REPORT OF THE

STATE CORPORATION COMMISSION

TO

THE GOVERNOR

AND

THE GENERAL ASSEMBLY OF VIRGINIA

ON

UTILITY CONSERVATION PROGRAMS

HOUSE DOCUMENT NO. 8

COMMONWEALTH OF VIRGINIA
RICHMOND
1983

COMMONWEALTH OF VIRGINIA

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STATE CORPORATION COMMISSION

November 24, 1982

MEMORANDUM

To: The Honorable Charles S. Robb
Governor of Virginia

and

The General Assembly of Virginia

The interim report contained herein is in response to House Joint Resolution No. 32 of the 1982 Session of the General Assembly of Virginia which directed the State Corporation Commission to review the existing or potential conservation programs of each electric and gas utility operating within the Commonwealth and to make an interim progress report to the Governor and General Assembly no later than December 1, 1982; the final report can be expected no later than December 1, 1983. The review was conducted by the Commission's Division of Energy Regulation.

Respectively submitted,

Junie L. Bradshaw, Chairman

Thomas P. Harwood, Jr., Commissioner

Preston C. Shannon, Commissioner

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HOUSE JOINT RESOLUTION NO. 32

Requesting the State Corporation Commission to review utility conservation programs.

Agreed to by the House of Delegates, February 5, 1982
Agreed to by the Senate, February 23, 1982

WHEREAS, the State Division of Energy estimates that 700,000 residential units in the Commonwealth have no storm windows, 300,000 have no attic insulation, and 600,000 have no floor or wall insulation; and

WHEREAS, approximately one-third of all residential units in the Commonwealth are heated by electricity, one-third by heating oil, and one-third by natural gas; and

WHEREAS, electricity is used to cool about one-half of all residential units in the Commonwealth and

WHEREAS, an estimated 600 million to one billion kilowatt hours of electricity could be saved annually if all electrically heated and cooled residential units in the Commonwealth were adequately insulated and equipped with storm windows; and

WHEREAS, insulation programs would also result in savings of natural gas and heating oil by Virginians using them; and

WHEREAS, the Appalachian Power Company, with the approval of the State Corporation Commission, instituted an insulation and weatherization loan program for its residential customers in 1977; and

WHEREAS, approximately 1500 of the Appalachian Power Company's customers have participated in this program, which allows them to borrow up to $750 at eight percent interest; and

WHEREAS, the Virginia Electric & Power Company has stated that it is continuing to examine conservation programs, including the financing of conservation improvements, as a means of reducing growth in demand for electricity; and

WHEREAS, the State Corporation Commission has approved certain types of conservation programs for several public utilities in the Commonwealth; and

WHEREAS, the State Corporation Commission feels that such programs have been beneficial and that such programs should be initiated and expanded whenever they will serve the public interest; now, therefore, be it

RESOLVED by the House of Delegates, the Senate concurring, that the State Corporation Commission is encouraged to review the operations of each electric and gas utility operating within the Commonwealth with regard to existing or potential conservation programs; and, be it

RESOLVED FURTHER, That the Commission is requested to make to the Governor and General Assembly an interim report on the progress of such programs no later than December 1, 1982, and a final report no later than December 1, 1983, on the progress of such programs.

EXECUTIVE SUMMARY

Introduction

Senate Joint Resolution No. 155, adopted during the 1981 session of the General Assembly, requested that the Virginia Coal and Energy Commission conduct a study relative to the role of electric and natural gas utilities in promoting energy conservation in the Commonwealth. This task was subsequently assigned to its "Energy Preparedness Subcommittee". Based on the Subcommittee's findings, the Coal and Energy Commission reported to the General Assembly during the 1982 session that additional study relative to conservation efforts by electric and gas utilities was warranted. The General Assembly, in February, 1982, in the form of House Joint Resolution No. 32, requested that the Virginia State Corporation Commission review utility conservation programs. The purpose of this interim report is to provide the details relative to current conservation efforts by the electric and gas utilities in the State. A copy of House Joint Resolution No. 32 in its entirety is presented as a preface to this report.

Discussion

Currently there are 33 electric and gas utilities providing service in Virginia. The Appendix to this report details those utilities and provides information relative to the number of customers served, customer mix, and the average cost of providing service to those customers. For the investor-owned electric and gas utilities, maps are presented depicting the service areas of those companies. Additionally, for the electric generating utilities, information relative to fuel used for generation is presented together with the relative fuel expenses by fuel type.

A review of this information indicates that the Virginia Electric and Power Company (Vepco) and the Appalachian Power Company (Apco) provide service to the bulk of the State's electric consumers. These utilities, combined, serve approximately 84% of total Virginia jurisdictional customers and represent approximately 89% of total kilowatt-hour sales made by all electric utilities, including the cooperatives.

Likewise, Columbia Gas of Virginia, Commonwealth Gas Services, Roanoke Gas Company, Virginia Natural Gas, and Washington Gas Light are the principal gas utilities operating within the State. On a combined basis, these companies account for approximately 93% of the State's total gas customers and 87% of total sales. In terms of geographic service area it is understandable why the foregoing companies are, in fact, the principal electric and gas utilities in Virginia.

The chart following this summary presents a synopsis of those conservation areas in which each of the electric and gas utilities named above have operative programs. The chart includes such conservation measures as:

- Customer Information - Includes all forms of information relative to conservation and/or the efficient use of energy as well as the potential for both in terms of reduced utility bills. Customer information includes, but is not limited to, the following: distribution of brochures and newsletters, mailing of bill stuffers, publishing advertisements, radio or television broadcasting, participation in workshops, distribution of educational materials to schools, providing specific information upon request, etc.

- Energy Audits (Residential, Commercial and Industrial) - Energy audits typically refer to an on premise inspection of a customer's residence or business by the utility to determine what, if any, cost effective measures should be implemented to effect reduced consumption and an attendant reduction in utility bills.

- Direct Load Control - Refers to the use by a utility of electronic or radio signals to physically remove certain appliances from the system during peak periods to accomplish a reduced load. Typically, electric hot water heaters, heat pumps and central air conditioning units are primary candidates for such direct load control.

- Weatherization and/or Equipment Financing - In such a loan financing program, utilities generally make available to their customers a specified sum of money at a designated interest rate and loan period. This money is to be used for a specific purpose such as insulation and weatherization and/or the installation of energy efficient equipment.

- Time-of-Use Rates (TOU) - Daily or seasonal time-of-use rates refer to Commission approved rate schedules, the charges of which are intended to reflect whether energy is used during the on-peak vs. the off-peak period or season. These charges are reflective of the fact that, depending upon the time of day or season of the year during which a customer imposes load upon the utility, the cost associated with providing service varies. TOU rates are generally designed to encourage off-peak usage when lower production cost base loaded capacity is available.

- Interruptible Rates - Such rates are typically offered to large industrial customers. They generally have a provision whereby service is provided at a lower cost than otherwise would be the case. The utility can, however, upon relatively short notice, discontinue service to such customers during peak periods or in the event of an unexpected loss of capacity.

- Cooperative Advertising - An advertising program wherein the utility shares, with the equipment manufacturer or dealer, the expense of advertising energy efficient equipment.

- Add-On Heat Pump - The Add-On Heat Pump innovation combines a fossil fuel furnace with an electric heat pump. In such installations, the heat pump operates when temperatures are moderate but is turned off at temperatures between 30°F. and 35°F. when the fossil fuel furnace begins operation and fulfills the heating requirements of the building.

- Research Studies and Programs - Refers to a broad range of research activities relative to promoting energy efficiency and/or conservation.

As is further evidenced by the chart attached to this summary, the major emphasis of the implementation of conservation measures has been directed towards the larger Virginia jurisdictional utilities. This is appropriate in that such programs will have a greater impact because of the large customer base. As such programs are proven to be cost effective they will be implemented as appropriate for the smaller utilities.

