refineries in the United States, 1955, by Bureau of Mines refinery districts and by months, in thousand gallons

District	January	February	March	April	May	June	July
East Coast	10,626	11,466	14,154	11,214	8,904	8,610	11,550
Appalachian	1,344	1,176	1,218	126	1,260	294	588
Indiana, Illinois, Kentucky, etc.	56,364	47,586	44,184	46,284	46,998	46,662	50,274
Oklahoma, Kansas, Missouri	48,300	36,876	40,614	40,152	40,824	51,156	51,912
Texas:							
Gulf Coast	116,802	101,892	106,554	97,776	100,506	108,822	107,310
Inland	78,666	68,334	77,238	80,850	86,856	75,138	75,726
Total Texas	195,468	170,226	183,792	178,626	187,362	183,960	183,036
Louisiana-Arkansas:							
Louisiana Gulf Coast	26,208	22,092	18,732	18,690	25,536	22,470	21,294
Arkansas, Louisiana Inland	2,520	2,100	2,142	1,932	2,730	2,058	2,226
Total Louisiana-Arkansas	28,728	24,192	20,874	20,622	28,266	24,528	23,520
Rocky Mountain	11,886	9,828	8,862	7,476	7,434	5,922	9,030
California	103,278	95,592	109,116	93,912	100,086	98,910	110,040
Total United States	455,994	396,942	422,814	398,412	421,134	420,042	439,950

District	August	September	October	November	December	Total
East Coast	7,980	10,122	9,576	11,340	13,188	128,730
Appalachian	546	588	1,974	798	1,722	11,634
Indiana, Illinois, Kentucky, etc.	54,642	47,124	65,562	67,830	64,302	637,812
Oklahoma, Kansas, Missouri	46,326	49,476	56,448	58,422	56,448	576,954
Texas:						
Gulf Coast	109,620	116,172	127,386	121,212	122,094	1,336,146
Inland	79,086	85,344	86,478	84,000	84,378	962,094
Total Texas	188,706	201,516	213,864	205,212	206,472	2,298,240
Louisiana-Arkansas:						
Louisiana Gulf Coast	24,486	26,586	32,172	30,324	29,568	298,158
Arkansas, Louisiana Inland	2,226	2,520	3,066	2,436	2,184	28,140
Total Louisiana-Arkansas	26,712	29,106	35,238	32,760	31,752	326,298
Rocky Mountain	7,896	9,072	10,416	10,668	11,214	109,704
California	114,198	98,784	106,848	90,888	97,020	1,218,672
Total United States	447,006	445,788	499,926	477,918	482,118	5,308,044

TABLE 8.—Percentage of natural-gas liquids in refinery gasoline in the United States, 1951–55, by Bureau of Mines refinery districts

Year	East Coast	Appalachian	Indiana, Illinois, Kentucky, etc.	Oklahoma, Kansas, Missouri	Texas Inland	Texas Gulf Coast	Louisiana Gulf Coast	Arkansas, Louisiana Inland	Rocky Mountain	California	Total
1951	2.6	1.7	5.1	8.9	23.1	11.1	5.3	12.4	4.3	16.1	9.0
1952	2.2	.7	5.2	8.4	24.3	11.1	5.3	12.2	4.7	16.8	9.0
1953 [1]	2.3	.3	5.2	8.6	25.7	10.7	5.5	9.4	5.6	16.9	9.0
1954 [1]	2.8	.7	5.2	9.4	31.5	10.2	6.5	7.0	5.8	18.2	9.5
1955 [1]	1.9	.8	5.8	9.7	33.8	10.2	5.9	5.4	5.5	16.6	9.5

[1] Refinery gasoline excludes jet fuel.

SALES OF LIQUEFIED-PETROLEUM GASES [2]

Sales of liquefied-petroleum gases increased 17 percent in 1955, compared with a minor gain in 1954. Exports of LP-gases in 1955, as reported by the Bureau of the Census, United States Department of Commerce, were only 8 percent above the 1954 total, in contrast to an increase of 32 percent in 1954.

Outstanding increases for several of the principal uses were indicated—30 percent for chemical-plant raw material, 32 percent for synthetic-rubber components, and 40 percent for industrial uses. The large gain in the amount of LP-gases used at chemical plants can be attributed in part to some raw materials used but not covered before the 1955 survey. These additional gases were reported as 2.5 million gallons of isobutane, 419.5 million gallons of ethane, and 62.7 million gallons of methane-ethane mixtures. The approach to normal conditions in 1955, with the synthetic rubber plants under private ownership, was a factor that explained the large increase in the use of these gases by this particular industry. Reporting companies were asked to show refinery fuel as a separate item under "industrial uses" for the first time. The LP-gases indicated for this purpose amounted to 101.1 million gallons in 1955, and it is apparent that this refinery fuel had not been fully reported in previous surveys.

There was a pronounced upward trend in the gain shown in the LP-gases used for internal-combustion engine fuel—19 percent in 1955 compared with 10 percent in 1954. A marked decline in the amount of these liquid gases used by manufactured-gas companies in recent years was reversed in 1955, when there was a gain of 11 percent in contrast to a decline of 14 percent in 1954. The percentage gain in the LP-gases sold for domestic and commercial uses showed little change—7 percent in 1955 compared with 6 percent in 1954.

TABLE 9.—Sales of LP-gases [1] in the United States, 1951–55, by uses, in thousand gallons

Year	Domestic and commercial	Chemical	Synthetic rubber	Internal combustion	Industrial	Gas manufacture	All other	Total
1951	2,166,813	844,507	374,864	289,991	262,102	281,692	7,306	4,227,275
1952	2,266,178	870,990	370,997	370,558	324,967	259,697	13,992	4,477,379
1953	2,479,180	967,427	390,501	498,238	348,517	222,430	25,716	4,932,009
1954	2,626,808	1,050,239	307,735	547,204	375,121	191,932	26,494	5,125,533
1955	2,801,379	1,366,942	406,210	651,821	524,464	213,760	31,907	5,996,483

[1] Data include LR-gases.

TABLE 10.—Sales of LP-gases [1] in the United States, 1951–55, in thousand gallons

Year	Butane	Percent of total	Propane	Percent of total	Butane-propane mixture	Percent of total	Total LP-gases	Percent	Percent increase
1951	708,989	16.8	2,418,790	57.2	1,099,496	26.0	4,227,275	100.0	21.4
1952	639,282	14.3	2,513,595	56.1	1,324,502	29.6	4,477,379	100.0	5.9
1953	671,320	13.6	2,832,495	57.4	1,428,194	29.0	4,932,009	100.0	10.2
1954	765,826	14.9	2,968,312	57.9	1,391,395	27.2	5,125,533	100.0	3.9
1955	765,540	12.8	3,260,571	54.4	1,970,372	32.8	5,996,483	100.0	17.0

[1] Data include LR-gases.

[2] LP-gases, as used in this section, include LR-(liquid-refinery) gases.

The survey covering sales of LP-gases in the Pacific coast marketing area (district 5) was made by E. T. Knudsen, supervising analyst, Branch of Petroleum Economics, Region II, Bureau of Mines, San Francisco, Calif.

TABLE 11.—Sales of LP-gases [1] in the United States, 1954–55, by districts, States, and uses, in thousand gallons

Districts [2] and States	Domestic and commercial		Gas manufacturing		Industrial		Synthetic rubber	
	1954	1955	1954	1955	1954	1955	1954	1955
District 1:								
Connecticut	20,456	21,891	565	843	14,747	13,409	----	----
Delaware	6,356	6,634	344	1,120	3,630	3,206	----	----
Florida	90,712	102,648	13,683	18,824	4,265	7,117	----	----
Georgia	70,296	71,887	9,518	11,827	4,481	4,903	----	----
Maine	13,879	14,290	1,210	1,399	1,299	1,175	----	----
Maryland & D. C	23,156	23,443	5,467	6,531	2,507	2,908	----	----
Massachusetts	26,256	27,669	4,276	3,658	3,377	2,960	----	----
New Hampshire	11,829	11,276	1,798	2,106	1,392	1,088	----	----
New Jersey	27,604	29,185	4,076	4,716	18,172	37,466	----	----
New York	67,934	72,192	3,995	6,400	12,371	13,161	----	----
North Carolina	55,327	60,764	13,773	13,751	3,405	3,530	----	----
Pennsylvania	36,895	45,554	14,432	13,516	25,567	40,202	----	----
Rhode Island	5,268	5,363	207	139	524	601	----	----
South Carolina	35,985	41,186	3,692	3,853	4,224	5,834	----	----
Vermont	9,233	9,249	2,211	2,354	498	1,072	----	----
Virginia	30,785	33,651	1,551	1,663	3,186	3,246	----	----
West Virginia	6,733	6,578	580	340	2,030	2,346	----	----
Total	538,704	583,460	81,378	93,040	105,675	144,224	----	----
District 2:								
Illinois	115,676	127,973	5,747	9,163	21,978	27,797	2,069	----
Indiana	72,291	78,680	13,822	10,707	12,319	17,959	----	----
Iowa	65,831	76,753	8,602	7,507	10,829	10,746	----	----
Kansas	110,393	117,141	19	----	8,024	29,692	----	----
Kentucky	41,446	43,337	350	----	2,446	3,102	900	----
Michigan	47,074	52,763	6,409	6,556	20,704	25,937	295	----
Minnesota	76,299	80,269	6,061	7,246	6,407	8,116	----	----
Missouri	103,147	111,198	3,230	4,687	6,130	7,009	----	----
Nebraska	60,532	62,573	1,497	1,782	2,879	3,855	----	----
North Dakota	27,473	31,152	1,468	2,343	1,117	1,847	----	----
Ohio	38,860	41,916	2,832	3,607	12,822	13,435	675	----
Oklahoma	139,009	143,828	1,673	900	5,564	11,548	----	----
South Dakota	37,029	39,377	4,647	8,470	1,956	2,613	----	----
Tennessee	25,935	31,496	1,579	1,804	1,927	2,423	98	----
Wisconsin	49,826	57,304	7,014	9,583	33,053	38,019	----	----
Total	1,010,821	1,095,760	64,950	74,355	148,155	204,098	4,037	----
District 3:								
Alabama	56,926	62,276	1,596	1,661	5.423	5,676	----	----
Arkansas	94,286	97,782	----	----	3,913	3,987	----	----
Louisiana	73,862	73,613	180	110	10,922	10,895	37,206	26,910
Mississippi	78,645	83,119	21	250	828	790	----	----
New Mexico	34,755	39,246	4,012	3,081	4,055	4,788	----	----
Texas	373,450	385,567	7,611	5,555	75,644	105,030	248,021	347,579
Total	711,924	741,603	13,420	10,657	100,785	131,166	285,227	374,489
District 4:								
Colorado	64,966	66,856	1,260	1,022	1,451	5,319	----	----
Idaho	9,519	11,875	1,363	1,400	699	1,426	----	----
Montana	18,134	18,634	503	350	1,709	1,290	----	----
Utah	9,292	9,922	1,100	2,280	944	1,645	----	----
Wyoming	22,963	24,723	----	----	1,016	1,121	----	----
Total	124,874	132,010	4,226	5,052	5,819	10,801	----	----
District 5:								
Arizona	16,078	19,224	----	----	3,053	1,190	----	----
California	166,542	164,881	5,884	6,554	5,508	24,941	18,471	31,721
Nevada	8,644	11,569	6,517	6,587	1,238	446	----	----
Oregon	34,102	35,999	8,616	9,591	1,587	3,617	----	----
Washington	15,119	16,873	6,941	7,924	3,301	3,981	----	----
Total	240,485	248,546	27,958	30,656	14,687	34,175	18,471	31,721
Total, United States	2,626,808	2,801,379	191,932	213,760	375,121	524,464	307,735	406,210

[1] Data include LR-gases.
[2] States are grouped according to petroleum-marketing districts rather than geographic regions.

TABLE 11.—Sales of LP-gases [1] in the United States, 1954–55, by districts, States, and uses, in thousand gallons—Continued

Districts and States [2]	Chemical		Internal combustion		All other		Total		Percent of total	
	1954	1955	1954	1955	1954	1955	1954	1955	1954	1955
District 1:										
Connecticut		11	636	625	2,869	2,474	39,273	39,253	4.3	3.4
Delaware	225	243	90	130	22	200	10,667	11,533	1.2	1.0
Florida		191	2,202	2,390	540	660	111,402	131,830	12.2	11.4
Georgia	122	123	2,286	2,238	1,278	1,537	87,981	92,515	9.6	8.0
Maine			41	44	1,320	1,015	17,749	17,923	1.9	1.5
Maryland and D. C.			50	95	102	150	31,282	33,127	3.4	2.9
Massachusetts			163	170	513	463	34,585	34,920	3.8	3.0
New Hampshire					29	34	15,048	14,504	1.7	1.2
New Jersey	21,803	28,308	121	125	461	400	72,237	100,200	7.9	8.6
New York	3,292	3,137	117	783	67	65	87,776	95,738	9.6	8.3
North Carolina	551	561	1,166	1,332	1,545	2,380	75,767	82,318	8.3	7.1
Pennsylvania	7,434	10,795	626	972	63	99	85,017	111,138	9.3	9.6
Rhode Island							5,999	6,103	0.7	0.5
South Carolina	562	616	219	240	627	646	45,309	52,375	5.0	4.5
Vermont						72	11,942	12,747	1.3	1.1
Virginia	40	114	157	213	44	202	35,763	39,089	3.9	3.4
West Virginia	134,860	273,899	625	640	60	55	144,888	283,858	15.9	24.5
Total	168,889	317,998	8,499	9,997	9,540	10,452	912,685	1,159,171	100.0	100.0
District 2:										
Illinois	2,649	1,767	37,395	40,576	393	357	185,907	207,633	12.6	12.6
Indiana	39,006	41,889	5,963	8,007	950	897	144,351	158,139	9.8	9.6
Iowa	42		2,702	3,121	390	465	88,396	98,592	6.0	6.0
Kansas	52		16,756	25,239	522	523	135,766	172,595	9.2	10.5
Kentucky	55,420	57,810	3,310	3,602	37	40	103,909	107,891	7.1	6.6
Michigan	1,504	2,250	3,515	4,347	141	256	79,642	92,109	5.4	5.6
Minnesota			5,653	6,039	590	873	95,010	102,543	6.5	6.2
Missouri		5	5,629	7,403	104	587	118,240	130,889	8.0	8.0
Nebraska	4		5,732	6,627	144	213	70,788	75,050	4.8	4.6
North Dakota			7,712	7,446	129	230	37,899	43,018	2.6	2.6
Ohio	866	155	2,264	2,773	87	448	58,406	62,334	4.0	3.8
Oklahoma	3,277	3,463	29,489	30,465	300	896	179,312	191,100	12.2	11.6
South Dakota		10	2,456	2,350	222	258	46,310	53,078	3.2	3.2
Tennessee	1,542	1,673	1,243	1,983	194	225	32,518	39,604	2.2	2.4
Wisconsin			4,171	4,865	157	442	94,221	110,213	6.4	6.7
Total	104,362	109,022	133,990	154,843	4,360	6,710	1,470,675	1,644,788	100.0	100.0
District 3:										
Alabama			2,366	2,789	77	108	66,388	72,510	3.1	2.8
Arkansas		21	19,523	20,222	971	1,720	118,693	123,732	5.5	4.9
Louisiana	162,777	188,083	25,111	26,508	134	74	310,192	326,193	14.4	12.8
Mississippi	11		14,446	17,499	1,311	1,487	95,262	103,145	4.4	4.1
New Mexico		1,152	26,238	29,154	1,220	1,242	70,280	78,663	3.2	3.1
Texas	547,216	683,026	241,889	302,019	5,524	6,010	1,499,355	1,834,786	69.4	72.3
Total	710,004	872,282	329,573	398,191	9,237	10,641	2,160,170	2,539,029	100.0	100.0
District 4:										
Colorado	75	169	6,619	7,298	199	292	74,570	80,956	49.4	48.9
Idaho			121	120	25	29	11,727	14,850	7.8	9.0
Montana			2,209	2,265			22,555	22,539	14.9	13.6
Utah		10	1,373	1,485	118	124	12,827	15,466	8.5	9.3
Wyoming			5,224	5,883	36	43	29,239	31,770	19.4	19.2
Total	75	179	15,546	17,051	378	488	150,918	165,581	100.0	100.0
District 5:										
Arizona			8,032	9,692			27,163	30,106	6.3	6.2
California	66,909	67,461	49,843	60,364	2,399	3,004	315,556	358,926	73.2	73.5
Nevada			196	220	133	19	16,728	18,841	3.9	3.9
Oregon			1,226	1,123	95	306	45,626	50,636	10.6	10.4
Washington			299	340	352	287	26,012	29,405	6.0	6.0
Total	66,909	67,461	59,596	71,739	2,979	3,616	431,085	487,914	100.0	100.0
Total United States	1,050,239	1,366,942	547,204	651,821	26,494	31,907	5,125,533	5,996,483		

[1] Data include LR-gases.
[2] States are grouped according to petroleum-marketing districts rather than geographic regions.

TABLE 12.—Sales of LP-gases[1] in the United States, 1954–55, by districts and States, in thousand gallons

District and States[2]	Butane		Progene		Mixture		Total LP-gases		Change, percent
	1954	1955	1954	1955	1954	1955	1954	1955	
District 1:									
Connecticut	1,031	659	37,403	38,188	839	406	39,273	39,253	-0.1
Delaware			10,667	11,533			10,667	11,533	8.1
Florida	2,991	1,824	74,043	89,557	34,368	40,449	111,402	131,830	18.3
Georgia	1,561	1,732	57,383	60,628	29,037	30,155	87,981	92,515	5.2
Maine			17,749	17,363		560	17,749	17,923	1.0
Maryland and D. C.	495	317	30,787	32,810			31,282	33,127	5.9
Massachusetts	430	234	34,155	34,686			34,585	34,920	1.0
New Hampshire	84	496	14,539	14,008	425		15,048	14,504	-3.6
New Jersey	22,247	40,634	48,614	55,657	1,376	3,909	72,237	100,200	38.7
New York	3,023	3,972	81,733	88,497	3,020	3,269	87,776	95,738	9.1
North Carolina	968	315	71,619	78,377	3,180	3,626	75,767	82,318	8.6
Pennsylvania	1,676	6,196	82,497	102,292	844	2,650	85,017	111,138	30.7
Rhode Island			5,999	6,103			5,999	6,103	1.7
South Carolina	2,483	5,570	32,230	36,266	10,596	10,539	45,309	52,375	15.6
Vermont	7		11,897	12,661	38	86	11,942	12,747	6.7
Virginia	516	300	35,226	38,717	21	72	35,763	39,089	9.3
West Virginia	14,163	13,799	24,053	12,672	106,672	257,387	144,888	283,858	95.9
Total	51,675	76,048	670,594	730,015	190,416	353,108	912,685	1,159,171	27.0
District 2:									
Illinois	11,025	12,169	165,461	188,936	9,421	6,528	185,907	207,633	11.7
Indiana	5,397	10,333	100,130	110,848	38,824	36,958	144,351	158,139	9.6
Iowa	2,946	1,493	84,466	96,571	984	528	88,396	98,592	11.5
Kansas	14,798	35,606	99,019	110,602	21,949	26,387	135,766	172,595	27.1
Kentucky	2,950	1,830	43,891	46,157	57,068	59,904	103,909	107,891	3.8
Michigan	6,075	7,354	72,597	81,342	970	3,413	79,642	92,109	15.7
Minnesota	1,968	3,215	91,725	99,189	1,317	139	95,010	102,543	7.9
Missouri	3,127	4,479	105,896	117,312	9,217	9,098	118,240	130,889	10.7
Nebraska	5,236	4,737	62,214	66,611	3,338	3,702	70,788	75,050	6.0
North Dakota	929	1,148	34,691	39,819	2,279	2,051	37,899	43,018	13.5
Ohio	4,507	3,654	53,017	58,633	882	47	58,406	62,334	6.7
Oklahoma	22,729	24,014	94,864	100,445	61,719	66,641	179,312	191,100	6.6
South Dakota	1,345	1,521	44,401	51,073	564	484	46,310	53,078	14.6
Tennessee	1,226	1,136	26,547	34,449	4,745	4,019	32,518	39,604	21.8
Wisconsin	17,940	18,133	73,969	89,540	2,312	2,540	94,221	110,213	17.0
Total	102,198	130,822	1,152,888	1,291,527	215,589	222,439	1,470,675	1,644,788	11.8
District 3:									
Alabama	3,201	3,956	27,008	29,414	36,179	39,140	66,388	72,510	9.2
Arkansas	12,019	11,961	48,717	50,545	57,957	61,226	118,693	123,732	4.2
Louisiana	198,391	28,369	31,546	74,461	80,255	223,363	310,192	326,193	5.2
Mississippi	4,851	5,143	34,795	40,308	55,616	57,694	95,262	103,145	8.3
New Mexico	7,602	9,541	39,760	42,979	22,918	26,143	70,280	78,663	11.9
Texas	334,073	428,026	537,494	529,812	627,788	876,948	1,499,355	1,834,786	22.4
Total	560,137	486,996	719,320	767,519	880,713	1,284,514	2,160,170	2,539,029	17.5
District 4:									
Colorado	3,703	2,941	66,828	70,750	4,039	7,265	74,570	80,956	8.6
Idaho	434	382	11,216	14,468	77		11,727	14,850	26.6
Montana	631	464	21,615	22,045	309	30	22,555	22,539	-0.1
Utah	415	980	12,239	14,452	173	34	12,827	15,466	20.6
Wyoming	3,322	3,480	23,643	25,273	2,274	3,017	29,239	31,770	8.7
Total	8,505	8,247	135,541	146,988	6,872	10,346	150,918	165,581	9.7
District 5:									
Arizona			8,542	25,468	18,621	4,638	27,163	30,106	10.8
California	43,311	62,461	196,659	204,584	75,586	91,881	315,556	358,926	13.7
Nevada			15,355	18,661	1,373	180	16,728	18,841	12.6
Oregon			44,679	49,035	947	1,601	45,626	50,636	11.0
Washington		966	24,734	26,774	1,278	1,665	26,012	29,405	13.0
Total	43,311	63,427	289,969	324,522	97,805	99,965	431,085	487,914	13.2
Total United States sales	765,826	765,540	2,968,312	3,260,571	1,391,395	1,970,372	5,125,533	5,996,483	17.0
Exports[3][4]							[r]164,308	177,708	8.2
Grand total							[r]5,289,841	6,174,191	16.7

[1] Data include LR-gases.
[2] States are grouped according to petroleum-marketing districts rather than geographic regions.
[3] Not available by the different gases.
[4] Converted from pounds to gallons at 4.5 pounds per gallon.
[r] Revised.

STOCKS

Stocks of natural-gas liquids at plants and terminals decreased 20 million gallons in 1955. The last such decrease in stocks occurred in 1952. The decrease was general at both plants and terminals for the various natural-gas liquids. Of the total of 569.7 million gallons of natural-gas liquids in storage, as of December 1955, 132 million gallons was in underground storage.

TABLE 13.—Stocks of natural-gas liquids in the United States, 1951–54 and 1955, by months, in thousand gallons

Date	Natural gasoline		LP-gases		Other products		Total		
	At plants and terminals	At refineries	At plants and terminals	At refineries	At plants and terminals	At refineries	At plants and terminals	At refineries	Grand total
Dec. 31:									
1951	111,426	94,752	53,256	11,718	68,166	4,494	232,848	110,964	343,812
1952	84,462	69,426	92,022	15,120	63,924	2,940	240,408	87,486	327,894
1953	126,924	60,312	157,164	13,986	75,978	3,612	360,066	77,910	437,976
1954	95,021	76,650	286,352	22,176	100,545	8,862	481,918	107,688	589,606
1955									
Jan. 31	108,037	64,302	239,661	18,228	104,150	10,500	451,848	93,030	544,878
Feb. 28	111,367	68,922	195,417	18,270	101,332	8,862	408,116	96,054	504,170
Mar. 31	122,854	67,704	219,402	16,548	102,464	8,820	444,720	93,072	537,792
Apr. 30	126,648	69,804	250,082	19,362	90,724	8,694	467,454	97,860	565,314
May 31	120,917	75,978	322,644	19,488	80,348	9,618	523,909	105,084	628,993
June 30	100,183	90,132	384,244	21,546	77,952	11,676	562,379	123,354	685,733
July 31	116,815	76,650	433,348	22,806	79,279	8,316	629,442	107,772	737,214
Aug. 31	116,431	73,794	456,964	21,504	82,138	7,182	655,533	102,480	758,013
Sept. 30	104,326	73,248	455,080	21,462	80,486	7,014	639,892	101,724	741,616
Oct. 31	103,358	74,004	474,795	19,614	83,776	6,510	661,929	100,128	762,057
Nov. 30	94,226	73,206	415,468	17,472	82,826	7,686	592,520	98,364	690,884
Dec. 31	92,047	73,752	281,649	18,480	96,299	7,476	469,995	99,708	569,703

PRICES

The average posted price of grade 26–70 natural gasoline to blenders f. o. b. group 3 basis was 5.13 cents per gallon in 1955, 0.26 cent per gallon above 1954. The posted price changed very little during the year, ranging from 5.5 cents to 6.0 at the end of the year. Producers' realization from all natural-gasoline sales averaged 7.0 cents per gallon in 1955 compared with 7.24 cents in 1954.

The average posted price of propane f. o. b. Houston, Tex., was 3.19 cents per gallon, compared with 3.28 cents per gallon in 1954. The average value received by producers for all LP-gases declined slightly in 1955, averaging 3.27 cents per gallon compared with 3.28 cents per gallon in 1954.

FOREIGN TRADE [2]

Exports of LP-gases increased 8 percent in 1955, primarily because of much larger shipments to Mexico. Shipments to Brazil decreased sharply. Shipments to Canada, our other major export customer, decreased only 3 percent from 1954.

Exports of natural gasoline declined sharply—78 percent—in 1955, with Canada receiving all of the volume.

[2] Figures on exports compiled by Mae B. Price and Elsie D. Page, of the Bureau of Mines, from records of the U. S. Department of Commerce.

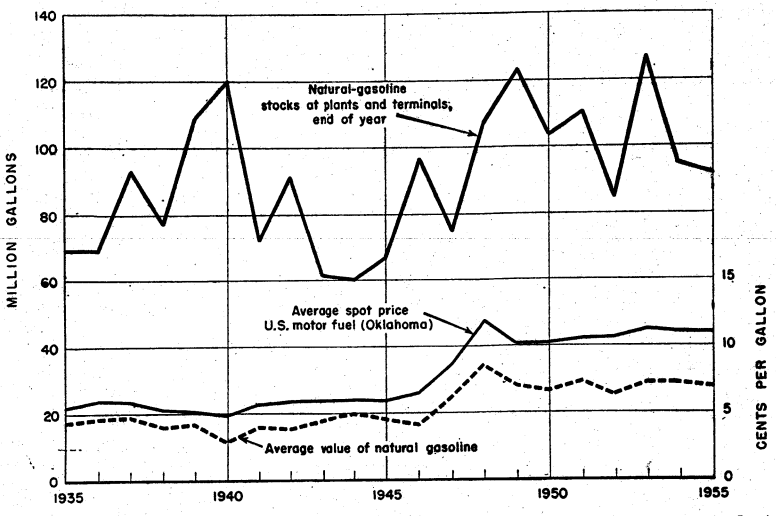

FIGURE 2.—Average value of natural gasoline, spot price of gasoline, and stocks of natural gasoline, 1935–55.

TABLE 14.—LP gases [1] exported from the United States, 1946–50 (average) and 1951–55, by countries, in thousand gallons [2]

[U. S. Department of Commerce]

	1946–50 (average)	1951	1952	1953	1954	1955
North America:						
Canada-Newfoundland-Labrador	30,775	43,293	42,951	56,155	58,330	56,826
Cuba	412	2,228	3,453	4,719	5,865	6,416
Mexico	17,892	31,977	40,003	49,567	72,994	95,398
Other North America	487	907	1,092	1,324	1,608	3,203
Total	49,566	78,405	87,499	111,765	138,797	161,843
South America:						
Brazil	2,334	6,413	11,046	12,469	24,657	13,668
Other South America	140	4	7	1	145	492
Total	2,474	6,417	11,053	12,470	24,802	14,160
Europe:						
France	933	1,266	1	13	7	93
Germany	(3)			[4] 1	[4] 1	[4] 333
Other Europe	139	8	11	14	30	146
Total	1,072	1,274	12	28	38	572
Asia:						
Japan	15	161	27	(3)	250	461
Philippines	543	783	528	243	269	399
Other Asia	33	32	(3)	(3)	24	2
Total	591	976	555	243	543	862
Africa	54	128	109	162	87	149
Oceania	41	45	68	81	41	122
Grand total	53,798	87,245	99,296	124,749	164,308	177,708

[1] Data include LR-gases.
[2] 4.5 pounds=1 gallon.
[3] Less than 500 gallons.
[4] West Germany.

TABLE 15.—Natural gasoline exported from the United States, 1946–50 (average) and 1951–55, by countries, in thousand gallons

[U. S. Department of Commerce]

	1946–50 (average)	1951	1952	1953	1954	1955
North America:						
Canada	54, 524	30, 024	26, 631	34, 186	24, 854	5, 447
Mexico	173	4	----------	18	16	----------
Netherlands Antilles	17, 446	4, 285	24, 049	5, 604	----------	----------
Trinidad and Tobago	2, 723	----------	----------	----------	----------	----------
Other North America	17	----------	----------	----------	38	----------
Total	74, 883	34, 313	50, 680	39, 808	24, 908	5, 447
Europe:						
Italy	----------	616	638	----------	----------	----------
United Kingdom	58, 760	----------	----------	----------	----------	----------
Other Europe	4, 149	34	----------	----------	----------	----------
Total	62, 909	650	638	----------	----------	----------
Asia	1, 141	----------	----------	----------	----------	----------
Africa	18	19	----------	----------	----------	----------
Oceania:						
Australia	6, 374	29, 843	15, 472	----------	----------	----------
New Zealand	----------	4, 094	2, 316	----------	----------	----------
Other Oceania	213	----------	----------	----------	----------	----------
Total	6, 587	33, 937	17, 788	----------	----------	----------
Grand total	145, 538	68, 919	69, 106	39, 808	24, 908	5, 447

Crude Petroleum and Petroleum Products

By Alfred G. White, Albert T. Coumbe, Donald S. Colby, and Emma M. Seeley

GENERAL SUMMARY

TOTAL DEMAND [1] for petroleum and petroleum products set another record in 1955, increasing 8.2 percent as compared with 1.4 percent in 1954. Outstanding factors in 1955 were recovery of industrial operations and their fuel requirements from the slump in 1954 and the improvement in the demand for heating oils due to more normal weather. Total exports increased 2.7 percent and domestic demand 8.4 percent.

Exports of oil fluctuate with the available supplies abroad, the competitive position of American companies in foreign markets, and problems of dollar exchange. Total exports increased 2.7 percent; exports of crude petroleum decreased about 16 percent; and product exports increased about 5 percent. The continued decrease in crude exports was related to expanding domestic crude supply in Canada. Exports of refined products increased chiefly because accumulated stocks of residual fuel in California were liquidated.

The increase of 8.4 percent in the domestic demand for petroleum and petroleum products in continental United States was well above the gain of only 2.1 percent in 1954 and also above the average annual gain of nearly 6 percent since 1946. This high gain for 1955 was in part a return to a more normal level after the slump in 1954.

In 1955 the percentage increase in each quarter was higher than the increase of each preceding quarter when compared with 1954.

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[1] Certain terms, as utilized in this chapter, are unique to the petroleum industry. Principal terms, and their meanings, are as follows:

Total demand.—A derived figure representing total new supply plus decreases or minus increases in reported stocks. Because substantial quantities of secondary and consumers' stocks are not reported to the Bureau of Mines, this figure varies considerably from consumption.

Domestic demand.—Total demand less exports.

New supply of all oils.—The sum of crude oil, natural-gas liquids, and benzol (coke-oven), used for motor fuel production, imports of crude oil and other petroleum products.

Transfers.—Crude oil conveyed to fuel oil stocks without processing, or reclassification of products from one product category to another.

All oils.—Crude petroleum, natural-gas liquids, and their derivatives.

Principal products.—Gasoline, kerosine, distillate fuel oil, and residual fuel oil.

Exports.—Total shipments from continental United States, including shipments to United States Territories and possessions.

Barrels.—42 gallons per barrel.

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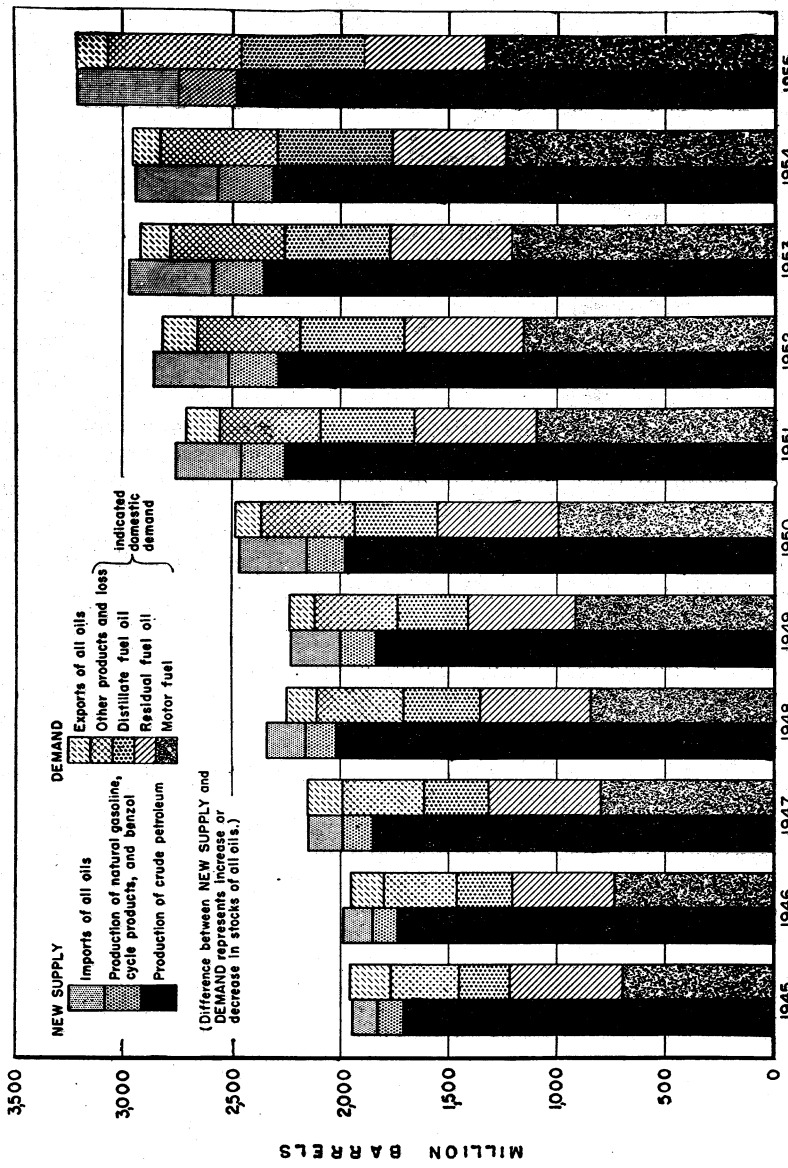

FIGURE 1.—Supply and demand of all oils in the United States, 1945–55.

The total new supply of all oils amounted to 3,205 million barrels, a gain of 8.6 percent. Total imports represented 14.2 percent of new supply, compared with 13.0 percent in 1954. Total stocks declined only 0.1 million barrels, compared with the decrease of 10.6 million barrels in 1954.

TABLE 1.—Salient statistics of crude petrolum, refined products, and natural-gas liquids in the United States, 1951–55 [1]

	1951	1952	1953	1954	1955 [2]
Crude petroleum:					
Domestic production.....thousand barrels..	2,247,711	2,289,836	2,357,082	2,314,988	2,484,521
World production.....do....	4,282,730	4,504,708	4,786,989	5,006,205	5,634,412
United States proportion of production.....percent..	52	51	49	46	44
Imports [3].....thousand barrels..	179,073	209,591	236,455	239,479	285,421
Exports [4].....do....	26,604	26,696	19,931	13,599	11,471
Stocks, end of year.....do....	255,783	271,928	274,445	258,385	265,610
Runs to stills.....do....	2,370,404	2,441,865	2,554,865	2,539,564	2,730,218
Total value of domestic production.....thousand dollars..	5,690,410	5,785,230	6,327,100	6,424,930	6,870,690
Average price per barrel at wells....	$2.53	$2.53	$2.68	$2.78	$2.77
Total producing oil wells in the United States, Dec 31....	474,990	488,520	498,940	511,200	524,010
Total oil wells completed in the United States during year (successful wells)....	23,453	23,466	25,762	29,773	31,567
Refined products:					
Imports [4].....thousand barrels..	129,121	138,916	141,044	144,476	170,373
Exports [4].....do....	125,448	131,492	126,660	116,134	121,772
Stocks, end of year [5].....do....	370,140	394,019	440,634	442,510	435,685
Output of gasoline.....do....	1,140,843	[6] 1,178,027	[6] 1,266,376	[6] 1,261,304	[6] 1,361,323
Yield of gasoline.....percent..	42.4	42.4	43.9	43.8	44.0
Number of refineries, end of year....	350	343	337	326	318
Daily crude-oil capacity of refineries.....thousand barrels..	7,333	7,639	8,007	8,421	8,632
Average dealers' net price (excluding tax) of gasoline in 50 United States cities.....cents per gallon [7]..	15.33	15.27	15.95	16.19	16.18
Natural-gas liquids:					
Production.....thousand barrels..	204,754	223,515	238,579	252,133	263,976
Stocks, end of year.....do....	8,186	7,807	10,428	14,038	13,564

[1] Data, including imports and exports, are for continental United States.
[2] Preliminary figures.
[3] Bureau of Mines.
[4] U. S. Department of Commerce, except Alaska and Hawaii, which are Bureau of Mines data. Exports include shipments to Territories.
[5] For 1951 and succeeding years, definition of bulk terminals for reporting purposes was redefined as follows:
1. All bulk installations that receive their supplies by tankers, barges, or pipelines.
2. Any other storage point with a combined capacity of 50,000 barrels or more, regardless of the means of transporting products.
[6] Excluding jet fuel.
[7] American Petroleum Institute.

DEMAND BY PRODUCTS

As over 99 percent of crude-oil consumption in continental United States was converted into products at refineries before sale to ultimate consumers, the analysis of demand trends involves consideration of each of the major products. The fuel oils (residual, distillate, and kerosine) compete directly with natural gas or coal in heating, cooking, and industrial uses. Gasoline and diesel fuel are the chief fuels used in transportation. The other products serve a wide variety of uses, in competition with other oil products as fuels and in special uses outside the fuels field. Because of rapid increase in the military use of jet fuel (a blend of low-grade gasoline, kerosine, and distillate), data for that product have been compiled separately since 1951.

TABLE 2.—Supply and demand of all oils [1] in continental United States, 1953 (total) and 1954–55, by months

(Thousand barrels)

	1954													1953
	January	February	March	April	May	June	July	August	September	October	November	December	Total	Total
New supply:														
Domestic production:														
Crude petroleum	193,437	178,644	201,763	198,502	200,627	194,974	194,098	190,388	184,325	189,724	190,372	198,134	2,314,988	2,357,082
Natural-gas liquids	21,667	20,067	21,483	20,147	20,688	20,104	20,221	20,235	20,603	21,792	22,036	23,090	252,133	238,579
Benzol, etc	34	35	38	34	22	57	45	46	52	43	48	53	507	505
Total production	215,138	198,746	223,284	218,683	221,337	215,135	214,364	210,669	204,980	211,559	212,456	221,277	2,567,628	2,596,166
Imports:														
Crude petroleum [2]	19,141	17,395	20,260	17,229	21,957	18,728	22,448	20,589	20,168	19,893	19,082	22,589	239,479	236,455
Refined products [2]	14,815	14,234	13,204	10,882	9,200	10,749	9,208	8,764	9,349	12,389	14,000	17,682	144,476	141,044
Total new supply	249,094	230,375	256,748	246,794	252,494	244,612	246,020	240,022	234,497	243,841	245,538	261,548	2,951,583	2,973,665
Increase (+) or decrease (−) in stocks	−28,473	−6,991	−2,688	+11,771	+29,183	+10,681	+14,170	+5,773	+3,012	+3,365	−13,458	−36,919	−10,574	+51,753
Demand:														
Total demand	277,567	237,366	259,436	235,023	223,311	233,931	231,850	234,249	231,485	240,476	258,996	298,467	2,962,157	2,921,912
Exports: [3]														
Crude petroleum	1,587	795	873	1,418	1,258	1,372	1,073	1,349	509	1,521	1,047	797	13,599	19,931
Refined products	8,578	8,964	8,911	10,150	10,729	10,891	10,416	8,852	8,725	9,786	10,602	9,530	116,134	126,660
Domestic demand:														
Gasoline	89,208	85,653	100,838	103,412	103,403	112,939	111,515	109,620	103,858	105,026	101,316	103,807	1,230,595	1,205,775
Kerosine	18,298	12,712	12,973	6,857	4,831	4,595	4,907	6,219	6,514	9,334	12,686	18,385	118,311	114,467
Distillate fuel oil	74,695	52,767	54,022	38,123	28,878	27,225	26,896	29,200	32,590	34,887	51,234	75,830	526,347	488,075
Residual fuel oil	53,736	46,674	48,798	42,178	38,994	37,753	35,669	37,050	38,904	42,451	46,055	54,055	522,317	560,474
Lubricants	2,997	2,808	3,589	3,320	3,207	3,190	3,418	3,372	3,307	3,285	3,083	2,961	38,537	40,497
Miscellaneous	28,468	26,993	29,432	29,565	32,011	35,966	37,956	38,587	37,078	34,186	32,973	33,102	396,317	366,033
Total domestic demand	267,402	227,607	249,652	223,455	211,324	221,668	220,361	224,048	222,251	229,169	247,347	288,140	2,832,424	2,775,321
Stocks:														
Crude petroleum	268,531	264,629	269,620	278,055	280,050	282,888	282,665	277,929	272,502	267,346	264,566	258,385	258,385	274,445
Natural-gas liquids	10,334	10,575	11,447	12,295	13,871	14,998	15,703	15,379	15,358	15,868	15,168	14,038	14,038	10,428
Refined products	418,169	414,839	406,288	408,776	434,388	441,104	454,792	465,625	474,085	482,096	472,118	442,510	442,510	440,634
Total stocks	697,034	690,043	687,355	699,126	728,309	738,990	753,160	758,933	761,945	765,310	751,852	714,933	714,933	725,507

	1955[4]													1954
	January	February	March	April	May	June	July	August	September	October	November	December	Total	Total
New supply:														
Domestic production:														
Crude petroleum	209,600	191,392	213,454	206,600	206,983	198,389	205,600	206,604	201,919	211,770	210,406	221,804	2,484,521	2,314,988
Natural-gas liquids	23,127	21,023	22,309	20,571	20,779	20,167	21,053	21,663	21,801	23,172	23,608	24,703	263,976	252,133
Benzol, etc	62	36	72	65	55	40	30	40	34	27	24	41	526	507
Total production	232,789	212,451	235,835	227,236	227,817	218,596	226,683	228,307	223,754	234,969	234,038	246,548	2,749,023	2,567,628
Imports:														
Crude petroleum[2]	22,922	21,033	22,989	20,907	23,017	22,934	25,788	23,406	24,882	25,439	24,685	27,419	285,421	239,479
Refined products[3]	18,872	17,566	17,902	12,787	12,222	11,840	9,050	12,414	11,655	11,957	14,964	19,144	170,373	144,476
Total new supply	274,583	251,050	276,726	260,930	263,056	253,370	261,521	264,127	260,291	272,365	273,687	293,111	3,204,817	2,951,583
Increase (+) or decrease (−) in stocks	−13,756	−16,854	+2,107	+15,929	+16,708	+1,648	+16,189	+627	+8,636	+14,123	−11,180	−34,251	−74	−10,574
Demand:														
Total demand	288,339	267,904	274,619	245,001	246,348	251,722	245,332	263,500	251,655	258,242	284,867	327,362	3,204,891	2,962,157
Exports:[3]														
Crude petroleum	381	976	771	1,431	1,166	1,053	887	1,191	832	871	872	1,040	11,471	13,599
Refined products	9,677	9,263	9,479	9,269	11,070	10,575	11,229	11,707	10,322	10,880	8,467	9,834	121,772	116,134
Domestic demand:														
Gasoline	96,397	88,464	105,684	111,116	115,707	120,710	115,653	121,816	113,379	112,558	109,212	111,034	1,321,730	1,230,595
Kerosine	17,071	15,003	10,940	5,799	3,878	4,374	5,436	6,116	7,036	9,087	13,473	18,602	116,815	118,311
Distillate fuel oil	73,801	68,513	58,252	37,177	31,726	29,994	28,359	33,781	37,290	38,848	59,700	83,910	581,351	526,347
Residual fuel oil	55,880	51,386	51,475	43,668	41,848	40,754	38,919	41,287	37,866	42,583	51,219	60,538	557,423	522,317
Lubricants	3,180	2,901	3,665	3,589	3,766	3,750	3,488	3,986	3,572	3,720	3,713	3,150	42,480	38,537
Miscellaneous	31,952	31,398	34,353	32,952	37,187	40,512	41,361	43,616	41,358	39,695	38,211	39,254	451,849	396,317
Total domestic demand	278,281	257,665	264,369	234,301	234,112	240,094	233,216	250,602	240,501	246,491	275,528	316,488	3,071,648	2,832,424
Stocks:														
Crude petroleum	260,156	258,630	264,430	275,232	276,948	270,850	264,601	256,427	256,269	259,201	260,707	265,610	265,610	258,385
Natural-gas liquids	12,973	12,004	12,805	13,460	14,976	16,327	17,553	18,048	17,658	18,144	16,450	13,564	13,564	14,038
Refined products	428,048	413,689	409,195	413,667	427,143	433,538	454,750	463,056	472,240	482,945	471,953	435,685	435,685	442,510
Total stocks	701,177	684,323	686,430	702,359	719,067	720,715	736,904	737,531	746,167	760,290	749,110	714,859	714,859	714,933

[1] For definition of this and other terms used in the petroleum industry, see text footnote 1 at the beginning of this chapter.
[2] Bureau of Mines.
[3] U. S. Department of Commerce, except for exports to Alaska and Hawaii, which are Bureau of Mines data.
[4] Preliminary figures.

TABLE 3.—Demand for all oils[1] in continental United States, 1946–55

(Million barrels)

Year	Domestic demand	Exports	Total demand	Year	Domestic demand	Exports	Total demand
1946	1,792.8	153.1	1,945.9	1951	2,569.8	154.1	2,723.9
1947	1,989.8	164.5	2,154.3	1952	2,664.4	158.2	2,822.6
1948	2,113.7	134.7	2,248.4	1953	2,775.3	146.6	2,921.9
1949	2,118.2	119.4	2,237.6	1954	2,832.4	129.7	2,962.1
1950	2,375.1	111.3	2,486.4	1955[2]	3,071.7	133.2	3,204.9

[1] See text footnote 1 at beginning of this chapter.
[2] Preliminary figures.

Gasoline.—This product represented 42.3 percent of the total demand for all oils in 1955 compared with 42.7 percent in 1954. The decline in the percentage of gasoline relative to the total demand for all oils was not due to a poor gasoline market but to the stronger demand for heating oils and miscellaneous products. All figures for aviation gasoline and commercial naphthas are included in the total.

Residual Fuel Oil.—Total demand increased 7.6 percent, including gains of 24.7 percent in exports and 6.7 percent in domestic demand. This total-demand increase primarily offset the decline in 1954.

The major factors in supply were the stock reduction of 17.6 million barrels in the California district and the increase of almost 32 million barrels in imports in the East Coast district. The California district provided the entire increase in exports and the extraordinary increase of almost 10 million barrels in intercoastal shipments to the east coast. The refinery yield of residual fuel continued to decline from 16.4 percent in 1954 to 15.3 percent in 1955.

Distillate Fuel Oil.—The total demand for distillate fuel increased 10.0 percent in 1955, including gains of 0.7 percent in exports and 10.5 percent in domestic demand. Heating oils constituted 58.4 percent of domestic distillate sales in 1955, compared with 54.7 percent in 1953. Although part of the increase was due to additional installations, the weather was an important factor, varying from unusually mild temperatures in 1953 to about normal in 1955.

Kerosine.—Total demand for kerosine declined 2.4 percent in 1955, including decreases of over 31 percent in exports and 1.3 percent in domestic demand. In 1955 about 73 percent of kerosine was sold for household uses. The use of natural gas and electricity and the substitution of No. 1 distillate and liquefied gases for kerosine caused the downward trend in demand.

Other Products.—The total demand for all other products includes crude exports and losses. Domestic demand for other products increased 13.7 percent in 1955; gains for all products were included. Exports of crude oil declined.

Shipments to United States Territories and Possessions.—Domestic demand includes only continental United States. Shipments from the United States to Territories and possessions are included with exports. Any foreign receipts in these areas are not included in the total imports shown. To arrive at domestic demand in these areas, a small reexport must be deducted.

TABLE 4.—Shipment of petroleum products to United States Territories and possessions, 1954–55 [1]

(Thousand barrels)

	1954			1955 [2]		
	From continental United States	Foreign	Total	From continental United States	Foreign	Total
Gasoline	7,876	164	8,040	8,647	294	8,941
Kerosine	860		860	844		844
Distillate fuel oil	2,527	1,063	3,590	2,973	677	3,650
Residual fuel oil	5,962	3,159	9,121	5,799	3,350	9,149
Lubricants:						
Grease	4		4	5		5
Oil	183		183	195		195
Coke	62		62	54		54
Asphalt	269	27	296	90	28	118
Liquefied gases	41		41	46		46
Total	17,784	4,413	22,197	18,653	4,349	23,002

[1] Source: U. S. Department of Commerce, except for imports to Alaska and Hawaii from continental United States, which are Bureau of Mines data.
[2] Preliminary figures.

