

A PROFILE OF UTILITY RATES  
USED FOR SOLAR ENERGY APPLICATIONS

prepared by

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1979

## ACKNOWLEDGMENTS

The National Regulatory Research Institute (NRRI) extends a note of thanks to all of the state regulatory commissions for their cooperation in this investigation. In addition to the nine commissions that submitted solar energy tariffs presented in this report, several sent information and material describing their efforts in the study of solar energy issues. This material was found to be valuable and will be used as a base for a future study by NRRI on investment and rate base treatment for solar energy application.

This report was prepared by The National Regulatory Research Institute under contract EC-77-C-01-8683 with the U.S. Department of Energy (DOE), Economic Regulatory Administration, Division of Regulatory Assistance. The opinions expressed herein are solely those of the NRRI and do not necessarily reflect the opinions nor the policies of the DOE.

The NRRI is making this report available to those concerned with state utility regulatory issues since the subject matter presented here is believed to be of timely interest to regulatory agencies and to others concerned with utility regulation.

## EXECUTIVE SUMMARY

This report has been compiled in response to a request by the United States Department of Energy, Economic Regulatory Administration, Office of Utility Systems, to explore the regulatory impact of rate-making on the solar/utility interface. Information was collected from 51 public utility commissions.

The investigation resulted in identifying 16 specific rates for solar energy users presently in force in nine states for 10 investor-owned utilities. The nine states are Illinois, Kansas, Michigan, New Hampshire, New York, North Carolina, South Carolina, Utah and Wisconsin. Two of the solar energy tariffs were designed for use by natural gas customers. Examination of the rate schedule for each tariff indicates that the utilities approached solar rate design in various ways. In terms of rate design, some use a traditional declining block approach, others use a flat rate and one utility based its tariffs on "time-of-use" principles.

Two common elements among the 16 tariffs could be identified. They are:

- 1) all are experimental and temporary, and
- 2) all require the customer to agree to the use of special metering equipment to monitor loads and usage.

Thirteen other states indicated that they either were close to implementing a rate schedule for solar energy or were investigating the subject in detail. The 13 states in this category are Arkansas, California, Delaware, Hawaii, Minnesota, Missouri, Montana, New Jersey, New Mexico, North Dakota, Pennsylvania, Vermont and Washington. From this group, New Jersey appears to be the candidate nearest to the implementation of a solar energy schedule. California and Hawaii may not be far behind. When the data were collected in May 1978, 28 states and the District of Columbia indicated either little or no interest in developing rate schedules for solar energy applications. Since that time, it has come to the Institute's attention that special rates for solar energy users are also in place in the states of Connecticut and Colorado.

## TABLE OF CONTENTS

	Page
Executive Summary . . . . .	i
List of Tables . . . . .	v
Section I - Background and Purpose of the Investigation . . . . .	1
Background . . . . .	1
Procedure for Investigation . . . . .	1
Organization of the Report . . . . .	2
Brief Summary of Findings . . . . .	2
Section II - Solar Energy Tariffs in Nine States . . . . .	8
1. Solar Tariffs in Illinois . . . . .	8
a. Central Illinois Light Company	
*Solar-Assisted Space Heating - Rate 4 . . . . .	10
b. Commonwealth Edison Company	
*Solar-Assisted Space Heating - Rate 14E. . . . .	11
c. Northern Illinois Gas Company	
Solar-Assisted Space Heating - Standard Rider 15 . . . . .	12
*Solar-Assisted Space Heating - Rate 1. . . . .	13
*Solar-Assisted Space Heating - Rate 4. . . . .	14
2. Solar Tariff in Kansas . . . . .	15
a. Kansas Gas and Electric Company	
*Solar-(or Mechanical) Assisted Space Heating/ Cooling and Water Heating - Rider OPS-977 (Electric) 16	16
3. Solar Tariff in Michigan . . . . .	17
a. Detroit Edison Company	
Michigan PSC Order Approving Application . . . . .	18
*Solar-Assisted Water Heating - Service Agreement . . . . .	21
*Solar-Assisted Water Heating - Rate MPSC No. 8 . . . . .	22

\*Indicates a solar tariff

	Page
4. Solar Tariffs in New Hampshire . . . . .	23
a. Public Service Company of New Hampshire	
*Solar-Assisted Space Heating - Special Contract No. NHPUC-37 with Total Environmental Action, Inc. . . . .	25
*Solar-Assisted Space Heating - Special Contract with Residential Customer . . . . .	36
5. Solar Tariff in New York . . . . .	41
a. Orange and Rockland Utilities	
*Solar-Assisted Space Heating and Water Heating - Rate PSC No. 2 (Electricity) . . . . .	42
6. Solar Tariffs in North Carolina . . . . .	44
a. Duke Power Company	
*Solar-Assisted Water Heating Rate - Schedule RWX(NC). . . . .	45
*Solar-Assisted Space Heating and Cooling, Water Heating and Cooking Rate - Schedule RAX(NC). . . . .	47
7. Solar Tariffs in South Carolina. . . . .	49
a. Duke Power Company	
*Solar-Assisted Water Heating - Rate Schedule RWX(SC). . . . .	51
*Solar-Assisted Space Heating and Cooling, Water Heating and Cooking - Rate Schedule RAX(SC). . . . .	53
*Solar-Assisted Space Heating and Cooling in Buildings and, in Addition, Solar-Assisted Water Heating and Cooking in Those Buildings with Residential Housekeeping Units - Rate Schedule GAX(SC) . . . . .	55
8. Solar Tariff in Utah . . . . .	57
a. Utah Power & Light Company	
*Solar-Assisted Water Heating - Rate Schedule No. 5A . . . . .	58
9. Solar Tariff in Wisconsin . . . . .	59
a. Wisconsin Power & Light Company	
*Solar - (and Certain Other Supplemental Energy Sources) Assisted Space and Other Heating and Cooling Requirements - Rate Schedule Rz-2. . . . .	60

Section III - A Profile of Solar Tariff Activity in the  
United States - May 1978. . . . . 62

LIST OF TABLES

	Page
Table 1: Solar Energy Tariffs: General Features . . . . .	4
Table 2: Solar Energy Tariffs: Rate Design Features . . . . .	6
Table 3: State Solar Tariff Profile: Regulatory Commissions, May 1978 . . . . .	63





SECTION I  
BACKGROUND AND PURPOSE OF THE INVESTIGATION

Background

This report has been compiled in response to a request by the United States Department of Energy, Economic Regulatory Administration, Office of Utility Systems, to catalog existing tariffs for solar energy users.

This request excludes the study of various types of customer tax incentives including property tax credits for the installation of solar equipment. The purpose of this survey is to provide a brief summary of solar rate schedules approved by state utility commissions. It is not intended to be an exhaustive treatment of the subject.

Procedure for Investigation

All 50 state regulatory commissions and the District of Columbia were included in the investigation. Primary interest was directed to determining if the commission has approved tariffs for solar energy users. In addition, the investigation tried to determine whether the commission was pursuing any study or investigation of solar energy tariffs. Several commissions indicated activity and interest in experimental rates for windmill applications. However, since the prime objective of this investigation is to determine the number of solar energy tariffs presently in effect in each state, rates for other energy sources such as wind, tidal or geothermal have not been included in the main body of this report.

## Organization of the Report

This report is organized into three major sections. Section I describes the background, objectives and procedures used in this investigation. A brief summary of findings is also presented in this section. Section II presents a brief description of the tariffs identified and presently in effect for utilities operating in nine states. Finally, Section III presents a tabular summary of information collected from all state regulatory commissions in the United States.

The primary purpose of this report is to serve as a brief overview of the activities and approaches in the design of tariffs for solar energy applications. No attempt has been made to determine whether the tariff acts as an incentive or a deterrent to the installation of solar energy devices. The NRRI recognizes that this issue, in addition to others, such as ownership and liability for energy systems and rate base determination, is critical and requires more systematic study.

## Brief Summary of Findings

This investigation of activity in solar energy rate design by state regulatory commissions identifies 16 tariffs designed for solar energy users. Nine state regulatory commissions have approved experimental tariffs specifically for solar energy applications or supplemental off-peak energy service. The states in which these tariffs are presently in force are Illinois, Kansas, Michigan, New Hampshire, New York, North Carolina, South Carolina, Utah and Wisconsin. The tariffs are offered to selected customers of 10 investor-owned utility systems.

The information found in Table 1 presents a brief overview of the major features for the 16 tariffs identified in this investigation. Examination of Table 1 indicates that there are two elements common to all the solar energy tariffs identified. First, they are experimental, and second, they require agreement by the customer to accept company measuring and monitoring devices. Ten tariffs specify the user to be residential only, and six tariffs include all customer classes. Utilities in Kansas and Wisconsin have an upper demand limit.

Examination of the rate design features in Table 2 indicates several different approaches to rate design. Declining block rates and flat rates are predominant although one utility uses time-of-day principles for its rate design. Utilities operating in Illinois and New York have seasonal rates that are higher during the summer period. In the case of Detroit Edison, the rate is made up of a customer charge, a flat rate for all kWh consumption and an interim surcharge.

The investigation also found that 13 states are about to release solar energy tariffs or have the matter under investigation. It appears that New Jersey, California and Hawaii are the states most likely to issue orders establishing solar energy tariffs in the very near future. Therefore, this investigation found that as of May 1978, 28 states and the District of Columbia indicated little or no interest in developing rate schedules for solar energy applications. All reportable findings from this group of states are presented in Table 3 found in Section III of this report.

TABLE 1

## SOLAR ENERGY TARIFFS: GENERAL FEATURES

State/Utility	Customer		Application			Special Conditions		
	Class Limit(1)*		Space Heating	Space Cooling	Water Heating	Experiment(2)	Peak-Load Control(3)	Service Deadline(4)
1. <u>Illinois</u> Central Illinois Light Co. Commonwealth Edison Co. Northern Illinois Gas Co. (two rates apply)	Res. 50 Res. 100 All (5) Classes 100		yes yes yes	no no no	no no no	yes yes yes	no no no	none 12/80 12/80
2. <u>Kansas</u> Kansas Gas and Electric Co.	All to 400 kW 200		yes	yes	yes	yes	yes	none
3. <u>Michigan</u> Detroit Edison Co.	All Classes 500		no	no	yes	yes	yes	none
4. <u>New Hampshire</u> Public Service Co. of New Hampshire Public Service Co. of New Hampshire	Res. 1 (6) Res. 1 (7)		yes yes	no no	no no	yes yes	yes yes	NA NA
5. <u>New York</u> Orange and Rockland Utilities, Inc.	Res. 20		yes	no	yes	yes	no	12/78
6. <u>North Carolina</u> Duke Power Co. - RWX (NC) Duke Power Co. - RAX (NC)	Res. none Res. none		no yes	no yes	yes yes	yes yes	no no	none none
7. <u>South Carolina</u> Duke Power Co. - RWX (SC) Duke Power Co. - RAX (SC) Duke Power Co. - GAX (SC)	Res. none Res. none All Classes none		no yes yes	no yes yes	yes yes yes(8)	yes yes yes	no no no	none none none
8. <u>Utah</u> Utah Power and Light Co.	Res. 4		no	no	yes	yes(9)	yes	none
9. <u>Wisconsin</u> Wisconsin Power and Light Co.	All to 75 kW 100		yes	yes	yes	yes	yes	none

\*Numbers in parentheses refer to notes on the next page.

NA = not applicable

TABLE 1

NOTES

1. Limit in number of customers for whom the tariff is available.
2. In general, all the tariffs require that the customer agree to the installation of special metering equipment by the company for monitoring usage and load as part of the experiment.
3. Load does not come on during peak-load period.
4. Service deadline is the date by which service under this tariff must begin.
5. Rate 1 is available to any single-family residential customer using the Company's gas service primarily for residential purposes. Rate 4 is available to any customer using the Company's gas service for general purposes.
6. The service to be rendered under this Special Contract consists in part of the furnishing of off-peak electricity to be utilized for controlled space heating in a solar-heated home by means of a megatherm thermal storage device as part of an experimental load research program. Agreement is between the utility and a company.
7. The service to be rendered under this Special Contract consists in part of the furnishing of off-peak electricity to be utilized for controlled back-up space heating in a solar-heated home by means of a customer-owned and -installed thermal storage system as part of an experimental load research program. Agreement is between the utility and an individual.
8. Only includes water heating in those buildings with residential housekeeping units.
9. Limited to residences with permanently installed electric heating equipment.

TABLE 2

## SOLAR ENERGY TARIFFS: RATE DESIGN FEATURES

State/Utility	Minimum Customer Charge	Demand Charge	Energy Charge	Rate (1)* Structure	Lower Off-Peak Rate	Peak Season Rate
1. <u>Illinois</u>						
Central Illinois Light Co.	\$1.00	no	yes	DB	no	yes(2)
Commonwealth Edison Co.	\$1.40	no	yes	DB	no	yes(3)
Northern Illinois Gas Co. Rate 1	\$1.75 net	no	yes	DB	no	yes(4)
Rate 4	\$1.90 net	no	yes	DB	no	no
2. <u>Kansas</u>						
Kansas Gas and Electric Co.	(5)	(5)	yes	flat(5)	yes(5)	no(5)
3. <u>Michigan</u>						
Detroit Edison Co.	\$1.50	no	yes(6)	flat	no	no
4. <u>New Hampshire</u>						
Public Service Co. of New Hampshire	(7)	(7)	yes	flat(7)	yes(7)	no(7)
Public Service Co. of New Hampshire	(7)	(7)	yes	flat(7)	yes(7)	no(7)
5. <u>New York</u>						
Orange and Rockland Utilities, Inc.	\$4.07	no	yes	DB	NA	yes(8)
6. <u>North Carolina</u>						
Duke Power Co. - RWX (NC)	\$4.69	yes(9)	yes	DB(10)	NA	no
Duke Power Co. - RAX (NC)	\$5.19	no	yes	DB(10)	NA	no
7. <u>South Carolina</u>						
Duke Power Co. - RWX (SC)	\$4.60	yes(9)	yes	DB(13)	NA	no
Duke Power Co. - RAX (SC)	\$4.80	no	yes	DB(14)	NA	no
Duke Power Co. - GAX (SC)	\$ .75/kWh	no	yes	DB(15)	NA	no
8. <u>Utah</u>						
Utah Power and Light Co.	(11)	no	yes	DB	no	no
9. <u>Wisconsin</u>						
Wisconsin Power and Light Co.	(16)	yes(12)	yes	TOD(16)	yes(16)	no(16)

\*Numbers in parentheses refer to notes on the following page.