Conclusions

The State Corporation Commission agrees with the concept of encouraging and facilitating the installation of energy conservation measures which have demonstrated the potential to be cost effective. The Commission believes that such cost effective energy conservation programs in and of themselves are desirable. However, such programs would better serve the public good as an integral part of a larger effort encompassing strategies leading to more efficient energy use, to the reduced need for electrical generating capacity and/or to a reduction in national dependence on foreign energy sources. Therefore, for the purposes of this report, the term "conservation" is not strictly limited to the conservation of energy in terms of reduced consumption. It has been enlarged in scope to include measures which optimize the efficient use of facilities and resources so that the total cost of service to the consumer will be lower than it otherwise would have been.

The following section of this report provides the details of such current programs relating to conservation efforts by the electric and gas utilities.

UTILITY CONSERVATION PROGRAMS

UTILITIES	Customer Information	Energy Audits Residential	Energy Audits Com & Ind	Direct Load Control	Weatherization and/or equip. Financing	TOU Rates	Seasonal Rates	Interruptible Rates	Cooperative[2] Advertising	Add-On Heat Pump	Research Studies & Programs
I. Electric											
A. Privately Owned Companies											
Appalachian Power	X			X	X	X[1]				X	X
Delmarva Power	X						X				
Old Dominion Power	X										
Potomac Edison Power	X	X	X							X	X
Potomac Electric Power	X	X	X	X		X	X	X			
Virginia Electric & Power	X	X	X	X		X	X			X	X
B. Consumer Owned Companies											
A & N	X	X									
B-A-R-C	X	X									
Central Virginia	X										
Community	X	X					X				
Craig-Botetourt	X										
Mecklenburg	X	X	X								
Northern Neck	X										
Powell Valley	X				X						
Prince George	X	X									
Prince William	X	X	X	X			X				
Rappahannock	X	X	X	X							
Shenandoah Valley	X	X		X							
Southside	X	X		X							
Tri-County											
II. Gas											
Columbia Gas	X	X	X						X		
Commonwealth Gas Services	X							X			
Commonwealth Public Service	X							X			
Eastern Shore Gas											
Lynchburg Gas	X										
Roanoke Gas	X	X									
Shenandoah Gas	X										
Southwestern Virginia Gas	X							X			
Suffolk Gas	X										
Tennessee-Virginia Energy											
United Cities Gas	X										
Virginia Natural Gas	X	X									
Washington Gas Light	X				X			X	X		

1. Appalachian Power Company has an active thermal storage program. The customers who volunteer to participate in this program are billed on TOU rates.
2. Advertisements promoting the use of high efficiency gas equipment wherein the utility shares the expense of advertising with the equipment dealer.

UTILITY CONSERVATION PROGRAMS

I. ELECTRIC UTILITIES

A. PRIVATELY OWNED COMPANIES

1. APPALACHIAN POWER COMPANY(Apco)

Apco has implemented conservation programs in the following major areas: Information, Customer Assistance, Load Management and Residential Insulation Financing. In addition there are a number of research programs in which the Company is involved.

a. Information

In the area of Information the Company, beginning in 1978, has made available to its customers at no charge the following six booklets: Customer Handbook, Insulation, Home Energy Management, Home Survey, Electrical Thermal Storage and Add-On Heat Pump. The Company through its monthly bill inserts has also provided conservation information. Apco actively assists teachers of home economics, science and consumer classes by providing classroom materials and demonstrations on the wise use of energy. The Company makes presentations or provides speakers on the efficient use of energy upon request to elementary school groups, civic groups, senior citizen's organizations and youth groups. Apco provides training for "Extension Service Program Leaders" on conservation and weatherization. The Company participates in local community conservation activities by appearing on educational TV programs sponsored by the Extension Service and actively participates in 4-H programs. Finally, in the area of information the Company, through its advertising in a variety of media forms, has provided conservation information.

b. Customer Assistance

In the area of customer assistance Apco provides cost data through three computer programs: TEL (Total Electric Living) - provides customers with a personalized computer printout of electric cost for their homes; BEEP (Building Energy Estimating Program) - provides commercial and industrial customers comparative costs of operating various types of environmental and energy systems in their buildings and evaluates the economics of changes in building structures as they relate to building energy requirements and cost and BOOP (Building Owning and Operating Program) - provides a complete evaluation of alternative heating and/or cooling proposals taking into consideration life cycle costs.

In the Customer Assistance area the Company also has leased a mobile display unit (Energy Van) which provides information on, among other subjects, conservation. The van periodically visits cities and towns in the Company's service area.

Finally, in the area of customer assistance Apco responds to specific individual customer requests to provide information and technical assistance on energy management conservation.

c. Load Management

The Company began a test program to study off-peak space and water heating in 1976. The results of the program indicated that off-peak heat storage for water heating and space heating could be beneficial to both the Company and the participating customers without any major change in customer lifestyle. Because of these results the Company began its Electric Thermal Storage (ETS) Program with the approval by the SCC of a Time-of-Day Rate for billing ETS customers. The Company is actively encouraging the use of electric thermal storage in Virginia because its test program determined that ETS could be a cost effective load management tool.

Another program the Company is promoting is the Add-on Heat Pump. The heat pump is designed to handle heat load requirements during moderate temperatures when the heat pump is most efficient. During extreme temperatures the customer relies on an oil or gas furnace. Under present energy prices the Company reports the customer experiences a substantial reduction in his heating costs. Summer cooling is also provided by the heat pump with more efficient use of electricity than with coventional cooling systems.

Finally, the Company undertook its first system wide appliance survey in 1979. The results of the survey will be used for several purposes and is expected to be helpful in evaluating alternative residential load management strategies

d. Residential Insulation Financing

The Company, since 1977, has had a Residential Insulation Financing program which was initially approved by the SCC for 120 customers. In 1980 the SCC authorized the Company to offer financing, the total amount of which would not exceed $1,284,000. The Program is available to all Residential Customers and provides up to $750.00 per customer to be paid back by the end of three years. The loan carries an annual interest rate of 8%. As of September 30, 1982, 1596 loans had been made. The Company has made a review of the savings experienced by a limited number of these customers and reports that the operating savings experienced by these customers off-set the amount of the Apco loan in approximately 2.6 years.

e. Research Programs

The Company is either conducting and/or participating with other companies of the AEP System in a number of research programs related to conservation. They include the following: Heat Pump Water Heating Tests; Heat Pump - Night Set-Back Test Program; Heat Pump "Seasonal Performance" Test Program; Test Program (Utility Control of the Operation of Heating, Air Conditioning and Water Heating Units.); Solar Research Houses, Combination

Heat Pump and ETS Unit; Project Aladdin (a cooperative venture with General Electric Company to field demonstrate G.E's AMRAC two way power line carrier communication, data acquisition and control system) and Residential Time-of-Day Rate Experiment Program. The analysis and evaluation of all of these programs has not been completed at this time as data collection is still in progress.

2. DELMARVA POWER AND LIGHT COMPANY

Delmarva's efforts regarding conservation within Virginia have been in the area of information. The Company has provided each school in the State with an Energy Education Resources Handbook which lists slides, tapes, brochures, speakers and films addressing a variety of subjects, including energy conservation. The Company has made available, at each of its District Offices, a number of pamplets related to and addressing ways to conserve energy. In the past year Delmarva has conducted a variety of meetings and hosted workshops on numerous conservation topics.

At the request of builders and individuals, the Company provides computerized heat loss/heat gain calculations for new homes utilizing efficient construction standards.

Finally the Company, along with realtors, builders and architects, has implemented The Super E+ Program. Homes constructed to meet the rigorous energy cost controlling standards specified in the program are awarded the Super E+ designation.

3. OLD DOMINION POWER COMPANY

Old Dominion will, upon request, assist and make recommendations on how home owners or businesses can make more efficient use of electricity. Kentucky Utilities Company, the parent company, is in the process of developing a computerized Residential Conservation Service Program which will be offered to Old Dominion's residential customers on a voluntary basis.

The Company in its utilization of mass media advertising communicates conservation measures to its customers.