SCOPE OF REPORT

This report deals primarily with the statistics of production, refining, distribution, and indicated consumption of crude petroleum and refined products in continental United States. The objective of the limitation to continental United States is to permit a breakdown and balancing of supply and demand by States and districts. The composition of the districts used by the Bureau of Mines is explained in the next section.

The increasing volume of natural-gas liquids recovered from natural gas has made it necessary to include them with the crude-oil data, as they are either blended with refinery products or are identical with materials recovered from refinery gases. These natural-gas liquids are recovered at special plants away from the oil refineries.

Most of the data were compiled by the Bureau of Mines from detailed reports, submitted on a voluntary basis by the various companies. These data are published monthly for release about 6 weeks after the end of the month. Complete coverage, with only minor estimates, was procured for production, stocks, and refinery operations. The Bureau of Mines used import data as reported by refineries for crude oil and unfinished oils. Other product imports and all export data were taken from the records of the United States Department of Commerce.

The impossibility of contacting many small producers to obtain current monthly data for crude-oil production makes necessary the use of pipeline-company reports. These companies report by States of origin, stocks on leases, oil taken from the leases, pipeline and tank-farm stocks, and crude deliveries. These data are cross-checked against reports from refineries showing crude receipts, States of origin, and method of transportation. These reports include information covering final receipts by boat, tank car, and trucks and cover stocks of crude oil, by States of origin, held at refineries. These data are

checked further against available current and annual production figures collected by State agencies and supplemented by estimates of unreported lease stocks. The Bureau of Mines crude-production figure includes some field condensate dumped in crude lines that cannot be identified when received at refineries and included with the crude runs reported.

Individual refineries reported, monthly, receipts input, stocks at the beginning and end of the month, refinery production, and deliveries. Data on both product stocks at refineries and pipeline and bulk terminal stocks are collected.

Annual canvasses provide supplemental information on value of crude petroleum at the well, number of producing oil wells, sales of fuel oils by uses, and refinery capacity. The table showing world production of crude oil by countries is based on monthly reports that also include data on crude movements and refinery operations. Data on crude reserves, wells drilled, and current prices were taken from sources indicated in the footnotes.

The tables on "Relative Rate of Growth of Coal, Petroleum, Natural Gas, and Waterpower," which appeared in the Bituminous Coal and Lignite chapter of the Minerals Yearbook in previous years, will be found for 1955 in the Review of the Mineral-Fuel Industries chapter of volume III.

DISTRICTS

The Bureau of Mines reported production of crude petroleum and natural-gas liquids and the number of wells drilled by States. The State of Louisiana, New Mexico, and Texas were also reported by districts.

Louisiana is divided into a Northern Louisiana district and a Louisiana Gulf Coast district. The Gulf Coast district includes Vernon, Rapides, Avoyelles, Pointe Coupee, West Feliciana, East Feliciana, Tangipahoa, St. Helena, and Washington Parishes and all parishes in the State south of these. All parishes not included in the Gulf Coast district are in the Northern Louisiana district.

New Mexico has two widely separated producing areas. The Southeastern district in the southeastern corner of the State comprises mainly Lea, Eddy, Chaves, and Roosevelt Counties. The Northwestern district in the northwestern corner of the State comprises mainly San Juan, Rio Arriba, Sandoval, and McKinley Counties.

The Bureau of Mines production districts in Texas correspond, with one exception, to groupings of the Texas Railroad Commission districts.

Bureau of Mines district:	*Railroad Commission district:*
Gulf Coast	No. 2 and No. 3
West Texas	No. 7C and No. 8
East proper	Part of No. 6 (East Texas field in Cherokee, Smith, Upshur, Rush, and Gregg Counties)
Panhandle	No. 7B and No. 9
Rest of State	No. 1
North	No. 4
Central	No. 5 and No. 6 (exclusive of East proper)
South	
Other East Texas	

The Bureau of Mines groups refinery operations into another set of districts called "Refining districts". These refining districts correspond with the grouping originated by the Petroleum Administration for War during World War II and called PAW districts.

PAW district	*Refining district*
1	**East Coast**—District of Columbia and Maine, New Hampshire, Vermont, Massachusetts, Rhode Island, Connecticut, New Jersey, Delaware, Maryland, Virginia, North Carolina, South Carolina, Georgia, Florida, and the following counties of New York: Cayuga, Tompkins, Chemung and all counties east and north thereof, and the following counties in Pennsylvania: Bradford, Sullivan, Columbia, Montour, Northumberland, Dauphin, York, and all counties east thereof.
1	**Appalachian No. 1**—West Virginia and those parts of Pennsylvania and New York not included in the East Coast district.
2	**Appalachian No. 2**—The following counties of Ohio: Erie, Huron, Crawford, Marion, Delaware, Franklin, Pickaway, Ross, Pike, Scioto, and all counties east thereof.
2	**Indiana-Illinois-Kentucky**—Indiana, Illinois, Kentucky, Tennessee, Michigan, Wisconsin, Minnesota, and that part of Ohio not included in the Appalachian district.
2	**Oklahoma-Kansas-Missouri**—Oklahoma, Kansas, Missouri, Nebraska, Iowa, North Dakota, and South Dakota.
3	**Texas Inland**—Texas, except the Texas Gulf Coast district.
3	**Texas Gulf Coast**—The following counties of Texas: Newton, Orange, Jefferson, Jasper, Tyler, Hardin, Liberty, Chambers, Polk, San Jacinto, Montgomery, Harris, Galveston, Waller, Fort Bend, Brazoria, Wharton, Matagorda, Jackson, Victoria, Calhoun, Refugio, Aransas, San Patricio, Nueces, Kleberg, Kenedy, Willacy, and Cameron.
3	**Louisiana Gulf Coast**—The following parishes of Louisiana: Vernon, Rapides, Avoyelles, Pointe Coupee, West Feliciana, East Feliciana, Tangipahoa, St. Helena, Washington, and all parishes south thereof. Also the following counties of Mississippi: Pearl River, Stone, George, Hancock, Harrison, and Jackson, and Mobile and Baldwin counties, Ala.
3	**North Louisiana-Arkansas**—Arkansas and those parts of Louisiana, Mississippi and Alabama not included in the Lousiana Gulf Coast district.
3	**New Mexico**—New Mexico.
4	**Rocky Mountain**—Montana, Idaho, Wyoming, Utah, and Colorado.
5	**California**—Washington, Oregon, California, Nevada, and Arizona.

WORLD OIL SUPPLY

Again in 1955 production and refining of crude oil and demand for petroleum products increased at a faster rate in the rest of the world than in the United States. The United States produced 44.1 percent of the world's crude oil in 1955 compared with 46.4 percent in 1954. Production in the rest of the world increased 17.0 percent compared with 1954; in the United States output increased 1.3 percent.

The United States refined 49.2 percent of the world crude oil in 1955 compared with 51.1 percent in 1954. Crude runs to stills increased at a faster rate in the Middle East, in South America, and in the U. S. S. R., according to estimated figures, than in the United States.

RESERVES

The Committee on Petroleum Reserves of the American Petroleum Institute estimated proved reserves of crude oil in the United States to be 30.0 billion barrels on December 31, 1955. These estimates include only oil recoverable under existing economic and operating conditions.

TABLE 5.—Estimates of proved oil reserves in the United States, on Dec. 31, 1948–55, by States [1]

(Million barrels)

State	1948	1949	1950	1951	1952	1953	1954	1955
Eastern States:								
Illinois	393	468	564	646	619	625	658	691
Indiana	49	50	57	51	56	62	67	62
Kentucky	59	56	56	59	56	82	85	107
Michigan	69	66	79	64	57	61	60	59
New York	67	63	59	57	53	49	46	43
Ohio	29	28	27	26	27	32	37	56
Pennsylvania	110	103	106	95	122	111	102	93
West Virginia	37	38	39	39	37	36	37	47
Total	813	872	987	1,037	1,027	1,058	1,092	1,158
Central and Southern States:								
Arkansas	300	297	342	337	352	358	351	330
Kansas	674	738	732	792	917	913	979	998
Louisiana	1,869	1,910	[2] 2,185	[2] 2,285	[2] 2,558	[2] 2,760	[2] 2,962	[2] 3,255
Mississippi	365	403	386	385	359	350	412	388
Nebraska	1	2	10	16	22	26	38	57
New Mexico	552	592	592	612	733	815	806	820
North Dakota				5	76	128	134	185
Oklahoma	1,250	1,330	1,397	1,476	1,558	1,752	1,955	2,016
Texas	12,484	13,510	[2] 13,581	[2] 15,315	[2] 14,916	[2] 14,999	[2] 14,982	[2] 14,934
Total	17,495	18,782	19,225	21,223	21,491	22,101	22,619	22,983
Mountain States:								
Colorado	366	345	339	325	306	319	329	334
Montana	119	112	111	108	156	209	272	299
Utah	1	16	22	30	42	38	36	37
Wyoming	716	692	841	973	1,065	1,279	1,304	1,374
Total	1,202	1,165	1,313	1,436	1,569	1,845	1,941	2,044
Pacific Coast States:								
California	3,764	3,823	[2] 3,734	[2] 3,761	[2] 3,854	[2] 3,920	[2] 3,889	[2] 3,801
Other States [3]	6	7	9	11	20	21	20	26
Total United States	23,280	24,649	25,268	27,468	27,961	28,945	29,561	30,012

[1] From reports of Committee on Petroleum Reserves, American Petroleum Institute. Includes crude oil that may be extracted by present methods from fields completely developed or sufficiently explored to permit reasonably accurate calculations. The change in reserves during any year represents total new discoveries, extensions, and revisions, minus production.

[2] Includes offshore reserves.

[3] Includes Alabama, Arizona, Florida, Missouri, Nevada, South Dakota, Tennessee, and Virginia.

CRUDE PETROLEUM

SUPPLY AND DEMAND

The new supply of crude petroleum in the United States is derived primarily from domestic production but has been augmented by increasing imports. Crude imports, which comprised 9.4 percent of crude supply in 1954 rose to 10.3 percent in 1955. In both 1954 and 1955, virtually the entire production of crude petroleum was refined; the remainder comprised exports, fuel, and losses.

TABLE 6.—Supply and demand [1] for crude petroleum in continental United States, 1951–55

(Thousand barrels)

	1951	1952	1953	1954	1955 [2]
Production	2,247,711	2,289,836	2,357,082	2,314,988	2,484,521
Imports [3]	179,073	209,591	236,455	239,479	285,421
Total new supply	2,426,784	2,499,427	2,593,537	2,554,467	2,769,942
Increase (+) or decrease (−) in stocks, end of year	7,320	16,145	2,517	−16,060	7,225
Demand:					
Domestic crude	2,237,305	2,276,691	2,357,423	2,331,269	2,478,982
Foreign crude	182,159	206,591	233,597	239,258	283,735
Total demand	2,419,464	2,483,282	2,591,020	2,570,527	2,762,717
Runs to stills:					
Domestic	2,188,677	2,235,198	2,321,820	2,300,766	2,446,833
Foreign	181,727	206,061	233,045	238,798	283,385
Exports [4]	28,604	26,696	19,931	13,599	11,471
Transfers to fuel oil:					
Distillate	2,863	2,705	1,966	1,500	1,347
Residual	6,006	6,343	5,617	5,924	5,559
Other fuel and losses	11,587	6,279	8,641	9,940	14,122
Total demand	2,419,464	2,483,282	2,591,020	2,570,527	2,762,717

[1] For definition, see text footnote at the beginning of this chapter.
[2] Preliminary figures.
[3] Bureau of Mines data.
[4] U. S. Department of Commerce.

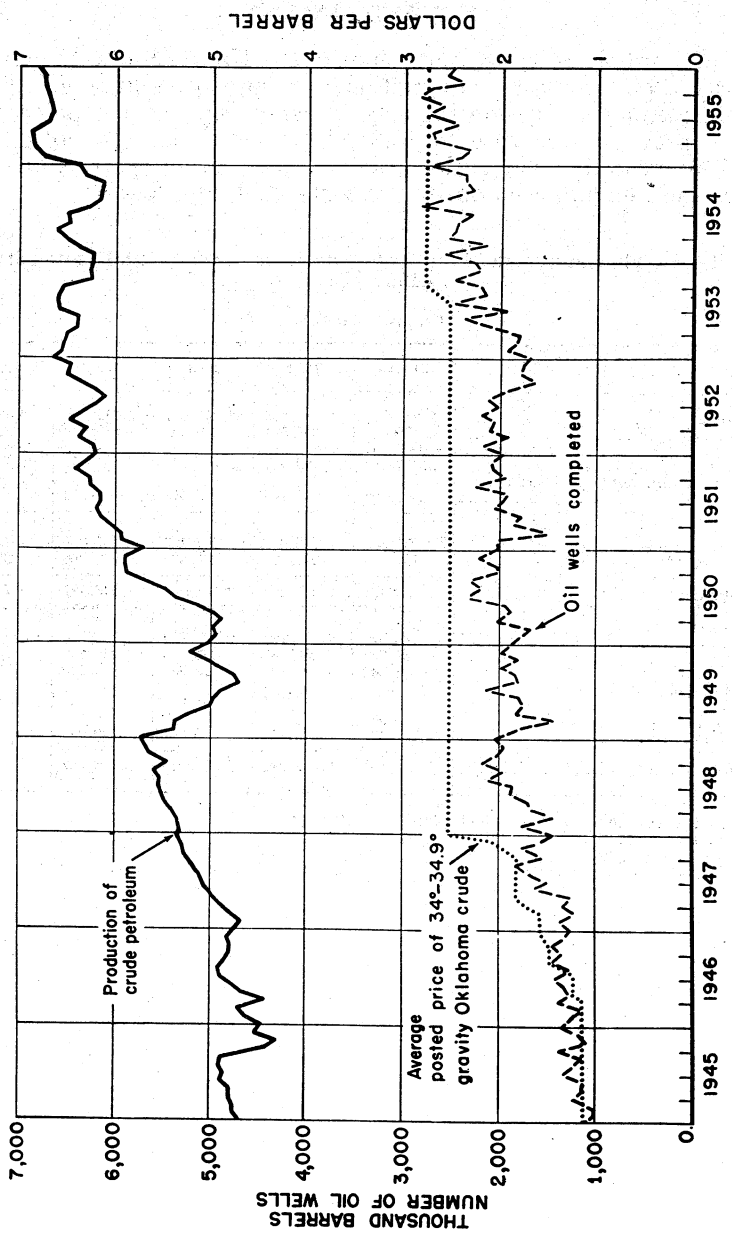

FIGURE 2.—Total number of oil wells completed per month.

TABLE 7.—Supply of and demand for crude petroleum in continental United States, 1954–55, by months

(Thousand barrels)

Year	January	February	March	April	May	June	July	August	September	October	November	December	Total
1954													
Supply: Production	193,437	178,644	201,763	198,502	200,627	194,974	194,098	190,388	184,325	189,724	190,372	198,134	2,314,988
Imports [1]	19,141	17,395	20,260	17,229	21,957	18,728	22,448	20,589	20,168	19,893	19,082	22,589	239,479
Total new supply	212,578	196,039	222,023	215,731	222,584	213,702	216,546	210,977	204,493	209,617	209,454	220,723	2,554,467
Change in stocks, end of period:													
Domestic	−5,914	−4,097	+4,256	+8,621	+201	+3,759	+716	−4,112	−4,753	−5,184	−3,122	−6,652	−16,281
Foreign		+195	+735	−186	+1,794	−921	−939	−624	−674	+28	+342	+471	+221
Demand: Domestic	199,351	182,741	197,507	189,881	200,426	191,215	193,382	194,500	189,078	194,908	193,494	204,786	2,331,269
Foreign	19,141	17,200	19,525	17,415	20,163	19,649	23,387	21,213	20,842	19,865	18,740	22,118	239,258
Runs to stills: Domestic	196,264	180,746	195,136	186,956	198,053	188,822	191,040	191,516	187,310	192,039	190,570	202,314	2,300,766
Foreign	19,102	17,168	19,484	17,380	20,125	19,586	23,362	21,192	20,845	19,812	18,674	22,068	238,798
Exports [2]	1,587	795	873	1,418	1,258	1,372	1,073	1,349	509	1,521	1,047	797	13,599
Transfers: Distillate	150	128	143	135	138	119	123	112	105	113	119	115	1,500
Residual	397	452	461	531	535	465	543	564	481	530	481	484	5,924
Losses	992	652	935	876	480	500	628	980	670	758	1,343	1,126	9,940
1955 [3]													
Supply: Production	209,600	191,392	213,454	206,600	206,983	198,389	205,600	206,604	201,919	211,770	210,406	221,804	2,484,521
Imports [1]	22,922	21,033	22,989	20,907	23,017	22,934	25,788	23,406	24,882	25,439	24,685	27,419	285,421
Total new supply	232,522	212,425	236,443	227,507	230,000	221,323	231,388	230,010	226,801	237,209	235,091	249,223	2,769,942
Change in stocks, end of period:													
Domestic	+1,606	−2,130	+6,445	+10,947	+712	−5,688	−7,012	−7,844	−535	+2,763	+2,264	+4,011	+5,539
Foreign	+165	+604	−645	−145	+1,004	−410	+763	−330	+377	+169	−758	+892	+1,686
Demand: Domestic	207,994	193,522	207,009	195,653	206,271	204,077	212,612	214,448	202,454	209,007	208,142	217,793	2,478,982
Foreign	22,757	20,429	23,634	21,052	22,013	23,344	25,025	23,736	24,505	25,270	25,443	26,527	283,735
Runs to stills: Domestic	206,048	190,981	205,010	193,059	203,705	201,207	209,964	211,255	199,985	206,181	205,327	214,111	2,446,833
Foreign	22,689	20,384	23,584	21,021	21,994	23,303	25,022	23,711	24,493	25,230	25,431	26,523	283,385
Exports [2]	381	976	771	1,431	1,166	1,053	887	1,191	832	871	872	1,040	11,471
Transfers: Distillate	122	104	125	109	113	103	116	107	101	106	113	128	1,347
Residual	443	400	408	436	492	431	469	482	437	460	409	692	5,559
Losses	1,068	1,106	745	649	814	1,324	1,179	1,438	1,111	1,429	1,433	1,826	14,122

[1] Bureau of Mines.
[2] U. S. Department of Commerce, except Alaska and Hawaii, which are Bureau of Mines data.
[3] Preliminary figures.

TABLE 8.—Crude petroleum produced in the United States, 1951–55, and total, 1859–1955, by States [1]

(Thousand barrels)

	1951	1952	1953	1954	1955 [2]	1859–1955 (total)
Production:						
Alabama	1,020	1,279	1,694	1,584	1,377	9,617
Arkansas	29,798	29,440	29,681	29,130	28,506	942,657
California	354,561	359,450	365,085	355,865	354,737	10,409,296
Colorado	27,823	30,381	36,402	46,206	51,018	338,824
Florida	596	591	543	548	490	4,348
Illinois	60,243	60,089	15,026	66,798	81,610	1,834,082
Indiana	11,100	12,037	12,823	11,204	11,089	258,976
Kansas	114,522	114,807	114,566	119,317	121,869	[3] 2,710,959
Kentucky	11,622	11,918	11,518	13,791	15,297	[4] 316,392
Louisiana	232,281	243,929	256,632	246,558	268,233	3,808,649
Michigan	13,927	13,251	12,285	12,028	11,267	[5] 385,005
Mississippi	37,039	36,310	35,620	34,240	37,280	464,548
Montana	8,958	9,606	11,920	14,195	15,613	228,543
Nebraska	2,558	2,660	6,344	7,783	9,854	36,583
Nevada				33	64	97
New Mexico	52,719	58,681	70,441	74,820	82,398	[6] 1,021,454
New York	4,254	4,242	3,800	3,257	2,904	[7] 185,058
North Dakota	25	1,549	5,183	6,025	11,143	23,925
Ohio	3,140	3,350	3,610	3,880	4,317	639,296
Oklahoma	186,869	190,435	202,570	185,851	203,337	7,204,171
Pennsylvania	11,345	11,233	10,649	9,107	8,423	1,186,330
Texas	1,010,270	1,022,139	1,019,164	974,275	1,058,720	18,807,427
Utah	1,305	1,737	1,807	1,905	2,058	[8] 10,693
West Virginia	2,757	2,602	3,038	2,902	2,320	454,579
Wyoming	68,929	68,074	82,618	93,533	100,473	1,329,425
Other States [9]	50	46	63	153	124	2,292
Total	2,247,711	2,289,836	2,357,082	2,314,988	2,484,521	52,613,226
Value at wells						
Total (thousand dollars)	5,690,410	5,785,230	6,327,100	6,424,930	6,870,690	89,389,218
Average per barrel	$2.53	$2.53	$2.68	$2.78	$2.77	$1.70

[1] For detailed figures by States, 1859–1935, see Minerals Yearbook, 1937, p. 1008.
[2] Preliminary figures.
[3] Oklahoma included with Kansas in 1905 and 1906.
[4] Includes Tennessee, 1883–1907.
[5] Figures represent 1925–55 production only; earlier years included under "Other States."
[6] Figures represent 1924–55 production only; earlier years included under "Other States."
[7] Early production in New York included with Pennsylvania.
[8] Figures represent 1948–55 production only, earlier years included under "Other States."
[9] Includes Alaska, 1912–33, Arkansas, 1920; Michigan, 1900–19; Mississippi, 1933–35; Missouri, 1899–1911, 1913–16, 1919–23, 1932–55; New Mexico, 1913, 1919–23, South Dakota, 1954–55; Tennessee, 1916–55; Utah, 1907–11, 1920, 1924–41; Virginia, 1943–55.

PRODUCTION

General

The production of 2,485 million barrels of crude petroleum set a new record in 1955, an increase of 170 million barrels (7.3 percent) over 1954. Six States (Texas, California, Louisiana, Oklahoma, Kansas, and Wyoming) produced over 100-million barrels each and supplied 84.8 percent of the total in 1955.

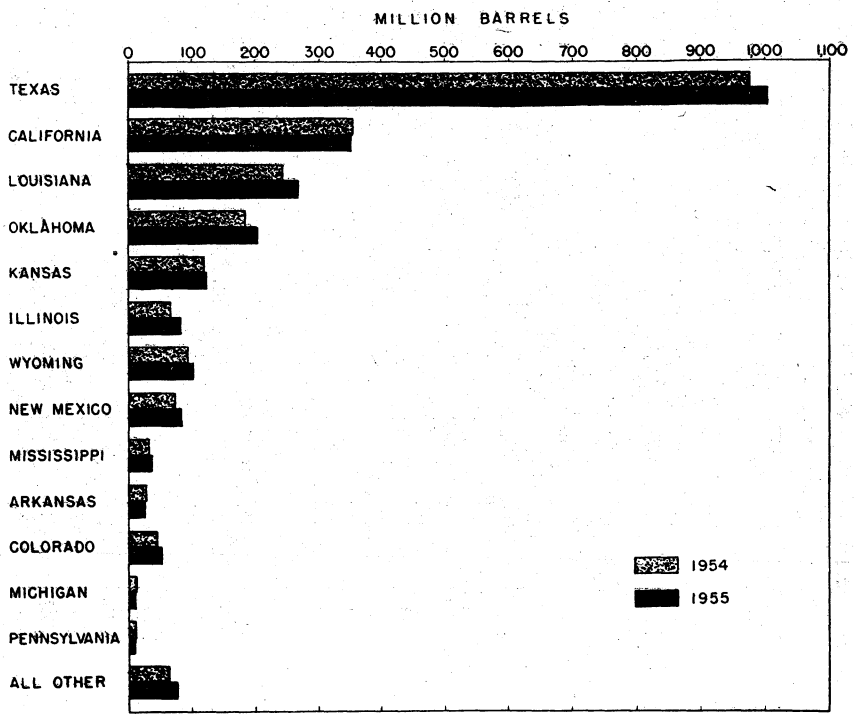

FIGURE 3.—Production of crude petroleum in the United States, 1954–55, by States

TABLE 9.—Production of crude petroleum in the United States in 1954–55, by States and months [1]

(Thousand barrels)

State	January	February	March	April	May	June	July	August	September	October	November	December	Total
1954													
Alabama	143	131	139	130	136	134	133	122	134	130	123	129	1,584
Arkansas	2,438	2,309	2,558	2,447	2,524	2,462	2,548	2,376	2,304	2,372	2,395	2,397	29,130
California [1]	31,016	27,938	30,656	29,606	30,527	29,348	30,065	29,684	28,808	29,720	28,739	29,758	355,865
Colorado	3,297	3,138	3,578	3,597	4,122	4,130	4,082	4,039	3,843	4,038	4,155	4,187	46,206
Florida	46	44	47	39	54	46	48	49	43	46	42	44	548
Illinois	5,150	4,941	5,464	5,403	5,557	5,645	5,536	5,454	5,443	6,023	5,998	6,184	66,798
Indiana	1,008	923	998	952	964	901	899	919	870	903	920	947	11,204
Kansas	9,437	9,199	10,438	10,107	10,218	10,093	10,304	9,938	9,642	9,951	9,908	10,082	119,317
Kentucky	1,066	1,041	1,181	1,140	1,146	1,168	1,148	1,139	1,150	1,205	1,190	1,217	13,791
Louisiana	21,671	19,295	21,721	21,670	22,325	21,276	20,532	19,767	18,643	19,525	19,421	20,712	246,558
Michigan [2]	1,015	963	1,040	1,033	1,000	1,021	1,000	1,010	975	978	975	1,018	12,028
Mississippi	2,960	2,689	2,962	2,838	2,942	2,811	2,885	2,802	2,731	2,842	2,806	2,972	34,240
Montana [3]	960	1,017	1,200	1,104	1,191	1,253	1,313	1,243	1,171	1,178	1,207	1,358	14,195
Nebraska	610	585	567	610	618	707	657	653	677	696	668	735	7,783
New Mexico	6,141	5,535	6,236	6,024	6,244	6,214	6,403	6,376	6,069	6,397	6,619	6,562	74,820
New York	273	257	293	280	273	272	265	267	287	261	262	267	3,257
North Dakota	453	416	461	422	454	417	457	450	444	604	660	787	6,025
Ohio	306	313	341	341	345	349	303	271	306	329	335	341	3,880
Oklahoma	16,176	15,387	17,388	16,936	16,359	14,203	14,671	15,156	14,526	14,917	14,733	15,399	185,851
Pennsylvania	836	709	835	811	790	791	770	754	728	704	682	697	9,107
Texas	80,486	74,574	85,395	84,965	84,581	83,263	81,288	79,365	77,408	78,831	80,477	83,642	974,275
Utah	147	159	177	162	165	164	162	136	162	159	152	160	1,905
West Virginia	266	240	260	239	226	248	242	254	246	229	230	222	2,902
Wyoming	7,527	6,829	7,814	7,634	7,852	8,045	8,366	8,143	7,696	7,673	7,656	8,298	93,533
Other States	9	12	14	12	14	13	21	21	19	13	19	19	[4] 186
Total: 1954	193,437	178,644	201,763	198,502	200,627	194,974	194,098	190,388	184,325	189,724	190,372	198,134	2,314,988
1953	203,211	183,183	202,024	191,953	198,117	197,630	204,711	204,490	196,571	193,726	188,116	193,350	2,357,082
Daily average, 1954	6,240	6,380	6,508	6,617	6,472	6,499	6,261	6,142	6,144	6,120	6,346	6,391	6,342
Pennsylvania Grade (included above)	1,472	1,313	1,504	1,444	1,404	1,416	1,391	1,382	1,378	1,310	1,280	1,286	16,580
1955 [5]													
Alabama	133	114	110	85	101	116	118	115	116	115	118	136	1,377
Arkansas	2,366	2,171	2,437	2,432	2,509	2,321	2,377	2,397	2,414	2,396	2,301	2,385	28,506
California	29,878	27,093	30,117	29,181	30,229	29,246	30,154	30,257	29,076	29,989	29,281	30,236	354,737
Colorado	3,767	3,386	3,793	3,735	4,392	4,300	4,535	4,616	4,549	4,653	4,467	4,825	51,018
Florida	43	33	40	38	42	39	44	45	40	42	42	42	490
Illinois	6,397	6,016	6,722	6,729	6,925	6,983	6,947	7,105	6,929	6,901	6,879	7,077	81,610
Indiana	912	803	889	886	945	972	956	988	853	955	950	980	11,089
Kansas	10,559	9,569	10,670	10,092	9,610	9,620	10,531	10,366	9,980	10,442	9,993	10,437	121,869
Kentucky	1,190	1,074	1,219	1,218	1,283	1,284	1,292	1,364	1,301	1,352	1,295	1,425	15,297

Louisiana	21,705	19,966	22,422	21,860	22,878	21,011	22,271	22,458	22,508	23,425	23,312	24,417	268,233
Michigan	977	916	1,000	934	940	940	919	971	922	919	898	931	11,267
Mississippi	2,836	2,682	2,992	2,881	3,044	3,023	3,141	3,238	3,292	3,404	3,314	3,433	37,280
Montana	1,370	1,218	1,383	1,329	1,307	1,312	1,271	1,299	1,171	1,203	1,258	1,492	15,613
Nebraska	714	610	730	678	792	819	832	865	828	911	947	1,128	9,854
New Mexico	6,795	6,231	6,866	6,687	6,827	6,662	6,884	7,023	6,664	7,204	7,050	7,505	82,398
New York	240	230	255	243	248	245	240	265	245	234	230	229	2,904
North Dakota	935	910	892	709	609	860	1,142	1,038	1,060	697	1,086	1,205	11,143
Ohio	318	297	364	344	362	376	346	403	373	377	367	390	4,317
Oklahoma	16,238	15,709	17,413	16,828	16,481	16,659	17,049	17,011	16,428	17,167	17,502	18,852	203,337
Pennsylvania	658	608	723	707	688	753	735	754	733	716	674	674	8,423
Texas	92,954	83,932	93,692	90,496	87,941	82,209	84,663	84,848	83,577	89,740	89,900	94,768	1,058,720
Utah	164	159	162	171	181	177	188	189	188	215	102	162	2,058
West Virginia	197	179	215	193	194	206	190	200	187	184	191	184	2,320
Wyoming	8,238	7,472	8,328	8,125	8,437	8,238	8,758	8,777	8,473	8,517	8,236	8,874	100,473
Other States	16	14	20	19	18	18	17	12	12	12	13	17	[6]188
Total: 1955	209,600	191,392	213,454	206,600	206,983	198,389	205,600	206,604	201,919	211,770	210,406	221,804	2,484,521
1954	193,437	178,644	201,763	198,502	200,627	194,974	194,098	190,388	184,325	189,724	190,372	198,134	2,314,988
Daily average, 1955	6,761	6,835	6,886	6,887	6,677	6,613	6,632	6,665	6,731	6,831	7,014	7,155	6,807
Pennsylvania Grade (included above)	1,199	1,111	1,303	1,249	1,242	1,324	1,271	1,339	1,277	1,245	1,204	1,200	14,964

[1] American Petroleum Institute.
[2] Michigan Department of Conservation.
[3] Montana Oil Conservation Board.
[4] Missouri (96), Nevada (33), South Dakota (37), Tennessee (13), and Virginia (7).
[5] Preliminary figures.
[6] Missouri (65), Nevada (64), South Dakota (30), Tennessee (17), and Virginia (12).

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TABLE 10.—Percentage of total crude petroleum produced in the United States 1946–55, by States

State	1946	1947	1948	1949	1950	1951	1952	1953	1954	1955 [1]
Texas	43.8	44.2	44.7	40.4	42.1	45.0	44.6	43.2	42.1	42.6
California	18.2	17.9	16.8	18.1	16.6	15.8	15.7	15.5	15.4	14.3
Louisiana	8.3	8.6	9.0	10.4	10.6	10.3	10.7	10.9	10.6	10.8
Oklahoma	7.8	7.6	7.7	8.2	8.3	8.3	8.3	8.6	8.0	8.2
Kansas	5.6	5.7	5.5	5.5	5.5	5.1	5.0	4.9	5.2	4.9
Wyoming	2.2	2.4	2.7	2.6	3.1	3.1	3.0	3.5	4.0	4.0
New Mexico	2.1	2.2	2.4	2.6	2.4	2.3	2.6	3.0	3.2	3.3
Illinois	4.3	3.6	3.2	3.5	3.1	2.7	2.6	2.5	2.9	3.3
Colorado	.7	.8	.9	1.3	1.2	1.2	1.3	1.5	2.0	2.1
Mississippi	1.4	1.9	2.3	2.1	1.9	1.7	1.6	1.5	1.5	1.5
Arkansas	1.6	1.6	1.6	1.6	1.6	1.3	1.3	1.3	1.3	1.1
Montana	.5	.5	.5	.5	.4	.4	.4	.5	.6	.6
Kentucky	.6	.5	.4	.5	.5	.5	.5	.5	.6	.6
Michigan	1.0	.9	.8	.9	.8	.6	.6	.5	.5	.5
Other States	1.9	1.6	1.5	1.8	1.9	1.7	1.8	2.1	2.1	2.2
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0

[1] Preliminary figures.

TABLE 11.—Production of crude petroleum in leading fields in the United States, 1954–55, and total production since discovery, (thousand barrels)[1]

[Oil and Gas Journal]

Field	State	1954	1955	Total since discovery [2]
East Texas	Texas	75,662	79,673	3,159,667
Wilmington	California	41,589	38,886	730,568
Sho-Vel-Tum	Oklahoma	([3])	30,316	418,428
Ventura	California	31,189	26,948	536,655
Huntington Beach	....do	21,446	24,253	568,231
Rangely	Colorado	22,472	23,678	189,350
Kelly-Snyder	Texas	17,035	21,773	154,968
Spraberry Trend area	....do	39,968	20,785	117,136
Golden Trend	Oklahoma	([4])	19,039	125,111
Hawkins	Texas	22,954	16,843	200,063
Coalinga Nose	California	23,488	16,416	250,007
Goldsmith (all fields)	Texas	14,577	15,744	201,563
Wasson—66 and 72	....do	15,422	15,673	306,453
Midway-Sunset	California	13,443	14,752	813,092
Cuyama, South	....do	12,748	12,674	76,059
Hastings	Texas	11,550	11,655	264,706
Slaughter	....do	11,370	11,277	221,547
Denton	New Mexico	10,651	11,031	36,313
San Ardo	California	11,170	10,931	45,202
Keystone—South	Texas	13,210	10,667	146,101
Webster	....do	10,392	10,572	212,057
Eunice-Monument	New Mexico	9,029	10,544	268,083
Clay City	Illinois	9,526	10,300	178,596
Burbank	Oklahoma	([5])	10,139	306,169
Seeligson (all zones)	Texas	10,670	10,060	143,375
Conroe—West	....do	10,001	9,995	352,405
Long Beach	California	7,654	9,992	791,453
Yates	Texas	9,903	9,884	431,023
Tom O'Connor	....do	9,696	9,738	216,249
Elk Basin—South	Montana-Wyoming	8,780	9,567	103,868
Levelland	Texas	9,992	9,556	84,147
Bradford-Allegheny [6]	Pennsylvania-New York	10,045	9,424	657,952
Diamond M	Texas	8,920	9,343	58,687
TXL	....do	8,277	9,214	132,118
Katz, North	....do	15,494	9,151	87,111
Caddo	Louisiana	8,319	9,136	222,749

See footnotes at end of table.

TABLE 11.—Production of crude petroleum in leading fields in the United States, 1954–55, and total production since discovery, (thousand barrels)[1]—Con.

[Oil and Gas Journal]

Field	State	1954	1955	Total since discovery [2]
Cowden—North and South	Texas	8,595	9,111	156,944
Caillou Island	Louisiana	8,388	8,998	95,650
Van	Texas	8,773	8,834	259,146
Thompson—North and South	do	9,002	8,743	201,840
South Pass, Block 24	Louisiana	4,400	8,481	16,160
Weeks Island	do	9,076	8,232	58,087
Buena Vista	California	7,988	7,711	448,088
Jameson (Strawn and Reef)	Texas	5,445	7,691	13,136
Salem	Illinois	4,981	7,673	245,903
Howard-Glasscock	Texas	7,488	7,647	177,017
Aqua Dulce—Stratton	do	6,975	7,537	127,511
Louden	Illinois	6,486	7,535	187,997
Brea-Olinda	California	8,411	7,485	244,176
Midland Farms	Texas	4,953	6,962	39,215
McElroy	do	6,718	6,912	247,956
Elk Hills	California	7,715	6,791	230,535
Fullerton—North and South	Texas	6,513	6,728	111,931
Coles Levee—North and South	California	7,427	6,589	99,852
Cogdell	Texas	6,558	6,507	39,393
Elk City	Oklahoma	5,348	6,277	38,258
Delhi-Big Creek	Louisiana	5,714	6,165	80,470
Hull-Merchant	Texas	5,392	5,918	136,871
Adena	Colorado	4,681	5,867	10,439
Kern Bluff—Front—River	California	5,630	5,827	419,611
Oregon Basin	Wyoming	4,935	5,796	71,120
Andector	Texas	5,580	5,618	44,890
Prentice	do	4,187	5,615	13,651
West Ranch	do	5,425	5,602	96,752
Pegasus	do	5,778	5,588	26,196
Russell—North	do	3,474	5,539	16,252
Seminole—West	do	5,459	5,524	87,713
Kettleman North Dome	California	6,049	5,451	407,642
Cat Canyon, West	do	5,991	5,337	77,149
Old Ocean	Texas	5,015	5,369	92,067
Anahuac	do	5,241	5,282	132,815
Baxterville	Mississippi	5,230	5,267	50,147
Dollarhide	Texas	6,728	5,232	50,903
Block 31	do	5,182	5,210	31,198
Sand Hills	do	4,000	5,111	55,476
Cotton Valley	Louisiana	4,709	5,109	84,203
Plymouth—East	Texas	4,859	5,097	88,925
Talco	do	4,926	5,022	152,802
Garland	Wyoming	4,395	5,022	34,899

[1] The classification of fields and data may differ from other sources used in the State summaries.
[2] Includes revisions.
[3] Includes following pools consolidated in 1955: Alma, North; Alma, Northeast; Alma, Southwest; Ava; Ava, North; Ava, Northwest; Camp; Camp, Southeast; Fox-Graham; Milroy; Milroy, West; Sholem-Alechem; Sholem-Alechem, Northwest; Sholem-Alechem, Southwest; Sholem-Alechem, West; Tatums; Velma; Wheeler.
[4] In addition to the Golden Trend pool, the following are included: Blue Hill; Bradley, East; Goldsby, Southwest; Iron Chapel; Lindsay, North; Lindsay, Northeast; Lindsay, West; Newcastle, East; Newcastle, Southeast.
[5] Includes Burbank; Burbank, South; Little Chief, Northeast; and Little Chief, West, consolidated in 1955.
[6] Bureau of Mines data.

CRUDE PRODUCTION BY STATES

Additional data on crude production by States will be found in Volume III of the Minerals Yearbook.

TABLE 12.—Production of crude petroleum in Arkansas, 1951–55, by fields

(Thousand barrels)

Field	1951	1952	1953	1954	1955 [1]
Atlanta	841	810	649	554	483
Buckner	719	722	645	529	478
Dorcheat-Macedonia	875	877	841	624	617
El Dorado	486	649	711	838	857
Fouke	929	1,053	1,429	1,210	1,241
Horsehead	----------	29	194	706	816
Magnolia	4,407	4,223	4,029	3,289	2,890
McKamie	1,175	1,446	1,369	1,480	1,331
Midway	2,684	2,674	2,642	2,262	2,048
Schuler	2,626	2,377	2,318	2,599	2,593
Smackover	3,910	3,814	3,892	4,370	4,678
Stephens	1,476	1,308	1,223	1,077	1,014
Village	1,247	1,018	840	850	846
Wesson	3,647	3,510	3,296	2,699	2,018
Other fields [2]	4,776	4,930	5,603	6,043	6,596
Total Arkansas	29,798	29,440	29,681	29,130	28,506

[1] Preliminary figures.
[2] Includes oil consumed on leases and net change in stocks held on leases for entire State.

TABLE 13.—Production of crude petroleum in California, 1951–55, by districts and fields, (thousand barrels)

[American Petroleum Institute]

District and field	1951	1952	1953	1954	1955
San Joaquin Valley:					
Belridge	3,516	3,237	3,567	4,015	4,092
Buena Vista	11,168	9,753	8,881	7,962	7,713
Coalinga	31,957	30,344	28,356	27,575	29,661
Coles Levee	7,224	7,007	6,785	6,462	6,585
Cuyama-Russell Ranch	21,230	19,805	17,409	16,769	16,132
Edison	4,867	5,489	5,057	4,419	3,835
Elk Hill	2,459	2,836	5,960	7,696	6,689
Fruitvale	3,312	3,372	3,562	3,576	3,399
Gosford, East	831	802	652	488	425
Greeley	4,615	4,739	4,769	4,531	4,355
Helm	728	545	540	555	512
Kern River-Kern Bluff-Kern Front	7,984	7,790	7,500	5,610	5,921
Kettleman North Dome	9,090	7,984	6,657	6,041	5,447
Lost Hills	2,084	2,161	2,317	1,982	1,842
McKittrick	6,309	7,148	8,621	7,764	8,503
Midway-Sunset	12,619	12,309	12,512	13,362	14,707
Mountain View	1,173	1,303	1,372	1,356	1,554
Mount Poso	3,451	3,276	3,100	3,078	3,161
Poso Creek	1,196	1,405	1,767	1,323	1,285
Raisin City	1,749	1,790	1,854	1,944	1,916
Rio Bravo	4,089	4,335	4,415	4,313	4,563
Riverdale	781	789	677	611	529
Round Mountain	2,056	2,015	1,915	1,793	1,681
Tejon Group	2,078	2,363	2,366	2,418	3,915
Ten Section	1,877	1,621	1,472	1,438	1,650
Other San Joaquin Valley	8,093	8,005	9,006	9,615	10,153
Total San Joaquin Valley	156,536	152,223	151,089	146,696	150,225
Coastal district:					
Aliso Canyon	1,986	2,428	2,640	2,790	2,845
Cat Canyon	6,324	6,700	6,992	6,065	5,382
Del Valle	1,677	1,229	995	1,070	926
Elwood	1,920	1,785	1,569	1,436	1,291
Gato Ridge	1,030	1,077	1,012	973	947
Lompoc	2,482	1,917	1,697	1,493	1,247
Newall-Potrero	2,865	2,851	3,314	3,558	3,612
Orcutt	1,476	1,421	1,354	1,265	1,231

TABLE 13.—Production of crude petroleum in California, 1951–55, by districts and fields, (thousand barrels)—Continued

District and field	1951	1952	1953	1954	1955
Coastal district—Continued					
Padre Canyon [1]	2,242	1,549	1,726	1,736	1,577
Placerita	3,982	3,458	2,756	2,171	1,834
Romona	1,505	1,287	1,047	863	724
Rincon	1,319	1,499	1,457	1,517	1,632
San Ardo	2,745	8,281	11,284	11,172	10,972
San Miguelito	4,464	4,250	3,134	1,990	1,835
San Maria	4,479	4,029	4,191	3,680	3,012
South Mountain	2,207	2,858	4,594	5,261	4,676
Ventura	23,301	27,241	29,901	31,129	25,603
Zaca Creek	1,648	1,537	1,653	1,709	1,317
Other Coastal	4,953	8,388	12,625	12,720	14,208
Total Coastal	72,605	83,784	93,941	92,598	84,871
Los Angeles Basin:					
Brea Olinda	5,402	6,928	8,574	8,314	7,498
Coyote	5,895	6,075	5,655	5,087	4,495
Dominquez	4,286	3,893	3,658	3,421	3,448
Huntington Beach	22,465	21,789	21,139	21,556	24,107
Inglewood	4,951	4,984	4,950	4,778	4,374
Long Beach	8,499	7,963	7,422	7,739	9,948
Montebello	2,014	1,916	1,767	1,575	1,559
Newport	1,575	1,494	1,546	1,555	1,671
Richfield	2,425	2,412	2,628	2,738	2,495
Rosecrans [2]	1,640	1,684	1,478	1,360	1,281
Sansinena	1,038	1,928	2,800	3,062	3,827
Santa Fe Springs	5,132	5,164	5,315	5,141	4,591
Seal Beach	4,118	4,083	3,852	3,545	3,634
Torrance	2,522	2,510	2,564	2,526	2,573
Wilmington	50,806	48,121	44,328	41,540	38,860
Other Los Angeles Basin	2,652	2,499	2,379	2,634	5,280
Total Los Angeles Basin	125,420	123,443	120,055	116,571	119,641
Total California	354,561	359,450	365,085	355,865	354,737

[1] Includes Oak Grove area.
[2] Includes Athens.

TABLE 14.—Production of crude petroleum in Colorado, 1951–55, by fields

(Thousand barrels)

Field [1]	1951	1952	1953	1954	1955 [2]
Adena			24	4,626	6,015
Badger Creek—West			455	1,033	747
Big Beaver				137	825
Black Hollow			56	500	783
Bobcat				496	1,200
Cliff					820
Divide				416	677
Graylin-South and Northwest	53	114	364	1,996	1,588
Lewis Creek			157	782	674
Little Beaver—East		50	2,539	2,687	2,089
Mt. Hope—East and North	239	578	1,125	892	1,024
Plum Bush Creek				2	665
Rangely	22,091	22,443	22,900	22,780	23,901
Sand River				187	560
Wilson Creek	2,795	2,851	2,854	2,640	2,440
Yenter	420	962	1,503	1,120	904
Other [3]	2,225	3,383	4,425	5,912	6,106
Total Colorado	27,823	30,381	36,402	46,206	51,018

[1] Figures by fields supplemented from Rocky Mountain Oil and Gas Operations for 1955.
[2] Preliminary figures.
[3] Includes crude oil consumed on leases and net change in stocks held on leases for entire State.

TABLE 15.—Production of crude petroleum in Illinois, 1951–55, by fields

(Thousand barrels)

[Oil and Gas Journal]

Field	1951	1952	1953	1954	1955
Albion	1,231	1,134	1,162	1,088	1,232
Benton	2,205	3,056	2,441	1,740	1,462
Boyd	687	557	539	533	718
Bridgeport	1,936	1,996	2,531	2,747	3,417
Centralia	946	836	701	634	563
Clay City	7,031	6,993	8,065	9,526	10,300
Dale	2,215	2,249	2,053	1,808	1,912
East Inman	837	630	539	461	1,067
Johnsonville	664	678	588	588	839
Louden	6,127	5,587	5,249	6,486	7,535
New Harmony	3,504	3,215	3,491	4,736	4,440
Phillipstown	1,092	1,084	989	868	979
Robinson	1,530	1,572	2,045	2,377	2,606
Roland	601	554	489	1,093	2,045
Sailor Springs	1,445	1,204	1,192	1,473	1,544
Salem	3,404	3,080	2,541	4,981	7,673
Other fields	24,372	25,139	[1] 24,411	[1] 25,659	[1] 33,278
Total Illinois	59,827	59,564	[1] 59,026	[1] 66,798	[1] 81,610

[1] Bureau of Mines figures.

TABLE 16.—Production of crude petroleum in Kansas, 1951–55, by fields

(Thousand barrels)

[Oil and Gas Journal]

Field	1951	1952	1953	1954	1955
Bemis-Shutts	4,287	3,741	3,526	3,549	3,263
Bloomer	2,782	2,344	2,067	1,589	1,456
Burnett—Southwest	3,044	2,709	[1] 2,303	2,170	2,464
Burrton—Haury	1,026	909	781	809	732
Chase	2,786	[2] 7,152	[2] 6,007	[2] 5,339	[2] 4,897
El Dorado	3,202	3,454	3,939	3,864	4,242
Fairport	1,135	879	834	823	903
Genesco-Edwards	3,001	3,304	3,061	2,869	2,941
Gladys	([3])	([3])	([3])	([3])	1,024
Gorham	2,452	1,990	1,793	1,692	1,589
Hall-Gurney	3,637	3,954	4,640	4,528	4,064
Iuka-Carmi	1,104	1,244	1,314	1,421	1,464
Kraft-Prusa	6,326	5,449	4,721	4,357	3,826
Marcotte	399	1,964	1,831	1,681	1,712
Morel	2,301	2,092	1,798	1,654	1,470
Ray	1,822	1,624	1,393	1,280	1,312
Seeley-Wick	760	1,292	1,753	1,798	1,479
Silica-Raymond	4,950	([3])	([3])	([3])	([3])
Stoltenberg	1,760	1,471	1,270	1,119	1,043
Thrall-Agard	1,324	1,650	1,121	1,002	775
Trapp	7,686	6,469	6,081	5,461	4,943
Welch-Bornholdt	([3])	740	1,259	1,361	1,254
Other fields	58,334	60,414	[4] 63,767	[4] 70,951	[4 5] 75,016
Total Kansas	114,118	114,845	[4] 115,259	[4] 119,317	[4] 121,869

[1] Revised.
[2] Silica included with Chase.
[3] Included with "Other fields."
[4] Bureau of Mines figures.
[5] Preliminary figures.