NA = Not applicable (see peak-load control column in Table 1, page 4).

TABLE 2

NOTES

1. DB = declining block, TOD = time-of-day
2. A higher seasonal rate exists during the five (5) consecutive billing months beginning with June of each year for all energy in excess of 400 kWh.
3. A higher seasonal rate for all use over 350 kWh per month for the customer's first monthly billing period with an ending meter reading date on, or after June 15, and in the three succeeding monthly billing periods.
4. When the customer uses gas for space cooling, a lower seasonal rate exists for all use over 40 therms supplied in the month during the four consecutive billing months beginning with the first regular meter reading taken on, or after July 1, each year.
5. The off-peak storage rider shows only a flat off-peak energy charge for solar-assisted applications. Other customer use is provided under an applicable standard rate.
6. Includes a .096¢ interim surcharge per kWh for all kWh.
7. The contract only provides a flat off-peak energy charge for controlled solar-assisted space heating. Charges for other use are in accordance with the standard tariff.
8. A higher seasonal rate for summer (June through September) is charged for all consumption above 130 kWh.
9. Measured hourly demand, if exceeding 10 kW in any month, will be assessed a charge of \$1.00 for each whole kW in excess of 10 if a demand meter is installed.
10. Declining block except for the first block.
11. Minimum charge is \$3.25 for single-phase service and \$9.75 for three-phase service.
12. \$3.50 up to 50 kW connected; \$6.50 over 50 kW and up to 75 kW connected.
13. Declining block through 350 kWh use per month, then higher kWh charges.
14. Declining block except for fourth block.
15. Declining block based upon hours use of demand.
16. The TOD rate is only for service in connection with supplemental energy sources, including solar. Other customer use is provided under an applicable standard rate.

## SECTION II

### SOLAR ENERGY TARIFFS IN NINE STATES

This section of the report contains reproduced copies of the solar energy tariffs received from nine state utility regulatory commissions and represents 16 separate tariffs presently in place for nine electric utility companies and one natural gas company.

Tariffs were obtained from state utility regulatory commissions in Illinois, Kansas, Michigan, New Hampshire, New York, North Carolina, South Carolina, Utah and Wisconsin. In each case, the tariff is termed "solar," except for the Kansas example that is titled "Experimental Off-Peak Storage Rider" and Wisconsin's that is titled "Supplemental Energy Off-Peak Service." However, in each example, it is clear from an analysis of the tariff that it is designed for, or intended to, include solar energy systems.

This investigation recognizes the efforts of several state regulatory commissions in attempting to set regulatory policy for solar energy systems. More information on the solar energy situation in these states can be found in note 4 of Table 3 on page 66.

#### 1. Solar Tariffs in Illinois

This part of the report shows residential solar-assisted space heating rates presently in effect for a limited number of customers in Illinois. Three investor-owned utilities offer customers a solar energy rate on an experimental basis. Illinois was the only state identified in the investigation with solar energy rates for residential natural gas customers.



Central Illinois Light Company (CILCO) - Residential Solar-Assisted  
Electric Space Heating - Rate 4

CILCO offers a customer a residential solar-assisted electric space heating rate on an experimental basis. The rate is restricted to the first 50 customers who use the Company's services for domestic and general farm purposes. The overall rate includes a \$1.00 customer charge and an energy charge based upon a declining block rate with a higher seasonal charge for all usage in excess of 400 kWh during the five summer months beginning in June. A condition for the rate, similar to that in all rates in this report, is that customers must agree to permit the use of special equipment to measure load requirements and usage.

Commonwealth Edison Company (CEC) Residential Service - Solar-Assisted  
Electric Space Heating - Rate 14E

CEC also offers a temporary rate on an experimental basis to the first 100 applicants. The tariff example shown on page 11 is for the city of Chicago. The overall rate includes a \$1.40 customer charge and a two-block declining rate that carries a surcharge of 4.194¢ per kWh for all use over 350 kWh for approximately three summer months.

Northern Illinois Gas Company (NIGC) Solar-Assisted Space Heating Gas  
Service - Experimental - Standard Rider 15

NIGC offers solar-assisted space heating gas service on an experimental basis under two rates, residential service and general service. The service is available to the first 100 applicants requesting gas service in combination with solar use. The rates to the customer under this rider are the same as those stipulated in the Company's applicable filed gas tariff specified as rates 1 and 4. All provisions of the rates will apply to the solar-assisted residential or general service space heating customer and, in addition, the Company will operate and maintain special equipment, at its expense, to determine the operating characteristics of the customers' solar installation.

## RESIDENTIAL SOLAR ASSISTED ELECTRIC SPACE HEATING RATE 4

### Availability:

This is a temporary rate available on an experimental basis to the first 50 applicants for service hereunder who use the Company's service for domestic purposes and to rural residence customers using service for domestic and general farming purposes and whose entire space heating requirements are supplied under this rate through a combination of permanently installed space heating facilities and solar energy collectors providing space heating through heat exchangers.

### Nature of Service:

Alternating current, 60 cycle, single phase, 120/240 nominal volts.

### \*Net Monthly Rate:

#### Customer Charge

The net monthly customer charge shall be \$1.00.

#### Energy Charge

4.808¢ per kwh for the first	200 kwh
4.658¢ per kwh for the next	200 kwh
2.798¢ per kwh for all over	400 kwh

However, during the five (5) consecutive billing months beginning with June of each year, all energy in excess of 400 kwh shall be billed at 5.108¢ per kwh.

**Minimum Charge:** The minimum monthly charge shall be the net monthly customer charge.

The above net rate and minimum charge are subject to "fuel cost adjustment" as set forth in the General Terms and Conditions.

### Payments:

Bills will be considered past due if not paid by the due date, which will not be less than twenty-one (21) days after the postmark date of the bill. An amount equal to 1½ percent per month will be applied to any unpaid balance existing at the immediate subsequent regular billing date.

### Terms and Conditions:

All customers served hereunder shall permit the Company to use special equipment to measure their loads or any part thereof, to measure the solar energy collected and to obtain any other data necessary to determine the operating characteristics of installations served hereunder, provided that the Company shall reimburse the Customer for any extra costs incurred as a result of such measurements or data collection.

All service shall be governed by the Company's General Terms and Conditions.

\* Asterisk indicates change

**RATE 14E. RESIDENTIAL SERVICE—SOLAR ASSISTED ELECTRIC SPACE HEATING**

**Availability.**

This is a temporary rate available on an experimental basis to the first 100 applicants for service hereunder who use the Company's electric service for residential purposes and whose entire space heating requirements are supplied under this rate through a combination of electric space heating facilities, the major portion of which are permanently installed, and solar energy collectors providing space heating through heat exchangers. Service hereunder must commence by December 31, 1980.

**\*Charges.**

**Monthly Customer Charge.**

The net monthly customer charge shall be \$1.40.

**Energy Charge.**

<u>Net</u>	<u>Kilowatthours Supplied in the Month</u>
4.194¢ per kilowatthour for the first .....	350
1.963¢ per kilowatthour for all over .....	350
except that the net charge shall be 4.194¢ per kilowatthour for all use over 350 kilowatthours per month in the Customer's first monthly billing period with an ending meter reading date on or after June 15 and in the three succeeding monthly billing periods.	

The fuel adjustment charge or credit provided for in Rider 20 shall apply to all kilowatthours supplied in the month.

The gross charge shall equal the sum of the net charge and the fuel adjustment, increased by three percent.

**Light Bulb Service.**

The above charges do not include light bulb service. They will be increased 0.06¢ per kilowatthour for the first 500 kilowatt-hours supplied in the month for light bulb service as described in Rider 10. Light bulb service is optional with the Customer.

**Minimum Charge.**

The minimum monthly charge shall be the net monthly customer charge.

**Term of Service.**

The Customer's term of service shall commence when the Company begins to supply service hereunder and shall continue not more than ten days after notice is received to discontinue service.

**Three-Phase Service.**

Three-phase service is available under this rate. Where a three-phase secondary supply is not available from the Company's distribution system adjacent to the Customer's property, the necessary primary and secondary extensions will be furnished by the Company subject to the provisions of Rider 2.

**\*General.**

All customers served hereunder shall permit the Company to use special equipment to measure their loads or any part thereof, to measure the solar energy collected and to obtain any other data necessary to determine the operating characteristics of installations served hereunder, provided that the Company shall reimburse the Customer for any extra costs incurred as a result of such measurements or data collection.

Service hereunder will be furnished only to a single occupancy, and where service to an apartment building is desired hereunder, each occupancy shall be treated as a separate customer; provided, however, that in apartment buildings if all space heating requirements, except for garages, are supplied electrically or through solar collectors, all building service requirements except water heating will be furnished hereunder either through the metering installation of one of the apartments or to the building operator as a separate customer. If the operator of the building so desires, space heating and air conditioning requirements for the individual apartments, but not water heating, may be included in such building service requirements.

The Customer's wiring shall be arranged so that all service hereunder is supplied through a single metering installation, except that additional metering installations for service for residential purposes or for building service requirements may be provided as optional facilities in accordance with the provisions of Rider 6. If there are two or more metering installations, the kilowatthours supplied shall be determined by adding together the kilowatthours metered at each installation.

Where a residence and a business are combined in one premises, service will not be furnished hereunder for the whole premises unless the preponderant requirement is for residential purposes.

The Schedule of which this rate is a part includes certain general Terms and Conditions and Riders. Service hereunder is subject to these Terms and Conditions and the Riders applicable to this rate.

STANDARD RIDER 15

SOLAR ASSISTED SPACE HEATING GAS SERVICE - EXPERIMENTAL

Applicable to Rates 1 and 4

Availability.

This rider is available on an experimental basis until December 31, 1981, to the first 100 applicants requesting gas service for purposes which include supplemental or standby use of gas-fired equipment in combination with the use of permanently installed solar energy collectors and heat exchangers for space heating requirements. Service hereunder must commence on or before December 31, 1980.

Rate Designations.

Service supplied hereunder shall be designated as Rate 1-S or 4-S on the Customer's bill, as appropriate, when provided in combination with Rate 1 or 4, respectively, of this Schedule.

General.

The Company is authorized hereunder to install, operate and maintain any special equipment deemed appropriate to measure the Customer's load or any part thereof, and to gather other data necessary to determine the operating characteristics of the Customer's solar installation; provided, however, that the Company shall reimburse the Customer for any extra costs incurred by the Customer as a result of such measurements or data collection.

Except as specified above, all other provisions of the rate shall apply.

**RATE 1. RESIDENTIAL GAS SERVICE**

**Availability.**

This rate is available to any single-family residential customer using the Company's gas service primarily for residential purposes.

**\*Charges.**

<u>Net</u>	<u>Therms Supplied in the Month</u>
33.75¢ per therm for the first .....	10
25.95¢ per therm for the next .....	30
22.20¢ per therm for the next .....	110
19.58¢ per therm for all over .....	150

When the Customer uses gas for space cooling, the above charges for all over 40 therms supplied in the month shall be 18.10¢ net per therm during the four consecutive billing months beginning with the first regular meter reading taken on or after July 1 each year.

The net charge for each therm supplied in any billing period is subject to adjustment in accordance with the provisions of the Company's "Adjustment for Cost of Purchased Gas" Rider 6.

The gross bill is eight percent more than the above net charges for the first \$10.00 or less per month of billing after adjustment for "Cost of Purchased Gas."

**Minimum Charge.**

The minimum monthly bill shall be \$1.75 net, \$1.89 gross.

**Term of Service.**

The Customer's term of service shall commence when the Company begins to supply service hereunder and shall continue not more than ten days after notice is received to discontinue service; provided that temporary or seasonal service shall be subject to the provisions of the Company's Temporary Gas Service rider.

**Combination Residence and Business.**

Gas will be supplied hereunder for the entire requirements of a combined residence and business, if the preponderant requirement is for residential purposes.

**Restrictions on Use of Gas.**

Gas will not be supplied hereunder for auxiliary, reserve or supplemental space heating.

**General.**

The Schedule of which this rate is a part includes certain general Terms and Conditions and Standard Riders. Service hereunder is subject to these Terms and Conditions and the Standard Riders which are listed as applicable to this rate.

These provisions are subject to change  
under Commission authority.

**RATE 4. GENERAL GAS SERVICE**

**Availability.**

This rate is available to any customer using the Company's gas service for general purposes.