4. THE POTOMAC EDISON COMPANY

The Potomac Edison Company, in 1982, initiated a ten year load management plan. The plan includes a number of activities and programs which involve the three major classes of customers: Residential, Commercial and Industrial.

a. Residential

The Company has begun an Energy Efficient Home Program for new electrically heated construction by:

(1) Promoting recommended energy efficient home thermal standards through media advertising and customer literature;

(2) Providing heat loss/gain calculations on new electrically heated homes;

(3) Promoting energy efficient home thermal treatment recommendations in builder/home shows;

(4) Conducting training seminars on proper thermal treatment of a home in Vocational-Technical Schools;

(5) Continuing to educate builders on the energy efficient home thermal standards recommended by the Company through seminars, exhibitions, direct mailings and personal contact;

(6) Providing materials to builders to identify homes built in accordance with recommendations for the Energy Efficient Home and

(7) Promoting employee interest and the achievement by employees of recommended energy efficient thermal standards in their own homes.

The Company has a Residential Conservation Service Program (RCS). Under this program, the Company offers to perform an energy audit of each customer's residence. It is auditing each residence as requested and providing the results of the audit to the customer along with recommendations and estimates of cost to meet recommendations. It is also educating consumers on the benefit of the RCS program through group presentations and through participation in energy shows and/or programs.

The Company has a number of other conservation programs either being promoted or which will be promoted in 1983. These programs include efforts to promote:

(1) The use of high efficiency central air conditioning equipment;

(2) The installation of additional insulation by electric heat customers to meet todays recommendations;

(3) The reduction of demand imposed by oversized central heating units by reducing the heating capacity to that required to meet the structural heat loss;

(4) The installation of thermal jackets for water heaters to reduce electric consumption;

(5) The installation of add-on heat pumps for oil and gas heating customers instead of total conversion to electric heat or replacement of central air conditioning units;

(6) The incorporation by builders of applicable passive solar measures in new homes and encouraging the orientation of homes for efficient energy utilization including the utilization of trees and shrubs to reduce heating and cooling loads;

(7) The installation of heat pump water heating and

(8) The manufacture and sale of energy efficient appliances.

b. Commercial

The Company has a number of programs to promote conservation among its existing and new commercial customers. They are as follows:

(1) Demand Reduction Program - Existing Customers - to reduce demand by: utilization of efficient in-and-outdoor lighting systems; improved use of thermal construction techniques; use of time clocks and demand control equipment and promoting waste heat utilization where applicable;

(2) Demand Reduction Program - New Customers - to reduce demand by all the methods listed in (1) above plus the promotion of the use of passive solar in building design;

(3) Heat Pump Water Heating Program to promote the use of Heat Pump Water Heaters;

(4) Add-on Heat Pump Program - to encourage add-on heat pumps where customers are converting from a fossil fuel system to electric heat;

(5) Street Lighting Program - to reduce demand by utilization of more efficient systems and moderization of existing systems

c. Industrial

The Company has Load Control and Energy Conservation Programs for both existing and new customers the objectives of which are the same as those outlined in the Demand Reduction Programs under Commercial. In addition the Company will implement or has begun the following programs to promote conservation by Industrial Customers: Parallel Generation Program to identify potential generation projects and secure 10,000 kw of additional generating capability; Interruptible Rate Program to provide interruptible rates that would encourage customers to reduce load by 2,500 kw at times of system capacity shortages; Standby Generation Program to utilize standby generating units as a potential source of capacity; demand limiting with a reduction of 1,000 kw and a Wholesale Customer Program to encourage wholesale customers to adopt and promote energy management programs.

d. General Information

To complement its load management program, the Company also encourages energy conservation by: providing services to educational facilities including; literature and films, furnishing conservation literature to the general public, providing speakers to give presentations on energy conservation and load management and providing conservation related films, programs and demonstations to adult groups.

At this time the Company has not completed the evaluation of the cost benefit studies to determine if these activities are cost justified, but advises that initial findings indicate each of these activities appear to be cost beneficial.

The Company in conjunction with the other companies of the Allegheny Power System is presently considering direct control of residential electric water heaters. Other activities under consideration include a research and development project involving two-way communications systems for direct control, remote meter reading and distribution automation and a load control demonstration project for data gathering to assess the benefits of direct load control.

5. POTOMAC ELECTRIC POWER COMPANY(Pepco)

a. Energy Audits

The Potomac Electric Power Company has had an audit program known as the "Waste Watchers Energy Audit Program" since 1978. This service is currently available to all residential customers who live in a one through four family dwelling. Beginning in January 1983 this service will be available to all customers provided they receive an electric bill and do not have central heating or cooling. This service costs the customer $15.00. The analysis performed determines which energy conservation and renewable resource measures, and what energy conservation practices are applicable to a customer's home. The report also provides the first year range of savings which can be expected from each recommendation; the installation cost of each recommendation and yearly maintenance cost if applicable.

In addition the company offers a Do-It-Yourself Waste Watchers Audit Program, also available since 1978, to residential customers who live in one through four family structures. The company furnishes the customer with an audit questionnaire which is returned to the company when completed. After processing, the company furnishes the customer a report containing recommended conservation improvements, estimated energy savings and estimated installation costs.

b. Education, Advisory and Information Services

For the last two years, Pepco has been actively involved in numerous activities and programs to directly assist special groups of residential customers to conserve energy. The projects include: the providing of publications and workshop materials to social service agencies and community volunteers; the providing of workshops on energy conservation in multi-family buildings for landlords, tenants, and condominium associations and the providing of conservation information to customers through a number of brochures, fact sheets and bill-stuffers.

c. Load Control

Pepco conducted a residential experimental load management project from 1977-1980 wherein it cycled the use of central air conditioners and water

heaters of 287 residential customers. As a result of this initial experiment, the Company began an expanded experimental Radio Load Control Program in 1981 with 700 residential customers and continued the program in 1982 with the addition of 50 District of Columbia customers.

The Company also has a Commercial/Governmental Curtailable Load Experiment involving a sample of 31 customers with loads in excess of 500 kw. These customers agree to reduce load, to a pre-established level, upon request. Upon compliance the customer receives a rate discount; upon noncompliance, they are billed a rate penalty. This experimental program began in 1982; the rate is a filed tariff in Maryland and in the District of Columbia for experimental purposes.

Both of these load control studies will continue in 1983 in Maryland and the District of Columbia. These programs have not been conducted in Virginia because customer population is too small in Virginia to maintain statistical reliability. The Company intends to evaluate, based on the data to be received from those programs, specific load control programs as a part of the Company's energy supply planning process. Programs finally adopted will be incorporated into the annual peak demand and energy forecasts.

d. Time-of-Day and Seasonal Rate Pricing

Pepco has had seasonal cost differential rate schedules since 1970. Currently such rates are in effect for the Residential, General Service, Temporary, Heat Service, and Cogeneration - Small Power Producers.

The Company, for its largest (approximately 270) commercial customers in the District of Columbia, has had time-of-day schedules in effect since June, 1980. In October 1982, the Maryland Public Service Commission approved a time-of-day rate program for Pepco's largest commercial and residential customers in that State. A proposal to extend time-of-day rates to Pepco's largest residential customers in the District of Columbia is pending before the D.C. Public Service Commission.

Pepco's programs extend time-of-day rates to customers on a demonstration basis for one year. After the initial year, the time-of-day rates are billed to the eligible customers on a mandatory basis. Time-of-day rates are originally applied to the customers who have the largest use because of the potential of such application for a positive cost benefit. These rates will be extended to smaller users over time as justified by cost/benefit analyses. Volunteers outside of the field of eligability are not accepted into the Pepco time-of-day rate program. It is mandatory for eligible customers. The Company has not yet evaluated the cost effectiveness of its time-of-day rates since the program has not provided the necessary data to make such an evaluation.

e. Commercial Energy Management Program

This program is designed to increase customer awareness of how their use of electricity can be controlled with emphasis placed on times of peak electrical requirements. Pepco qualified personnel assist the customer to understand how the electric rates are applied and the individualized and

combined impact that the cost components have on his total bill. This provides the customer with a basis to determine cost effectiveness of conservation measures appropriate to his operation. The primary conservation activity in this program involves walk-through audits of customer facilities by engineers and technical specialists to identify potential energy saving through modifications to operation, controls, and equipment maintenance procedures. A written report is given to the customer advising of potential modifications and, where possible, potential estimated energy savings are included. Where detailed designs and cost estimates are necessary, the customer is referred to a consulting engineer or a mechanical contractor.