TABLE 17.—Production of crude petroleum in Louisiana, 1951–55, by districts and fields

(Thousand barrels)

District and field	1951	1952	1953	1954	1955 [1]
Gulf Coast:					
Anse la Butte	2,442	2,373	2,165	1,699	1,719
Avery Island	3,018	3,090	3,111	2,724	3,499
Barateria	3,294	2,876	2,351	1,628	1,358
Bay de Chene	1,259	1,288	1,302	1,208	1,456
Bay Marchand	2,428	2,004	1,560	2,430	2,933
Bay St. Elaine	2,672	2,733	3,194	3,130	3,353
Bayou Blue	1,122	1,156	1,158	1,060	955
Bayou Choctaw	393	600	893	1,171	1,293
Bayou Mallett	1,253	1,604	1,796	1,413	1,140
Bayou Sale	5,139	5,199	4,710	3,589	3,090
Bully Camp	867	1,250	1,640	1,353	1,767
Caillou Island	6,499	7,136	8,540	8,398	9,017
Charenton	1,136	1,176	1,278	1,223	1,234
Cox Bay	1,123	2,102	2,700	3,413	3,113
Delta Farms	7,190	6,751	6,480	5,456	4,810
Dog Lake	1,320	1,276	1,530	1,270	1,072
Duck Lake	1,123	2,269	2,935	3,199	2,589
East White Lake	1,443	1,427	1,479	1,179	1,390
Egan	2,083	2,041	2,017	2,117	2,225
Erath	1,178	1,179	1,370	1,152	964
Garden Island	1,583	1,590	1,590	1,419	1,343
Gibson	1,460	1,498	1,410	1,140	1,020
Golden Meadows	4,864	4,546	3,918	3,974	3,784
Good Hope	2,434	2,288	2,045	1,446	1,208
Grand Bay	3,853	3,638	3,768	3,519	3,327
Gueydan	2,325	1,970	1,570	1,298	1,076
Hackberry	3,621	3,780	4,512	4,215	4,451
Horseshoe Bayou	1,346	1,303	1,394	1,097	871
Iowa	2,282	2,513	2,842	2,701	2,465
Jeanerette	1,067	1,084	1,137	1,228	1,193
Lafitte	4,489	4,467	4,650	3,686	3,323
Lake Barre	233	417	599	1,056	1,363
Lake Chicot	1,105	1,104	1,072	1,021	1,031
Lake Fausse Point	317	468	576	823	1,339
Lake Pelto	2,173	2,456	2,697	2,324	2,421
Lake Salvador	2,086	1,843	1,831	1,415	1,370
Lake Washington	352	380	951	1,947	4,672
Leeville	2,205	2,417	3,251	3,556	4,088
Little Lake		192	823	1,582	2,132
Main Pass	2,057	2,445	4,287	4,981	6,327
North Crowley	1,669	1,390	1,504	1,273	1,299
Paradis	3,626	3,411	3,445	3,379	3,172
Phoenix Lake	614	1,507	1,781	1,778	1,533
Pine Prairie	1,048	984	955	864	885
Point-a-La Hache	2,464	2,746	2,689	2,451	2,168
Port Barre	1,438	1,285	1,327	1,056	925
Quarantine Bay	3,960	3,480	3,151	2,649	3,151
Romre Pass	2,315	3,641	4,570	4,719	3,913
St. Gabriel	1,793	2,095	1,778	1,278	1,047
Section 28	1,117	1,343	1,244	1,335	1,359
Tepetate	3,321	2,647	2,149	1,722	1,692
Timbalier Bay	368	1,731	2,514	2,289	3,935
University	2,203	1,811	1,534	1,391	1,073
Valentine	651	902	1,252	1,379	1,684
Venice	5,742	5,965	5,728	5,364	4,903
Ville Platte	1,462	1,424	1,333	1,402	1,249
Vinton	3,960	3,786	3,168	2,712	2,352
Weeks Island	8,190	10,680	11,258	9,029	8,210
West Bay	2,936	3,123	3,132	2,525	2,423
West Cote Blanche	2,392	2,830	2,865	2,380	2,016
West Lake Verrett	1,782	1,966	1,757	1,517	1,332
White Castle	1,672	1,563	1,343	941	763
Other Gulf Coast [2]	47,211	49,780	56,521	58,048	75,472
Total Gulf Coast	188,768	200,019	214,130	204,721	224,337

See footnotes at end of table.

TABLE 17.—Production of crude petroleum in Louisiana, 1951–55, by districts and fields—Continued

(Thousand barrels)

District and field	1951	1952	1953	1954	1955 [1]
Northern:					
Big Creek	1,468	1,432	1,279	900	750
Caddo	4,995	5,111	5,438	8,251	9,111
Delhi	6,679	6,436	5,916	4,880	5,367
Haynesville	5,480	5,008	4,445	3,694	3,234
Lake St. John	5,871	4,870	4,015	3,162	2,788
Nebo [3]	2,302	2,272	2,268	2,270	2,193
Olla [4]	2,294	2,203	2,106	1,934	1,709
Rodessa	1,043	934	868	784	793
Sligo	538	859	879	966	1,030
Other Northern [2]	12,843	14,785	15,288	14,996	16,921
Total Northern	43,513	43,910	42,502	41,837	43,896
Total Louisiana	232,281	243,929	256,632	246,558	268,233

[1] Preliminary figures.
[2] Includes crude oil consumed on leases and net change in stocks held on leases for entire district.
[3] Includes Hemphill, Trout Creek, and Jena.
[4] Includes Little Creek and Summerville.

TABLE 18.—Production of crude petroleum in Michigan, 1951–55, by fields

(Thousand barrels)

[Michigan Department of Conservation]

	1951	1952	1953	1954	1955 [1]
Beaver Creek	641	510	421	342	298
Coldwater	1,488	1,388	1,253	1,160	1,052
Deep River	2,029	1,847	1,774	1,569	1,180
East Norwich	384	470	488	462	415
Kawkawlin	631	559	480	447	400
Kimball Lake	569	411	288	194	115
Pentwater	718	660	383	274	219
Reed City and East Reed City	686	594	495	482	477
Rose City	180	557	599	553	464
St. Helen	388	410	307	238	223
Stony Lake	881	733	659	561	420
Other fields	5,332	5,112	5,138	5,746	6,004
Total Michigan	13,927	13,251	12,285	12,028	11,267

[1] Preliminary figures.

TABLE 19.—Production of crude petroleum in Mississippi, 1951–55, by fields

(Thousand barrels)

Field	1951	1952	1953	1954	1955 [1]
Baxterville	6,487	6,212	5,940	5,137	5,301
Brookhaven	4,237	3,905	4,211	3,724	3,511
Cranfield	3,334	2,792	2,398	1,776	1,497
Eucutta	1,746	1,670	1,542	1,352	1,355
Heidelburg	3,452	3,437	3,336	3,098	3,253
LaGrange	3,666	3,277	2,701	2,269	2,128
Mallalieu	2,520	1,944	1,484	1,252	1,117
Soso	245	288	316	748	3,110
Tinsley	5,071	4,934	4,545	4,326	4,475
Yellow Creek	1,650	1,633	1,652	1,526	1,433
Other fields	4,631	6,218	7,495	9,032	10,100
Total, Mississippi	37,039	36,310	35,620	34,240	37,280

[1] Preliminary figures.

TABLE 20.—Production of crude petroleum in Montana, 1951–55, by fields

(Thousand barrels)

[Montana Oil Conservation Board]

Field	1951	1952	1953	1954	1955
Big Wall	716	316	191	258	300
Bowes	427	1,025	1,095	980	510
Cabin Creek			(1)	235	631
Cat Creek	325	271	209	200	174
Cut Bank	2,724	2,633	2,673	2,575	2,694
Elk Basin	1,821	1,819	1,704	1,643	1,441
Glendive	(1)	(1)	601	718	621
Kevin-Sunburst	1,449	1,344	1,296	1,207	1,131
Pine		(1)	(1)	430	1,115
Pondera	792	697	753	549	491
Poplar	(1)	(1)	1,155	3,016	3,185
Reagan	215	227	269	234	224
Sumatra	(1)	(1)	380	733	1,540
Other fields [2]	489	1,274	1,594	1,417	1,556
Total, Montana	8,958	9,606	11,920	14,195	15,613

[1] Included in "Other fields."
[2] Includes crude oil consumed on leases and net change in stocks held on leases for entire State.

TABLE 21.—Production of crude petroleum in New Mexico, 1951–55, by districts and fields

(Thousand barrels)

[Oil and Gas Journal]

District and field	1951	1952	1953	1954	1955
Southeast:					
Bagley	1,662	2,447	2,033	1,867	1,659
Brunson	2,515	3,511	3,007	2,264	1,691
Caprock-East	(1)	(1)	1,886	2,135	2,243
Crossroad	737	939	939	1,355	1,193
Denton	873	4,329	8,668	10,651	11,031
Dollarhide-West	(1)	753	1,978	3,251	3,164
Drinkard	5,037	4,007	3,454	2,828	2,482
Eunice-Monument	10,590	9,588	9,321	9,029	10,544
Fowler	(1)	(1)	(1)	837	1,362
Gladiola	(1)	780	1,304	1,571	1,293
Grayburg-Jackson	1,545	1,353	1,162	1,114	1,054
Hare	1,277	2,027	2,047	1,642	1,290
Hobbs	4,380	3,902	3,663	3,340	3,397
Langlie-Mattix	1,700	1,635	1,669	1,402	1,641
Lovington-East	(1)	1,136	2,472	3,250	3,316
Maljamar	1,829	1,813	1,792	1,790	1,878
Moore	(1)	(1)	921	1,166	1,228
Saunders-South	(1)	1,571	2,164	2,200	1,903
Vacuum	4,865	4,496	4,281	3,832	3,804
Warren	(1)	(1)	1,438	1,469	1,508
Other fields	15,392	13,872	[3] 15,466	[3] 17,112	[3] 23,700
Northwest [2]	327	566	776	715	1,017
Total, New Mexico	52,729	58,725	[3] 70,441	[3] 74,820	[3] 82,398

[1] Included in "Other fields."
[2] Bureau of Mines figures.
[3] Preliminary figures.

TABLE 22.—Production of crude petroleum in Oklahoma, 1951–55, by fields

(Thousand barrels)

[Oil and Gas Journal]

Field	1951	1952	1953	1954	1955
Allen	1,447	1,336	1,456	1,709	1,733
Bebee	1,073	1,244	1,087	926	836
Burbank	2,318	3,157	3,476	[1] 3,466	[2] 10,139
Cache Creek	1,289	1,042	956	787	707
Camp	([3])	975	1,606	1,329	([4])
Cement	4,127	3,964	4,070	3,517	4,186
Cumberland	3,475	3,102	2,562	1,690	1,841
Cushing	2,816	2,889	3,385	3,176	2,823
Dilworth	([3])	([3])	([3])	1,279	1,135
Doyle	([3])	2,475	3,934	2,976	2,683
Elk City	7,426	7,248	6,380	5,348	6,277
Eola	891	1,178	1,651	1,424	[5] 2,193
Fox-Graham	3,196	5,532	5,920	4,559	([4])
Glenn	2,502	2,252	2,145	2,045	1,983
Healdton	2,267	2,183	2,288	2,171	2,307
Hewitt	3,694	3,173	2,703	[6] 3,339	[6] 3,411
Holdenville-East	([3])	([3])	([3])	1,149	[7] 1,476
Hoover-Northwest	887	693	601	[8] 1,189	[8] 1,662
Knox	1,725	1,627	1,595	1,165	1,143
Milroy	([3])	1,091	2,325	1,755	([4])
Oklahoma City	6,303	5,513	5,187	4,148	3,803
Olympic	1,485	2,013	4,064	4,083	2,662
Payson-East	([3])	([3])	1,725	1,076	[10] 918
Ringwood	2,288	1,338	855	727	551
Seminole:					
Bowlegs	1,178	1,003	1,121	872	718
Little River	945	852	826	756	699
St. Louis	1,560	1,440	1,507	1,464	1,672
Seminole	1,207	1,077	1,211	998	921
Sholem-Alechem	10,557	12,239	12,736	10,261	([4])
Sho-Vel-Tum					[4] 30,316
South Burbank	776	617	894	1,429	([2])
Tatums	3,378	3,466	3,892	3,321	([4])
Velma-West	16,089	18,999	16,064	8,435	([4])
West Edmonds	3,482	4,471	1,887	[11] 1,821	1,733
Witcher	1,655	1,120	660	541	439
Yale-Quay	1,352	1,891	2,171	1,915	1,479
Other fields	95,478	90,323	[12] 99,630	[12] 99,005	[12] 110,891
Total, Oklahoma	186,866	191,523	[12] 202,570	[12] 185,851	[12] 203,337

[1] Includes Burbank South, and Fairfax.
[2] Includes Burbank, Burbank South, Little Chief, Northeast, and Little Chief, West, consolidated in 1955.
[3] Included in "Other fields."
[4] Included in Sho-Vel-Tum. The following pools were consolidated in 1955: Alma, North; Alma, Northeast; Alma, Southwest; Ava; Ava, North; Ava, Northwest; Camp; Camp, Southeast; Fox-Graham; Milroy; Milroy, West; Sholem-Alechem; Sholem-Alechem, Northwest; Sholem-Alechem, Southwest; Sholem-Alechem, West; Tatums; Velma; and Wheeler.
[5] Includes Eola, North, and Eola, Northwest; consolidated in 1955.
[6] Includes Brockwest and Lone Grove, Southwest.
[7] Includes Grief Creek.
[8] Includes Hoover, North; Brady, Southeast; and Roady, Northeast.
[9] Includes Holdenville, East, and Holdenville, West; consolidated in 1955.
[10] Includes Payson, consolidated in 1955.
[11] Includes Edmonds, Northwest, and Lockridge, Northeast.
[12] Bureau of Mines figures.

TABLE 23.—Production of crude petroleum in Texas, 1951–55, by districts and fields

(Thousand barrels)

District and field [1]	1951	1952	1953	1954	1955 [2]
Gulf Coast:					
Amelia	1,073	1,004	1,282	1,161	1,122
Anahuac	7,727	7,032	6,453	5,240	5,279
Barbers Hill	2,038	2,132	1,862	1,805	1,959
Beaumont, West	662	986	1,148	1,035	954
Bloomington	1,934	1,756	1,535	1,341	1,332
Boling	1,110	1,524	1,959	1,763	1,698
Chocolate Bayou	5,166	5,028	4,531	4,952	4,605
Conroe	14,081	12,813	11,937	10,081	10,376
Damon Mound	147	369	605	1,153	1,098
Dickinson-Gillock	4,090	4,105	4,235	4,030	3,987
Dyersdale	1,449	1,340	1,183	975	841
Esperson	1,496	1,474	1,365	1,284	1,154
Fairbanks	1,403	1,383	1,585	1,426	1,427
Falls City	1,341	1,232	1,059	898	904
Fannette	1,737	1,780	1,760	1,380	1,252
Francitas	280	656	962	1,172	1,556
Friendswood	14,989	13,729	12,398	10,378	10,620
Gohlke, Helen	955	2,180	2,512	2,478	2,305
Goose Creek	2,873	3,148	2,692	2,715	3,007
Greta	3,512	3,269	2,871	2,370	2,398
Hankamer	835	1,136	1,072	1,110	1,253
Hastings	16,536	14,767	13,644	11,570	11,649
Heyser	1,671	1,491	1,361	1,064	1,087
High Island	2,384	2,291	2,605	2,819	2,800
Houston, South	1,192	1,255	1,286	1,377	1,267
Hull	4,612	[3] 3,388	2,660	4,411	4,040
Humble	1,246	1,036	958	1,067	1,185
Liberty, South	1,665	1,626	2,011	2,348	2,677
Livingston	1,395	1,208	1,154	1,086	1,152
Lolita	1,803	1,589	1,476	1,247	1,358
Lovells Lake	1,418	1,217	978	863	922
McFaddin	1,339	1,368	1,275	1,076	1,225
Manvel	2,393	2,166	2,058	1,735	1,709
Markham	1,333	1,585	1,691	1,548	1,422
Old Ocean	6,247	6,268	5,954	4,994	5,378
Oyster Bayou	3,519	3,368	3,219	3,104	3,080
Pierce Junction	1,782	1,591	1,349	1,036	1,213
Placedo	2,291	1,997	2,210	1,951	1,832
Port Neches	1,621	1,847	1,846	1,687	1,491
Raccoon Bend	1,874	1,966	2,225	2,068	2,082
Refugio-Fox	2,708	2,655	2,419	2,330	2,422
Saratoga	673	758	675	1,417	1,968
Silsbee	1,364	1,465	1,398	1,248	1,340
Sour Lake	2,009	1,804	1,576	1,451	1,459
Stowell	2,336	2,360	1,936	1,645	1,709
Sugarland	1,380	1,294	1,193	933	959
Sugar Valley	1,943	1,468	1,364	1,143	1,135
Thompson	12,840	11,846	10,563	9,099	8,944
Tomball	2,444	2,204	2,095	1,888	2,188
Village Mills	3,300	3,216	3,494	2,871	2,519
West Columbia	2,331	2,297	2,252	2,344	2,436
West Ranch	7,525	6,844	6,652	5,427	5,606
Withers-Magnet	4,345	4,018	3,933	3,467	3,273
Other Gulf Coast [4] [5]	68,990	69,268	73,120	62,098	81,050
Total Gulf Coast	239,407	231,597	227,636	203,159	223,704
East Texas:					
East Texas proper	100,695	96,526	90,743	81,364	80,359
Cuyuga	1,568	1,373	1,258	1,082	1,078
Ham Gossett	465	1,040	1,186	1,099	1,067
Hawkins	13,638	16,261	18,417	16,589	16,865
Long Lake	1,619	1,476	1,236	959	988
New Hope	2,355	2,309	2,191	2,481	2,510
Pewitt Ranch	1,874	1,637	1,444	1,209	1,117
Pickton	2,027	1,383	1,788	1,477	1,585
Quitman	3,078	2,848	2,941	2,230	2,190
Talco	6,692	6,440	5,876	4,928	4,994
Van	9,698	11,349	10,650	8,850	8,816
Waskom	896	1,131	1,398	1,049	1,118
Woodlawn		91	411	1,045	1,019
Other East Texas	17,641	15,573	13,359	14,321	22,256
Total East Texas	162,246	159,437	152,898	138,683	145,962

See footnotes at end of table.

TABLE 23.—Production of crude petroleum in Texas, 1951–55, by districts and fields—Continued

(Thousand barrels)

District and field [1]	1951	1952	1953	1954	1955 [2]
Central Texas:					
Big Foot	456	793	1,792	2,413	2,455
Charlotte	2,434	1,778	1,536	1,760	2,110
Darst Creek	2,830	2,943	3,210	3,442	3,487
Luling	1,951	2,385	2,410	2,433	2,555
Other Central Texas	3,846	4,148	4,733	5,110	7,690
Total Central Texas	11,517	12,047	13,681	15,158	18,297
North Texas [6 7]	87,985	96,513	111,269	114,979	129,701
Panhandle [8]	31,287	29,272	28,080	30,903	33,400
South Texas:					
Aqua Dulce	2,232	1,945	1,736	1,500	1,389
Flour Bluff	1,016	1,066	1,200	1,286	1,118
Fulton Beach	1,819	1,945	2,718	2,985	2,701
Garcia	1,321	1,294	1,223	1,057	1,008
Hoffman	2,154	1,983	1,841	1,500	1,417
Kelsey	3,017	3,059	3,243	3,173	3,609
London Gin	1,330	1,192	1,106	955	1,101
Midway	1,582	1,298	982	928	1,070
Mustang Island	1,332	2,154	2,878	2,697	2,768
Portilla	(3)	(3)	4,373	3,506	3,143
Saxet-Saxet Frio	1,176	980	998	830	997
Stratton	3,680	3,344	2,990	2,403	2,401
Sun	1,293	1,405	1,618	1,752	1,840
Taft	1,491	1,477	1,491	1,580	1,223
White Point	3,391	3,312	3,319	2,973	3,279
Willamer, West	2,205	3,152	2,920	2,434	2,480
Other South Texas	67,510	65,367	60,022	56,724	58,920
Total South Texas	96,549	94,973	94,658	88,283	90,464
West Texas, by counties:					
Andrews	37,308	38,225	39,305	43,969	
Borden	8,981	9,614	8,888	5,728	
Coke	4,790	5,817	9,397	13,553	
Crane-Upton	31,557	42,500	39,282	37,260	
Crockett	8,574	8,725	8,532	8,447	
Dawson	2,305	2,300	2,469	2,664	
Ector [9]	69,576	69,516	55,779	51,484	
Gaines-Yoakum	35,742	34,854	36,941	36,122	
Garza	4,199	3,802	3,787	4,230	
Glasscock-Howard-Mitchell	11,598	9,597	16,841	20,114	
Hockley [10]	31,338	30,263	26,832	22,804	
Kent	7,121	6,980	7,638	6,568	
King	1,090	978	806	676	(11)
Midland	9,598	14,885	10,054	12,787	
Pecos	22,305	22,004	20,358	17,672	
Reagan	2,031	3,007	6,629	11,024	
Reeves	1,295	1,609	1,299	728	
Runnels	7,703	6,052	10,205	6,185	
Scurry	48,478	48,077	43,421	36,050	
Schleicher	863	2,465	3,179	3,298	
Terry	3,391	5,102	6,647	6,106	
Tom Green	1,911	1,618	1,173	1,369	
Ward	8,281	11,521	10,221	9,548	
Winkler	19,228	16,653	16,111	14,928	
Other West Texas	2,016	2,136	5,148	9,796	
Total West Texas	381,279	398,300	390,942	383,110	
West Texas by fields:	(12)	(12)	(12)	(12)	
Abell	2,042	1,264	1,439	1,227	1,497
Adair	1,863	2,676	2,915	2,390	2,487
Andector	7,156	6,667	6,691	5,580	5,692
Anton Irish-Anton	1,891	2,743	2,914	2,586	2,930
Benedum	2,553	4,046	3,444	2,853	2,645
Big Lake	999	984	1,018	1,014	921
Block 31	(13)	3,489	5,204	5,182	5,191
Bronte	(13)	(13)	(13)	906	1,129
Cedar Lake	1,964	1,810	1,702	1,544	1,614
Cogdell	7,629	8,118	8,171	6,558	6,507
Cowden	10,542	9,844	9,219	8,595	9,109
Cree-Sykes	1,555	2,456	2,303	1,429	1,230
Diamond M	9,175	13,398	10,592	8,920	9,300
Dollarhide	8,316	7,311	8,259	6,728	5,944

See footnotes at end of table.

TABLE 23.—Production of crude petroleum in Texas, 1951–55, by districts and fields—Continued

(Thousand barrels)

District and field [1]	1951	1952	1953	1954	1955 [2]
West Texas by fields—Continued					
Ekthorn	(12)	837	1,579	1,739	1,216
Embar	1,268	1,062	1,080	1,002	1,259
Emma	(12)	(12)	(12)	(12)	2,118
Fort Chadborne	3,868	419	5,183	5,275	4,516
Fort Stockton	(12)	923	1,237	1,325	1,294
Foster	5,457	4,758	4,326	3,714	4,616
Fuhrman	1,580	1,451	1,497	1,671	2,655
Fullerton	10,855	8,748	7,862	6,513	6,973
Garza	3,716	3,186	3,125	2,899	2,628
Goldsmith	21,221	18,699	18,663	14,577	16,212
Good	2,209	1,812	1,637	1,290	1,448
Harper	(12)	(12)	(12)	(12)	1,477
Hendrick	1,161	1,161	1,225	1,409	1,307
Howard-Glasscock	5,853	5,618	6,657	7,488	7,364
Hulldale-Hulldale Penn	(12)	1,392	1,903	1,528	1,824
Jameson	2,787	3,506	4,425	5,445	7,694
Jordan	4,573	4,228	4,131	3,620	3,481
Kelly Snyder	28,020	27,004	25,549	17,035	22,308
Kermit	(12)	(12)	(12)	1,972	2,834
Keystone	13,031	11,220	10,990	13,210	8,848
Lea	(12)	(12)	(12)	(12)	1,363
Levelland	12,683	11,783	11,410	9,992	9,504
Luther	(12)	(12)	(12)	(12)	1,136
McCamey	3,431	3,079	2,825	2,497	2,003
McElroy	8,447	7,431	7,250	6,718	6,829
Mabee	864	771	824	944	1,016
Magutex	(12)	(12)	(12)	974	1,997
Martin	3,384	2,888	2,643	2,026	2,052
Means	1,674	1,626	1,523	1,336	2,996
Midland Farms	6,210	7,467	6,843	4,953	6,997
Pegasus	3,998	4,365	5,706	5,778	5,481
Penwell	837	793	978	1,426	1,612
Prentice	(12)	(12)	(12)	4,187	5,529
Reinecke	3,101	2,923	2,748	1,642	1,572
Russell	(12)	(12)	(12)	3,474	5,541
Salt Creek	2,402	2,688	3,309	3,371	4,180
Sand Hills	4,691	4,099	4,065	4,000	5,074
Seminole	7,213	5,610	6,673	5,459	5,547
Shafter Lake	3,152	2,814	3,044	3,343	3,799
Sharon Ridge	5,972	1,324	1,174	1,253	1,348
Slaughter	15,197	13,669	13,591	11,370	11,151
Spraberry Trend	1,077	30,040	17,015	39,968	22,155
Three Bar	2,000	1,499	1,577	2,201	1,214
Todd	3,812	3,329	2,997	2,492	2,502
Triple N	(12)	(12)	(12)	1,046	1,254
TXL	14,673	12,075	10,476	8,277	6,146
University	(12)	(12)	(12)	[14] 2,615	2,163
Vealmoor-East	4,241	5,015	5,008	3,603	3,440
Waddell	1,296	1,113	1,912	1,151	1,349
Ward-Estes	6,794	10,397	8,921	7,433	9,013
Wasson	22,465	19,941	19,160	15,422	15,752
Welch	1,211	(12)	1,074	1,032	1,392
Wellman	897	1,862	2,077	966	1,163
Wilshire	(12)	3,832	4,620	3,384	2,953
World	1,426	1,561	1,519	1,376	1,456
Yarbrough	2,031	2,455	2,569	2,023	2,202
Yates	14,162	12,883	12,271	9,903	9,878
Other West Texas					88,165
Total West Texas					417,192
Total Texas	1,010,270	1,022,139	1,019,164	974,275	1,058,720

[1] Texas Railroad Commission districts.
[2] Preliminary figures.
[3] Included in "Other."
[4] A new field was created out of a portion of Hull and included in "Other Gulf Coast."
[5] Includes crude oil consumed on leases for entire district.
[6] Includes the fields in and between Hardeman, Wilbarger, Wichita, Clay, Montague, and Cook Counties on the north and San Saba, Lampasas, and Coryell on the south.
[7] Includes crude oil consumed on leases and net change in stocks held on leases for East (exclusive of East Texas proper) Central, North, and South Texas.
[8] Carson, Gray, Hutchinson, Moore, Sherman, and Wheeler Counties.
[9] Includes the part of Jordan pool in Crane County.
[10] Includes Slaughter and Levelland fields.
[11] Production reported by fields.
[12] From Oil and Gas Journal.
[13] Not available.
[14] University Block 9 and University-Waddell.

TABLE 24.—Production of crude petroleum in Wyoming, 1951–55, by fields

(Thousand barrels)

Field	1951	1952	1953	1954	1955 [1]
Beaver Creek	314	679	605	726	1,130
Big Muddy	878	1,197	1,373	1,088	1,232
Big Sand Draw	2,185	2,387	2,400	2,503	2,546
Bonanza	[2]	1,620	2,935	3,536	5,033
Byron-Garland	5,186	4,343	5,603	6,642	7,599
Cole Creek, Northeast and South	1,317	1,820	2,271	1,506	1,223
Elk Basin	7,292	8,041	8,488	6,889	7,543
Frannie	3,703	3,709	3,731	3,708	3,523
Gebo	323	288	888	698	1,469
Glenrock-South	1,597	2,414	4,197	3,940	3,660
Grass Creek	1,816	2,395	3,583	4,367	4,155
Hamilton Dome	3,870	3,075	3,558	3,766	4,681
Lance Creek	2,385	1,895	1,662	1,937	1,556
Little Buffalo	1,001	951	1,142	1,224	1,228
Lost Soldier-Wertz, etc	5,225	5,299	5,900	6,519	6,449
Oregon Basin	3,717	2,688	3,508	4,898	5,888
Salt Creek	4,063	4,159	4,375	4,583	4,423
Steamboat Butte	3,018	2,056	3,611	3,443	3,470
Sussex-Meadow	3,043	2,960	4,022	6,802	7,392
Winkleman	817	811	1,255	1,414	1,319
Other fields [3]	17,179	15,287	17,511	23,344	24,954
Total Wyoming	68,929	68,074	82,618	93,533	100,473

[1] Preliminary figures.
[2] Included in "Other fields."
[3] Includes crude oil consumed on leases and net change in stocks held on leases for entire State.

WELLS

The number of wells drilled in the United States, including oil and gas wells and dry holes, set a new record of 56,682 in 1955—an increase of 3,763 wells over 1954. Dry holes drilled increased from 36.2 percent in 1954 to 37.9 percent in 1955.

The daily average per producing well rose from 12.6 barrels in 1954 to 13.2 barrels in 1955.

TABLE 25.—Wells drilled for oil and gas in the United States, 1954–55, by months

[Oil and Gas Journal]

Wells	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Total	
													Number	Percent
1954														
Oil	2,601	2,164	2,564	2,488	2,467	2,298	2,867	2,534	2,298	2,370	2,379	2,743	29,773	56.3
Gas	348	268	300	286	289	359	413	352	348	331	328	355	3,977	7.5
Dry	1,705	1,317	1,443	1,537	1,499	1,468	1,796	1,696	1,593	1,628	1,665	1,822	19,169	36.2
Total	4,654	3,749	4,307	4,311	4,255	4,125	5,076	4,582	4,239	4,329	4,372	4,920	52,919	100.0
1955														
Oil	2,486	2,340	2,738	2,787	2,594	2,798	2,661	2,834	2,746	2,473	2,598	2,512	31,567	55.7
Gas	261	227	264	280	305	306	317	340	326	321	337	329	3,613	6.4
Dry	1,597	1,504	1,686	1,875	1,714	1,934	1,693	1,985	1,983	1,854	1,809	1,868	21,502	37.9
Total	4,344	4,071	4,688	4,942	4,613	5,038	4,671	5,159	5,055	4,648	4,744	4,709	56,682	100.0

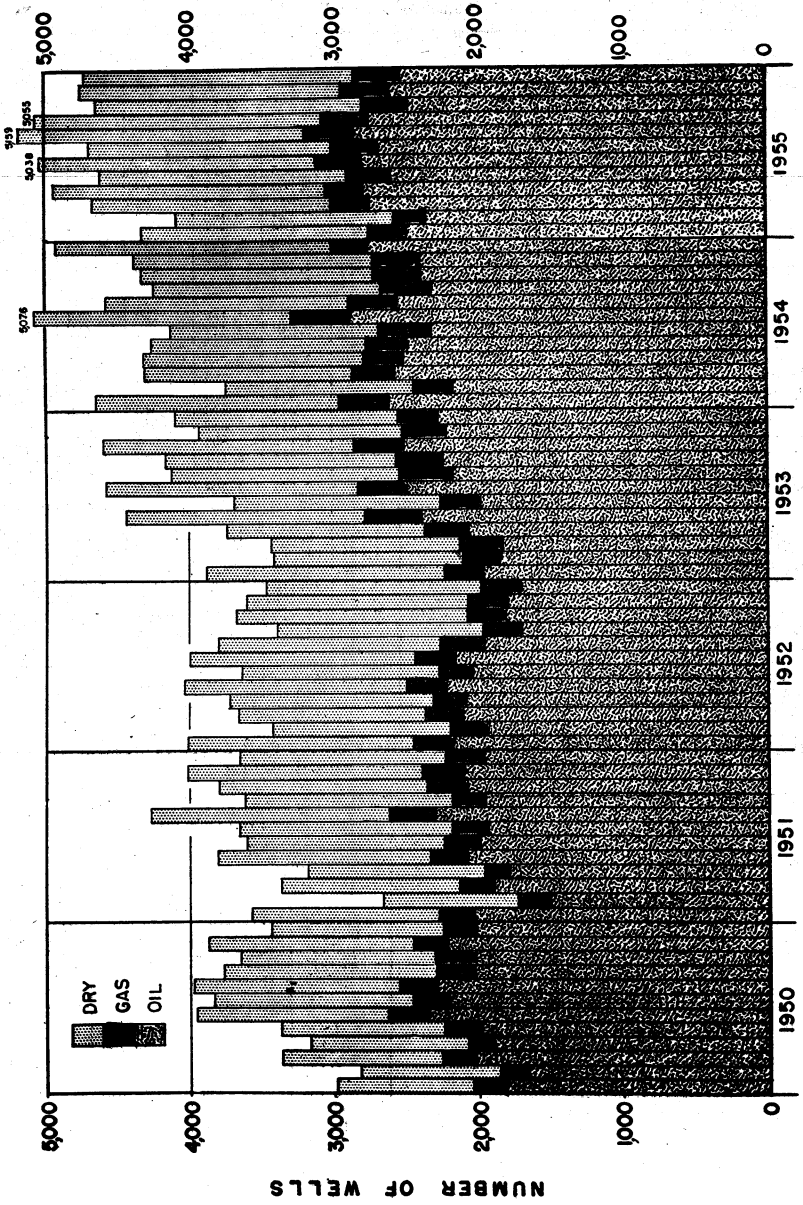

FIGURE 4.—Wells drilled in the United States, 1950–55, by months.

TABLE 26.—Wells drilled for oil and gas in the United States, 1954–55, by States and districts

[Oil and Gas Journal]

State and district	1954				1955			
	Oil	Gas	Dry	Total	Oil	Gas	Dry	Total
Alabama	2	2	59	63	1		40	41
Arkansas	366	10	289	665	429	10	365	804
California	1,668	47	620	2,335	1,747	64	654	2,465
Colorado	486	72	800	1,358	402	84	1,023	1,509
Illinois	1,709	4	1,421	3,134	2,100	16	1,776	3,892
Indiana	310	12	565	887	205	22	479	706
Kansas	2,428	381	1,864	4,673	2,434	362	2,162	4,958
Kentucky	487	214	485	1,186	655	162	775	1,592
Louisiana:								
Gulf Coast	942	122	537	1,601	1,139	126	683	1,948
Northern	1,431	166	413	2,010	1,417	156	498	2,071
Total Louisiana	2,373	288	950	3,611	2,556	282	1,181	4,019
Michigan	219	10	334	563	194	19	299	512
Mississippi	164	8	269	441	180	1	267	448
Montana	156	17	170	343	170	16	225	411
Nebraska	232	20	259	511	307	4	580	891
New Mexico	548	392	186	1,126	859	564	240	1,663
Oklahoma	5,417	383	2,658	8,458	5,131	359	2,921	8,411
Pennsylvania, New York, Ohio, West Virginia	1,121	1,163	694	2,978	1,098	986	910	2,994
Texas:								
Gulf Coast	1,368	197	1,087	2,652	1,239	159	1,108	2,506
West Texas	3,329	65	1,034	4,428	3,912	37	959	4,908
East Texas	419	169	465	1,053	410	95	479	984
Other districts	5,952	481	4,277	10,710	6,915	312	4,356	11,583
Total Texas	11,068	912	6,863	18,843	12,476	603	6,902	19,981
Wyoming	818	29	374	1,221	439	46	430	915
Other States	201	13	309	523	184	13	273	470
Total United States	29,773	3,977	19,169	52,919	31,567	3,613	21,502	56,682

TABLE 27.—Producing oil wells in the United States and average production per day, 1954–55, by States and districts

State and district	Producing oil wells			
	1954		1955 [1]	
	Approximate number Dec. 31	Average production per well per day (barrels)	Approximate number Dec. 31	Average production per well per day (barrels)
Arkansas	4,410	18.6	4,610	17.3
California	32,860	30.1	34,760	28.7
Colorado	1,750	85.2	1,940	75.8
Illinois	30,280	6.1	29,600	7.5
Indiana	4,160	7.5	4,080	7.4
Kansas	37,755	8.9	36,177	9.0
Kentucky	16,900	2.3	17,800	2.4
Louisiana:				
Gulf	7,330	80.1	8,600	77.2
Northern	8,650	14.2	10,200	12.8
Total Louisiana	15,980	44.7	18,800	42.3
Michigan	4,173	8.1	4,034	7.5
Mississippi	2,173	45.5	2,339	45.3
Montana	3,415	11.4	3,414	12.5
Nebraska	550	47.4	790	40.3
New Mexico	7,760	27.2	8,640	27.5
New York	22,390	.4	20,100	.4

See footnotes at end of table.

TABLE 27.—Producing oil wells in the United States and average production per day, 1954–55, by States and districts—Continued

State and district	Producing oil wells			
	1954		1955 [1]	
	Approximate number Dec. 31	Average production per well per day (barrels)	Approximate number Dec. 31	Average production per well per day (barrels)
North Dakota	460	46.0	570	59.3
Ohio	14,110	.7	14,195	.8
Oklahoma	65,390	7.9	69,930	8.2
Pennsylvania	73,700	.3	72,525	.3
Texas.[2]				
Gulf	19,600	28.1	20,070	30.9
West Texas	45,080	24.6	47,450	24.7
East Texas proper	20,670	10.6	20,660	10.7
Other districts	67,840	12.9	71,700	13.3
Total Texas	153,190	18.0	159,880	18.5
West Virginia	12,900	.6	12,500	.5
Wyoming	6,530	42.5	6,960	40.8
Other States [3]	364	33.2	366	30.9
Total United States	511,200	12.6	524,010	13.2

[1] Preliminary figures.
[2] Texas Railroad Commission divisions.
[3] Alabama, Florida, Missouri, Nevada, South Dakota, Tennessee, Utah, and Virginia.

CONSUMPTION AND DISTRIBUTION

The total demand for crude oil in the United States set a new record in 1955, a gain of 6.6 percent over 1954, and included increases of 6.3 percent in the demand for domestic crude oil and 18.6 percent in the demand for foreign crude. Foreign crude supplied 10.3 percent of the total demand in 1955.

Runs to Stills.—Total crude runs to stills rose from 6,958,000 barrels daily in 1954 to 7,480,000 barrels daily in 1955, a gain of 7.5 percent.

Distribution.—The Bureau of Mines collects data relating to receipts of domestic and foreign crude petroleum at United States refineries. These receipts include the crude runs to stills, a small quantity used as refinery fuel, and any increase in crude stocks at refineries. Classification of receipts, by States of origin, shows the quantity received from local production (intrastate) and from other States (interstate), as well as receipts of imported crude. Classification by method of transportation indicates the final receipts by water, pipeline, tank car, and truck. Receipts of domestic crude by water were usually moved by pipeline from the point of production to the point of water shipment.

Receipts of domestic and foreign crude petroleum at refineries totaled 2,731.9 million barrels in 1955 and, with 0.5 million barrels from crude stocks at refineries, provided for total crude runs of 2,730.2 million barrels and 2.2 million barrels for fuel use or losses. Receipts of foreign crude oil comprised 10.5 percent of the total.

TABLE 28.—Runs to stills of crude petroleum in the United States in 1955, by district and month [1]

(Thousand barrels)

District [2]	January	February	March	April	May	June	July	August	September	October	November	December	Total
East Coast:													
Domestic	14,528	13,483	12,975	12,641	12,682	11,126	13,871	13,449	13,021	13,225	13,295	13,427	157,723
Foreign	19,511	17,370	20,037	17,237	18,412	19,652	20,253	19,290	19,529	19,458	19,772	20,524	231,045
Total East Coast	34,039	30,853	33,012	29,878	31,094	30,778	34,124	32,739	32,550	32,683	33,067	33,951	388,768
Appalachian	5,898	5,304	6,171	5,471	5,652	5,736	6,239	5,963	5,718	6,128	6,083	6,569	70,842
Indiana, Illinois, Kentucky, etc.:													
Domestic	42,006	38,912	41,799	37,604	41,360	41,746	44,055	41,954	38,367	41,231	39,922	44,324	493,280
Foreign	200	128	205	264	343	366	453	583	511	818	1,317	1,308	6,496
Total Indiana, Illinois, Kentucky, etc.	42,206	39,040	42,004	37,868	41,703	42,112	44,508	42,537	38,878	42,049	41,239	45,632	499,776
Oklahoma, Kansas, etc.	20,907	18,773	19,573	17,723	20,297	21,119	20,938	21,249	21,099	20,348	20,800	22,245	245,071
Texas Inland	7,756	7,214	7,855	7,774	7,791	7,407	7,828	7,947	7,919	7,530	7,534	8,076	92,631
Texas Gulf Coast:													
Domestic	54,932	52,621	57,338	53,207	55,232	53,173	55,187	57,046	52,547	55,328	57,115	58,323	662,049
Foreign	833	403	741	566	699	1,171	985	737	887	860	1,077	757	9,716
Total Texas Gulf Coast	55,765	53,024	58,079	53,773	55,931	54,344	56,172	57,783	53,434	56,188	58,192	59,080	671,765
Louisiana Gulf Coast:													
Domestic	19,276	17,965	19,703	19,188	19,281	20,114	18,920	20,819	19,696	21,074	20,501	21,446	237,983
Foreign	97	98	85	96	118	136	145	133	148	135	140	63	1,394
Total Louisiana Gulf Coast	19,373	18,063	19,788	19,284	19,399	20,250	19,065	20,952	19,844	21,209	20,641	21,509	239,377
Arkansas, Louisiana Inland, etc.	2,610	2,639	2,597	2,592	2,933	2,849	2,879	2,914	2,649	2,798	2,901	2,901	33,262
Rocky Mountain	8,828	7,711	8,169	7,401	7,951	8,708	9,234	9,270	8,294	8,131	8,364	8,588	100,649
California:													
Domestic	29,307	26,359	28,830	29,458	30,616	29,229	30,813	30,644	30,675	30,388	28,812	28,212	353,343
Foreign	2,048	2,385	2,516	2,858	2,422	1,978	3,186	2,968	3,418	3,959	3,125	3,871	34,734
Total California	31,355	28,744	31,346	32,316	33,038	31,207	33,999	33,612	34,093	34,347	31,937	32,083	388,077
Total United States:													
Domestic	206,048	190,981	205,010	193,059	203,705	201,207	209,964	211,255	199,985	206,181	205,327	214,111	2,446,833
Foreign	22,689	20,384	23,584	21,021	21,994	23,303	25,022	23,711	24,493	25,230	25,431	26,523	283,385
Grand total: 1955	228,737	211,365	228,594	214,080	225,699	224,510	234,986	234,966	224,478	231,411	230,758	240,634	2,730,218
1954	215,366	197,914	214,620	204,336	218,178	208,408	214,402	212,708	208,155	211,851	209,244	224,382	2,539,564
Daily average, 1955	7,379	7,549	7,374	7,136	7,281	7,484	7,580	7,580	7,483	7,465	7,692	7,762	7,480

[1] Preliminary figures.

[2] Where no breakdown is shown, runs were all of domestic crude.

The East Coast district received 81.6 percent of the foreign crude in 1955; the California District, 11.9 percent; the Gulf Coast district, 3.9 percent; and the Indiana-Illinois district, 2.6 percent.

Refinery receipts of crude oil in 1955, by methods of transportation, indicated that 75.7 percent was delivered by pipeline, 22.9 percent by boat, and 1.4 percent by tank-car and truck. Domestic crude oil began moving principally by pipeline; a considerable quantity was moved by water afterward. Tank car and truck movements are primarily local.

The Movements by boat were mostly interstate, from the Gulf coast to the east coast and between Texas and Louisiana. Important quantities were shipped intrastate by boat in California, Louisiana, Mississippi, Texas, and Kentucky.

TABLE 29.—Receipts of domestic and foreign crude petroleum at refineries in the United States, 1951–55

(Million barrels)

Method of transportation	1951	1952	1953	1954	1955 [1]
By water:					
Intrastate	145.9	170.0	173.1	161.0	155.4
Interstate	256.9	243.1	231.1	205.6	202.9
Foreign	178.7	208.5	233.9	236.9	268.6
Total by boat	581.5	621.6	638.1	603.5	626.9
By pipeline:					
Intarstate	1,127.0	1,113.7	1,158.1	1,172.6	1,278.1
Interstate	629.4	680.3	727.7	721.2	772.0
Foreign	.4	1.1	2.5	2.6	16.8
Total by pipeline	1,756.8	1,795.1	1,888.3	1,896.4	2,066.9
By tank cars and trucks:					
Interstate	18.3	20.6	26.1	26.2	28.9
Intrastate	15.4	10.1	11.5	10.5	9.2
Total by tank cars and trucks	33.7	30.7	37.6	36.7	38.1
Grand total	2,372.0	2,447.4	2,564.0	2,536.6	2,731.9

[1] Preliminary figures.

Demand by State of Origin.—Distribution of domestic crude oil by refining States and districts can be analyzed from data on receipts of crude oil at refineries. When long-distance shipments are involved, various crudes may be mixed in transit or storage, and identification by origin may be only approximate.

TABLE 30.—Refinery receipts of domestic crude oil in the United States, in 1955, by States and districts

(Thousand barrels)

Receiving State and district	Total domestic receipts	Intrastate receipts	Interstate receipts from—																	
			Ala. and Miss.	Ark.	Calif. and Nev.	Colo.	Fla. and N. Y.	Ill.	Ind.	Kans.	Ky. and Ohio	La.	Mont.	Nebr., N. Dak., and S. Dak.	N. Mex.	Okla.	Pa.	Tex.	W. Va.	Utah and Wyo.	Total
Florida, Georgia, South Carolina	111		111																		111
Maryland	12,256		768		514							4,472						6,502			12,256
Massachusetts, Rhode Island, Delaware	8,686		706		205							5,501						2,274			8,686
New Jersey	46,047		1,088				570					12,797			423			31,169			46,047
New York:																					
East	4,100		3,489															611			4,100
West	20,840	1,558						4,939		2,863						1,510	2	9,968			19,282
Pennsylvania:																					
East	87,709											13,736						73,973			87,709
West	12,973	10,168									918							1,322	565		2,805
West Virginia	2,210	1,568						43			569					30					642
District 1	194,932	13,294	6,162		719		570	4,982		2,863	1,487	36,506			423	1,540	2	125,819	565		181,638
Illinois	179,400	30,031				2,575			1,336	20,007		349	50	209	7,654	27,631		77,323		12,235	149,369
Indiana	138,940	959				1,528		5,073		21,036				1,524	881	24,406		55,893		27,640	137,981
Kansas	91,774	63,472				3,590								566		10,818		13,299		29	28,302
Kentucky, Tennessee	26,657	13,972	3,193	975					2,242		91	5,650						534			12,685
Michigan	46,235	12,646				1,009		5,550	1,078					1,125		2,943		11,858		10,026	33,589
Minnesota, Wisconsin	5,612					67		120		4			3,575	279		14				1,553	5,612
Missouri	24,020									2,371						5,315		13,673		2,661	24,020
Nebraska	788	80																		708	708
North and South Dakota	10,764	10,676											88								88
Ohio:																					
East	34,870	2,776	161			586		24,093		3,632	907					2,104		611			32,094
West	97,509	30	197	428		4,372		14,067		90	4,524	1,829		3,273		18,587		50,056		56	97,479
Oklahoma	116,065	87,459								12,019					2,416			14,171			28,606
District 2	772,634	222,101	3,551	1,403		13,727		48,903	4,656	59,159	5,522	7,828	3,713	6,976	10,951	91,818		237,418		54,908	550,533

Alabama, Mississippi	6,296	4,498	1,489									232						77			1,798
Arkansas	24,600	21,663										152						2,785			2,937
Louisiana	239,929	160,169	19,214	12,518				102										47,926			79,760
New Mexico	7,793	6,317																1,343		133	1,476
Texas	754,778	636,406								733		56,826			59,043	1,770					118,372
District 3	1,033,396	829,053	20,703	12,518				102		733		57,210			59,043	1,770		52,131		133	204,343
Colorado	9,792	2,843											116	32	13					6,788	6,949
Montana	20,837	9,033												12						11,792	11,804
Utah	27,849	1,903			61	24,766									48					1,071	25,946
Wyoming	34,499	33,417				1,082															1,082
District 4	92,977	47,196			61	25,848							116	44	61					19,651	45,781
California	350,794	350,794																			
Oregon, Washington	1,763				1,763																1,763
District 5	352,557	350,794			1,763																1,763
United States Total 1955	2,446,496	1,462,438	30,416	13,921	2,543	39,575	570	53,987	4,656	62,755	7,009	101,544	3,829	7,020	70,478	95,128	2	415,368	565	74,692	984,058
Daily average 1955	6,703	4,007	83	38	7	108	2	148	13	172	19	278	10	19	193	261		1,138	2	205	2,696
Daily average 1954	6,293	3,725	82	38		86	2	121	12	159	14	289	11	16	174	246	4	1,125	2	187	2,568

TABLE 31.—Crude runs to stills and refinery receipts of crude oil in the United States in 1955 by methods of transportation and by receiving States and districts

(Thousand barrels)

Receiving State and district	Crude runs to stills	Fuel and losses	Origin of domestic crude receipts	Change in refinery stocks	Total receipts, by method of transportation						
					Intrastate			Interstate			Foreign boats
					Pipelines	Tank cars and trucks	Boats	Pipelines	Tank cars and trucks	Boats	
Florida, Georgia, South Carolina	4,687	84	570	+5						111	4,665
Maryland	19,347	66		+166						12,256	7,323
Massachusetts, Rhode Island, Delaware	15,692	−1		+242						8,686	7,247
New Jersey	130,498	289		+898				347		45,700	85,638
New York:											
East	12,804	28		+213						4,100	8,945
West	20,827	−2	1,558	+15	1,558			19,282			
Pennsylvania:											
East	205,740	198		+803						87,709	119,032
West	12,851	−9	10,170	+131	10,111	57		1,592	108	1,105	
West Virginia	2,225		2,133	−15	1,547	21		640	2		
District 1	424,671	653	14,431	+2,458	13,216	78		21,861	110	159,667	232,850
Illinois	179,404	22	84,018	−26	30,031			149,019	350		
Indiana	138,676	227	5,615	+37	590	369		137,877	104		
Kansas	91,739	15	126,227	+20	62,192	1,280		28,261	41		
Kentucky, Tennessee	26,408	−9	19,494	+258	3,243	58	10,671	4,529	621	7,535	
Michigan	45,595	570	12,646	+70	12,026	620		32,407		1,182	
Minnesota, Wisconsin	10,210	70		+798				67	4,064	1,481	[1] 5,466
Missouri	23,956			+64				24,020			
Nebraska	759	2	6,809	+27	73	7		636	72		
North and South Dakota	10,815	2	10,967	−53	10,400	276			88		
Ohio:											
East	34,939	−3	4,293	−66	2,683	93		32,094			
West	99,483	−27		+12	10	20		97,479			1,959
Oklahoma	117,802	92	182,587	−1,829	86,099	1,360		28,606			
District 2	779,786	961	452,656	−688	207,347	4,083	10,671	534,995	5,340	10,198	7,425

Alabama, Mississippi	7,571	9	34,914	+56	2,750	646	1,102	----------	870	928	1,340
Arkansas	24,948	−18	35,584	−330	21,502	161	----------	2,782	155	----------	----------
Louisiana	240,120	260	261,713	−308	97,151	1,303	61,715	72,509	887	6,364	143
New Mexico	7,750	12	76,795	+31	5,706	611	----------	1,343.	133	----------	----------
Texas	764,396	61	1,051,774	−64	595,195	8,252	32,959	94,430	----------	23,942	9,615
District 3	1,044,785	324	1,460,780	−615	722,304	10,973	95,776	171,064	2,045	31,234	11,098
Colorado	9,755	7	42,418	+30	1,963	880	----------	6,914	35	----------	----------
Montana	20,931	8	12,862	−102	5,525	3,508	----------	11,627	177	----------	----------
Utah	27,881	−14	2,036	−18	1,597	306	----------	25,554	392	----------	----------
Wyoming	34,332	105	107,976	+62	32,562	855	----------	----------	1,082	----------	----------
District 4	92,899	106	165,292	−28	41,647	5,549	----------	44,095	1,686	----------	----------
California, Nevada	374,826	105	353,337	−2,146	293,614	8,228	48,952	----------	----------	----------	21,991
Oregon, Washington	13,251	7	----------	+562	----------	----------	----------	----------	----------	1,763	[2] 12,057
District 5	388,077	112	353,337	−1,584	293,614	8,228	48,952	----------	----------	1,763	34,048
Total 1955	2,730,218	2,156	2,446,496	−457	1,278,128	28,911	155,399	772,015	9,181	202,862	285,421
Daily average 1955	7,480	6	6,703	−1	3,502	79	426	2,115	25	556	782
Daily average 1954	6,958	7	6,293	−15	3,212	72	441	1,976	29	563	656

[1] Pipeline. [2] Includes 11,344,000 barrels by pipeline.