**\*Charges.**

<u>Net</u>		<u>Therms Supplied in the Month</u>
34.75¢	per therm for the first .....	10
26.65¢	per therm for the next .....	30
23.75¢	per therm for the next .....	110
20.23¢	per therm for the next .....	9,850
19.68¢	per therm for the next .....	10,000
19.10¢	per therm for all over .....	20,000

The net charge for each therm supplied in any billing period is subject to adjustment in accordance with the provisions of the Company's "Adjustment for Cost of Purchased Gas" Rider 6.

The gross bill is eight percent more than the above net charges for the first \$10.00 or less per month of billing after adjustment for "Cost of Purchased Gas." For larger consumptions, the gross bill is three percent more than the net charge after adjustment for "Cost of Purchased Gas," but not less than 80¢ nor more than \$200.00 in excess of such net charge for gas supplied in the month.

**Minimum Charge.**

The minimum monthly bill shall be \$1.90 net, \$2.05 gross.

**Term of Contract.**

The initial term of contract hereunder shall be one year.

The initial term shall commence when the Company begins to supply gas hereunder and, after the expiration of such initial term, the contract shall be automatically renewed each year for a period of one year. The Customer shall have the right to terminate service under the contract at the end of any month on 30 days' written notice to the Company; provided, however, that in the event of termination, all amounts due the Company shall forthwith be paid, and provided, further, that temporary or seasonal service shall be subject to the provisions of the Company's Temporary Gas Service rider.

**Substitution of Rate.**

The Customer may elect to transfer to another rate at any time after any period of 12 months or more of continuous service hereunder. Each transfer shall be effective with the first regular meter-reading date following the request for transfer.

**Restrictions on Use of Gas.**

Gas will not be supplied hereunder for auxiliary, reserve or supplemental space heating except in conjunction with Rate 11, Gas Energy Service.

**Interfering Equipment.**

Whenever any of the Customer's utilization equipment, such as compressors and furnaces, has characteristics which will cause interference with service to any other customer or interfere with proper metering, suitable facilities shall be provided at the Customer's expense to preclude such interference.

**General.**

The Schedule of which this rate is a part includes certain general Terms and Conditions and Standard Riders. Service hereunder is subject to these Terms and Conditions and the Standard Riders which are listed as applicable to this rate.

These provisions are subject to change  
under Commission authority.

## 2. Solar Tariff in Kansas

Kansas Gas and Electric Company - Solar- (or Mechanical Assisted Space Heating/Cooling and Water Heating - Rider OPS-977 (Electric)

This tariff is designated as an "Experimental Off-Peak Storage Rider." It is limited to 200 customers whose total electric load is 400 kW/KVA or less. It is applicable to electric service for storage equipment used in the operation of heating, cooling and water heating normally supplied from solar or mechanical sources. The "off-peak" is defined as the period from 10:00 p.m. to 11:00 a.m., seven days per week. All provisions of the appropriate standard rate schedule shall apply except that the off-peak rate for the solar applications is a flat 1.941¢ per kWh.

The general terms and conditions for this rate require that the customer shall bear all costs for the installation of a Company-approved load control device. The circuit supplying this load shall be separately metered. Any additional cost for metering devices or cabinets shall be paid for by the customer.

KANSAS GAS AND ELECTRIC COMPANY  
(Name of Issuing Utility)

Replacing Schedule OPS-677 Sheet

All territory served by the Company  
(Territory to which schedule is applicable)

which was filed June 16, 1977-77U208

No supplement or separate understanding shall modify the tariff as shown hereon.

Sheet 1 of 1 Sheets

EXPERIMENTAL OFF-PEAK STORAGE RIDER

AVAILABILITY

Available to customers whose total electric load is 400 kw/kva or less. This rider is limited to 200 customers and may be withdrawn after September 1, 1981.

APPLICATION

Applicable to electric service for storage equipment used in the operation of heating, cooling and water heating normally supplied from solar or mechanical sources, electrically separated from the customer's normal usage, and where the supply of service is controlled and available only between 10 pm and 11 am every day of the year or such other hours as Company may specify upon thirty (30) days written notice. Service supplied hereunder shall be in conjunction with Company's Standard Rate Schedules.

The circuit supplying this load shall be in conduit and separately metered, shall have a Company approved load interrupting device furnished, installed and maintained by customer and located adjacent to the meter in a cabinet provided by Company. Additional investment for facilities required to serve the off-peak load including metering and control device cabinet shall be paid for by customer.

All other provisions of the Standard Rate Schedule shall apply except as modified by this rider.

NET MONTHLY RATE

1.941¢ per kwh

Fuel Adjustment: All kwh will be subject to the applicable Retail Fuel Adjustment Clause Rider.

SERVICE REGULATIONS

Service under this rider is subject to the Service Regulations of Company at present on file with the Kansas State Corporation Commission and any modifications thereof lawfully made.

109227-3

Commission File Number

Issued September 21 1977  
Month Day Year  
Effective All bills rendered after Sept. 29, 1977  
Month Day Year  
*C. Wilson* Executive Vice President

FILED SEP 21 1977  
THE STATE CORPORATION COMMISSION  
OF KANSAS  
*Clayton D. Carter* Secretary



### 3. Solar Tariff in Michigan

The Detroit Edison Company - Experimental Solar-Assisted Water Heating Service Rate MPSC No. 8

The Detroit Edison Company filed an application requesting authority to conduct studies to determine the effect of solar-assisted water heaters on energy consumption and to provide a rate for solar-assisted water heating, separately metered, to the first 500 customers who apply for the service. This application was given approval on May 1, 1978. The rates for solar energy customers are determined by an existing water heating service rate schedule that the Commission found applicable for the Detroit Edison Company solar energy experiment. The Commission order is presented on page 18.

The specific solar-assisted water heating service rate schedule is presented on page 22. A separate agreement (page 21) allows the Company to install load monitoring equipment. This is also specified in the rate. Control of the service shall not exceed four hours per day, the hours to be established from time to time by the Company. The rate schedule contains a fixed customer charge of \$1.50 per month, a flat energy charge of 2.43¢ per kWh and an interim surcharge of .096¢ per kWh.

STATE OF MICHIGAN  
BEFORE THE MICHIGAN PUBLIC SERVICE COMMISSION

\* \* \* \* \*

In the matter of the application )  
of THE DETROIT EDISON COMPANY for )  
authority to supply electric )  
energy for experimental solar )  
assisted water heating service. )  
\_\_\_\_\_ )

Case No. U-5731

At a session of the Michigan Public Service Commission held at its offices in the City of Lansing, Michigan, on the 1st day of May, 1978.

PRESENT: Hon. Daniel J. Demlow, Chairman  
Hon. Lenton G. Sculthorp, Commissioner  
Hon. Willa Mae King, Commissioner

ORDER APPROVING APPLICATION

On March 13, 1978, The Detroit Edison Company (Applicant) filed an application requesting authority to conduct studies to determine the effect of solar assisted water heaters on energy consumption and to provide a rate for solar assisted water heating, separately metered, to the first 500 customers who apply for the service.

From the application and the records and files of the Commission, it appears that:

1. Applicant is a public utility operating within the State of Michigan supplying electric service to customers under a schedule of electric rates approved by this Commission.
2. Applicant proposes to conduct studies to determine the effect of solar assisted water heaters of Kwh consumption, as compared to standard electric hot water heaters.

3. Applicant would make available, to the first 500 customers who apply, a rate for solar assisted water heating. To qualify, customers should be taking service under rate D1, D2, D3, or D4 and have installed a solar assisted water heating system approved by Applicant and separately metered. The customer must permit installation of meters and instruments on his premises so that Applicant can determine the feasibility and energy consumption of solar assisted electric water heating.

4. Applicant will deliver electricity under terms of the Experimental Solar Assisted Water Heating Service Agreement and Experimental Solar Assisted Water Heating Service Rate, Sheet No. D5.1 copies of which are attached hereto as Exhibit A and Exhibit B, respectively.

5. The proposed rate is identical to the existing Water Heating Service Rate D5, Option 1, with the exception that a heat exchanger may be added to the tank to receive heat transferred to it by solar heat collectors. Applicant proposes that the experimental rate be subject to any future rate changes which the D5, Option 1 rate would be subject to, until a different rate would be considered more appropriate.

6. The proposal will not result in an increase in costs to any of Applicant's existing customers.

The Commission FINDS that:

a. Jurisdiction is pursuant to 1909 PA 106, as amended, MCLA 460.551 et seq.; 1909 PA 300, as amended, MCLA 462.2 et seq.; 1919 PA 419, as amended, MCLA 460.51 et seq.; 1939 PA 3, as amended, MCLA 460.1 et seq.; 1969 PA 306, as amended, MCLA 24.201 et seq.; and the Commission's Rules of Practice and Procedure, 1954 Administrative Code, 1968 Annual Supplement, R 460.11 et seq.

b. The public interest in this matter will be adequately protected without the time and expense of a public hearing.

c. Applicant's proposal to conduct a study of solar assisted electric water

heating and to offer a rate for such service, as filed in its application of March 13, 1978, is just, reasonable and in the public interest, and should be approved.

THEREFORE, IT IS ORDERED that:

A. The Detroit Edison Company is authorized to conduct a study on experimental solar assisted water heating. The rate sheet, attached hereto as Exhibit B, is hereby approved, effective on and after the date of this order.

B. The rate is subject to the same increases as the D5, Option I water heating rate.

C. In conformance with Commission Order No. U-3096, Filing Procedures, The Detroit Edison Company shall, within 30 days from the date of this order, submit to the Commission its tariff sheet D5.1, substantially the same as Exhibit B attached hereto.

D. Applicant shall submit to the Commission the results of its study as they become available.

The Commission specifically reserves jurisdiction of the matters herein contained and the authority to issue such further order or orders as the facts and circumstances may require.

MICHIGAN PUBLIC SERVICE COMMISSION

( S E A L )

/s/ Daniel J. Demlow  
Chairman

/s/ Lenton G. Sculthorp  
Commissioner

By the Commission and pursuant to  
its action of May 1, 1978.

/s/ Willa Mae King  
Commissioner

/s/ Thomas R. Lonergan  
Its Secretary

EXPERIMENTAL SOLAR ASSISTED  
WATER HEATING SERVICE AGREEMENT

WHEREAS, The Detroit Edison Company, hereinafter called the Company, is conducting studies to determine the effect on electric energy consumption of the use of solar assisted water heaters in comparison with standard electric water heaters:

NOW THEREFORE, THIS AGREEMENT DATED \_\_\_\_\_, 19\_\_\_\_

between \_\_\_\_\_ hereinafter called the Customer, and the Company, is made and entered for a supply of electric energy to be delivered by the Company to the Customer's premises located at \_\_\_\_\_ in

Street Address

City - Village - Township

The supply shall be delivered by the Company and received and paid for by the Customer under the terms of the Experimental Solar Assisted Water Heating Service Rate and the Rules and Regulations applicable thereto as set forth in the Company's Rate Schedule on file with and approved by the Michigan Public Service Commission, hereafter called the Commission. The Experimental Solar Assisted Water Heating Service Rate in effect as of the date of this Agreement is printed on the back of this sheet and made a part hereof. This rate schedule is subject to change from time to time by order issued by the Commission.

The supply is also governed by the Rules for Electric Service established by the Commission (MPSC Order No. 1692), and by the Rules of the Company on file with the Commission which do form a part of the Rate Schedule. All Rules are subject to change from time to time.

Special equipment necessary for monitoring this service may be installed on the Customer's premises. The Company will be responsible for only the actual installation and removal costs of this equipment. Said costs shall be limited to those incurred in installing and/or removing the special equipment as well as those incurred in making reasonable repairs. Good faith shall be the standard by which the Company's efforts to comply with its obligation to make "reasonable repairs" will be measured.

This agreement may be terminated by either the Company or the Customer on three days written notice or by action of the Commission.

CUSTOMER'S SIGNATURE \_\_\_\_\_ DATE \_\_\_\_\_

Accepted:  
THE DETROIT EDISON COMPANY

By: \_\_\_\_\_ DATE \_\_\_\_\_  
Authorized Signature

EXPERIMENTAL SOLAR ASSISTED  
WATER HEATING SERVICE RATE

AVAILABILITY OF SERVICE—Available to the first 500 customers using hot water for sanitary purposes and taking service under rate schedule designations:

Domestic Service Rate	Schedule Designation D1
Domestic Space Heating Rate	Schedule Designation D2
General Service Rate	Schedule Designation D3
Large General Service Rate	Schedule Designation D4

and who desire controlled water heating service to the electric heating elements of a water heater equipped with solar heat collectors. The design and method of installation of the electrical portion of this equipment must be approved by the Company. The customer must permit the installation of record or recording meters and instruments necessary to determine the patterns of solar assisted electric water heaters.

HOURS OF SERVICE: The daily use of controlled water heating service will be controlled by a timer or other monitoring device. Control of service shall not exceed 4 hours per day, said hours to be established from time to time by the Company.

CURRENT, PHASE AND VOLTAGE: Alternating current, single or three phase, nominally at 208,240 or 480 volts compatible with the service taken under the rate schedules listed above.

RATE PER MONTH:

\$1.50 Service Charge plus  
2.43¢ per kWh for all kWh  
Interim Surcharge: .096¢ per kWh for all kWh.

FUEL ADJUSTMENT AND PURCHASED POWER ADJUSTMENT: The Energy Charge in the above rate is subject to the provisions of Schedule Designation B-4.6.

LATE PAYMENT CHARGE: See Schedule Designation B-2.10.

MINIMUM CHARGE: Service Charge.

CONTRACT TERM: Open order, terminable on three days written notice by either party. Where special services are required, the term will be as specified in the applicable contract rider.

