APPENDIX A

1978

TEN-YEAR PLAN OF MARYLAND ELECTRIC UTILITIES, POSSIBLE AND PROPOSED POWER PLANTS,

1978 through 1987

Public Service Commission
of Maryland
301 W. Preston Street
Baltimore, Maryland 21201

TABLE OF CONTENTS

I. INTRODUCTION

This report constitutes the 1978 Ten-Year Plan of the Public Service Commission of Maryland (referred to herein as the Commission or the PSC) regarding the possible and proposed sites, including associated transmission routes, for the construction of electric power plants within the State of Maryland. The report is in accordance with Section 54B (b) of Article 78 of the Annotated Code of Maryland. The plans herein are based upon the individual long-range plans submitted by the Maryland electric utilities, with supporting analyses and information by the Engineering Division of the Commission.

II. UTILITIES IDENTIFIED

The 16 retail electric companies presently operating in Maryland and subject to the jurisdiction of the Commission are listed in Attachment No. 1, according to type of ownership: investor-owned, municipally-owned, and customer-owned (i.e., cooperatives).

In addition, there are two non-retail electric companies owning generation property in Maryland. They are:

1. Pennsylvania Electric Company owns a hydro-electric plant on the Youghiogheny River, Garrett County (Deep Creek Lake Reservoir) and an associated transmission line.

2. Susquehanna Power Company, a wholly-owned subsidiary of Philadelphia Electric Company, owns the Conowingo hydro-electric plant on the Susquehanna River, Harford and Cecil Counties.

Of these 18 companies, only the 7 utilities listed below have future power plant siting interests in Maryland:

Baltimore Gas and Electric Company
Conowingo Power Company
Delmarva Power and Light Company of Maryland
Easton Utilities Commission
The Potomac Edison Company
Potomac Electric Power Company
Southern Maryland Electric Cooperative, Inc.

Of these 7 companies, two, namely, Conowingo Power Company and Southern Maryland Electric Cooperative, own no generation capacity at the present time.

III. 1978 TEN-YEAR SITING PLANS, BY COMPANY

General

These Plans reflect continued planning by the electric utilities for the deferral and stretch-out of new generation and associated transmission plant construction in the next decade. These current plans are indicative of the uncertainties in formulating long-range electric demand forecasts. A listing of the utility planned and possible new power plant sites is given in Attachment No. 7 (at end of report), arranged by utility and further indicating: name of site/plant, type of fuel, capacity, initial construction and in-service dates. A discussion and further explanation of the sites is given below:

1. Baltimore Gas and Electric Company

The second unit of the Calvert Cliffs nuclear plant became operational April 1, 1977. Total rated capacity of both units is 1730 MW.

In 1973 the Company was granted approval to begin construction of two 610-MW fossil-fueled steam units at Brandon Shores, Anne Arundel County. These two units are to become operational in 1981 and 1983, respectively. These dates represent a one-year stretch-out from last year's Plan.

New generating plant of 100-MW capacity is planned for Sollers Point, Baltimore County. Total acreage involved is 1000 acres. Actual size of the individual units, the kind of fuel and the year construction is to start are presently undetermined although completion is expected by 1986. This represents a two-year delay in completion date from the previous year's Plan. The Company had previously considered building a 200-MW plant at this site.

Additional generation is now being planned at the Safe Harbor Water Power Corporation hydro-electric plant. This plant is on the Susquehanna River, Lancaster County, Pennsylvania, approximately 20 miles upstream from the Maryland-Pennsylvania border.

The proposed expansion is being planned in conjunction with the application for the renewal in 1980 of the plant's operating license by the Federal Power Commission, filed April, 1977. If the license is not renewed, these expansion plans will be cancelled.

The expansion would include 5 units having a total capacity of 187.5 MW. Capacity entitlement of 125-MW would be allocated to the Baltimore Gas and Electric Company in the proportion of its ownership: 2/3 Baltimore Gas and Electric Company and 1/3 Pennsylvania Power and Light Company. No transmission line reinforcements will be required insofar as the Baltimore Gas and Electric Company is concerned.

