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Commission. Rates and Re-
search Dept.

A survey of rural electri-
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SURVEY OF RURAL ELECTRIFICATION IN WISCONSIN

- COMPARISON OF RETAIL RATES
- RURAL LINE EXTENSION POLICIES
- GROWTH & DISTRIBUTION OF CUSTOMERS
- COST & CONSUMPTION RATIOS
- MISCELLANEOUS STATISTICS RELATING TO RURAL ELECTRIC SERVICE IN WISCONSIN

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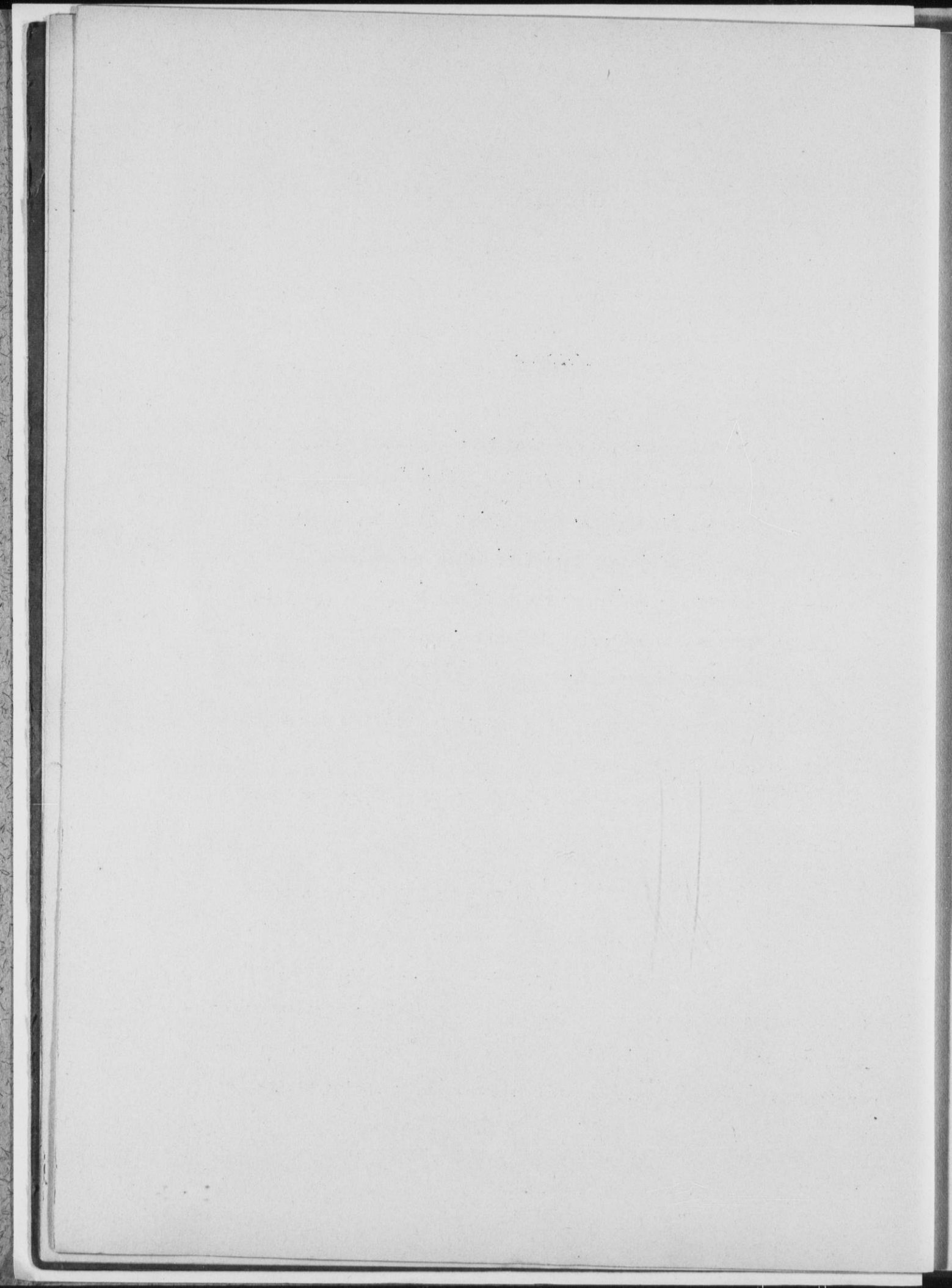
INDEX TO CHARTS

CHART A1	NET MONTHLY ELECTRIC BILLS FOR 40 KILOWATT-HOURS
CHART A2	" " " " " 50 " "
CHART A3	" " " " " 100 " "
CHART A4	" " " " " 150 " "
CHART A5	" " " " " 250 " "
CHART B	WEIGHTED AVERAGE OF NET MONTHLY BILLS FOR RURAL ELECTRIC SERVICE
CHART C	COST AND CONSUMPTION RATIOS FOR RURAL ELECTRIC SERVICE IN WISCONSIN AND EAST HALF OF UNITED STATES
CHART D	COST AND CONSUMPTION RATIOS FOR RURAL ELECTRIC SERVICE FOR 8 PRIVATE UTILITIES IN WISCONSIN
CHART E	TOTAL GROSS FARM INCOME AND YEARLY INCREASE IN NUMBER OF CUSTOMERS
CHART F	NUMBER OF RURAL ELECTRIC CUSTOMERS IN WISCONSIN
CHART G	NUMBER OF FARMS RECEIVING ELECTRIC SERVICE IN UNITED STATES
CHART H	FARM ELECTRIFICATION, LAND VALUE, GROSS INCOME AND FARM DENSITY IN WISCONSIN
CHART J	PER CENT AND NUMBER OF OCCUPIED FARMS ELECTRIFIED AND FARM DENSITY PER SQUARE MILE IN WISCONSIN AND FIVE SURROUNDING STATES



FOREWORD

This bulletin has been prepared under the auspices of the Work Projects Administration, Official Project No. 665-53-3-41, Clifford E. Johnson, Associate Director; under the general supervision and sponsorship of the Public Service Commission of Wisconsin, Rates and Research Department.



INTRODUCTION

A comparison of the charges made for rural electric service by 38 electric companies and cooperatives in Wisconsin is presented in this bulletin in the form of net monthly bills calculated on the basis of certain definite quantities of electrical energy, assumed to represent typical conditions of service.

Net bills, effective as of July 1, 1939, were computed for 40, 50, 100, 150, and 250 kilowatt-hours of energy. These bills are assumed to be typical of the following types of consumption by a rural (farm) customer.

Lighting and small appliances - 40 kilowatt-hours per month

Lighting, small appliances,
and small pumping - 50 kilowatt-hours per month

Lighting, small appliances,
pumping and refrigeration - 100 kilowatt-hours per month

Lighting, small appliances,
pumping, refrigeration, and
miscellaneous farm equipment - 150 kilowatt-hours per month

Lighting, small appliances,
pumping, refrigeration, mis-
cellaneous farm equipment,
and cooking - 250 kilowatt-hours per month

A farm customer as referred to in this bulletin is defined as a user of electric current who is engaged primarily in agricultural pursuits, including farming, gardening, stock raising, poultry raising, and dairying, in a location outside the limits of an urban community, at such a distance that he cannot be served adequately by a

secondary extension from the local urban distribution system. The service to be furnished under the bills included in this comparison is assumed to be nominally 115-230 volts, single phase, 60 cycle, alternating current.

The bills for the privately owned and municipal utilities were calculated from the rate schedules filed with the Public Service Commission. The rates for the rural electric cooperatives were computed from the rate schedules filed with the Wisconsin Development Authority.

It is difficult to make comparisons of the cost of rural electric service offered by the various utilities in widely separated parts of the state. The length of the extension of line required to serve a customer, the magnitude and character of the load, and the special conditions included in the rate schedules of each utility, make strictly accurate comparisons of the rates impossible.

LINE EXTENSION POLICIES

Most rural line extensions at present are made at the expense of the utilities under ordinary conditions. However, the first extensions of lines into rural areas in this state, beginning twenty or more years ago, were usually financed largely by customers. Beginning about fifteen years ago, stimulated by pressure from the commission, rural line extensions were increasingly made largely at the expense of the utilities until today customer contributions toward the main line investment are the

exception rather than the rule. This development has been accompanied by adjustment or refund of previous contributions and old customers transferring to the utility-financed rates and rules. However, in some instances such transfers have not been effected or for one reason or another the old rates and rules have remained as standard or optional. Under these circumstances a comparison of rural rates must include consideration of customer contributions where they still exist.

An analysis of the rural extension policies of the utilities included in this study, reveals that the provisions with respect to customer contributions vary widely among companies, both as to amount and to the method of payment. To put all companies on an equal basis for comparison, bills were based on a customer density of three per mile and an average extension cost of \$1,000 per mile of line or \$333.33 per customer.

Some of the more common types of rural extension plans in effect in Wisconsin are as follows:

1. Fixed Maximum Company Investment

The utility will invest up to a certain specified amount per customer toward the construction cost of the line. If the average cost of the line exceeds this amount, then the excess is paid by the customer. An example of this type of plan is that of a private utility which will invest up to \$400 per customer in extending rural lines. Assuming three customers per mile and a construction cost of \$1,000 per mile of line, the cost per cus-

tomer will be \$333.33 and the utility will make the extension without cost to the customer. Six of the utilities included had this type of extension policy. One private utility included would invest up to \$200 per customer for rural line extension, the balance to be paid by the customer. Based on the foregoing assumption of \$333.33 per customer line construction cost, the customer then would be required to pay the balance of \$133.33 to receive service.

2. Revenue Guarantee

The utility will extend service, without cost to the customer, provided that the length of such extension does not exceed a certain fixed limit, and provided further that the customer contracts for service for a certain number of years (usually three) and guarantees the company a minimum bill. An example of this type of extension plan is that of three private companies which will make extensions up to three-quarters ($3/4$) of a mile to a rural customer without charge. Under this plan, the customer is required to guarantee the company an annual revenue of at least \$48 for a period of three years. The utilities having the above plan provide that the customer can, at his option, receive service at the regular rate without a revenue guarantee, provided that such customer pay in advance to the company an amount equal to the estimated cost of the extension, but not in excess of \$150.

3. Free Limit

Some utilities specify in their rural extension rules that they will extend service, without cost to the customer, up to a certain specified distance. If an extension required to serve a customer is greater than the "free limit" the customer may be required to finance the remaining portion of the line, either by a cash payment or by one of the other methods explained herein. Two of the utilities included in this comparison stipulated that they would make extensions, without cost to the customer, up to two standard spans and two poles or four standard spans if poles were in place. These utilities also included a type of revenue guarantee clause in their extension policy. One utility specified that it would make further extensions without cost to the customer provided that the cost of extension as estimated by the utility was not greater than three (3) times the utility's estimated annual revenue to be derived from the extension. Rules of this character are frequently applied in urban areas and are not usually adapted to extensive rural development.

4. Customer and Company Financed Rate Schedules

Some utilities have separate rate schedules for company and customer-financed lines. One privately owned utility having this type of plan charges a flat rate of \$1.25 net per month extra for the first block of 15 kilowatt-hours of energy to customers who have not contributed toward line extension cost.

5. Increased Minimum Bill

Minimum monthly bills vary with the company's investment

in some cases. One utility requires that the minimum bill be increased 50¢ with every \$30 increase in investment from \$250 to \$400 per customer. For example, this utility's minimum bills are based on the following table:

<u>Company Investment</u>	<u>Minimum Monthly Bill</u>
\$250 or less	\$2.75
251 - 280	3.25
281 - 310	3.75
311 - 340	4.25
341 - 370	4.75
371 - 400	5.25

If the cost of the extension exceeds \$400 per customer, contributions covering the excess cost will be made by the customers, and in addition, a monthly charge of 7/10 of one per cent (.7%) of such contributions will be added to the bill.

6. Service Charge

Under this type of rate, the fixed charges on line construction cost are borne entirely or in part by the customer in the form of a service charge, independent of the energy charge and graduated upon the amount of the investment only. One utility having this plan requires the customer to pay, in addition to the regular energy charge, \$1.00 net per month where the average investment in the extension per customer is less than \$150, plus \$.75 net per month for each \$100 of investment per customer in excess of \$150.

7. Objective Rate Plan

Under this plan the utility offers reduced rates to cus-

tomers in certain areas when the customer density has reached a certain definite quota.

8. Group or Area Plan

The rural extension policies explained above are applicable in general to rural electric line extensions to serve as few as one customer. Some of the utilities, however, will make extensions to a group of customers on a project basis provided that the average conditions for the whole area meet the specified requirements, even though some individual customers may not.

9. R. E. A. Cooperative Extension Policy

The Rural Electrification Administration at Washington will make 20-year loans at 2.88 per cent interest, chiefly to farmers' cooperatives, but also to public power districts, private utilities and other agencies, for the entire cost of building electric transmission and distribution lines. Practically all R. E. A. loans to Wisconsin have been made to Rural Electric Cooperative Associations, organized on a project unit basis. The area covered by such a project is dependent upon its economic and engineering feasibility. R. E. A. initially would not approve projects having an average potential customer density of less than three customers per mile; however, many of the cooperatives in Wisconsin have not reached this quota to date. With the exception of a small membership fee, the customer or member of the cooperative is not required to make any further contribution toward line construction costs. Part of his monthly electric bill goes back to the Federal govern-

ment toward amortization of, and interest on, the loan. Extensions of cooperative lines may be made, provided that such extension has first been approved by R. E. A.

RATE SCHEDULES

Electric service is offered to rural customers under a large number and great variety of rate schedules. The trend in Wisconsin is toward the simplification of rural rate schedules, although some of the utilities included in this survey still have in effect rate schedules which are complex and involve numerous special condition clauses. Some of the special conditions which affect the amount of the bills, and the assumptions used in each are as follows:

- (a) Where the rate schedules are affected by the size of transformer used, it was assumed that only one customer is served from each transformer, with capacities of: $1\frac{1}{2}$ KVA for bills of 40, 50, and 100 kilowatt-hours
3 KVA for bills of 150 and 250 kilowatt-hours.
- (b) Heating and cooking customers are served through a single meter at the standard rate.
- (c) Where rate schedules are affected by connected motor load, bills are based on a total installed capacity of three (3) rated horsepower.
- (d) The net monthly bills tabulated herein are based upon service from distribution lines of 6600-6900 volts or

less where this feature affects the rate schedules from which the bills were computed.

- (e) Special rates for electric water heating are not included in this study since the conditions under which this service is offered vary considerably. The time of use is usually restricted to off-peak hours, which differ among utilities.

1. Minimum Charge Block Rate

The most common type of rate schedule used by the Wisconsin utilities and cooperatives in marketing electrical energy to the rural consumer, is the "Block" type rate with a minimum charge for the initial block of energy. This type of rate schedule provides lower prices per kilowatt-hour for successive blocks of kilowatt-hours used.

An example of this type of rate is that of a private utility in Wisconsin which is as follows:

<u>RATE</u>	
First 30 kw-hrs. or less used per month	\$4.20 gross, \$4.00 net
Next 420 kw-hrs. used per month	2.7¢ " 2.5¢ " per kw-hr.
Over 500 kw-hrs. used per month	2.2¢ " 2.0¢ " " "
Minimum Monthly Bill	\$4.20 " \$4.00 "

Prompt Payment Discount

The difference between bills at the gross and net rates will be the discount if bills are paid on or before the last discount date.

Sample Bill

Assume that a rural customer used 520 kilowatt-hours of electricity in one month; his net bill under the above rate for that particular month would be computed as follows:

First 80 kw-hrs.	\$ 4.00 net
Next 420 kw-hrs. @ .025	10.50 "
Next 20 kw-hrs. @ .02	.40 "
Total 520 kw-hrs.	<u>\$14.90</u> "

If the above bill were not paid on or before the last discount date, the amount due would be \$1.08 greater or a total of \$15.98.

2. Service Charge Rate

This type of rate has two parts: (1) A flat service charge, which is independent of the amount of energy used but depends usually on the size of transformer used to serve the customer; and (2) an energy charge, usually graduated by the block method explained above.

The service charge is intended to cover most of the costs incident to special investment for serving the customer, principally the fixed charges on a transformer in rural service, and certain operating expenses such as meter-reading, billing, collecting and customer accounting which likewise are independent of the customer's use of energy. Those costs not covered by the service charge are reflected in the energy charges. Usually the minimum bill is the service charge.

An example of this type of rate is that of one of the private

utilities included in this study and is as follows:

Transformer Charge

2 KVA or less	\$1.50 net per month
3 KVA	2.00 " " "
5 KVA	2.50 " " "

Energy Charge

First 20 kw-hrs. per month	7¢ net per kw-hr.
Over 20 kw-hrs. per month	3.5¢ " " "

Minimum Bill

The transformer charge.