Pepco is in the process of designing an automated energy audit which will provide more detailed information, including the suggested modification, estimated fixed costs, energy savings and payback periods.

6. VIRGINIA ELECTRIC AND POWER COMPANY(Vepco)

a. Residential Energy Audits

Vepco offers an energy audit to all of its residential customers except those located in buildings which utilize central heating and/or cooling systems or buildings containing more than four residential units. These exceptions will become eligible when the Commercial and Apartment Conservation Service Programs, authorized by the Energy Security Act, become effective. This is expected to be in early 1983.

This program provides the residential customer with a walk-through evaluation of his home and a detailed computer analysis of the conservation measures which are recommended for his home. This program was initiated in Virginia, West Virginia and North Carolina in 1981. A total of 3516 audits have been conducted. Of this total, 3297 have been performed in Virginia.

Vepco plans to offer its Residential Conservation Program as Federally mandated until January 1, 1985. If Federal rulings are not renewed it is possible that Vepco will continue the program to meet national and local energy usage curtailment requirements prevailing at that time and as a service to its customers.

b. Direct Control Water Heater and Air Conditioner Program

(1) Water Heater - Vepco received the approval, in June 1977, of the State Corporation Commission to study the control of electric water heaters in its service area. Since 1978 pilot projects have been conducted in five localities and about 3000 customers have participated in this program. Three different control technologies have been utilized. Ripple control was evaluated in Fredericksburg, Va. and in Roanoke Rapids, N.C.; Radio Control was evaluated in South Boston, Va. while Power Line Carrier Control was utilized in Hopewell and Williamsburg, Virginia.

These pilot projects demonstrated that residential electric water heaters can successfully be remotely

controlled, capacity requirements can be reduced, the control technologies used are effective communication techniques for remote load control, and that customer acceptance was good with only minor exceptions. A major conclusion drawn was that in 1996, winter and summer peaks could be reduced by 238 Mw and 104 Mw respectively.

Based on these conclusions, Vepco adopted a goal to control 25% of residential electric water heaters by 1990. The first phase of the expansion of this program was initiated in June 1982 when the program was offered to customers in the Tidewater Cities of Virginia and in Ahoskie and Williamston, North Carolina.

(2) Air Conditioners

The North Carolina Utilities Commission, in May 1982, ordered that a test program be conducted in Roanoke Rapids to control air conditioners of approximately 200 residential customer for at least one year. The Company is soliciting volunteers first from among customers who are already participating in the water heater control program and plans to conduct this test program in the summer of 1983.

c. Commercial, Industrial and Governmental Audits

Vepco began, in 1978, to offer walk-through inspections, upon request, of customers' establishments to identify modifications that would reduce consumption, demand and ultimately electric bills. The Company has conducted 1,231 such audits resulting in a load reduction of 13,514 Kw in the summer peak and 120,780 Kw in the winter.

d. Energy Saver Home Program

Beginning in June 1982 Vepco implemented an Energy Saver Home Program in its Eastern Division. This program was expanded in September 1982 to include the Company's total service area. The program specifies thermal standards, and heat pump and central cooling unit efficiency standards. The program is promoted through contacts with builders and developers of single family homes; the Company supplies Information Kits, Home Site Signs, Promotional Aids and Sales Brochures. In addition, the Company participates in local consumer shows, promotes the program in its newspaper advertisements, and provides speakers on the program as requested.

Each home constructed and equipped to meet the standards of this program is so identified by a brass plate with a registered serial number which is attached to the circuit panel in the home.

The Company's goal in adopting this program is to reduce residential electric demand and improve customer relations. The Company has experienced positive builder and customer response in its Eastern Division where the pilot program began in June 1982. Vepco projects a reduction in demand of 40 mw through 1990 as a result of this program.

e. Add-on Heat Pump Program

The Company, beginning this year (1982), undertook the development of an Add-On Heat Pump Program. It is an effort to promote the installation of a Heat Pump when an existing oil or gas customer is planning to install central air conditioning or to replace a failed central cooling unit. A second effort is to offer the customer an alternative to removing a working oil or gas furnace because of high operating costs. Many customers would probably choose a standard heat pump, but if they installed an add on heat pump, it would reduce the escalation of winter system peak. The heat pump, in lieu of the conventional air conditioner for central cooling, would also reduce the growth in summer peak. Vepco believes the heat pump will have no adverse effects on the system winter peak.

The Company, in order to launch this program, held meetings for manufacturers and dealers to provide details of the program and to advise of the Company's efforts to increase customer awareness of the add-on heat pump. Vepco's program recommends a specific efficiency rating for add-on heat pump units and reliability of operation standards as well dealer servicing availability recommendations and manufacturers' extended service agreement availability recommendations.

The Company has undertaken the promotion of this program through advertising, bill stuffers, direct mailing, brochures, speakers, contacts with dealers and homeowners, and displays at home shows.

An add-on heat pump promotion is being developed, in North Carolina, which will offer a reduced rate for space heating and cooling consumption.

f. Time-of-Usage Rates

In June 1977 Vepco, with the approval of this Commission, instituted two pilot programs to evaluate Residential Time-of-Usage (TOU) rates. One plan solicited 1000 customers to volunteer to be billed on the TOU rate. The other plan was to install meters on customers whose usage in any summer month exceeded 3500 kWh, send them a comparative bill on TOU rates for at least a year, and bill them under the traditional residential schedule during the first year. This plan involved 10,876 customers. If, after evaluation of the effect of the plan, the benefits exceeded the cost, the intent was to bill these customers on the TOU rates and to extend TOU rates to other groups of customers if evaluations indicated the benefits exceeded the cost for such groups.

These programs were initiated because it was anticipated that time differentiated pricing would encourage customers to shift their consumption and load to off-peak periods when the price was lower. Such a shift would reduce the growth in peak demand.

The Commission has decided that the mandatory program not be instituted because the cost effectiveness of the rates has not been proven. The Commission approved the expansion of the volunteer TOU rate program to increase customer awareness and understanding of the potential benefits of TOU rates. Vepco is seeking an additional 5000 volunteers.

As of August 1982, 436 of the original customers in the volunteer program and 2256 customers in the mandatory study program have volunteered for TOU rates. The remainder of the customers in the mandatory program will be encouraged to volunteer when the issuing of comparative bills is discontinued.

Also in June 1977, with Commission approval, the Company implemented a Voluntary Clock Controlled Water Heating Program that offered a reduced rate for off peak water heating. Vepco now has 562 residential customers on the Off-Peak Time Controlled Water Heating Rate. The Company plans to expand this number to 2000 volunteers and expand the program to make it available to customers who install storage space conditioning systems.

In May 1978, at Vepco's request, this Commission approved a TOU rate for Churches, Synagogues and Charitable Institutions. Presently there are 10 customers being billed under that rate. The Company intends to seek approval to extend this rate to a limited number of small general service customers and to make available a TOU rate for large general service customers.

The Company, in conjunction with an Alternative Energy Study it is conducting, is in the process of soliciting responses from large industrial customers to evaluate the potential of interruptible rates. If the evaluation of these responses indicates the need and potential for such a rate, Vepco will introduce an interruptible tariff for customers agreeing to curtail their load during peak demand periods.

B. CONSUMER OWNED ELECTRIC COOPERATIVES

1. A & N ELECTRIC COOPERATIVE

A&N has an Energy Audit Program which is divided into two types. Whenever the Cooperative receives a bill complaint, the technician handling the complaint, in addition to testing the consumer's meter, offers to make a walk through audit of the customers home. If requested to make such an audit, he checks and makes recommendations on the following: thermal insulation, ventilation and moisture control, air infiltration, heating and/or cooling systems, appliances, plumbing system, water heater, lighting etc.