The Company is considering the possibility of a 800-MW coal-fired plant to be located on an undetermined site in the northeastern section of Maryland. Approximately 800-1000 acres will be required. Cooling water, services and other special requirements are presently under review.

Last year's Company Plan listed a Northwest Substation in Baltimore County as the site of a peaking generating station. Plans for this station have been deleted. Plans for additional generation at the Perryman station, Harford County, have also been deleted.

2. Conowingo Power Company

The Philadelphia Electric Company and its wholly-owned subsidiary, Conowingo Power Company, operate their facilities as though these facilities were that of a single company. Conowingo customers thus obtain the benefits of being a part of the larger Philadelphia Electric system and of the PJM Interconnection, of which Philadelphia Electric is a member.

At the present time, almost all of the Philadelphia Electric system generation plant is in Pennsylvania. The Conowingo hydro-electric plant represents about 6% of the Philadelphia Electric's installed capacity.

An additional 938-MW of capacity is being added to the Philadelphia Electric system through the partial (42%) entitlement of the 220-MW nuclear generating plant at Salem, New Jersey. The first unit of this plant went on-line in June, 1977. The second unit is scheduled for service in 1979.

The Conowingo hydro-electric plant is a peaking generation station with an annual capacity factor of about 40%. Because of this, Conowingo is unable to supply just the Maryland load but instead must be operated in conjunction with base load generation plant of the Philadelphia Electric system.

A major new generating station in the Philadelphia Electric system is scheduled to become operational sometime within 1992-1994, with construction beginning approximately 1985. Prime location of this station is in Fulton Township, Lancaster County, Pennsylvania.

The three alternate locations for this station are in Maryland. They are the following sites:

Canal site
Bainbridge site
Seneca Point site

Conowingo Power Company presently owns 680 acres at the Canal site. This is located approximately 1 mile west of Chesapeake City, Maryland on the Chesapeake and Delaware Canal. The Canal site was listed in the application to the Nuclear Regulatory Commission for the Fulton Nuclear Generating Station, as an alternate site.

Bainbridge, formerly the location of the Naval Training Center just east of Port Deposit, Maryland, has approximately 1260 acres available for power plant construction. The State of Maryland is currently negotiating with the General Services Administration of the Federal Government for acquisition of this site, to be included with the Elms site in St. Mary's County, in the State Power Plant Site Bank. The Philadelphia Electric Company is interested in either joint or wholly-owned development of generation plant at this site.

The Seneca Point site is approximately 500 acres of which 394 are currently owned for future development. It is located on the west bank of the Northeast River, approximately 1 mile southwest of Charlestown, Cecil County, Maryland.

At any of these three sites, development would probably be two base load nuclear-fueled units for possible service in the 1990's. Unit capacity would be in the 1100-1500-MW range. Alternately, the development could be equivalent fossil-fueled capacity. Final determination of the type of plant would depend on detailed studies including plant and fuel costs, environmental considerations and licensing aspects.

3. Delmarva Power and Light Company of Maryland

The Company has no proposed generating station sites either through ownership or under option. Studies are continuing on potential plant sites in the lower eight Maryland counties on the eastern shore. No information is available on specific sites at this time.

4. Easton Utilities Commission

In 1975, the Public Service Commission granted Easton Utilities Commission a Certificate of Public Convenience and Necessity for the construction of a new generating plant, known as Plant No. 2. Located on a Town-owned 7-acre site within the city limits of Easton, this plant is presently under construction, with completion of the first two units, having a total capacity of 12.5-MW, now scheduled for 1978. This was to be completed in 1977, according to the Easton Utilities Commission's 1977 Plan.

Additional capacity will be incorporated at Plant No. 2 in 1982 and 1986. Prime mover of all units will be diesel engines, fueled by No. 2 fuel oil.

5. The Potomac Edison Company

The Company owns one site in Maryland for possible use as a power generation site. This site, known as Point of Rocks, is in Frederick County, 2¼ miles down the Potomac River from the community of Point of Rocks.