Issued:

By: E. L. Grove, Jr.  
Senior Executive Vice President—Finance  
2000 Second Avenue, Detroit, Michigan 48226

Effective on service rendered on and after under authority of Order of the Michigan Public Service Commission dated

#### 4. Solar Tariffs in New Hampshire

Public Service Company of New Hampshire - Special Contract between Public Service Company of New Hampshire and Total Environmental Action, Inc. - Contract No. NHPUC-37

The New Hampshire Public Utilities Commission approved two requests for a solar energy tariff on a case-by-case basis. The first example presented in this section is a contract agreement between the Public Service Company of New Hampshire, and the Company, Total Environmental Action, Inc. The first two pages of the agreement present a statement of the special circumstances justifying departure from general schedules just and consistent with the public interest.

The service to be rendered under this Special Contract consists of the utility providing the customer off-peak electricity for controlled electric thermal storage for space heating when a solar energy system is used. This tariff is part of an experimental load research program being undertaken by the Commission.

A rate of 1.95¢ per kWh for electric service was set as the average of uncontrolled space heating (2.4¢ per kWh) and controlled water heating (1.5¢ per kWh) rates. This off-peak rate is in effect from 10:00 p.m. to 7:00 a.m. for controlled solar-assisted space heating. It will be reduced to 1.80¢ per kWh if, after one year, the owner has not and does not intend to request an increase in the hours of operation; and the difference (.15¢ per kWh) for use up to that time will be refunded. The rates for other use are the same as in the standard tariff.

The contract has addressed a number of issues such as specifying that certain insulation standards be met and that the residence be heated by no other energy source. Another requirement specifies that the Company has the right to install, maintain, use and remove, timing devices, meters and other types of measuring equipment.

Public Service Company of New Hampshire - Special Contract between Public Service Company of New Hampshire and Residential Customer

The Public Service Company of New Hampshire also entered into a solar energy service agreement with an individual residential customer. In most respects it carries similar provisions previously described for Total Environmental Action, Inc. The service to be rendered under this Special Contract consists of furnishing off-peak electricity to be utilized for controlled back-up space heating in a solar-heated home by means of a customer-owned and -installed thermal storage system as part of an experimental load research program.

A rate of 1.8¢ per kWh was set for controlled solar-assisted space heating under this agreement. The hours of operation are limited to the new hours between 10:00 p.m. and 7:00 a.m., and there is no provision for increasing the hours of operation. The rates for other use are the same as set forth in the standard tariff. The requirement for load monitoring and measuring devices is also specified.



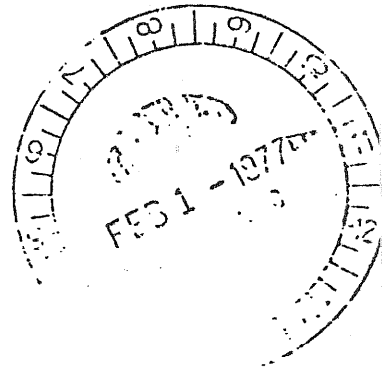
SPECIAL CONTRACT - ELECTRICITY

Contract No. NHPUC - 37

PUBLIC SERVICE COMPANY OF NEW HAMPSHIRE

WITH

TOTAL ENVIRONMENTAL ACTION, INC.



Term: Through May 1, 1979  
(Subject to Extension)

Date of Execution: January 21, 1977

Effective Date: As to Facilities Installation,  
October 12, 1976; As to Electric  
Service, the Date when Facilities  
Installed are Ready for Use

Date of Termination: May 1, 1979  
(Subject to Extension)

4 STATEMENT OF THE SPECIAL CIRCUMSTANCES  
RENDERING DEPARTURE FROM GENERAL SCHEDULES  
JUST AND CONSISTENT WITH THE PUBLIC INTEREST

- 5 1. The service to be rendered under this Special Contract consists in part of the furnishing of off-peak electricity to be utilized for controlled space heating in a solar heated home by means of a Megatherm thermal storage device as part of an experimental load research program.
2. The space heating rate of 2.4 cents per kilowatt-hour contained in Tariff NHPUC No. 20, presently in effect, is for uncontrolled service. Space heating energy to be supplied during off-peak hours under this Special Contract can be supplied at lower cost. The cost, however, will be higher than the 1.5 cents per kilowatt-hour cost of controlled water heating; therefore, the controlled space heating rate under this Special Contract has initially been set at the average of the present uncontrolled space heating and controlled water heating rates (presently 1.95 cents per kilowatt-hour). Further, if the Owner does not elect to expand the hours of operation of the controlled space heating service as provided for under this Special Contract, the Company will adjust the rate downward to an amount (presently 1.8 cents per kilowatt-hour) 0.6 cents per kilowatt-hour less than the present uncontrolled space heating rate and will credit to the Owner's account the difference between the amount the Owner actually paid for the controlled space heating service and the amount the Owner would have paid if it had been billed for such service at the lower rate.
3. Since the Company wishes to experiment with a new type of controlled water heater, the customer will be allowed to connect a non-standard water heater and take service under the standard controlled water heating provisions of Rate D.

4. This Special Contract has been prepared in a form which covers all electric service to the premises of the customer, even though only the space heating rate and the non-standard water heater depart from the provisions of Tariff NHPUC No. 20. The Company believes this is preferable to the Company's providing a part of the customer's service under the Special Contract and the balance under the filed tariff.

AGREEMENT

This agreement made this \_\_\_\_\_ day of \_\_\_\_\_, 19\_\_\_\_, by and between Public Service Company of New Hampshire, a corporation with offices in Manchester, in the County of Hillsborough, in the State of New Hampshire (hereinafter called the Company), and Total Environmental Action, Inc. (hereinafter called the Owner);

. WITNESSETH THAT

WHEREAS, the Company wishes by an electric load research program to determine whether the use of (1) a controlled electric thermal storage device in conjunction with a solar energy heating system for residential space heating, and (2) a controlled electric thermal storage device for water heating, would result in more efficient use of the Company's energy producing facilities and reduced costs to its customers; and

WHEREAS, in order to make such a determination, it is necessary to install such controlled thermal storage devices as a part of an experimental program in homes and to install equipment to monitor and record data on the operation of these devices; and

WHEREAS, the Owner is agreeable to participating in the research program by the installation of such devices and equipment in the single family dwelling it is constructing at New Sargent Camp Road in Harrisville in Cheshire County, in accordance with the terms and conditions hereinafter set forth; and

WHEREAS, it is appropriate in connection with the research program contemplated by this agreement that off-peak electric service to be utilized for controlled space heating be provided to the Owner at a rate different from that set forth for residential space heating service under the Company's electric tariff presently in effect and that service therefore be provided under a special contract to be filed with the New Hampshire Public Utilities Commission.

NOW, THEREFORE, in consideration of the mutual covenants set out herein, the parties do hereby agree as follows:

1. The Company will furnish and deliver to the Owner for installation at the dwelling identified above, an electric hydronic thermal storage device manufactured by the Megatherm Corporation (which device shall hereinafter be referred to as a Megatherm unit) to be used as a source of heat for an in-duct heater in conjunction with a solar energy heating system (to be furnished by the Owner) and a non-standard Sepco 80 gallon off-peak electric water heater having an uncontrolled upper heating element with a rating of 3,000 watts and a controlled lower heating element with a rating of 3,000 watts. The Owner shall pay to the Company the sum of \$500 for said Megatherm unit and Sepco water heater, and shall arrange and pay for the cost of their installation. For billing purposes, the Megatherm unit and the controlled lower element of the water heater shall be separately wired by means of approved circuits to two separate meters which shall record the energy used for controlled space heating and off-peak water heating purposes, respectively, and the uncontrolled upper element of the water heater shall be connected to the regular meter which records all other energy uses.

2. Installation of the Megatherm unit and hot water heater and all related control and metering equipment shall be completed and the dwelling occupied by February 1, 1977, or as soon as practicable thereafter.

3. The dwelling shall be constructed or, if existing, altered in accordance with good construction practice to provide insulation so that the maximum calculated heat loss shall not exceed ten watts per square foot of living area. Total heat loss of the dwelling shall be within the range of 12 to 27 kilowatts. The dwelling shall be equipped with weather-

stripped doors and tight-fitting storm doors and windows or their equivalent. The Company understands that the Megatherm unit will be used in conjunction with a solar energy heating system, and the Owner agrees that no other source of space heating other than the solar energy heating system and Megatherm unit shall be used to heat the dwelling during the term of this agreement. During the course of construction or alteration, personnel of the Company will be afforded access to the dwelling at reasonable times to ascertain that these standards are being met; however, the Company assumes no responsibility for and in no way guarantees any quality of work or standard associated with any aspect of construction of the dwelling or the installation of the Megatherm unit, hot water heater, and solar energy heating system.

4. During the term of this agreement, the Company will have the right to install, maintain, use and remove: (1) timing devices or other types of controls on the Megatherm unit and hot water heater to prevent, permit or limit the use of electric energy during system peak hours; (2) recording meters to separately record energy use of the Megatherm unit, the two elements of the hot water heater, and all other energy use in the dwelling unit; (3) temperature recording devices to monitor temperatures at various locations, including out-of-doors; and (4) such other equipment as it deems necessary to effectuate the recording and analysis of data connected with its load research program. For these purposes, personnel of the Company will have the right of access to the dwelling at reasonable hours, with sufficient advance notice to the dwelling Owner and/or occupant.

5. In order that the integrity of the data to be collected will be maintained, the Owner will not alter or in any way adjust or tamper with the Megatherm unit, the hot water heater (with the exception of the hot water heater temperature setting), or any devices, meters or

equipment installed in connection with the load research program being conducted by the Company. In the event that the Owner finds it necessary to adjust the hot water heater temperature setting, the Company shall be so advised.

6. The Owner agrees to take electric service, and to pay for all electric service taken, at the rates specified in this section and, to the extent not otherwise specifically provided in this agreement, in accordance with the terms and conditions of the Electric Tariff of the Company as now or hereafter effective and on file with the New Hampshire Public Utilities Commission. (Such tariff as now or hereafter effective is hereinafter referred to as "the Tariff".)

The Company agrees to render electric service at the above premises through separate billing meters for the following uses:

(a) Controlled Space Heating. Initially, the rate for all energy used for controlled space heating service shall be the average of the rates applicable to uncontrolled space heating and residential controlled water heating as set forth in the Tariff (presently 1.95 cents per kilowatt-hour), plus the fuel adjustment charge and any surcharge then applicable under the Tariff, and the hours of operation of the controlled space heating service shall be limited to the hours between 10:00 P.M. and 7:00 A.M. Further, the hours of operation will be expanded, at the request of and without added cost to the Owner, to include as many continuous hours during the periods between 8:00 P.M. and 9:00 A.M., and 12:00 P.M. and 4:00 P.M. as the Owner may elect. If, at any time after an initial trial period of one year but within fifteen months of the date service begins, the Owner has not requested and received an expansion of the number of hours of operation and does not then elect such expansion, the Owner may request the Company to, and the Company will, adjust downward the controlled space

heating rate hereunder to an amount (presently 1.8 cents per kilowatt-hour) 0.6 cents per kilowatt-hour less than the uncontrolled space heating rate as set forth in the Tariff (presently 2.4 cents per kilowatt-hour), plus the fuel adjustment charge and any surcharge then applicable under the Tariff. Upon receipt of the request the Company will thereafter charge the lower rate and will also credit to the Owner's account the difference between the amount the Owner actually paid for the controlled space heating service during the entire period prior to requesting the lower rate and the amount which the Owner would have paid during that period if it had been billed for such service at the lower rate. Once the Owner has requested the lower rate, the Owner will no longer have the right to require the Company to expand said hours of operation during the term of this agreement, but the Company may agree to such an expansion on terms acceptable to it.

(b) Controlled Water Heating. The rate for all energy used for controlled water heating shall be the rate applicable to residential controlled water heating service as set forth in the Tariff (presently 1.50 cents per kilowatt-hour), plus the fuel adjustment charge and any surcharge then applicable under the Tariff. The hours of operation of the controlled water heating service shall be limited to the hours between 8:00 P.M. and 9:00 A.M. and between 12:00 P.M. and 4:00 P.M.

(c) Other Uses. The rate for energy used for all other uses shall be the rate applicable to residential service (other than controlled water heating or space heating) as set forth in the Tariff, including the fuel adjustment charge and any surcharge then applicable.

7. The term of this agreement shall begin on the date hereof, and electric service hereunder shall begin on the date when the thermal storage space heating and the water heating facilities, and all related control and metering equipment, have been installed to the extent



necessary to permit the normal operation of such facilities and the term hereof shall end on May 1, 1979; provided that the Company may by written notice to the Owner extend the term of this agreement to a specific date not later than May 1, 1980. At the end of the term, service to the premises shall be rendered by the Company under the Tariff (which may then contain controlled space heating rates) unless the term of this agreement is extended or another agreement covering the service is entered into between the parties. The Company will, within a reasonable time after the termination of this agreement or any agreement entered into in place of this agreement, have the right to remove all recording meters and other equipment and devices not necessary for the normal use and operation of the Megatherm unit and water heating facilities or the energy usage at the dwelling.