Sample Bill

Assume that a customer used 42 kilowatt-hours of energy in a month. The bill would be computed as follows:

Transformer Charge

(assumed $1\frac{1}{2}$ KVA transformer) \$1.50 net

Energy Charge

20 kilowatt-hours	@	7¢	=	\$1.40
22 kilowatt-hours	@	3.5¢	=	<u>.77</u>
Total net bill				\$3.67

3. Active Room Rate

This rate is also a form of "Block" rate in which the size of the blocks is determined by the number of so-called "active" rooms in the farm unit as defined by the utility rate. A customer having a large home and several wired out-buildings, therefore, would have to consume more electricity to get into the lower rate block than a farmer who has a smaller house and fewer buildings.

One utility having this type of rate has the following re-

quirements:

Service Charge

Two dollars (\$2.00) per month for four or less active rooms plus forty cents (\$.40) per month for each active room in excess of the first four.

Service charge shall include energy consumption equivalent to five kilowatt-hours per active room per month or not less than 20 kilowatt-hours in case the active rooms are less than four.

Energy Charge

Three and four-tenths cents (3.4¢) per kilowatt-hour for all energy consumed in excess of 5 kilowatt-hours per active room or in excess of 20 kilowatt-hours, in case the active rooms are less than four, up to a total of 500 kilowatt-hours consumed during the month. Two cents (2.0¢) for all over 500 kilowatt-hours used per month.

Discount

5% of gross bill if paid on or before last discount date.

Active Rooms

The number of active rooms shall be computed on the following basis:

(1) All rooms contained in the residence shall be counted as active, except bathrooms, basements, garrets, closets, halls, pantry, unwired storage rooms, and rooms used as bedrooms or sleeping quarters but not used for other purposes.

(2) Rural installations having barns, poultry houses, or greenhouses, but not wired, shall have residence count increased by one active room.

(3) Rural installations having barns, poultry houses, or greenhouses wired shall have their counts increased by one active room for each separate horse barn, dairy barn, poultry house, and greenhouse actually connected to the distribution system and receiving energy. A barn used as a combination horse and dairy barn shall be counted only as one active room.

Sample Bill

The bill for 100 kilowatt-hours of use per month under this type of rate would be computed as follows: (Assume 5 active rooms)

Service Charge

For 4 active rooms	\$2.00
One extra room	<u>.40</u>
Total (Includes 5 kw-hrs. per room or 25 kw-hrs.)	2.40

Energy Charge

75 kilowatt-hours @ 3.4¢	<u>2.55</u>
Total gross bill	4.95
Discount .05 x 4.95	<u>.25</u>
Total net bill	\$4.70

INTEREST ON CUSTOMERS' INVESTMENT

As previously explained, rural customers have been and sometimes now are required to make an investment in rural lines in order to obtain electric service. This investment, depending on the method of its payment, has an effect on the cost of electricity

to the new customer. For the purpose of this comparison, the net monthly electric bills have been computed under the terms of the utilities' rates and in order to make the bills comparable with those where no customer contribution is required, there has been added to these bills an interest charge on the customers' investment computed at the rate of $\frac{1}{2}$ of one per cent (.5%) per month on this amount.

As an example, let us take the case of a utility, included in this comparison, which will invest up to \$200 per customer, the balance to be paid by the customer. Based on the assumption that it will cost \$333.33 to construct a line to serve one customer, then the customer would be required to pay the company \$133.33 to receive service. One half ($\frac{1}{2}$) of one per cent interest on this amount, or \$.67 has therefore been added to the regular monthly bill and the total amount is regarded in the comparisons as the net monthly bill.

The interest on customer's investment included in the net monthly bills is shown in tables I and II.

NET MONTHLY BILLS FOR RURAL ELECTRIC SERVICE

In Tables I, II, and III are listed the net monthly bills, effective as of July 1, 1939 for rural electric service in Wisconsin communities served by 15 private companies, 5 municipal utilities and 18 rural electric cooperatives, which serve approximately 92% of all rural customers in Wisconsin. Only the rates which are available to the customer under the assumed conditions, and which result in the minimum bill for any consumption, are tabulated in the following tables. Exceptions to this procedure are pointed out by footnotes at the end of each table.

The bills for all 38 utilities and cooperatives are compared graphically on charts A1 to A5, inclusive, for consumptions of 40, 50, 100, 150, and 250 kilowatt-hours per month. The lowest bills which are available under any of the rates included in tables I, II, and III for each consumption are used in this comparison.

Weighted averages of net monthly bills for each consumption for municipal and private utilities and cooperatives are summarized in table IV. These averages were computed by multiplying the low net bill for each utility by the number of rural customers. The total of these products for each group (private, municipal, or cooperative) was then divided by the total number of customers in each group, to get the average net monthly bill.

It is interesting to note that the weighted averages of net monthly bills for private and municipal utilities and rural coop-

eratives vary only slightly for any of the assumed typical amounts of consumption per month. (See chart B) The greatest variation was found in the average bills for 40 kilowatt-hours per month, where the municipal average bill is approximately 15% higher than that for the cooperatives. For all other typical amounts of use the variation between the average bills was less than 10%.

For consumptions of 40 and 50 kilowatt-hours per month, the cooperatives offered the lowest rates, while the average bills charged by municipal utilities were the lowest of the three for consumptions of 100, 150, and 250 kilowatt-hours per month.

As previously explained, the average bills for private and municipal utilities were computed from the lowest bill for each consumption, which was available under any rate. In many cases, the rate which results in the lowest bill is not available to the customer under the assumed conditions until after such customer has been receiving service for an initial development period of three years. All customers connected to cooperative lines receive service at the rates tabulated herein.

TABLE I
NET MONTHLY BILLS FOR RURAL ELECTRIC SERVICE IN WISCONSIN*
15 PRIVATE UTILITIES
AS OF JULY 1, 1939

Name of Utility	Interest on Customer Investment ^{1/}	Minimum Charge		Net Monthly Bills				
		Amount	Kw-hr. Included	40 Kw-hrs.	50 Kw-hrs.	100 Kw-hrs.	150 Kw-hrs.	250 Kw-hrs.
Wis. Power & Light Co.	-	\$4.00	50	\$4.00	\$4.00	\$6.25	\$7.50	\$10.00
Wis. Gas & Electric Co.	-	4.00	80	4.00	4.00	4.50	5.75	8.25
Standard Rate	-	4.00	80	4.00	4.00	4.50	5.75	8.25
Optional Rate ^{2/}	\$.75 ^{3/}	3.03	25	3.51	3.84	4.70	6.32	9.55
Wis. Public Service Corp.	-	4.00	50	4.00	4.00	6.25	7.50	10.00
Standard Rate ^{4/}	-	4.00	50	4.00	4.00	6.25	7.50	10.00
Wis. Michigan Power Co.	-	4.00	80	4.00	4.00	4.50	5.75	8.25
Standard Rate	-	4.00	80	4.00	4.00	4.50	5.75	8.25
Optional Rate ^{2/}	.75 ^{3/}	3.03	25	3.53	3.86	4.77	6.44	9.76
Wis. Electric Power Co.	-	4.00	80	4.00	4.00	4.50	5.75	8.25
Standard Rate	-	4.00	80	4.00	4.00	4.50	5.75	8.25
Optional Rate ^{2/}	.75 ^{3/}	3.03	25	3.51	3.84	4.70	6.32	9.55
Northern States Power Co.	-	4.00	50	4.00	4.00	6.25	7.50	10.00
Standard Rate ^{5/}	-	4.00	50	4.00	4.00	6.25	7.50	10.00
Wis. Hydro Electric Co.	-	7.50	80	7.50	7.50	8.10	9.60	12.60
Standard Rate ^{6/}	-	7.50	80	7.50	7.50	8.10	9.60	12.60
Objective Rate ^{7/}	-	4.50	40	4.50	4.80	6.30	7.80	10.80
Lake Superior Dist. Power Co.	-	4.25	53	4.25	4.25	5.65	6.90	9.40

TABLE I (Continued)

Name of Utility	Interest on Customer Investment ^{1/}	Minimum Charge		Net Monthly Bills				
		Amount	Kw-hr. Included	40 Kw-hrs.	50 Kw-hrs.	100 Kw-hrs.	150 Kw-hrs.	250 Kw-hrs.
Neshonoc Light & Power Co.								
West Salem	-	\$3.25	15	\$4.50	\$5.00	\$6.75	\$8.50	\$10.50
Stevenson, Burr Oaks, Mindora	-	3.25	15	5.00	5.70	7.70	9.70	12.70
Dahlberg Light & Power Co. ^{8/}	-	2.50	0	5.33	5.73	7.73	9.23	12.23
Kegonsa Electric Line Co.	^{2/}	2.49	0	4.13	4.54	5.56	6.59	8.64
Interstate Power Co.	\$.17	6.12	75	6.12	6.12	6.87	8.25	10.75
Northwestern Wis. Electric Co.	.17	4.97	50	4.97	4.97	7.22	8.72	11.72
Polk Burnett Light & Power Co.	.17	4.97	50	4.97	4.97	7.22	8.72	11.72
Pleasant Springs Light & Power Co.	.67	2.17	0	4.27	4.62	6.37	8.62	12.12

* Based on three customers per mile.

^{1/} Computed at $\frac{1}{2}$ of 1% per month on contribution required of the customer under the assumption of 3 customers per mile and line construction cost of \$1,000 per mile.

^{2/} Optional rate based on 5 active rooms.

^{3/} Applies only to bills of \$4.00 and less

^{4/} Optional rate provides lower bills than the standard rate for consumptions of 36 kw-hrs. or less in the Eastern division, and of 33 kw-hrs. or less in Wisconsin Valley division.

^{5/} A rural residential rate provides lower bills than the standard farm rate for consumptions of 37 kw-hrs. or less.

TABLE I (Continued)

- 6/ Customers in Durand division connected before April 1, 1937 have rates available which are lower than the standard rate.
- 7/ The objective rate becomes available to the customers when the density increases to certain fixed quotas. As of July 1, 1939 practically all farm customers in the Amery division had been transferred to the Objective Rate, now being made the standard rate.
- 8/ Bills based on connected motor load of $1\frac{1}{2}$ H.P.
- 9/ Interest charge varies for each bill, since contribution required varies with revenue.

TABLE II
NET MONTHLY BILLS FOR RURAL ELECTRIC SERVICE IN WISCONSIN*
5 MUNICIPAL UTILITIES
AS OF JULY 1, 1939

Name of Utility	Interest on Customer Investment ^{1/}	Minimum Charge		Net Monthly Bills				
		Amount	Kw-hrs. Included	40 Kw-hrs.	50 Kw-hrs.	100 Kw-hrs.	150 Kw-hrs.	250 Kw-hrs.
PLYMOUTH								
Standard Rate ^{2/}	-	\$2.57	0	\$4.17	\$4.37	\$5.37	\$6.70	\$8.70
Optional Rate	-	4.80	80	4.80	4.80	5.20	6.20	8.20
MARSHFIELD	-	1.73	0	4.33	4.63	5.93	7.90	9.90
STURGEON BAY	\$1.37	3.37	25	4.00	4.30	5.79	7.28	9.40
KAUKAUNA								
Standard Rate ^{3/}	-	3.42	53	3.42	3.42	4.75	5.94	8.31
OCONOMOWOC	-	4.00	80	4.00	4.00	4.50	5.75	8.25

* Based on three customers per mile.

^{1/} Computed at $\frac{1}{2}$ of 1% per month on contribution required of the customer under the assumption of 3 customers per mile and line construction cost of \$1,000 per mile.

^{2/} Assumes 6600 volt line. Utility's rate schedule based on estimated line construction cost of \$900 per mile or \$300 per customer, and 4% carrying charge on such investment in utility financed lines.

^{3/} Some of this utility's rural customers served under special conditions pay higher rates.

TABLE III
NET MONTHLY BILLS FOR RURAL ELECTRIC SERVICE IN WISCONSIN
18 RURAL ELECTRIC COOPERATIVES
AS OF JULY 1, 1939

<u>Name of Cooperative</u>	<u>Interest on Customer Investment^{1/}</u>	<u>Minimum Charge</u>		<u>Net Monthly Bills</u>				
		<u>Amount</u>	<u>Kw-hr. Included</u>	<u>40 Kw-hrs.</u>	<u>50 Kw-hrs.</u>	<u>100 Kw-hrs.</u>	<u>150 Kw-hrs.</u>	<u>250 Kw-hrs.</u>
Lafayette		\$3.50	50	\$3.50	\$3.50	\$6.00	\$7.50	\$ 9.88
Oakdale		3.50	40	3.50	4.00	6.00	7.25	9.25
Oconto		3.25	40	3.25	3.65	5.35	6.60	8.60
Pierce-Pepin		3.50	40	3.50	4.00	5.90	6.90	8.65
Richland		3.50	40	3.50	3.95	5.80	7.05	9.18
Rock		3.50	50	3.50	3.50	5.75	7.25	9.88
Taylor		3.50	40	3.50	4.00	5.90	6.90	8.53
Trempealeau		3.50	40	3.50	3.95	5.70	6.70	8.33
Vernon		3.50	40	3.50	3.95	5.70	6.70	8.45
Barron		3.50	40	3.50	4.00	6.00	7.25	9.25
Buffalo		3.50	40	3.50	4.00	5.90	6.90	8.53
Chippewa		3.50	40	3.50	4.00	5.90	6.90	8.53
Clark		3.50	40	3.50	4.00	5.90	6.90	8.53
Columbus		3.50	40	3.50	4.00	6.00	7.25	9.38

TABLE III (Continued)

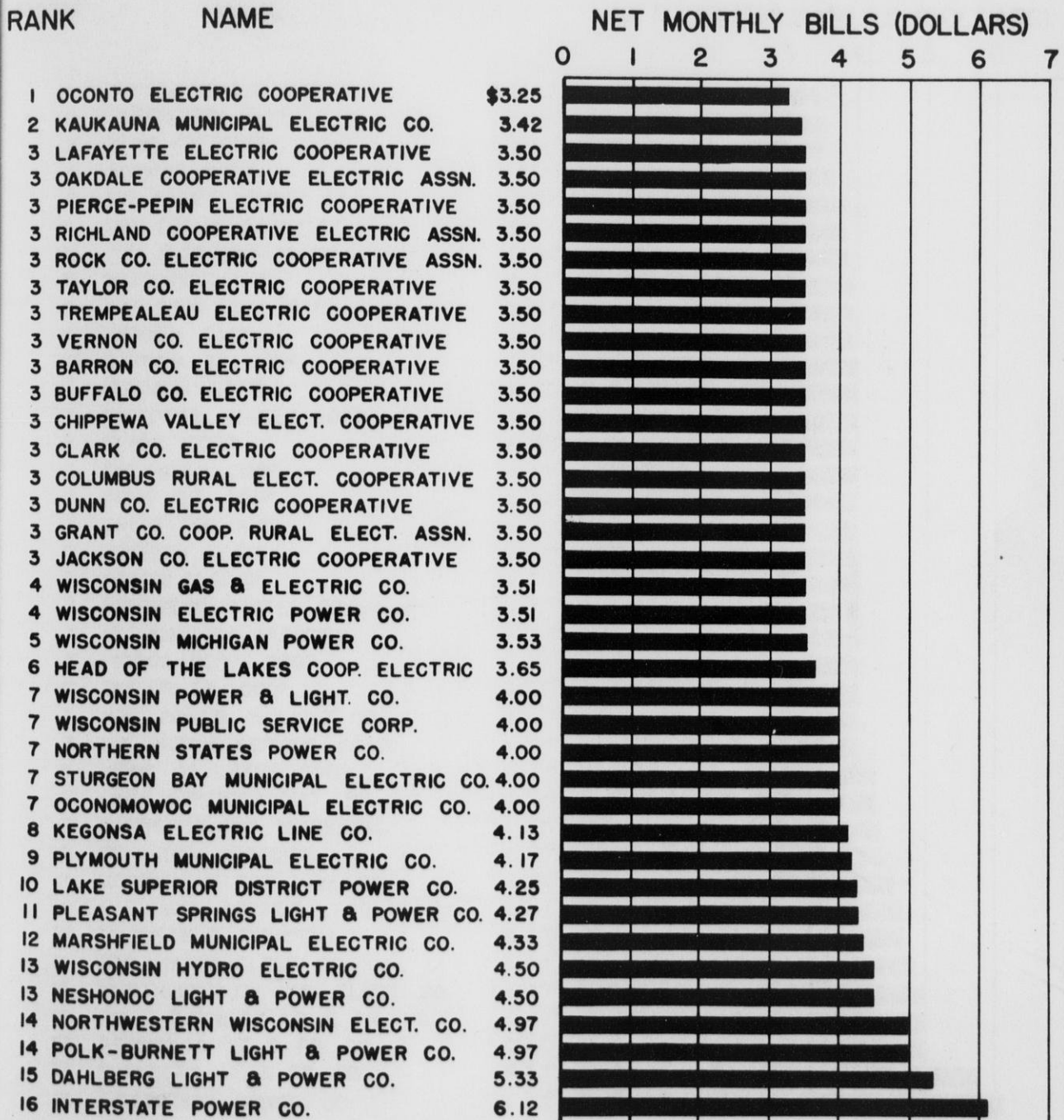
<u>Name of Cooperative</u>	<u>Interest on Customer Investment^{1/}</u>	<u>Minimum Charge Kw-hr. Amount Included</u>	<u>Net Monthly Bills</u>				
			<u>40 Kw-hrs.</u>	<u>50 Kw-hrs.</u>	<u>100 Kw-hrs.</u>	<u>150 Kw-hrs.</u>	<u>250 Kw-hrs.</u>
Head of the Lakes (Douglas)		\$2.75 25	\$3.65	\$4.25	\$5.85	\$7.10	\$ 9.10
Dunn		3.50 40	3.50	4.00	5.90	6.90	8.53
Grant		3.50 40	3.50	4.00	6.00	7.25	9.38
Jackson		3.50 40	3.50	4.00	6.00	7.25	9.25

^{1/} Cooperative lines are built entirely with funds borrowed from the Federal Government. The customer or member is not required to make any direct cash contribution toward the construction cost of the line. Net monthly bills include interest and payments on the loan, which is intended to be payed back over a period of 20 years.