The other type of audit is at the request of the consumer and the pertinent data collected is analyzed through use of a computer model. The information produced helps the consumer decide what modifications should be implemented.

In 1981 a total of 242 audits of both types were completed.

The Cooperative believes the high capacity cost in wholesale rates may necessitate consideration of direct load control systems in the future.

2. B-A-R-C ELECTRIC COOPERATIVE

BARC makes a number of brochures concerning energy conservation available to its members. Upon request, the Cooperative provides on-premise assistance and advice to its members concerning ways to use energy efficiently.

The Cooperative works with approximately 100 members each year regarding heating systems, insulation recommendations, electrical systems and improvements to reduce high usage. The Cooperative will also make energy audits, if requested, from a simple walk-through survey from which recommendations to improve efficiency can be made to a complete heat loss-heat gain summary.

The Cooperative works closely with electrical and insulation contractors in its service area to keep them aware of the insulation standards recommended in the Cooperative's service area.

3. CENTRAL VIRGINIA ELECTRIC COOPERATIVE

Central Virginia Electric Cooperative (CVEC) promotes conservation in the following ways: distribution of literature, annual letter to members advising of the free statewide energy audit program, speeches before various organizations and explanations of the operation of appliances to reduce high consumption.

Technical assistance is offered to all consumers including heat loss calculations on new and modified electrical systems. The Cooperative advises its large power consumers how to improve power factor and thereby achieve reduced demand charges.

CVEC participates with other organizations to encourage energy conservation including various associations of electric cooperatives. In addition, it is a member of the 4-H Electric Energy Program and the Virginia Farm and Home Electrification Council.

4. COMMUNITY ELECTRIC COOPERATIVE

The Cooperative provides informational service to its membership relative to conservation. These include articles in Rural Living Magazine, newspaper advertising, exhibits and handout booklets.

The Cooperative provides consultation services in the following areas to its members: computerized energy audits, on site energy audits; building design recommendations; heating and cooling systems; insulation standards; financing from FHA, local bank, special government grants and/or loans, efficiencies of various motors and major appliances and how to reduce excessive energy consumption.

5. CRAIG-BOTETOURT ELECTRIC COOPERATIVE

The Cooperative has not adopted any formal conservation program. It has presented conservation topics to Civic Groups when requested. Rural Living Magazine, which frequently includes articles on conservation measures and recommendations, is mailed to the Cooperatives consumers monthly.

6. MECKLENBURG ELECTRIC COOPERATVE

The Cooperative has designated the time equivalent of one and one-half staff members to performing energy audits, providing engineering assistance and developing and distributing information on energy conservation to both residential and commercial consumers.

The Cooperative has been performing approximately 200 energy audits and personal contacts annually.

The Cooperative is initiating a feasibility study to consider a direct load management program.

7. NORTHERN NECK ELECTRIC COOPERATIVE

Northern Neck Electric Cooperative promotes the conservation and efficient use of energy through information in the Cooperatives' Monthly Newsletter and through consumer contacts. The information provided covers the following areas: energy efficient appliances, recommended conservation measures, weatherization of existing homes and specifications for the installation of insulation, and storm doors and windows for new homes.

In 1981, Cooperative personnel made 4,167 individual contacts. In 1982 there have been 3,688 contacts to date.

The Cooperative plans to continue to expand its efforts to meet consumers' requests.

8. POWELL VALLEY ELECTRIC COOPERATIVE

The Tennessee Valley Authority (TVA) began to offer a conservation program to its Distributors several years ago. TVA furnishes the cash resources and the distribution utility (in this case Powell Valley) distributes the cash. The program offers financing to consumers for insulation, storm windows and doors, wood stoves and heat pumps. The program, as revised in October, 1982, authorized Powell Valley to offer up to $5,000 per dwelling. The first $1200 is interest free and the remaining $3800 is at an interest rate based on the cost of money to TVA. The program, as revised, offers financing for insulation, storm doors and windows, wood stoves, heat pumps, heat pump water heaters and Solar Water Heaters.

Power Valley signed its first contract with TVA to make this financing program available to its consumers on July 1, 1977. TVA provides two full time employees to make audits and recommendations for Powell Valley consumers in the Virginia and Tennessee service areas of the Cooperative. Through July, 1982 the Cooperative has made 782 loans, estimates a savings of 2,920,000 kWh and a reduction in consumer charges of at least $131,400.

As of July, 1982, TVA estimates dollar savings to its entire system to be $32 million and the total cost to be $51.7 million. Saving's will continue to accumulate as a result of the improvements made to make consumer's homes more energy efficient.

9. PRINCE GEORGE ELECTRIC COOPERATIVE

The Prince George Electric Cooperative is promoting energy conservation among its consumers by: the use of the State Association newsletter to inform consumers of the availability of the Cooperative to assist in any way possible and to inform of conservation measures; providing pamphlets and brochures on energy conservation; advising clubs and civic organizations of the films available on energy conservation and the display of posters on conservation at the Cooperative Office.

The Cooperative offers technical assistance as follows: planning and installing new and up graded services and equipment; calculation on insulation requirements, efficient heating, cooling and proper ventilation equipment; reducing excessive consumption and Energy Audits. The Energy Audits are offered through VPI and the State Energy Office and by qualified staff members on walk-through surveys of homes.

The Cooperative also advises its consumers where financial assistance can be obtained to make energy saving improvements.

10. PRINCE WILLIAM ELECTRIC COOPERATIVE

The Cooperative, as a part of its Energy Use and Conservation Program, offers walk through home energy audits for residential consumers. From 1979 through 1981, Cooperative personnel completed 1216 audits. This year, energy audits, for the first time, are being offered to commercial and industrial consumers.

Individual recommendations are made on heating and cooling unit sizing, proper insulation, proper ventilating and energy efficient design including solar. Such assistance includes heat gain/loss calculations.

Education and information relative to conservation and the efficient use of energy is provided through: the monthly Rural Living magazine; programs to various community groups; bi-weekly advertisments in each of four local newspapers; the issuance of an Energy Packet to new applicants for service; the providing of a film on conservation at Community meetings and a booth at the Prince William County Fair at which efficient energy equipment is demonstrated and energy conservation literature is distributed. Recently, the Cooperative along with the Cities of Manassas and Manassas Park designed and conducted training seminars on practical remedies in decreasing energy consumption. This program was initiated to train volunteers to teach energy workshops for local residents.

Prince William also participates with other organizations; such as: the State Association, the VPI Extension Service and The Virginia Farm and Home Electricfication Council to promote energy conservation through meetings, demonstations and fairs.

Prince William began a Load Management Program, in 1979 which utilizes radio control to reduce the loads water heaters and air conditioners contribute during periods of peak load. As of May 1982, the Cooperative had direct control of 2581 air conditioners and 2741 water heaters. At that time the estimated demand under control was 175,000 kw and the estimated demand reduction during peak periods was 14,000 kw or 12.5% of peak demand. The consumers participating in this program are volunteers; no pecuniary incentive is offered.

11. RAPPAHANNOCK ELECTRIC COOPERATIVE

The Cooperative has an operating pilot load management program which controls the operation of electric water heaters during peak periods. This program is offered on a volunteer basis and the participants receive no monetary incentive. At the present time 1216 consumers are participating. The object is to reduce the Cooperative's demand costs as billed by its wholesale supplier of power. This program is presently being studied by a consultant to determine if there is economic justification for future expansion and, if so, to develop the necessary plans and specifications.

The Cooperative's Large Power Rate Schedule offers a reduction in demand charges during off-peak times for consumers with demands of 1000 kw or more. The Cooperatives wholesale demand charges are also less during off peak periods.

Since January 1980, the Cooperative has offered energy audits at no charge to all classes of customers as requested. An audit provides advice and recommendations on more efficient use of electricity and other fuels. In 1981 the Cooperative completed 90 audits.