8. The Owner understands and agrees that the purpose of this contractual arrangement is to permit the Owner to use a combination of electric and solar heating and to provide the Company actual operating data on the effects of (1) using a Megatherm unit on a controlled usage basis in conjunction with a solar energy heating system for space heating purposes and (2) controlled water heating service. The benefits of all warranties issued by the manufacturers of the Megatherm unit and hot water heater furnished by the Company shall inure to the Owner, but THE COMPANY HEREBY DISCLAIMS ALL OTHER WARRANTIES OF ANY KIND, WHETHER STATUTORY, WRITTEN, ORAL OR IMPLIED (INCLUDING WITHOUT LIMITATION WARRANTIES OF FITNESS FOR A PARTICULAR PURPOSE AND MERCHANTABILITY).

9. This agreement shall inure to the benefit of and be binding on both parties, their heirs, administrators, executors, successors and assigns and the Owner specifically agrees that if during the term of this agreement he sells, leases, rents or otherwise transfers title to the

dwelling which is identified in this agreement, he will advise the transferee of the obligations to be assumed under this agreement. Further, either party may, if it desires, cause a copy of this agreement to be recorded in the Registry of Deeds for the County in which the dwelling is located.

10. This agreement shall supersede all prior agreements and understandings between the parties.

11. The mailing addresses of the parties are as follows:

Company: P. O. Box 330

Manchester, New Hampshire 03105

Owner: Total Environmental Action, Inc.

Church Hill

Harrisville, New Hampshire 03450

IN WITNESS WHEREOF, the parties have caused their names to be subscribed and their seals to be affixed as of the day and year first above written.

In the presence of: PUBLIC SERVICE COMPANY OF NEW HAMPSHIRE

/s/ Floyd F. Plummer  
Floyd F. Plummer

by /s/ Wilbur C. Beaupré, Jr.  
Wilbur C. Beaupré, Jr. - District Manager

TOTAL ENVIRONMENTAL ACTION INC.

/s/ Floyd F. Plummer  
Floyd F. Plummer

/s/ Bruce Anderson  
Bruce N. Anderson - President

State of New Hampshire  
County of

The foregoing instrument was acknowledged before me this 21st day of January , 1977 , by Wilbur C. Beaupré Jr. Dist. Mgr. , of Public Service Company of New Hampshire, a New Hampshire corporation, on behalf of the corporation.

My Commission expires:  
12/10/1979

/s/ Richard F. Miller  
~~Notary Public~~/Justice of the Peace

The foregoing instrument was acknowledged before me this 21st day of January , 1977 , by Total Environmental Action Inc., Bruce N. Anderson President.

My Commission expires:  
12/10/1979

/s/ Richard F. Miller  
~~Notary Public~~/Justice of the Peace

STATEMENT OF THE SPECIAL CIRCUMSTANCES  
RENDERING DEPARTURE FROM GENERAL SCHEDULES  
JUST AND CONSISTENT WITH THE PUBLIC INTEREST

1. The service to be rendered under this Special Contract consists in part of the furnishing of off-peak electricity to be utilized for controlled back-up space heating in a solar-heated home by means of a customer-owned and installed thermal storage system as part of an experimental load research program.
2. The residential space heating rate of 2.4 cents per kilowatt-hour contained in Tariff NHPUC No. 20, presently in effect, is for uncontrolled service. Space heating energy to be supplied during off-peak hours under this Special Contract can be supplied at lower cost. The cost, however, will be higher than the 1.5 cents per kilowatt-hour rate for controlled water heating; therefore, the controlled space heating rate under this Special Contract has been initially set at 1.8 cents per kilowatt-hour. This is a lower rate than the rate of 1.95 cents per kilowatt-hour applicable under Contract NHPUC No. 36 for service to the Megatherm thermal storage devices, and is justified because the hours of service will be limited to the nine hours between 10:00 P.M. and 7:00 A.M., whereas the Megatherm devices may be permitted to operate for seventeen hours per day.
3. This Special Contract has been prepared in a form which covers all electric service to the premises of the customer, even though only the controlled space heating rate is not provided for in Tariff NHPUC No. 20. The Company believes this is preferable to the Company's providing a part of the customer's service under the Special Contract and the balance under the filed tariff.

AGREEMENT

This agreement made this 31st day of May, 1977, by and between Public Service Company of New Hampshire, a corporation with offices in Manchester, in the County of Hillsborough, in the State of New Hampshire (hereinafter called the Company), and Mrs. Anne L. Rieger (hereinafter called the Owner);

WITNESSETH THAT

WHEREAS, the Company wishes by an electric load research program to determine whether the use of a customer-owned and installed thermal energy storage system, which utilizes off-peak electric energy in conjunction with solar energy for residential space heating, would result in more efficient use of the Company's energy producing facilities and reduced costs to its customers; and

WHEREAS, in order to make such a determination, it is necessary to install equipment to monitor and record data on the operation of the thermal energy storage system; and

WHEREAS, the Owner has installed a thermal energy storage system in the single-family dwelling she owns, located at Snow Hill, Lot No. 5, Eastman, in Grantham in Sullivan County, and is agreeable to participating in the research program by allowing the installation of equipment to monitor and record operating data in said dwelling; and

WHEREAS, it is appropriate in connection with the research program contemplated by this agreement that off-peak electric service to be utilized for controlled space heating be provided to the Owner at the premises identified above at a rate different from that set forth for residential space heating service under the Company's electric tariff presently in effect and that service therefore be provided under a special contract to be filed with the New Hampshire Public Utilities Commission.

NOW, THEREFORE, in consideration of the mutual covenants set forth herein, the parties do hereby agree as follows:

1. During the term of this agreement, the Company will have the right to install, maintain, use and remove: (1) timing devices or other types of controls on the thermal storage system, to permit the use of electric energy for controlled space heating only during the hours between 10:00 P.M. and 7:00 A.M.; (2) recording meters to separately record electrical energy use for controlled space heating, the uncontrolled water heater, and all other electrical energy use in the dwelling; (3) temperature recording devices to monitor temperatures at various locations, including out-of-doors; and (4) such other equipment as the Company deems necessary to effectuate the recording and analysis of data connected with the load research program. For these purposes, personnel of the Company will have the right of access to the premises at reasonable hours with sufficient advance notice to the Owner.
2. In order that the integrity of the data to be collected will be maintained, the Owner agrees not to alter or tamper with any devices, meters or equipment installed in connection with the load research program being conducted by the Company.
3. The Owner agrees to take electric service, and to pay for all electric service taken, at the rates specified in this section and, to the extent not otherwise specifically provided in this agreement, in accordance with the terms and conditions of the electric tariff of the Company as now or hereafter effective and on file with the New Hampshire Public Utilities Commission. (Such tariff as now or hereafter effective is hereinafter referred to as "the Tariff".)

The Company agrees to render electric service at the above premises through separate billing meters for the following uses:

(a) Controlled Space Heating

Electric energy used for controlled space heating under the terms of this agreement shall be only that off-peak electric energy used for resistance heating as an energy input to the thermal energy storage system.

The rate for all electric energy used for controlled space heating shall be an amount (initially 1.8 cents per kilowatt-hour) determined solely by the Company which will appropriately provide for a lower rate for this service than the rate for uncontrolled space heating set forth under Rate D in the Tariff (presently 2.4 cents per kilowatt-hour), plus the fuel adjustment charge and any surcharge then applicable under the Tariff.

The hours of operation of the controlled space heating service will be limited, by means of timing controls, to the hours between 10:00 P.M. and 7:00 A.M.

(b) Uncontrolled Water Heating

The rate for all electric energy use for uncontrolled water heating shall be at the rate applicable to uncontrolled water heating service as set forth under Rate D in the Tariff, plus the fuel adjustment charge and any surcharge then applicable under the Tariff.

(c) Other Uses

The rate for electric energy used for all other uses shall be the rate applicable to residential service (other than controlled space heating and controlled or uncontrolled water heating) as set forth under Rate D in the Tariff, including the fuel adjustment charge and any surcharge then applicable.

4. The term of this agreement shall begin when service to the Owner at the above premises commences and shall end on June 30, 1979; provided that the Company may by written notice to the Owner extend the term of this agreement to a specific date not later than June 30, 1980. At the end of the term, service to the premises shall be rendered by the Company under the Tariff (which may then contain controlled space heating rates) unless the term of this agreement is extended or another agreement covering the service is entered into between the parties. The Company will, within a reasonable time after the termination of this agreement or any agreement entered into in place of this agreement, have the right to remove all recording meters and other equipment and devices not necessary for the normal use and operation of the thermal storage system or other energy usage at the dwelling. .
5. This agreement shall supersede all prior agreements and understandings between the parties.
6. The mailing addresses of the parties are as follows:

Company: P.O. Box 330  
Manchester, New Hampshire 03105

Owner: 119 Congdon Street  
Providence, Rhode Island 02906

July 1st, 1977 - Aug. 78:  
c/o Mr. Richard Billings  
Hinckley, Allen, Salisbury & Parsons  
2200 Industrial Bank Building  
Providence, R.I. 02903



## 5. Solar Tariff in New York

### Orange and Rockland Utilities, Inc. - Solar-Assisted Space Heating and Water Heating - Rate PSC No. 2 (Electricity)

The New York Public Service Commission (NYPSC) has approved a tariff for residential service with solar-assisted electric water and space heating. This is a temporary rate available on an experimental basis to the first 20 single-family applicants served by the Orange and Rockland Utilities, Inc.

The NYPSC experience with solar energy ratemaking goes back to December 1976 when Orange and Rockland (O&R) filed a new service classification (S.C. No. 7) applicable to residential customers with solar-assisted electric domestic hot water and space heating. The first O&R filing for a solar energy tariff had a September 1, 1977 deadline for application.

The NYPSC staff analyzed the first O&R filing and recommended a number of changes:

1. Change eligibility for the tariff from "commence by September 1, 1977" to "commence by December 31, 1977" and change the termination date to December 31, 1979.
2. Reduce sample size from 100 to 20 customers.
3. Remove the 500 kWh water heating block discount in the summer.
4. Indicate in the "availability" provision that the rate is subject to change in both structure and level in accordance with company-wide rate changes.

The NYPSC staff recommended that O&R cancel its first solar heating rate and gave the Company authority to operate under the new service classification in accordance with the changes listed above.

At the time of this investigation, only one customer, a builder of homes with a solar heating design, has applied for the new rate.

The NYPSC staff, commenting on the use of the present declining block rate structure applied to the O&R experiment, recognized that a well formulated time-of-day rate applicable to solar-assisted equipment would be desirable. It is important to note that O&R, in a current rate case, has undertaken a marginal cost study for establishing time-of-day rates. That effort was still under way when this report was completed.

**SERVICE CLASSIFICATION NO. 7**

APPLICABLE TO USE OF SERVICE FOR:

Residential Service with solar assisted electric water and space heating.

AVAILABILITY:

This is a temporary rate available on an experimental basis to the first 20 eligible applicants for service hereunder who use the Company's electric service for single-family residential purposes and whose entire space and water heating requirements are supplied under this rate through a combination of electric space and water heating facilities, which are permanently installed, and solar energy collectors providing space and water heating through heat exchangers. Service hereunder must commence by December 31, 1978 and will terminate on December 31, 1979. This rate is subject to change in both structure and level in accordance with the company-wide rate changes.

CHARACTER OF SERVICE - MULTIPLE:

Continuous, 60 cycles, A. C., single phase at approximately 120, 120/208 or 120/240 Volts as designated by the Company.

- (a) Single phase at approximately 120, 120/208 or 120/240 Volts
- (b) Three phase four wire at approximately 120/208 Volts in limited areas.

RATE - TWO PART - MONTHLY:

(1)	Energy Charge	Summer Months*	Other Months
	First 13 kWh or less...@	\$4.07	\$4.07
	Next 47 kWh .....@	8.45¢ per kWh	8.45¢ per kWh
	Next 70 kWh .....@	7.39¢ per kWh	7.39¢ per kWh
	Next 370 kWh .....@	7.39¢ per kWh	6.51¢ per kWh
	Next 500 kWh .....@	7.09¢ per kWh	5.09¢ per kWh
	Over 1000 kWh .....@	7.09¢ per kWh	3.86¢ per kWh

(2A) Adjustments for Changes in Cost of Fuels

The provisions of the Company's fuel adjustment clause as described in Section 14, General Information apply to electricity sold under this Service Classification.

(2B) Adjustments in Rates Applicable in Municipality Where Service is Supplied

All rates and charges under this Service Classification are increased by the percentage shown on Leaf No. 23M for service supplied within the municipality where the customer is taking service.

\* Definition of Summer Billing Months

June through September for all bills rendered under this Service Classification.

MINIMUM CHARGE EACH CONTRACT EACH LOCATION:

\$4.07 monthly, not less than \$24.42 per contract. (Continued)

(Original Leaf No. 42-cancelled)  
SERVICE CLASSIFICATION NO. 7 (Continued)

TERMS OF PAYMENT:

Bills are due when rendered. If bill is not paid within fifteen days from date rendered, service may be discontinued after suitable written notice.

TERM:

Terminable at any time unless a specified period is required under a line extension agreement.

EXTENSION OF FACILITIES:

Where service is supplied from an extension the charges thereon shall be determined as provided in General Information.

SPECIAL PROVISIONS:A. SYSTEM MODIFICATION

Customer agreement to accept system modifications, where feasible, made at the expense of the company to improve customer load characteristics through the use of hot and cold storage and off-peak charging capabilities shall be a requirement for eligibility for service under this classification.

B. METERING

All customers served hereunder shall permit the Company to use special equipment to measure their loads or any part thereof, to measure the solar energy collected and to obtain any other data necessary to determine the operating characteristics of installations served hereunder.