CHART AI
**NET MONTHLY BILLS FOR RURAL ELECTRIC SERVICE
 IN WISCONSIN COMMUNITIES SERVED BY
 20 ELECTRIC UTILITIES AND 18 COOPERATIVES**

40 KILOWATT HOURS

EFFECTIVE AS OF JULY 1, 1939



ABOVE BILLS ARE BASED ON THE FOLLOWING ASSUMPTIONS:

1. *Three customers per mile.*
2. *Line extension cost of \$1000 per mile or \$333.33 per customer.*
3. *One customer served from each transformer with capacity of 1½ KVA.*

CHART A1
 NET MONTHLY BILLS FOR RURAL ELECTRIC SERVICE
 IN WISCONSIN COMMUNITIES SERVED BY
 20 ELECTRIC UTILITIES AND 18 COOPERATIVES
 40 KILOWATT HOURS
 EFFECTIVE AS OF JULY 1, 1933

RANK	NAME	NET MONTHLY BILLS-DOLLARS									
		0	1	2	3	4	5	6	7	8	9
1	ADAMS ELECTRIC COOPERATIVE	2.15									
2	ADAMS ELECTRIC COOPERATIVE	2.15									
3	ADAMS ELECTRIC COOPERATIVE	2.15									
4	ADAMS ELECTRIC COOPERATIVE	2.15									
5	ADAMS ELECTRIC COOPERATIVE	2.15									
6	ADAMS ELECTRIC COOPERATIVE	2.15									
7	ADAMS ELECTRIC COOPERATIVE	2.15									
8	ADAMS ELECTRIC COOPERATIVE	2.15									
9	ADAMS ELECTRIC COOPERATIVE	2.15									
10	ADAMS ELECTRIC COOPERATIVE	2.15									
11	ADAMS ELECTRIC COOPERATIVE	2.15									
12	ADAMS ELECTRIC COOPERATIVE	2.15									
13	ADAMS ELECTRIC COOPERATIVE	2.15									
14	ADAMS ELECTRIC COOPERATIVE	2.15									
15	ADAMS ELECTRIC COOPERATIVE	2.15									
16	ADAMS ELECTRIC COOPERATIVE	2.15									
17	ADAMS ELECTRIC COOPERATIVE	2.15									
18	ADAMS ELECTRIC COOPERATIVE	2.15									
19	ADAMS ELECTRIC COOPERATIVE	2.15									
20	ADAMS ELECTRIC COOPERATIVE	2.15									
21	ADAMS ELECTRIC COOPERATIVE	2.15									
22	ADAMS ELECTRIC COOPERATIVE	2.15									
23	ADAMS ELECTRIC COOPERATIVE	2.15									
24	ADAMS ELECTRIC COOPERATIVE	2.15									
25	ADAMS ELECTRIC COOPERATIVE	2.15									
26	ADAMS ELECTRIC COOPERATIVE	2.15									
27	ADAMS ELECTRIC COOPERATIVE	2.15									
28	ADAMS ELECTRIC COOPERATIVE	2.15									
29	ADAMS ELECTRIC COOPERATIVE	2.15									
30	ADAMS ELECTRIC COOPERATIVE	2.15									
31	ADAMS ELECTRIC COOPERATIVE	2.15									
32	ADAMS ELECTRIC COOPERATIVE	2.15									
33	ADAMS ELECTRIC COOPERATIVE	2.15									
34	ADAMS ELECTRIC COOPERATIVE	2.15									
35	ADAMS ELECTRIC COOPERATIVE	2.15									
36	ADAMS ELECTRIC COOPERATIVE	2.15									
37	ADAMS ELECTRIC COOPERATIVE	2.15									
38	ADAMS ELECTRIC COOPERATIVE	2.15									
39	ADAMS ELECTRIC COOPERATIVE	2.15									
40	ADAMS ELECTRIC COOPERATIVE	2.15									

ABOVE BILLS ARE BASED ON THE FOLLOWING ASSUMPTIONS:
 1. Three customers per mile.
 2. Line extension cost of \$1000 per mile or \$33.33 per customer.
 3. One customer served from each transformer with capacity of 10 KW.

CHART A2

NET MONTHLY BILLS FOR RURAL ELECTRIC SERVICE
IN WISCONSIN COMMUNITIES SERVED BY
20 ELECTRIC UTILITIES AND 18 COOPERATIVES

50 KILOWATT HOURS

EFFECTIVE AS OF JULY 1, 1939

RANK	NAME	NET MONTHLY BILLS (DOLLARS)	NET MONTHLY BILLS (DOLLARS)						
			0	1	2	3	4	5	6
1	KUAKAUNA MUNICIPAL	\$ 3.42							
2	LAFAYETTE COOP.	3.50							
2	ROCK CO. COOP.	3.50							
3	OCONTO COOP.	3.65							
4	WIS. ELECT. POWER CO.	3.84							
4	WIS. GAS & ELECT. CO.	3.84							
5	WIS. MICH. POWER CO.	3.86							
6	RICHLAND COOP.	3.95							
6	TREMPEALEAU COOP.	3.95							
6	VERNON COOP.	3.95							
7	BARRON CO. COOP.	4.00							
7	BUFFALO COOP.	4.00							
7	CHIPPEWA VALLEY COOP.	4.00							
7	CLARK COOP.	4.00							
7	COLUMBUS COOP.	4.00							
7	DUNN CO. COOP.	4.00							
7	GRANT CO. COOP.	4.00							
7	JACKSON COOP.	4.00							
7	OAKDALE COOP.	4.00							
7	NORTHERN STATES POWER CO.	4.00							
7	OCONOMOWOC MUNICIPAL	4.00							
7	PIERCE-PEPIN COOP.	4.00							
7	TAYLOR CO. COOP.	4.00							
7	WIS. POWER & LIGHT CO.	4.00							
7	WIS. PUBLIC SERVICE CORP.	4.00							
8	HEAD OF LAKES COOP.	4.25							
8	LAKE SUPERIOR DIST. PR. CO.	4.25							
9	STURGEON BAY MUNICIPAL	4.30							
10	PLYMOUTH MUNICIPAL	4.37							
11	KEGONSA ELECT. LINE CO.	4.54							
12	PLEASANT SPRINGS LT. & PR. CO.	4.62							
13	MARSHFIELD MUNICIPAL	4.63							
14	WIS. HYDRO ELECT. CO.	4.80							
15	NORTHWESTERN WIS. ELECT. CO.	4.97							
15	POLK-BURNETT LT. & PR. CO.	4.97							
16	NESHONOC LT. & PR. CO.	5.00							
17	DAHLBERG LT. & PR. CO.	5.73							
18	INTERSTATE POWER CO.	6.12							

ABOVE BILLS ARE BASED ON THE FOLLOWING ASSUMPTIONS:

1. Three customers per mile.
2. Line extension cost of \$1000.00 per mile or \$333.33 per customer.
3. One customer served from each transformer with capacity of 1½ KVA.

CHART A2
 NET MONTHLY BILLS FOR RURAL ELECTRIC SERVICE
 IN WISCONSIN COMMUNITIES SERVED BY
 50 ELECTRIC UTILITIES AND 16 COOPERATIVES
 50 KILOWATT HOURS
 EFFECTIVE AS OF JULY 1, 1959

RANK	NAME	NET MONTHLY BILLS (DOLLARS)					
		0	1	2	3	4	5
1	KURKAWA MUNICIPAL	1.47					
2	LAFAYETTE COOP	1.50					
3	LOOK CO COOP	1.50					
4	GOVTO COOP	1.51					
5	WY ELECT POWER CO	1.54					
6	WY GAS & ELECT CO	1.54					
7	WY HIGH POWER CO	1.54					
8	PHONIA COOP	1.55					
9	TRIPLETALE COOP	1.55					
10	WYHIGH COOP	1.55					
11	BARREN CO COOP	1.56					
12	BARREN COOP	1.56					
13	WYHIGH VALLEY COOP	1.56					
14	CLARK COOP	1.56					
15	DELMAR COOP	1.56					
16	WYAR CO COOP	1.56					
17	GRANT CO COOP	1.56					
18	JACKSON COOP	1.56					
19	GARDNER COOP	1.56					
20	NORTHERN STATES PARK CO	1.56					
21	DESMOND MUNICIPAL	1.56					
22	PERCE-PERRIN COOP	1.56					
23	TAYLOR CO COOP	1.56					
24	WY HIGH POWER & LIGHT CO	1.56					
25	WY PUBLIC SERVICE COOP	1.56					
26	HEAD OF LAKE COOP	1.56					
27	LATE SUPERIOR INT PR CO	1.56					
28	STANBORN BAY MUNICIPAL	1.56					
29	PLYMOUTH MUNICIPAL	1.57					
30	WYHIGH CLINT LIND CO	1.57					
31	PLEASANT SPRING LT & PR CO	1.57					
32	WYHIGH MUNICIPAL	1.57					
33	WY HIGH ELECT CO	1.58					
34	NORTHWESTERN WA ELECT CO	1.57					
35	POW-BURNETT LT & PR CO	1.57					
36	DESMOND LT & PR CO	1.58					
37	WYHIGH LT & PR CO	1.58					
38	WESTSTATE POWER CO	1.58					

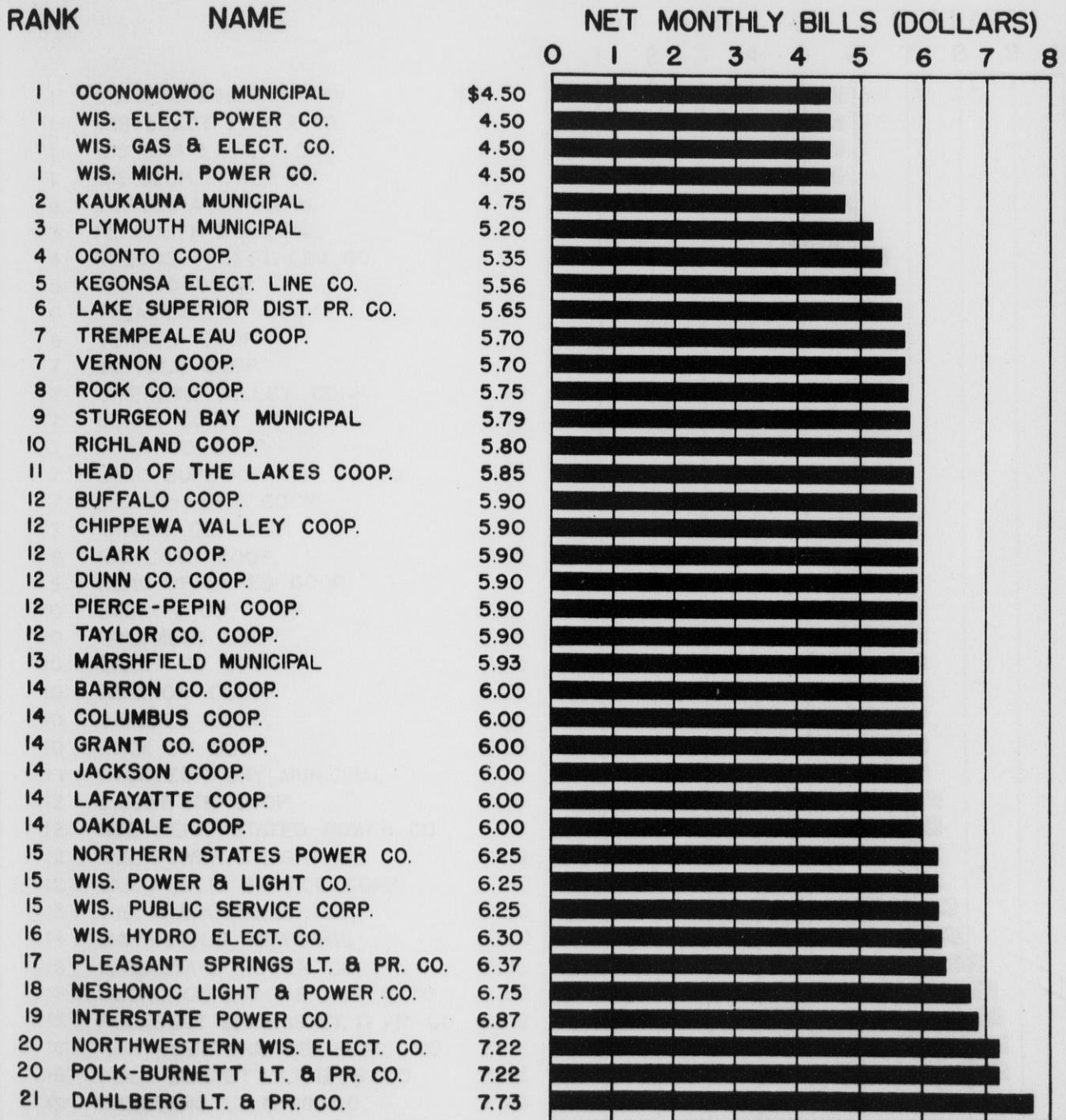
ABOVE BILLS ARE BASED ON THE FOLLOWING ASSUMPTIONS:
 1. Three customers per mile
 2. Line extension cost of \$1000.00 per mile at \$333.33 per customer
 3. One customer served per each mile with an average of 100 ft.

CHART A3

NET MONTHLY BILLS FOR RURAL ELECTRIC SERVICE
IN WISCONSIN COMMUNITIES SERVED BY
20 ELECTRIC UTILITIES AND 18 COOPERATIVES

100 KILOWATT HOURS

EFFECTIVE AS OF JULY 1, 1939



ABOVE BILLS ARE BASED ON THE FOLLOWING ASSUMPTIONS:

1. Three customers per mile.
2. Line extension cost of \$1000 per mile or \$333.33 per customer.
3. One customer served from each transformer with capacity of 1 1/2 KVA.

CHART A3
 NET MONTHLY BILLS FOR RURAL ELECTRIC SERVICE
 IN WISCONSIN COMMUNITIES SERVED BY
 20 ELECTRIC UTILITIES AND 18 COOPERATIVES
 100 KILOWATT HOURS
 EFFECTIVE AS OF JULY, 1939

RANK	NAME	NET MONTHLY BILLS (DOLLARS)
1	DOWNSWOOD MUNICIPAL	24.28
1	WIS. ELECT. POWER CO.	2.28
1	WIS. GAS & ELECT. CO.	4.20
1	WIS. WEA. POWER CO.	4.20
2	KAUKUNA MUNICIPAL	4.12
3	PLYMOUTH MUNICIPAL	3.20
4	GOUNTO COOP.	2.28
5	KEOSAUO ELECT. LINE CO.	1.28
6	LAKE SUPERIOR DIST. PR. CO.	1.28
7	TREMPEALEAU COOP.	1.20
7	VERNON COOP.	1.20
8	ROCK OJ. COOP.	1.20
9	STURGEON BAY MUNICIPAL	1.20
10	REARLAND COOP.	1.20
11	HEAD OF THE LAKE COOP.	1.20
12	RUFFALO COOP.	1.20
13	CHIPPewa VALLEY COOP.	1.20
13	CLARK COOP.	1.20
13	DUNN CO. COOP.	1.20
13	PERCE-PERIN COOP.	1.20
13	TAYLOR CO. COOP.	1.20
13	MARSHFIELD MUNICIPAL	1.20
14	BARRON CO. COOP.	1.20
14	COLUMBUS COOP.	1.20
14	GRANT CO. COOP.	1.20
14	JACKSON COOP.	1.20
14	LAKATATE COOP.	1.20
14	OAKDALE COOP.	1.20
15	NORTHERN STATE POWER CO.	1.20
15	WIS. POWER & LIGHT CO.	1.20
15	WIS. PUBLIC SERVICE COOP.	1.20
15	WIS. HYDRO ELECT. CO.	1.20
17	PLEASANT SPRING LT. & PR. CO.	1.20
18	WERNON LIGHT & POWER CO.	1.20
19	ATERSTATE POWER CO.	1.20
20	NORTHWESTERN WIS. ELECT. CO.	1.20
20	POLK-BURNETT LT. & PR. CO.	1.20
21	DAHLBERG LT. & PR. CO.	1.20

ABOVE BILLS ARE BASED ON THE FOLLOWING ASSUMPTIONS:

1. Three customers per mile.
2. Line extension cost of \$1000 per mile or \$223.33 per customer.
3. One customer served from each transformer with capacity of 15 kva.