This site, containing 829 acres, was purchased for a nuclear generating facility having an ultimate capacity of about 2500-MW. There are no active plans at the present time to proceed with construction at this site.

After extensive internal study and discussions with the state power plant siting program, the Company has withdrawn the Black Oaks site in Allegany County from consideration as a location of a future generation plant.

The Black Oak site has three serious deficiencies for power generation: air quality, flooding and water makeup. The problem of meeting applicable governmental air quality standards appears to be insoluble.

The Company has no plans for expansion of its R. Paul Smith plant at Williamsport or its Celanese power plant, the only existing plants it operates in Maryland.

6. The Potomac Electric Power Company

On June 9, 1977 the Company announced the indefinite deferral of its plans to construct a nuclear generating station at Douglas Point

in Charles County. However, the site will be retained for eventual construction of a generation plant when the needs so warrant. NRC (Nuclear Regulatory Commission) site suitability determination will be pursued. Specific contracts and arrangements associated with the two planned units will be abandoned, sold, terminated or otherwise dealt with, as determined by economic analysis and estimates of future technical applicability.

Potomac Electric Power Company now expects the 600-MW Unit No. 4 at Chalk Point to begin commercial service in 1982. It is now under construction. This represents a 2 year delay from the 1980 date given in the Company plans last year.

This unit will burn residual fuel oil in accordance with the Carter Administration policy of allowing existing plants to burn oil where coal-firing capability does not exist.

In June, 1977, PEPCO and Baltimore Gas and Electric Company executed an Agreement in Principle on the Dickerson #4 coal-fired unit. This agreement calls for tenancy in common with equal shares of ownership. Capacity and KWH output will be shared equally with the Baltimore Gas and Electric Company. PEPCO is designated as the managing party, to serve as agent for construction and operation of this Unit.

Construction of the 800-MW Dickerson Unit No. 4 is to begin in 1978 with commercial service expected in 1985. This represents a 3-year stretch-out in the operational date.

According to PEPCO, requirements still exist for a 1000-MW pumped-storage hydro-electric plant to be located on a 1000 acre undetermined site in Maryland. The year this site is needed to become operational is not specified.

7. Southern Maryland Electric Cooperative, Inc.

The Cooperative owns a 300 acre site on the Patuxent River, St. Mary's County. This site, known as the Della Brooke Farm, is considered for possible future generation. However, no plans have been made for such use.

IV. PROJECTED GROWTH IN PEAK LOAD AND GENERATING CAPACITY

The growth in peak load and in installed generation capacity within Maryland, as projected by each utility (except The Potomac Edison Company) over the next decade, 1978-1987, is listed in Attachment 2. The listing of the utilities is by regional areas in the State. This arrangement allows demand and generating capacity by region to be readily compared. The numbers within parenthesis are changes from the projections made last year.

A third potline at the Eastalco plant in Frederick County is under consideration. Depending upon approval of appropriate environmental permits, this line is estimated to become operation during the winter of 1979/1980. At this time, this load will increase the peak demand by 35-MW and by 130-MW for each year thereafter. Formal notice of this additional load, however, has not been received by The Potomac Edison Company.

Attachment #2A lists the projections in the Maryland peak load, both with and without this third ptoline, for The Potomac Edison Company over the next ten-year period, 1978-1987. The Company's generating capacity in this period will remain at 139-MW.

The Potomac Electric Power Company data in Attachment No. 2 are for the entire Company system. PEPCO's service area includes the entire District of Columbia, the Pentagon and Rosslyn complexes in Virginia, as well as the Metropolitan Washington area lying in Maryland. PEPCO owns generation plants in the District, Virginia and Maryland, and shares with other utilities mine-mouth generating plants in Pennsylvania.

Data on the Baltimore Gas and Electric Company generation include a proportionate share of the Keystone and Conemaugh Mine-Mouth plants in Pennsylvania.

The generating facilities of the Hagerstown Municipal Plant have a total nameplate rating of 20-MW capacity. These facilities are maintained on a stand-by basis and are used for peaking purposes only when The Potomac Edison Company is unable to supply the demand. Present interconnection capability with The Potomac Edison Company is 65-MW.