TABLE 32.—Daily average demand for total crude petroleum in the United States in 1954–55, by States of origin and months

(Thousand barrels)

State	January	February	March	April	May	June	July	August	September	October	November	December	Year
1954													
Alabama	4.6	5.6	4.2	3.3	3.4	5.7	4.1	3.4	6.4	4.6	4.3	4.8	4.5
Arkansas	80.4	78.9	85.4	70.6	90.0	79.8	73.7	84.2	78.0	81.1	79.5	74.7	79.7
California	1,018.3	967.6	977.2	1,004.0	1,033.3	993.6	951.9	948.7	958.0	987.6	979.1	968.0	982.4
Colorado	96.8	108.6	104.6	116.4	128.3	119.1	116.3	143.0	134.4	106.8	125.3	148.6	120.7
Florida	(1)	3.9	2.6	1.1	.1	(1)	3.7	(1)	.2	3.6	.3	3.3	1.6
Illinois	165.2	181.5	185.8	157.2	156.3	150.7	212.7	189.7	194.3	186.9	213.4	213.1	184.0
Indiana	35.3	34.6	33.5	30.2	32.6	23.6	31.1	25.5	35.8	29.5	29.8	32.6	31.2
Kansas	289.0	312.4	355.0	313.9	348.0	341.8	341.4	317.6	317.3	305.4	326.8	326.1	324.7
Kentucky	37.4	37.3	36.1	31.7	36.0	47.9	37.9	32.5	41.2	40.1	40.9	37.5	38.0
Louisiana	745.6	728.2	720.1	657.0	708.6	704.5	661.8	666.1	639.7	645.2	645.5	665.1	682.1
Michigan	36.3	35.9	29.5	30.9	37.1	31.7	35.3	32.4	29.6	34.9	33.7	33.6	33.4
Mississippi	90.4	105.7	89.8	98.8	103.1	92.0	90.8	108.2	85.6	95.5	82.9	99.2	95.1
Missouri, Nevada, South Dakota, Tennessee, Virginia	.3	.4	.4	.4	.5	.4	.7	.7	.6	.4	.6	.6	.5
Montana	31.5	36.4	34.6	31.8	35.9	46.1	42.1	43.0	40.6	32.2	44.7	47.9	38.9
Nebraska	26.0	15.3	20.7	19.5	23.3	23.0	21.9	11.9	27.1	22.3	18.5	23.8	21.1
New Mexico	189.6	204.5	236.0	181.9	213.2	189.3	195.5	203.2	183.5	202.0	235.2	246.8	206.8
New York	8.7	9.3	9.3	9.2	7.6	5.0	8.3	8.8	9.5	11.5	12.4	8.8	9.0
North Dakota	8.7	8.9	8.0	6.6	15.8	13.3	12.0	12.2	12.3	26.5	30.0	34.7	15.8
Ohio	10.0	4.2	17.2	9.4	13.4	11.4	9.6	10.0	8.0	6.0	14.4	11.7	10.5
Oklahoma	498.2	582.5	537.9	540.4	524.5	527.3	438.0	506.0	507.4	488.2	466.9	555.2	513.9
Pennsylvania	28.0	18.4	16.7	19.3	25.6	26.9	26.5	25.6	27.3	26.6	23.4	24.0	24.1
Texas	2,773.8	2,788.5	2,601.3	2,755.4	2,663.9	2,640.6	2,624.7	2,621.1	2,693.8	2,703.6	2,772.7	2,791.3	2,701.7
Utah	4.9	6.0	5.5	5.3	5.5	5.3	5.1	4.4	5.5	5.2	5.4	5.8	5.3
West Virginia	7.2	7.5	8.3	7.3	5.6	9.9	8.3	7.3	7.4	7.5	8.8	6.9	7.7
Wyoming	244.5	244.4	251.5	227.8	253.8	284.9	284.7	268.7	259.1	234.2	255.3	242.0	254.3
Total domestic crude	6,430.7	6,526.5	6,371.2	6,329.4	6,465.4	6,373.8	6,238.1	6,274.2	6,302.6	6,287.4	6,449.8	6,606.1	6,387.0
Foreign crude	617.4	614.3	629.8	580.5	650.4	655.0	754.4	684.3	694.7	640.8	624.7	713.5	655.5
Grand total 1954	7,048.1	7,140.8	7,001.0	6,909.9	7,115.8	7,028.8	6,992.5	6,958.5	6,997.3	6,928.2	7,074.5	7,319.6	7,042.5
Pennsylvania Grade (included above)	49.0	36.1	42.4	36.4	43.4	45.4	47.3	45.1	46.5	43.6	47.8	43.1	44.3
1955 [2]													
Alabama	3.7	2.5	3.3	2.8	3.8	3.2	5.1	4.2	3.2	3.6	3.6	4.3	3.6
Arkansas	72.9	83.5	81.1	79.3	83.4	75.9	76.8	85.0	75.6	82.0	80.9	81.1	79.8
California	954.3	938.5	942.0	993.3	1,000.6	985.6	1,005.7	1,003.1	1,031.8	994.9	968.7	929.8	979.2
Colorado	114.1	146.5	106.7	127.5	131.1	153.8	160.1	142.2	147.0	152.8	158.9	154.8	141.2
Florida	(1)	.2	3.2	.7	.3	.3	1.7	.8	2.5	1.3	(1)	3.6	1.2
Illinois	220.7	211.8	248.0	196.2	194.2	255.6	240.6	244.2	257.4	232.2	212.5	239.9	229.6
Indiana	20.6	39.6	27.1	26.0	36.5	28.0	35.8	30.6	30.3	30.3	26.5	32.0	30.2

Kansas	337.0	341.4	338.4	324.0	352.4	324.9	339.0	336.8	352.2	281.4	342.6	342.0	334.3
Kentucky	44.0	41.1	32.4	41.6	39.4	45.2	40.7	48.9	42.2	52.3	33.1	41.4	41.9
Louisiana	688.1	739.6	686.0	720.0	705.9	756.0	698.0	756.7	708.5	772.4	760.5	782.7	731.1
Michigan	30.3	40.3	32.8	27.5	32.6	29.9	29.2	30.4	30.9	29.9	29.5	29.2	31.1
Mississippi	84.4	99.8	98.6	102.0	91.3	94.7	105.6	109.5	103.5	110.3	110.7	112.1	101.9
Missouri, Nevada, South Dakota, Tennessee, Virginia	.5	.5	.6	.6	.6	.6	.5	.4	.4	.4	.4	.5	.5
Montana	46.8	46.2	42.5	42.5	47.9	43.0	36.1	46.8	36.2	33.9	36.1	37.0	41.2
Nebraska	15.3	15.2	25.5	19.5	23.7	22.2	19.4	32.4	15.3	36.5	36.8	31.8	24.5
New Mexico	229.1	220.3	207.4	216.8	205.1	245.1	224.2	202.7	220.9	211.9	255.2	236.8	222.8
New York	8.4	8.6	8.6	8.4	6.1	8.3	8.1	8.4	8.4	8.2	7.7	7.7	8.1
North Dakota	32.4	32.1	34.9	6.2	21.8	38.8	37.8	36.3	36.6	16.0	38.2	39.1	30.8
Ohio	11.1	12.3	9.2	9.2	12.3	12.6	12.7	10.6	12.3	12.9	14.7	12.2	11.8
Oklahoma	535.9	570.1	529.3	583.7	551.2	591.8	579.6	568.1	553.7	583.5	513.0	608.6	564.0
Pennsylvania	26.1	22.2	22.7	25.5	19.8	28.7	20.6	14.6	18.9	24.9	30.3	27.6	23.5
Texas	2,949.0	3,033.9	2,902.5	2,717.7	2,822.9	2,769.1	2,879.2	2,911.8	2,776.2	2,793.5	2,984.6	2,991.4	2,877.1
Utah	5.0	6.0	5.2	5.9	5.5	6.1	6.0	6.1	6.1	5.9	4.6	5.1	5.6
West Virginia	4.9	6.0	8.3	5.3	7.4	5.5	4.7	6.7	2.8	5.4	9.2	7.5	6.2
Wyoming	274.9	253.3	281.4	239.6	258.1	277.7	291.2	280.4	275.6	265.7	279.8	267.3	270.6
Total domestic crude	6,709.5	6,911.5	6,677.7	6,521.8	6,653.9	6,802.6	6,858.4	6,917.7	6,748.5	6,742.1	6,938.1	7,025.5	6,791.7
Foreign crude	734.1	729.6	762.4	701.7	710.1	778.1	807.3	765.7	816.8	815.2	848.1	855.7	777.4
Grand total 1955	7,443.6	7,641.1	7,440.1	7,223.5	7,364.0	7,580.7	7,665.7	7,683.4	7,565.3	7,557.3	7,786.2	7,881.2	7,569.1
Pennsylvania Grade (included above)	43.6	40.6	42.5	40.9	37.2	46.2	37.8	32.5	33.7	41.6	52.7	46.0	41.2

[1] Less than 100 barrels per day. [2] Preliminary figures.

TABLE 33.—Demand for total crude petroleum in the United States, in 1954–55, by States of origin and months

(Thousand barrels)

State	January	February	March	April	May	June	July	August	September	October	November	December	Year
1954													
Alabama	141	158	130	100	105	172	126	104	193	142	130	147	1,648
Arkansas	2,491	2,210	2,648	2,118	2,790	2,394	2,285	2,610	2,339	2,514	2,385	2,316	29,100
California	31,569	27,092	30,293	30,121	32,033	29,808	29,509	29,411	28,740	30,614	29,373	30,008	358,571
Colorado	3,002	3,041	3,243	3,493	3,976	3,574	3,604	4,433	4,032	3,311	3,760	4,606	44,075
Florida	1	108	80	32	3	1	115	1	5	111	9	102	568
Illinois	5,122	5,083	5,759	4,715	4,844	4,521	6,593	5,881	5,827	5,795	6,401	6,607	67,148
Indiana	1,095	968	1,040	905	1,012	709	964	790	1,074	913	894	1,010	11,374
Kansas	8,958	8,748	11,006	9,417	10,788	10,254	10,584	9,845	9,519	9,468	9,805	10,108	118,500
Kentucky	1,158	1,043	1,118	952	1,117	1,436	1,174	1,009	1,237	1,244	1,227	1,163	13,878
Louisiana	23,114	20,388	22,322	19,708	21,966	21,133	20,515	20,649	19,190	20,001	19,364	20,617	248,967
Michigan	1,124	1,006	914	928	1,151	950	1,095	1,006	889	1,082	1,011	1,042	12,198
Mississippi	2,803	2,958	2,783	2,964	3,196	2,760	2,815	3,353	2,568	2,961	2,486	3,075	34,722
Missouri, Nevada, South Dakota, Tennessee, Virginia	9	12	14	12	14	13	21	21	19	13	19	19	186
Montana	976	1,018	1,074	952	1,113	1,383	1,307	1,332	1,218	999	1,340	1,485	14,197
Nebraska	806	429	642	586	723	690	679	369	813	690	555	739	7,721
New Mexico	5,878	5,726	7,315	5,457	6,608	5,680	6,060	6,299	5,504	6,262	7,057	7,652	75,498
New York	270	261	289	275	236	149	259	272	286	357	371	273	3,298
North Dakota	270	249	249	198	491	398	373	378	369	821	899	1,074	5,769
Ohio	310	116	532	283	414	343	298	309	240	187	432	363	3,827
Oklahoma	15,443	16,311	16,675	16,212	16,261	15,818	13,579	15,686	15,222	15,134	14,006	17,211	187,558
Pennsylvania	869	516	517	580	792	807	822	795	820	824	701	744	8,787
Texas	85,987	78,077	80,640	82,663	82,581	79,219	81,366	81,253	80,814	83,810	83,181	86,529	986,120
Utah	151	169	170	158	169	160	158	137	166	162	164	178	1,942
West Virginia	224	211	258	219	175	296	256	227	221	232	265	215	2,799
Wyoming	7,580	6,843	7,796	6,833	7,868	8,547	8,825	8,330	7,773	7,261	7,659	7,503	92,818
Total domestic crude	199,351	182,741	197,507	189,881	200,426	191,215	193,382	194,500	189,078	194,908	193,494	204,786	2,331,269
Foreign crude	19,141	17,200	19,525	17,415	20,163	19,649	23,387	21,213	20,842	19,865	18,740	22,118	239,258
Grand total 1954	218,492	199,941	217,032	207,296	220,589	210,864	216,769	215,713	209,920	214,773	212,234	226,904	2,570,527
Daily average:													
Domestic	6,431	6,526	6,371	6,329	6,465	6,374	6,238	6,274	6,303	6,287	6,450	6,606	6,387
Domestic and foreign crude	7,048	7,141	7,001	6,910	7,116	7,029	6,993	6,958	6,997	6,928	7,074	7,320	7,043
Pennsylvania Grade (included above)	1,520	1,010	1,315	1,093	1,344	1,363	1,465	1,398	1,394	1,508	1,433	1,336	16,179
1955 [1]													
Alabama	115	71	103	85	117	95	157	129	95	113	109	133	1,322
Arkansas	2,261	2,339	2,513	2,379	2,587	2,276	2,381	2,635	2,268	2,543	2,428	2,514	29,124
California	29,583	26,277	29,201	29,800	31,018	29,567	31,177	31,096	30,954	30,843	29,060	28,825	357,401
Colorado	3,538	4,101	3,307	3,825	4,063	4,613	4,964	4,407	4,411	4,737	4,767	4,799	51,532
Florida	1	6	100	19	8	10	52	25	75	41		113	450

Illinois	6,841	5,931	7,688	5,887	6,021	7,669	7,459	7,569	7,720	7,198	6,374	7,437	83,794
Indiana	639	1,108	841	780	1,131	839	1,111	950	907	938	796	993	11,033
Kansas	10,448	9,559	10,492	9,721	10,924	9,747	10,509	10,442	10,567	8,722	10,276	10,602	122,009
Kentucky	1,365	1,150	1,003	1,248	1,220	1,356	1,263	1,517	1,266	1,621	995	1,283	15,287
Louisiana	21,330	20,707	21,265	21,599	21,883	22,679	21,637	23,457	21,256	23,946	22,814	24,263	266,836
Michigan	939	1,129	1,018	825	1,010	898	904	944	925	928	883	905	11,308
Mississippi	2,618	2,795	3,057	3,062	2,831	2,842	3,275	3,394	3,103	3,418	3,321	3,474	37,190
Missouri, Nevada, South Dakota, Tennessee, Virginia	16	14	20	19	18	18	17	12	12	12	13	17	188
Montana	1,449	1,293	1,319	1,276	1,486	1,289	1,118	1,452	1,087	1,052	1,082	1,148	15,051
Nebraska	474	426	790	585	736	665	600	1,004	460	1,132	1,104	987	8,963
New Mexico	7,101	6,169	6,430	6,503	6,358	7,353	6,949	6,284	6,628	6,570	7,655	7,342	81,342
New York	261	240	266	253	189	249	252	260	251	253	231	239	2,944
North Dakota	1,005	900	1,081	185	677	1,163	1,171	1,124	1,098	495	1,146	1,212	11,257
Ohio	345	344	284	275	380	379	395	329	370	399	443	378	4,321
Oklahoma	16,611	15,963	16,407	17,511	17,087	17,755	17,966	17,610	16,612	18,090	15,390	18,867	205,869
Pennsylvania	807	622	705	764	614	861	638	452	567	771	909	854	8,564
Texas	91,419	84,948	89,978	81,530	87,509	83,075	89,256	90,267	83,285	86,598	89,538	92,732	1,050,135
Utah	156	169	161	176	172	182	186	188	183	182	139	159	2,053
West Virginia	151	167	258	159	230	165	147	209	85	169	276	232	2,248
Wyoming	8,521	7,094	8,722	7,187	8,002	8,332	9,028	8,692	8,269	8,236	8,393	8,285	98,761
Total domestic crude	207,994	193,522	207,009	195,653	206,271	204,077	212,612	214,448	202,454	209,007	208,142	217,793	2,478,982
Foreign crude	22,757	20,429	23,634	21,052	22,013	23,344	25,025	23,736	24,505	25,270	25,443	26,527	283,735
Grand total 1955	230,751	213,951	230,643	216,705	228,284	227,421	237,637	238,184	226,959	234,277	233,585	244,320	2,762,717
Daily average:													
Domestic crude	6,709	6,912	6,678	6,522	6,654	6,803	6,858	6,918	6,748	6,742	6,938	7,026	6,792
Domestic and foreign crude	7,444	7,641	7,440	7,224	7,364	7,581	7,666	7,683	7,565	7,557	7,786	7,881	7,569
Pennsylvania Grade (included above)	1,352	1,136	1,317	1,228	1,152	1,385	1,172	1,008	1,010	1,291	1,580	1,425	15,056

[1] Preliminary figures.

STOCKS

The total stocks of all oils declined 0.1 million barrels in 1955, including an increase of 7.2 million in crude stocks, a decline of 0.5 million in stocks of natural-gas liquids, and a drop of 6.8 million barrels in stocks of refined products.

In comparing the demand for crude oil with total petroleum requirements, the change in product stocks must be considered. The decline in these stocks of about 7 million barrels in 1955 and the small increase of 2 million in 1954 were correctives of the abnormal increase of 47 million barrels in 1953.

TABLE 34.—Stocks of crude petroleum, natural-gas liquids, and refined products in continental United States at end of year, 1951–55

(Thousand barrels)

Product	1951	1952	1953	1954	1955
Crude petroleum:					
At refineries	62,311	66,275	72,738	67,309	66,852
Pipeline and tank-farm	175,481	187,852	182,934	172,081	178,771
Producers	17,991	17,801	18,773	18,995	19,987
Total crude petroleum	255,783	271,928	274,445	258,385	265,610
Natural-gas liquids	8,186	7,807	10,428	14,038	13,564
Refined products	351,146	394,019	440,634	442,510	435,685
	[1] 370,140				
Grand total	615,115	673,754	725,507	714,933	714,859
	[1] 634,109				

[1] New basis, for comparison with subsequent years.

TABLE 35.—Stocks of crude petroleum in continental United States in 1955, by States of origin and months [1]

(Thousand barrels)

State of origin	Jan. 1	Jan. 31	Feb. 28	Mar. 31	Apr. 30	May 31	June 30	July 31	Aug. 31	Sept. 30	Oct. 31	Nov. 30	Dec. 31
Alabama	102	120	163	170	170	154	175	136	122	143	145	154	157
Arkansas	2,841	2,946	2,778	2,702	2,755	2,677	2,722	2,718	2,480	2,626	2,479	2,352	2,223
California	31,436	31,731	32,547	33,463	32,844	32,055	31,734	30,711	29,872	27,994	27,140	27,361	28,772
Colorado	4,349	4,578	3,863	4,349	4,259	4,588	4,275	3,846	4,055	4,193	4,109	3,809	3,835
Florida	67	109	136	76	95	129	158	150	170	135	136	178	107
Illinois	10,968	10,524	10,609	9,643	10,485	11,389	10,703	10,191	9,727	8,936	8,639	9,144	8,784
Indiana	333	606	301	349	455	269	402	247	285	231	248	402	389
Kansas	8,781	8,892	8,902	9,080	9,451	8,137	8,010	8,032	7,956	7,369	9,089	8,806	8,641
Kentucky	1,544	1,369	1,293	1,509	1,479	1,542	1,470	1,499	1,346	1,381	1,112	1,412	1,554
Louisiana	15,069	15,444	14,703	15,860	16,121	17,116	15,448	16,082	15,083	16,335	15,814	16,312	16,466
Michigan	811	849	636	618	727	657	699	714	741	738	729	744	770
Mississippi	2,822	3,040	2,927	2,862	2,681	2,894	3,075	2,941	2,785	2,974	2,960	2,953	2,912
Montana	1,200	1,121	1,046	1,110	1,163	984	1,007	1,160	1,007	1,091	1,242	1,418	1,762
Nebraska	796	1,036	1,220	1,160	1,253	1,309	1,463	1,695	1,556	1,924	1,703	1,546	1,687
New Mexico	7,104	6,798	6,860	7,296	7,480	7,949	7,258	7,193	7,932	7,968	8,602	7,997	8,160
New York	113	92	82	71	61	120	116	104	109	103	84	83	73
North Dakota	713	643	653	464	988	920	617	588	502	464	666	606	599
Ohio	672	645	598	678	747	729	726	677	751	754	732	656	668
Oklahoma	24,162	23,789	23,535	24,541	23,858	23,252	22,156	21,239	20,640	20,456	19,533	21,645	21,630
Pennsylvania	2,096	1,947	1,933	1,951	1,894	1,968	1,860	1,957	2,259	2,425	2,370	2,135	1,955
Texas	115,962	117,497	116,481	120,195	129,161	129,593	128,727	124,134	118,715	119,007	122,149	122,511	124,547
Utah	31	39	29	30	25	34	29	31	32	37	70	33	36
West Virginia	603	649	661	618	652	616	657	700	691	793	808	723	675
Wyoming	14,428	14,145	14,523	14,129	15,067	15,502	15,408	15,138	15,223	15,427	15,708	15,551	16,140
Total domestic	247,003	248,609	246,479	252,924	263,871	264,583	258,895	251,883	244,039	243,504	246,267	248,531	252,542
Foreign [2]	11,382	11,547	12,151	11,506	11,361	12,365	11,955	12,718	12,388	12,765	12,934	12,176	13,068
Grand total	258,385	260,156	258,630	264,430	275,232	276,948	270,850	264,601	256,427	256,269	259,201	260,707	265,610
Pennsylvania Grade (included above)	3,056	2,903	2,878	2,864	2,885	2,975	2,914	3,013	3,344	3,611	3,565	3,189	2,964

[1] Final figures.

[2] Includes foreign crude petroleum held in district 5: December 1954—3,069,000, January—3,216,000, February—2,903,000, March—2,356,000, April—2,138,000, May—2,352,000, June—2,335,000, July—2,570,000, August—3,215,000, September—3,079,000, October—2,060,000, November—2,267,000, December—2,383,000 barrels.

TABLE 36.—Stocks of crude petroleum in continental United States in 1955, by location and months [1]

(Thousand barrels)

State	Jan. 1	Jan. 31	Feb. 28	Mar. 31	Apr. 30	May 31	June 30	July 31	Aug. 31	Sept. 30	Oct. 31	Nov. 30	Dec. 31
Alabama	609	588	753	464	581	649	708	346	447	502	513	619	596
Arkansas	2,375	2,415	2,202	2,158	2,296	2,229	2,160	2,054	2,039	1,942	1,976	1,825	1,809
California, Oregon, Washington	34,505	34,947	35,450	35,819	34,776	34,049	33,820	33,064	32,852	30,925	29,124	29,559	31,140
Colorado	1,146	1,282	1,295	1,333	1,405	1,502	1,568	1,530	1,538	1,697	1,776	1,748	1,749
Florida, Georgia, South Carolina	306	278	402	455	520	412	480	548	434	418	468	372	351
Illinois	16,912	17,072	16,536	16,929	16,605	17,460	17,215	16,453	16,069	16,243	15,326	15,995	15,917
Indiana	4,518	4,610	4,406	4,458	4,538	4,475	4,591	4,457	4,153	4,156	4,105	3,783	4,235
Iowa, Missouri	6,690	6,518	6,736	6,847	6,737	6,498	7,111	6,965	7,366	6,904	7,170	7,379	7,204
Kansas	10,056	11,011	11,483	11,819	12,008	10,926	10,361	10,745	10,444	10,238	11,151	11,332	11,532
Kentucky, Tennessee	3,082	3,113	2,945	3,071	3,418	3,021	3,105	3,062	3,054	3,053	2,713	3,240	3,197
Louisiana	13,965	13,680	13,377	14,009	14,538	14,593	14,330	13,989	13,131	13,870	13,741	14,180	13,695
Maryland	938	999	712	787	1,138	1,095	1,329	1,572	1,330	1,297	1,217	1,077	1,104
Massachusetts, Rhode Island, Delaware	622	516	774	712	857	975	935	1,067	873	1,064	1,020	1,042	864
Michigan	1,279	1,259	1,032	1,016	1,131	1,139	1,181	1,224	1,311	1,194	1,207	1,248	1,346
Minnesota, Wisconsin	189	212	194	149	219	144	247	812	1,262	1,446	1,393	1,239	987
Mississippi	1,623	1,687	1,676	1,703	1,769	1,765	1,960	1,777	1,699	1,772	1,783	1,845	1,637
Montana	1,516	1,401	1,312	1,427	1,611	1,335	1,319	1,337	1,188	1,418	1,706	1,709	1,774
Nebraska	1,828	1,958	1,697	1,584	1,379	1,462	1,446	1,467	1,548	1,627	1,584	1,624	1,661
New Jersey	5,611	5,924	5,783	5,766	5,557	6,080	6,794	5,893	5,192	5,453	5,616	5,039	6,195
New Mexico	2,323	2,190	2,034	2,045	2,214	2,189	2,006	2,080	2,404	2,603	2,269	2,323	2,645
New York	1,076	966	947	1,045	750	1,058	1,050	1,072	854	860	1,090	1,069	1,298
North Dakota	639	615	615	440	915	863	563	560	485	441	653	596	589
Ohio	8,049	7,876	7,700	7,927	8,687	9,246	8,280	7,819	8,051	7,678	7,158	7,225	6,929
Oklahoma	25,346	24,533	24,844	25,552	27,852	27,517	25,331	23,678	22,735	22,478	23,408	25,168	25,762
Pennsylvania	9,798	9,521	9,302	9,940	10,118	10,833	9,329	10,130	9,568	9,816	11,432	10,258	10,647
Texas	92,540	94,743	94,130	96,315	102,338	103,706	102,378	99,912	95,209	96,229	98,480	98,683	99,590
Utah	747	586	461	394	495	626	564	608	661	699	724	645	824
West Virginia	666	650	712	732	756	736	797	852	824	810	831	762	720
Wyoming	9,431	9,006	9,120	9,534	10,024	10,365	9,892	9,528	9,706	9,436	9,567	9,123	9,613
Total	258,385	260,156	258,630	264,430	275,232	276,948	270,850	264,601	256,427	256,269	259,201	260,707	265,610

[1] Final figures.

TABLE 37.—Stocks of crude petroleum in continental United States in 1955, by classification and location [1]

(Thousand barrels)

Classification and location	Jan. 1	Jan. 31	Feb. 28	Mar. 31	Apr. 30	May 31	June 30	July 31	Aug. 31	Sept. 30	Oct. 31	Nov. 30	Dec. 31
At refineries:													
Alabama	241	235	358	259	284	362	389	227	210	273	262	282	298
Arkansas	620	544	437	433	561	506	450	452	433	460	466	339	290
California, Oregon, Washington	12,714	13,005	13,415	13,513	13,372	13,192	13,035	12,990	12,939	12,215	10,231	10,081	11,130
Colorado	180	144	182	180	243	244	231	181	194	328	276	208	210
Georgia, South Carolina, Florida	239	169	266	379	405	283	400	424	380	324	332	306	244
Illinois	3,712	3,911	4,110	3,812	4,029	3,793	4,252	3,954	3,752	3,818	3,667	3,988	3,686
Indiana	1,737	1,815	1,624	1,712	1,743	1,752	1,724	1,866	1,542	1,708	1,610	1,470	1,774
Kansas	1,343	1,446	1,575	1,418	1,617	1,355	1,344	1,065	1,208	1,118	1,575	1,427	1,363
Kentucky, Tennessee	835	846	863	1,031	1,171	1,000	1,014	933	982	1,066	825	1,137	1,093
Louisiana	5,095	4,806	4,655	5,212	5,364	5,307	5,536	5,282	4,633	5,129	5,037	5,205	4,787
Maryland	938	999	712	787	1,138	1,095	1,329	1,572	1,330	1,297	1,217	1,077	1,104
Massachusetts, Rhode Island, Delaware	622	516	774	712	857	975	935	1,067	873	1,064	1,020	1,042	864
Michigan	558	631	449	470	543	585	605	605	662	553	609	559	628
Minnesota, Wisconsin	189	212	194	149	219	144	247	812	1,262	1,446	1,393	1,239	987
Mississippi	23	22	19	20	15	19	23	28	18	17	11	24	22
Missouri	264	286	260	271	336	357	369	329	357	292	339	390	328
Montana	654	568	508	513	634	496	496	521	458	620	803	560	552
Nebraska	25	35	23	50	45	38	34	41	43	57	57	38	52
New Jersey	5,171	5,485	5,345	5,336	5,172	5,740	6,489	5,652	5,010	5,324	5,488	4,911	6,069
New Mexico	154	167	173	228	228	191	173	172	176	223	208	197	185
New York	841	758	727	838	540	802	806	883	669	685	866	842	1,069
North Dakota	287	249	213	109	601	430	229	259	188	108	294	222	234
Ohio	1,851	1,993	1,851	2,391	2,205	2,218	2,070	2,086	1,920	1,870	1,514	1,524	1,797
Oklahoma	4,690	3,930	3,645	3,802	3,685	3,191	2,567	2,506	2,683	2,755	2,845	3,405	2,861
Pennsylvania	7,787	7,735	7,563	8,235	8,308	8,889	7,512	8,262	7,378	7,262	8,935	8,024	8,721
Texas	14,996	16,202	15,599	15,901	16,706	17,018	17,261	15,932	15,236	16,414	16,414	15,176	14,932
Utah	635	424	301	238	340	453	402	444	492	537	513	472	617
West Virginia	56	31	39	63	58	55	67	50	62	91	76	67	41
Wyoming	852	752	694	767	796	803	799	804	830	833	940	883	914
Total at refineries	67,309	67,916	66,574	68,829	71,215	71,293	70,788	69,399	65,920	67,887	67,823	65,095	66,852

See footnote at end of table.

TABLE 37.—Stocks of crude petroleum in continental United States in 1955, by classification and location [1]—Continued

(Thousand barrels)

Classification and location	Jan. 1	Jan. 31	Feb. 28	Mar. 31	Apr. 30	May 31	June 30	July 31	Aug. 31	Sept. 30	Oct. 31	Nov. 30	Dec. 31
Pipeline and tank-farm stocks:													
Alabama	355	338	379	180	279	276	310	110	228	219	242	329	290
Arkansas	1,385	1,496	1,395	1,355	1,370	1,353	1,340	1,237	1,241	1,117	1,145	1,116	1,154
California	17,094	17,207	17,400	17,688	16,699	16,061	16,210	15,381	15,109	13,803	13,836	14,410	14,946
Colorado	736	918	878	923	932	1,028	1,117	1,109	1,104	1,129	1,245	1,290	1,294
Florida, New Jersey	493	535	561	496	489	457	374	351	223	215	255	176	217
Illinois	12,615	12,551	11,816	12,547	12,006	13,097	12,403	11,909	11,757	11,855	11,184	11,447	11,646
Indiana	2,716	2,725	2,712	2,681	2,730	2,658	2,802	2,526	2,546	2,383	2,430	2,248	2,396
Iowa, Missouri	6,426	6,232	6,476	6,576	6,401	6,141	6,742	6,636	7,009	6,812	6,831	6,989	6,876
Kansas	7,823	8,700	9,043	9,546	9,501	8,601	8,072	8,775	8,361	8,235	8,701	9,085	9,329
Kentucky, Tennessee	2,172	2,192	2,007	1,965	2,177	1,951	2,021	2,059	2,002	1,922	1,823	2,038	2,039
Louisiana	7,270	7,194	7,032	7,117	7,504	7,676	7,279	7,062	6,863	7,061	7,029	7,255	7,243
Michigan	566	463	418	391	438	399	426	464	499	496	443	544	558
Mississippi	1,185	1,210	1,222	1,253	1,314	1,321	1,517	1,314	1,281	1,345	1,357	1,411	1,225
Montana	592	553	529	639	702	564	562	521	465	528	628	834	922
Nebraska	1,733	1,853	1,604	1,464	1,269	1,349	1,337	1,346	1,425	1,490	1,442	1,496	1,524
New Mexico	1,389	1,248	1,066	1,032	1,186	1,178	1,018	1,088	1,378	1,465	1,206	1,271	1,500
New York	205	178	190	177	180	226	214	159	155	145	194	197	199
North Dakota	192	199	193	197	193	193	194	195	195	198	194	196	197
Ohio	6,113	5,798	5,764	5,456	6,402	6,948	6,130	5,653	6,051	5,728	5,564	5,621	5,052
Oklahoma	19,211	19,133	19,729	20,280	22,577	22,771	21,469	19,682	18,567	18,258	19,063	20,293	21,491
Pennsylvania	1,861	1,626	1,579	1,550	1,650	1,784	1,662	1,708	2,035	2,404	2,342	2,079	1,771
Texas	71,404	72,016	71,996	73,934	79,027	80,143	78,672	77,525	73,753	73,045	75,346	76,882	78,283
Utah	96	142	146	140	140	158	147	151	155	144	155	150	186
West Virginia	440	449	503	499	533	516	565	637	597	554	590	530	509
Wyoming	8,009	7,679	7,791	8,107	8,618	8,922	8,493	8,104	8,286	7,993	8,002	7,570	7,924
Total pipeline and tank-farm stocks	172,081	172,635	172,429	176,193	184,317	185,771	181,076	175,702	171,285	168,344	171,247	175,427	178,771
Producers' stocks	18,995	19,605	19,627	19,408	19,700	19,884	18,986	19,500	19,222	20,038	20,131	20,185	19,987
Grand total: 1955	258,385	260,156	258,630	264,430	275,232	276,948	270,850	264,601	256,427	256,269	259,201	260,707	265,610
1954	274,445	268,531	264,629	269,620	278,055	280,050	282,888	282,665	277,929	272,502	267,346	264,566	258,385

[1] Final figures.

VALUE AND PRICE

In the United States the average value of crude oil at the well was $2.78 per barrel in 1954 and $2.77 per barrel in 1955. Value of crude petroleum at the well ($6.4 billion in 1954, $6.9 billion in 1955) rose, principally because of the 170 million-barrel increase in crude production.

The only significant change in the posted prices of crude petroleum was an increased price for Pennsylvania Grade oils. Small price rises were reported for several other grades.

TABLE 38.—Value of crude petroleum at wells in the United States, 1954–55, by States

State	1954		1955 [1]	
	Total (Thousand dollars)	Average per barrel	Total (Thousand dollars)	Average per barrel
Arkansas	79,520	$2.73	77,250	$2.71
California	907,460	2.55	886,820	2.50
Colorado	127,990	2.77	140,300	2.75
Illinois	199,060	2.98	237,490	2.91
Indiana	33,160	2.96	32,270	2.91
Kansas	335,280	2.81	341,230	2.80
Kentucky	40,270	2.92	44,210	2.89
Louisiana:				
Gulf Coast	601,880	2.94	659,550	2.94
Northern	120,490	2.88	125,540	2.86
Total Louisiana	722,370	2.93	785,090	2.93
Michigan	35,600	2.96	32,900	2.92
Mississippi	85,600	2.50	91,710	2.46
Montana	31,230	2.20	35,280	2.26
Nebraska	21,400	2.75	27,100	2.75
New Mexico	205,760	2.75	225,770	2.74
New York	11,140	3.42	10,310	3.55
North Dakota	12,890	2.14	32,200	2.89
Ohio	10,710	2.76	12,480	2.89
Oklahoma	518,520	2.79	565,280	2.78
Pennsylvania	31,150	3.42	29,820	3.54
Texas:				
Gulf Coast	613,540	3.02	675,590	3.02
West Texas	1,061,210	2.77	1,155,620	2.77
East Texas proper	235,140	2.89	232,240	2.89
Other districts	858,600	2.80	941,530	2.79
Total Texas	2,768,490	2.84	3,004,980	2.84
West Virginia	8,500	2.93	7,080	3.05
Wyoming	229,160	2.45	242,140	2.41
Alabama, Florida, Missouri, Nevada, South Dakota, Tennessee, Utah, Virginia	9,670	2.29	8,980	2.18
Total United States	6,424,930	2.78	6,870,690	2.77

[1] Preliminary figures.

TABLE 39.—Posted price per barrel of petroleum at wells in the United States in 1955, by grade, with date of change

Date	Pennsylvania Grade		Corning Grade in Buckeye Pipe Line Co.[2]	Western Kentucky [3]	Illinois Basin [4]	Midland Michigan [5]	Oklahoma-Kansas [6]	
	Bradford and Allegany districts [1]	In Southwest Pennsylvania [2]					34°–34.9°	36°–36.9°
Jan. 1	$3.35	$2.93	$2.72	$2.90	$2.95	$3.04	$2.78	$2.82
Jan. 21	3.50	3.08						
Mar. 16					2.90			
July 11	3.60	3.18						
Oct. 5					3.00			
Oct. 15				3.00				
Nov. 1	3.75	3.33				3.08		
Dec. 1	3.85	3.43						

Date	Panhandle Texas (Carson, Gray, Hutchinson, and Wheeler Counties) 35°–35.9°	West Texas 30°–30.9° (sweet) [7]	Lea County N. Mex. 30°–30.9° [7]	South Texas, Duval-Mirando 24°–24.9° [7]	East Texas [7]	Gulf Coast			
						Conroe, Tex. [8]	Texas 30°–30.9° [8]	Texas 20°–20.9° [8]	Louisiana 30°–30.9° [8]
Jan. 1	$2.80	$2.63	$2.63	$2.88	$2.90	$3.13	$2.90	$2.70	$2.85

Date	Rodessa, La. 36°–36.9° [9]	Smackover, Ark. [10]	Elk Basin, Wyo., 30°–30.9° (heavy) [4]	Salt Creek, Wyo., 36°–36.9° (light) [11]	California [12]			
					Coalinga 32°–32.9°	Kettleman 37°–37.9°	Midway Sunset, 19°–19.9°	Wilmington 24°–24.9°
Jan. 1	$2.82	$2.33	$2.39	$2.82	$3.05	$3.30	$2.20	$2.62
Oct. 17							2.28	2.65

[1] The Tide Water Associated Oil Co.
[2] The South Penn Oil Co.
[3] Sohio Corp.
[4] The Ohio Oil Co.
[5] The Pure Oil Co.
[6] Standard Oil Co. (Indiana)
[7] Humble Oil & Refining Co.
[8] The Texas Co.
[9] Esso Standard Oil Co.
[10] Arkansas Fuel Oil Co.
[11] Stanolind Oil & Gas Co.
[12] Standard Oil Co. of California.

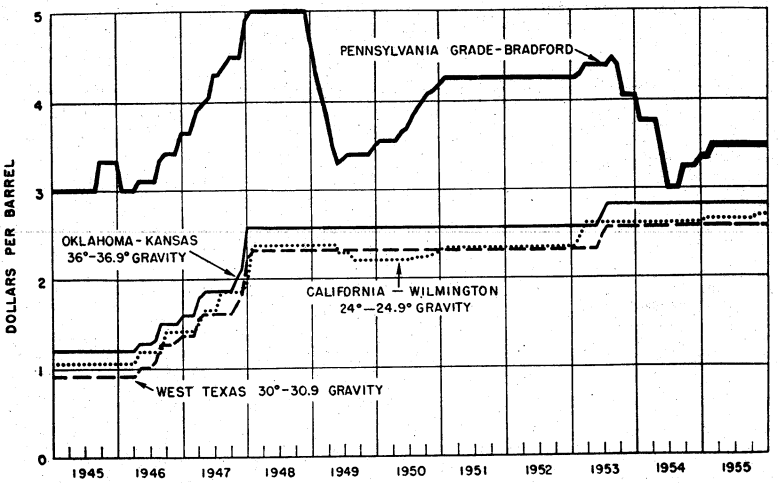

FIGURE 5.—Posted prices of selected grades of crude petroleum in the United States, 1945–55.

REFINED PRODUCTS

GENERAL REVIEW

Petroleum is consumed as a variety of finished products that must be considered individually. Competition with other fuels and the economic and climatic conditions influence the consumption of these products.

Gasoline is consumed principally in highway transport, aviation, and mechanized farming. The demand for kerosine (a product defined as meeting lamp-oil specifications for color and flashpoint), has been affected, especially in rural areas, by the increased competition from electricity and liquefied petroleum. Distillate fuel oil, including light diesel oils, is used for space heating. As a fuel for diesel locomotives, it has nearly replaced residual fuel oil and coal in railroad use. Residual fuel oil usually sells for less than crude oil at refineries and competes directly with natural gas and coal for heavy-fuel uses. As it cannot be moved by pipeline, its distribution depends principally on cheap water transport and limited tank-car movements. Therefore, it cannot, normally, compete with coal in coal-producing areas. Liquefied gases, in competition with kerosine and light distillate fuel oils in domestic applications, are gaining importance as fuel in internal-combustion engines and are also the starting raw material in synthesizing many petrochemicals. Jet fuels (a blend of gasoline, kerosine and distillate fuel oil) are replacing aviation gasoline in military combat aircraft.

Total demand for all oils (8,781,000 barrels per day) increased 8.2 percent, mostly due to increased domestic use. Exports increased only 2.7 percent.

TABLE 40.—Salient statistics of the major refined petroleum products in continental United States, 1951–55

(Thousand barrels)

	1951	1952 [1]	1952 [2]	1953	1954	1955 [3]
Gasoline (finished and natural):						
Production	1,140,843	1,192,097	1,178,027	1,266,376	1,261,304	1,361,323
Imports	463	1,761	1,761	459	1,185	4,761
Exports	40,136	36,285	36,285	37,925	34,366	34,321
Stocks, end of year	135,306	135,599	134,737	157,872	155,400	165,433
Domestic demand	1,089,566	1,157,280	1,142,987	1,205,775	1,230,595	1,321,730
Kerosine:						
Production	135,742	132,300	128,767	123,200	122,305	117,137
Transfers from gasoline plants						[4] 1,950
Exports	6,843	7,821	7,821	7,265	4,852	3,328
Stocks, end of year	27,088	26,842	26,529	[5] 28,684	27,826	26,770
Domestic demand	123,241	124,725	121,253	114,467	118,311	116,815
Distillate fuel oil:						
Production	475,801	520,378	517,920	528,111	542,278	602,547
Transfers from gasoline plants						[4] 615
Transfers from crude	2,863	2,705	2,705	1,966	1,500	1,347
Imports	1,767	2,742	2,742	3,379	3,195	4,426
Exports	22,555	33,515	33,515	32,328	24,223	24,395
Stocks, end of year	86,619	99,582	99,375	[5] 111,741	108,144	111,333
Domestic demand	447,278	479,347	476,986	488,075	526,347	581,351
Residual fuel oil:						
Production	469,377	453,897	453,897	449,979	416,757	420,331
Transfers from crude	6,006	6,343	6,343	5,617	5,924	5,559
Imports	119,166	128,479	128,479	131,533	129,124	151,972
Exports	28,999	27,701	27,701	25,991	26,753	33,370
Stocks, end of year	42,853	48,706	48,706	49,370	52,105	39,174
Domestic demand	564,397	555,165	555,165	560,474	522,317	557,423
Jet fuel:						
Production			20,929	35,747	46,550	56,648
From gasoline			14,938	25,086	32,889	43,262
From kerosine			3,533	6,551	9,934	9,887
From distillate			2,458	4,110	3,727	3,499
Exports				409	149	120
Stocks, end of year			[6] 1,811	2,666	3,215	3,457
Domestic demand			[7] 20,126	34,483	45,852	56,286
Lubricants:						
Production	61,489	55,600	55,600	52,545	53,243	55,836
Imports					1	
Exports: Grease	447	451	451	325	412	441
Exports: Oil	16,982	15,580	15,580	12,674	14,663	13,854
Stocks, end of year	9,617	11,021	11,021	10,070	9,702	8,763
Domestic demand	42,292	38,165	38,165	40,497	38,537	42,480
Wax (1 barrel=280 pounds):						
Production	4,814	4,331	4,331	4,978	5,290	5,293
Imports					1	
Exports	1,349	1,036	1,036	1,126	1,342	1,248
Stocks, end of year	723	575	575	538	562	551
Domestic demand	3,246	3,443	3,443	3,889	3,925	4,056
Coke (5 barrels=1 short ton):						
Production	18,977	18,123	18,123	21,607	24,284	28,337
Exports	4,385	4,205	4,205	3,661	3,261	4,517
Stocks, end of year	519	513	513	860	2,107	1,524
Domestic demand	14,481	13,924	13,924	17,599	19,776	24,403
Asphalt (5.5 barrels=1 short ton):						
Production	66,302	70,312	70,312	72,409	74,912	83,121
Imports	2,462	2,697	2,697	2,502	3,394	3,653
Exports	1,258	2,301	2,301	1,710	1,868	1,568
Stocks, end of year	6,620	6,321	6,321	7,314	7,175	7,768
Domestic demand	66,179	71,007	71,007	72,208	76,577	84,613

See footnotes at end of table.

TABLE 40.—Salient statistics of the major refined petroleum products in continental United States, 1951–55—Continued

(Thousand barrels)

	1951	1952 [1]	1952 [2]	1953	1954	1955 [3]
Road oil:						
Production	6,100	6,998	6,998	6,594	7,213	8,482
Stocks, end of year	402	453	453	437	434	560
Domestic demand	6,095	6,947	6,947	6,610	7,216	8,356
Still gas (1 barrel=3,600 cu. ft.) Production	96,294	95,275	95,275	102,243	102,552	116,506
Liquefied gases:						
Production [5]	33,045	30,968	30,968	33,306	34,169	43,615
Transfers of liquefied gas [9] from natural gasoline plants	70,341	79,708	79,708	88,512	98,394	103,557
Exports	2,121	2,402	2,402	3,002	3,953	4,280
Stocks, end of year	668	638	638	792	941	1,032
Domestic demand	101,254	108,304	108,304	118,662	128,461	142,801
Miscellaneous:						
Production	7,201	7,258	7,258	9,091	11,013	10,806
Transfers from gasoline plants						[4] 2,677
Exports	373	195	195	244	292	330
Stocks, end of year	1,071	1,036	1,036	1,001	1,236	1,327
Domestic demand	6,565	7,098	7,098	8,882	10,486	13,062
Unfinished gasoline:						
Rerun (net)	353	[10] 489	(11)	(11)	(11)	(11)
Stocks, end of year	7,747	8,236	(11)	(11)	(11)	(11)
Other unfinished oils:						
Rerun (net)	11,367	4,136	4,136	422	7,974	11,231
Transfers of other products from natural gasoline plants	3,411	4,110	4,110	4,236	4,772	(4)
Imports	5,263	3,237	3,237	3,171	7,576	5,561
Stocks, end of year	59,093	62,304	62,304	69,289	73,663	67,993
Shortage	(2,648)	(2,552)	(2,552)	(7,184)	(8,468)	(12,356)

[1] Figures on stocks and demand are on new basis because of a redefinition of bulk terminals. Stock figures as of Jan. 1, 1951, are as follows: Gasoline, 123,702,000 barrels; kerosine, 21,430,000; distillate fuel oil, 76,021,000; residual fuel oil, 41,700,000.