CHART A4
**NET MONTHLY BILLS FOR RURAL ELECTRIC SERVICE
 IN WISCONSIN COMMUNITIES SERVED BY
 20 ELECTRIC UTILITIES AND 18 COOPERATIVES**
150 KILOWATT HOURS
EFFECTIVE AS OF JULY 1, 1939

RANK	NAME	NET MONTHLY BILLS (DOLLARS)	NET MONTHLY BILLS (DOLLARS)									
			0	1	2	3	4	5	6	7	8	9
1	OGONOMOWOC MUNICIPAL	\$ 5.75	[Bar chart showing \$5.75]									
1	WIS. ELECT. POWER CO.	5.75	[Bar chart showing \$5.75]									
1	WIS. GAS & ELECT. CO.	5.75	[Bar chart showing \$5.75]									
1	WIS. MICH. POWER CO.	5.75	[Bar chart showing \$5.75]									
2	KAUKAUNA MUNICIPAL	5.94	[Bar chart showing \$5.94]									
3	PLYMOUTH MUNICIPAL	6.20	[Bar chart showing \$6.20]									
4	KEGONSA ELECT. LINE CO.	6.59	[Bar chart showing \$6.59]									
5	OGONTO COOP.	6.60	[Bar chart showing \$6.60]									
6	TREMPEALEAU COOP.	6.70	[Bar chart showing \$6.70]									
6	VERNON COOP.	6.70	[Bar chart showing \$6.70]									
7	BUFFALO COOP.	6.90	[Bar chart showing \$6.90]									
7	CHIPPEWA VALLEY COOP.	6.90	[Bar chart showing \$6.90]									
7	CLARK COOP.	6.90	[Bar chart showing \$6.90]									
7	DUNN CO. COOP.	6.90	[Bar chart showing \$6.90]									
7	LAKE SUPERIOR DIST. PR. CO.	6.90	[Bar chart showing \$6.90]									
7	PIERCE-PEPIN COOP.	6.90	[Bar chart showing \$6.90]									
7	TAYLOR CO. COOP.	6.90	[Bar chart showing \$6.90]									
8	RICHLAND COOP.	7.05	[Bar chart showing \$7.05]									
9	HEAD OF LAKES COOP.	7.10	[Bar chart showing \$7.10]									
10	BARRON CO. COOP.	7.25	[Bar chart showing \$7.25]									
10	COLUMBUS COOP.	7.25	[Bar chart showing \$7.25]									
10	GRANT CO. COOP.	7.25	[Bar chart showing \$7.25]									
10	JACKSON COOP.	7.25	[Bar chart showing \$7.25]									
10	OAKDALE COOP.	7.25	[Bar chart showing \$7.25]									
10	ROCK CO. COOP.	7.25	[Bar chart showing \$7.25]									
11	STURGEON BAY MUNICIPAL	7.28	[Bar chart showing \$7.28]									
12	LAFAYETTE COOP.	7.50	[Bar chart showing \$7.50]									
12	NORTHERN STATES POWER CO.	7.50	[Bar chart showing \$7.50]									
12	WIS. POWER & LIGHT CO.	7.50	[Bar chart showing \$7.50]									
12	WIS. PUBLIC SERVICE CORP.	7.50	[Bar chart showing \$7.50]									
13	WIS. HYDRO ELECT. CO.	7.80	[Bar chart showing \$7.80]									
14	MARSHFIELD MUNICIPAL	7.90	[Bar chart showing \$7.90]									
15	INTERSTATE POWER CO.	8.25	[Bar chart showing \$8.25]									
16	NESHONOC LIGHT & POWER CO.	8.50	[Bar chart showing \$8.50]									
17	PLEASANT SPRINGS LT. & PR. CO.	8.62	[Bar chart showing \$8.62]									
18	NORTHWESTERN WIS. ELECT. CO.	8.72	[Bar chart showing \$8.72]									
18	POLK-BURNETT LT. & PR. CO.	8.72	[Bar chart showing \$8.72]									
19	DAHLBERG LT. & PR. CO.	9.23	[Bar chart showing \$9.23]									

ABOVE BILLS ARE BASED ON THE FOLLOWING ASSUMPTIONS:

1. Three customers per mile.
2. Line extension cost of \$1000 per mile or \$333.33 per customer.
3. One customer served from each transformer with capacity of 3 KVA.

CHART A
 NET MONTHLY BILLS FOR RURAL ELECTRIC SERVICE
 IN WISCONSIN COMMUNITIES SERVED BY
 50 ELECTRIC UTILITIES AND 18 COOPERATIVES
 150 KILOWATT HOURS
 EFFECTIVE AS OF JULY 1, 1939

RANK	NAME	NET MONTHLY BILLS (DOLLARS)
1	ECONOMY MUNICIPAL	2.78
2	WIS. ELECT. POWER CO.	2.75
3	WIS. GAS & ELECT. CO.	2.75
4	WIS. HIGH POWER CO.	2.75
5	BAUKUNTA MUNICIPAL	2.74
6	CLYBURN MUNICIPAL	2.50
7	KEOSAUQUA ELECT. LINE CO.	2.50
8	DOONAN COOP.	2.50
9	TRUMBULL COOP.	2.50
10	WISCONSIN COOP.	2.50
11	WISCONSIN COOP.	2.50
12	WISCONSIN COOP.	2.50
13	WISCONSIN COOP.	2.50
14	WISCONSIN COOP.	2.50
15	WISCONSIN COOP.	2.50
16	WISCONSIN COOP.	2.50
17	WISCONSIN COOP.	2.50
18	WISCONSIN COOP.	2.50
19	WISCONSIN COOP.	2.50
20	WISCONSIN COOP.	2.50
21	WISCONSIN COOP.	2.50
22	WISCONSIN COOP.	2.50
23	WISCONSIN COOP.	2.50
24	WISCONSIN COOP.	2.50
25	WISCONSIN COOP.	2.50
26	WISCONSIN COOP.	2.50
27	WISCONSIN COOP.	2.50
28	WISCONSIN COOP.	2.50
29	WISCONSIN COOP.	2.50
30	WISCONSIN COOP.	2.50
31	WISCONSIN COOP.	2.50
32	WISCONSIN COOP.	2.50
33	WISCONSIN COOP.	2.50
34	WISCONSIN COOP.	2.50
35	WISCONSIN COOP.	2.50
36	WISCONSIN COOP.	2.50
37	WISCONSIN COOP.	2.50
38	WISCONSIN COOP.	2.50
39	WISCONSIN COOP.	2.50
40	WISCONSIN COOP.	2.50
41	WISCONSIN COOP.	2.50
42	WISCONSIN COOP.	2.50
43	WISCONSIN COOP.	2.50
44	WISCONSIN COOP.	2.50
45	WISCONSIN COOP.	2.50
46	WISCONSIN COOP.	2.50
47	WISCONSIN COOP.	2.50
48	WISCONSIN COOP.	2.50
49	WISCONSIN COOP.	2.50
50	WISCONSIN COOP.	2.50

ABOVE BILLS ARE BASED ON THE FOLLOWING ASSUMPTIONS:
 1. Three customers per mile
 2. Line extension cost of \$1000 per mile or \$333.33 per customer
 3. One customer served from each transformer with capacity of 3 KW.

CHART A5

NET MONTHLY BILLS FOR RURAL ELECTRIC SERVICE
IN WISCONSIN COMMUNITIES SERVED BY
20 ELECTRIC UTILITIES AND 18 COOPERATIVES

250 KILOWATT HOURS

EFFECTIVE AS OF JULY 1, 1939

RANK	NAME	NET MONTHLY BILLS (DOLLARS)	NET MONTHLY BILLS (DOLLARS)												
			0	1	2	3	4	5	6	7	8	9	10	11	12
1	PLYMOUTH MUNICIPAL	\$ 8.20	[Bar chart showing 8.20]												
2	OCONOMOWOC MUNICIPAL	8.25	[Bar chart showing 8.25]												
2	WIS. ELECT. POWER CO.	8.25	[Bar chart showing 8.25]												
2	WIS. GAS & ELECT. CO.	8.25	[Bar chart showing 8.25]												
2	WIS. MICH. POWER CO.	8.25	[Bar chart showing 8.25]												
3	KAUKAUNA MUNICIPAL	8.31	[Bar chart showing 8.31]												
4	TREMPEALEAU COOP.	8.33	[Bar chart showing 8.33]												
5	VERNON COOP.	8.45	[Bar chart showing 8.45]												
6	BUFFALO COOP.	8.53	[Bar chart showing 8.53]												
6	CHIPPEWA VALLEY COOP.	8.53	[Bar chart showing 8.53]												
6	CLARK COOP.	8.53	[Bar chart showing 8.53]												
6	DUNN CO. COOP.	8.53	[Bar chart showing 8.53]												
6	TAYLOR CO. COOP.	8.53	[Bar chart showing 8.53]												
7	OCONTO COOP.	8.60	[Bar chart showing 8.60]												
8	KEGONSA ELECT. LINE CO.	8.64	[Bar chart showing 8.64]												
9	PIERCE-PEPIN COOP.	8.65	[Bar chart showing 8.65]												
10	HEAD OF LAKES COOP.	9.10	[Bar chart showing 9.10]												
11	RICHLAND COOP.	9.18	[Bar chart showing 9.18]												
12	BARRON CO. COOP.	9.25	[Bar chart showing 9.25]												
12	JACKSON COOP.	9.25	[Bar chart showing 9.25]												
12	OAKDALE COOP.	9.25	[Bar chart showing 9.25]												
13	COLUMBUS COOP.	9.38	[Bar chart showing 9.38]												
13	GRANT CO. COOP.	9.38	[Bar chart showing 9.38]												
14	LAKE SUPERIOR DIST. PR. CO.	9.40	[Bar chart showing 9.40]												
14	STURGEON BAY MUNICIPAL	9.40	[Bar chart showing 9.40]												
15	LAFAYETTE COOP.	9.88	[Bar chart showing 9.88]												
15	ROCK CO. COOP.	9.88	[Bar chart showing 9.88]												
16	MARSHFIELD MUNICIPAL	9.90	[Bar chart showing 9.90]												
17	NORTHERN STATES POWER CO.	10.00	[Bar chart showing 10.00]												
17	WIS. POWER & LIGHT CO.	10.00	[Bar chart showing 10.00]												
17	WIS. PUBLIC SERVICE CORP.	10.00	[Bar chart showing 10.00]												
18	NESHONOC LIGHT & POWER CO.	10.50	[Bar chart showing 10.50]												
19	INTERSTATE POWER CO.	10.75	[Bar chart showing 10.75]												
20	WIS. HYDRO ELECT. CO.	10.80	[Bar chart showing 10.80]												
21	NORTHWESTERN WIS. ELECT. CO.	11.72	[Bar chart showing 11.72]												
21	POLK BURNETT LT. & PR. CO.	11.72	[Bar chart showing 11.72]												
22	PLEASANT SPRINGS LT. & PR. CO.	12.12	[Bar chart showing 12.12]												
23	DAHLBERG LT. & PR. CO.	12.23	[Bar chart showing 12.23]												

ABOVE BILLS ARE BASED ON THE FOLLOWING ASSUMPTIONS:

1. Three customers per mile.
2. Line extension cost of \$1000 per mile or \$333.33 per customer.
3. One customer served from each transformer with capacity of 3 KVA.

CHART A2
 NET MONTHLY BILLS FOR RURAL ELECTRIC SERVICE
 IN WISCONSIN COMMUNITIES SERVED BY
 20 ELECTRIC UTILITIES AND 18 COOPERATIVES
 250 KILOWATT HOURS
 EFFECTIVE AS OF JULY 1, 1959

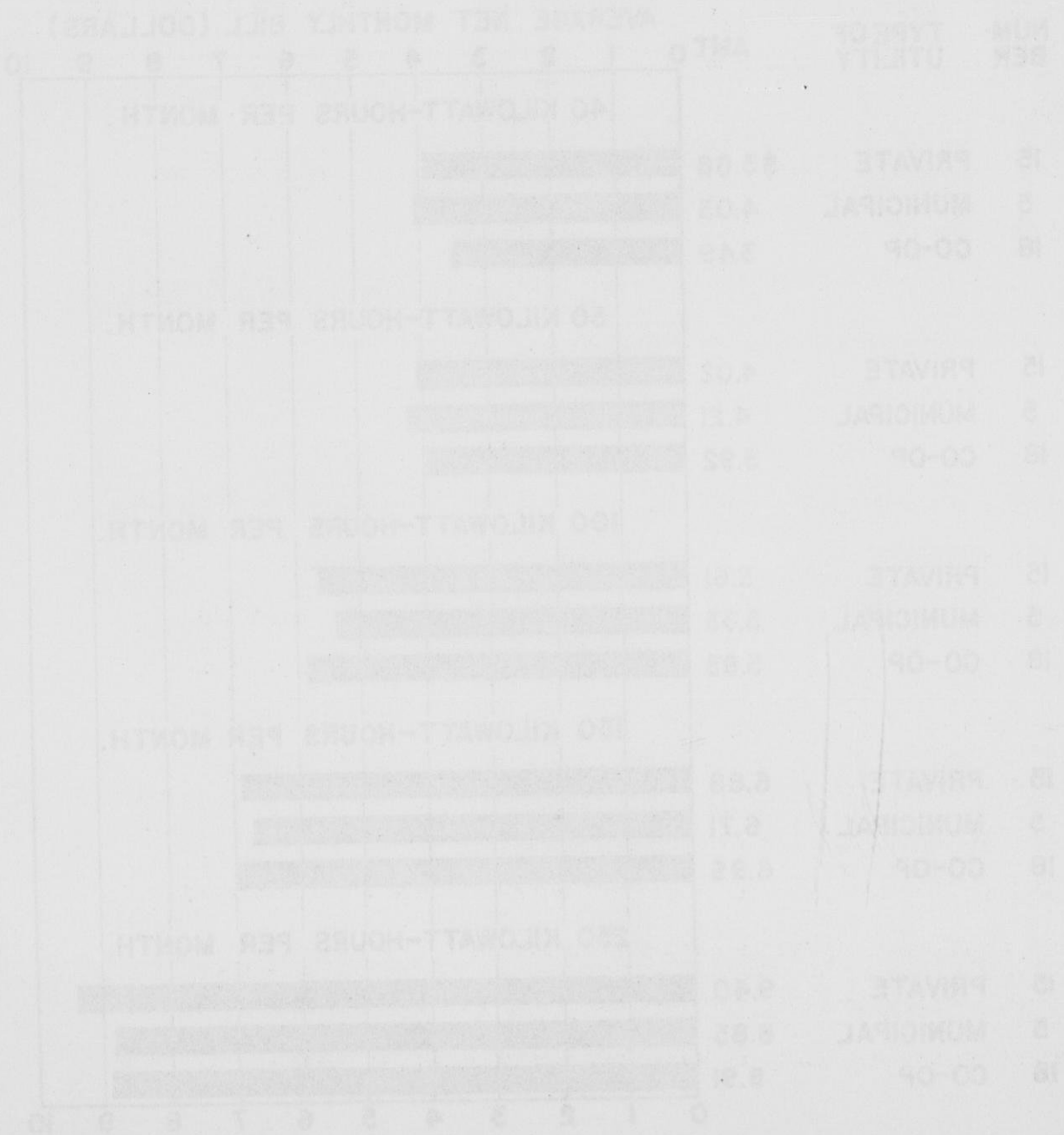
RANK	NAME	NET MONTHLY BILLS (DOLLARS)
1	PLUMBOTH MUNICIPAL	4.20
2	POCONONG MUNICIPAL	4.15
3	WIS ELEC POWER CO	4.10
4	WIS ELEC POWER CO	4.05
5	WIS ELEC POWER CO	4.00
6	WIS ELEC POWER CO	3.95
7	KAUBARA MUNICIPAL	3.90
8	TEMPEREAU COOP	3.85
9	VERNON COOP	3.80
10	WATER VALLEY COOP	3.75
11	CLARK COOP	3.70
12	WYCK CO COOP	3.65
13	TAYLOR CO COOP	3.60
14	COONTS COOP	3.55
15	KEONDA ELEC LINE CO	3.50
16	FRANCIS COOP	3.45
17	HEAD OF LAKE COOP	3.40
18	RICHARD COOP	3.35
19	BARON CO COOP	3.30
20	WADSWORTH COOP	3.25
21	GARDNER COOP	3.20
22	COLUMBUS COOP	3.15
23	GRANT CO COOP	3.10
24	LAKE SUPERIOR DIST. PR. CO.	3.05
25	STURGEON BAY MUNICIPAL	3.00
26	LAVALLE COOP	2.95
27	POOP CO COOP	2.90
28	KARLISLA MUNICIPAL	2.85
29	WESTERN STATE POWER CO	2.80
30	WIS POWER & LIGHT CO	2.75
31	WIS PUBLIC SERVICE COOP	2.70
32	WIS PUBLIC SERVICE COOP	2.65
33	WIS PUBLIC SERVICE COOP	2.60
34	WIS PUBLIC SERVICE COOP	2.55
35	WIS PUBLIC SERVICE COOP	2.50
36	WIS PUBLIC SERVICE COOP	2.45
37	WIS PUBLIC SERVICE COOP	2.40
38	WIS PUBLIC SERVICE COOP	2.35
39	WIS PUBLIC SERVICE COOP	2.30
40	WIS PUBLIC SERVICE COOP	2.25
41	WIS PUBLIC SERVICE COOP	2.20
42	WIS PUBLIC SERVICE COOP	2.15
43	WIS PUBLIC SERVICE COOP	2.10
44	WIS PUBLIC SERVICE COOP	2.05
45	WIS PUBLIC SERVICE COOP	2.00
46	WIS PUBLIC SERVICE COOP	1.95
47	WIS PUBLIC SERVICE COOP	1.90
48	WIS PUBLIC SERVICE COOP	1.85
49	WIS PUBLIC SERVICE COOP	1.80
50	WIS PUBLIC SERVICE COOP	1.75