C. SHORT TERM SERVICE

Customers desiring service under this Schedule for less than six months, where service is already installed, shall pay in advance the contract minimum as specified under "Minimum Charge Each Contract Each Location" or under an applicable line extension agreement, or, if the estimated bill for two months or such shorter period as service may be desired exceeds the contract minimum, the Company reserves the right to request a deposit equal to this estimated bill. A part of a month shall be considered a full month for computing all charges hereunder.

ISSUED July 1, 1977

EFFECTIVE August 1, 1977

43

ISSUED BY Dean B. Seifried, President  
Pearl River, New York

## 6. Solar Tariffs in North Carolina

The North Carolina Utilities Commission has approved experimental rate schedules for two types of solar energy applications. One schedule, RWX (NC), covers residential service, water heating-electric/solar; and the other is schedule RAX(NC) that includes residential service, all-electric/solar.

Duke Power Company - Schedule RWX(NC) Residential Service, Water Heating-Electric/Solar with Uncontrolled Water Heating (Experimental)

The rate structure described in RWX(NC) calls for a basic facilities (i.e., customer) charge of \$4.69 per month and an energy charge based upon a declining block rate except for the first block. In order to receive service on this schedule, the customers agree to allow the Company to install and operate metering and control devices on the solar-assisted water heating system. This schedule is made available to customers in residences, condominiums, mobile homes or individually metered apartments. A feature of this schedule is an excess capacity charge for those installations where the measured hourly demand exceeds 10 kW in any month.

Duke Power Company - Schedule RAC (NC) Residential Service, All-Electric/Solar (Experimental)

This schedule is designed to serve residences, condominiums, mobile homes and individually metered apartments in which the energy required for all water heating, cooking and environmental space conditioning (heating and cooling) is supplied electrically, except that supplied by solar energy. The rate structure consists of a \$5.19 per month facilities charge and a declining block energy charge except for the first block.

The schedule describes in detail the basic conditions and engineering standards for heating, the heat pump and electric water heaters. Water heaters with capacity exceeding 119 gallons require special approval.

SCHEDULE RWX (NC)  
RESIDENTIAL SERVICE, WATER HEATING-ELECTRIC/SOLAR  
with uncontrolled water heating  
(EXPERIMENTAL)

AVAILABILITY (North Carolina Only)

Available only to residential customers in residences, condominiums, mobile homes, or individually-metered apartments, in which an electric water heater meeting the specifications set forth below is installed and is used to supply the entire water heating requirement, except that which is supplied through the collection of solar energy.

As a condition of the customer's use of service on this Schedule, the Company shall have the right at its option to install, monitor and operate metering and control devices on the various components of the customer's solar and electrical equipment to determine the effect of solar collection on electric service demand and usage.

Water heaters shall be of the automatic insulated storage type, of not less than 30 gallon capacity, and may be equipped with only a lower element or with a lower element and an upper element.

Heaters having only a lower element may have wattages up to but not exceeding the specific wattages as shown below for various tank capacities.

<u>Tank Capacity in Gallons</u>	<u>Maximum Single Element Wattage</u>
30-39	3500
40-49	4500
50-119	5500

Heaters having both a lower and an upper element may have wattages in each element up to but not exceeding the specific wattages set forth in the table above for single element heaters, but they must have interlocking thermostats to prevent simultaneous operation of the two elements; however, if the sum of the wattages of the two elements does not exceed the specific wattages for single element heaters set forth in the table above, no interlocking devices will be required.

Heaters of 120 gallons capacity and larger shall be subject to special approval.

Billing of service on Schedule RW will begin after the customer has notified the Company that a water heater has been installed and after the Company has inspected it for compliance with the provisions of the schedule. The Company at all reasonable times shall have the right of ingress to and egress from the premises of the customer for periodic inspections subsequent to the initial inspection of the water heater.

If the water heater meets the foregoing specifications but is not used, or if it does not meet the specifications, service will be billed on Schedule R.

TYPE OF SERVICE

The Company will furnish 60 Hertz service through one meter, at one delivery point, at one of the following approximate voltages where available:

- Single phase, 120/240 volts; or
- 3 phase, 208Y/120 volts; or other available voltages at the Company's option.

Motors in excess of 2 H.P. frequently started, or arranged for automatic control, must be of a type to take the minimum starting current and must be equipped with controlling devices approved by the Company.

Three phase service will be supplied, if available. Where three phase and single phase service is supplied through the same meter, it will be billed on the rate below. Where the three phase service is supplied through a separate meter, it will be billed on the applicable General Service Schedule.

RATE:

<p>\$ 4.69</p> <p>2.39 cents per Kwh for the first</p> <p>3.16 " " " " " next</p> <p>3.07 " " " " " all over</p>	<p>Basic Facilities Charge</p> <p>350 Kwh used per month</p> <p>950 " " " "</p> <p>1300 " " " "</p>
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APPROVED FUEL CHARGE

The Company's approved fuel charge over or under the Rates set forth above, if any, pursuant to North Carolina General Statute 62-134 (e) will apply to all service supplied under this Schedule.

EXCESS CAPACITY CHARGE

Demand meters may be installed by the Company on any installation served under this Schedule. When the measured hourly demand in any month exceeds 10 KW, a charge of \$1.00 will be made for each whole KW in excess of 10, which charge will be in addition to the charge for the Kwh used.

PAYMENT

Bills under this Schedule are due and payable on the date of the bill at the office of the Company. Bills are past due and delinquent on the twenty-fifth day after the date of the bill. In addition, all bills not paid by the twenty-fifth day after the date of the bill shall be subject to a one per cent (1%) late payment charge on the unpaid amount. This late payment charge shall be rendered on the following month's bill and it shall become part of and be due and payable with the bill on which it is rendered.

CONTRACT PERIOD

The original term of this contract shall be one year, and thereafter until terminated by either party on thirty days' written notice.

SCHEDULE RAX (NC)  
RESIDENTIAL SERVICE, ALL-ELECTRIC/SOLAR  
(EXPERIMENTAL)

AVAILABILITY (North Carolina Only)

Available only to residences, condominiums, mobile homes, or individually-metered apartments in which the energy required for all water heating, cooking, and environmental space conditioning is supplied electrically, except that which is supplied through the collection of solar energy.

As a condition of the customer's use of service on this Schedule, the Company shall have the right at its option to install, monitor and operate metering and control devices on the various components of the customer's solar and electrical equipment to determine the effect of solar collection on electric service demand and usage.

Service under this Schedule shall be used solely by the individual customer in a single residence, condominium, mobile home, or a single apartment, and all electric energy used in such dwelling must be recorded through a single meter.

To qualify for service under this Schedule, the environmental space conditioning system and a separate electric water heater must be permanently installed in accordance with sound engineering practices and the manufacturer's recommendations, and both shall meet the following conditions:

**Electric Resistance Heating:**

1. Room-type systems shall be controlled by individual room thermostats with loadings limited to 5 KW per thermostat.
2. Central systems shall be controlled by stages limited to 48 amps (11.5 kw @ 240 volts) per stage. Stages shall be switched so that the energizing of successive stages is delayed a minimum of 10 seconds per stage. Excess heating capacity (15% more than total calculated heat losses) may be disconnected at the option of the Company.
3. The residence shall be insulated so that total heat losses (as calculated by the Company's heating manual or the current edition of ASHRAE\* Guide) shall not exceed 0.158 watts (0.539 BTUH) per sq. ft. of net heated area per degree F. temperature differential. Duct or pipe losses shall be included in the computation of total heat losses.

**Electric Heat Pump:**

1. Heat Pumps shall be controlled by two-stage heating thermostats, the first stage controlling compressor operation and the second stage controlling all auxiliary resistance heaters. Auxiliary heaters shall be limited to 48 amps (11.5 kw @ 240 volts) each and shall be switched so that the energizing of each successive heater is delayed a minimum of 10 seconds per heater, or each heater may be controlled by a separate adjustable outdoor thermostat. Excess resistance heater capacity (15% more than total calculated heat losses) may be disconnected at the option of the Company. A manual switch for bypass of the first stage and the interlock of the second stage of the heating thermostat will be permitted.
2. The residence shall be insulated so that total heat losses (as calculated by the Company's heating manual or the current edition of ASHRAE\* Guide) shall not exceed 0.158 watts (0.539 BTUH) per sq. ft. of net heated area per degree F. temperature differential. Duct or pipe losses shall be included in the computation of total heat losses.

**Electric Water Heater:**

1. Water heaters shall be of the automatic insulated storage type, of not less than 30 gallon capacity, and may be equipped with only a lower element or with a lower element and an upper element.
2. Heaters having only a lower element may have wattages up to but not exceeding the specific wattages as shown below for various tank capacities:

Tank Capacity in Gallons	Maximum Single Element Wattage
30-39	3500
40-49	4500
50-119	5500

Electric Water Heater (Continued)

3. Heaters having both a lower and an upper element may have wattages in each element up to but not exceeding the specific wattages set forth in the table above for single element heaters, but they must have interlocking thermostats to prevent simultaneous operation of the two elements; however, if the sum of the wattages of the two elements does not exceed the specific wattages for single element heaters set forth in the table above, no interlocking device will be required.
4. Heaters of 120 gallons capacity and larger shall be subject to special approval.

TYPE OF SERVICE

The Company will furnish 60 Hertz service through one meter, at one delivery point, at one of the following approximate voltages, where available:

- Single phase, 120/240 volts; or
- 3 phase, 208Y/120 volts; or other available voltages at the Company's option.

Motors in excess of 2 H.P. frequently started, or arranged for automatic control, must be of a type to take the minimum starting current and must be equipped with controlling devices approved by the Company.

RATE:

<p>\$ 5.19</p> <p>2.35 cents per Kwh for the first</p> <p>3.11 " " " " " next</p> <p>2.76 " " " " " "</p> <p>2.31 " " " " " all over</p>	<p>Basic Facilities Charge</p> <p>350 Kwh used per month</p> <p>950 " " " "</p> <p>200 " " " "</p> <p>1500 " " " "</p>
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APPROVED FUEL CHARGE

The Company's approved fuel charge over or under the Rates set forth above, if any, pursuant to North Carolina General Statute 62-134 (e) will apply to all service supplied under this Schedule.

PAYMENT

Bills under this Schedule are due and payable on the date of the bill at the office of the Company. Bills are past due and delinquent on the twenty-fifth day after the date of the bill. In addition, all bills not paid by the twenty-fifth day after the date of the bill shall be subject to a one per cent (1%) late payment charge on the unpaid amount. This late payment charge shall be rendered on the following month's bill and it shall become part of and be due and payable with the bill on which it is rendered.

CONTRACT PERIOD

The original term of this contract shall be one year, and thereafter until terminated by either party on thirty days' written notice.

\*American Society of Heating, Refrigeration, and Air Conditioning Engineers



## 7. Solar Tariffs in South Carolina

The first two solar tariffs presented in this section are very similar to those that Duke Power offers residential solar energy customers in North Carolina described in part 6 of this Section. A third tariff describing a schedule for general service for customers who have larger demand is also offered in South Carolina.

Duke Power Company - Schedule RWX(SC) Residential Service, Water Heating-Electric/Solar with Uncontrolled Water Heating (Experimental)

This solar water heating tariff is similar to RWX(NC) offered by Duke Power in North Carolina. The main difference between the two is in the rate schedule. The first 80 kWh or less costs \$4.60 per month. It is a declining block rate through 350 kWh use per month, after which there are higher kWh charges.

Duke Power Company - Schedule RAX(SC) Residential Service, All-Electric/Solar (Experimental)

This solar residential tariff is also similar to RAX (NC) offered to Duke Power customers in North Carolina. Again, the main difference is in the rate structure. This rate schedule has a minimum charge of \$4.80 for the first 80 kWh block followed by five blocks that provide a declining block structure, except for the fourth block.

Duke Power Company - Schedule GAX(SC) General Service, All-Electric/Solar (Experimental)

This tariff is designed for industrial and commercial customers. It is available only to establishments in which environmental space conditioning is required and all energy for all such conditioning, is supplied electrically through the same meter as all other electric energy used in the establishment.

The rate schedule for this tariff includes a demand charge of \$1.75 per kW of billing demand and a declining block energy charge based upon hours use of demand (kWh per kW of demand).

SCHEDULE RWX (SC)  
 RESIDENTIAL SERVICE, WATER HEATING-ELECTRIC/SOLAR  
 with uncontrolled water heating  
 (EXPERIMENTAL)

AVAILABILITY (South Carolina Only)

Available only to residential customers in residences, condominiums, mobile homes, or individually-metered apartments, in which an electric water heater meeting the specifications set forth below is installed and is used to supply the entire water heating requirement, except that which is supplied through the collection of solar energy.

As a condition of the customer's use of service on this Schedule, the Company shall have the right at its option to install, monitor and operate metering and control devices on the various components of the customer's solar and electrical equipment to determine the effect of solar collection on electric service demand and usage.

Water heaters shall be of the automatic insulated storage type, of not less than 30 gallon capacity, and may be equipped with only a lower element or with a lower element and an upper element.

Heaters having only a lower element may have wattages up to but not exceeding the specific wattages as shown below for various tank capacities:

<u>Tank Capacity in Gallons</u>	<u>Maximum Single Element Wattage</u>
30-39	3500
40-49	4500
50-119	5500

Heaters having both a lower and an upper element may have wattages in each element up to but not exceeding the specific wattages set forth in the table above for single element heaters, but they must have interlocking thermostats to prevent simultaneous operation of the two elements; however, if the sum of the wattages of the two elements does not exceed the specific wattages for single element heaters set forth in the table above, no interlocking device will be required.