12. SHENANDOAH VALLEY ELECTRIC COOPERATIVE

Shenandoah Valley offers a two part home energy audit program including: (1) visual examination of the home, and (2) complete analysis heat estimate. The visual analysis is made to determine what action can be taken to make more efficient use of energy and reduce consumption. The Heat Loss Estimate is a computer analysis and informs the consumer of the proper heating units to be installed.

The Cooperative furnishes Rural Living magazine to its consumers monthly. The magazine, in the course of a year, includes a wide variety of articles concerning energy conservation. Upon request, the Cooperative will make presentations concerning efficient use of electricity in the home, farm and office to various civic, school, and professional groups.

The Cooperative has a voluntary load management program aimed at the control of water heaters. No monetary incentive is offered. The program was initiated in October 1980 as a means to help reduce demand during peak periods. As of this October, 3831 water heaters were subject to radio control.

13. SOUTHSIDE ELECTRIC COOPERATIVE

The Cooperative has provided information on energy conservation through Rural Living Magazine to all of its consumers and through radio spots broadcasted in its service area.

Southside has established a resource library of films, slide presentations and literature on energy conservation management. In 1981 it made 31 presentations, using resources from its library, to various civic and local associations. The Company participates in seminars and workshops on energy conservation conducted in its service area.

The Cooperative works with local contractor and builder associations in regard to the use of efficient energy equipment and appliances and the proper insulation in buildings.

The Cooperative has offered energy audits and heat gain/heat loss calculations. It is active in the energy audit program of the Virginia Energy Office as a supplier of the questionnaire to consumers and in interpreting the results of the audits when they are returned from V.P.I.

In addition, the Cooperative has a load management program in which the electric water heaters of 100 volunteers are radio controlled. These 100 consumers also agreed to the installation of demand meters on their services as did another 100 consumers for the collection of demand data. The Cooperative is in the process of evaluating the data collected in this program.

14. TRI-COUNTY ELECTRIC COOPERATIVE

The Cooperative has not adopted a formal conservation program. The boards and members of Tri-County Electric Cooperative and Prince William

Electric Cooperative have voted to merge the two cooperatives to form the Northern Virignia Electric Cooperative The anticipated merger date is January 1, 1983. After that merger, it is expected that the consumers now served by Tri-County will participate in the same programs as are presently utilized in the Prince William Electric Cooperative service area.

II. GAS UTILITIES

1. COLUMBIA GAS OF VIRGINIA, INC.

Columbia Gas has a number of programs to promote conservation. These programs include (1) media advertising (newspaper, radio and television); (2) distribution of numerous brochures; (3) providing speakers as requested; (4) bill inserts; (5) audio-visual presentations to builders, heating contractors and equipment dealers on high efficiency gas equipment; (6) money for dealers for cooperative advertising to promote the use of high efficiency gas equipment and (7) encouraging builders of homes to install high efficiency gas equipment.

The Company is active in the promotion of the conversion of non-gas heated homes to gas heat which the Company considers to be more efficient and economical to operate than oil or electric heating units.

Columbia Gas also has a program of surveying (energy audits) its customers buildings to determine how the customer can make more efficient use of gas or what conservation measures the customer can take to reduce gas consumption. These audits are available for residential, commercial and industrial customers.

2. COMMONWEALTH GAS SERVICES, INC.

Commonwealth Gas Services provides an assortment of literature on ways to conserve gas and reduce monthly bills. The Company also encourages its customers to take advantage of the free Home Energy Audit offered by the Virginia Energy Office.

The Company offers an interruptible rate schedule.

3. COMMONWEALTH PUBLIC SERVICE CORPORATION

Commonwealth Public Service does not routinely offer energy audits; however, the Company will visit a customer's home or business to make recommendations on ways to conserve gas including insulation, storm windows, etc.

The Company will also, upon request, check a customer's furnace including making adjustments etc., and advise the customer of any problem that could cause excess consumption and what repairs should be made.

The Company offers interruptible rates to Commercial and Industrial Customers who install stand-by firing capabilities.

4. EASTERN SHORE GAS COMPANY OF VIRGINIA

This Company has no formal conservation program established or planned.

5. LYNCHBURG GAS COMPANY

The Company promotes conservation by providing information on saving energy in its limited advertising program which includes newspapers, television and radio.

Yearly, the Company mails a safety notice to its customers which also includes information on conservation techniques.

This year, the Company worked with a local service agency to provide information on conservation methods that the Service Agency is using to assist its clients.

6. ROANOKE GAS COMPANY

The Company implemented a Residential Energy Management Program in 1978. This program was set up to provide energy audits for residential customers to help them conserve gas and ultimately reduce bills. As of July 1982, 302 audits have been completed. When the program was initiated, bill stuffers and a packet of energy conservation information and educational material were distributed to all customers.

In the summer of 1982 the Company made an aggressive effort to encourage the adoption of conservation measures by individuals in the lower income segment of its residential customer base. Nine hundred personalized letters were mailed seeking appointments to schedule a visit to the customer's home to make an energy counseling inspection. The result of this effort was the inspection of 177 homes.

This program has been expanded to include a sampling group of middle income, younger families. The preliminary response has been encouraging. The Company intends to significantly expand this effort.

7. SHENANDOAH GAS COMPANY

The Company has no formal conservation program. When requested, the Company assists its customers with advice and recommendations on insulation, weatherization and the use of more fuel efficient gas heating equipment.

In addition, the Company makes periodic mailings to its customers advising of various conservation measures that can be undertaken.

8. SOUTHWESTERN VIRGINIA GAS COMPANY

Southwestern Virginia Gas Company does not have a formal conservation program. They have encouraged their customers, through bill stuffers, to lower thermostat settings and are preparing to mail out information on the automatic set back thermostat.

The Company offers interruptible rates.

9. SUFFOLK GAS CORPORATION

The Company provides conservation information through newspaper advertisments on energy saving appliances and equipment. The Company plans to make available to its customers booklets on home improvements and other ideas to conserve energy.

10. TENNESSEE-VIRGINIA ENERGY CORPORATION

The Company has no conservation program at the present time.

11. UNITED CITIES GAS COMPANY

The Company makes available to its customers booklets and brochures on conservation including proper insulation, weather stripping, etc.

United Cities Gas offers management personnel as speakers for various civic and community groups to provide information on the efficient use of energy and new energy saving concepts and ideas.

The Company consults with its Commercial and Industrial customers on a continuing basis on ways to use gas more efficiently in their operations.

The Company promotes set back temperature control devices, high efficient energy appliances and sectionalized heating units.

The Company promotes the conversion of non-gas heating equipment to gas heating equipment which the Company considers to be more efficient and economical to operate than non-gas heating equipment.

12. VIRGINIA NATURAL GAS COMPANY

Virginia Natural Gas Company is a division of the Virginia Electric and Power Company; the Company offers residential energy audits to its customers as does Vepco. A discussion on the Vepco Residential Energy Audit Program is contained in this report under Virginia Electric and Power Company. Of the 3297 audits performed in Virginia, 507 were customers whose primary energy source for heating was gas.

Virginia Natural Gas Company is currently studying various conservation methods and programs it hopes to initiate in the near future.

13. WASHINGTON GAS LIGHT COMPANY

a. Information

The Company actively promotes conservation by making available conservation related information to its customers. In the fall of 1981, the Company opened an Energy Aid Center in the lobby of its Washington Office. The Center features exhibits, videotapes and literature on heating, water heating, insulation, caulking and weatherstripping. A representative of the Company mans the center and counsels consumers. The center is publicized through the media, community contacts, flyers and, when it opened, it received major T.V., Radio and newspaper coverage. Over 6,000 people a month visit the Center. Approximately 10% are from Virginia.

Washington Gas Light provides literature, audiovisual presentations and educational information to consumers and educators relative to conservation.

Six of the last twelve bill inserts sent to customers included conservation messages. The Company sent a catalogue of available educational materials for classroom use to 10,000 educators in its service area.

The Company's news media relations office periodically issues press releases on matters concerning conservation. A number of the Company's news media staff members have made guest appearances on radio and television to discuss conservation topics.