[2] Figures on 1953 basis because figures are shown separately for jet fuel; unfinished gasoline is included with gasoline; total as of Jan. 1, 1952, 134,221,000 barrels; kerosine, 26,836,000; distillate fuel oil, 86,509,000 barrels.

[3] Preliminary figures.

[4] Production at natural-gasoline plants shown as direct "transfers" and omitted from the input and output at refineries.

[5] Stock figures as of Jan. 1, 1953, were revised to 27,216,000 barrels for kerosine and 98,688,000 barrels for distillate fuel oil, new basis, because one company reported incorrectly.

[6] Stock figure on Jan. 1, 1952, was 1,008,000 barrels. Previously included with gasoline, kerosine, and distillate fuel oil on Dec. 31, 1951.

[7] Includes exports of 42,526 barrels not included in total United States exports for the year.

[8] Liquefied refinery gases.

[9] Liquefied petroleum gases.

[10] Negative quantity; represents net excess of unfinished oils produced over unfinished oils rerun.

[11] Included with gasoline (finished and natural).

TABLE 41.—Input and output of petroleum products at refineries in the United States, 1951–55

(Thousand barrels)

	1951	1952	1952 [1]	1953	1954	1955 [2]
Input:						
Crude petroleum:						
Domestic	2,188,677	2,235,198	2,235,198	2,321,820	2,300,766	2,446,833
Foreign	181,727	206,061	206,061	233,045	238,798	283,385
Total crude petroleum	2,370,404	2,441,259	2,441,259	2,554,865	2,539,564	2,730,218
Natural-gas liquids	99,250	103,898	103,898	111,293	117,549	126,382
Total input	2,469,654	2,545,157	2,545,157	2,666,158	2,657,113	2,856,600
Output:						
Gasoline	1,108,880	1,155,916	[3] 1,141,467	[3] 1,233,954	[3] 1,232,989	[3] 1,331,528
Kerosine	135,742	132,300	128,767	123,200	122,305	[4] 117,137
Distillate fuel oil	475,801	520,378	517,920	528,111	542,278	[4] 602,547
Residual fuel oil	469,377	453,897	453,897	449,979	416,757	420,331
Jet fuel		[5]	20,929	35,747	46,550	56,648
Lubricants	61,489	55,600	55,600	52,545	53,243	55,836
Wax [6]	4,814	4,331	4,331	4,978	5,290	5,293
Coke [6]	18,977	18,123	18,123	21,607	24,284	28,337
Asphalt [6]	66,302	70,312	70,312	72,409	74,912	83,121
Road oil	6,100	6,998	6,998	6,594	7,213	8,482
Still gas [6]	96,294	95,275	95,275	102,243	102,552	116,506
Liquefied refinery gases	33,045	30,968	30,968	33,306	34,169	43,615
Other finished products	7,201	7,258	7,258	9,091	11,013	[4] 10,806
Unfinished gasoline (net)	[7] 353	489				
Other unfinished oils (net)	[7] 11,367	[7] 4,136	[7] 4,136	[7] 422	[7] 7,974	[7] 11,231
Shortage (or overage) [8]	(2,648)	(2,552)	(2,552)	(7,184)	(8,468)	(12,356)
Total output	2,469,654	2,545,157	2,545,157	2,666,158	2,657,113	2,856,600

[1] On 1953 basis, separating jet fuel from its components.
[2] Preliminary figures.
[3] New basis, including unfinished gasoline.
[4] Production at natural gasoline plants shown as direct "transfers" and omitted from the input and output at refineries.
[5] Jet fuel was included in gasoline, kerosine, and distillate fuel.
[6] Conversion factors: 280 pounds of wax to the barrel; 5.0 barrels of coke to the short ton; 5.5 barrels of asphalt to the short ton; 3,600 cubic feet of still gas to the barrel.
[7] Negative quantity; represents net excess of unfinished oils rerun over unfinished oils produced.
[8] Includes losses or gains in volume during processing.

TABLE 42.—Percentage yields of refined petroleum products in the United States, 1946–55

Product	1946	1947	1948	[1]1948	1949	1950	1951	1952	1952 [2]	1953	1954	1955 [3]
Finished products:												
Gasoline:												
Cracked	22.5	([4])	([4])	([4])	([4])	([4])	([4])	([4])	([4])	([4])	([4])	([4])
Straight run	17.1	([4])	([4])	([4])	([4])	([4])	([4])	([4])	([4])	([4])	([4])	([4])
Total gasoline	39.6	40.2	40.3	40.1	43.7	43.0	42.4	43.0	42.4	43.9	43.8	44.0
Kerosine	6.0	6.0	6.0	6.0	5.2	5.6	5.7	5.4	5.3	4.8	4.8	4.3
Distillate fuel oil	16.6	16.8	18.7	18.5	17.5	19.0	20.0	21.3	21.2	20.7	21.3	22.0
Residual fuel oil	24.9	24.1	23.0	23.5	21.7	20.2	19.7	18.5	18.5	17.6	16.4	15.3
Jet fuel								([5])	.8	1.4	1.8	2.1
Lubricating oil	2.7	2.8	2.5	2.5	2.3	2.5	2.6	2.3	2.3	2.1	2.1	2.0
Wax	.2	.2	.2	.2	.2	.2	.2	.2	.2	.2	.2	.2
Coke	.6	.7	.7	.7	.9	.8	.8	.7	.7	.8	1.0	1.0
Asphalt	2.6	2.7	2.6	2.5	2.5	2.8	2.8	2.9	2.9	2.8	2.9	3.0
Road oil	.4	.4	.4	.4	.4	.3	.3	.3	.3	.3	.3	.3
Still gas	5.1	4.6	4.0	4.0	4.2	4.0	4.1	3.9	3.9	4.0	4.0	4.3
Liquefied refinery gases	([6])	([6])	([6])	([6])	([6])	([6])	([6])	1.3	1.3	1.3	1.3	1.6
Other finished products	1.3	1.3	1.5	1.5	1.4	1.6	1.7	.3	.3	.4	.4	.4
Unfinished products (net):												
Gasoline	([7] [8])	([9])	([9])	([9])	([9])	([9])	([9])	([9])	([9])	([9])	([9])	([9])
Other	([8]).1	([10])	([10])	([10])	([10])	([10])	([10])	[8].1	[8].1	[8].3	[8].3	[8].5
Shortage	.1	.2	.1	.1			[8].3					
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0

[1] Yields computed on the 1949 basis for California to compare with succeeding years.
[2] Yields computed on the 1953 basis to show jet fuel separately.
[3] Preliminary figures.
[4] Not separated after 1946.
[5] Included in statistics of gasoline, kerosine, and distillate fuel oil.
[6] Included in "Other".
[7] Less than 0.1 percent.
[8] Negative percentage; represents excess rerun over produced.
[9] Added to finished gasoline production in computing yields after 1946.
[10] Added to crude in computing yields after 1946.

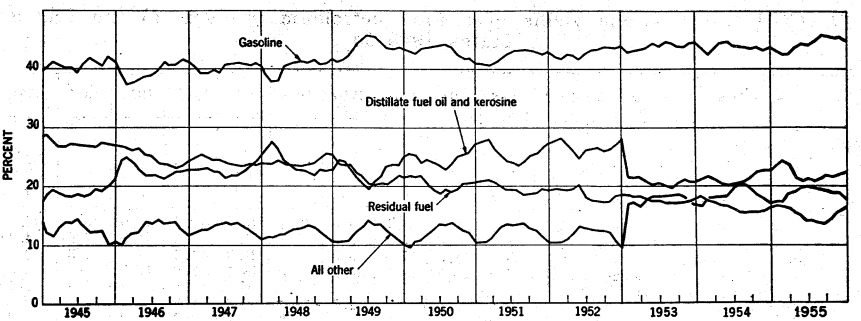

FIGURE 6.—Yields of principal products from crude run to stills in the United States, 1945–55, by months.

After declining for 2 years, exports of refined products increased, owing to an effort in California to liquidate by shipping accumulated residual stocks. Exports of most products either did not change or declined. Crude exports declined 15.4 percent.

Domestic demand for all refined products increased 8.4 percent in 1955, recovering with the general economy. Near-capacity industrial production, particularly of automobiles, and cooler than normal weather in the last quarter of 1955 furnished a demand for all petroleum products except kerosine. Domestic demand for gasoline increased 7.4 percent; for residual fuel oil, 6.7 percent; for distillate fuel oil, 10.5 percent; kerosine decreased 1.3 percent, and other products increased 13.7 percent. Combined deliveries of aviation gasoline, jet fuel, distillate fuel oil, and residual fuel oil to the armed forces totaled 135 million barrels compared with 113 million in 1954. The increases were principally in jet fuel and aviation gasoline.

The new supply of refined products comprises the refinery output from crude oil, the recovery of natural-gas liquids, a small amount of motor benzol derived from coal, and imports of petroleum products from other countries. Crude oil run to stills, the production of natural-gas liquids, and imports increased in 1955 but compensated demand fairly well, resulting in slightly decreased stocks at the end of 1955 compared with December 31, 1954.

Refinery yields of petroleum products from crude oil in 1955 follow the trend in effect for a number of years. Residual fuel-oil yield dropped 1.1 percent to 15.3, a new low. Kerosine yield dropped 0.5 percent to 4.3 also a new low. Most of the increase was in the yield of distillate fuel oil, with smaller increases for gasoline, jet fuel, and liquefied gases.

The monthly average wholesale price index for petroleum and petroleum products, compiled by the Bureau of Labor Statistics, increased from 110.8 in 1954 to 112.8 in 1955, this returns it to approximately the position it held in 1953. Prices of products were stable during the first half of 1955, but price increases were prevalent during July and August.

TABLE 43.—Stocks of refined petroleum products in continental United States at end of month, 1954–55

(Thousand barrels)

Product	Jan. 31	Feb. 28	Mar. 31	Apr. 30	May 31	June 30	July 31	Aug. 31	Sept. 30	Oct. 31	Nov. 30	Dec. 31
1954												
Gasoline [1]	171,704	179,950	181,297	177,006	177,606	165,404	158,010	153,168	150,916	149,661	150,604	155,400
Kerosine	22,013	20,183	17,533	19,656	23,892	28,184	31,953	34,949	37,099	37,140	34,547	27,826
Distillate fuel oil	81,044	70,390	60,270	61,721	73,581	86,325	101,657	116,529	128,061	139,128	133,886	108,144
Residual fuel oil	47,474	47,119	44,249	44,362	47,009	50,216	54,365	56,332	56,702	56,541	54,891	52,105
Jet fuel	2,839	2,611	2,777	2,861	2,927	2,848	3,016	3,040	3,356	2,920	3,052	3,215
Lubricating oil	10,472	10,646	10,385	9,745	9,764	9,599	9,251	9,035	9,230	9,183	9,475	9,702
Wax	598	619	644	612	663	609	597	571	567	572	589	562
Coke	1,046	1,111	1,346	1,494	1,657	1,774	1,918	1,973	2,009	2,118	1,974	2,107
Asphalt	8,370	9,589	10,970	11,530	11,383	9,579	8,542	7,150	5,912	5,702	6,165	7,175
Road oil	541	652	769	895	984	894	744	725	592	527	470	434
Liquefied refinery gases	779	832	893	849	952	1,093	1,091	1,184	1,153	1,161	1,164	941
Miscellaneous	1,061	1,233	1,284	1,180	1,219	1,265	1,318	1,304	1,297	1,205	1,154	1,236
Other unfinished oils	70,228	69,904	73,871	76,865	82,751	83,314	82,330	79,665	77,191	76,238	74,147	73,663
Total 1954	418,169	414,839	406,288	408,776	434,388	441,104	454,792	465,625	474,085	482,096	472,118	442,510
1955												
Gasoline [1]	169,562	181,643	183,972	175,601	168,751	157,439	157,079	151,912	150,194	153,103	157,871	165,433
Kerosine	23,266	18,291	18,187	21,486	26,375	29,830	32,749	35,292	36,361	36,705	33,283	26,770
Distillate fuel oil	86,692	69,283	62,457	70,139	83,559	100,652	119,169	133,675	143,248	152,288	141,808	111,333
Residual fuel oil	49,457	46,042	44,970	43,838	45,083	44,398	44,894	45,480	46,267	47,040	44,071	39,174
Jet fuel	3,472	3,368	3,566	3,607	3,480	3,619	3,456	3,542	3,329	3,229	3,197	3,457
Lubricating oil	10,162	10,087	9,779	9,615	9,430	9,233	8,947	8,547	8,291	8,108	8,433	8,763
Wax	579	578	542	552	554	590	602	573	561	535	536	551
Coke	2,245	2,369	2,380	2,491	2,363	2,198	2,184	2,012	1,806	1,648	1,536	1,524
Asphalt	8,623	9,888	10,869	11,779	11,524	9,943	9,107	6,918	5,789	5,669	6,504	7,768
Road oil	472	534	640	814	907	868	772	590	552	514	539	560
Liquefied refinery gases	941	845	898	905	952	957	1,160	1,100	1,143	1,239	1,119	1,032
Miscellaneous	1,215	1,285	1,228	1,144	1,141	1,291	1,246	1,269	1,253	1,223	1,266	1,327
Other unfinished oils	71,362	69,476	69,707	71,696	73,024	72,520	73,385	72,146	73,446	71,644	71,790	67,993
Total 1955	428,048	413,689	409,195	413,667	427,143	433,538	454,750	463,056	472,240	482,945	471,953	435,685

[1] Includes unfinished gasoline.

TABLE 44.—Input and output of petroleum products at refineries in the United States, 1954–55, by months

(Thousand barrels)

	January	February	March	April	May	June	July	August	Septem-	October ber	Novem-	Decem- ber	Total
1954													
Input:													
Crude petroleum	215,366	197,914	214,620	204,336	218,178	208,408	214,402	212,708	208,155	211,851	209,244	224,382	2,539,564
Natural-gas liquids	9,633	8,987	9,240	8,861	9,441	9,423	9,828	10,334	10,487	10,612	10,604	10,099	117,549
Total input	224,999	206,901	223,860	213,197	227,619	217,831	224,230	223,042	218,642	222,463	219,848	234,481	2,657,113
Output:													
Gasoline [1]	103,969	94,231	101,091	98,935	104,682	101,379	104,920	105,132	102,613	104,207	102,853	108,977	1,232,989
Kerosine	12,086	11,542	10,943	9,665	9,350	9,177	9,156	9,357	9,018	9,596	10,619	11,796	122,305
Distillate fuel oil	45,474	43,256	45,204	41,218	42,531	41,966	43,892	45,048	45,415	47,890	48,666	51,718	542,278
Residual fuel oil	39,398	34,754	36,222	34,215	35,582	33,691	33,749	33,131	32,569	33,047	33,593	36,806	416,757
Jet fuel	2,956	3,237	3,897	3,229	3,424	4,158	4,332	4,662	4,633	4,008	4,208	3,806	46,550
Lubricating oil	4,408	4,221	4,376	4,204	4,566	4,508	4,386	4,563	4,522	4,475	4,470	4,544	53,243
Wax [2]	442	420	478	434	474	409	433	408	453	450	485	404	5,290
Coke [2]	1,936	1,623	1,975	1,929	1,897	1,857	2,102	2,061	2,049	2,282	2,220	2,353	24,284
Asphalt [2]	3,447	3,956	4,895	5,392	6,888	7,775	8,850	8,726	7,999	7,413	5,371	4,200	74,912
Road oil	221	259	260	417	658	980	1,364	1,342	845	479	253	135	7,213
Still gas [2]	7,985	7,545	8,359	8,653	9,096	9,093	9,771	9,464	8,644	8,000	7,778	8,164	102,552
Liquefied refinery gases	2,823	2,848	3,241	2,681	2,792	2,804	2,850	2,730	2,676	2,500	2,911	3,313	34,169
Other miscellaneous	864	820	894	965	1,001	987	1,003	889	1,011	783	870	926	11,013
Other unfinished oils (net)	[3] 149	[3] 1,284	2,839	2,009	5,038	[3] 578	[3] 2,081	[3] 3,617	[3] 3,261	[3] 2,000	[3] 3,231	[3] 1,659	[3] 7,974
Shortage or overage	(861)	(527)	(814)	(749)	(360)	(375)	(497)	(854)	(544)	(667)	(1,218)	(1,002)	(8,468)
Total output	224,999	206,901	223,860	213,197	227,619	217,831	224,230	223,042	218,642	222,463	219,848	234,481	2,657,113

1955 [4]													
Input:													
Crude petroleum	228,737	211,365	228,594	214,080	225,699	224,510	234,986	234,966	224,478	231,411	230,758	240,634	2,730,218
Natural-gas liquids	10,857	9,451	10,067	9,486	10,027	10,001	10,475	10,643	10,614	11,903	11,379	11,479	126,382
Total input	239,594	220,816	238,661	223,566	235,726	234,511	245,461	245,609	235,092	243,314	242,137	252,113	2,856,600
Output:													
Gasoline [1]	110,276	99,875	107,274	102,279	109,043	109,292	116,057	116,954	110,873	116,742	113,634	119,229	1,331,528
Kerosine [5]	12,431	10,286	10,866	9,258	9,065	7,923	8,767	8,797	8,270	9,391	10,055	12,028	117,137
Distillate fuel oil [5]	53,858	51,661	52,713	46,001	47,033	48,802	48,788	50,187	48,557	49,934	50,347	54,666	602,547
Residual fuel oil	38,276	34,683	36,722	33,288	34,426	32,392	33,823	33,794	31,815	34,821	36,412	39,879	420,331
Jet fuel	4,163	4,265	5,285	4,243	4,845	5,007	4,549	5,029	4,968	5,076	4,754	4,464	56,648
Lubricating oil	4,565	3,992	4,602	4,691	4,740	4,818	4,557	4,871	4,526	4,666	5,115	4,693	55,836
Wax [2]	433	427	466	441	423	464	433	408	416	445	482	455	5,293
Coke [2]	2,285	2,181	2,428	2,190	2,381	2,396	2,412	2,335	2,086	2,366	2,597	2,680	28,337
Asphalt [2]	4,246	4,230	5,067	6,278	7,827	8,799	9,506	9,462	9,047	8,082	6,017	4,560	83,121
Road oil	197	233	353	478	856	1,141	1,516	1,577	1,049	588	293	201	8,482
Still gas [2]	8,188	7,905	9,279	9,462	10,510	10,537	10,955	10,688	9,493	10,045	9,458	9,986	116,506
Liquefied refinery gases	3,521	3,271	3,451	3,240	3,453	3,709	3,811	3,695	3,653	3,987	3,656	4,168	43,615
Other miscellaneous [5]	745	791	939	789	871	910	971	946	780	946	945	1,173	10,806
Other unfinished oils (net)	[3] 2,658	[3] 2,058	[3] 232	1,512	1,026	[3] 1,027	373	[3] 1,796	615	[3] 2,387	[3] 281	[3] 4,318	[3] 11,231
Shortage or overage	(932)	(926)	(552)	(584)	(773)	(652)	(1,057)	(1,338)	(1,056)	(1,388)	(1,347)	(1,751)	(12,356)
Total output	239,594	220,816	238,661	223,566	235,726	234,511	245,461	245,609	235,092	243,314	242,137	252,113	2,856,600

[1] Includes unfinished gasoline (net).
[2] Conversion factors: 280 pounds of wax to the barrel; 5.0 barrels of coke to the short ton; 5.5 barrels of asphalt to the short ton; 3,600 cubic feet of still gas to the barrel.
[3] Negative quantity; represents net excess of unfinished oils rerun over unfinished oil produced.
[4] Preliminary figures.
[5] Production at natural gasoline plants shown as direct "transfers" and omitted from the input and output at refineries.

TABLE 45.—Input and output of petroleum products at refineries in the United States, 1954–55, by districts

(Thousand barrels)

	East Coast	Appalachian	Indiana, Illinois, Kentucky, etc.	Oklahoma, Kansas, etc.	Texas Inland	Texas Gulf Coast	Louisiana Gulf Coast	Arkansas-Louisiana Inland, etc.	Rocky Mountain	California	Total
1954											
Input:											
Crude petroleum	375,845	68,018	465,640	219,322	86,974	616,458	208,986	32,045	93,802	372,474	2,539,564
Natural-gas liquids	4,340	225	12,842	11,869	19,673	29,538	6,665	900	2,659	28,838	117,549
Total input	380,185	68,243	478,482	231,191	106,647	645,996	215,651	32,945	96,461	401,312	2,657,113
Output:											
Gasoline [1]	154,979	32,353	246,673	125,760	63,163	290,154	101,951	12,894	46,204	158,858	1,232,989
Kerosine	11,845	3,713	26,958	5,961	3,658	43,234	20,588	2,863	1,558	1,927	122,305
Distillate fuel oil	93,444	12,966	88,837	51,027	15,462	143,807	54,761	7,575	21,192	53,207	542,278
Residual fuel oil	76,965	7,158	59,948	15,357	9,105	82,641	15,607	2,471	14,440	133,065	416,757
Jet fuel	2,086	595	3,806	4,592	2,331	16,681	4,476	516	961	10,506	46,550
Lubricating oil	8,480	4,314	4,658	3,849	144	19,373	5,401	1,804	220	5,000	53,243
Wax [2]	1,684	376	205	557	167	1,065	729		76	431	5,290
Coke [2]	1,491	301	9,947	3,292	644	2,270	1,882	820	1,073	2,564	24,284
Asphalt [2]	17,803	3,005	13,048	8,535	3,830	5,465	4,379	3,962	4,548	10,337	74,912
Road oil	124	32	1,393	982	27	11	2	2	1,774	2,866	7,213
Still gas [2]	12,694	3,679	21,891	7,313	4,647	26,425	6,251	1,402	3,547	14,703	102,552
Liquefied refinery gases	4,516	220	3,528	2,867	1,445	8,752	6,873	366	475	5,127	34,169
Other miscellaneous	1,288	252	1,198	655	1,742	1,355	1,341	1,053	89	2,040	11,013
Other unfinished oils (net)	[3] 6,362	[3] 482	400	[3] 177	[3] 1,854	5,505	[3] 4,128	[3] 2,552	[3] 5	1,681	[3] 7,974
Shortage	(852)	(239)	(4,008)	621	2,136	(742)	(4,462)	(231)	309	(1,000)	(8,468)
Total output	380,185	68,243	478,482	231,191	106,647	645,996	215,651	32,945	96,461	401,312	2,657,113

1955 [4]											
Input:											
Crude petroleum	388,768	70,842	499,776	245,071	92,631	671,765	239,377	33,262	100,649	388,077	2,730,218
Natural-gas liquids	3,065	277	15,186	13,737	22,907	31,813	7,099	670	2,612	29,016	126,382
Total input	391,833	71,119	514,962	258,808	115,538	703,578	246,476	33,932	103,261	417,093	2,856,600
Output:											
Gasoline [1]	159,210	33,261	262,563	141,263	67,678	312,796	120,568	12,520	47,252	174,417	1,331,528
Kerosine [2]	11,290	3,424	25,417	6,488	2,764	41,753	20,035	2,480	1,563	1,923	117,137
Distillate fuel oil [2]	98,514	13,637	99,187	58,261	17,969	166,004	59,053	7,910	23,190	58,822	602,547
Residual fuel oil	76,198	7,276	63,421	12,413	7,919	88,977	16,376	2,257	14,689	130,805	420,331
Jet fuel	2,859	1,898	4,876	7,176	3,440	13,495	6,371	302	2,807	13,424	56,648
Lubricating oil	7,786	4,765	4,763	4,390	144	21,163	5,771	1,904	188	4,962	55,836
Wax [3]	1,692	424	219	439	56	1,175	741	----------	85	462	5,293
Coke [3]	1,611	357	10,606	4,247	938	2,767	2,670	801	1,087	3,253	28,337
Asphalt [3]	18,965	3,030	15,968	9,297	4,447	5,764	5,057	4,600	4,891	11,102	83,121
Road oil	116	67	1,627	1,158	15	10	1	1	2,312	3,175	8,482
Still gas [3]	14,080	3,848	24,506	8,890	5,031	28,153	9,147	1,337	3,735	17,779	116,506
Liquefied refinery gases	4,590	209	3,773	2,981	1,698	14,330	9,817	326	564	5,327	43,615
Other miscellaneous [3]	1,829	167	1,481	868	345	1,467	1,769	124	114	2,642	10,806
Other unfinished oils (net)	[3] 5,660	[3] 1,032	995	512	582	7,621	[3] 4,247	[3] 683	223	[3] 9,542	[3] 11,231
Shortage or overage	(1,247)	(212)	(4,440)	425	2,512	(1,897)	(6,653)	53	561	(1,458)	(12,356)
Total output	391,833	71,119	514,962	258,808	115,538	703,578	246,476	33,932	103,261	417,093	2,856,600

[1] Includes unfinished gasoline (net). [2] Conversion factor: 280 pounds of wax to the barrel; 5.0 barrels of coke to the short ton; 5.5 barrels of asphalt to the short ton; 3,600 cubic feet of still gas to the barrel. [3] Negative quantity; represents net excess of unfinished oils rerun over unfinished oils produced. [4] Preliminary figures. [5] Production at natural gasoline plants shown as direct "transfers" and omitted from the input and output at refineries.

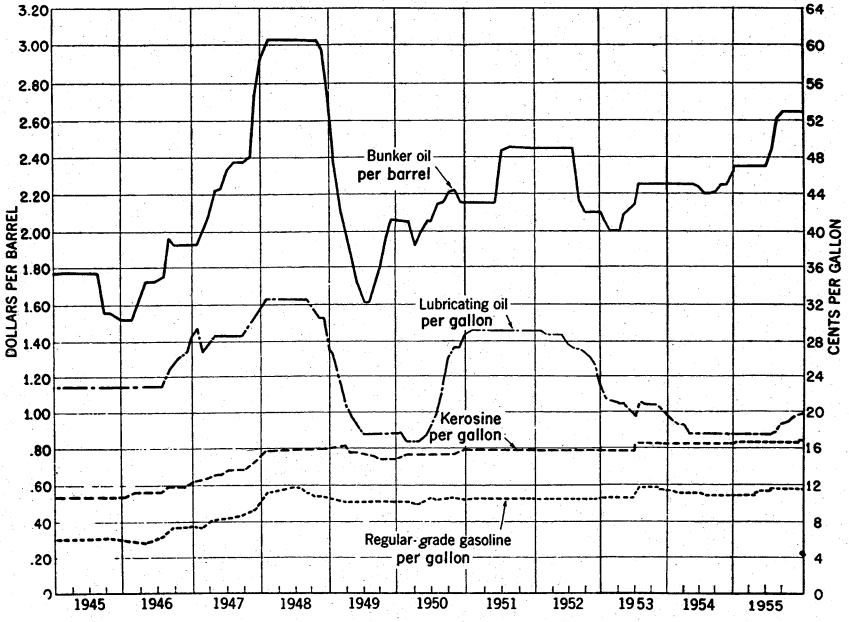

FIGURE 7.—Average prices of bunker "C" oil at New York, bright stock at Oklahoma refineries, tank-wagon prices of kerosine at Chicago, and regular-grade gasoline at refineries in Oklahoma, 1945–54, by months.

REFINERY CAPACITY

The crude-oil capacity of refineries in the United States on January 1, 1956, was 8,632,000 barrels per day, a net addition of 212,000 barrels per day. This annual increase, smallest since the close of World War II, reflects the leveling off of demand in 1954. The refining districts showing the largest capacity increases in 1955 were California, with a net increase of 72,000 barrels per day; Texas Gulf, with 65,000; and

TABLE 46.—Petroleum-refinery capacity in the United States, Jan. 1, 1951–56

	Number of refineries				Capacity (barrels per day)			
	Operating	Shut down	Total	Building	Operating	Shut down	Total	Building
1951	325	32	357	1	6,701,815	261,829	6,963,644	160,100
1952	327	23	350	----------	7,161,366	171,519	7,332,885	282,680
1953	315	28	343	4	7,481,701	[1] 156,960	7,638,861	509,721
1954	308	29	337	7	7,782,103	[1] 224,794	8,006,897	397,500
1955	296	30	326	4	8,069,154	[1] 351,476	8,420,630	146,800
1956	294	24	318	2	8,380,801	[1] 251,589	8,632,390	267,000

[1] Includes 18,941 in 1953, 22,920 in 1954, 34,586 in 1955, and 49,754 in 1956 reported as inoperative without reconditioning.

Indiana and Illinois, with 54,000. Capacity in the East Coast district, declined because a refinery in New Jersey shut down. Two completely new refineries were under construction in the East Coast district, however, one in Delaware to replace that shut down in New Jersey and another in Virginia.

AVIATION GASOLINE

The total demand for aviation gasoline increased 5.1 million barrels (6.1 percent), but it was below 1953. The 1955 figures, for the first time, compare total demand by grade for 2 successive years. Demand was greatest for 115–145 octane gasoline, which increased 6.9 million barrels. Demand for 100–130 grade declined 2.6 million barrels. Military deliveries rebounded in 1955 after an unusual slump in 1954. A better picture of the changes in aviation-gasoline demand can be obtained by comparing 1955 figures with those for 1953.

Jet fuels, important aircraft fuels, are reported in this chapter as a separate product, and are not included in aviation gasoline.

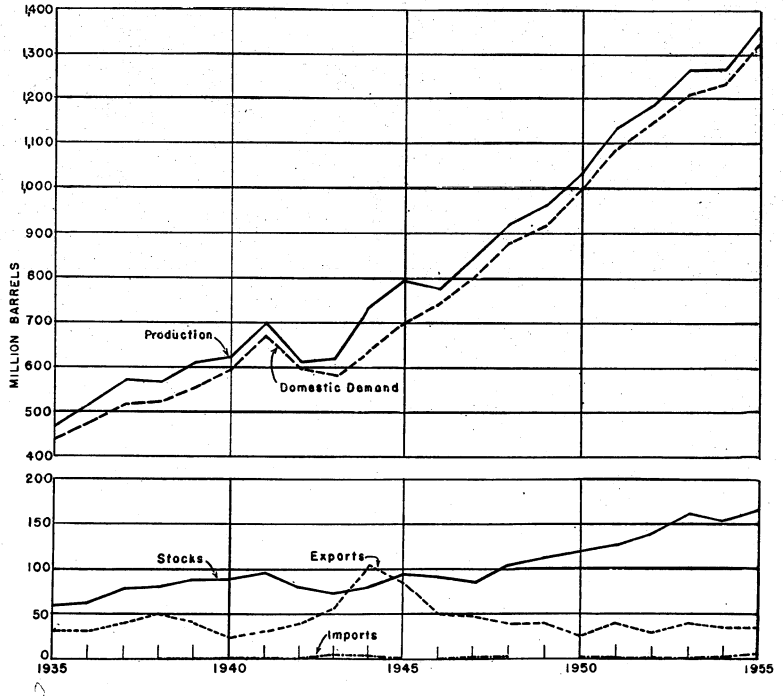

FIGURE 8.—Production, domestic demand, exports, imports, and stocks of gasoline in the United States, 1935–55.

TABLE 47.—Salient statistics of aviation gasoline in the United States, 1954, by months

(Thousand barrels)

	January	February	March	April	May	June	July	August	September	October	November	December	Total
Production, by grades:													
115- to 145-octane	2,381	2,293	2,533	2,478	2,533	2,673	2,354	2,638	2,614	2,691	2,788	3,401	31,377
108- to 135-octane	236	122	200	244	285	268	279	476	298	279	378	241	3,306
100- to 130-octane	3,370	3,213	3,380	3,119	3,862	3,929	3,802	3,634	3,215	3,239	2,924	3,366	41,053
91- to 98-octane	568	455	519	574	318	484	573	476	504	662	522	512	6,167
Other- grades	173	114	263	248	258	254	343	286	280	357	275	223	3,074
Alkylate	754	879	790	869	613	882	831	1,089	798	738	830	818	9,891
Transfers out-[1]	672	858	823	751	656	1,203	901	900	893	977	942	994	10,570
Exports	1,757	1,382	879	1,134	1,737	2,225	1,633	1,673	1,586	1,690	1,813	1,658	19,167
Stocks, by grades (Dec. 31, 1953):[2]													
115- to 145-octane 1,965	2,277	1,988	2,212	1,996	2,220	1,468	1,743	1,917	2,162	2,456	2,151	1,796	1,796
108- to 135-octane 352	248	238	290	259	307	237	287	333	273	273	400	333	333
100- to 130-octane 2,921	2,884	2,968	3,038	3,181	4,073	3,537	3,453	3,499	3,406	3,322	3,179	3,440	3,440
91- to 98-octane 1,105	1,296	1,349	1,398	1,494	1,228	1,144	1,111	895	777	796	871	851	851
Other grades 391	391	379	383	371	370	355	413	380	395	366	387	399	399
Alkylate 2,321	2,501	2,603	2,668	2,840	2,721	2,527	2,565	2,888	2,783	2,663	2,518	2,399	2,399
Domestic demand, all grades	4,511	4,908	5,609	5,405	4,698	6,713	5,344	5,636	5,396	5,219	5,332	6,197	64,968
Total demand,[3] by grades:													
115- to 145-octane	2,015	2,528	2,404	2,460	2,263	3,359	2,106	2,481	2,383	2,420	3,083	3,773	31,275
108- 135-octane	340	132	148	276	234	338	234	379	408	258	245	280	3,272
100- to 130-octane	3,344	3,077	3,211	2,974	2,966	4,418	3,748	3,538	3,281	3,281	3,027	3,071	39,936
91- to 98-octane	375	402	471	477	581	466	533	548	504	487	407	488	5,739
Other grades	172	119	253	258	259	272	280	317	260	383	250	207	3,030
Alkylate	22	32	1	94	132	85	76	46	146	80	133	36	883
Production, by districts:													
District 1	496	473	448	518	429	579	517	552	444	434	508	466	5,864
District 2	828	756	857	855	721	824	1,021	1,084	829	775	827	1,004	10,381
District 3	4,417	4,041	4,623	4,680	4,987	5,212	4,877	5,121	4,733	5,049	4,755	5,200	57,695
District 4	127	121	100	113	103	128	133	109	125	90	91	80	1,320
District 5	1,614	1,685	1,657	1,366	1,629	1,747	1,634	1,733	1,578	1,618	1,536	1,811	19,608
Total	7,482	7,076	7,685	7,532	7,869	8,490	8,182	8,599	7,709	7,966	7,717	8,561	94,868
Exports, by districts:													
District 1	1	110	1	35	2	1	2	4	1	2	104		263
District 2	30	35	35	72	83	101	91	65	76	79	42	94	803
District 3	1,517	1,030	713	887	1,349	1,943	1,152	1,365	1,297	1,491	1,262	1,508	15,514
District 4												1	1
District 5	209	207	130	140	303	180	388	239	212	118	405	55	2,586
Total	1,757	1,382	879	1,134	1,737	2,225	1,633	1,673	1,586	1,690	1,813	1,658	19,167

Stocks, by districts:														
District 1	721	609	583	552	639	605	719	819	848	778	656	585	585	
District 2	2,032	1,848	1,940	2,099	2,068	1,769	1,847	2,021	1,801	1,959	1,991	2,020	2,020	
District 3	4,884	5,054	5,338	5,513	5,927	4,848	5,009	5,095	4,849	4,707	5,038	4,824	4,824	
District 4	94	84	62	83	72	85	98	99	93	110	127	107	107	
District 5	1,866	1,930	1,976	1,894	2,213	1,901	1,899	1,928	2,115	2,322	1,694	1,682	1,682	
Total	9,597	9,525	9,899	10,141	10,919	9,268	9,572	9,962	9,796	9,876	9,506	9,218	9,218	
Total demand,[2] by districts:														
District 1	355	566	429	492	293	504	417	430	396	487	521	533	5,423	
District 2	684	671	571	496	588	880	727	699	722	621	670	778	8,016	
District 3	4,043	3,592	4,034	4,147	4,312	5,652	4,280	4,575	4,587	4,520	3,889	4,904	52,544	
District 4	113	110	120	88	107	104	97	104	100	51	59	60	1,113	
District 5	1,173	1,351	1,334	1,316	1,135	1,789	1,447	1,501	1,177	1,230	2,006	1,580	17,039	
Total	6,268	6,290	6,488	6,539	6,435	8,938	6,977	7,309	6,982	6,909	7,145	7,855	84,135	

[1] Reject material used as automotive gasoline. [2] New basis—excludes stocks of components not of petroleum origin. [3] Includes exports.

TABLE 48.—Salient statistics of aviation gasoline in the United States, 1954 (total) and 1955, by months

(Thousand barrels)

	1955 [1]													1954 (year)
	January	February	March	April	May	June	July	August	September	October	November	December	Total	
Production, by grades:														
115- to 145-octane	2,846	2,893	2,961	3,024	3,385	3,877	2,886	3,429	3,429	3,327	3,215	3,999	39,271	31,377
108- to 135-octane	308	194	254	321	358	244	421	367	434	345	403	328	3,977	3,306
100- to 130-octane	2,910	2,658	2,719	3,088	2,753	3,048	3,635	3,431	2,980	3,808	3,185	3,120	37,335	41,053
91- to 98-octane	425	286	448	336	516	514	453	577	659	512	555	564	5,845	6,167
Other grades	220	75	242	241	329	351	368	386	302	261	213	163	3,151	3,074
Alkylate	1,310	1,139	1,593	868	1,430	892	1,552	1,226	1,130	1,010	724	955	13,829	9,891
Transfers out [2]	953	1,095	1,532	1,184	1,407	1,143	1,265	1,189	1,127	1,037	825	1,049	13,806	10,570
Exports	1,287	1,283	1,225	1,252	1,543	1,353	1,988	1,980	1,650	2,095	1,582	1,876	19,114	19,167
Stocks, by grades:														
115- to 145-octane	2,381	2,712	2,726	2,476	2,820	2,149	2,408	2,650	3,079	2,969	2,831	2,700	2,700	1,796
108- to 135-octane	246	271	233	300	311	252	337	272	385	232	368	285	285	333
100- to 130-octane	3,486	3,397	3,104	3,322	2,993	2,829	3,370	3,288	3,023	3,326	3,372	3,123	3,123	3,440
91- to 98-octane	899	838	860	797	792	815	624	608	719	705	694	680	680	851
Other grades	412	355	415	421	436	462	411	426	399	446	470	472	472	399
Alkylate	2,706	2,729	2,692	2,289	2,323	2,050	2,406	2,377	2,503	2,396	2,300	2,280	2,280	2,399
Domestic demand, all grades	4,867	4,695	5,732	5,867	5,751	7,548	5,063	6,182	5,670	6,165	5,927	6,699	70,166	64,968
Total demand, [3] by grades:														
115- to 145-octane	2,255	2,524	2,945	3,271	3,032	4,525	2,571	3,158	2,977	3,402	3,336	4,132	38,128	31,275
108- to 135-octane	385	169	292	252	347	303	320	432	320	498	267	411	3,996	3,272
100- to 130-octane	2,852	2,751	2,991	2,830	3,072	3,199	3,012	3,535	3,142	3,494	3,124	3,342	37,344	39,936
91- to 98-octane	347	346	407	369	426	473	597	512	480	449	485	446	5,337	5,739
Other grades	203	132	180	228	303	331	401	361	323	210	184	155	3,011	3,030
Alkylate	112	56	142	169	114	70	150	164	78	207	113	89	1,464	883
Production, by districts:														
District 1	486	506	560	550	449	595	609	677	570	493	478	560	6,533	5,864
District 2	924	752	948	686	1,062	990	1,184	1,151	1,036	1,013	950	1,074	11,770	10,381
District 3	4,630	4,434	4,888	4,980	5,209	5,346	5,540	5,552	5,374	5,572	4,956	5,504	61,985	57,695
District 4	117	86	110	37	98	138	138	119	179	178	172	192	1,564	1,320
District 5	1,862	1,467	1,711	1,625	1,953	1,857	1,844	1,917	1,775	2,007	1,739	1,799	21,556	19,608
Total	8,019	7,245	8,217	7,878	8,771	8,926	9,315	9,416	8,934	9,263	8,295	9,129	103,408	94,868
Exports, by districts:														
District 1	1	1	1	77	-------	1	134	-------	1	2	2	-------	220	263
District 2	33	32	58	75	124	115	99	101	91	103	55	86	972	803
District 3	995	1,020	870	805	1,077	1,037	1,296	1,456	1,159	1,710	1,117	1,662	14,204	15,514
District 4	2	1	4	1	1	2	2	2	3	2	1	-------	21	1
District 5	256	229	292	294	341	198	457	421	396	278	407	128	3,697	2,586
Total	1,287	1,283	1,225	1,252	1,543	1,353	1,988	1,980	1,650	2,095	1,582	1,876	19,114	19,167

Stocks, by districts:														
District 1	632	740	697	710	518	619	563	748	716	679	739	752	752	585
District 2	2,220	2,131	2,101	1,792	2,064	1,936	2,205	2,147	2,099	2,206	2,155	2,085	2,085	2,020
District 3	5,121	5,229	5,250	5,089	4,984	4,228	4,674	4,724	5,228	4,821	4,935	4,763	4,763	4,824
District 4	144	160	134	94	120	124	132	125	119	116	132	136	136	107
District 5	2,013	2,042	1,848	1,920	1,989	1,650	1,982	1,877	1,946	2,252	2,074	1,804	1,804	1,682
Total	10,130	10,302	10,030	9,605	9,675	8,557	9,556	9,621	10,108	10,074	10,035	9,540	9,540	9,218
Total demand,[3] by districts:														
District 1	425	357	485	394	475	344	602	418	532	498	332	468	5,330	5,423
District 2	587	616	681	765	604	870	710	999	997	815	928	1,081	9,653	8,016
District 3	3,772	3,649	4,011	4,497	4,519	5,518	4,334	4,835	4,238	5,393	4,408	4,988	54,162	52,544
District 4	58	63	85	66	58	114	119	111	123	125	111	119	1,152	1,113
District 5	1,312	1,293	1,695	1,397	1,638	2,055	1,286	1,799	1,430	1,429	1,730	1,919	18,293	17,039
Total	6,154	5,978	6,957	7,119	7,294	8,901	7,051	8,162	7,320	8,260	7,509	8,575	89,280	84,135

[1] Preliminary figures. [2] Reject material used as automotive gasoline. [3] Includes exports.

GASOLINE

Total demand for gasoline gained 7.2 percent in 1955, compared with the gain of only 2.3 percent recorded in 1954. All gain during 1955 was due to increased domestic demand; exports were virtually unchanged from 1954.

All figures for aviation gasoline and naphtha are included under total gasoline.

TABLE 49.—Salient statistics of gasoline in the United States, 1953 (total) and 1954, by months

(Thousand barrels)

	1954						
	January	February	March	April	May	June	July
Production:							
Finished gasoline and naphtha from crude oil	94,984	85,673	91,357	89,606	95,000	92,024	95,005
Unfinished gasoline (net)	−648	−429	+494	468	241	−68	87
Natural-gas liquids used at refineries	9,633	8,987	9,240	8,861	9,441	9,423	9,828
Sold to jobbers	1,774	2,499	2,869	2,724	2,678	2,592	2,300
Total production	105,743	96,730	103,960	101,659	107,360	103,971	107,220
Daily average	3,411	3,455	3,354	3,389	3,463	3,466	3,459
Imports	2	2	1	1	2	133	133
Exports	2,705	2,833	1,776	2,539	3,359	3,367	3,232
Daily average	87	101	57	85	108	112	104
Stocks, end of period:							
Finished gasoline	163,532	172,207	173,060	168,301	168,660	156,526	149,045
Unfinished gasoline	8,172	7,743	8,237	8,705	8,946	8,878	8,965
Total stocks	171,704	179,950	181,297	177,006	177,606	165,404	158,010
Domestic demand	89,208	85,653	100,838	103,412	103,403	112,939	111,515
Daily average	2,878	3,059	3,253	3,447	3,336	3,765	3,597

	1954						1953 (total)
	August	September	October	November	December	Total	
Production:							
Finished gasoline and naphtha from crude oil	95,210	92,200	93,459	92,423	98,598	1,115,539	1,122,077
Unfinished gasoline (net)	−412	−74	136	−174	280	−99	584
Natural-gas liquids used at refineries	10,334	10,487	10,612	10,604	10,099	117,549	111,293
Sold to jobbers	2,507	1,920	2,182	2,175	2,095	28,315	32,422
Total production	107,639	104,533	106,389	105,028	111,072	1,261,304	1,266,376
Daily average	3,472	3,484	3,432	3,501	3,583	3,456	3,470
Imports	4	15	530	198	164	1,185	459
Exports	2,865	2,942	3,148	2,967	2,633	34,366	37,925
Daily average	92	98	102	99	85	94	104
Stocks, end of period:							
Finished gasoline	144,615	142,437	141,046	142,163	146,679	146,679	149,052
Unfinished gasoline	8,553	8,479	8,615	8,441	8,721	8,721	8,820
Total stocks	153,168	150,916	149,661	150,604	155,400	155,400	157,872
Domestic demand	109,620	103,858	105,026	101,316	103,807	1,230,595	1,205,775
Daily average	3,536	3,462	3,388	3,377	3,349	3,371	3,303

Production.—The production of gasoline and naphtha from crude oil in 1955 increased 8.0 percent. Natural-gas liquids blended in gasoline both at refineries and outside refineries increased 1.6 percent.

Yields.—In the first half of 1955, gasoline yields were lower than in the corresponding months of 1954. Yields rose in July and continued high (44.8–45.0 percent) through October of 1955.

TABLE 50.—Salient statistics of gasoline in the United States, 1954 (total) and 1955, by months

(Thousand barrels)

	1955[1]						
	January	February	March	April	May	June	July
Production:							
Finished gasoline and naphtha from crude oil	98,064	89,279	96,852	94,181	99,005	99,205	105,632
Unfinished gasoline (net)	1,355	1,145	355	−1,388	11	86	−50
Natural-gas liquids used at refineries	10,857	9,451	10,067	9,486	10,027	10,001	10,475
Sold to jobbers	2,532	2,467	2,564	2,790	2,716	2,467	2,491
Total production	112,808	102,342	109,838	105,069	111,759	111,759	118,548
Daily average	3,639	3,655	3,543	3,502	3,605	3,725	3,824
Imports	306	534	575	125	310	297	339
Exports	2,555	2,331	2,400	2,449	3,212	2,658	3,594
Daily average	82	83	77	82	104	89	116
Stocks, end of period:							
Finished gasoline	159,486	170,422	172,396	165,413	158,552	147,154	146,844
Unfinished gasoline	10,076	11,221	11,576	10,188	10,199	10,285	10,235
Total stocks	169,562	181,643	183,972	175,601	168,751	157,439	157,079
Domestic demand	96,397	88,464	105,684	111,116	115,707	120,710	115,653
Daily average	3,110	3,159	3,409	3,704	3,732	4,024	3,731

	1955[1]						1954 total
	August	September	October	November	December	Total	
Production:							
Finished gasoline and naphtha from crude oil	105,986	100,861	104,774	102,457	108,185	1,204,481	1,115,539
Unfinished gasoline (net)	325	−602	65	−202	−435	665	−99
Natural-gas liquids used at refineries	10,643	10,614	11,903	11,379	11,479	126,382	117,549
Sold to jobbers	2,647	2,654	1,910	2,375	2,182	29,795	28,315
Total production	119,601	113,527	118,652	116,009	121,411	1,361,323	1,261,304
Daily average	3,858	3,784	3,827	3,867	3,916	3,730	3,456
Imports	258	1,063	205	536	213	4,761	1,185
Exports	3,210	2,929	3,390	2,565	3,028	34,321	34,366
Daily average	104	98	109	86	98	94	94
Stocks, end of period:							
Finished gasoline	141,352	140,236	143,080	148,050	156,047	156,047	146,679
Unfinished gasoline	10,560	9,958	10,023	9,821	9,386	9,386	8,721
Total stocks	151,912	150,194	153,103	157,871	165,433	165,433	155,400
Domestic demand	121,816	113,379	112,558	109,212	111,034	1,321,730	1,230,595
Daily average	3,930	3,779	3,631	3,640	3,582	3,621	3,371

[1] Preliminary figures

Domestic Demand.—The domestic demand for gasoline and naphthas increased 7.4 percent in 1955. Civilian highway use of gasoline (1,107.8 million barrels) as computed by the Bureau of Public Roads, increased 7.5 percent. As in 1954, civilian highway usage accounted for 83.8 percent of the domestic demand for gasoline and naphtha.

No breakdown is available for the 119.6 million barrels of gasoline consumed by nonhighway vehicles, military motor vehicles, stationary engines, and losses.