ABOVE BILLS ARE BASED ON THE FOLLOWING ASSUMPTIONS:
 1. Three customers per mile
 2. Line extension cost of \$1000 per mile or \$333.33 per customer
 3. One customer served from each transformer with capacity of 3 KVA

TABLE IV
 WEIGHTED AVERAGE OF
 NET MONTHLY BILLS FOR RURAL ELECTRIC SERVICE
 IN WISCONSIN COMMUNITIES SERVED BY
 PRIVATE AND MUNICIPAL UTILITIES AND RURAL COOPERATIVES
 AS OF JULY 1, 1939

<u>Monthly Consumption</u>	<u>Average (Weighted) Net Monthly Bills</u>		
	<u>Private</u>	<u>Municipal</u>	<u>Cooperative</u>
40 Kw-hrs.	\$3.88	\$4.03	\$3.49
50 Kw-hrs.	4.02	4.21	3.92
100 Kw-hrs.	5.61	5.33	5.83
150 Kw-hrs.	6.88	6.71	6.99
250 Kw-hrs.	9.40	8.85	8.91

CHART B
WEIGHTED AVERAGE OF
NET MONTHLY BILLS FOR RURAL ELECTRIC SERVICE
IN WISCONSIN COMMUNITIES SERVED BY
PRIVATE AND MUNICIPAL UTILITIES AND RURAL COOPERATIVES
AS OF JULY, 1933



UNIT COST AND CONSUMPTION OF ENERGY

On chart C is compared the cost and consumption ratios for rural electric service in Wisconsin and the eastern one half of the United States from 1930 to 1938, inclusive. The western half of the United States, where electricity is used to a large extent for irrigation and agricultural pumping, was not considered comparable with Wisconsin and, therefore, was not included in the comparison. Rural electric cooperatives were omitted from the cost and consumption data for Wisconsin, since most of them have been operating for less than two years.

Rural service is defined as all service supplied at rural rates. In cases where commercial or industrial customers located in rural areas are served at a rural rate, sales to such customers are included in rural service. If they are served at regular commercial rates they are excluded.

The average cost per kilowatt-hour to ultimate consumers of rural electric service in Wisconsin has been decreasing steadily since 1932. During the past five years the average cost has been reduced from 7.31¢ in 1933 to 5.38¢ in 1938 for a reduction of 26.4%. The average consumption per customer increased from 67 to 92 kilowatt-hours per month for an increase of 37.4%.

That the unit cost of electrical energy should vary inversely with the amount of energy used per customer is to be expected since the form of rate schedules generally results in lower cost per kilowatt-hour when the usage per customer is increased.

Rate reductions, resulting in a lower unit cost undoubtedly have some effect on the consumption of electricity by the rural user. However, other factors such as farm income, initial cost of appliances, appliance sales programs, and other promotional schemes influence the amount of electrical energy consumed by the farm customer.

It is interesting to note that during the past five years the average monthly bill for rural electric service in Wisconsin has varied only 3.6% ranging from a low of \$4.77 in 1935 to \$4.94 in 1938. The average monthly bill for the eastern one half of the United States in 1938 was only \$3.92, which is 20.6% lower than the Wisconsin average. However, it should be pointed out that the average use per rural customer is higher, and, in general, the number of customers per mile of line is less in Wisconsin than in the more densely populated eastern half of the United States.

A comparison of the cost and consumption ratios for rural electric service by eight private utilities is made on Chart D. These utilities served approximately 91% of all rural customers served by private utilities, or 72.8% of all rural customers in Wisconsin, as of December 31, 1938.

From an analysis of Chart D it can be seen that the average cost per kilowatt-hour and the monthly consumption per customer, for each of the eight utilities compared, follows the same general trend as did the state and national averages. The ratios

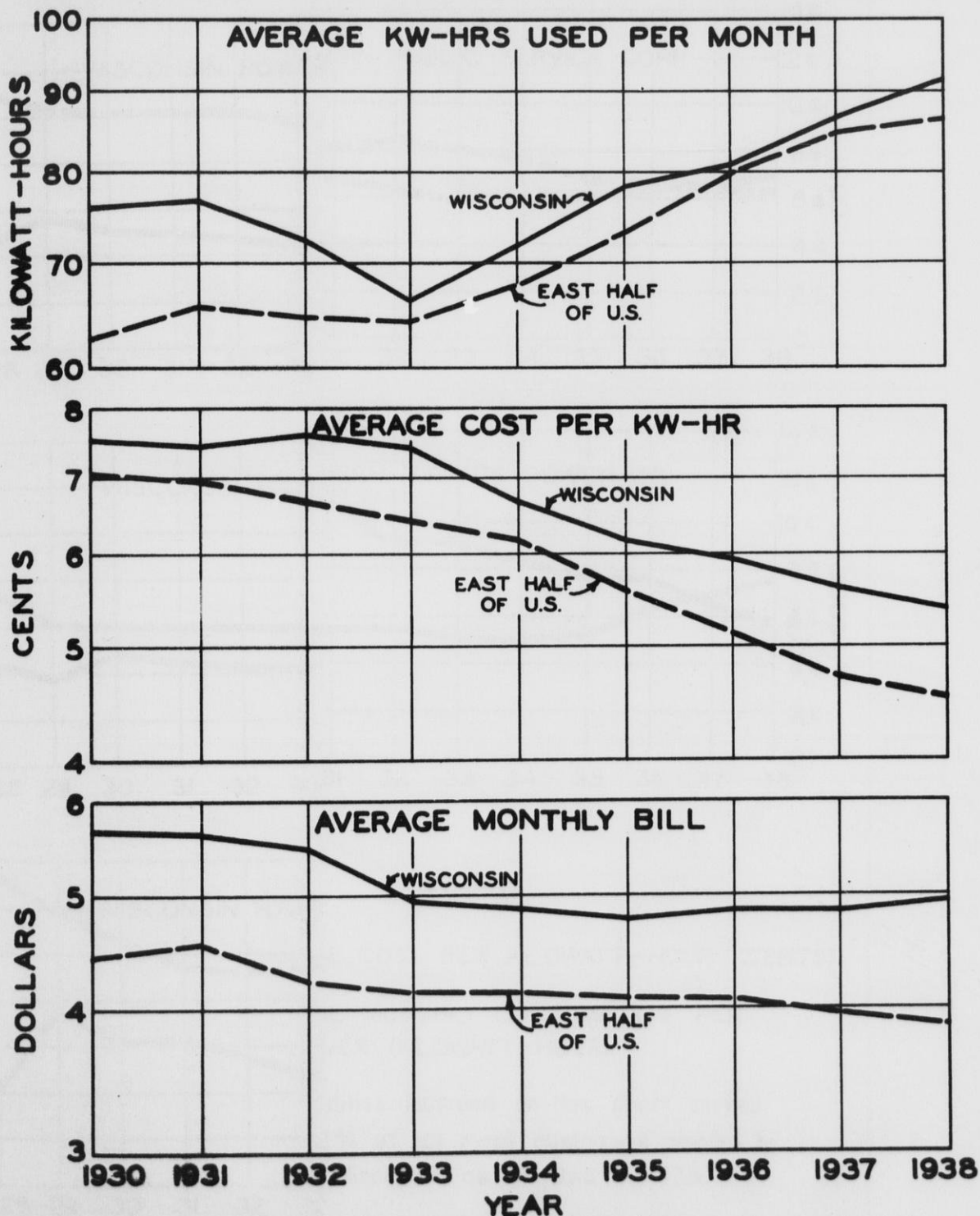
for each utility give some indication of the average type of territory served, and the history of the utilities rural electrification program since 1928. The fact that commercial customers located in rural areas are not treated the same by each of the eight utilities shown on the chart is an important factor in explaining the variations between companies.

During the late 1920's and early 30's, many of the privately owned utilities in Wisconsin adopted a line financing policy which required guaranteed revenues for three-year periods. Under this plan, the minimum bill usually included an amount of energy which was somewhat greater than the average normal consumption and, therefore, had a tendency to increase consumption.

"Free electricity" and other bargain offers made by various companies also have an important effect on the trends in revenue per kilowatt-hour and average consumption shown in Chart D. The Wisconsin Electric Power Company (formerly The Milwaukee Electric Railway & Light Company), the Wisconsin Gas & Electric Company, and the Wisconsin Michigan Power Company all offered "free electricity" during certain months in 1934 and 1935. Similar offers were made by the Wisconsin Public Service Corporation and its subsidiary the Menomonie & Marinette Light & Traction Company in 1935 and the Wisconsin Hydro Electric Company in 1936.

Since 1935 the Wisconsin Electric Power Company has operated its "10 for 1" plan to stimulate consumption of electricity. This rate is optional and provides that the customer who elects to participate may in any given month use up to double the amount of electricity used during the same month in the previous year and pay the last year's bill for that month plus ten per cent.

CHART C
**COST AND CONSUMPTION RATIOS FOR
 RURAL ELECTRIC SERVICE**
 IN WISCONSIN AND EAST HALF OF UNITED STATES
 1930-1938
 (RATIO SCALE)

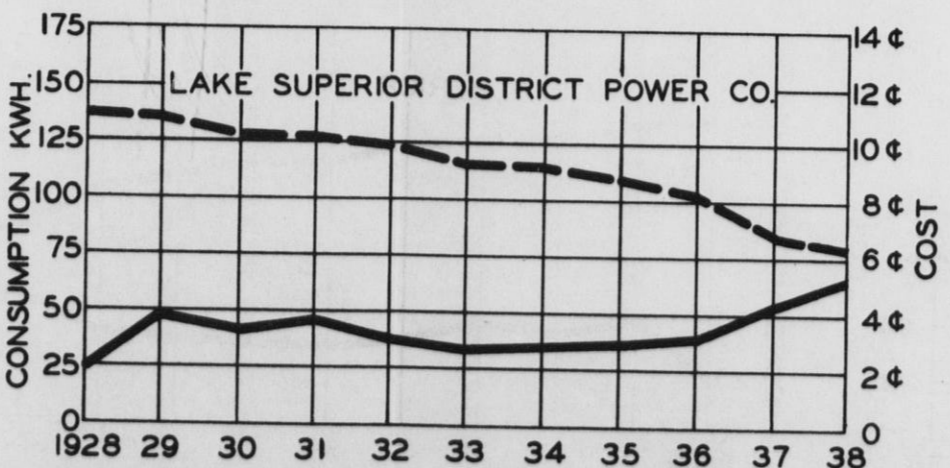
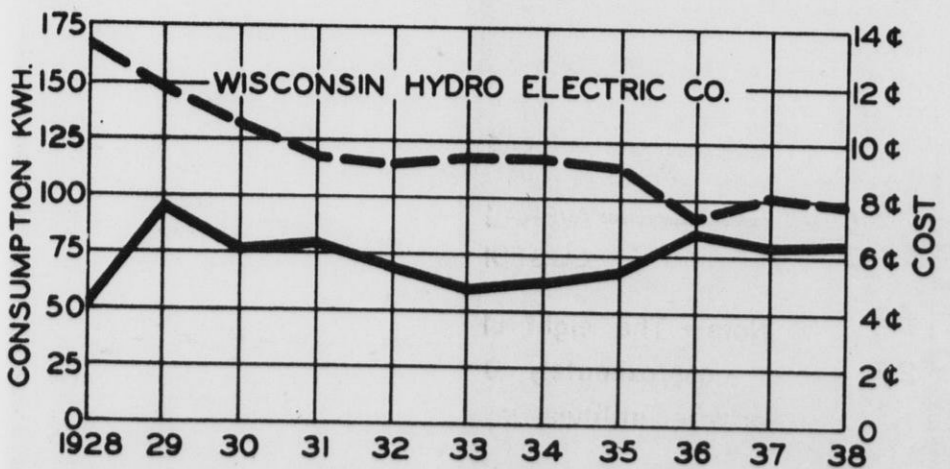
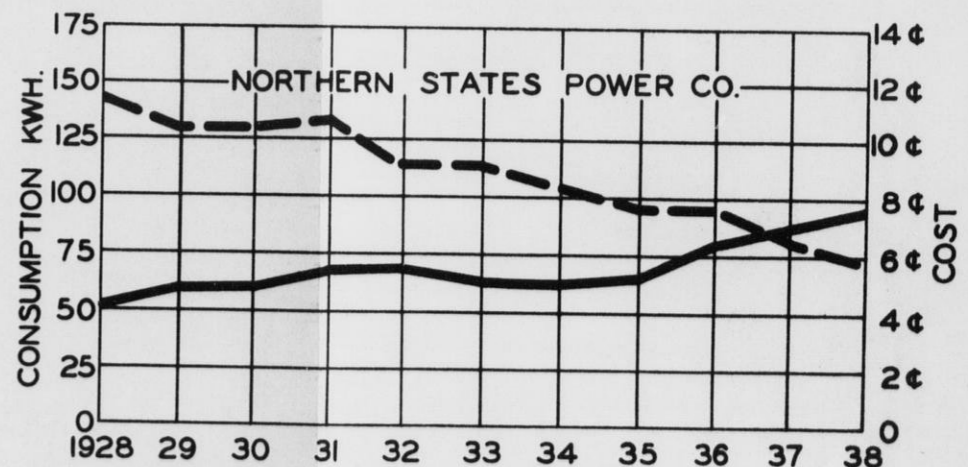
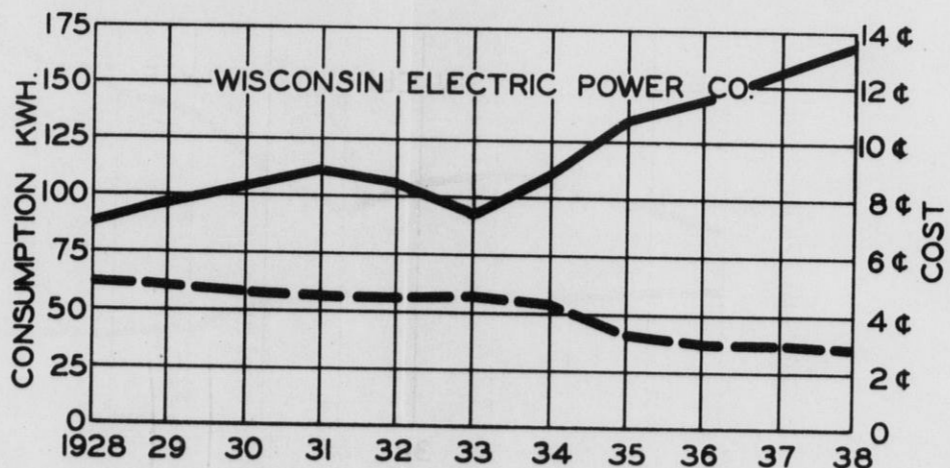
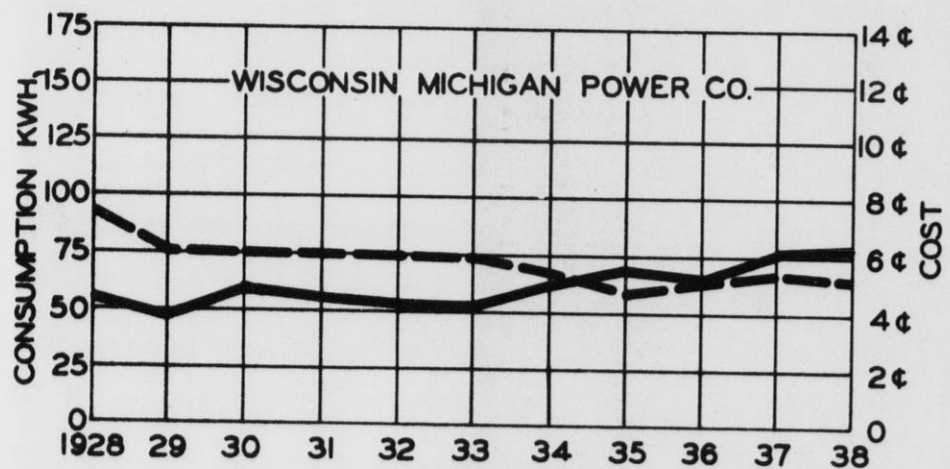
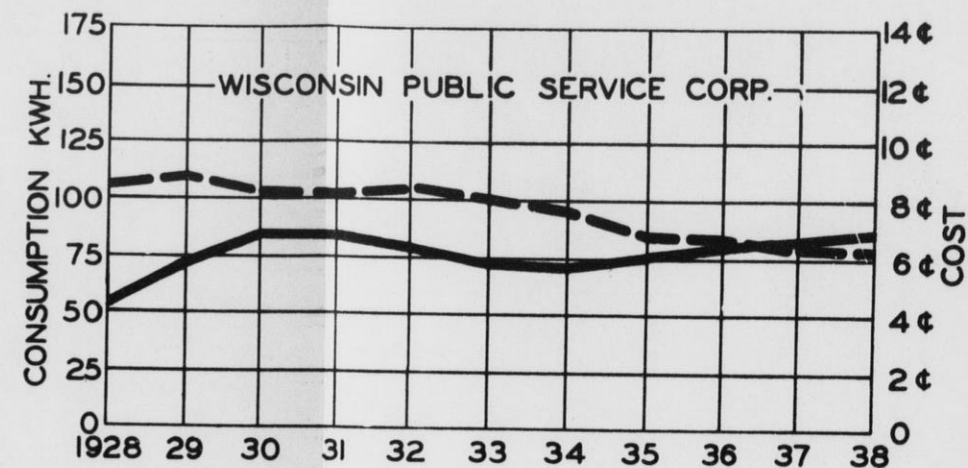
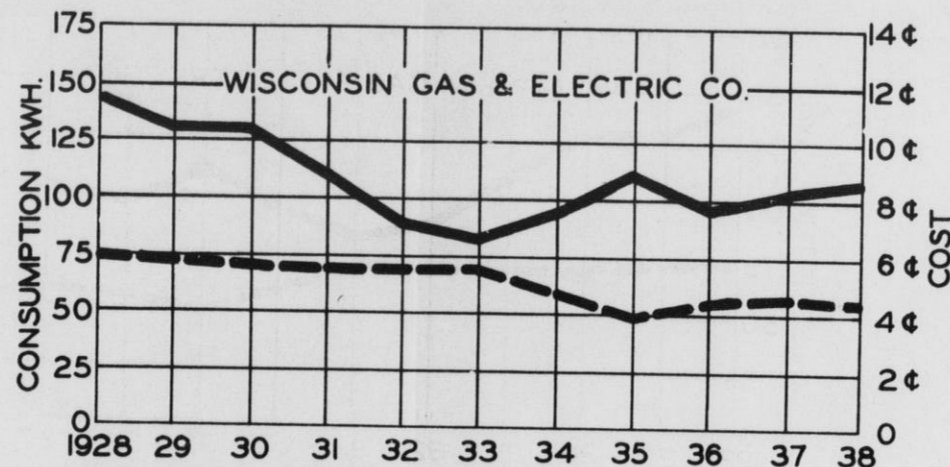
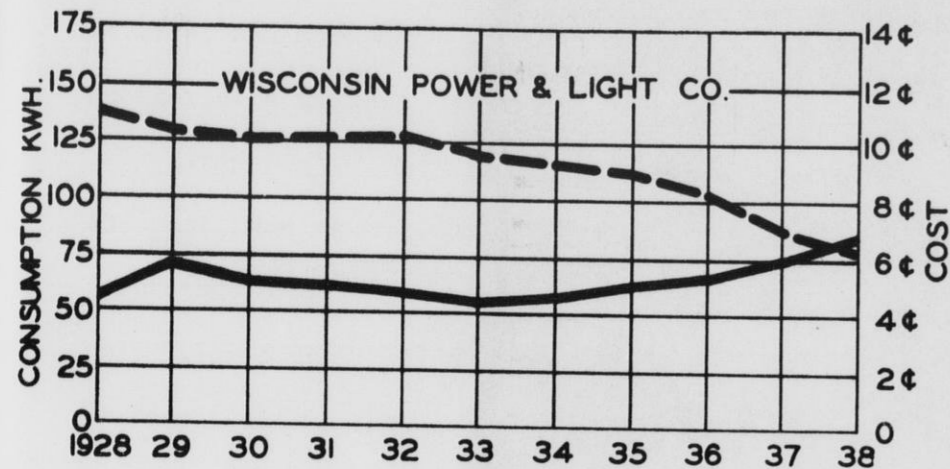