Heaters of 120 gallons capacity and larger shall be subject to special approval.

Billing of service on Schedule RW will begin after the customer has notified the Company that a water heater has been installed and after the Company has inspected it for compliance with the provisions of the schedule. The Company at all reasonable times shall have the right of ingress to and egress from the premises of the customer for periodic inspections subsequent to the initial inspection of the water heater.

If the water heater meets the foregoing specifications but is not used, or if it does not meet the specifications, service will be billed on Schedule R.

TYPE OF SERVICE

The Company will furnish 60 Hertz service through one meter, at one delivery point, at one of the following approximate voltages where available:

- Single phase, 120/240 volts; or
- 3 phase, 208Y/120 volts; or other available voltages at the Company's option.

Motors in excess of 2 H.P. frequently started, or arranged for automatic control, must be of a type to take the minimum starting current and must be equipped with controlling devices approved by the Company.

Three phase service will be supplied, if available. Where three phase and single phase service is supplied through the same meter, it will be billed on the rate below. Where the three phase service is supplied through a separate meter, it will be billed on the applicable General Service Schedule.

RATE:

\$ 4.60	for the first	80	Kwh or less used per month
3.10	cents per Kwh for the next	70	" used per month
2.30	" " " " " "	200	" " " "
2.82	" " " " " "	950	" " " "
2.58	" " " " all over	1300	" " " "

#### FUEL ADJUSTMENT

The Company's Fuel Adjustment Clause will apply to all service supplied under this Schedule.

#### EXCESS CAPACITY CHARGE

Demeter meters may be installed by the Company on any installation served under this Schedule. When the measured hourly demand in any month exceeds 10 KW, a charge of \$1.00 will be made for each whole KW in excess of 10, which charge will be in addition to the charge for the Kwh used.

#### PAYMENT

Bills under this Schedule are due and payable on the date of the bill at the office of the Company. Bills are past due and delinquent on the fifteenth day after the date of the bill. In addition, all bills not paid by the twenty-fifth day after the date of the bill shall be subject to a one per cent (1%) late payment charge on the unpaid amount. This late payment charge shall be rendered on the following month's bill and it shall become part of and be due and payable with the bill on which it is rendered.

#### CONTRACT PERIOD

The original term of this contract shall be one year, and thereafter until terminated by either party on thirty days' written notice.

SCHEDULE RAX (SC)  
RESIDENTIAL SERVICE, ALL-ELECTRIC/SOLAR  
(EXPERIMENTAL)

AVAILABILITY (South Carolina Only)

Available only to residences, condominiums, mobile homes, or individually-metered apartments in which the energy required for all water heating, cooking, and environmental space conditioning is supplied electrically, except that which is supplied through the collection of solar energy.

As a condition of the customer's use of service on this Schedule, the Company shall have the right at its option to install, monitor and operate metering and control devices on the various components of the customer's solar and electrical equipment to determine the effect of solar collection on electric service demand and usage.

Service under this Schedule shall be used solely by the individual customer in a single residence, condominium, mobile home, or a single apartment, and all electric energy used in such dwelling must be recorded through a single meter.

To qualify for service under this Schedule, the environmental space conditioning system and a separate electric water heater must be permanently installed in accordance with sound engineering practices and the manufacturer's recommendations, and both shall meet the following conditions:

Electric Resistance Heating:

1. Room-type systems shall be controlled by individual room thermostats with loadings limited to 5 KW per thermostat.
2. Central systems shall be controlled by stages limited to 48 amps (11.5 kw @ 240 volts) per stage. Stages shall be switched so that the energizing of successive stages is delayed a minimum of 10 seconds per stage. Excess heating capacity (15% more than total calculated heat losses) may be disconnected at the option of the Company.
3. The residence shall be insulated so that total heat losses (as calculated by the Company's heating manual or the current edition of ASHRAE\* Guide) shall not exceed 0.158 watts (0.539 BTUH) per sq. ft. of net heated area per degree F. temperature differential. Duct or pipe losses shall be included in the computation of total heat losses.

Electric Heat Pump:

1. Heat Pumps shall be controlled by two-stage heating thermostats, the first stage controlling compressor operation and the second stage controlling all auxiliary resistance heaters. Auxiliary heaters shall be limited to 48 amps (11.5 kw @ 240 volts) each and shall be switched so that the energizing of each successive heater is delayed a minimum of 10 seconds per heater, or each heater may be controlled by a separate adjustable outdoor thermostat. Excess resistance heater capacity (15% more than total calculated heat losses) may be disconnected at the option of the Company. A manual switch for bypass of the first stage and the interlock of the second stage of the heating thermostat will be permitted.
2. The residence shall be insulated so that total heat losses (as calculated by the Company's heating manual or the current edition of ASHRAE\* Guide) shall not exceed 0.158 watts (0.539 BTUH) per sq. ft. of net heated area per degree F. temperature differential. Duct or pipe losses shall be included in the computation of total heat losses.

Electric Water Heater:

1. Water heaters shall be of the automatic insulated storage type, of not less than 30 gallon capacity, and may be equipped with only a lower element or with a lower element and an upper element.
2. Heaters having only a lower element may have wattages up to but not exceeding the specific wattages as shown below for various tank capacities:

<u>Tank Capacity in Gallons</u>	<u>Maximum Single Element Wattage</u>
30-39	3500
40-49	4500
50-119	5500

Electric Water Heater (Continued)

3. Heaters having both a lower and an upper element may have wattages in each element up to but not exceeding the specific wattages set forth in the table above for single element heaters, but they must have interlocking thermostats to prevent simultaneous operation of the two elements; however, if the sum of the wattages of the two elements does not exceed the specific wattages for single element heaters set forth in the table above, no interlocking device will be required.
4. Heaters of 120 gallons capacity and larger shall be subject to special approval.

TYPE OF SERVICE

The Company will furnish 60 Hertz service through one meter, at one delivery point, at one of the following approximate voltages, where available:

- Single phase, 120/240 volts; or
- 3 phase, 208Y/120 volts; or other available voltages at the Company's option.

Motors in excess of 2 H.P. frequently started, or arranged for automatic control, must be of a type to take the minimum starting current and must be equipped with controlling devices approved by the Company.

RATE:

\$ 4.80	for the first	80 Kwh or less used per month
3.10	cents per Kwh for the next	120 " " " used per month
2.30	" " " " " "	150 " " " " " "
2.72	" " " " " "	950 " " " " " "
2.25	" " " " " "	200 " " " " " "
1.90	" " " " all over	1500 " " " " " "

FUEL ADJUSTMENT

The Company's Fuel Adjustment Clause will apply to all service supplied under this Schedule.

PAYMENT

Bills under this Schedule are due and payable on the date of the bill at the office of the Company. Bills are past due and delinquent on the fifteenth day after the date of the bill. In addition, all bills not paid by the twenty-fifth day after the date of the bill shall be subject to a one per cent (1%) late payment charge on the unpaid amount. This late payment charge shall be rendered on the following month's bill and it shall become part of and be due and payable with the bill on which it is rendered.

CONTRACT PERIOD

The original term of this contract shall be one year, and thereafter until terminated by either party on thirty days' written notice.

\* American Society of Heating, Refrigeration, and Air Conditioning Engineers

SCHEDULE GAN (SC)  
 GENERAL SERVICE, ALL-ELECTRIC/SOLAR  
 (EXPERIMENTAL)

AVAILABILITY (South Carolina Only)

Available only to establishments in which environmental space conditioning is required and all energy, except that which is supplied through the collection of solar energy, for all such conditioning is supplied electrically through the same meter as all other electric energy used in the establishment, provided however that if any such establishment contains residential housekeeping units, all energy for all water heating and cooking for such units is also supplied electrically, except that which is supplied through the collection of solar energy.

As a condition of the customer's use of service on this Schedule, the Company shall have the right at its option to install, monitor and operate metering and control devices on the various components of the customer's solar and electrical equipment to determine the effect of solar collection on electric service demand and usage.

Service under this Schedule shall be used solely by the contracting customer in a single establishment, located entirely on a single contiguous premises, and all electric energy used in the establishment must be provided by the Company.

To qualify for service under this Schedule, space conditioning systems shall be permanently installed in accordance with sound engineering practices and the manufacturer's recommendation.

This Schedule is not available for auxiliary or breakdown service, and power delivered hereunder shall not be used for resale or exchange or in parallel with other electric power, or as a substitute for power contracted for or which may be contracted for, under any other schedule of the Power Company, except at the option of the Company, under special terms and conditions expressed in writing in the contract with the Customer.

The obligations of the Company in regard to supplying power are dependent upon its securing and retaining all necessary rights-of-way, privileges, franchises and permits, for the delivery of such power, and the Company shall not be liable to any customer or applicant for power in the event it is delayed in, or is prevented from furnishing the power by its failure to secure and retain such rights-of-way, rights, privileges, franchises and permits.

TYPE OF SERVICE

The Company will furnish 60 Hertz service through one meter, at one delivery point, at one of the following approximate voltages, where available:

- Single phase, 120/240 volts; or
- 3 phase, 208Y/120 volts, 460Y/265 volts; or
- 3 phase, 3 wire, 240, 460, 575, or 2300 volts; or
- 3 phase, 4160Y/2400, 12470Y/7200 or 24940Y/14400 volts; or
- 3 phase voltages other than the foregoing, but only at the Company's option, and provided that the size of the customer's contract warrants a substation solely to serve that customer, and further provided that the customer furnish suitable outdoor space on the premises to accommodate a ground-type transformer installation, or substation, or a transformer vault built in accordance with the Company's specifications.

The type of service supplied will depend upon the voltage available. Prospective customers should ascertain the available voltage by inquiry at the nearest office of the Company before purchasing equipment.

Motors of less than 5 H.P. may be single-phase. All motors of more than 5 H.P. must be equipped with starting compensators and all motors of more than 25 H.P. must be of the slip ring type except that the Company reserves the right, when in its opinion the installation would not be detrimental to the service of the Company, to permit other types of motors.

RATE:

For the First 125 Kwh per KW Billing Demand per Month:

\$	6.50	for the first	100	Kwh
	4.49	cents per Kwh for the next	1,170	"
	3.62	" " " " " "	1,730	"
	3.10	" " " " " "	27,000	"
	2.94	" " " " " "	30,000	"
	2.76	" " " " " "	30,000	"
	2.15	" " " " " "	910,000	"
	2.12	" " " " all over	1,000,000	"

For the Next 275 Kwh per KW Billing Demand per Month:

1.38 cents per Kwh for the first	140,000 Kwh
1.21 " " " " " next	60,000 "
1.04 " " " " " all over	200,000 "

For all Over 400 Kwh per KW Billing Demand per Month:

1.04 cents per Kwh for the first	1,000,000 Kwh
.97 " " " " " all over	1,000,000 "

FUEL ADJUSTMENT

The Company's Fuel Adjustment Clause will apply to all service supplied under this Schedule.

DETERMINATION OF BILLING DEMAND

The demand for billing purposes each month shall be the maximum integrated thirty-minute demand measured during the month for which the bill is rendered, but not less than 50 per cent of the maximum monthly demand during the previous 12 months, including the month for which bill is rendered, nor less than 50 per cent of the contract demand, nor less than 15 KW; however, the minimum billing demand for contracts made prior to March 15, 1971 shall be 5 KW until the maximum integrated thirty-minute demand measured during the month for which the bill is rendered becomes 15 KW or more, after which time the minimum billing demand on such contracts shall be 15 KW.

MINIMUM BILL

The monthly minimum bill shall be \$.75 per KW of the billing demand.

The Company may establish an annual minimum bill, in lieu of a monthly minimum bill. The annual minimum bill shall be \$15.00 per KW of demand determined (1) by a count of connected load in KW adjusted for the effect of diversity, (2) by the contract demand or by the maximum monthly demand recorded in the previous contract year, whichever is the larger, or (3) in consideration of special or unusual characteristics of the type of service provided. Unless otherwise specified by long form contract, the billing procedure will be as follows: If no energy is used during certain months of the contract year, no monthly minimum will be billed. During months when energy is used, the total of the bills rendered will be credited to the annual minimum. At the end of the contract year, the Company will bill the customer the difference between the annual minimum and the total of the monthly bills, if such total is less than the annual minimum. If the total of the monthly bills exceeds the annual minimum, the last bill of the contract year will include only the amount of energy used during the month for which the bill is rendered.

POWER FACTOR CORRECTION

When the average monthly power factor of the customer's power requirements is less than 85 per cent, the company may correct the integrated demand in kilowatts for that month by multiplying by 85 per cent and dividing by the average power factor in per cent for that month.

PAYMENT

Bills under this Schedule are due and payable on the date of the bill at the office of the Company. Bills are past due and delinquent on the fifteenth day after the date of the bill. If any bill is not so paid, the Company has the right to suspend service. In addition, all bills not paid by the twenty-fifth day after the date of the bill shall be subject to a one per cent (1%) late payment charge on the unpaid amount. This late payment charge shall be added on the following month's bill and it shall become part of and be due and payable with the bill on which it is rendered.

CONTRACT PERIOD

Each customer shall enter into a contract to purchase electricity from the Company for a minimum original term of one (1) year, and thereafter from year to year upon the condition that either party can terminate the contract at the end of the original term, or at any time thereafter, by giving at least sixty (60) days' previous notice of such termination in writing; but the Company may require a contract for a longer original term of years where the requirement is justified by the circumstances.