TABLE 51.—Production of gasoline in the United States in 1955, by districts and months

(Thousand barrels)

	January	February	March	April	May	June	July	August	September	October	November	December	Total
Gasoline from crude oil (including net unfinished):													
East Coast	13,726	11,842	12,548	11,573	11,744	12,250	13,572	13,774	13,527	13,605	12,429	13,846	154,436
Appalachian	2,649	2,433	2,635	2,528	2,601	2,479	2,919	2,866	2,784	2,701	2,835	3,025	32,455
Indiana, Illinois, Kentucky, etc.	19,658	18,355	19,272	18,051	19,491	21,082	22,841	21,247	19,174	21,503	20,617	22,084	243,375
Oklahoma, Kansas, etc.	10,901	9,652	9,754	8,431	10,094	11,059	11,070	10,812	11,325	10,609	10,640	11,461	125,808
Texas Inland	3,687	3,434	3,738	3,781	3,764	3,436	3,514	3,682	3,795	3,848	3,555	3,869	44,103
Texas Gulf Coast	21,839	20,570	22,667	21,470	23,258	22,123	23,475	24,178	21,810	23,062	23,563	23,948	271,963
Louisiana Gulf Coast	8,380	7,795	8,937	9,343	9,278	9,399	8,736	9,730	9,206	9,806	9,780	9,890	110,280
Arkansas, Louisiana Inland, etc.	1,025	878	904	861	950	988	977	1,040	938	939	1,022	1,068	11,590
Rocky Mountain	4,032	3,433	3,635	2,958	3,426	3,747	4,010	4,180	3,677	3,681	3,753	3,963	44,495
California and Washington	11,790	10,201	11,141	11,665	12,255	10,941	12,131	12,881	12,000	12,963	12,012	12,509	142,489
Total gasoline	97,687	88,593	95,231	90,661	96,861	97,504	103,245	104,390	98,236	102,717	100,206	105,663	1,180,994
Naphtha:													
East Coast	110	127	171	128	142	203	109	128	142	182	139	128	1,709
Appalachian	11	27	29	47	62	52	57	51	48	49	51	45	529
Indiana, Illinois, Kentucky, etc.	351	322	374	357	407	263	392	242	305	333	305	351	4,002
Oklahoma, Kansas, etc.	132	108	128	129	147	154	146	163	142	170	155	144	1,718
Texas Inland	50	52	41	60	57	67	58	55	48	70	49	61	668
Texas Gulf Coast	630	618	730	783	757	655	896	733	773	768	785	892	9,020
Louisiana Gulf Coast	259	227	241	322	281	223	347	264	279	255	233	258	3,189
Arkansas, Louisiana Inland, etc.	21	22	21	22	24	22	22	20	19	20	20	27	260
Rocky Mountain	11	11	19	13	9	11	18	16	12	10	8	7	145
California and Washington	157	317	222	271	269	137	292	249	255	265	304	174	2,912
Total naphtha	1,732	1,831	1,976	2,132	2,155	1,787	2,337	1,921	2,023	2,122	2,049	2,087	24,152
Total gasoline and naphtha from crude	99,419	90,424	97,207	92,793	99,016	99,291	105,582	106,311	100,259	104,839	102,255	107,750	1,205,146
Percent yield of gasoline and naphtha[1]	43.0	42.4	42.5	43.7	44.1	44.0	45.0	44.9	44.8	44.3	44.3	44.0	44.0
Natural-gas liquids blended at refineries	10,857	9,451	10,067	9,486	10,027	10,001	10,475	10,643	10,614	11,903	11,379	11,479	126,382

Total refinery production:														
East Coast	14,089	12,242	13,056	11,968	12,098	12,658	13,956	14,092	13,910	14,015	12,838	14,288	159,210	
Appalachian	2,692	2,488	2,693	2,678	2,693	2,588	2,990	2,980	2,846	2,797	2,905	3,111	33,261	
Indiana, Illinois, Kentucky, etc.	21,351	19,810	20,698	19,510	21,017	22,456	24,430	22,790	20,601	23,397	22,597	23,906	262,563	
Oklahoma, Kansas, etc.	12,183	10,638	10,849	9,616	11,213	12,431	12,452	12,078	12,045	12,123	12,136	12,949	141,263	
Texas Inland	5,610	5,113	5,618	5,766	5,889	5,292	5,375	5,620	5,875	5,977	5,604	5,939	67,678	
Texas Gulf Coast	25,250	23,614	25,934	24,581	26,408	25,369	26,926	27,521	25,349	26,863	27,234	27,747	312,796	
Louisiana Gulf Coast	9,263	8,548	9,624	10,110	10,167	10,157	9,590	10,577	10,118	10,827	10,735	10,852	120,568	
Arkansas, Louisiana Inland, etc.	1,106	950	976	929	1,039	1,059	1,052	1,113	1,017	1,082	1,100	1,147	12,520	
Rocky Mountain	4,326	3,678	3,865	3,149	3,612	3,899	4,243	4,384	3,905	3,939	4,015	4,237	47,252	
California and Washington	14,406	12,794	13,961	14,172	14,907	13,433	15,043	15,849	14,607	15,772	14,480	14,998	174,471	
Total 1955	110,276	99,875	107,274	102,279	109,043	109,292	116,057	116,954	110,873	116,742	113,634	119,229	1,331,528	
Natural-gas liquids used in other gasoline blends [2]	2,532	2,467	2,564	2,790	2,716	2,467	2,491	2,647	2,654	1,910	2,375	2,182	29,795	
Total gasoline production	112,808	102,342	109,838	105,069	111,759	111,759	118,548	119,601	113,527	118,652	116,009	121,411	1,361,323	

[1] Based on crude runs to stills adjusted for net stocks of unfinished oils. [2] This represents a net figure and includes exports.

Production and Consumption by States.—Table 52, which shows gasoline production and consumption by States, provides an indication of the areas and an approximate measure of the quantity of surplus production and deficit supply. The refinery-production data were compiled by the Bureau of Mines and do not include natural-gas liquids blended into gasoline outside refineries. Consumption data, by States, were compiled by the American Petroleum Institute and do not include commercial naphthas or offshore military shipments. These omissions roughly offset each other.

District 1 (Atlantic Coast States and West Virginia) produced 174 million barrels of gasoline and consumed 428 million barrels in 1955. The deficit of 254 million barrels was made up mainly by receipts from District 3 of 219 million barrels by tanker and 39 million barrels by pipeline.

District 2 (including refinery districts Appalachian 2 (eastern Ohio), Indiana-Illinois, and Oklahoma-Kansas) produced 422 million barrels and consumed 467 million barrels. The deficit of 45 million barrels was partly offset by pipeline movement of 31 million barrels from District 3 and 3 million barrels from District 1. The remaining deficit was met by barge and rail movement from District 3.

District 3 (Texas, Louisiana, Arkansas, Mississippi, Alabama, and New Mexico) produced 519 million barrels and consumed 180 million barrels indicating a surplus of 339 million barrels. Tankers moved 219 million barrels from the gulf to the east coast, and pipelines transported 73 million barrels out of the district. The remaining surplus was moved by rail, barge, and truck or was exported.

District 4 (Rocky Mountain States except New Mexico) produced 43 million barrels and consumed 38 million barrels indicating a surplus of 5 million barrels. Pipeline movements of 4.4 million barrels to District 5 were partly offset by pipeline receipts from District 3. Most of the new surplus must have been moved by rail or truck.

District 5 (California, Oregon, Washington, Nevada, and Arizona) produced 174 million barrels and consumed 181 million. The deficit was principally offset by pipeline, rail, and truck movements from District 4.

Methods of Distribution.—Gasoline supplied 73 percent of the volume of refined petroleum products transported by pipeline. Only 88 million of the 552 barrels of gasoline turned into pipelines moved between PAW districts. The main pipeline movement was between the States in District 2. Waterborne shipments of gasoline are principally from the Gulf to the east coast. This totaled 219 million barrels in 1955. Barges up the Mississippi and Ohio Rivers also move considerable volumes of petroleum products.

Stocks.—Stocks of finished gasoline, as reported, include stocks held at refineries and bulk terminals and by pipelines but do not include those held by secondary distributors, consumers, or in military custody. There are definite normal seasonal variations in gasoline storage because of a summer peak and a winter low in gasoline demand.

TABLE 52.—Production (refinery output) and consumption of gasoline in the United States, 1953–55, by States

(Thousand barrels)

	1953		1954		1955 [1]	
	Production [2]	Consumption [3]	Production [2]	Consumption [3]	Production [2]	Consumption [3]
Alabama	[4]	17,288	[4]	18,167	[4]	19,668
Arizona		7,652		7,778		8,564
Arkansas	9,847	11,025	10,693	11,530	10,843	12,321
California	[5] 162,926	116,061	[5] 158,858	125,151	[5] 174,417	133,713
Colorado	4,346	12,867	4,755	13,525	5,014	14,176
Connecticut		14,523		15,118		16,021
Delaware		3,034		3,088		3,426
District of Columbia		4,863		4,785		4,932
Florida		27,118		29,378	5	32,693
Georgia	[6] 8,112	23,163	[6] 8,709	24,348	[6] 6,990	26,291
Idaho	[7]	5,551	[7]	5,694	[7]	5,949
Illinois	[8] 97,666	60,595	[8] 98,400	62,731	[8] 109,133	65,844
Indiana	72,239	35,648	68,356	36,320	67,556	39,076
Iowa		24,482		25,354		26,294
Kansas	[9] 59,386	21,004	[9] 62,169	23,259	[9] 69,085	24,474
Kentucky	[10] 13,197	16,344	[10] 11,580	17,285	[10] 11,049	18,544
Louisiana	[4] 101,317	16,490	[4] 104,153	17,572	[4] 122,245	19,961
Maine		6,302		6,554		6,966
Maryland	[6]	16,142	[6]	16,885	[6]	18,300
Massachusetts	[11] 2,432	25,488	[11] 4,979	26,752	[11] 5,291	28,892
Michigan	16,942	52,936	16,140	53,928	17,894	58,326
Minnesota	[8]	24,866	[8]	26,001	[8]	27,436
Mississippi	[4]	12,403	[4]	12,955	[4]	13,806
Missouri	[9]	33,378	[9]	34,907	[9]	36,767
Montana	8,926	6,127	8,637	6,367	8,967	6,580
Nebraska	[9]	12,659	[9]	13,094	[9]	13,530
Nevada		2,519		2,677		2,973
New Hampshire		3,653		3,848		4,100
New Jersey	63,576	37,809	56,394	39,942	52,808	43,010
New Mexico	4,362	7,234	4,150	7,414	4,090	8,008
New York	12,471	74,631	13,927	78,392	14,505	83,714
North Carolina		27,251		27,369		29,861
North Dakota		6,936	[9]	7,075	[9]	7,200
Ohio	66,541	62,364	68,212	64,501	75,377	69,378
Oklahoma	63,797	19,328	63,591	19,637	72,178	21,916
Oregon		13,631		[12] 14,024		14,769
Pennsylvania	83,082	62,005	85,818	63,422	93,535	67,774
Rhode Island	[11]	4,789	[11]	5,175	[11]	5,558
South Carolina	[6]	14,010	[6]	14,058	[6]	14,936
South Dakota		7,353		7,693		7,830
Tennessee	[10]	20,920	[10]	21,954	[10]	23,233
Texas	352,132	109,848	353,317	106,245	380,474	105,672
Utah	13,077	6,132	12,963	6,385	13,115	7,000
Vermont		2,671		2,718		2,833
Virginia		24,933		25,256		27,505
Washington	[5]	18,943	[5]	19,232	[5]	20,690
West Virginia	2,202	9,934	1,490	10,253	841	10,935
Wisconsin	[8]	26,971	[8]	27,255	[8]	28,292
Wyoming	[7] 15,378	3,698	[7] 15,698	3,785	[7] 16,066	3,862
Total	1,233,954	1,175,572	1,232,989	[12] 1,216,836	1,331,528	1,293,649

[1] Preliminary figures.
[2] Excludes jet fuel.
[3] American Petroleum Institute.
[4] Alabama and Mississippi included with Louisiana.
[5] Washington included with California.
[6] Maryland and South Carolina included with Georgia.
[7] Idaho included with Wyoming.
[8] Minnesota and Wisconsin included with Illinois.
[9] Missouri, Nebraska, and North Dakota included with Kansas.
[10] Tennessee included with Kentucky.
[11] Rhode Island included with Massachusetts.
[12] Revised.

TABLE 53.—Transportation of petroleum products by pipeline between PAW districts in the United States in 1954–55, by months

(Thousand barrels)

	January	February	March	April	May	June	July	August	September	October	November	December	Total
1954													
From district 1 to District 2:													
Gasoline	206	195	191	239	240	289	326	326	305	262	181	236	2,996
Kerosine	3			4				10	10			5	32
Distillate fuel oil	28	10	12	18	11			15	20	15		35	164
From District 3 to District 1:													
Gasoline	2,524	2,230	2,880	2,740	2,797	2,793	3,017	2,916	2,625	2,905	3,034	2,512	32,973
Kerosine	1,081	1,005	625	412	354	130	405	462	691	788	794	1,238	7,985
Distillate fuel oil	946	973	614	685	401	493	661	717	760	778	777	1,073	8,878
From District 3 to District 2:													
Gasoline	2,037	2,081	2,619	2,441	2,910	3,117	3,271	2,789	2,508	2,743	2,702	2,268	31,486
Kerosine	156	141	72	49	39	62	44	43	51	154	118	171	1,100
Distillate fuel oil	1,104	662	589	609	298	479	616	247	668	465	466	1,007	7,210
From District 3 to District 4:													
Gasoline	189	199	230	253	239	295	282	296	275	279	240	244	3,021
Kerosine	23	13	13	17	1	4	5	4	12	9	16	17	134
Distillate fuel oil	20	15	15	17	21	18	7	16	15	19	14	17	194
1955													
From District 1 to District 2:													
Gasoline	241	211	170	184	153	259	346	300	372	456	388	409	3,489
Kerosine	5		5	4		5	5			12		5	41
Distillate fuel oil	15	16	27	10	15	15	12				12	14	136
From District 2 to District 3:													
Gasoline	439	477	440	667	545	317	730	395	331	899	936	704	6,880
Kerosine													
Distillate fuel oil	316	463	239	146	150	194	135	190	178	183	331	482	3,007
From District 3 to District 1:													
Gasoline	2,719	2,883	3,217	3,183	3,176	3,306	3,395	3,486	3,111	3,298	3,427	3,325	38,526
Kerosine	1,227	985	641	370	373	305	486	648	553	972	888	952	8,400
Distillate fuel oil	1,167	911	1,106	544	575	563	875	714	923	868	735	1,013	9,994
From District 3 to District 2:													
Gasoline	3,000	2,020	2,444	2,792	1,069	2,837	2,610	2,769	2,890	3,289	2,785	2,218	30,723
Kerosine	157	123	85	27	53	29	2	79	74	82	178	218	1,107
Distillate fuel oil	1,226	1,029	644	652	282	216	416	400	526	501	748	1,155	7,795
From District 3 to District 4:													
Gasoline	261	278	285	297	299	295	334	328	284	319	261	230	3,471
Kerosine	21	22	21	18	7	8	7	4	9	16	18	21	172
Distillate fuel oil	12	15	17	19	26	20	17	23	17	18	18	17	219
From District 4 to District 5:													
Gasoline	363	323	342	367	362	366	365	371	398	334	387	445	4,423
Kerosine													
Distillate fuel oil	264	241	244	248	199	216	189	179	279	308	339	318	3,024

TABLE 54.—Transportation of petroleum products by pipeline in 1954–55, by months

(Thousand barrels)

	January	February	March	April	May	June	July	August	September	October	November	December	Total
1954													
Turned into lines: [1]													
Gasoline	35,490	32,929	39,062	39,770	40,996	41,633	43,516	41,175	42,889	42,973	42,634	42,395	485,462
Kerosine	4,223	3,519	2,649	2,209	1,343	1,749	1,552	1,860	2,836	3,426	4,125	5,198	34,689
Distillate fuel oil	15,644	13,021	10,570	9,817	8,238	8,423	8,399	9,390	10,693	12,478	13,400	17,852	138,425
LP-gases	424	389	388	322	343	237	424	349	521	672	839	798	5,706
Delivered from lines: [1]													
Gasoline	34,497	32,226	38,588	39,344	40,680	42,134	42,861	41,867	42,849	43,701	43,142	41,873	483,762
Kerosine	4,243	3,818	2,799	2,228	1,387	1,311	1,313	1,744	2,601	3,192	3,917	5,194	33,747
Distillate fuel oil	17,521	13,759	12,097	9,639	7,395	6,889	6,882	8,723	10,499	12,145	13,284	18,969	137,802
LP-gases	545	300	367	344	228	232	330	337	553	600	640	823	5,299
Shortage (or overage): [2]													
Gasoline	58	(31)	69	24	83	67	101	108	83	99	59	29	749
Kerosine	78	66	66	56	47	37	41	41	55	70	63	76	696
Distillate fuel oil	(30)	49	(10)	10	(15)	(4)	(1)	(7)	21	25	27	(9)	56
LP-gases	17	18	23	15	19	18	24	18	23	27	28	65	295
Stocks in lines and working tanks at end of month:													
Gasoline	17,992	18,726	19,131	19,533	19,766	19,198	19,752	18,952	18,909	18,082	17,515	18,008	18,008
Kerosine	1,809	1,444	1,228	1,153	1,062	1,463	1,661	1,736	1,916	2,080	2,225	2,153	2,153
Distillate fuel oil	7,367	6,580	5,063	5,231	6,089	7,627	9,145	10,319	10,492	10,800	10,889	9,781	9,781
LP-gases	254	325	323	286	382	369	439	433	378	423	594	504	504
1955													
Turned into lines: [1]													
Gasoline	41,100	38,512	44,900	45,313	47,456	47,564	47,447	49,353	48,748	47,395	47,340	46,768	551,896
Kerosine	4,600	3,747	3,193	2,252	1,711	1,891	1,707	2,378	2,454	3,172	4,156	5,102	36,363
Distillate fuel oil	19,065	16,793	14,604	11,408	10,079	10,313	10,536	11,532	11,606	13,007	15,612	21,711	166,266
LP-gases	797	611	591	429	444	371	322	465	547	514	645	937	6,673
Delivered from lines: [1]													
Gasoline	40,321	37,061	44,757	45,698	47,418	47,892	47,303	49,924	48,425	48,103	46,570	47,333	550,805
Kerosine	4,892	4,080	3,206	2,090	1,745	1,650	1,523	2,068	2,342	3,244	3,834	5,097	35,771
Distillate fuel oil	19,904	18,102	16,266	9,975	8,828	8,995	9,622	9,826	11,438	12,258	16,342	23,547	165,103
LP-gases	815	709	497	397	362	334	319	390	522	427	595	1,011	6,378
Shortage (or overage): [2]													
Gasoline	3	(19)	25	(19)	(32)	13	45	97	(47)	168	6	(159)	81
Kerosine	87	46	55	55	46	51	55	51	50	72	74	94	736
Distillate fuel oil	(4)	30	10	14	(4)	(7)	13	22	10	19	17	4	124
LP-gases	29	30	37	22	28	19	14	16	31	26	33	52	337
Stocks in lines and working tanks at end of month:													
Gasoline	18,784	20,254	20,372	20,006	20,076	19,735	19,834	19,166	19,536	18,660	19,424	19,018	19,018
Kerosine	1,774	1,395	1,327	1,434	1,354	1,544	1,673	1,932	1,994	1,850	2,098	2,009	2,009
Distillate fuel oil	8,946	7,607	5,935	7,354	8,609	9,934	10,835	12,519	12,677	13,407	12,660	10,820	10,820
LP-gases	457	329	386	396	450	468	457	516	510	571	588	462	462

[1] The quantities "Turned into lines" and "Delivered from lines" are on a net basis, eliminating intersystem transfers, and are not comparable with data published before 1949.
[2] Figures in parentheses represent overage.

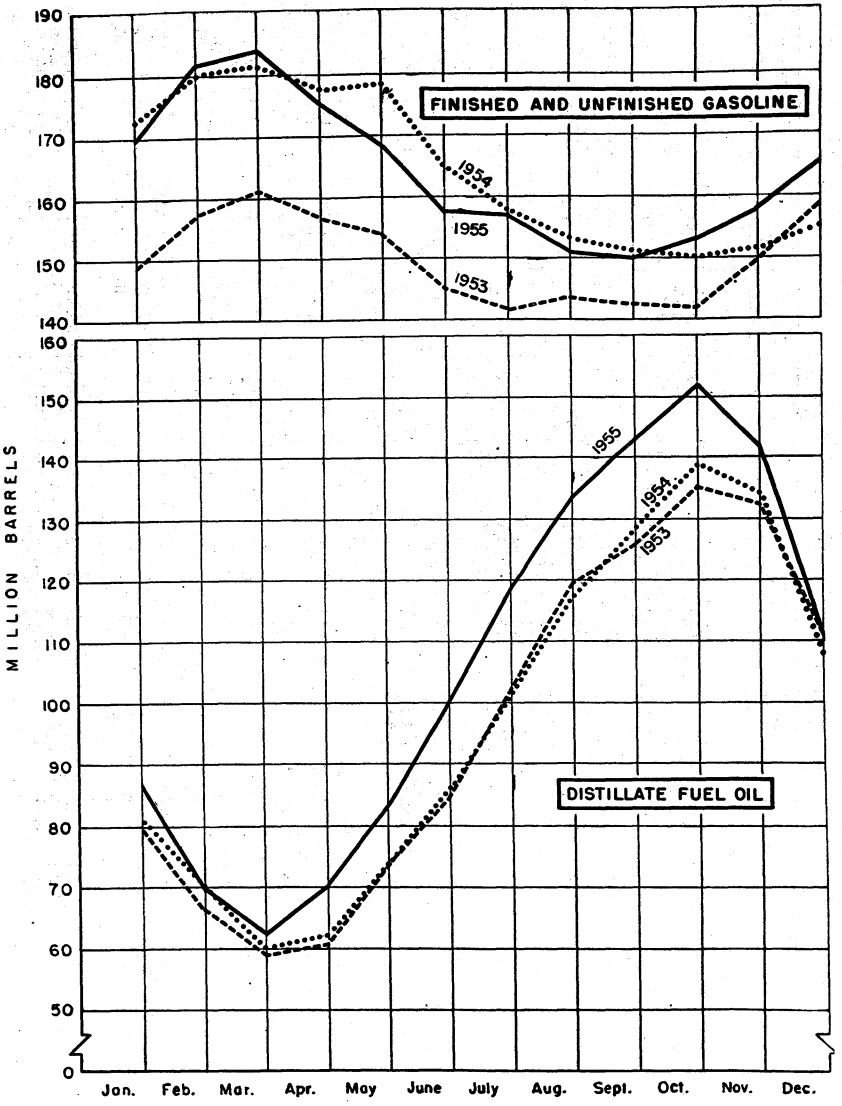

FIGURE 9.—Stocks of finished and unfinished gasoline (excluding jet) and stocks of distillate fuel oil (excluding jet) in the United States 1953–55, by months.

TABLE 55.—Stocks of gasoline in the United States in 1955, by districts and months

(Thousand barrels)

District	Jan. 31	Feb. 28	Mar. 31	Apr. 30	May 31	June 30	July 31	Aug. 31	Sept. 30	Oct. 31	Nov. 30	Dec. 31
Finished gasoline: [1]												
East Coast	32,294	33,826	35,987	36,434	36,175	34,452	34,229	33,444	33,612	34,805	35,316	33,909
Appalachian	7,137	7,259	7,543	7,628	6,950	6,458	6,660	6,298	6,281	6,698	6,783	6,742
Indiana, Illinois, Kentucky, etc	36,187	38,982	38,765	36,101	33,712	32,005	32,403	30,115	28,571	30,218	31,262	33,208
Oklahoma, Kansas, etc	17,891	19,518	20,264	17,112	15,628	14,854	14,787	14,336	15,067	14,324	15,521	17,587
Texas Inland	5,946	6,306	6,273	6,361	6,007	5,478	5,192	5,408	5,367	3,350	5,246	5,842
Texas Gulf Coast	19,732	21,172	20,325	19,524	19,019	17,015	16,915	15,972	15,595	15,594	16,557	18,633
Louisiana Gulf Coast	11,136	11,735	11,040	10,431	9,991	9,160	8,891	9,093	9,340	8,310	8,574	9,401
Arkansas, Louisiana Inland, etc	4,381	4,481	4,711	4,203	3,689	3,489	3,798	3,761	3,772	3,780	4,119	4,283
Rocky Mountain	7,247	8,458	8,746	8,029	7,609	6,910	6,321	5,548	5,089	5,034	5,396	6,016
California	17,535	18,685	18,742	19,590	19,772	17,333	17,648	17,377	17,542	18,967	19,276	20,426
Total finished gasoline	159,486	170,422	172,396	165,413	158,552	147,154	146,844	141,352	140,236	141,080	148,050	156,047
Unfinished gasoline:												
East Coast	1,269	1,415	1,255	1,024	1,108	1,214	1,377	1,277	1,210	1,186	1,093	1,003
Appalachian	181	196	186	155	156	176	236	227	192	193	189	179
Indiana, Illinois, Kentucky, etc	928	967	1,020	1,045	1,097	1,068	1,256	1,310	1,143	989	935	883
Oklahoma, Kansas, etc	206	283	245	245	222	232	171	170	158	174	124	129
Texas Inland	319	252	460	340	225	280	273	222	246	247	274	245
Texas Gulf Coast	4,119	4,851	5,198	4,369	4,268	4,130	4,039	4,554	4,230	4,444	4,310	4,295
Louisiana Gulf Coast	559	527	488	434	439	476	475	479	441	464	481	528
Arkansas, Louisiana Inland, etc	7	6	6	1	1				1	2	1	1
Rocky Mountain	121	143	157	124	147	157	125	148	124	132	109	134
California	2,367	2,581	2,561	2,451	2,536	2,552	2,283	2,173	2,213	2,192	2,305	1,989
Total unfinished gasoline	10,076	11,221	11,576	10,188	10,199	10,285	10,235	10,560	9,958	10,023	9,821	9,386
Total finished and unfinished gasoline:												
East Coast	33,563	35,241	37,242	37,458	37,283	35,666	35,606	34,721	34,822	35,991	36,409	34,912
Appalachian	7,318	7,455	7,729	7,783	7,106	6,634	6,896	6,525	6,473	6,891	6,972	6,921
Indiana, Illinois, Kentucky, etc	37,115	39,949	39,785	37,146	34,809	33,073	33,659	31,425	29,714	31,207	32,197	34,091
Oklahoma, Kansas, etc	18,097	19,801	20,509	17,357	15,850	15,086	14,958	14,506	15,255	14,498	15,645	17,716
Texas Inland	6,265	6,558	6,733	6,701	6,232	5,758	5,465	5,630	5,613	5,597	5,520	6,087
Texas Gulf Coast	23,851	26,023	25,523	23,893	23,287	21,145	20,954	20,526	19,825	20,038	20,867	22,928
Louisiana Gulf Coast	11,695	12,262	11,528	10,865	10,430	9,636	9,366	9,572	9,781	8,774	9,055	9,929
Arkansas, Louisiana Inland, etc	4,388	4,487	4,717	4,204	3,690	3,489	3,798	3,761	3,773	3,782	4,120	4,284
Rocky Mountain	7,368	8,601	8,903	8,153	7,756	7,067	6,446	5,696	5,213	5,166	5,505	6,150
California	19,902	21,266	21,303	22,041	22,308	19,885	19,931	19,550	19,755	21,159	21,581	22,415
Total: 1955	169,562	181,643	183,972	175,601	168,751	157,439	157,079	151,912	150,224	153,103	157,871	165,433
1954	171,704	179,950	181,297	177,006	177,606	165,404	158,010	153,168	150,916	149,661	150,604	155,400

[1] Includes stocks of finished gasoline at refineries and bulk terminals, and in pipelines (excluding jet fuel).

These stocks build up in winter, although refinery yields are lower, and decrease sharply during the summer. This variation in stocks makes unnecessary large variations in seasonal yields of gasoline from crude oil. The yields and stocks of distillate fuel oil are the reverse of this pattern, as demand is high in winter and low in summer.

Total gasoline stocks increased 10 million barrels in 1955. Stocks were below those in 1954 for most of the year but rose 15 million barrels (as is normal) in the last quarter. In 1954 stocks rose only 4.5 million barrels in the last quarter. The days' supply of gasoline stocks at the end of 1955 was only 0.6 day higher than a year earlier.

Prices.—The average dealer net price for Regular-Grade gasoline (exclusive of dealers' margins and sales taxes) in 50 representative cities in the United States provides an index of wholesale gasoline prices. The average service-station price, exclusive of taxes, declined 0.14 cent; the dealers' margin declined 0.13 cent to 5.24 cents per gallon. Total taxes rose from 7.48 cents in 1954 to 7.65 cents per gallon in 1955. The average local tax dropped from 0.09 cent to 0.07 cent per gallon, the average State tax rose from 5.39 cents to 5.58 cents, and the Federal tax remained at 2.0 cents per gallon.

TABLE 56.—Days' supply of gasoline on hand in the United States at end of month, 1953–55 [1]

	1953			1954			1955 [2]		
	Finished and unfinished	Natural gasoline	Total gasoline	Finished and unfinished	Natural gasoline	Total gasoline	Finished and unfinished	Natural gasoline	Total gasoline
January	47.6	2.4	50.0	54.0	3.2	57.2	52.3	4.0	56.3
February	48.7	2.4	51.1	54.0	3.2	57.2	52.1	3.4	55.5
March	46.4	2.4	48.8	51.1	3.2	54.3	48.6	3.4	52.0
April	45.4	2.6	48.0	51.1	3.6	54.7	45.8	3.5	49.3
May	40.3	2.7	43.0	45.6	3.6	49.2	41.0	3.7	44.7
June	39.3	3.0	42.3	44.4	4.0	48.4	40.9	4.3	45.2
July	40.1	3.2	43.3	43.3	4.3	47.6	38.9	4.4	43.3
August	40.3	3.4	43.7	42.7	4.3	47.0	39.2	4.6	43.8
September	41.5	3.7	45.2	42.9	4.4	47.3	40.2	4.7	44.9
October	42.7	4.0	46.7	42.7	4.5	47.2	41.1	4.9	46.0
November	45.7	3.8	49.5	43.6	4.4	48.0	42.9	4.5	47.4
December	52.9	3.5	56.4	48.7	4.4	53.1	49.6	4.1	53.7

[1] Stocks divided by daily average total demand (domestic plus exports) for succeeding month.
[2] Preliminary figures.

TABLE 57.—Average monthly prices of gasoline in the United States, 1954–55, in cents per gallon

	January	February	March	April	May	June	July	August	September	October	November	December	Average for year
1954													
Monthly average at refineries in Oklahoma, regular, 84-octane [1]	11.22	11.10	11.06	11.06	11.06	11.06	10.88	10.81	10.81	10.81	10.81	10.81	10.96
Average of 50 cities on 1st of month: [2]													
Dealer's net, (excluding tax)	16.35	16.27	16.22	16.24	16.22	16.23	16.05	15.90	16.28	16.20	16.08	16.14	16.19
Service station (including State, local, and Federal taxes)	29.43	29.27	29.06	29.06	28.83	29.29	29.08	28.94	29.20	28.82	28.78	28.76	29.04
1955													
Monthly average at refineries in Oklahoma, regular, 86-octane	10.81	10.81	10.81	10.87	11.00	11.00	11.03	11.25	11.25	11.25	11.25	11.25	11.05
Average of 50 cities on 1st of month: [2]													
Dealer's net (excluding tax)	15.91	16.00	16.05	16.24	16.26	16.37	16.33	16.33	16.22	16.26	16.11	16.03	16.18
Service station (including State, local, and Federal taxes)	28.76	28.63	28.68	28.96	29.11	29.05	29.20	29.68	29.51	29.23	29.06	29.00	29.07

[1] National Petroleum News.
[2] American Petroleum Institute compiled by The Texas Co.

KEROSINE

The overall demand for kerosine was 3 percent lower in 1955, compared with a small gain in 1954. Decreased demand for kerosine in 1955 was strongly evident in exports, which declined a third, whereas domestic demand declined only 1 percent.

A smaller percentage yield was the reason for the lower kerosine production in 1955, as crude runs at refineries were higher than in 1954.

A downward trend in kerosine exports and shipments to noncontiguous Territories since 1952 was again evident in 1955, when a further 31-percent decline was reported, compared with a 33-percent drop in 1954.

According to a survey by the Bureau of Mines, sales of kerosine in 1955 decreased 2 percent in contrast to the 3-percent gain in 1954. All principal uses of kerosine in 1955 were below 1954 totals. The quantity of kerosine delivered for tractor fuel in 1955, continuing the downward trend of recent years due to the greater use of competitive fuels such as gasoline and liquified-petroleum gases, was 10 percent below 1954 requirements.

Sales of range oil increased 1 percent in 1955 compared with a 3-percent gain in 1954. The kerosine reported as range-oil fuel in 1955 and representing over 80 percent of the total, was 1 percent below 1954 requirements, while in contrast No. 1 fuel oil sold for the same purpose gained approximately 12 percent. The fact that some reporting companies do not keep separate records for these two similar fuels may be the reason for these different percentage changes in 1955.

The average quotations for representative kerosine prices were fractionally higher in 1955 than in 1954.

Small quantities of kerosine (11,000 barrels in 1954 and 9,000 in 1955) were shipped from District 5 to other Western States by rail and truck; receipts into the area, including imports, increased from 1,000 barrels in 1954 to 31,000 in 1955.

Kerosine shipped by tanker and barge from the Gulf coast to east-coast ports increased from 41.4 million barrels in 1954 to 43.8 million in 1955, a 6-percent gain, according to published monthly reports released by the Office of Oil and Gas, United States Department of the Interior. The quantity loaded in Texas was reported as 33.4 million barrels in 1955 compared with 31.7 million in 1954, the quantity from Louisiana was 9.7 million in 1954 and 10.4 million in 1955.

Kerosine shipped by barge from the Gulf coast and Arkansas to terminals on the Mississippi River and its tributaries declined 28 percent—from 5.8 million barrels in 1954 to 4.2 million in 1955. Most of the kerosine moved by river barge was unloaded in District 2 (5.7 million barrels in 1954 and 4.1 million in 1955); small quantities were received in District 1.

TABLE 58.—Salient statistics of kerosine in the United States, 1954–55, by months and districts

(Thousand barrels)

Month and district	Production		Yield (percent)		Transfers from gasoline plants		Exports		Domestic demand		Stocks, end of period	
	1954	1955 [1]	1954	1955 [1]	1954	1955 [1]	1954	1955 [1]	1954	1955 [1]	1954	1955 [1]
By months:												
January	12,086	12,431	5.6	5.4		234	459	154	18,298	17,071	22,013	23,266
February	11,542	10,286	5.8	4.8		185	660	443	12,712	15,003	20,183	18,291
March	10,943	10,866	5.2	4.7		214	620	244	12,973	10,940	17,533	18,187
April	9,665	9,258	4.8	4.4		115	685	275	6,857	5,799	19,656	21,486
May	9,350	9,065	4.4	4.0		99	283	397	4,831	3,878	23,892	26,375
June	9,177	7,923	4.4	3.5	(2)	161	290	255	4,595	4,374	28,184	29,830
July	9,156	8,767	4.2	3.7		110	480	522	4,907	5,436	31,953	32,749
August	9,357	8,797	4.3	3.7		178	142	316	6,219	6,116	34,949	35,292
September	9,018	8,270	4.3	3.7		93	354	258	6,514	7,036	37,099	36,361
October	9,596	9,391	4.5	4.0		175	221	135	9,334	9,087	37,140	36,705
November	10,619	10,055	5.0	4.3		174	526	178	12,686	13,473	34,547	33,283
December	11,796	12,028	5.2	4.9		212	132	151	18,385	18,602	27,826	26,770
Total	122,305	117,137	4.8	4.3	----------	1,950	4,852	3,328	118,311	116,815	27,826	26,770
By districts:												
East Coast	11,845	11,290	3.1	2.9		---------					11,480	11,060
Appalachian	3,713	3,424	5.4	4.8		---------					1,073	1,101
Indiana, Illinois, Kentucky, etc.	26,958	25,417	5.8	5.1		---------					7,296	6,084
Oklahoma, Kansas, etc.	5,961	6,488	2.7	2.6		---------					1,701	1,277
Texas Inland	3,658	2,764	4.1	3.0	(2)	658	(2)	(2)	(2)	(2)	373	438
Texas Gulf Coast	43,234	41,753	7.1	6.3		652					2,429	3,105
Louisiana Gulf Coast	20,588	20,035	9.7	8.2		156					2,304	2,428
Arkansas, Louisiana Inland, etc.	2,863	2,480	8.3	7.3		484					586	607
Rocky Mountain	1,558	1,563	1.7	1.6		---------					248	282
California	1,927	1,923	0.5	0.5		---------					336	388
Total	122,305	117,137	4.8	4.3	----------	1,950	4,852	3,328	118,311	116,815	27,826	26,770

[1] Preliminary figures.
[2] Not available.

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TABLE 59.—Sales of kerosine in the United States, 1954–55, by States and uses

(Thousand barrels)

District [1] and State	Sold as range oil		Tractor fuel		All other uses		Total	
	1954	1955	1954	1955	1954	1955	1954	1955
District 1:								
Connecticut	4,625	4,583	14	11	367	379	5,006	4,973
Delaware	481	622	11	9	78	63	570	694
District of Columbia	187	172	3	3	83	72	273	247
Florida	1,823	1,803	109	110	769	760	2,701	2,673
Georgia	1,895	1,836	203	205	574	549	2,672	2,590
Maine	2,956	3,113	23	24	247	225	3,226	3,362
Maryland	1,493	1,581	108	101	533	498	2,134	2,180
Massachusetts	10,938	10,838	42	32	916	850	11,896	11,720
New Hampshire	1,350	1,362	9	8	32	50	1,391	1,420
New Jersey	3,782	3,769	25	22	1,433	1,407	5,240	5,198
New York	7,933	7,914	162	146	874	831	8,969	8,891
North Carolina	7,922	7,918	54	49	3,270	3,388	11,246	11,355
Pennsylvania	2,288	2,248	129	111	1,211	1,277	3,628	3,636
Rhode Island	2,439	2,498	38	34	68	77	2,545	2,609
South Carolina	3,263	3,289	41	37	1,182	1,276	4,486	4,602
Vermont	569	559	20	21	46	41	635	621
Virginia	2,326	2,393	19	22	968	875	3,313	3,290
West Virginia	224	197	6	6	132	126	362	329
Total	56,494	56,695	1,016	951	12,783	12,744	70,293	70,390
District 2:								
Illinois	3,383	3,239	223	203	1,371	1,321	4,977	4,763
Indiana	2,352	2,320	86	61	1,602	1,599	4,040	3,980
Iowa	1,705	1,694	243	202	799	749	2,747	2,645
Kansas	723	668	91	84	254	225	1,068	977
Kentucky	736	681	72	64	503	446	1,311	1,191
Michigan	3,644	3,608	90	86	1,654	1,584	5,388	5,278
Minnesota	1,691	1,665	17	15	620	573	2,328	2,253
Missouri	1,650	1,644	23	24	602	572	2,275	2,240
Nebraska	761	736	54	42	156	144	971	922
North Dakota	683	608	53	45	137	115	873	768
Ohio	1,619	1,523	72	75	721	715	2,412	2,313
Oklahoma	673	657	126	108	659	649	1,458	1,414
South Dakota	598	483	42	36	61	52	701	571
Tennessee	1,661	1,581	67	56	669	574	2,397	2,211
Wisconsin	1,689	1,688	72	60	864	793	2,625	2,541
Total	23,568	22,795	1,331	1,161	10,672	10,111	35,571	34,067
District 3:								
Alabama	901	892	137	122	643	586	1,681	1,600
Arkansas	751	606	124	117	519	493	1,394	1,216
Louisiana	605	571	118	103	625	554	1,348	1,228
Mississippi	518	452	87	76	582	565	1,187	1,093
New Mexico	178	163	14	11	53	53	245	227
Texas	1,603	1,594	257	230	2,126	2,079	3,986	3,903
Total	4,556	4,278	737	659	4,548	4,330	9,841	9,267
District 4:								
Colorado	205	197	17	15	48	44	270	256
Idaho	28	21	2	2	29	27	59	50
Montana	172	148	14	11	75	56	261	215
Utah	12	26	3	2	16	12	31	40
Wyoming	77	70	3	3	121	115	201	188
Total	494	462	39	33	289	254	822	749
District 5:								
Arizona	8	2	-------	-------	78	55	86	57
California	83	90	-------	-------	886	1,080	969	1,170
Nevada	2	-------	-------	-------	11	1	13	1
Oregon	7	5	-------	-------	106	73	113	78
Washington	12	4	-------	-------	195	97	207	101
Total	112	101	-------	-------	1,276	1,306	1,388	1,407
Total United States	85,224	84,331	3,123	2,804	29,568	28,745	117,915	115,880

[1] States are grouped according to petroleum-marketing districts rather than geographic regions.

The tanker freight rate for kerosine on the Gulf coast—New York Harbor run was changed a number of times during 1955, according to Platt's Oil Price Handbook, and advanced from an average of 26 cents a barrel in 1954 to an average of 42.8 cents in 1955. The charge dropped from an average of 39.9 cents in January 1955 to a "low" of 29 cents in August. Demand at the year end boosted this freight rate for kerosine to an average of 80.6 cents a barrel in December 1955.

TABLE 60.—Sales of range oil [1] in the United States, 1953–55, by States

(Thousand barrels)

State	1953	1954	1955	
			Total	Percent of U. S. total
Massachusetts	12,107	11,610	11,556	11.4
New York	8,467	8,466	8,508	8.4
North Carolina	7,512	8,179	8,180	8.1
Michigan	5,516	6,217	6,248	6.1
Illinois	6,160	6,241	6,149	6.0
Connecticut	4,795	4,857	4,849	4.8
New Jersey	4,140	4,071	4,065	4.0
South Carolina	3,234	3,334	3,400	3.3
Maine	3,005	3,174	3,341	3.3
Indiana	3,138	3,225	3,330	3.3
Wisconsin	3,069	3,126	3,320	3.3
Iowa	2,276	2,278	2,754	2.7
Minnesota	2,510	2,630	2,698	2.7
Pennsylvania	2,469	2,533	2,642	2.6
Rhode Island	2,562	2,531	2,601	2.6
Virginia	2,119	2,409	2,484	2.4
Missouri	2,245	2,406	2,462	2.4
Ohio	2,139	2,209	2,166	2.1
Texas	2,205	1,963	1,941	1.9
Georgia	1,836	1,981	1,931	1.9
Florida	1,672	1,900	1,881	1.8
Tennessee	1,615	1,732	1,650	1.6
Maryland	1,401	1,549	1,639	1.6
New Hampshire	1,360	1,432	1,457	1.4
Kentucky	1,073	1,078	1,080	1.1
All other	9,648	9,670	9,373	9.2
Total	98,273	100,801	101,705	100.0

[1] Includes mostly kerosine and a small quantity of No. 1 fuel oil.

TABLE 61.—Monthly average prices of kerosine in the United States, 1954–55, in cents per gallon

[Platt's Oil Price Handbook]

Year and grade	January	February	March	April	May	June	July	August	September	October	November	December	Average for year
1954													
42°–44° gravity, water-white kerosine at refineries, Oklahoma	9.18	9.30	9.31	9.31	9.31	9.31	9.26	9.25	9.30	9.31	9.37	9.50	[1] 9.31
Kerosine (and/or No. 1 fuel oil) at New York Harbor	10.71	11.00	10.81	10.50	10.21	10.17	10.08	10.08	10.09	10.35	10.35	10.87	10.43
Kerosine, tank-wagon at Chicago	16.30	16.30	16.30	16.30	16.30	16.30	16.30	16.30	16.30	16.30	16.30	16.30	16.30
Kerosine, tank-wagon at New York City [2]	14.80	15.10	14.75	14.75	14.23	14.20	14.20	14.20	14.21	14.35	14.35	14.89	14.50
1955													
42°–44° gravity, water-white kerosine at refineries, Oklahoma	9.69	9.69	9.69	9.69	9.69	9.67	9.50	9.40	9.38	9.41	9.50	9.69	9.58
Kerosine (and/or No. 1 fuel oil) at New York Harbor	10.95	10.95	10.95	10.89	10.80	10.80	10.80	10.80	10.80	10.55	10.60	10.80	10.81
Kerosine, tank-wagon at Chicago	16.60	16.60	16.60	16.60	16.60	16.60	16.60	16.60	16.60	16.60	16.60	16.72	16.61
Kerosine, tank-wagon at New York City [2]	14.95	14.95	14.95	14.95	14.80	14.80	14.80	14.80	14.80	14.80	14.80	14.80	14.85

[1] Corrected figure.
[2] Manhattan and Queens.

DISTILLATE FUEL OIL

Production of distillate fuel oil at refineries, representing about 99 percent of the supply in recent years, increased 11 percent in 1955, owing to higher runs of crude at refineries and a greater percentage yield. Imports, of minor importance, were 39 percent above the 1954 total. Small quantities of distillate fuel oils were added to the supply in 1955 as "transfers" from crude petroleum and from natural-gasoline plants.

Weather, colder than in 1954, and an 8-percent increase in the use of domestic oil burners in 1955 were the main factors that brought an 11 percent increase in the domestic demand for distillate fuel oils, compared with an 8-percent gain in 1954. The expanded market for light fuel oils in 1955 was evident throughout the year, with large gains (11 and 13 percent) in the first and fourth quarters, during the heating season, and with gains of 5 and 12 percent during the second and third quarters.

Sales of distillate fuel oils, continuing an upward trend dating back to 1950, marked up a new record in 1955. Quantities sold for all principal uses gained sharply. In 1955, as in 1954, the expanded market for heating oils and the greater use of diesel fuel by railroads and by heavy road equipment, caused the increase.

A 7-percent gain in deliveries of distillate fuel oil, mostly diesel grades, to vessels in contrast to an 8-percent decline in 1954 was another reason for the increased sales of light fuel oils in 1955. Distillate grades of bunker oil sold to vessels engaged in foreign trade increased 3 percent from 9.0 million barrels in 1954 to 9.3 million in 1955, according to the Bureau of the Census, United States Department of Commerce; consumption by vessels using coastal and inland waterways was higher by 14 percent—7.4 million barrels in 1955 compared with 6.5 million in 1954.

Diesel fuel consumed by electric-power-generating plants totaled 4.4 million barrels in both 1954 and 1955, according to the Federal Power Commission. Distillate fuel oil used by manufactured-gas companies increased from 1.5 million barrels in 1954 to 2.1 million in 1955, as reported by the American Gas Association.

Light crude petroleum used as fuel by pipeline companies is added as "transfers" to the distillate-fuel-oil supply. These "transfers", quite unimportant in volume, have decreased continuously in recent years, and the total for 1955 was one-tenth below that for 1954. The larger share of these "transfers" was reported from the Indiana-Illinois-Kentucky and the Texas Inland refinery districts.

A small quantity of distillate fuel oil was entered for the first time as "transfers" from natural-gasoline plants. The fuel oils included in this category formerly were included as "refinery input" coming from natural-gasoline plants.

Imports of distillate fuel oils, relatively small in volume, increased 35 percent in 1955 compared with 1954. The larger share was received from Netherlands Antilles.

TABLE 62.—Salient statistics of distillate fuel oil in the United States, 1954–55, by months and districts

(Thousand barrels)

Month and district	Production		Yield (percent)		Transfers from gasoline plants		Transfers, east of California [1]		Imports		Exports		Domestic demand		Stocks, end of period	
	1954	1955 [2]	1954	1955 [2]	1954	1955 [2]	1954	1955 [2]	1954	1955 [2]	1954	1955 [2]	1954	1955 [2]	1954	1955 [2]
By months:																
January	45,474	53,858	21.1	23.3		68	150	122	156	271	1,782	1,970	74,695	73,801	81,044	86,692
February	43,256	51,661	21.7	24.2		58	128	104	159	342	1,430	1,061	52,767	68,513	70,390	69,283
March	45,204	52,713	21.4	23.0		66	143	125	236	291	1,681	1,769	54,022	58,252	60,270	62,457
April	41,218	46,001	20.4	21.6		32	135	109	317	148	2,096	1,431	38,123	37,177	61,721	70,139
May	42,531	47,033	20.0	20.9		61	138	113	262	294	2,193	2,355	28,878	31,726	73,581	83,559
June	41,966	48,802	20.1	21.6	(3)	37	119	103	306	562	2,422	2,417	27,225	29,994	86,325	100,652
July	43,892	48,788	20.3	20.8		44	123	116	199	333	1,986	2,405	26,896	28,359	101,657	119,169
August	45,048	50,187	20.8	21.2		50	112	107	461	413	1,549	2,470	29,200	33,781	116,529	133,675
September	45,415	48,557	21.5	21.7		60	105	101	251	525	1,649	2,380	32,590	37,290	128,061	143,248
October	47,890	49,934	22.4	21.4		51	113	106	299	323	2,348	2,526	34,887	38,848	139,128	152,288
November	48,666	50,347	22.9	21.8		46	119	113	163	431	2,956	1,717	51,234	59,700	133,886	141,808
December	51,718	54,666	22.9	22.3		42	115	128	386	493	2,131	1,894	75,830	83,910	108,144	111,333
Total	542,278	602,547	21.3	22.0		615	1,500	1,347	3,195	4,426	24,223	24,395	526,347	581,351	108,144	111,333
By districts:																
East Coast	93,444	98,514	24.4	25.0											38,452	40,171
Appalachian	12,966	13,637	18.9	19.0											2,802	3,022
Indiana, Illinois, Kentucky, etc.	88,837	99,187	19.1	19.9			300	324							19,132	18,621
Oklahoma, Kansas, etc.	51,027	58,261	23.2	23.8			173	160							11,760	11,261
Texas Inland	15,462	17,969	17.4	19.5	(3)	122	603	498	(3)	(3)	(3)	(3)	(3)	(3)	2,070	2,118
Texas Gulf Coast	143,807	166,004	23.5	25.0		192	162	141							14,012	14,444
Louisiana Gulf Coast	54,761	59,053	25.7	24.2		26	40	43							4,329	5,964
Arkansas, Louisiana Inland, etc.	7,575	7,910	21.9	23.3		275	23	20							1,476	2,042
Rocky Mountain	21,192	23,190	22.6	23.1			199	161							2,167	2,587
California	53,207	58,822	14.3	14.7											11,944	11,103
Total	542,278	602,547	21.3	22.0		615	1,500	1,347	3,195	4,426	24,223	24,395	526,347	581,351	108,144	111,333

[1] Figures represent crude oil used as fuel on pipelines, which is considered part of the demand for distillate.
[2] Preliminary figures.
[3] Figures not available.