NOTE—COOPERATIVES NOT INCLUDED IN WISCONSIN DATA
 U.S. DATA FROM EDISON ELECTRIC INSTITUTE STATISTICAL BULLETINS

CHART D
COST AND CONSUMPTION RATIOS FOR RURAL ELECTRIC SERVICE

PRIVATE ELECTRIC UTILITIES IN WISCONSIN

1928—1938



LEGEND

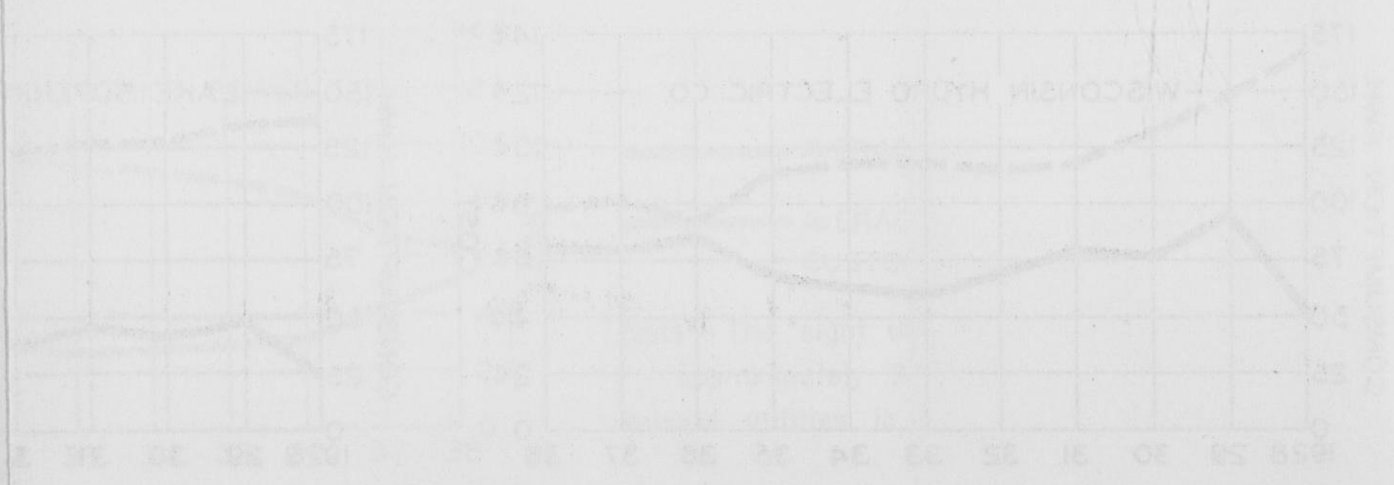
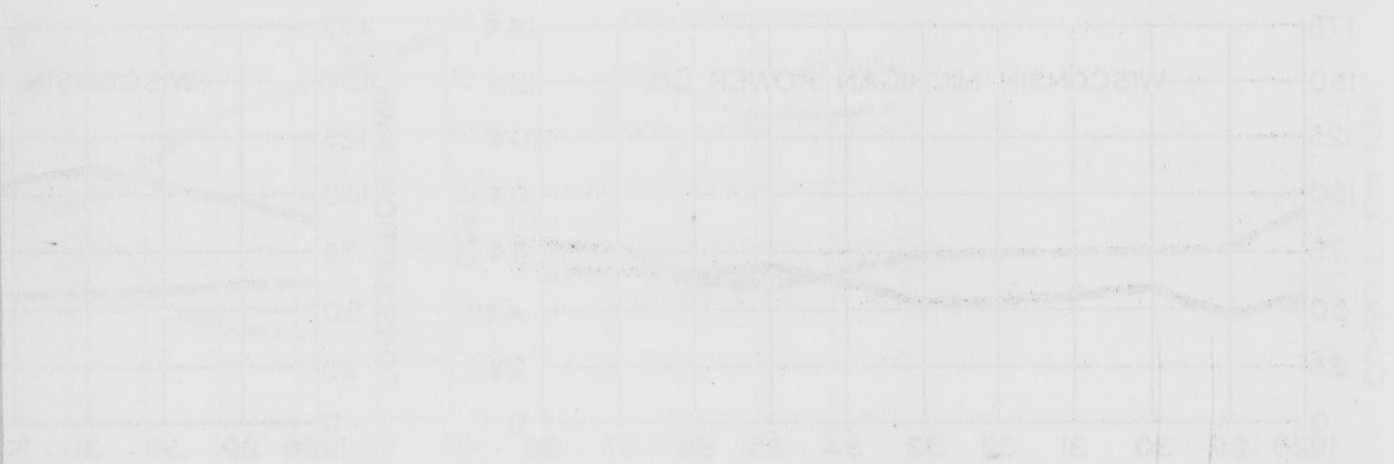
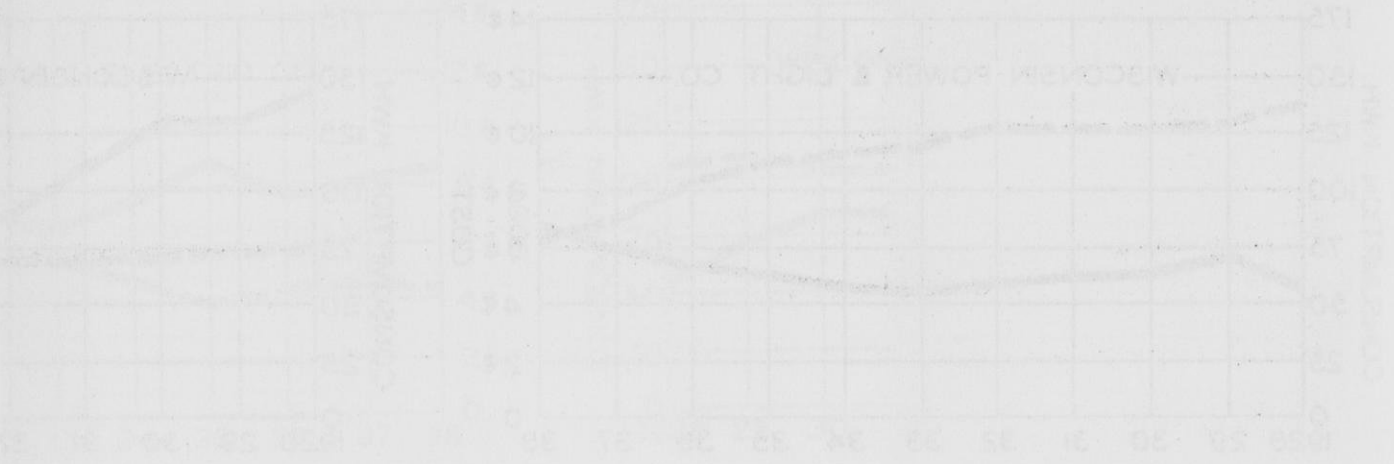
- AVERAGE COST PER KILOWATT-HOUR (CENTS)
- AVERAGE MONTHLY CONSUMPTION PER CUSTOMER (KILOWATT-HOUR)

Note— The eight utilities included on this chart served approximately 91% of all rural customers served by private utilities in Wisconsin as of Dec.31, 1938.

POWER COST AND CONSUMPTION

WISCONSIN HYDRO ELECTRIC CO.

1958-59



CUSTOMERS

At the beginning of 1939 nearly one and one-half million rural homes in the United States were receiving central station electric service, and more are being connected at the rate of nearly a quarter of a million a year. (See Chart G)

Extension of electric lines into farm and rural areas, until the past four years progressed at a relatively slow rate. The percentage of farms electrified in the United States increased only 7.7 per cent during the ten years from 1925 to 1935. (In Wisconsin this increase was approximately 12 per cent over the same period). It was estimated that some 29,000,000 of the 32,000,000 people living on farms in the United States were not receiving highline electric service in 1935. This figure is particularly significant when it is realized that it represents approximately 23 per cent or nearly one quarter of the nation's entire population.

Rural electrification, however, was recognized as a matter of national concern and on May 11, 1935 the Rural Electrification Administration was established. The Rural Electrification Act, passed by Congress one year later, made R.E.A. a permanent organization and authorized an appropriation of \$410,000,000 to carry on a continuous program of rural electric line building for a period of ten years.

GENERAL

The rate at which customers were connected to rural electric lines in Wisconsin during the past ten years is shown in Table V. From an analysis of these data it is evident that the progress in the field of rural electrification, particularly in obtaining new customers, is influenced to a large extent by the income of the farmer. (See Chart E)

For example, during the three-year period from 1928 to 1930, inclusive, utilities in Wisconsin added more than 17,000 rural customers to their lines for an increase of nearly 100 per cent over the total number receiving service at the end of 1927. In 1932, however, when the total gross farm income dropped to a low of only about 47 per cent of the 1929 level, the privately owned electric utilities in Wisconsin reported an actual decrease of 345 rural customers and the municipals added but 75. The greatest increase occurred in 1937 during which time the utilities (private and municipal) added nearly twelve thousand rural customers to their lines. This tremendously increased activity among the utilities generally followed the normal trend in relation to gross farm income, but was undoubtedly accelerated by the stimulus produced by the R.E.A. Some 3,750 customers were connected to R.E.A. cooperative lines during the last half of 1937, the first project being energized in June of that year.

In 1938, cooperatives added approximately 48.2 per cent of the total number of 13,737 new customers, privately owned utilities added 45.8 per cent, and municipal utilities added the balance of 6.0 per cent or 824 customers, which is nearly one and one-half times

the previous high for municipal utilities. of 569 new customers in 1937.

On Chart F is shown graphically the number of rural customers in Wisconsin served by private and municipal utilities and rural electric cooperatives as of December 31, for 1927 to 1938, inclusive. Chart F is based on the total number of rural customers, including all customers served at rural rates such as cheese factories, stores, filling stations, taverns, schools, etc. in addition to farms. As of December 31, 1938 the number of farm customers constituted approximately 87.7 per cent of the total. No reliable information is available on the actual number of farms served before 1938.

As of the end of 1938 slightly more than one-third or 34.7 per cent of the occupied farms in Wisconsin were receiving highline electric service while in the entire United States, according to the Edison Electric Institute, 21.9 per cent of the occupied farms were electrified. Chart J shows a comparison of the per cent and number of occupied farms electrified and the average farm density per square mile in Wisconsin and in the five surrounding states.

In this group of six states, Wisconsin ranks second to Michigan both in total number of farms electrified and in per cent of occupied farms electrified, although Indiana, Illinois, and Iowa each have a higher farm density per square mile of total area.

A study of the distribution of Wisconsin's farm electric customers reveals that the southeastern one-quarter of the state was well over 50 per cent electrified as of December 31, 1938, the remainder of the

state being developed to a smaller extent. The percentage of occupied farms electrified in Wisconsin by counties as of December 31, 1938 is shown on Chart H.

It is interesting to note the correlation between the extent of farm electrification and the average land value, average gross income per farm, and the average farm density per square mile, by counties in Wisconsin. This information is also included on Chart H.

CHART E
TOTAL GROSS FARM INCOME AND
YEARLY INCREASE IN NUMBER OF CUSTOMERS
BY ELECTRIC UTILITIES AND COOPERATIVES IN WISCONSIN
1928-1938

Note:-Farm income data from Wisconsin Department of Agriculture, 1938 figure based on estimates.

Rural electric customer data from Wisconsin Public Service Commission files.