Also listed on Attachment No. 2 are estimates of the average annual growth rate of both the peak load and generating capacity for each utility and for the state as a whole. These rates are computed as compound rates over the ten-year period, 1978-1987. The corresponding doubling times are also listed.

The individual peak loads do not sum to the listed state totals in Attachment No. 2. Peak demand data for Hagerstown and Southern Maryland are excluded from the state figures since these data for these utilities are included in The Potomac Edison Company and Potomac Electric Power Company figures, respectively.

Attachment No. 3 is a summary of the projected annual growth rates in peak demand and installed generating as predicted by the utilities in their 1976, 1977 and 1978 (current) Ten-Year Plans. State-wide data are also shown.

Several observations concerning these estimates should be noted:

1. This year the community of Easton projects the highest growth in peak demand (8.4% per year) in the state.

2. In the estimate made last year Southern Maryland Coop. expected an annual growth in demand of 10.5%. This has now been scaled down to a more modest 6.1%, still significantly higher than the state as a whole

3. Lowest growth in peak demand in the state is again projected for the PEPCO service area (3.1%), down from the 4.0% estimate in the 1977 Plan.

4. Baltimore, the other major metropolitan area, is expecting a growth of 5.2%, down slightly from the 1977 estimate of 5.4%.

5. The Potomac Edison Company, which serves virtually all of western Maryland, estimates its growth in peak demand at 5.7% without the additional pot-line in the Eastalco plant, virtually unchanged from the 1977 figure. With this pot-line, the estimate is 7.2%. The load created by this additional pot-line is almost 11% of the peak load expected during the winter of 1980-1981, when it may become on-line.

6. For the state as a whole, peak demand is expected to increase at 4.5% per year average. This is down from the 5.1% estimate last year.

Attachment No. 4 is a bar graph of these expected annual growth rates for these 5 principal regions and for the state.

V. COMPARISON OF 1978 and 1977 BG&E AND PEPCO TEN-YEAR PLANS

Shown on Attachment No. 5 are the ten-year projections of the peak demand, installed generating capacity and reserve margin for the Baltimore Gas and Electric Company and Potomac Electric Power Company as given in their 1977 and 1978 Plans. Differences between these estimates are also listed for comparison purposes.

The reserve margin is usually defined by the relation:

$$\text{Reserve Margin} = \frac{\text{Installed Generating Capacity - Peak Load}}{\text{Peak Load}} \times 100$$

This definition is used in this Plan.

Current Potomac Electric Power Company reserve margin estimates for the next ten years varies from a minimum of about 17.4% in 1981 to a peak of 29.0% next year. The average margin over this decade is 22.1%, down somewhat from the 24.8% average in last year's estimate.

For the Baltimore Gas and Electric Company the estimated reserve margin peaks at 28.4% next year with a low of about 14.5% for the years 1980, 1982, 1984 and 1986. The current estimate of the margin over the next decade is 15.7% which is also less than the estimate for this same period in last year's plan (22.9%).

Attachment No. 6 graphs the estimated reserve margins for these two utilities.

VI. POWER PLANT CONSTRUCTION SCHEDULES

Attachment No. 7 has been prepared to assist in visualizing the planning schedules for new electric generation facilities in Maryland. Dashed lines and dashed blocks show indefinite construction and/or in-service dates of proposed new generation.

VII. ASSOCIATED TRANSMISSION LINES

The transmission lines associated with the construction of new generating stations will generally operate at 115KV and higher voltages. They will require rights-of-way widths of 150 to 300 feet. An "associated transmission line", with respect to Section 54B of Article 78, refers to the means of transporting electric power from a power plant to one or more points on an existing transmission system. Such lines are often called "generation leads". There are also "transmission lines", with respect to Section 54A of Article 78, which are not "generation leads" but rather they provide substation-to-substation bulk power transmission for increased capacity or reliability purposes. In any of these instances, the long-range need and probable capacity of a future transmission line can be determined from extensive system studies. However, the actual route and often the actual terminal location/s of a line can be established only after subsequent years of planning and surveys.