TABLE 63.—Sales of distillate fuel oil [1] in the United States, 1951–55, by uses

(Thousand barrels)

Uses	1951	1952	1953	1954	1955	Percent change
Railroads	59,962	68,002	75,246	77,389	84,668	9.4
Vessels (including tankers)	14,393	17,213	16,898	15,563	16,675	7.1
Gas and electric power plants	9,612	8,350	6,825	6,070	5,884	−3.1
Industrial:						
Oil-company fuel	7,811	7,976	7,755	7,699	8,597	11.7
All other	42,567	42,760	42,384	41,589	43,606	4.8
Heating oils	249,758	263,379	267,498	304,540	339,714	11.5
Range oil (No. 1 fuel oil)	16,224	15,947	15,602	15,577	17,374	11.5
Military	8,430	9,644	9,569	8,752	10,914	24.7
Miscellaneous uses	40,151	45,939	47,067	49,066	54,163	10.4
Total United States	448,908	479,210	488,844	526,245	581,595	10.5

[1] Includes diesel fuel.

Oil companies in District 5 shipped 631,000 barrels of distillate fuel oils to other Western States by rail and truck in 1955, a 38-percent gain over the 1954 total (458,000 barrels). No distillate fuel oil moved by tanker from California to the east coast in 1954; however, 113,000 barrels was reported in this traffic in 1955. Receipts, including imports of distillate fuel oils, in District 5 amounted to 3.8 million barrels, compared with 3.7 million in 1954. Quantities received from other areas supplied about 6 percent of the overall supply for the Pacific Coast area in 1955 and approximately 7 percent in 1954.

Tanker and barge movements of distillate fuel oils from the Gulf coast to east-coast terminals, according to data published by the Office of Oil and Gas, United States Department of the Interior totaled 169.4 million barrels in 1955, a 16-percent gain over the 145.5 million barrels shipped in 1954. Quantities loaded in Texas were 137.9 million barrels in 1955 and 114.0 million in 1954, and in Louisiana 31.5 million in both 1954 and 1955.

Some distillate fuel oils are loaded on barges at Gulf ports and in Arkansas for shipment to terminals on the Mississippi River and its tributaries. This trade increased from 7.8 million barrels in 1954 to 8.9 million in 1955, a 14-percent gain. The share originating in Texas declined from 1.8 million barrels in 1954 to 1.4 million in 1955; Louisiana, Louisiana's portion decreased from 3.9 million in 1954 to 3.5 million in 1955. Conversely, quantities of light fuel oils from Mississippi and Arkansas gained substantially from 2.1 million barrels in 1954 to 4.0 million in 1955. Distillate fuel oils unloaded in District 2 increased from 7.4 million barrels in 1954 to 8.0 million in 1955; smaller quantities reaching District 1 more than doubled—from 0.4 million barrels in 1954 to 0.9 million in 1955.

The tanker freight rate for No. 2 fuel oil on the Gulf coast—New York Harbor route during 1955 shifted from an average January charge of 42.4 cents a barrel to a "low" of 30.2 cents in August and then rose to an average of 85.3 cents a barrel in December. The average rate for the year 1955 was 44.9 cents a barrel, compared with 27.7 cents in 1954.

TABLE 64.—Sales of distillate fuel oil [1] in the United States, 1951–55 by districts and States

(Thousand barrels)

District [2] and State	1951	1952	1953	1954	1955
District 1:					
Connecticut	11,777	12,286	12,520	14,928	16,071
Delaware	1,556	1,702	1,861	2,365	2,677
District of Columbia	2,982	3,368	3,458	3,728	3,907
Florida	5,343	6,863	7,176	8,441	9,613
Georgia	3,962	4,262	4,119	4,225	4,560
Maine	3,935	4,276	4,514	5,309	5,703
Maryland	10,898	11,189	11,731	14,468	16,009
Massachusetts	27,261	28,064	27,925	31,306	34,036
New Hampshire	3,102	3,442	3,370	4,220	4,498
New Jersey	32,298	33,028	33,124	35,733	38,971
New York	56,334	59,373	59,604	64,262	70,744
North Carolina	5,490	6,360	7,381	7,860	8,982
Pennsylvania	34,585	35,827	36,513	40,288	44,286
Rhode Island	4,260	4,343	4,482	4,484	4,762
South Carolina	2,202	2,491	3,004	2,990	3,259
Vermont	1,166	1,212	1,321	1,415	1,726
Virginia	9,156	9,800	9,442	10,888	13,242
West Virginia	1,229	1,188	1,331	1,307	1,500
Total	217,536	229,074	232,876	258,217	284,546
District 2:					
Illinois	28,517	29,061	29,021	30,388	33,371
Indiana	13,205	13,968	15,166	16,294	18,962
Iowa	9,791	10,204	10,488	10,399	11,417
Kansas	5,552	5,695	5,938	5,897	6,493
Kentucky	2,753	3,250	3,359	3,291	4,126
Michigan	20,334	22,268	22,351	24,625	27,402
Minnesota	14,560	15,478	15,784	16,218	17,409
Missouri	8,684	10,224	10,854	11,283	12,137
Nebraska	3,829	4,071	4,378	4,723	5,229
North Dakota	2,026	2,456	2,425	2,600	3,151
Ohio	14,474	15,953	16,542	18,150	20,184
Oklahoma	2,223	2,192	2,436	2,368	2,493
South Dakota	2,133	2,399	2,626	2,756	3,298
Tennessee	3,428	3,487	3,628	3,529	3,845
Wisconsin	11,437	11,803	11,877	13,648	16,089
Total	142,946	152,509	156,873	166,169	185,606
District 3:					
Alabama	2,846	3,073	3,186	3,508	3,914
Arkansas	2,244	2,325	2,222	2,136	2,357
Louisiana	5,224	5,840	6,212	6,242	7,385
Mississippi	1,507	1,502	1,774	1,619	1,808
New Mexico	972	1,224	1,309	1,457	1,991
Texas	16,183	19,022	19,046	18,913	20,728
Total	28,976	32,986	33,749	33,875	38,183
District 4:					
Colorado	2,036	2,503	2,732	3,108	3,371
Idaho	2,291	2,457	2,595	3,080	3,706
Montana	2,851	3,063	3,553	3,755	3,980
Utah	2,334	3,263	3,542	3,574	3,994
Wyoming	1,893	2,103	2,294	2,624	2,829
Total	11,405	13,389	14,716	16,141	17,880
District 5:					
Arizona	1,233	1,341	1,329	1,279	1,073
California	22,031	23,875	24,063	23,812	23,873
Nevada	2,102	2,158	2,281	2,375	1,686
Oregon	8,534	8,974	8,680	8,939	10,981
Washington	14,145	14,904	14,277	15,438	17,767
Total	48,045	51,252	50,630	51,843	55,380
Total United States	448,908	479,210	488,844	526,245	581,595

[1] Includes diesel fuel oil.

[2] States are grouped according to petroleum-marketing districts rather than conventional geographic regions.

TABLE 65.—Monthly average prices of distillate fuel oil and diesel fuel in the United States, 1954-55

[Platt's Oil Price Handbook]

Year and grade	January	February	March	April	May	June	July	August	September	October	November	December	Average for year
1954													
No. 2 Straw fuel oil at refineries, Oklahoma cents per gallon	8.17	8.41	8.44	8.41	8.44	8.44	8.34	8.31	8.36	8.38	8.38	8.53	8.38
No. 2 fuel oil at New York Harbor do	9.71	9.98	9.78	9.50	9.21	9.17	9.08	9.17	9.22	9.60	9.60	10.12	9.51
Diesel oil, shore plants, New York Harbor do	10.12	10.40	10.29	9.90	9.61	9.57	9.48	9.57	9.63	10.00	10.00	10.52	9.92
Diesel oil for ships:													
New York dollars per barrel	4.19	4.29	4.24	4.08	3.90	3.89	3.89	3.89	3.90	4.05	4.05	4.27	4.05
New Orleans do	3.74	3.74	3.74	3.74	3.74	3.74	3.74	3.74	3.74	3.84	3.86	3.94	3.77
San Pedro do	4.20	4.20	4.20	4.20	4.20	4.20	4.20	4.20	4.20	4.20	4.20	4.20	4.20
1955													
No. 2 Straw fuel oil at refineries, Oklahoma cents per gallon	8.87	8.88	8.88	8.88	8.88	8.68	8.46	8.31	8.25	8.33	8.50	8.69	8.63
No. 2 fuel oil at New York Harbor do	10.20	10.20	10.20	10.14	10.05	10.05	10.05	10.20	10.30	10.05	10.10	10.30	10.15
Diesel oil, shore plants, New York Harbor do	10.60	10.60	10.60	10.54	10.45	10.45	10.45	10.60	10.70	10.45	10.50	10.70	10.55
Diesel oil for ships:													
New York dollars per barrel	4.30	4.30	4.30	4.30	4.24	4.24	4.24	4.30	4.34	4.34	4.34	4.34	4.30
New Orleans do	3.95	3.95	3.95	3.95	3.95	3.95	3.95	4.00	4.03	4.03	4.03	4.03	3.98
San Pedro do	4.20	4.20	4.20	4.21	4.30	4.33	4.33	4.33	4.33	4.33	4.33	4.33	4.29

TABLE 66.—Salient statistics of residual fuel oil in the United States, 1954–55, by months and districts

(Thousand barrels)

Month and district	Production		Yield (percent)		Transfers [1]				Imports		Exports		Domestic demand		Stocks, end of period	
					East of California		California									
	1954	1955 [2]	1954	1955 [2]	1954	1955 [2]	1954	1955 [2]	1954	1955 [2]	1954	1955 [2]	1954	1955 [2]	1954	1955 [2]
By months:																
January	39,398	38,276	18.3	16.5	326	322	71	121	13,815	17,773	1,770	3,260	53,736	55,880	47,474	49,457
February	34,754	34,683	17.5	16.2	337	258	115	142	13,217	16,265	2,104	3,377	46,674	51,386	47,119	46,042
March	36,222	36,722	17.1	16.0	320	258	141	150	12,033	16,037	2,788	2,764	48,798	51,475	44,249	44,970
April	34,215	33,288	16.9	15.7	342	276	189	160	9,748	11,735	2,203	2,923	42,178	43,668	44,362	43,838
May	35,582	34,426	16.7	15.3	345	308	190	184	8,143	11,089	2,619	2,914	38,994	41,848	47,009	45,083
June	33,691	32,392	16.1	14.4	315	299	150	132	9,212	10,189	2,408	2,943	37,753	40,754	50,216	44,398
July	33,749	33,823	15.6	14.4	323	294	220	175	7,860	7,390	2,334	2,267	35,669	38,919	54,365	44,894
August	33,131	33,794	15.3	14.3	339	292	225	190	7,398	10,907	2,076	3,310	37,050	41,287	56,332	45,480
September	32,569	31,815	15.4	14.2	314	277	167	160	8,206	9,034	1,982	2,633	38,904	37,866	56,702	46,267
October	33,047	34,821	15.4	14.9	361	301	169	159	10,546	10,521	1,833	2,446	42,451	42,583	56,541	47,040
November	33,593	36,412	15.8	15.8	329	249	152	160	12,622	13,395	2,291	1,966	46,055	51,219	54,891	44,071
December	36,806	39,879	16.3	16.3	334	282	150	410	16,324	17,637	2,345	2,567	54,055	60,538	52,105	39,174
Total	416,757	420,331	16.4	15.3	3,985	3,416	1,939	2,143	129,124	151,972	26,753	33,370	522,317	557,423	52,105	39,174
By districts:																
East Coast	76,965	76,198	20.1	19.3					[3]	[3]	[3]	[3]	[3]	[3]	9,360	11,063
Appalachian	7,158	7,276	10.4	10.1											658	826
Indiana, Illinois, Kentucky, etc	59,948	63,421	12.9	12.7	747	610									3,660	3,803
Oklahoma, Kansas, etc	15,357	12,413	7.0	5.1	220	184									1,260	1,261
Texas Inland	9,105	7,919	10.3	8.6	799	593									1,368	1,342
Texas Gulf Coast	82,641	88,977	13.5	13.4	271	254									4,086	6,896
Louisiana Gulf Coast	15,607	16,376	7.3	6.7	677	695									1,328	1,371
Arkansas, Louisiana Inland, etc	2,471	2,257	7.1	6.6	319	347									121	66
Rocky Mountain	14,440	14,689	15.4	14.6	952	733									835	736
California	133,065	130,805	35.9	32.9			1,939	2,143							29,429	11,810
Total	416,757	420,331	16.4	15.3	3,985	3,416	1,939	2,143	129,124	151,972	26,753	33,370	522,317	557,423	52,105	39,174

[1] Represents crude oil used as fuel on leases and for general industrial purposes.
[2] Preliminary figures.
[3] Figures not available.

RESIDUAL FUEL OIL

The available supply of residual fuel oil in 1955 was 7 percent above the 1954 quantity. About 71 percent of the 1955 total was produced at petroleum refineries, compared with a 76-percent share in 1954. Imports were higher by 18 percent, in contrast to a 2-percent decline in 1954. A small part of the supply—about 1 percent, known as "transfers"—represents heavy crude petroleum used as fuel on leases or for industrial purposes.

The overall demand for residual fuel oils was about 8 percent above the 1954 total. The domestic market in 1955 was 7 percent above 1954. The more favorable domestic demand for heavy fuel oils was due to increased deliveries (8 percent up) of bunkers to vessels engaged in foreign trade and to a greater use of these fuel oils (up 14 percent) by electric powerplants.

TABLE 67.—Sales of residual fuel oil [1] in the United States, 1951–55, by uses

(Thousand barrels)

Uses	1951	1952	1953	1954	1955	Percent change
Railroads	54,998	40,489	28,477	16,122	15,018	−6.8
Vessels (including tankers)	107,007	110,412	114,324	108,790	115,128	5.8
Gas and electric power plants	70,550	70,497	85,352	70,749	75,966	7.4
Industrial:						
Oil company fuel	54,056	54,421	51,243	52,165	53,387	2.3
All other	157,279	158,373	166,748	[2] 160,121	173,030	8.1
Heating oils	76,164	79,151	81,824	[2] 78,845	86,282	9.4
Military	38,054	37,185	30,435	26,887	27,900	3.8
Miscellaneous uses	5,280	5,745	6,326	7,035	9,804	39.4
Total U. S. sales	563,388	556,273	564,729	520,714	556,515	6.9

[1] Includes Navy Grade and crude oil burned as fuel.
[2] Revised.

The increasingly lower requirements of railroads for heavy fuel oils reflect the shift to diesel equipment in recent years; however, their purchases in 1955 were only 7 percent below the 1954 total, compared with a 43-percent decline in 1954.

Residual fuel oils sold to vessels gained 6 percent in 1955. The rise in these sales was more pronounced in the quantities delivered to vessels engaged in overseas trade, which increased 8 percent, according to figures released by the Bureau of the Census, United States Department of Commerce. The indicated demand for heavy bunker oil by vessels using inland and coastal waterways increased 2 percent in 1955.

According to the Federal Power Commission, increased sales of residual fuel oils to gas and electric powerplants by 7 percent in 1955, in contrast to a 17-percent decline in 1954, were due to a greater consumption by electric powerplants and rose from 62.4 million barrels in 1954 to 70.9 million in 1955. Manufactured-gas plants consumed 5.7 million barrels of heavy fuel oils in both 1954 and 1955, as shown by statistics released by the American Gas Association.

TABLE 68.—Sales of residual fuel oil [1] in the United States, 1951–55, by districts and States

(Thousand barrels)

District [2] and State	1951	1952	1953	1954	1955
District 1:					
Connecticut	14,888	13,475	14,377	12,897	13,108
Delaware	1,888	2,501	2,558	2,228	2,907
District of Columbia	1,688	1,915	2,035	1,963	2,152
Florida	20,322	24,789	27,343	28,909	32,236
Georgia	5,619	5,816	6,573	5,590	6,118
Maine	3,178	4,032	4,228	3,481	4,443
Maryland	15,814	14,852	15,323	14,031	15,466
Massachusetts	29,883	30,003	32,763	30,500	30,496
New Hampshire	2,326	2,295	2,467	2,129	2,377
New Jersey	44,775	44,153	47,667	43,339	46,154
New York	52,684	50,966	53,437	50,809	51,444
North Carolina	1,109	1,257	1,439	1,809	2,377
Pennsylvania	42,614	42,491	42,951	42,734	45,176
Rhode Island	10,030	9,756	10,993	9,473	11,215
South Carolina	4,145	5,230	5,332	3,985	4,291
Vermont	300	300	475	409	424
Virginia	18,037	20,294	15,523	12,998	16,556
West Virginia	1,464	1,337	1,526	1,269	1,355
Total	270,764	275,462	287,010	268,553	288,295
District 2:					
Illinois	20,257	20,455	20,823	20,499	22,227
Indiana	16,850	17,230	17,679	14,234	14,588
Iowa	1,365	1,217	1,051	884	994
Kansas	7,110	6,071	5,247	4,020	4,179
Kentucky	1,007	738	913	949	1,013
Michigan	13,743	14,153	14,809	14,675	15,387
Minnesota	2,431	2,430	2,370	2,352	2,700
Missouri	5,379	5,146	5,140	4,837	5,863
Nebraska	467	334	351	313	363
North Dakota	224	120	124	179	515
Ohio	18,017	17,670	18,698	18,118	18,915
Oklahoma	3,890	3,011	2,351	1,479	1,783
South Dakota	231	239	232	165	176
Tennessee	1,331	1,097	1,257	652	930
Wisconsin	1,861	2,042	2,118	2,109	2,168
Total	94,163	91,953	93,163	85,465	91,801
District 3:					
Alabama	2,417	2,677	3,873	3,123	3,907
Arkansas	2,051	1,497	1,006	415	419
Louisiana	10,953	10,422	9,929	9,710	10,601
Mississippi	257	173	163	160	179
New Mexico	532	831	696	262	283
Texas	50,464	46,508	41,978	36,312	38,108
Total	66,674	62,108	57,645	49,982	53,497
District 4:					
Colorado	1,068	1,203	1,124	1,326	1,363
Idaho	945	1,029	1,067	1,115	1,421
Montana	4,958	4,220	3,276	1,751	1,692
Utah	4,979	5,351	5,044	4,321	4,392
Wyoming	3,252	2,819	2,762	2,076	2,118
Total	15,202	14,622	13,273	10,589	10,986
District 5:					
Arizona	1,157	542	206	45	61
California	85,884	79,127	85,870	79,973	83,959
Nevada	2,685	2,266	2,048	1,353	1,359
Oregon	12,215	13,168	11,186	9,776	10,152
Washington	14,644	17,025	14,328	14,978	16,405
Total	116,585	112,128	113,638	106,125	111,936
Total United States	563,388	556,273	564,729	520,714	556,515

[1] Includes some crude oil burned as fuel.
[2] States are grouped according to petroleum-marketing districts rather than conventional geographic regions.

"Transfers" or heavy crude petroleum used as fuel in the oilfields and by industrial plants, representing about 1 percent of the overall supply, declined 6 percent in 1955 compared with a 6-percent gain in 1954. The "transfers" reported in the California refinery district gained 11 percent over the 1954 quantity; those east of California decreased 14 percent in 1955.

Residual fuel oils imported from foreign countries, representing about one-quarter of the available supply, increased 18 percent in 1955, compared with a decline of 2 percent in 1954. The larger imports of heavy fuels oils were received from Netherland Antilles and Venezuela.

The California refinery district shipped 39.8 million barrels of residual fuel oils, a gain of 83 percent over the 21.7 million barrels in 1954. Most of these movements covered exports to foreign countries—22.1 million barrels in 1955 and 13.9 million in 1954. Shipments to Alaska and Hawaii furnished 5.8 million barrels in 1955 and 6.0 million in 1954. Heavy fuel oil moved by tanker from California to the east coast showed a sharp upward trend from 1.6 million barrels in 1954 to 11.5 million in 1955, largely because of the higher prices prevailing in the eastern market. The volume of heavy liquid fuels shipped from District 5 by rail and truck to other Western States was not great—0.4 million barrels in 1955 compared with 0.2 million in 1954. Receipts, including imports of residual fuel oils, in the Pacific Coast area were comparatively small in quantity—1.0 million barrels in 1954 and 1.3 million in 1955.

Tanker and barge shipments of residual fuel oils from the Gulf-coast to Atlantic-coast ports declined for a second year, dropping from 57.9 million barrels in 1954 to 51.8 million, a 10-percent loss. The heavy fuel oils loaded in Texas totaled 53.4 million barrels in 1954 and 48.5 million in 1955; those credited to Louisiana decreased from 4.5 million barrels in 1954 to 3.3 million barrels in 1955.

Residual fuel oils moved by barge from the Gulf coast and Arkansas to terminals on the Mississippi River and its tributaries nearly doubled in 1955, after declining 16 percent in 1954; the total was 6.7 million barrels compared with 3.5 million in 1954. The larger share, loaded in Texas, was 2.7 million barrels in 1954 and 5.2 million in 1955; 0.7 million barrels was credited to Louisiana in 1954 and 1.5 million in 1955. Small amounts (47 thousand barrels in 1954 and 30 thousand in 1955) originated in Mississippi and Arkansas. The shares unloaded in District 1 were 3.3 million barrels in 1955 and 1.1 million in 1954 and those for District 2 were 3.4 million in 1955 and 2.4 million barrels in 1954.

The tanker freight rate for Bunker "C" fuel oil on the Gulf Coast—New York Harbor run increased from an average of 30.6 cents a barrel in 1954 to 43.2 cents in 1955. The average charge of 43.7 cents a barrel in January 1955 dropped to a "low" of 32.1 cents in June, and subsequent markups brought it to a "high" of 87.7 cents a barrel in the final month of the year.

TABLE 69.—Monthly average prices of residual fuel oil in the United States, 1954–55, in dollars per barrel

[Platt's Oil Price Handbook]

Year and grade	January	February	March	April	May	June	July	August	September	October	November	December	Average for year
1954													
No. 6 fuel oil at refineries, Oklahoma	1.54	1.51	1.39	1.27	1.21	1.13	1.08	1.15	1.20	1.34	1.42	1.47	1.31
No. 5 fuel oil at New York Harbor	2.77	2.77	2.76	2.73	2.73	2.73	2.73	2.73	2.73	2.73	2.73	2.85	2.75
Bunker "C" for ships:													
New York	2.25	2.25	2.25	2.25	2.25	2.24	2.20	2.20	2.21	2.25	2.25	2.33	2.24
New Orleans	1.95	1.95	1.95	1.95	1.95	1.95	1.95	1.95	1.95	1.95	1.95	1.95	1.95
San Pedro	1.80	1.80	1.80	1.80	1.80	1.80	1.80	1.80	1.80	1.80	1.80	1.80	1.80
1955													
No. 6 fuel oil at refineries, Oklahoma	1.57	1.58	1.58	1.59	1.65	1.79	1.83	1.83	1.83	1.83	1.83	1.96	1.74
No. 5 fuel oil at New York Harbor	2.87	2.87	2.87	2.87	2.87	2.87	2.94	3.06	3.08	3.08	3.10	3.13	2.97
Bunker "C" for ships:													
New York	2.35	2.35	2.35	2.35	2.35	2.35	2.44	2.61	2.65	2.65	2.65	2.65	2.48
New Orleans	1.95	2.05	2.05	2.05	2.05	2.05	2.12	2.20	2.20	2.20	2.20	2.20	2.11
San Pedro	1.80	1.80	1.80	1.80	1.80	1.80	1.80	1.80	1.80	1.87	1.95	1.99	1.83

LUBRICANTS

Total demand for lubricants varies with the number of motor vehicles, industrial activity, and export demand. As lubricating oils for motor vehicles have been improved, the period between oil changes has been extended. Working in the opposite direction, the high-compression engines of new-model cars require heavy-duty lubricating oils and may require more frequent oil changes. Export demand depends upon the ability of refineries in foreign countries to supply the needs of their markets.

Total demand for lubricants in 1955 amounted to 56.8 million barrels. Domestic demand increased 10.2 percent, and exports decreased 5.9 percent.

The production of lubricants in 1955 was approximately the same as in 1952. Production, however, in two refinery districts changed substantially. The East Coast district produced 19.3 percent of the United States total in 1952; by 1955 output had declined to 13.9 percent. Conversely, the Texas Gulf Coast district, which produced 32.3 percent of the total lubricants in 1952, furnished 37.9 percent in 1955.

TABLE 70.—Salient statistics of lubricants in the United States, 1954–55, by months and districts

Month and district	Production (thousand barrels)		Yield (percent)		Domestic (thousand barrels)		Stocks, end of period (thousand barrels)	
	1954	1955 [1]	1954	1955 [1]	1954	1955 [1]	1954	1955 [1]
By months:								
January	4,408	4,565	2.0	1.6	2,997	3,180	10,472	10,162
February	4,221	3,992	2.1	1.7	2,808	2,901	10,646	10,087
March	4,376	4,602	2.1	1.8	3,589	3,665	10,385	9,779
April	4,204	4,691	2.1	2.4	3,320	3,589	9,745	9,615
May	4,566	4,740	2.1	2.2	3,207	3,766	9,764	9,430
June	4,508	4,818	2.2	2.1	3,190	3,750	9,599	9,233
July	4,386	4,557	2.0	1.9	3,418	3,488	9,251	8,947
August	4,563	4,871	2.1	2.0	3,372	3,986	9,035	8,547
September	4,522	4,526	2.1	1.9	3,307	3,572	9,230	8,291
October	4,475	4,666	2.1	2.0	3,285	3,720	9,183	8,108
November	4,470	5,115	2.1	2.3	3,083	3,713	9,475	8,433
December	4,544	4,693	2.0	1.9	2,961	3,150	9,702	8,763
Total	53,243	55,836	2.1	2.0	38,537	42,480	9,702	8,763
By districts:								
East Coast	8,480	7,786	2.2	2.0			2,727	1,970
Appalachian	4,314	4,765	6.3	6.6			986	706
Indiana, Illinois, Kentucky, etc.	4,658	4,763	1.0	1.0			1,184	986
Oklahoma, Kansas, etc.	3,849	4,390	1.8	1.8			605	436
Texas Inland	144	144	.2	.2			12	9
Texas Gulf Coast	19,373	21,163	3.2	3.2	[2]	[2]	2,801	3,134
Louisiana Gulf Coast	5,401	5,771	2.5	2.4			495	667
Arkansas, Louisiana Inland, etc.	1,804	1,904	5.2	5.6			143	127
Rocky Mountain	220	188	.2	.2			112	91
California	5,000	4,962	1.3	1.3			637	637
Total	53,243	55,836	2.1	2.0	38,537	42,480	9,702	8,763

[1] Preliminary figures.
[2] Figures not available.

TABLE 71.—Average monthly refinery prices of five selected grades of lubricating oil in the United States, 1954–55, in cents per gallon

[National Petroleum News]

Year and grade	January	February	March	April	May	June	July	August	September	October	November	December	Average for year
1954													
Oklahoma:													
200 viscosity, No. 3 color, neutral	14.25	14.25	14.25	13.25	13.25	13.25	13.25	13.25	13.25	13.25	13.25	13.25	13.50
150–160 viscosity at 210°, bright stock, 10–25 pour test	18.98	18.50	18.50	17.50	17.50	17.50	17.50	17.50	17.50	17.50	17.50	17.50	17.79
Pennsylvania:													
200 viscosity, No. 3 color, neutral 420–425 flash, 25 pour test	20.77	20.00	20.00	20.00	19.81	17.45	17.00	17.00	17.00	17.00	17.00	17.00	18.34
600 steam-refined, cylinder stock, filtrable	13.40	13.02	12.71	12.00	11.92	10.85	10.50	10.50	10.50	10.50	10.50	10.50	11.41
South Texas: 500 viscosity, No. 2½–3½ color, neutral	14.86	14.50	14.72	14.75	14.75	14.75	14.75	14.75	14.75	14.75	14.75	14.75	14.74
1955													
Oklahoma:													
200 viscosity, No. 3 color, neutral	13.25	13.25	13.25	13.25	13.25	13.25	13.25	12.48	14.25	14.60	15.25	15.64	13.83
150–160 viscosity at 210°, bright stock, 10–25 pour test	17.50	17.50	17.50	17.50	17.50	17.50	17.50	17.73	18.50	18.85	19.50	19.89	18.08
Pennsylvania:													
200 viscosity, No. 3 color, neutral 420–425 flash, 25 pour test	17.01	17.50	17.50	17.50	17.50	17.50	17.81	18.17	19.08	19.29	19.50	19.89	18.19
600 steam-refined, cylinder stock, filtrable	10.50	10.50	10.75	10.75	10.75	10.75	10.85	11.76	13.18	13.94	15.27	15.25	12.02
South Texas: 500 viscosity, No. 2½–3½ color, neutral	14.75	14.75	14.75	14.75	14.75	14.75	14.75	14.75	14.75	14.75	14.75	14.75	14.75

LIQUEFIED GASES

Liquefied gases are derived from two sources. Those produced at refineries are called "liquefied refinery gases" to distinguish them from those extracted from natural gas and called "liquefied petroleum gases". The liquefied petroleum gases are all saturated—propane, butane, etc. The liquefied refinery gases may contain unsaturated compounds or olefins—propylene, butylene, etc. The olefins are used as feedstock for chemical plants. The saturated gases may be used as chemical raw material or as fuel. Liquefied gases are also used in producing gasoline and are reported in this chapter as natural-gas liquids used at refineries or as gasoline.

Domestic demand for liquefied gases increased 11.2 percent. Output of liquefied refinery gases increased 27.6 percent and supplied most of the increase.

JET FUELS

Data on jet fuels were first collected in 1952. This fuel was consumed entirely by the military establishment. The few commercial turboprop aircraft in service in 1955 used kerosine for fuel. Jet fuel is a blend of gasoline, kerosine, and distillate fuel oil. In 1955 its average composition was 76.4 percent gasoline, 17.5 percent kerosine, and 6.2 percent distillate fuel oil. The data collected since 1952 indicated an increase in the proportion of gasoline and a decrease in distillate.

Domestic demand for jet fuels increased 22.8 percent in 1955 to 56.3 million barrels. Exports remained very small.

OTHER PRODUCTS

Wax.—Wax is used principally for waterproofing paper containers and paper wrappers and for candles. Total demand for wax in 1955 was unchanged from 1954 at 5.3 million barrels (converted at the rate of 280 pounds per barrel).

Coke.—Petroleum coke is formed in cracking operations. In catalytic cracking plants the coke is deposited on the finely ground catalyst and must be burned off at the plant. This coke is not marketable, but the heat generated in burning it from the catalyst is employed in refinery operations. Coke produced at thermal cracking plants is recoverable and can be marketed as fuel or for making electrodes. Petroleum-coke electrodes are used principally in the electrolytic production of aluminum.

In 1955 the domestic demand for petroleum coke was 24.4 million barrels (converted at 5 barrels to the short ton); petroleum refineries consumed 12.3 million barrels (12.0 million barrels of catalyst coke and 0.3 million barrels of marketable coke) as fuel.

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TABLE 72.—Salient statistics of wax in the United States, 1954–55, by types, months, and districts

(Thousand barrels) [1]

	Production						Domestic demand (all types)		Exports (all types)		Stocks, end of period					
	1954			1955 [2]			1954	1955 [2]	1954	1955 [2]	1954			1955 [2]		
	Microcrystalline	Fully refined	Other	Microcrystalline	Fully refined	Other					Microcrystalline	Fully refined	Other	Microcrystalline	Fully refined	Other
By months:																
January	53	233	156	46	239	148	299	335	83	81	116	204	278	102	248	229
February	46	211	163	44	201	182	296	320	108	108	111	233	275	102	235	241
March	69	224	185	51	246	169	361	365	92	137	120	240	284	98	213	231
April	57	185	192	40	248	153	344	318	122	113	123	210	279	87	220	245
May	65	229	180	59	244	120	314	326	109	95	112	252	299	88	237	229
June	46	210	153	59	268	137	357	349	107	79	116	229	264	93	255	242
July	50	239	144	54	241	138	333	311	112	110	102	237	258	101	255	246
August	50	216	142	46	220	142	313	326	121	111	99	221	251	98	246	229
September	60	228	165	50	229	137	334	334	123	94	102	231	234	94	230	237
October	60	242	148	57	262	126	314	356	131	115	109	234	229	91	238	206
November	64	242	179	60	259	163	349	379	119	102	111	242	236	94	239	203
December	48	216	140	65	229	161	311	337	120	103	105	244	213	99	238	214
Total	668	2,675	1,947	631	2,886	1,776	3,925	4,056	1,342	1,248	105	244	213	99	238	214
By districts:																
East Coast	172	1,096	416	227	1,173	292					26	91	31	29	44	30
Appalachian	16	70	290	22	82	320					11	26	24	9	31	17
Indiana, Illinois, Kentucky, etc.	8	190	7	13	186	20					1	13	21	1	20	27
Oklahoma, Kansas, etc.	146	132	279	177	117	145	(3)	(3)	(3)	(3)	25	3	8	23	5	7
Texas Inland	167			56							13			7		
Texas Gulf Coast	134	584	347	97	694	384					25	27	60	23	27	76
Louisiana Gulf Coast	23	104	602	32	101	608					3	10	38	6	4	35
Rocky Mountain	2	68	6	7	71	7					1	10	31	1	10	22
California		431			462							64			97	
Total	668	2,675	1,947	631	2,886	1,776	3,925	4,056	1,342	1,248	105	244	213	99	238	214

[1] Conversion factor: 280 pounds to the barrel.
[2] Preliminary figures.
[3] Figures not available.

TABLE 73.—Average monthly refinery prices of 124°–126° white crude scale wax at Pennsylvania refineries, 1951–55, in cents per pound

[National Petroleum News]

Year	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Average for year
1951	6.64	6 63	6.63	6.55	6.30	6.10	5.75	5.47	5.31	5.26	5.24	5.13	5.92
1952	4.83	4.73	4.40	4.38	4.35	4.25	4.14	4.12	3.93	3.88	3.82	3.81	4.22
1953	3.81	3.81	3.90	4.34	4.56	4.85	5.00	5.00	5.00	5.00	5.00	5.00	4.61
1954	5.00	5.00	5.05	5.13	5.16	5.44	5.45	5.45	5.45	5.45	5.45	5.45	5.29
1955	5.45	5.45	5.45	5.45	5.45	5.45	5.45	5.45	5.45	5.45	5.47	5.68	5.47

TABLE 74.—Salient statistics of petroleum coke in the United States, 1954–55, by months and districts [1]

	Production (thousand barrels)		Yields (percent)		Domestic demand (thousand barrels)		Stocks, end of period (thousand barrels)	
	1954	1955 [2]	1954	1955 [2]	1954	1955 [2]	1954	1955
By months:								
January	1,936	2,285	0.9	1.0	1,344	1,931	1,046	2,245
February	1,623	2,181	.8	1.0	1,384	1,765	1,111	2,369
March	1,975	2,428	.9	1.1	1,524	2,055	1,346	2,380
April	1,929	2,190	.9	1.0	1,508	1,705	1,494	2,491
May	1,897	2,381	.9	1.1	1,418	2,192	1,657	2,363
June	1,857	2,396	.9	1.1	1,472	2,079	1,774	2,198
July	2,102	2,412	1.0	1.0	1,650	1,915	1,918	2,184
August	2,061	2,335	1.0	1.0	1,774	2,061	1,973	2,012
September	2,049	2,086	1.0	.9	1,796	2,003	2,009	1,806
October	2,282	2,366	1.1	1.0	1,777	2,028	2,118	1,648
November	2,220	2,597	1.1	1.1	2,145	2,364	1,974	1,536
December	2,353	2,680	1.0	1.1	1,984	2,305	2,107	1,524
Total	24,284	28,337	1.0	1.0	19,776	24,403	2,107	1,524
By districts:								
East Coast	1,491	1,611	.4	.4	[3]	[3]	[3]	8
Appalachian	301	357	.4	.5				
Indiana, Illinois, Kentucky, etc.	9,947	10,606	2.1	2.1			1,382	366
Oklahoma	3,292	4,247	1.5	1.7			388	270
Texas Inland	644	938	.7	1.0			79	69
Texas Gulf	2,270	2,767	.4	.4				
Louisiana Gulf Coast	1,882	2,670	.9	1.1			20	12
Arkansas, Louisiana Inland	820	801	2.4	2.4				1
Rocky Mountain	1,073	1,087	1.1	1.1			131	171
California	2,564	3,253	.7	.8			107	627
Total	24,284	28,337	1.0	1.0	19,776	24,403	2,107	1,524

[1] Conversion factor: 5 barrels to the short ton.
[2] Preliminary figures.
[3] Figures not available.

Still Gas.—The production of still gas increased from 102.6 million barrels in 1954 to 116.5 million in 1955 or from 494 billion cubic feet to 593 billion. The increases were spread through most of the refining districts. The conversion from cubic feet to barrels is in terms of the crude-oil equivalent to balance the refinery input and output and not on the basis of heating value. Most of the still gas is consumed as refinery fuel.

Asphalt and Road Oil.—The domestic demand for asphalt gained more in 1955 than in any year since 1950. Both building- and road-construction activity were high in 1955, resulting in this large increase. Road oil also showed a record gain for the year.

TABLE 75.—Production of still gas in the United States, 1953–55, by districts

	1953		1954		1955 [1]	
	Million cubic feet	Equivalent in thousand barrels	Million cubic feet	Equivalent in thousand barrels	Million cubic feet	Equivalent in thousand barrels
East Coast	56,733	13,057	60,464	12,694	72,093	14,080
Appalachian	15,803	4,204	14,235	3,679	14,889	3,848
Indiana, Illinois, Kentucky, etc.	94,354	22,753	98,370	21,891	118,306	24,506
Oklahoma, Kansas, etc.	30,730	6,887	31,631	7,313	40,179	8,890
Texas Inland	21,928	4,848	20,411	4,647	23,498	5,031
Texas Gulf Coast	131,875	26,133	135,923	26,425	154,141	28,153
Louisiana Gulf Coast	32,709	5,729	35,030	6,251	48,353	9,147
Arkansas, Louisiana Inland, etc.	5,448	1,115	6,220	1,402	5,798	1,337
Rocky Mountain	15,707	3,948	15,503	3,547	17,433	3,735
California	74,358	13,869	76,703	14,703	98,137	17,779
Total	479,645	102,243	494,490	102,552	592,827	116,506

[1] Preliminary figures.

Sales of asphalt by State and use are contained in the Asphalt chapter of the Minerals Yearbook.

Miscellaneous Oils.—The production of miscellaneous oils increased 22 percent in 1955. Specialities, solvents, and "other" increased most. These categories include the products usually termed petrochemicals.

Unfinished Oils.—Unfinished oils include all oils requiring cracking or further distillation, except the unfinished-gasoline portion naphtha distillate. Unfinished ordinarily are rerun and become finished products.

TABLE 76.—Production of miscellaneous finished oils in the United States in 1955, by districts and classes [1]

(Thousand barrels)

District	Petrolatum	Absorption oil	Medicinal oil	Specialties oils	Solvents	Other	Total [2]
East Coast	2		39	1,564	212	12	1,829
Appalachian	130		6	31			167
Indiana, Illinois, Kentucky, etc.	161			827	126	367	1,481
Oklahoma, Kansas, etc.	458	215		201			874
Texas Inland		1,444				328	1,772
Texas Gulf Coast	189	72		378		900	1,539
Louisiana Gulf Coast	3	167		1,732		14	1,916
Arkansas, Louisiana Inland, etc.	9	1,025			115		1,149
Rocky Mountain and New Mexico	1	13		48		52	114
California		15	34	616	295	1,682	2,642
Total	953	2,951	79	5,397	748	3,355	13,433

[1] Includes production at natural gasoline and cycling plants.
[2] Conversion factor: 300 pounds to the barrel.

INTERCOASTAL SHIPMENTS

Crude oil and products moved principally from Gulf-coast to east-coast ports. In 1955, 11.5 million barrels of residual fuel oils moved from California to the east coast to reduce accumulated stocks in California, and shipments of this size were temporary.

Crude-oil shipments from the Gulf coast to the east coast again declined in 1955, as east-coast refineries increased their runs of imported crude oil. Shipments from Gulf to east coast increased for all major products except residual fuel oil.

TABLE 77.—Minerals oils, crude and refined, shipped commercially from Gulf-coast to east-coast ports of the United States, 1954–55, by classes [1]

(Thousand barrels)

Year and class	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Total
1954													
Crude petroleum	14,080	13,800	14,804	14,575	13,880	13,024	12,224	12,524	12,284	13,956	13,330	13,799	162,280
Gasoline	14,248	13,223	17,291	18,357	16,923	16,964	15,611	17,707	15,748	17,891	15,549	15,960	195,472
Kerosine	3,996	4,036	3,762	2,797	2,418	3,196	3,155	2,931	2,544	3,095	3,792	5,725	41,447
Distillate fuel oil	16,845	15,041	11,767	10,366	9,419	8,516	9,017	10,600	10,353	12,842	12,783	17,964	145,513
Residual fuel oil	5,362	5,181	5,628	5,251	4,954	3,919	3,753	4,283	4,421	5,875	4,559	4,683	57,869
Lubricating oils	602	539	578	668	785	806	598	747	497	705	680	779	7,984
Miscellaneous oils	857	902	1,347	1,522	1,935	1,251	1,088	840	614	978	1,031	668	13,033
Total	55,990	52,722	55,177	53,536	50,314	47,676	45,446	49,632	46,461	55,342	51,724	59,578	623,598
1955													
Crude petroleum	15,402	12,536	14,485	12,073	13,053	11,377	13,870	12,526	13,144	13,845	12,792	14,389	159,492
Gasoline	16,266	15,546	19,654	18,259	20,830	18,464	18,801	18,381	18,534	19,212	18,158	17,305	219,410
Kerosine	5,336	4,827	3,832	3,205	2,676	2,197	3,236	3,304	2,767	3,771	3,799	4,895	43,845
Distillate fuel oil	20,770	18,116	16,782	10,822	11,513	10,126	11,549	12,435	11,923	12,561	13,956	18,844	169,397
Residual fuel oil	4,323	3,807	4,561	4,268	4,459	3,741	4,141	3,798	4,426	4,686	4,241	5,393	51,844
Lubricating oils	1,214	636	806	680	1,028	697	808	818	780	792	724	721	9,704
Miscellaneous oils	592	581	741	795	663	885	623	818	709	689	865	896	8,857
Total	63,903	56,049	60,861	50,102	54,222	47,487	53,028	52,080	52,283	55,556	54,535	62,443	662,549

[1] Oil and Gas Division, U. S. Department of the Interior.

FOREIGN TRADE[1]

Foreign-trade statistics in this section, as reported by the United States Department of Commerce, differ slightly from those used in other sections of this chapter. Bureau of Mines petroleum-import statistics pertain to continental United States only, and its export statistics include not only foreign countries but also shipments to the Territories. Imports of crude petroleum and unfinished oils (table 78) are obtained by the Bureau of Mines from petroleum companies to balance refinery reports and therefore differ from the totals reported by the United States Department of Commerce.

Imports.—Again in 1955, imports of mineral oils into continental United States increased at a faster rate than the total new supply of mineral oils. Imports were 8.6 percent higher and furnished 14.2 percent of the total supply compared with 13 percent in 1954. The principal imports again were crude oil and residual fuel oil. The indicated rise in gasoline imports was chiefly jet fuel classified as gasoline.

Net imports (imports minus exports) into continental United States rose from 696,000 barrels per day in 1954 to 884,000 barrels in 1955.

According to the United States Department of Commerce, crude-petroleum imports averaged 806,000 barrels per day, an increase of 21 percent over 1954.

Late in 1954, refineries in Washington began to use crude oil from the pipeline completed from Canada to the Pacific Northwest area; this use increased imports from that country. The organization of the consortium brought the restoration of imports from Iran in July 1955.

Imports of residual fuel oil, almost entirely from the Netherland Antilles, Venezuela, and Mexico, increased 17 percent.

Exports:—Exports of crude petroleum declined. Canada, which has been the largest export customer for United States crude oil, has been able to supply a larger part of its own needs each year. Residual-fuel-oil exports increased from 20.3 million barrels in 1954 to 27.5 million in 1955 and was due principally to shipments made for reducing accumulated stocks in California. The increased exports were principally to Japan and to the Netherland Antilles.

WORLD PRODUCTION[2]

World crude-oil production increased 12.5 percent in 1955 to total 5.6 billion barrels (15.4 million barrels daily). The largest increases over 1954 occurred in the United States, 169.5 million barrels; the U. S. S. R., an estimated 99.0 million; Iran, 98.5 million; Venezuela, 95.6 million; Kuwait, 51.2 million; Canada, 33.4 million; and Iraq, 22.8 million barrels. The United States furnished 44 percent of world production in 1955 compared with 46 percent in 1954. Venezuela, ranking second as a producing country, furnished about 14 percent of the world total in both years. The countries of the Middle East (Bahrein Island, Iran, Iraq, Kuwait, Neutral Zone, Qatar, Saudi Arabia, Turkey, and Egypt) produced over 1 billion barrels in 1955 to increase their share of the world total from 20 percent to 21 percent.

[1] By F. X. Jordan, Office of Oil and Gas, U. S. Department of the Interior.
[2] By F. X. Jordan, Office of Oil and Gas, U. S. Department of the Interior.

TABLE 78.—Mineral oils, crude and refined, imported into continental United States, 1954–55, by months [1]

(Thousand barrels)

Year and class	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Total
1954													
Crude petroleum	19,141	17,395	20,260	17,229	21,957	18,728	22,448	20,589	20,168	19,893	19,082	22,589	239,479
Refined products:													
Gasoline	2	2	1	1	2	133	133	4	15	530	198	164	1,185
Distillate fuel oil	156	159	236	317	262	306	199	461	251	299	163	386	3,195
Residual fuel oil	13,815	13,217	12,033	9,748	8,143	9,212	7,860	7,398	8,206	10,546	12,622	16,324	129,124
Lubricants												1	1
Wax						1							1
Asphalt	148	237	193	194	284	346	309	402	468	343	299	171	3,394
Unfinished oils	694	619	741	622	509	751	707	499	409	671	718	636	7,576
Total	33,956	31,629	33,464	28,111	31,157	29,477	31,656	29,353	29,517	32,282	33,082	40,271	383,955
1955 [2]													
Crude petroleum	22,922	21,033	22,989	20,907	23,017	22,934	25,788	23,406	24,882	25,439	24,685	27,419	285,421
Refined products:													
Gasoline	306	534	575	125	310	297	339	258	1,063	205	536	213	4,761
Distillate fuel oil	271	342	291	148	294	562	333	413	525	323	431	493	4,426
Residual fuel oil	17,773	16,265	16,037	11,735	11,089	10,189	7,390	10,907	9,034	10,521	13,395	17,637	151,972
Asphalt	165	253	536	302	227	269	496	279	348	323	175	280	3,653
Unfinished oils	357	172	463	477	302	523	492	557	685	585	427	521	5,561
Total	41,794	38,599	40,891	33,694	35,239	34,774	34,838	35,820	36,537	37,396	39,649	46,563	455,794

[1] Imports of crude reported to Bureau of Mines; imports of refined products compiled from records of U. S. Department of Commerce.
[2] Preliminary figures.

TABLE 79.—Crude petroleum and petroleum products imported for consumption into continental United States, 1954–55, by countries, in thousand barrels [1]

[U. S. Department of Commerce]

Country	Crude petroleum	Gasoline [2]	Kerosine	Distillate oil [3]	Residual oil [3]	Asphalt	Unfinished oil	Miscellaneous oil [4]	Total
1954									
North America:									
Canada	2,606	117	------	5	103	2	1	3	2,837
Mexico	[5] 5,151	------	------	3	9,747	------	5,231	------	[5] 20,132
Netherland Antilles	------	[5] 1,231	------	[5] 2,575	79,391	3,378	------	------	[5] 86,575
Trinidad and Tobago	459	12	------	------	429	23	104	------	1,027
Total	[5] 8,216	[5] 1,360	------	[5] 2,583	89,670	3,403	5,336	3	[5] 110,571
South America:									
Colombia	12,655	------	------	------	------	------	------	------	12,655
Ecuador	300	------	------	------	------	------	------	------	300
Peru	609	------	------	------	------	------	------	------	609
Venezuela	129,737	------	------	517	42,494	17	2,220	------	174,985
Total	143,301	------	------	517	42,494	17	2,220	------	188,549
Europe:									
Azores	------	------	------	(6)	------	------	------	------	(6)
France	------	------	------	------	113	------	------	------	113
Germany, West	------	------	------	------	------	(6)	------	(6)	(6)
Netherlands	------	------	------	------	------	(6)	------	------	(6)
United Kingdom	------	------	------	------	------	------	------	1	1
Total	------	------	------	(6)	113	(6)	------	1	114
Asia:									
Bahrein	------	------	------	108	------	------	------	------	108
Hong Kong	------	------	------	------	3	------	------	------	3
Indonesia	13,828	------	------	------	------	------	------	------	13,828
Iran	208	------	------	------	------	------	------	------	208
Iraq	2,188	------	------	------	------	------	------	------	2,188
Japan	------	------	------	------	3	------	------	------	3
Kuwait	41,842	------	------	------	------	------	701	------	42,543
Qatar [7]	2,751	------	------	------	------	------	------	------	2,751
Saudi Arabia	30,311	(6)	(6)	1,120	------	------	------	------	31,431
Total	91,128	(6)	(6)	1,228	6	------	701	------	93,063
Grand total	[5] 242,645	[5] 1,360	(6)	[5] 4,328	132,283	3,420	8,257	4	[5] 392,297
Imports into the United States Territories and possessions from foreign countries:									
Alaska	------	137	------	------	------	(6)	------	------	137
Hawaii	------	------	------	1,063	------	------	------	------	1,063
Puerto Rico	------	27	------	------	3,159	27	------	------	3,213
Total	------	164	------	1,063	3,159	27	------	------	4,413
Total net imports into continental United States	[5] 242,645	[5] 1,196	(6)	[5] 3,265	129,124	3,393	8,257	4	[5] 387,884
1955									
North America:									
Canada	16,395	390	------	37	282	(6)	------	(6)	17,104
Mexico	6,159	------	------	------	13,789	------	2,752	------	22,700
Netherland Antilles	182	4,481	44	4,320	86,192	3,314	------	------	98,533
Trinidad and Tobago	------	105	------	------	416	25	------	------	546
Total	22,736	4,976	44	4,357	100,679	3,339	2,752	(6)	138,883

See footnotes at end of table.