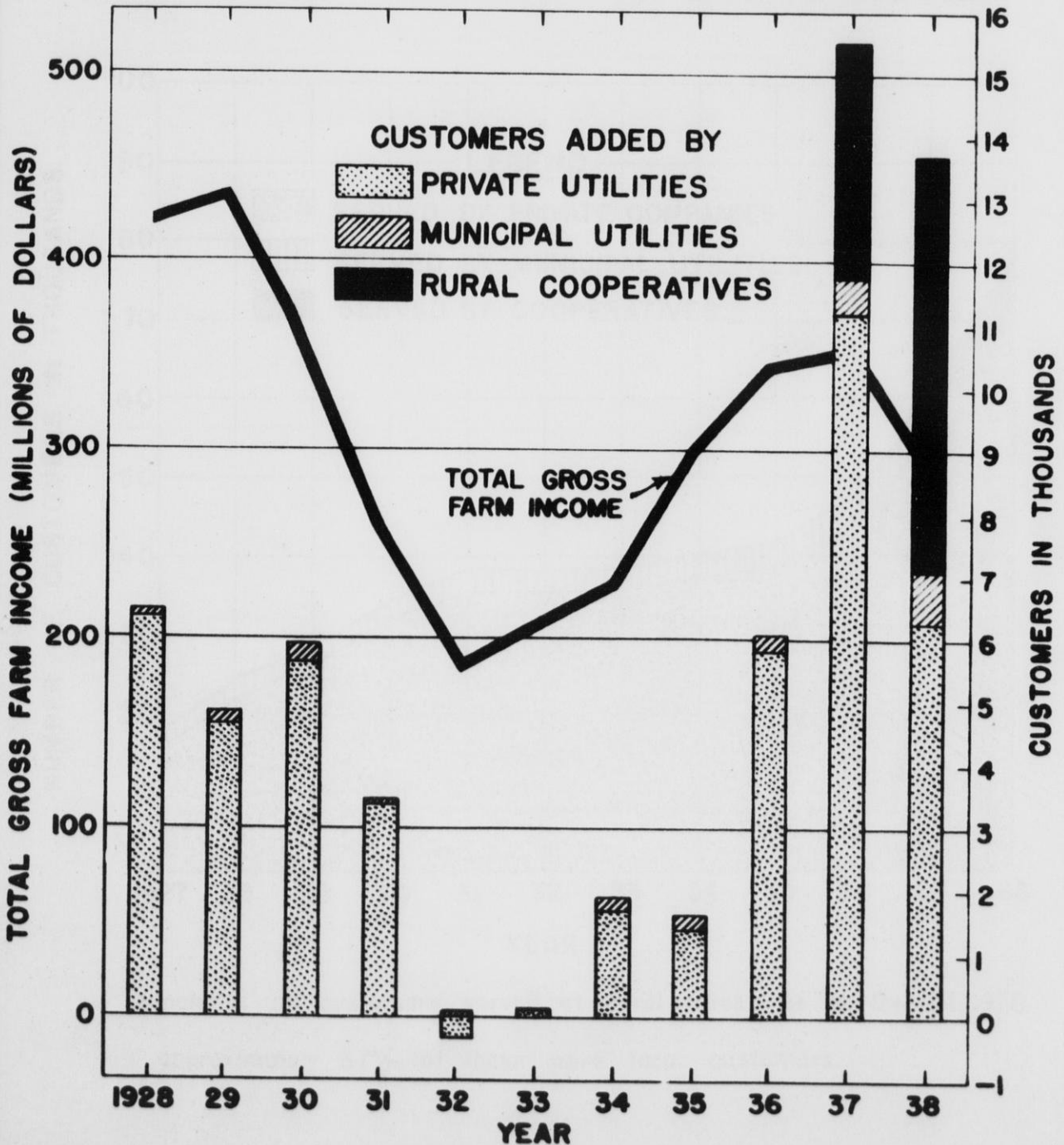


CHART 3
 TOTAL GROSS FARM INCOME AND
 YEARLY INCREASE IN NUMBER OF CUSTOMERS
 BY ELECTRIC UTILITIES AND COOPERATIVES IN WISCONSIN
 1928-1935

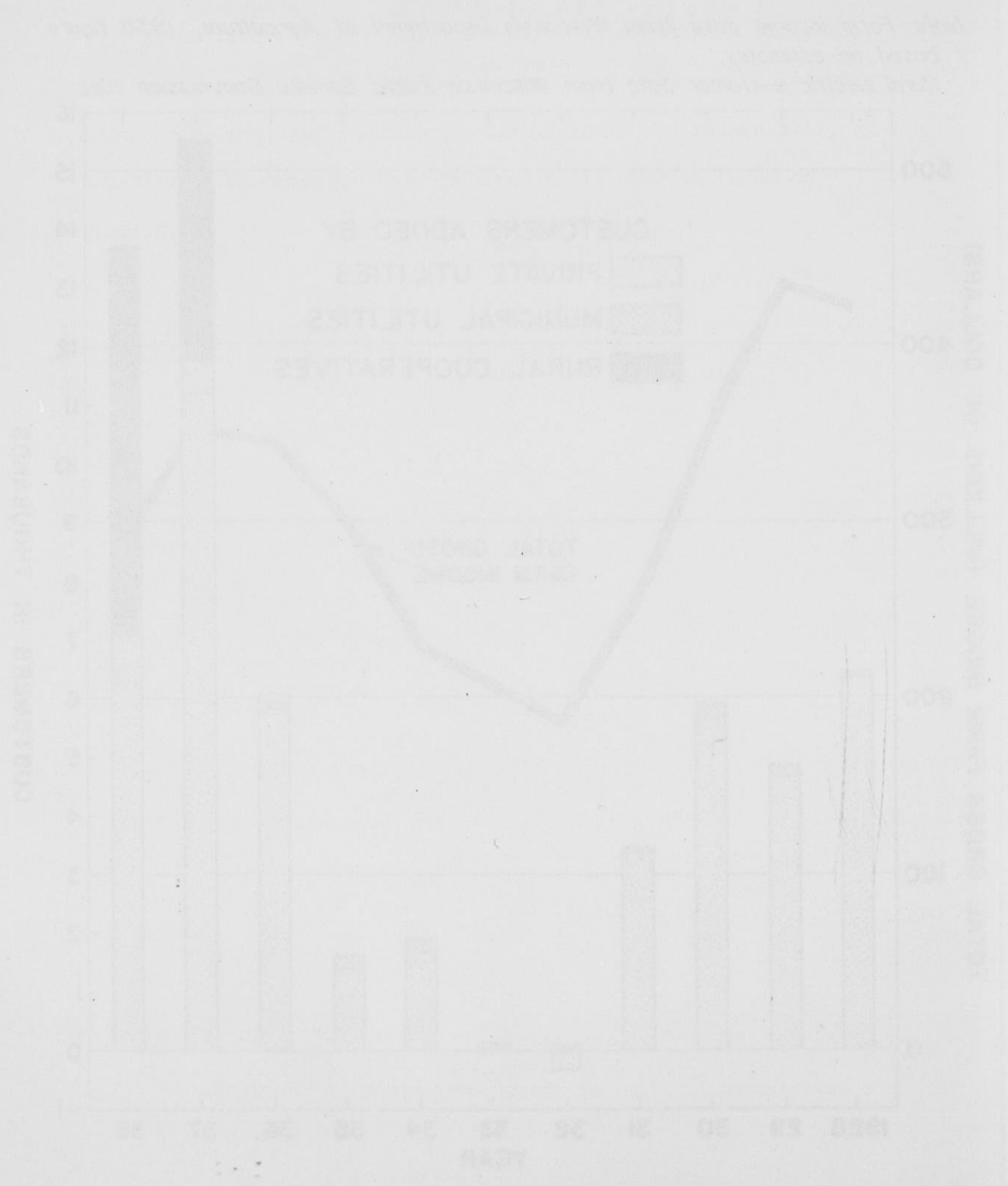
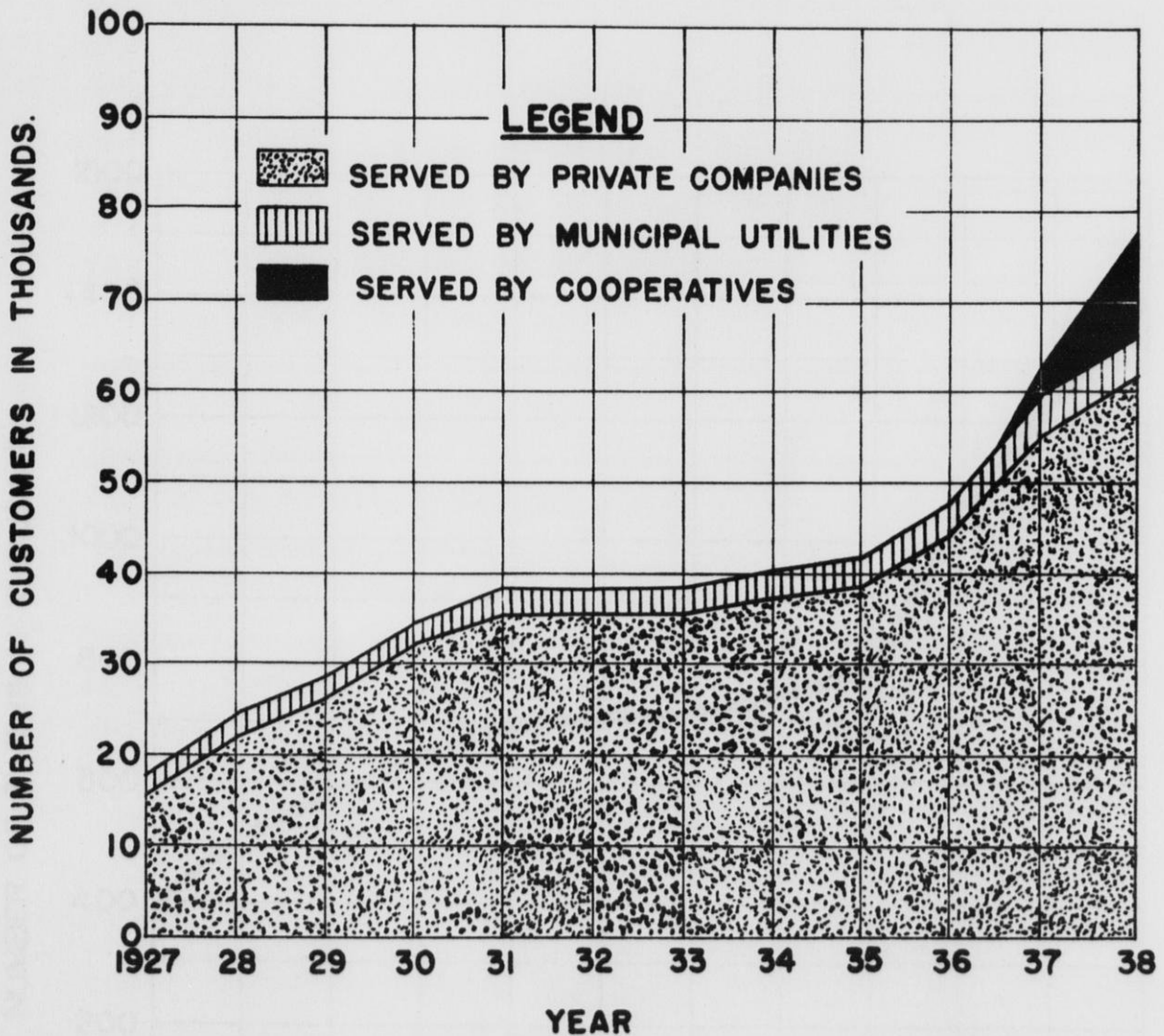


CHART F
NUMBER OF
RURAL ELECTRIC CUSTOMERS*
IN WISCONSIN
AS OF DEC. 31.
1927-1938.



*Includes all customers served at rural rates. As of Dec. 31, 1938 approximately 87% of these were farm customers.

CHART G
NUMBER OF
FARMS RECEIVING ELECTRIC SERVICE
IN UNITED STATES

AS OF DEC. 31
1927 — 1938

DATA FROM EDISON ELECTRIC INSTITUTE, BASED ON 100 %
OF ELECTRIC & POWER INDUSTRY

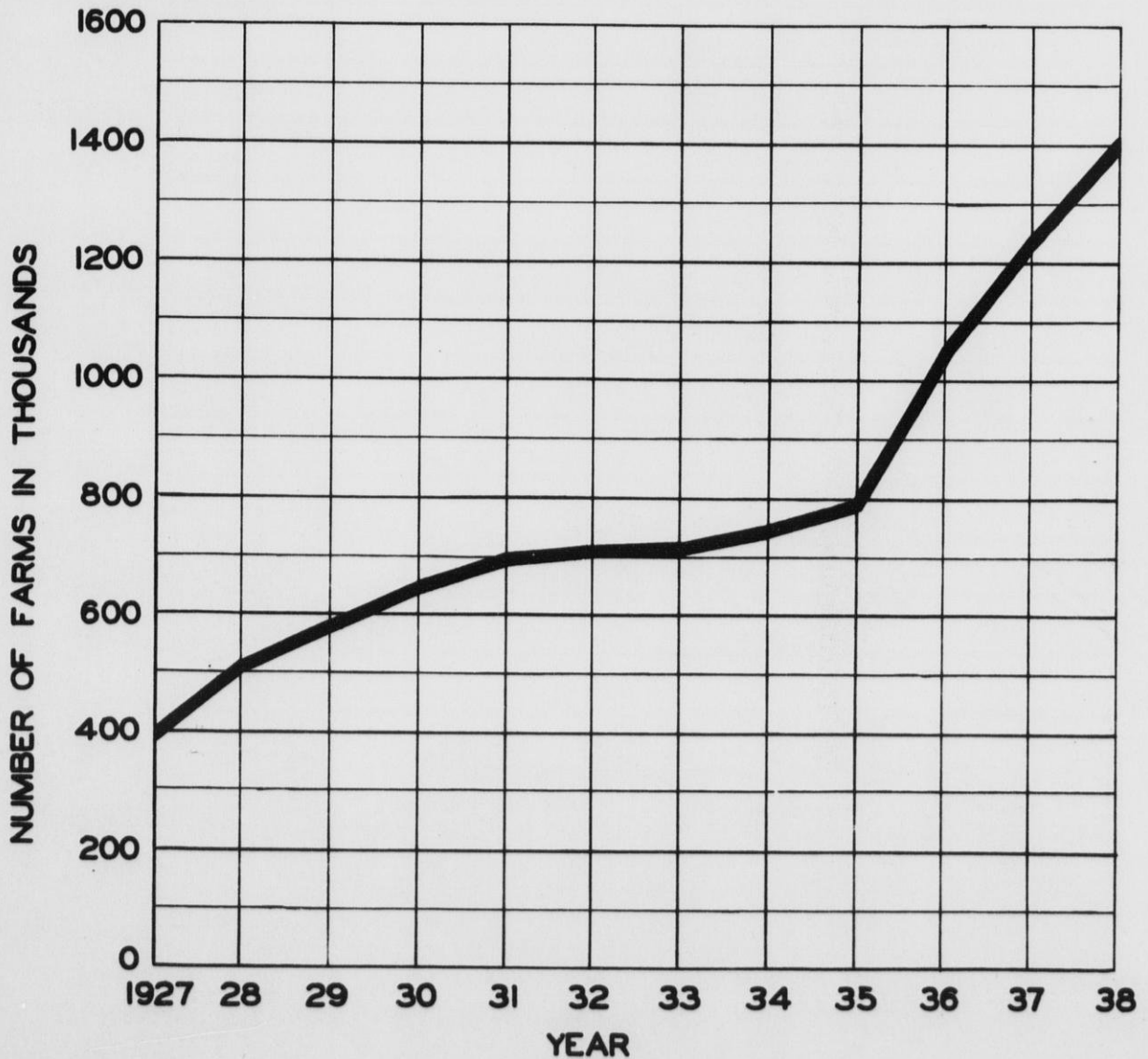
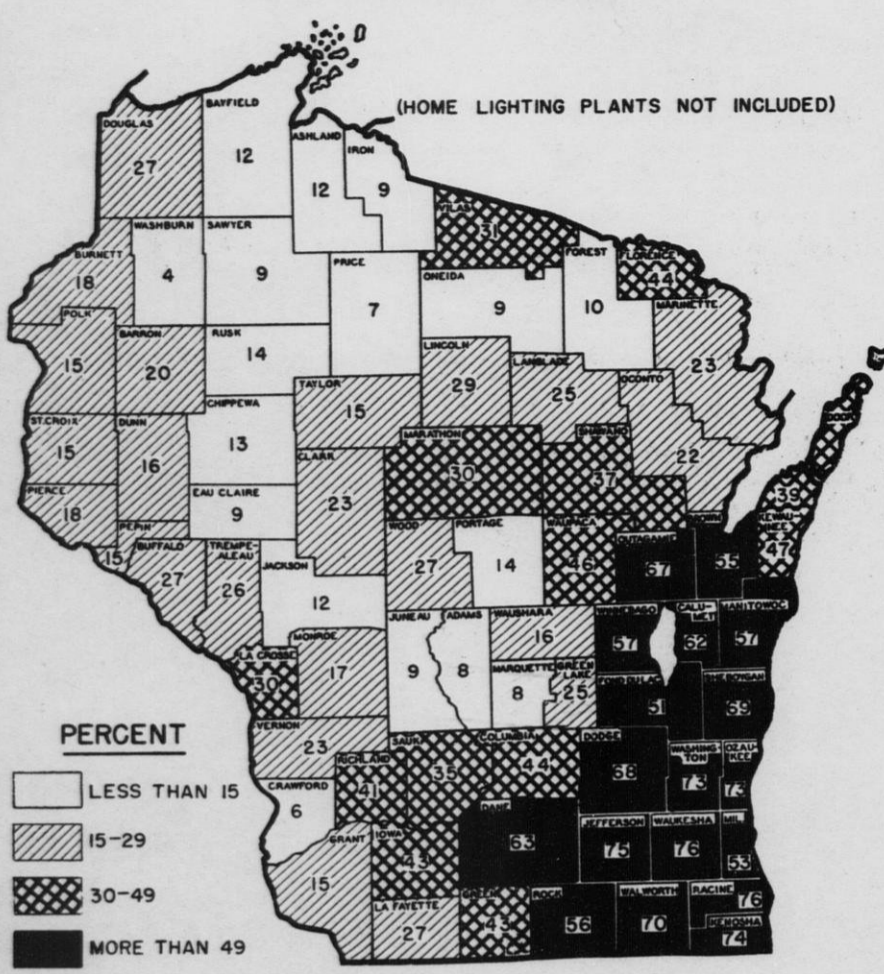
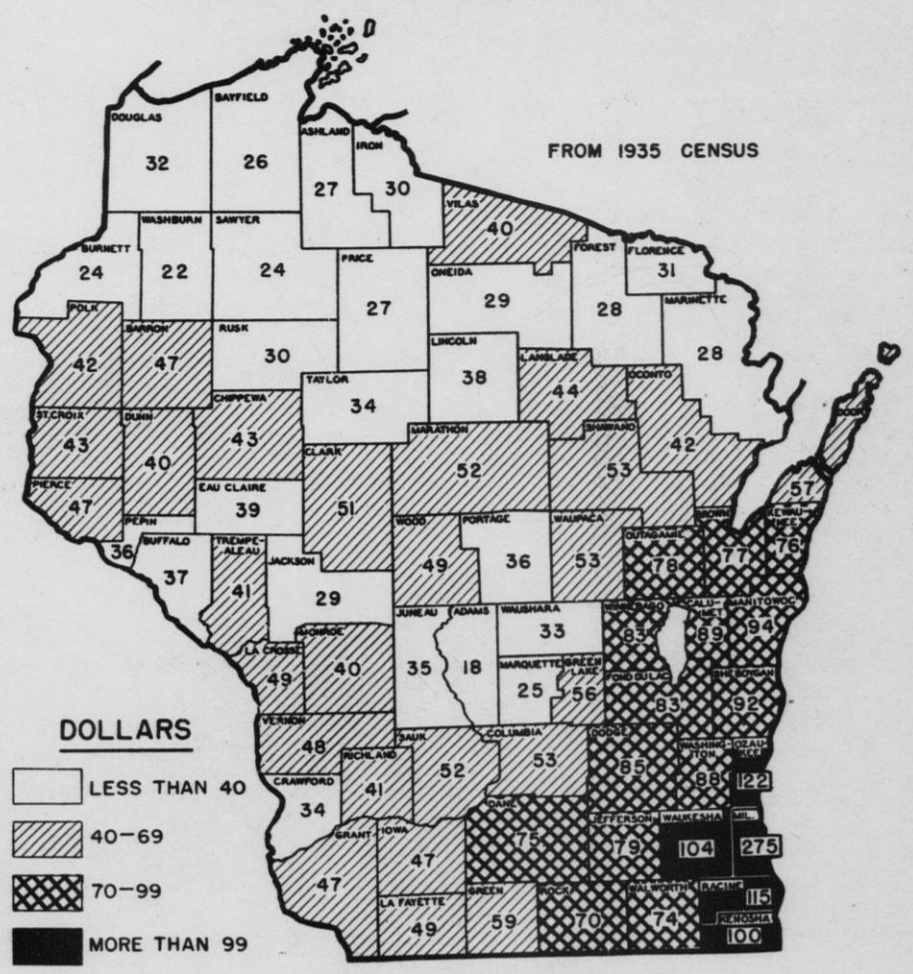