The Company's volunteer employee speakers present programs to community groups and agencies on conservation topics. The Company also offers workshops to provide conservation information to members of organizations; such as, Arlington Chapter, American Red Cross; Virginia Office of Consumer Affairs; Fairfax Department of Social Service etc.

b. Cooperative Advertising

Washington Gas Light sponsors cooperative advertising for qualified gas contractors. Many of the ads promote high efficiency gas equipment. Over 200 dealers participate in the Company's Qualified Gas Contractor Program. Customers may finance their purchases over five years and make payments through payment of their gas bills.

c. Energy Conservation Systems

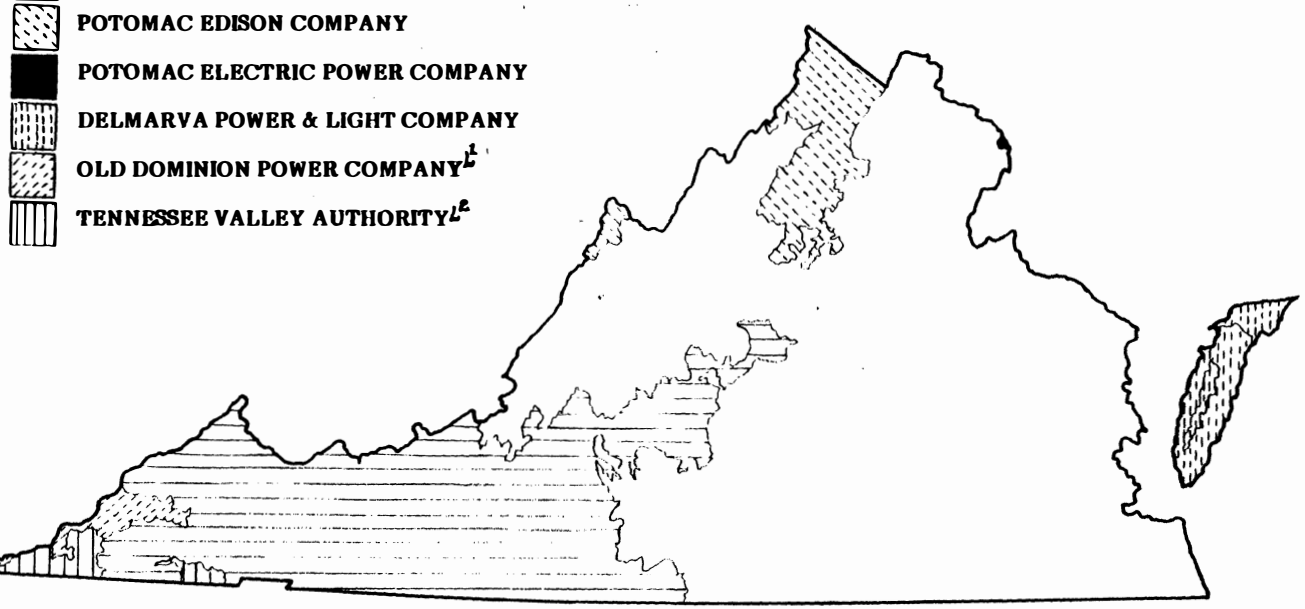
Energy Conservation Systems is a non-utility operation of Washigton Gas Light Company which sells and installs energy conservation products such as: insulation, thermal windows and doors, thermal wall systems, thermal roof and ventilation systems. Current gas customers may receive financing for up to five years and make payments on their gas bills. Non-gas customers are also offered financing and are billed separately.

d. Interruptible Service

The Company provides interruptible service to large commercial and industrial users. Many of these customers have the capability to switch to alternate fuels during interruptions in gas service.

APPENDIX

TERRITORY SERVED BY ELECTRIC SUPPLIER



1. Purchases all energy requirements from Kentucky Utilities.
2. Service provided by Powell Valley Electric Cooperative which buys all of its energy requirements from TVA.

NATURAL GAS SERVICE AREAS IN VIRGINIA

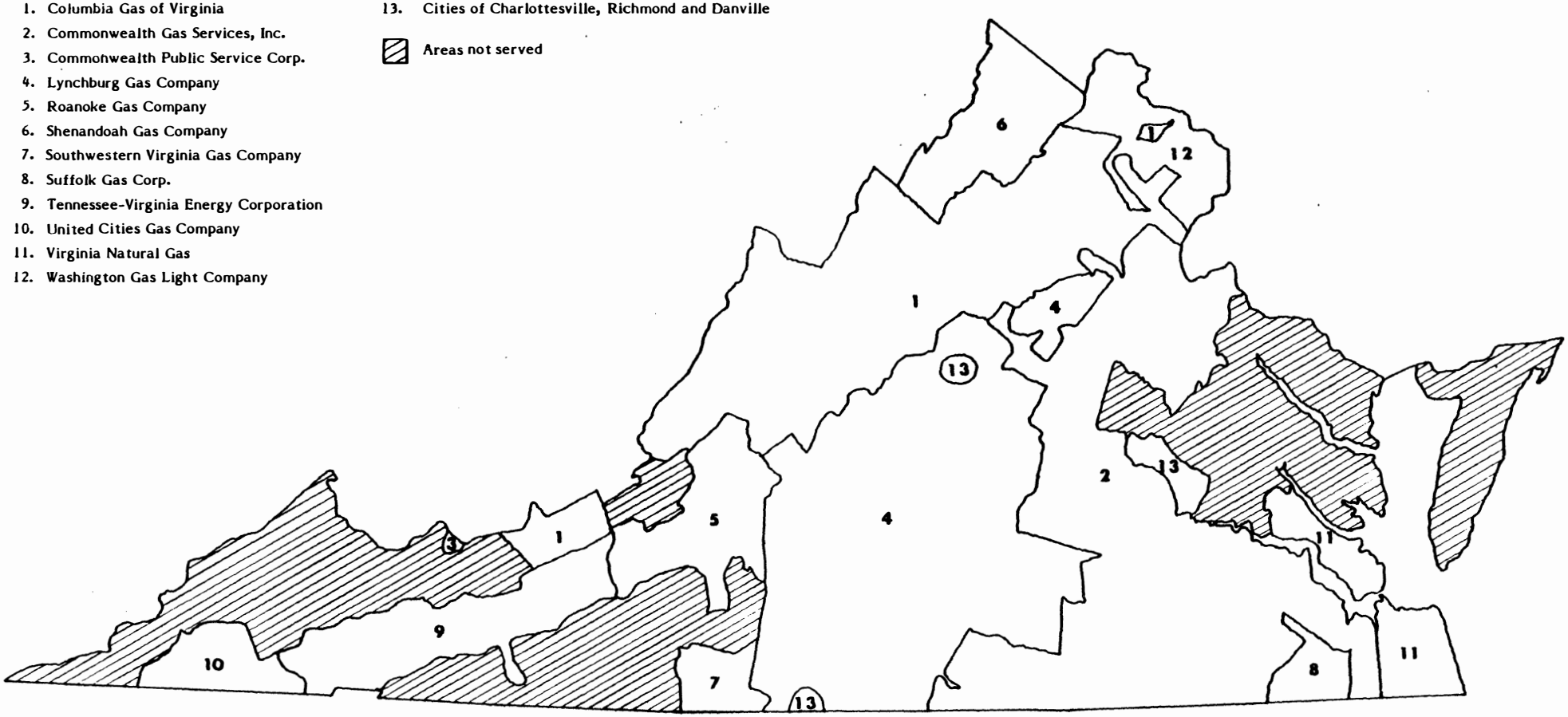
Certificated Companies:

1. Columbia Gas of Virginia
2. Commonwealth Gas Services, Inc.
3. Commonwealth Public Service Corp.
4. Lynchburg Gas Company
5. Roanoke Gas Company
6. Shenandoah Gas Company
7. Southwestern Virginia Gas Company
8. Suffolk Gas Corp.
9. Tennessee-Virginia Energy Corporation
10. United Cities Gas Company
11. Virginia Natural Gas
12. Washington Gas Light Company

Municipal Systems:

13. Cities of Charlottesville, Richmond and Danville

Areas not served



1982

STATISTICAL SUMMARY
OF
ELECTRIC & GAS UTILITIES
1981

UTILITIES	RESIDENTIAL			COMM. & INDUSTRIAL			PUBLIC ST. & HWY. LIGHTING			OTHER PUBLIC AUTH.			TOTAL[1]		
	No. of Customers	MWH or MCF Sold	Cost ¢/kWh or ¢/CCF	No. of Customers	MWH or MCF Sold	Cost ¢/kWh or ¢/CCF	No. of Customers	MWH Sold	Cost ¢/kWh	No. of Customers	MWH or MCF Sold	Cost ¢/kWH or ¢/CCF	No. of Customers	MWH or MCF Sold	Cost ¢/kWh or ¢/CCF
I. ELECTRIC															
A. Privately Owned Companies															
Appalachian Power	317,238	3,540,457	5.0	35,027	5,491,700	4.0	620	31,612	5.0	3,048	364,464	4.2	355,940	10,888,516	4.3
Delmarva Power	12,783	83,989	8.4	2,050	109,318	6.9	38	1,300	11.1	0	0	0.0	14,872	297,412	6.7
Old Dominion Power	21,675	287,052	4.3	2,766	301,402	4.2	17	2,516	3.5	396	30,183	2.8	24,854	621,153	4.2
Potomac Edison	47,559	485,951	5.2	7,474	592,730	4.1	43	3,697	9.6	0	0	0.0	55,079	1,164,739	4.5
Potomac Electric Power	2,504	8,615	7.2	532	397,433	5.3	9	1,706	7.3	2	21,303	5.9	3,047	429,057	5.3
Virginia Electric&Power	1,142,224	12,610,674	6.1	110,991	15,030,363	5.0	845	173,254	9.7	14,622	4,717,975	4.1	1,268,704	36,010,412	5.2
B. Consumer Owned Companies															
A & N	7,436	50,305	8.3	395	43,154	6.4	7	321	9.3	111	810	9.2	7,949	94,590	7.5
B-A-R-C	7,821	58,043	6.1	288	19,233	4.9	0	0	0.0	1	1	3.9	8,110	77,277	5.8
Central Virginia	16,017	146,398	5.6	721	69,799	5.8	0	0	0.0	55	165	7.7	16,793	216,363	5.7
Community	5,683	65,652	5.8	1,028	12,780	6.0	0	0	0.0	15	1,390	5.4	6,726	79,822	5.8
Craig-Botetourt	3,971	29,295	7.0	123	3,141	7.0	55	23	9.9	72	334	7.1	4,221	32,793	7.0
Mecklenburg	19,735	164,714	6.0	1,062	51,905	5.7	0	0	0.0	413	6,735	5.6	21,210	223,354	5.9
Northern Neck	9,695	78,790	6.7	606	13,059	6.9	11	13	10.4	79	862	6.7	10,391	92,724	6.7
Powell Valley	5,438	56,258	5.2	324	18,669	5.7	0	0	0.0	1	2,889	3.4	5,763	77,816	5.2
Prince George	4,972	59,813	5.9	209	7,085	6.0	0	0	0.0	0	0	0.0	5,181	66,898	5.9
Prince William	32,348	427,154	6.1	1,515	181,457	6.2	25	581	9.2	0	0	0.0	33,888	609,192	6.1
Rappahannock	36,291	377,774	6.4	2,121	624,427	4.3	0	0	0.0	663	7,928	6.5	39,075	1,010,129	5.1
Shenandoah Valley	17,883	179,548	6.1	1,605	68,449	5.2	0	0	0.0	0	0	0.0	19,488	247,997	5.8
Southside	27,414	267,378	6.1	739	58,552	5.5	0	0	0.0	359	5,863	5.6	28,512	331,793	6.0
Tri-County	3,791	46,889	7.1	78	19,017	5.8	1	91	9.8	0	0	0.0	3,870	65,997	6.7
II. GAS[2]															
Columbia	34,498	3,985,400	39.7	4,356	12,518,897	34.7	0	0	0.0	0	0	0.0	38,854	16,504,297	35.9
Commonwealth Gas Serv.	45,889	4,277,371	50.2	3,829	7,598,173	41.1	0	0	0.0	1	603,041	35.6	49,719	12,478,585	44.0
Commonwealth Public Serv.	554	69,686	43.9	84	121,326	39.4	0	0	0.0	0	0	0.0	638	191,012	41.0
Lynchburg Gas	8,396	939,021	47.3	1,098	4,148,433	40.8	0	0	0.0	0	0	0.0	9,494	508,454	41.9
Roanoke Gas	28,914	3,590,579	48.1	2,571	4,099,237	39.0	0	0	0.0	0	0	0.0	31,485	768,816	43.2
Shenandoah Gas	4,624	457,749	46.6	1,012	3,716,495	37.5	0	0	0.0	0	0	0.0	5,636	4,174,244	37.5
Southwestern Gas	2,533	228,712	51.4	651	1,537,340	43.8	0	0	0.0	0	0	0.0	3,184	1,766,052	44.8
Suffolk Gas	1,762	134,922	56.4	287	535,154	47.6	0	0	0.0	0	0	0.0	2,049	670,076	49.4
Tennessee-Virginia	4,664	502,308	42.3	1,470	3,866,520	38.0	0	0	0.0	192	343,387	38.1	6,326	4,712,215	41.4
United Cities Gas	893	128,033	37.5	387	714,785	35.5	0	0	0.0	193	23,681	36.1	1,473	866,499	36.8
Virginia Natural Gas	110,551	8,272,709	50.8	9,003	10,465,266	47.3	0	0	0.0	0	0	0.0	119,554	18,737,975	48.9
Washington Gas Light	161,419	17,741,722	53.6	12,077	13,031,005	47.7	0	0	0.0	0	0	0.0	173,496	30,805,177	48.4

1. The totals in this column for Appalachian Power, Delmarva Power, Potomac Edison and Virginia Electric & Power include the number of customers and the megawatt-hour sales of the Resale Class.
2. Eastern Shore Gas of Virginia is a propane company; current data not available.

VIRGINIA ELECTRIC UTILITIES

AVERAGE COST OF FUEL BURNED PER KWH (SALES)
(Va. Jurisdictional)

Company	1979 (¢/kWh)	1980 (¢/kWh)	1981 (¢/kWh)
Virginia Electric and Power	2.09	2.36	2.07
Appalachian Power	1.47	1.58	1.82
The Potomac Edison	1.30	1.38	1.53
Potomac Electric Power	1.67	1.88	2.37
Delmarva Power and Light	2.24	2.87	2.49

Note:

- Equation for calculations:

  $$\text{Average Cost of Fuel Burned per kWh Sale} = \frac{\text{Va. Jurisdictional Fuel Expenses}}{\text{Va. Jurisdictional Sales}}$$

- Data for calculations was obtained from Company's Fuel Hearing Reports.

VIRGINIA ELECTRIC UTILITIES

AVERAGE COST OF FUEL BURNED PER KWH (Net. Gen)
BY FUEL TYPE

TWELVE MONTHS ENDED 3-31-1982

Company	Nuclear (¢/kWh)	Coal (¢/kWh)	Heavy Oil (¢/kWh)	Light Oil (¢/kWh)	Gas (¢/kWh)
Virginia Electric and Power	0.58	2.03	5.39	12.07*	5.89
Appalachian Power	----	1.85	----	----	----
The Potomac Edison	----	1.51	----	7.82	----
Potomac Electric Power	----	1.98	4.84	7.13	----
Delmarva Power and Light	0.69	2.16	5.26	7.47	4.29

Note:

- Equation for Calculation:

$$\text{Ave. Cost of Fuel Burned per kWh (net gen.) by Fuel Type} = \frac{\text{Fuel Expenses by Fuel Type}}{\text{Net Generation by Fuel Type}}$$

- Data for calculations was obtained from Company's Fuel Hearing Reports.

* Based solely on Light Oil used for combustion turbine generation.