TABLE 79.—Crude petroleum and petroleum products imported for consumption into continental United States, 1954–55, by countries, in thousand barrels [1]—Continued

Country	Crude petroleum	Gasoline [2]	Kerosine	Distillate oil [3]	Residual oil [3]	Asphalt	Unfinished oil	Miscellaneous oil [4]	Total
South America:									
Colombia	8,143			1					8,144
Ecuador	409								409
Peru	856								856
Venezuela	148,829	10		159	54,620	12	3,864		207,494
Total	158,237	10		160	54,620	12	3,864		216,903
Europe:									
France				1	2				3
Germany, West			(6)					(6)	(6)
Italy		(6)							(6)
Netherlands						(6)		(6)	(6)
Sweden								(6)	(6)
Trieste		95							95
United Kingdom				(6)		(6)		(6)	(6)
Total		95	(6)	1	2	(6)		(6)	98
Asia:									
Bahrein				114					114
Indonesia	11,778								11,778
Iran	3,075								3,075
Iraq	7,012								7,012
Kuwait	56,276								56,276
Qatar [7]	5,447								5,447
Saudi Arabia	29,609			457					30,066
Total	113,197			571					113,768
Grand total	294,170	5,081	44	5,089	155,301	3,351	6,616	(6)	469,652
Imports into United States Territories and possessions from foreign countries:									
Alaska		7							7
Hawaii				570	92				662
Puerto Rico	2,726	265	44	106	3,257	26	126		6,550
Total	2,726	272	44	676	3,349	26	126		7,219
Total net imports into continental United States	291,444	4,809	(6)	4,413	151,952	3,325	6,490	(6)	462,433

[1] Compiled by M. B. Price and E. D. Page, of the Bureau of Mines, from records of the U. S. Department of Commerce.
[2] Includes naphtha but excludes benzol (thousands of barrels: 1954—291; 1955—764.
[3] Includes quantities imported free of duty for supplies of vessels and aircraft.
[4] Includes quantities imported free for manufacture in bond and export, and for supplies of vessels and aircraft.
[5] Revised figure.
[6] Less than 1,000 barrels.
[7] Assumed source; classified in import statistics under "Arabia Peninsular States, n. e. c."

TABLE 80.—Mineral oils, crude and refined, shipped from continental United States, including shipments to Territories and possessions, 1954–55, by classes and months [1]

(Thousand barrels)

Year and class	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Total
1954													
Crude petroleum	1,587	795	873	1,418	1,258	1,372	1,073	1,349	509	1,521	1,047	797	13,599
Refined products:													
Gasoline [2]	2,705	2,833	1,776	2,539	3,359	3,367	3,232	2,865	2,942	3,148	2,967	2,633	34,366
Kerosine	459	660	620	685	283	290	480	142	354	221	526	132	4,852
Distillate fuel oil	1,782	1,430	1,681	2,096	2,193	2,422	1,986	1,549	1,649	2,348	2,956	2,131	24,223
Residual fuel oil	1,770	2,104	2,788	2,203	2,619	2,408	2,334	2,076	1,982	1,833	2,291	2,345	26,753
Jet fuel		3	14	50	2	2	78						149
Lubricants	1,009	1,239	1,048	1,524	1,340	1,483	1,316	1,407	1,020	1,237	1,095	1,357	15,075
Paraffin wax	83	103	92	122	109	107	112	121	123	131	119	120	1,342
Coke	406	174	216	273	316	268	308	232	217	396	219	236	3,261
Asphalt	78	50	279	271	189	192	243	111	109	113	91	142	1,868
Liquefied gases	270	339	383	355	290	330	301	324	310	336	311	404	3,953
Miscellaneous oils	16	29	14	32	29	22	26	25	19	23	27	30	292
Total refined	8,578	8,964	8,911	10,150	10,729	10,891	10,416	8,852	8,725	9,786	10,602	9,530	116,134
Total crude and refined	10,165	9,759	9,784	11,568	11,987	12,263	11,489	10,201	9,234	11,307	11,649	10,327	129,733
1955 [3]													
Crude petroleum	381	976	771	1,431	1,166	1,053	887	1,191	832	871	872	1,040	11,471
Refined products:													
Gasoline [2]	2,555	2,331	2,400	2,449	3,212	2,658	3,594	3,210	2,929	3,390	2,565	3,028	34,321
Kerosine	154	443	244	275	397	255	522	316	258	135	178	151	3,328
Distillate fuel oil	1,970	1,061	1,769	1,431	2,355	2,417	2,405	2,470	2,380	2,526	1,717	1,894	24,395
Residual fuel oil	3,260	3,377	2,764	2,923	2,914	2,943	2,267	3,310	2,633	2,446	1,966	2,567	33,370
Jet fuel						35	1	44		40			120
Lubricants	925	1,166	1,245	1,266	1,159	1,265	1,355	1,285	1,210	1,129	1,077	1,213	14,295
Paraffin wax	81	108	137	113	95	79	110	111	94	115	102	103	1,248

Coke	216	292	362	374	317	482	511	446	289	496	345	387	4,517
Asphalt	88	94	120	84	233	89	135	138	171	156	97	163	1,568
Liquefied gases	402	357	399	329	366	332	308	347	334	419	392	295	4,280
Miscellaneous oils	26	34	39	25	22	20	21	30	24	28	28	33	330
Total refined	9,677	9,263	9,479	9,269	11,070	10,575	11,229	11,707	10,322	10,880	8,467	9,884	121,772
Total crude and refined	10,058	10,239	10,250	10,700	12,236	11,628	12,116	12,898	11,154	11,751	9,339	10,874	133,243

[1] Compiled from records of the U. S. Department of Commerce, except Alaska and Hawaii, which are Bureau of Mines data; figures may differ slightly from those used in other sections of this chapter.
[2] Includes benzol, naphtha, natural gasoline, and antiknock compounds.
[3] Preliminary figures.

TABLE 81.—Crude petroleum and petroleum products exported from continental United States, 1954–55, by countries of destination, and shipments to and exports from Territories and possessions,[1] (Thousand barrels)

[U. S. Department of Commerce]

Country	Crude petroleum	Gasoline [2 3]	Kerosine	Distillate oil	Residual oil	Lubricating oil [2]	Asphalt	Liquefied petroleum gases	Wax	Coke	Petrolatum	Miscellaneous products [2]	Total
1954													
North America:													
Canada	8,130	2,583	551	9,658	5,755	621	193	1,389	94	1,712	10	69	30,765
Canal Zone		64	23	196	154	5	11		(4)		(4)	1	454
Costa Rica		42	4	52	10	8	11	(4)	6		(4)	1	134
Cuba	2,928	915	(4)	229	1,371	72	7	140	22		2	16	5,702
Mexico		4,182	267	2,427	2,585	344	82	1,738	337	(4)	6	35	12,003
Netherland Antilles		516		1,709	288	10	(4)				(4)	1	2,524
Other North America		135	19	69	881	64	17	38	56	(4)	4	16	1,299
Total	11,058	8,437	864	14,340	11,044	1,124	321	3,305	515	1,712	22	139	52,881
South America:													
Argentina	608	(4)	128	235		120	(4)	(4)	(4)	(3)		1	[5] 1,092
Brazil		133	44	100		618	111	587	98	4	21	13	1,729
Chile		6	(4)	68	1,895	70	42	(4)	19		(4)	6	2,106
Colombia		1	(4)			41	91	2	166		2	9	312
Uruguay		2				21	4	(4)	1		(4)	5	33
Other South America		17	1	20	24	84	58	1	90		4	40	339
Total	608	159	173	423	1,919	954	306	590	374	[5] 4	27	74	[5] 5,611
Europe:													
Belgium-Luxembourg		10	1	172		739	4	(4)	15	6	6	10	963
Denmark		2	1			130	(4)		3	1	(4)	1	138
France	638	48		1		63	1	(4)	34	256	7	3	1,051
Germany, West		12	2	128	98	159		(4)	41		9	6	455
Italy	107	116	1			240	1	(4)	30	227	9	144	875
Netherlands		5	1	191		317	(4)	(4)	25		11	11	561
Norway		3	(4)			62	(4)		1	206	2	6	280
Sweden		4	(4)	158		205	(4)		6	17	3	7	400
Switzerland		1				63	2		10		3	4	83
Turkey		20	78	37		213	18		4		1	14	385
United Kingdom	462	192	302	4,597	594	1,799	(4)	(4)	108	28	66	1	8,149
Other Europe		77	111	194		461	1		35	77	10	12	978
Total	1,207	490	497	5,478	692	4,451	27	(4)	312	818	127	219	14,318

Asia:													
Aden		(4)		13		1						(4)	14
India		171	[5] 1,498	94		521	101	1	1	11	9	11	[5] 2,418
Indochina		4				47	359		(4)		3	10	423
Indonesia		1	(4)			40	68		6		11	4	130
Japan-Nansei and Nanpo Islands	726	453	96	271	6,318	65	11	6	12	628	16	290	8,892
Pakistan			72	52		104			(4)		3	4	235
Philippines		12	33	43		164	140	6	42		10	12	462
Other Asia		23		56	200	217	78	(4)	54	25	20	31	[5] 704
Total	726	664	[5] 1,699	529	6,518	1,159	757	13	115	664	72	362	[5] 13,278
Africa:													
Belgian Congo		62	14	73	14	50	28		(4)	(4)	1	8	250
Egypt		(4)	601	229		160			1		4	3	998
French West Africa		33	9	214	112	15	(4)		(4)			3	386
Mozambique				66		9	9	1	1		1	2	89
Union of South Africa		127	22	55		259	94	2	17	(4)	27	29	632
Other Africa		17	14	114	35	136	35		1		2	25	379
Total		239	660	751	161	629	166	3	20	(4)	35	70	2,734
Oceania:													
Australia		285	138	365		537	(4)	(4)	2	(4)	6	2	1,335
New Zealand		12	2			115	21	1	2		4	(4)	157
Other Oceania		50	16	45	4	2	1	(4)			(4)	(4)	118
Total		347	156	410	4	654	22	1	4	(4)	10	2	1,610
Grand total	13,599	26,618	[5] 4,049	21,931	20,338	14,482	[5] 1,599	3,912	1,340	[5] 3,198	293	1,014	[5] 112,373
Shipments from continental United States to Territories and possessions:													
Alaska and Hawaii [6]		4,553	131	2,202	5,962	121	162	41	(7)	61	(7)		13,233
Puerto Rico	(7)	2,810	716	273	(7)	53	107	(7)	(7)	(7)	(7)	4	3,963
Wake	(7)	472	(4)	17	(7)	3		(7)	(7)	(7)	(7)	(4)	492
Other	(7)	41	14	35	(7)	4	2	(7)	(7)	(7)	(7)	(4)	96
Total		7,876	861	2,527	5,962	181	271	41	(7)	61	(7)	4	17,784
Exports from noncontiguous Territories and possessions to foreign countries:													
Alaska		127	7	231	5	1						(4)	371
Other		1	1	2		(4)			(4)		(4)	(4)	4
Total		128	8	233	5	1			(4)		(4)	(4)	375
Total net shipments from continental United States	13,599	34,366	[5] 4,902	24,225	26,295	14,662	[5] 1,870	3,953	1,340	[5] 3,259	293	1,018	[5] 129,782

See footnotes at end of table.

TABLE 81.—Crude petroleum and petroleum products exported from continental United States, 1954–55, by countries of destination, and shipments to and exports from Territories and possessions,[1] (Thousand barrels)—Continued

[U. S. Department of Commerce]

Country	Crude petroleum	Gasoline [2 3]	Kerosine	Distillate oil	Residual oil	Lubricating oil [3]	Asphalt	Liquefied petroleum gases	Wax	Coke	Petrolatum	Miscellaneous products [3]	Total
1955													
North America:													
Canada	6,501	1,873	299	7,206	5,735	804	209	1,353	128	2,448	13	55	26,624
Canal Zone		173	55	65	223	5	5		(4)		(4)	(4)	526
Cuba	3,136	29	(4)	61	1,564	95	7	153	28		2	15	5,090
El Salvador		241		7	190	6	4	8	5		(4)	2	463
Mexico	(4)	5,826	478	3,879	2,952	167	146	2,271	280	(4)	26	37	16,062
Netherland Antilles		602		849	2,258	10	1				(4)	1	3,721
Other North America		119	20	149	515	66	43	67	50		4	17	1,050
Total	9,637	8,863	852	12,216	13,437	1,153	415	3,852	491	2,448	45	127	53,536
South America:													
Argentina	236	(4)	1,060	880		316	1	(4)	2		(4)	1	2,496
Brazil		21	7	90		524	12	326	11	7	5	3	1,006
Chile		4	(4)	6	2,150	69	19	(4)	19		(4)	8	2,275
Colombia		1	1			44	41	6	175		3	14	285
Peru		6				17	1	(4)	28	(4)	1	5	58
Venezuela		7	3			46	5	4	20	(4)	1	24	110
Other South America		10	4	4	188	33	150	1	29		2	11	432
Total	236	49	1,075	980	2,338	1,049	229	337	284	7	12	66	6,662
Europe:													
Belgium-Luxembourg		36	2	82	68	792	4	1	16	56	8	8	1,073
France	546	45		1		65	(4)	2	37	306	6	5	1,013
Germany, West		26	2	356	231	251	(4)	8	21	137	14	6	1,052
Italy	104	138	(4)		3	132	2	1	68	214	10	50	722
Netherlands		23	2	978	541	350		(4)	25	45	13	21	1,998
Sweden		56	1	180		282	1	(4)	6	33	2	11	572
Turkey		203	27	21	4	152	3		8		1	10	429
United Kingdom	470	226	289	5,609	1,018	1,394	(4)	2	67	61	82	(4)	9,218
Other Europe		79	57	187	39	585	23	(4)	61	393	13	24	1,461
Total	1,120	832	380	7,414	1,904	4,003	33	14	309	1,245	149	135	17,538
Asia:													
India		56	2	(4)		553	206		1	11	13	12	854
Japan-Nansei and Nanpo Islands	477	128	(4)	946	9,097	110	9	11	20	732	15	214	11,759
Malaya		20			300	52	8		(4)		7	4	391

Philippines		5	(4)		47	184	159	10	42	1	10	15	473
Other Asia		20	(4)	5	145	431	213	(4)	86	19	40	51	1,010
Total	477	229	2	951	9,589	1,330	595	21	149	763	85	296	14,487
Africa:													
Belgian Congo		20	1	7	14	52	34		(4)		(4)	11	139
Egypt		(4)	100	(4)		181		(4)	1		4	4	290
French West Africa		6	30	25	97	2	2				(4)	2	164
Union of South Africa		191	1			277	100	3	7	(4)	21	31	631
Other Africa		(4)	25		121	161	60	1	2		5	37	412
Total		217	157	32	232	673	196	4	10	(4)	30	85	1,636
Oceania:													
Australia		338	22	98		527	1	(4)	4		6	1	997
New Zealand		10	1			99	6	3	1		3	(4)	123
Other Oceania		33	8	36	7	(4)	2	(4)			(4)	(4)	86
Total		381	31	134	7	626	9	3	5		9	1	1,206
Grand total	11,470	25,993	2,497	21,727	27,507	13,663	1,477	4,231	1,248	4,463	330	830	115,436
Shipments from continental United States to Territories and possessions:													
Alaska and Hawaii [6]		5,308	144	2,523	5,799	118	20	46	(7)	54	(7)		14,012
Puerto Rico	(7)	2,631	687	389	(7)	73	65	(7)	(7)	(7)	(7)	5	3,850
Wake	(7)	604	(4)	20	(7)	(4)		(7)	(7)	(7)	(7)	(4)	624
Other	(7)	104	13	41	(7)	4	5	(7)	(7)	(7)	(7)	(4)	167
Total		8,647	844	2,973	5,799	195	90	46	(7)	54	(7)	5	18,653
Exports from noncontiguous Territories and possessions to foreign countries:													
Alaska		111	4	218		(4)						(4)	333
Other		8	2	4	1	(4)					(4)	(4)	15
Total		119	6	222	1	(4)					(4)	(4)	348
Total net shipments from continental United States	11,470	34,521	3,335	24,478	33,305	13,858	1,567	4,277	1,248	4,517	330	835	133,741

[1] Compiled by M. B. Price and E. D. Page, of the Bureau of Mines, from records of the U. S. Department of Commerce.

[2] Country and continent totals exclude, but grand totals include: 1954—16,282; 1955—15,422 thousand barrels of gasoline; 1954—5,511; 1955—4,829 thousand barrels of lubricating oils; and 1954—148; 1955—120 thousand barrels of jet fuel for which country breakdown may not be published for security reasons.

[3] Includes naphtha but excludes benzol (thousand barrels): 1954—153 (revised figure); 1955—59.

[4] Less than 1,000 barrels.

[5] Revised figure.

[6] Figures represent shipments from refining companies to Alaska and Hawaii through Pacific coast ports as reported to Bureau of Mines by shippers.

[7] Not separately classified.

Crude-oil production in the Western Hemisphere increased 9.4 percent compared with a growth of 18.6 percent in Eastern Hemisphere output.

On July 8, 1955, Guatemala issued a new oil decree which permits exploration by foreign companies. At the end of November, 29 companies had filed for concessions. Turkey amended its petroleum law, and applications for licenses were received in October 1955; 12 companies had been alloted licenses by the end of 1955. Bolivia passed a new petroleum law in October 1955, opening the country to foreign exploration on a concession basis.

Canadian crude-oil production increased over 33 million barrels in 1955, the greatest yearly increase ever recorded. Crude-oil producibility rose from about 400,000 barrels daily in 1954 to approximately 650,000 barrels daily. The development of the Pembina field in Alberta and increased oil activity in southeast Saskatchewan were the highlights of 1955.

South American production increased almost 13 percent owing principally to record production in Venezuela. Brazil more than doubled crude-oil production from existing fields; during the year, a significant new discovery was made in the Amazon Valley of northern Brazil. Colombian production was maintained at the 1954 rate. A 12-inch pipeline from the Velasquez field in Colombia to the Andean pipeline began to operate in October and contributed to higher output in the last quarter. The Argentine Government-controlled Yacimientos Petroliferos Fiscales increased production 4 percent; production by private companies declined.

In western Europe, Russia returned control of the Austrian oil industry to Austria on August 13, 1955. The Parentis field in France, discovered in 1954, furnished about two-thirds of total French crude-oil production. A new field was discovered during the year at Mothes, near Parentis. Italy's production nearly tripled owing to production from the Ragusa field in Sicily. Germany increased production 18 percent; Netherlands, 9 percent; and Yugoslavia, 30 percent.

Reliable statistics for eastern Europe are not available, and estimates must be employed. It is estimated that the U. S. S. R. (including Sakhalin) increased production about 24 percent to 1.4 million barrels daily. Production in Rumania is estimated to have increased almost 13 percent, and Hungary 47 percent. Crude production in Albania, Czechslovakia, and Poland apparently decreased from 1954.

Crude-oil production in Africa dropped 9.1 percent, as all 3 producing countries decreased from 1954. Output from the Asl field in Egypt declined sharply. Active exploration was carried out in Algeria, Angola, Belgian Congo, Ethiopia, French West Africa, Kenya, Libya, Morocco, Nigeria, Tanganyika, and Tunisia, and others.

The Middle East area continued to gain substantially in crude-oil production. Production by the Iranian Oil Exploration & Producing Co. in south Iran averaged 326,000 barrels daily in the first complete year of operations. Output in the Kuwait-Saudi Arabia Neutral Zone was up 47.6 percent in this, its second full year of commercial production. In Kuwait the Raudhatain No. 1 wildcat in the northern part of Kuwait was successfully completed, with indications of a major oilfield. The Heletz test well in Israel was completed successfully in September by deepening a hole drilled by a subsidiary of the Iraq Petroleum Co. in 1947 to about 3,500 feet. The Rumaila, Iraq field,

which was placed on production late in 1954, produced slightly more than 55,000 barrels daily in 1955.

In the Far East, the United States of Indonesia raised production almost 9.4 percent, owing principally to a substantial gain in output from the Minas field in Sumatra. British Borneo production increased 9.5 percent in contrast with the slight decrease in 1954. Production in Netherland New Guinea dropped almost 16 percent, owing to disappointing results from the Mogoi field. Both India and Pakistan showed notable percentage increases in output in 1955. Since discovery of oil in Australia in December 1953 the results have been discouraging. Ten subsequent wells on the Rough Range structure have been dry. No commercial production was reported in 1955.

TABLE 82.—World production of crude petroleum, by countries, 1951–55 [1]

[Compiled by Pearl J. Thompson]

(Thousand barrels)

Country	1951	1952	1953	1954	1955 [2]
North America:					
Canada	47,615	61,237	80,899	96,080	129,453
Cuba [3]	128	36	17	25	375
Mexico	77,312	77,275	72,440	83,653	91,370
Trinidad	20,843	21,258	22,346	23,629	24,896
United States	2,247,711	2,289,836	2,357,082	2,314,988	2,484,521
Total	2,393,609	2,449,642	2,532,784	2,518,375	2,730,615
South America:					
Argentina	24,465	24,588	28,501	29,650	30,501
Bolivia	523	526	601	1,695	2,693
Brazil	691	750	916	992	2,022
Chile	760	910	1,258	1,736	2,574
Colombia	38,398	38,683	40,179	40,547	40,492
Ecuador	2,708	2,839	2,967	3,146	3,531
Peru	16,110	16,403	15,999	17,161	17,244
Venezuela	622,216	660,254	644,243	691,808	787,409
Total	705,871	744,953	734,664	786,735	886,466
Europe:					
Albania [4]	1,200	1,100	1,400	1,600	1,500
Austria	15,500	18,760	21,860	23,400	24,880
Czechoslovakia [4]	644	740	900	1,100	1,000
France	2,036	2,377	2,555	3,616	6,608
Germany, West	9,681	12,435	15,505	19,008	22,435
Hungary [4]	3,500	3,500	5,000	7,500	11,000
Italy	135	487	656	535	1,519
Netherlands	4,942	4,975	5,701	6,535	7,137
Poland [4]	1,502	1,700	1,800	2,000	1,500
Rumania [4]	31,000	45,000	67,000	70,000	78,800
U. S. S. R. [4 5]	285,000	322,400	363,000	411,000	510,000
United Kingdom	335	407	410	450	408
Yugoslavia	1,067	1,091	1,236	1,557	2,027
Total [4 5]	356,542	414,972	487,023	548,301	668,814
Asia:					
Bahrein	10,994	11,004	10,978	10,992	10,982
Burma	851	869	1,051	1,345	1,592
China [4]	900	1,000	1,500	3,000	3,500
India	1,949	1,900	2,215	2,235	2,526
Indonesia	55,453	62,495	75,626	79,586	87,083
Iran	123,512	7,800	9,400	21,500	120,035
Iraq	65,122	141,100	210,268	228,432	251,206
Japan	2,337	2,134	2,101	2,124	2,229
Kuwait	204,910	273,433	314,592	347,319	398,493
Kuwait-Neutral Zone				5,995	8,848
Pakistan	1,348	1,580	1,762	1,945	2,068
Qatar	18,009	25,255	31,025	36,450	41,983
Sarawak and Brunei	37,506	38,251	36,848	36,315	39,751
Saudi Arabia	277,963	301,861	308,294	347,845	352,240
Taiwan (Formosa)	21	18	17	35	24
Turkey	133	146	179	399	1,210
U. S. S. R.: Sakhalin [4]	7,000	7,000	7,000	8,000	7,500
Total [5]	808,008	875,846	1,012,856	1,133,517	1,331,270

See footnotes at end of table.

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TABLE 82.—World production of crude petroleum, by countries, 1951–55 [1]—Con.

[Compiled by Pearl J. Thompson]

(Thousand barrels)

Country	1951	1952	1953	1954	1955 [2]
Africa:					
Algeria	49	348	641	570	435
Egypt	16,311	16,464	16,501	13,774	12,634
French Morocco	587	749	761	881	765
Total	16,947	17,561	17,903	15,225	13,834
Oceania:					
Australia (Victoria)	2				
New Guinea	1,746	1,725	1,751	4,045	3,413
New Zealand	5	9	8	7	
Total	1,753	1,734	1,759	4,052	3,413
World total (estimate)	4,282,730	4,504,708	4,786,989	5,006,205	5,634,412

[1] This table incorporates a number of revisions of data published in previous Petroleum chapters.
[2] Preliminary figures.
[3] Natural naphtha and gas oil.
[4] Estimate.
[5] U. S. S. R. in Asia (except Sakhalin) included with U. S. S. R. in Europe.

PETROLEUM TECHNOLOGY IN 1955 [3]

The year 1955 was characterized by continued progress and growth of the petroleum industry in the United States. It was a year of record crude-oil production and refining, demand for products, and improvement in overall use of raw materials.

Few outstanding new processes or equipment were developed but improvement continued in effective application of knowledge to problems in production, transportation, storage, refining, and utilization of crude petroleum and petroleum products.

PRODUCTION

Deep Producing Wells.—Production depth records were broken in 9 areas of the United States in 1955; record drilling depths were reached in 7 areas. The world's deepest producing area at the end of 1955 was at Weeks Island field in Iberia Parish in southern Louisiana. Several wells in the field were producing in the Miocene series below 17,500 feet. The well in the Coles Levee field in Kern County, Calif., which was not producing in 1955, set the alltime producing depth record in 1953 at 17,892 feet. Seventy wells were drilled to depths greater than 15,000 feet in southern Louisiana in 1955.[4]

More Efficient Recovery.—The outstanding aspect of petroleum production practice in 1955 was the intensified research for methods that might prove more efficient than the conventional ones used in primary production and secondary recovery of crude petroleum.

Secondary recovery involves injection of water or gas, or other means of supplementing the natural energy in an oil-producing reservoir, thereby increasing the yield over that obtained by primary recovery (natural flow) alone. In the United States, about 22 percent of pe-

[3] By A. J. Kraemer, staff advisor to chief, Division of Petroleum.
[4] McCaslin, John C., Depth Records Are Broken in Sixteen Areas: Oil and Gas Jour., vol. 54, No. 39, Jan. 30, 1956, pp. 147–149.

troleum production came from fields in which injection projects were active.[5]

Research was in progress in laboratories and in oilfields on (1) in situ combustion, (2) in situ-combustion combined with steam injection, (3) imbibition, (4) injection of dry gas under high pressure to increase the volume of the liquid phase, (5) injection of wet gases to increase the volume of the liquid phase, (6) use of heat at the bottom of wells to increase the yield, (7) liquefied-petroleum-gas drive, and (8) a combination of repressuring and gas storage.

Although none of the new methods of production being tested in 1955 had been shown to have promise over a wide range of conditions, several appeared to be particularly applicable under specific conditions.

(1) *In situ combustion.*—In secondary recovery of petroleum by a process known as "in situ combustion," hot gases are used to transfer heat to the oil in oil-bearing formations that is not recoverable by conventional production practices. The purpose is to promote movement of the oil to production wells by increasing the fluidity of the oil by heating. A mixture of air and natural gas under pressure is ignited and burned underground to provide a heat-sweeping medium to drive oil toward output wells.[6] The process has been tried in Kansas, California, and Kentucky.

(2) *Combustion in place combined with steam injection.*—A variation of the gas-injection method of increasing the yield of oil from a formation that contains viscous oil was tried on a pilot-plant scale on a small tract of land in southeastern Illinois. The field was selected because it contained highly viscous oil previously considered to be unrecoverable by existing methods.

A variable mixture of hot combustion gas, steam, and hot air was forced into the oil-bearing formation through input wells to reduce the viscosity of the oil so that it would flow more readily to production wells on the tract. The hot combustion gases and steam supplied heat to reduce the viscosity of the crude oil, and the hot air caused underground combustion of some of the oil to supply additional heat. Core tests revealed recovery of 80 percent of the oil content, originally estimated at 24,000 barrels per acre.[7 8]

(3) *Imbibition.*—Imbibition is a method for displacing crude petroleum by injecting water into tight oil-bearing formations, such as the Spraberry, Tex., reservoir, in which virtually all of the high permeability is concentrated in a large number of naturally occurring fractures. The fractures appear to be about 3 to 4 feet apart, and their average width is about 0.002 inch, according to micrometer measurements made by Sohio Petroleum Co.

Because of this fractured condition, oil cannot be forced from the matrix by means of conventional water flooding. Channeling and bypassing through the fractures would be extremely serious and would be even more troublesome in gas injection.

The Atlantic Refining Co. conceived the idea that, if these fractures were to be filled with water, the natural capillary attraction of the

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[5] Finch, Lewis, Jr., and Stewart, F. M., Fifth of U. S. Oil From Fields Operating Injection Projects: Oil Gas Jour., vol. 54, No. 35, Jan. 2, 1956, pp. 91-94.
[6] Oil and Gas Journal, Sinclair to Test New Oil-Recovery Method: Vol. 53, No. 49, Apr. 11, 1955, p. 81.
[7] Oil and Gas Journal, Amazing Recovery Claimed in New Gas-Steam Heat Drive: Vol. 54, No. 29, Nov 21, 1955, p. 131.
[8] Chemical and Engineering News, Trial by Fire: Vol. 34, No. 33, Aug. 13, 1956, p. 3864.

fine pores in the tight matrix rock would imbibe or soak in the water from the fractures. Laboratory tests on a qualitative basis confirmed the theory, and a field experiment was begun in November 1952 by The Atlantic Refining Co. The Tex-Harvey Oil Co. began injecting water in an imbibition experiment in the Spraberry area in June 1954. Although results of this experiment were not highly spectacular, oil recovery was increased substantially, and the work was being continued.[9] [10]

(4) *Injection of dry gas under high pressure.*—Injection of dry gas under high pressure into commercially depleted oil-bearing formations was started in 1949 by The Atlantic Refining Company in Crane County, Tex. The allowable production at this project at the end of 1955 was 15,350 barrels a day. A second project was put in operation early in 1956 in Beauregard Parish, La. Dry gas for injection came from a natural-gasoline plant at Neale, La. The gas was cooled and compressed at the plant and pumped into the oil-bearing formation at a depth of 10,400 feet to maintain the original bottom-hole pressure of 4,300 p. s. i. The process apparently is best adapted to undersaturated reservoirs with bottom-hole pressures greater than 3,000 p. s. i. [11]

The oil is washed out of the reservoir as if by kerosine or a similar solvent. The dry gas, entering the partly depleted, oil-bearing formation at a high pressure, passes over and absorbs some of the residual oil in the reservoir. The enriched gas, moving forward, forms a front of light liquid that has a gravity approximating that of the original reservoir oil. The compressed gas-oil liquid displaces the reservoir oil, which flows to a production well.

(6) *"Bottom-hole" heaters.*—Use of heat at the bottom of shallow wells in partly depleted pools of heavy, highly viscous crude oil to increase the flow of oil to the well was not new in 1955. However, improvements in electrical heaters and in closed systems for circulating hot water or hot oil were resulting in wider application of the idea.[12] A study of more than 200 heaters installed in California showed that they increased production an average of 12 barrels daily per well and decreased pumping costs. In other areas the increased yield was 7 to 8 barrels per well per day.

The usual practice was to circulate either hot water or hot oil from heaters at the surface to the oil-bearing formation at 230° to 240° F. In some areas electric heaters at the bottom of wells at depths of about 2,000 feet or more were found to be more efficient than surface heaters. The economics depends upon the depth of the wells and the costs of electricity and of gas for generating heat. Estimates of the time required to repay the cost of the heating facilities plus operating expense ranged from 3 to 24 months.

To increase the depths at which circulating-type heaters can be used profitably, efforts were being made to insulate the line carrying the hot fluid to the bottom of the well. Another manufacturer was reported planning to produce a unit designed for steam operation.

[9] Enright, Robert J., Imbibition—Newest Producing Technique: Oil-Gas Jour., vol. 53, No. 2, May 17, 1954, pp. 104-107.
[10] Oil and Gas Journal, Imbibition Extended: Vol. 53, No. 46, Mar. 21, 1955, p. 134.
[11] Oil and Gas Journal, In High-Pressure Gas Injection First Success No Fluke: Vol. 54, No. 33, Dec. 15, 1955, p. 58.
[12] Stormont, D. H., In Shallow, Low-Gravity Pools, Formation Heaters Pay: Oil Gas Jour., vol. 54, No. 14, Aug. 8, 1955, p. 66.

Individual generators at each well would supply steam at 500 p. s. i. pressure to operate a pumping jack. Exhaust steam would then be used for down-the-hole heating and for wash-tank heating.

(7) *Liquefied-petroleum-gas drive.*—Use of liquefied petroleum gas (mainly butane) to increase the yield of oil from tight or partly depleted oil-bearing formations was tried in the Spraberry area of Texas in 1955. Production of crude oil was increased, but mechanical difficulties and variations in availability of LP-gases for injection cast doubt upon the economic soundness of the process.[13]

(8) *Combination of repressuring and gas storage.*—The Federal Bureau of Mines studied an oil reservoir that had been depleted by the primary-production procedure and converted to a gas-storage reservoir.[14] The study was made primarily to determine the probable additional oil yield by this new type of secondary-recovery procedure and to establish a procedure for calculating the gas-storage capacity of the reservoir. Two major conclusions were drawn from the study: (1) Selection of the respective positions of injection and producing wells on the storage-reservoir structure may affect materially the secondary oil recovery and (2) more oil will be recovered by repeated gas injection and withdrawal in storage operation than by conventional gas cycling.

Another project, involving injection of natural gas into a commercially depleted oil-bearing formation, was started in 1955 off the coast of Jefferson Parish, La. The Louisiana Department of Conservation granted permission to Humble Oil & Refining Co. to inject natural gas into the only well in a 46-acre offshore reservoir and later to produce secondary oil from the same well. The 1.6 billion cubic feet of gas to be injected probably would have been flared otherwise. The company expected an additional yield of a million barrels of oil in this manner.[15]

REFINING

The petroleum-refining industry in the United States set a record in 1955 in volume of operations and achieved notable advances in processing. Crude oil run to stills in refineries in the United States has more than doubled in 15 years.

Quality of products of petroleum refining continued to increase in 1955. Average octane rating of Regular-Grade gasolines was increased 1.9 octane numbers (from 86.2 to 88.1 by the Research Method) from the winter of 1954 to the winter of 1955.[16] This increase was achieved despite an increase in yield of gasoline from 43.8 percent of crude oil run to stills in 1954 to 44.0 percent in 1955.

Still Gas.—An indication of the increase in alteration that was undergone by crude-oil run to stills in 1955 is found in the data on yield of still gas. Production of still gas increased 12.6 percent in 1955 over 1954, with 7.5-percent increase in crude run to stills. Still gas, as reported by the Bureau of Mines, represents gas obtained as a result

[13] Oil and Gas Journal, New "Flood" Technique: Vol. 54, No. 26, Oct. 31, 1955, p. 63.
[14] Cook, Alton B., Coulter, Jr., R. H., Spencer, G. B., Chin, Tim, and Elliott, Jr., W. C., Secondary Recovery From Semidepleted Oil Reservoirs Converted to Gas-Storage Operations: Am. Gas Assoc. GSTS-56-2, May 10-11, 1956.
[15] Oil and Gas Journal, Humble Proposes Novel Gas-Injection Plan: Vol. 54, No. 15, Aug. 15, 1955, p. 99.
[16] Blade, O. C., National Motor-Gasoline Survey, Winter 1955-56: Bureau of Mines Inf. Circ. 7763, 1956, 26 pp.

of refinery operations and used mainly as fuel in refineries. Refinery gases used as charging stocks for polymerization, alkylation, hydrogenation, and similar petroleum-refinery processes are not reported as still gas.

Refinery Remodeling.—John M. Deal [17] gives an interesting and informative account of improving yield structure and quality of product brought about by changing refining techniques. The expansion and improvement program in refineries of the Union Oil Co. of California was carried on from June 1950 to April 1955 at a cost of $70,000,000.

The article states that in 1950 Union's gasoline production was only 38.6 percent of the volume of crude oil charged to stills, whereas in 1955 the yield was 43.7 percent; the yield of fuel oil was reduced from 37 percent of the crude oil in 1950 to less than 29 percent in 1950. Excluding the effect of price increases, the average realization per barrel of product sold during the first 6 months of 1955 was 10 percent above 1950.

Refining Processes.—Summaries of processes in use or available in 1955 for petroleum refining were published in the Oil and Gas Journal and in Petroleum Refiner.[18] [19] Flowsheets, typical charges and yields, and related data are given for a wide variety of processes. The article in Petroleum Refiner has a list of 221 references to literature cited.

Catalytic Reforming.—The major development in petroleum-refining technology in the United States in 1955 was probably the marked increase in using platinum as catalyst. Platinum as a catalyst in petroleum refining reforms naphtha fractions and increases their octane rating. Its increased use in petroleum refining is reflected in platinum sales to the chemical industry in recent years. The Bureau of Mines reports [20] that the chemical industry (including the petroleum industry) purchased 214,068 troy ounces of platinum in 1954 and 348,088 troy ounces in 1955. The Bureau of Mines estimates that about 90 percent of the 562,156 troy ounces of platinum purchased by the chemical industry in the 2 calendar years 1954 and 1955 was bought by the petroleum industry. Assuming an average price of $100 a troy ounce, the petroleum industry spent $50,594,000 for platinum in these 2 years.

Platinum was used as catalyst in 1955 in petroleum-refining processes known as catalytic reforming. Weber [21] reports that the installed capacity for catalytic reforming in United States refineries increased from 569,330 barrels per day at the end of 1954 to 926,469 barrels at the end of 1955—an increase of 357,139 barrels per day during the year 1955.

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[17] Deal, John M., How Union Gets Top Octane From Two California Plants: Oil Gas Jour., vol. 54, No. 46, Mar. 19, 1956, pp. 195–211.

[18] Oil and Gas Journal, Annual Refining Section: vol. 45, No. 26, Mar. 19, 1956, pp. 137–184.

[19] Petroleum Refiner, 1955 Process Issue: Vol. 34, No. 9, pp. 121–280, Sept. 1956.

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C. Helium

Helium

By Henry P. Wheeler, Jr.

GENERAL SUMMARY

THE BUREAU OF MINES met all Federal demands for helium in 1955; enough helium was made available to non-Federal users to fulfill all defense industry and medical requirements. Some non-Federal users requiring helium for civilian industries, advertising, and toy balloons were unable to obtain as much helium as they desired in the summer months.

Additional sources of helium-bearing gas became available to the Navajo (Shiprock), N. Mex., and Otis, Kans., plants in July, bringing relief from the temporary helium shortage a few months later. At year end, substantially all demands were being met.

The extremely close balance between supply and demand prompted the Bureau of Mines decision to expand production facilities at the present Exell, Tex., plant. Funds were provided in the 1955 Supplemental Appropriations Act; and an architect-engineering contract was awarded to Stearns-Roger Manufacturing Co. of Denver, Colo., in August 1955. When completed, the new facilities can produce an additional 150 million cubic feet per year.

PRODUCTION

In 1955, the Bureau of Mines, sole producer of helium, produced 220,710,600 cubic feet of helium at its 4 plants (Amarillo and Exell, Tex.; Otis, Kans.; and Shiprock, N. Mex.)—11.6 percent more than the previous record in 1954 and almost double the production in 1951. The demands for helium exceeded even this record production, however, and the Bureau of Mines withdrew 16,131,400 cubic feet of conservation helium from storage in the Cliffside field (near Amarillo). Thus, a total of 236,842,000 cubic feet of helium was made available for distribution.

Two plants obtained access to new sources of helium-bearing natural gas during the year. The connection of the Hogback field to the Navajo (Shiprock), N. Mex., plant was a major factor in enabling the Bureau of Mines to achieve the new production record. The Otis, Kans., plant benefited to a lesser degree from a pipeline connection with the nearby Reichel field.

TABLE 1.—Helium production in the United States, 1921–55

Year	Active plants	Production (cubic feet)
1921–January 1929 [1]	Fort Worth, Tex.	46,088,800
1929 (April)–1942	Amarillo, Tex.	164,867,100
1943	Amarillo and Exell, Tex.	116,307,400
1944	Amarillo and Exell, Tex., Otis and Cunningham, Kans., and Navajo (Shiprock), N. Mex.	126,933,100
1945	Amarillo and Exell, Tex., and Otis and Cunningham, Kans.	94,733,700
1946	do.	58,236,400
1947	Amarillo and Exell, Tex.	70,297,700
1948	Exell, Tex.	63,143,500
1949	do.	55,165,500
1950	do.	81,394,400
1951	Amarillo and Exell, Tex., and Otis, Kans.	112,009,200
1952	do.	144,556,100
1953	Amarillo and Exell, Tex., Otis, Kans., and Navajo, N. Mex.	161,086,800
1954	do.	190,741,400
1955	do.	220,710,600
Total		[2] 1,706,271,700

[1] No helium was produced at Government helium plants in February or March 1929. The Fort Worth plant was shut down Jan. 10, 1929, and the Amarillo plant was not put into operation until April.
[2] Includes 71,225,000 cubic feet extracted at the Exell plant and injected into the Government-owned Cliffside gas field for conservation, in excess of that subsequently withdrawn.

SHIPMENTS

The Bureau of Mines shipped 235,867,400 cubic feet of helium in 1955; 171,649,600 cubic feet went to Federal agencies and 64,217,800 cubic feet to non-Federal customers.

Efforts to improve the utilization of shipping containers continued. On July 1, 1955, all 78 Navy helium tank cars were transferred to the Bureau of Mines. With this transfer, the Bureau assumed responsibility for operating and maintaining the Government helium tank-car pool. The Bureau purchased 22 additional tank cars during the year—10 for itself and 12 for the Atomic Energy Commission. At year end the Government pool consisted of 88 Bureau of Mines cars designated MHAX and 19 Atomic Energy Commission cars designated ATMX—107 cars in all.

CONSUMPTION AND USES

Federal agencies received about 73 percent of the helium shipped in 1955, and 27 percent went to non-Federal customers. A survey [1] completed by the Bureau of Mines in December 1955 disclosed that at least 52 percent of the helium sold to private customers was used on Federal contracts. Thus, at least 87 percent of the helium shipped was used directly or indirectly for the benefit of the Federal Government.

The survey, representing information obtained from more than 800 companies, also revealed that inert-gas shielded-arc welding represents almost 66 percent of the private helium usage. Other important private uses were: (1) Leak detection, 8.5 percent; (2) titanium and zirconium production and fabrication, 9.0 percent; (3) research, 5.1 percent; (4) controlled atmospheres, 5 percent; (5) medical, 2.6 percent; and (6) transistors, 2.3 percent. Less than 1.5

[1] Helium—1955: Bureau of Mines, Mineral Industry Survey, 1955, 3 pp.

percent was for advertising and toy balloons, private lighter-than-air craft, and other miscellaneous purposes.

Because both Federal and private helium demands were increasing steadily, the Bureau of Mines was unable to meet the total demand early in the summer of 1955, and the supply available to private users was inadequate to meet their demands throughout the summer months. Consequently, an informal allocation system was utilized to assure that more important private helium requirements were met. Private helium distributors and users cooperated magnificently with the Bureau of Mines in making this system work.

Gas from the Hogback field in July boosted the production of the Navajo plant and enabled the Bureau of Mines to gradually increase the supply of helium to private users until the shortage was relieved in September.

RESERVES

Helium is a minor constituent (usually less than 1 percent) of some natural gases in the southwestern part of the United States. These gases are found in fields associated with buried igneous masses and are the only known sources from which helium can be produced economically and in large quantity. Helium also occurs in the earth's atmosphere (about 1 part in 200,000) and in gases from some mineral springs, volcanoes, and fumeroles.

Government Helium Reserves.—The Government owns or otherwise controls 4 helium-bearing natural gas deposits, which contain about 3 billion cubic feet of recoverable helium. Two of these deposits—Helium Reserve No. 1, Woodside Structure, Utah, and Helium Reserve No. 2, Harley Dome, Utah—are on lands of the public domain, are relatively small, and have not been used for producing helium.

The Government-leased Rattlesnake gas field, which is connected to the Navajo (Shiprock), N. Mex., helium plant, has been shut in since July, when helium-bearing gas became available to the plant from a privately owned source. Wells in the Rattlesnake field had begun to produce water with the gas before the shut-in, causing considerable doubt about previous estimates of the size of the field.

The Government-owned Cliffside field, which supplies helium-bearing gas to the Amarillo, Tex., plant, constitutes the principal Government reserve for the future. This field contains approximately 2 billion cubic feet of recoverable helium.

Other Sources of Helium-Bearing Natural Gas.—The Bureau of Mines is extracting helium in its Exell, Tex., and Otis, Kans., plants from natural gas produced by private companies for sale in fuel markets. This natural gas is produced whether or not the helium is removed, and the Bureau of Mines has no control over it.

Expansion of the facilities at Exell will permit the Bureau of Mines to recover most of the helium produced with fuel gas in that immediate area. However, a considerably greater volume is being transported to fuel markets through private pipelines not accessible to present plants, representing a great quantity of helium not utilized because the fields are natural-gas sources—not helium reserves. Thus, the only real helium reserves for the future are those controlled by the Government.

CONSERVATION

Although 16,131,400 cubic feet of conservation helium was withdrawn from the Cliffside field to meet current demands, the connection of the Hogback field to the Navajo plant enabled the Bureau of Mines to register a conservation gain during the year. The availability of this new helium source enabled the Bureau to shut in the Government-controlled Rattlesnake field and thereby conserve helium, which otherwise would have been produced from that reserve. At year end, 71,225,000 cubic feet of conservation helium remained in the Cliffside field.

The growing importance of helium to the national defense and economy has brought about an increased awareness of the need for a more extensive helium-conservation program. Helium resources of the Nation are being depleted while helium demands are increasing. A few years ago helium resources seemed adequate for many years to come; now, the continued upward trend in demand, coincident with depletion of helium-bearing natural-gas resources, portends a much shorter period of adequate supply. Conservation undoubtedly will be an important factor in future helium programs.

PRICES

The Helium Act (50 Stat. 885; 50 U. S. C. 161, 163–166) provides that Federal agencies may requisition helium from the Bureau of Mines by paying proportionate shares of the expenses incident to the administration, operation, and maintenance of the Government helium plants and properties. Throughout 1955 the price to Federal agencies was $15.50 per thousand cubic feet.

The price of helium sold by the Bureau of Mines to non-Federal customers was $19.00 per thousand cubic feet. An additional charge of $2.00 per thousand cubic feet was made to cover compressing costs when the helium was required in standard-type cylinders. These charges and other information concerning the sale of helium by the Bureau of Mines are included in the Code of Federal Regulations (30 C. F. R. 1).

FOREIGN TRADE

Helium is not known to be produced in commercial quantities outside the United States. Relatively small quantities of helium are exported annually, after application to the Secretary of State and the subsequent issuance of a license authorizing such exportation.

TECHNOLOGY

Development and testing of new equipment and techniques to reduce horsepower requirements and increase efficiency of helium production progressed during the year; major emphasis was directed toward planning and developing specifications for the new helium-production facilities at Exell. The Bureau's technical staff at Amarillo, working closely with the architect-engineer contractor, assisted the purchasing group in procuring major items of equipment. In this way, the Bureau of Mines will have much of the material on order and

scheduled for delivery when the design phase is completed and a contract is awarded for constructing the new facilities.

The continuous survey of new natural-gas fields to determine possible new sources of helium was kept up to date. Research also was continued on the phase relationships and thermodynamic properties of selected helium-bearing gases. A windowed equilibrium cell and phase-equilibrium apparatus were designed and constructed for use at pressures up to 800 p. s. i. g. Other investigations included a test of the effect of pressure variation upon solid desiccants and a review of the use of thermal conductivity cells in monitoring helium content of gas streams.

PART III. APPENDIX

Tables of Measurement

Volumetric measures

	U. S. gallons	Imperial gallons	Cubic feet	Barrels	Cubic centimeters	Liters	Cubic meters
1 U. S. gallon [1]	1	0.83268	0.13368	0.02381	3,785.4	3.7853	0.0037854
1 imperial gallon [2]	1.201	1	.16054	.028594	4,546.04	4.5460	.004546
1 cubic foot	7.4805	6.22888	1	.17811	28,317.01	28.316	.028317
1 barrel [3]	42	34.972	5.6146	1	158,987.55	158.98	.15899
1 cubic centimeter	.00026417	.00021996	.000035314	.0000062895	1	.00099997	.000001
1 liter	.26418	.219976	.035316	.0062899	1,000.027	1	.001000027
1 cubic meter	264.17	219.97	35.314	6.2898	1,000,000.	999.97	1

[1] U. S. gallon=the volume occupied by 231 cubic inches.
[2] 1 imperial gallon=the volume occupied by 10 pounds of water at 62° F. when weighed against brass in air at 30″ barometric pressure.
[3] 1 barrel=42 U. S. gallons.

Weight measures

	Pounds	Kilograms	Short or net tons	Metric tons	Long ton
1 pound	1	0.45359	0.0005	0.00045359	0.00044643
1 short or net hundredweight	100.0	45.359	.05	.04536	.04464
1 gross or long hundredweight	112.0	50.802	.056	.05080	.05
1 kilogram	2.2046	1	.0011023	.001	.0009842
1 short or net ton	2,000	907.185	1	.90718	.89286
1 metric ton	2,204.6	1,000	1.1023	1	.98421
1 long ton	2,240	1,016.06	1.12	1.01606	1

NOTE.—1 English water ton=the volume occupied by 1 long ton of water at 60° F

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