## 8. Solar Tariff in Utah

On June 16, 1976, the Public Service Commission of Utah issued an order to the Utah Power & Light Company (UP&L) to undertake a research project relating to the utilization of solar heat as an augmented power source for water heating (Case No. 76-035003). UP&L proposed to install solar-assisted water heating equipment in four residences at a cost of \$4,000 each to be tested for a four-year period. Electric Service Schedule No. 5A, designed solely for this experiment, was issued on May 1, 1978.

Utah Power & Light Company - Electric Service Schedule No. 5A - State of Utah

This is a temporary electric service schedule available on an experimental basis solely for the service of those four customers participating in the Company's solar-augmented domestic water heating study program. The rate structure is made up of three declining blocks where all kWh above 400 kWh are charged at 2.51164¢ per kWh.

One feature of this tariff is the detailed "specifications for water heating service" section. The tariff also specifies that the period of service shall not be less than 17 hours per day as selected by the Company.

**ELECTRIC SERVICE  
SCHEDULE NO. 5A  
STATE OF UTAH**

**RESIDENTIAL SERVICE — ALL-ELECTRIC  
WITH SOLAR ASSISTED HOT WATER HEATING**

**AVAILABILITY:** At any point on the Company's interconnected system where there are facilities of adequate capacity.

**APPLICATION:** This is a temporary electric service schedule available on an experimental basis solely for service to those four customers participating in the Company's solar augmented domestic water heating study program to evaluate solar energy's possible contribution to energy conservation and effects upon residential load characteristics and patterns. This Schedule is for alternating current electric service supplied at approximately 120 or 240 volts through one kilowatt-hour meter at a single point of delivery for all residential purposes to individual private dwellings and individually metered apartments when the customer regularly uses electric energy for all residential service requirements, including but not limited to lighting, cooking, appliance operation, laundry and drying, air conditioning, and the heating of all dwelling space in the home except that water heating requirements will be supplied through a combination of electric water heating equipment and solar energy collectors providing supplemental water heating through heat exchangers. Service hereunder is limited to the period during which the Company's solar augmented domestic water heating study program is being conducted and evaluated and electric service supplied to solar augmented domestic water heating installations thereafter will be furnished under such rates and conditions as may be approved by the Public Service Commission of Utah.

This Schedule is only available when the heating installation conforms to the specifications for space heating below.

When conditions are such that service is supplied through one meter to more than one dwelling or apartment unit, the charge for such service will be computed by multiplying the number of kwh in each block and the minimum charges by the maximum number of dwelling or apartment units that may be served.

Where a portion of a dwelling is used regularly for business, professional, or other gainful purposes, the premises will be classified as nonresidential and the appropriate schedule applied. However, if the wiring is so arranged that the service for residential purposes can be metered separately, this Schedule will be applied to such service. This Schedule is not applicable to seasonal service.

**MONTHLY BILL:**

Rate:  
 7.56264¢ per kwh for the first 60 kwh  
 3.56364¢ per kwh for the next 340 kwh  
 2.51164¢ per kwh all additional kwh  
 Minimum:  
 \$3.25 for single-phase service  
 \$9.75 for three-phase service

**SPECIFICATIONS FOR WATER HEATING SERVICE:** Water heaters served hereunder shall be insulated storage, single or two-unit type of construction approved by the Company, the heating units of which shall be noninductive and controlled by separate thermostats. In a single-unit heater, the unit shall be placed to heat the entire tank. In two-unit heater, the upper unit and thermostat shall be located so as to heat not more than the upper one-third of the tank; the lower unit and thermostat shall be located so as to heat the entire tank. The rating of any single heating unit shall not exceed 4500 watts. Thermostats shall be permanently connected so that both heating units cannot operate at the same time except where the total installed heater capacity does not exceed 4500 watts. Service will be supplied for a period of not less than seventeen hours per day, such hours to be selected by the Company. The Company may furnish, install, and maintain suitable time switch or other device for controlling the hours of service. The combination of solar water heating and electric water heating shall be the only means of supplying hot water requirements. All customers served hereunder shall permit the Company to use such special equipment as deemed necessary to measure their loads or any part thereof, to measure the solar energy collected and utilized and to obtain any other data necessary to determine the load patterns and the operating characteristics of installations served hereunder, provided that all costs associated with use of such special equipment shall be borne by the Company and that Company shall reimburse the customer for any costs incurred by customer as a result of such measurements or data collection.

**SPECIFICATIONS FOR SPACE HEATING:** Permanently installed electric heating equipment shall be the only source of comfort heating. All space heating equipment and the installation thereof shall conform with the Company's requirements, with the voltage therefor designated by the Company for the service required. Heating units shall be controlled by approved thermostatic devices. The maximum wattage of any heating unit or the wattage of any group of such units controlled by a single thermostat, all of which may be energized at the same time, shall not exceed 5 kw.

**CONTRACT PERIOD:** The period during which the Company's solar augmented domestic water heating study program is being conducted and evaluated.

**ELECTRIC SERVICE REGULATIONS:** Service under this Schedule will be in accordance with the terms of the Electric Service Agreement between the Customer and the Company. The Electric Service Regulations of the Company on file with and approved by the Public Service Commission of the State of Utah, including future applicable amendments, will be considered as forming a part of and incorporated in said Agreement.

Issued on not less than one day's notice to the Commission and to the public by authority of Order of the Public Service Commission of Utah dated May 1, 1978 in Case P.S.C.U. No. 78-035-13.

ISSUED: May 1, 1978

EFFECTIVE: May 2, 1978

## 9. Solar Tariff in Wisconsin

### Wisconsin Power & Light Company - Supplemental Energy Off-Peak Service - Schedule Rz-2

The Public Service Commission of Wisconsin has approved a rate schedule available to 100 customers for use with supplemental energy systems with demands of less than 75 kW per month. The rate is designed for customers who would use substantial off-peak service with the supplemental energy source. Other customers' use is supplied separately under an applicable standard rate. If a storage system is used, it should be able to furnish 24 hours of heating or cooling requirements and normally use electricity only during the 10 off-peak hours. The supplemental energy source (a source other than natural gas, propane, electricity, fuel oil or coal) should also be able to furnish 5 percent or more of the customer's total heating or cooling requirements.

The rate structure has a fixed charge dependent on demand. For up to 50 kW, a monthly demand charge of \$3.50 is in effect; a monthly demand charge of \$6.50 is applicable for a billing demand between 50 kW and 75 kW. An energy charge of 7.1¢ per kWh for on-peak and 1.5¢ per kWh for off-peak usage is in effect.

0259

**SUPPLEMENTAL ENERGY OFF-PEAK SERVICE**  
(Limited to 100 customers)**ELECTRIC**1. Effective In

All territory served by the Company.

2. Availability

Available for 100 customers who use the Company's electric service for lighting or other purposes and who agree to use off-peak service under the terms and conditions hereinafter set forth. No seasonal or temporary service can be taken on this rate schedule. Customers must take service delivery at secondary voltage and have maximum monthly demands of less than 75 KW.

A Controlled Supplemental Energy Off-Peak Installation is defined to include heaters or other devices whose operation is consistent with the Purpose of this rate (see below). Energy purchased on this schedule may be used to furnish storage for space heating and cooling, space heating or other devices provided the off-peak installation used for this purpose will use energy only during the designated off-peak hours. An active supplemental energy system must be used during the on-peak period. At least 5% or more of the customer's total heating or cooling requirements must be furnished by this supplemental energy system.

If this rate is used for storage heat, the storage facility must be large enough to store 14 hours of the hourly BTU loss of the structure and must provide enough heating elements to heat the building during off-peak 10 hour period, as well as store 14 hours of BTU loss.

3. Purpose

The rate is to: 1) encourage the development of supplemental energy sources which will reduce the BTU's of typical fuels consumed, and 2) provide an incentive to use energy in the off-peak period. Supplemental energy sources do not include natural gas, propane, electric, fuel oil and coal.

4. Rate

Fixed Charge - A monthly fixed charge of:

\$3.50 up to 50 KW connected

\$6.50 over 50 KW and up to 75 KW connected

Energy Charge - (Subject to fuel cost adjustment clause - See Sheet No. 3.00)

7.1¢ net per KWH on-peak

1.5¢ net per KWH off-peak

Issued: 10-10-77

PSCW Authorization: Letter 1602 TRS/RJS  
dated 10-4-77

60

Effective: 10-10-77

0260

**SUPPLEMENTAL ENERGY OFF-PEAK SERVICE**  
(Limited to 100 customers)

ELECTRIC

**5. Pricing Periods**

Unless specified to the contrary in writing by the Company to any customers using this schedule.

- A. On-peak period - 8:00 A.M. to 10:00 P.M., Monday through Saturday.
- B. Off-peak period - 10:00 P.M. to 8:00 A.M., Monday through Saturday, plus all day Sunday.

**6. Metering and Service Facilities**

The customer shall furnish, install and wire the necessary service entrance equipment, meter sockets, meter enclosure cabinets, or meter connection cabinets that may be required by the Company to properly meter on- and off-peak usage.

The voltage rating of heating element shall be 230-240 volts except for devices specially designed for use in 208 volt service area.

The Company will furnish and install a watthour meter to measure the energy used on the special circuit.

**7. Wiring to Off-Peak Devices**

The customer shall provide the necessary wiring between the off-peak meter and the off-peak device.

All wires connecting the device with the off-peak service meter shall be run in a separate metal raceway or in a separate cable, or if run in a raceway or cable with other wires shall be coded or colored differently from the other wires; however, that portion (if any) of the special circuit which runs between buildings may be overhead open wiring.

Only off-peak devices are to be connected to the circuit served through the off-peak service meter. No "plug-in" receptacle shall be connected to said circuit. If off-peak installation is used for storage heating, the heating elements are connected to off-peak service, but fans, motors and blowers should be connected to general service.

Service will be furnished under this schedule when installation and its operation conform with the Company's electric rules. Drawings in the Electric Service Rules booklet illustrate connections of heaters to the supply circuits. The customer or his wiring contractor should consult the Company's nearest office as to the type of meter that the Company may furnish for each installation, as the equipment available from time to time varies.

Home heating elements shall not exceed 6000 watts each and shall be switched in sequence to reduce voltage fluctuations.

Issued: 10-10-77

PSCW Authorization: Letter 1602 TRS/RJS  
dated 10-4-77

61

Effective: 10-10-77

SECTION III  
A PROFILE OF SOLAR TARIFF ACTIVITY IN THE UNITED STATES  
MAY 1978

This section of the report presents a brief summary of solar energy tariff activity in 50 states and the District of Columbia. The information presented in Table 3 represents the extent of activities in solar energy issues as reported by state regulatory commissions in May 1978. In several states, this investigation resulted in identifying activity worthy of recognition. Information concerning such activity can be found in the notes to Table 3.

Table 3: State Solar Tariff Profile: Regulatory Commissions, May 1978

Commissions	Yes-Tariff	None Identified	Under Investigation or Study
Alabama		x	
Alaska		x	
Arizona		x	
Arkansas			x
California			x
Colorado	(1)*	x	
Connecticut	(1)	x	
Delaware			x(2)
District of Columbia		x	
Florida		x	
Georgia		x	
Hawaii			x(3)
Idaho		x	
Illinois	x		
Indiana		x	
Iowa		x(4)	
Kansas	x		
Kentucky		x	
Louisiana		x	
Maine		x	
Maryland		x	
Massachusetts		x	
Michigan	x		
Minnesota			x

\* Numbers in parentheses refer to notes on page 67.

Table 3 - Continued

Commissions	Yes-Tariff	None Identified	Under Investigation or Study
Mississippi		x	
Missouri			x
Montana			x
Nebraska		x	
Nevada		x	
New Hampshire	x		
New Jersey			x (5)
New Mexico			x (6)
New York	x		
No. Carolina	x		
No. Dakota			x (7)
Ohio		x	
Oklahoma		x	
Oregon		x	
Pennsylvania			x (8)
Rhode Island		x (9)	
So. Carolina	x		
So. Dakota		x	
Tennessee		x	
Texas		x	
Utah	x (10)		
Vermont			x
Virginia		x	
Washington			x (11)



Table 3 - Continued

Commissions	Yes-Tariff	None Identified	Under Investigation or Study
West Virginia		x	
Wisconsin	x		
Wyoming		x	

TABLE 3

NOTES

1. Since the completion of this investigation in May of 1978, the Institute has been made aware that the Public Service Company of Colorado, Connecticut Light & Power Company and Hartford Electric Light Company have supplemental energy source tariffs that include solar application.
2. A study is being conducted at The University of Delaware.
3. A generic hearing was conducted in Hawaii that included an examination of solar rate designs. At least one company is actively involved in gathering information for a more extensive study.
4. A tariff is currently in effect for a single customer utilizing a "Wind Energy Conversion System." This is an experimental project between the customer and the Iowa Power and Light Company.
5. The Public Service Electric and Gas Company has filed a residential solar tariff. The time-of-day rate specified in this tariff is for the total electric solar home. Several other utility companies have expressed interest in investigating solar concepts.
6. A study is being conducted by the Public Service Company of New Mexico.
7. Northern States Power Company has investigated solar rates.
8. The Pennsylvania Power & Light Company is planning to file a rate for solar application.
9. An engineering study is now under way to investigate windmill interference with television reception on Block Island. A windmill would supply approximately one-half of the daily load for Block Island's 500 year-round residents.
10. Utah has on file a tariff for the Mountain Fuel Supply Company, Rate Schedule F-3, that is applicable to natural gas service for residential, commercial or industrial use. This tariff is a standby rate to the "use of other fuels or other forms of energy."
11. The Commission has issued an order to look into rate structures for solar applications.