CHART H COMPARISON OF FARM ELECTRIFICATION, LAND VALUE, INCOME, AND DENSITY IN WISCONSIN BY COUNTIES

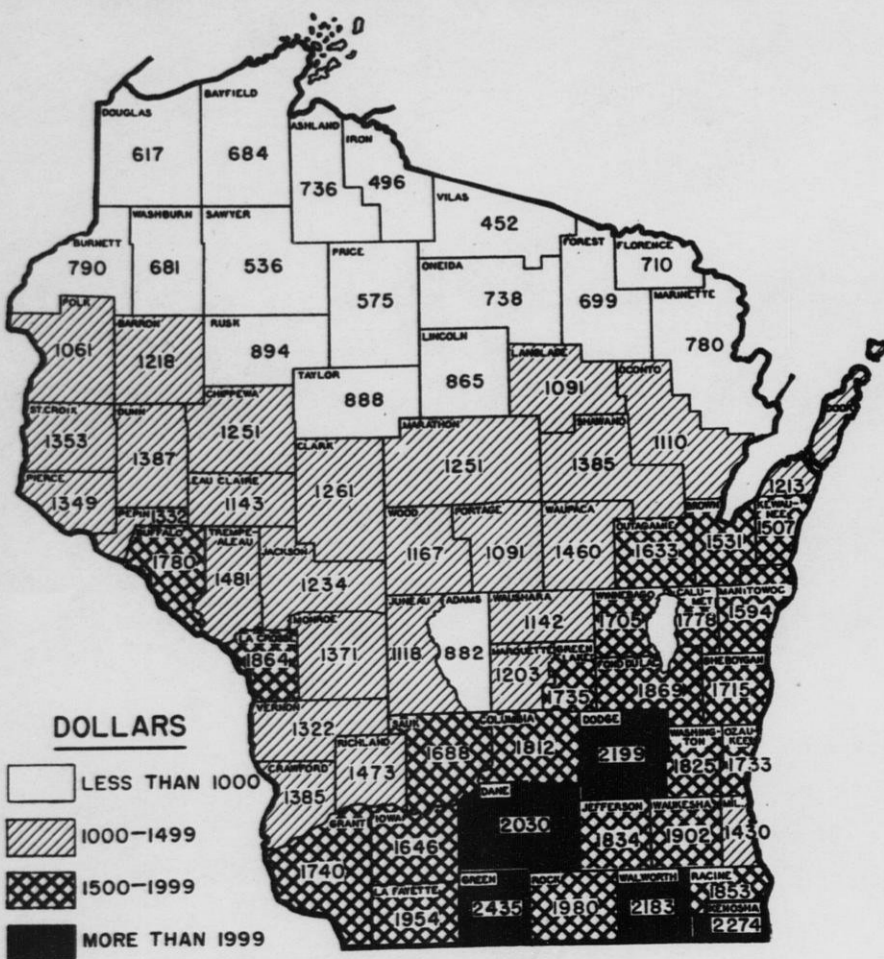
**PERCENT OF OCCUPIED FARMS ELECTRIFIED
AS OF DECEMBER 31, 1938**



**AVERAGE VALUE PER ACRE OF
LAND AND IMPROVEMENTS**



**AVERAGE GROSS INCOME PER FARM
BASED ON AVERAGE FOR 1931, 1933 & 1936**



**AVERAGE NUMBER OF OCCUPIED FARMS
PER SQUARE MILE OF TOTAL AREA**

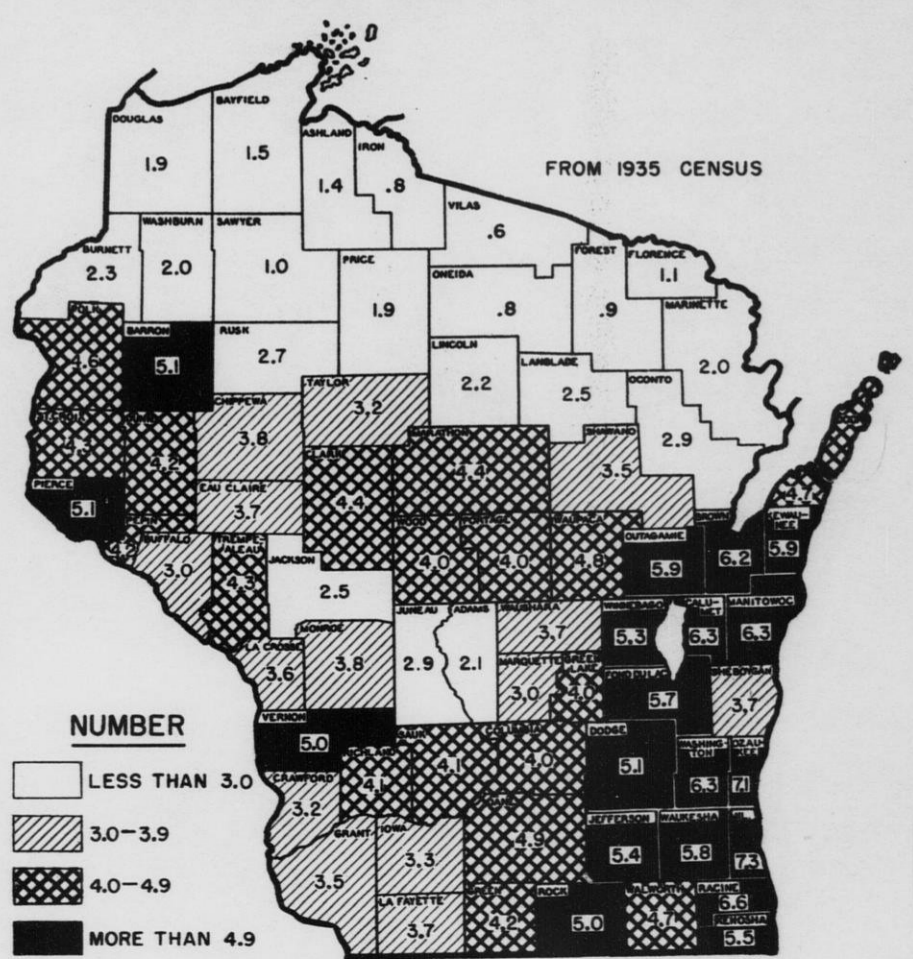
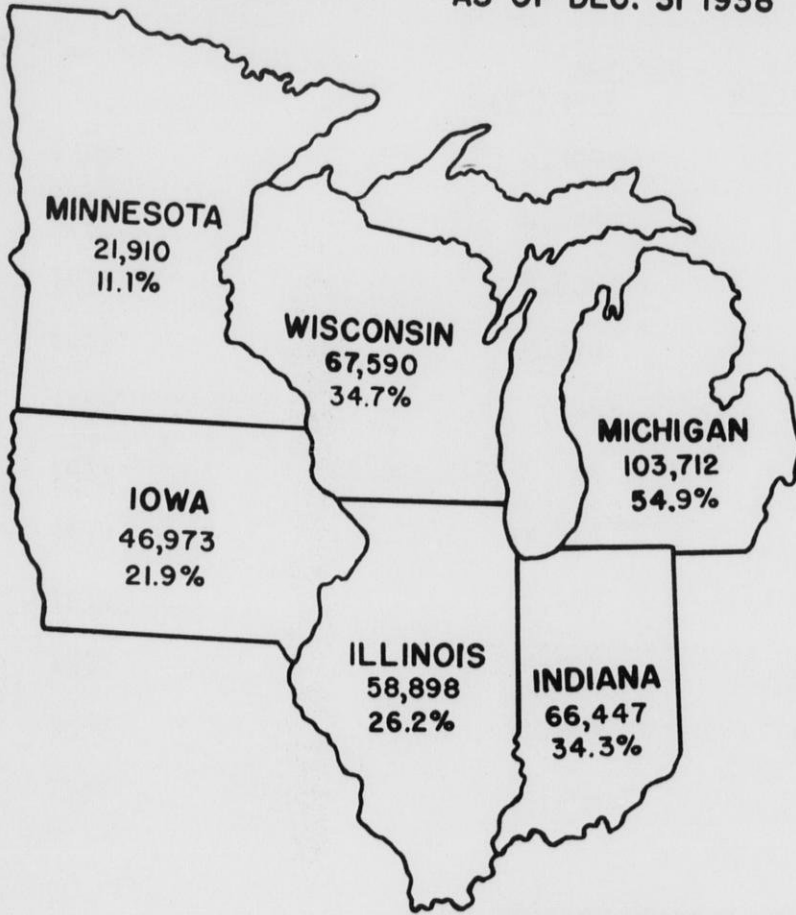


CHART J
PERCENT & NUMBER OF OCCUPIED FARMS ELECTRIFIED
AND
FARM DENSITY PER SQUARE MILE
IN
WISCONSIN AND FIVE SURROUNDING STATES
AS OF DEC. 31 1938



**PERCENT BASED
ON ALL
OCCUPIED FARMS**

Data From
Edison Electric Institute
Bulletins



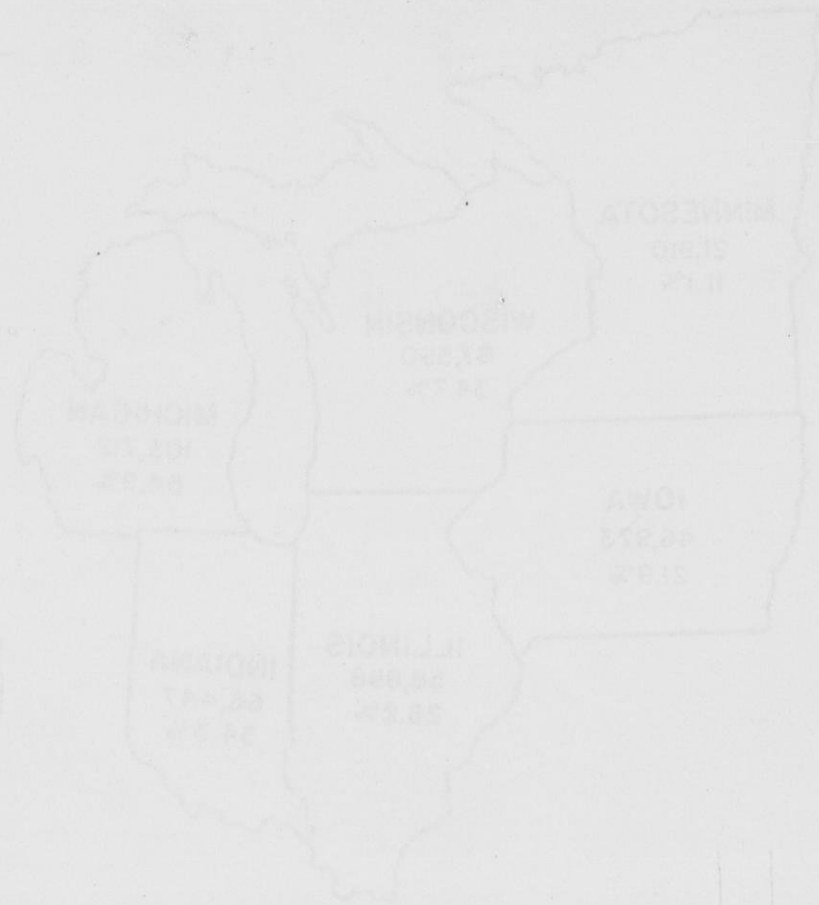
Average Number Of Farms Per Square Mile



CHART V
 PERCENT & NUMBER OF OCCUPIED FARMS ELECTRIFIED
 AND
 FARM DENSITY PER SQUARE MILE
 IN
 WISCONSIN AND FIVE SURROUNDING STATES
 AS OF DEC. 31, 1936

PERCENT BASED
 ON ALL
 OCCUPIED FARMS

Date Farm
 Electric Service Institute
 Bulletin



Average Number of Farms per Square Mile



TABLE V

INCREASE IN NUMBER OF RURAL ELECTRIC CUSTOMERS
BY PRIVATE AND MUNICIPAL UTILITIES AND COOPERATIVES
1928 - 1938

	<u>Increase in Customers During Year</u>		
	<u>Privates</u>	<u>Municipals</u>	<u>Cooperatives</u>
1928	6,349	93	-
1929	4,645	210	-
1930	5,606	362	-
1931	3,374	48	-
1932	(345)	75	-
1933	85	4	-
1934	1,726	224	-
1935	1,425	221	-
1936	5,829	243	-
1937	11,215	569	3,754*
1938	6,284	824	6,629

() Denotes decrease

* First cooperative energized in June 1937.