Lines planned for possible construction at later dates and in particular the "associated transmission lines" for new power plants cannot be defined as to specific siting. However, general planning information regarding terminal points, voltage levels and dates to the extent possible is contained in the individual plans submitted by the major companies.

VIII. FURTHER INQUIRY

In the event further inquiry is indicated, such as by other state agencies, the request may be directed to the Commission by writing

to Mr. Frank J. Wasowicz, Executive Secretary. Specific information requests of an engineering nature and comments on this Plan may be directed to Mr. John W. Dorsey, Chief Engineer.

ATTACHMENT NO. 1

RETAIL ELECTRIC COMPANIES OPERATING IN MARYLAND

NAME	ADDRESS	TELEPHONE NO.
Investor Owned		
Baltimore Gas and Electric Company	Gas and Electric Building Baltimore, MD 21203	234-5000
Conowingo Power Company	211 North Street Elkton, MD 21921	1-398-1400
Delmarva Power and Light Company of Maryland	P. O. Box 1739 Salisbury, MD 21801	1-749-6111
Potomac Edison Company, The	Downsville Pike Hagerstown, MD 21740	1-731-3400
Potomac Electric Power Company	1900 Pennsylvania Avenue., N. W. Washington, D. C. 20006	1-202-872-2449
Municipally Owned		
Berlin, Mayor and Council of	P. O. Box 235 Berlin, MD 21811	1-641-2770
Centreville, The Town of	Centreville, MD 21617	1-758-0830
Easton Utilities Commission, The	11 S. Harrison Street Easton, MD 21601	1-822-6110
Hagerstown Municipal Electric Light Plant	Hagerstown, MD 21740	1-731-2600
St. Michaels Utilities Commission	St. Michaels, MD 21663	1-745-9400
Thurmont Municipal Light Company	P. O. Box 385 Thurmont, MD 21788	1-271-7313
Williamsport, Mayor & Council of	Williamsport, MD 21795	1-223-7711
Customer Owned		
A and N Electric Cooperative	Parksley, Virginia 23421	1-804-665-5116
Choptank Electric Coop., Inc.	P. O. Box 430 Denton, MD 21629	1-479-0380
Somerset Rural Electric Coop., Inc.	P. O. Box 270 125 E. Fairview Street Somerset, PA 15501	1-814-445-4106
Southern Maryland Electric Coop., Inc.	Hughesville, MD 20637	1-274-3111

ATTACHMENT NO. 2

PROJECTED TEN-YEAR GROWTH IN PEAK ELECTRIC
DEMAND AND IN INSTALLED GENERATING CAPACITY IN MARYLAND
1978-1987 TIME PERIOD
IN MEGAWATTS

REGION	1978		1979		1980		1981	
	PEAK LOAD	GEN. CAP.	PEAK LOAD	GEN. CAP.	PEAK LOAD	GEN. CAP.	PEAK LOAD	GEN. CAP.
Balto. Metro								
BG&E (1)	4020 (2) (-110) (3)	5162(-120)	4280(-110)	5162(-120)	4510(-120)	5162(-730)	4750(-130)	5772(-120)
Washington Metro								
PEPCO (5) (Entire System)	3885(-266)	5013(+3)	4017(-346)	5013(+3)	4142(-409)	5013(-597)	4269(-488)	5013(-597)
Western Maryland								
Hagerstown (6)	51	20	54	20	58	20	61	20
Potomac Edison	(4)	139	(4)	139	(4)	139	(4)	139
Southern Maryland								
South. MD Elec. Coop., Inc.	242(+10)	0	259(+2)	0	279(+7)	0	293(-25)	0
Eastern Shore								
A & N (6)	1	1	1	1	1	1	2	1
Berlin (6)	N/A	4	N/A	4	N/A	4	N/A	4
Conowingo	86	0	90	0	94	0	98	0
Delmarva	390(-19)	258(0)	410(-38)	258(0)	435(-56)	258(0)	460(-70)	258(0)
Easton	26.3(-0.3)	44.6(0)	28.5(-0.3)	44.6(0)	30.9(0.2)	44.6(0)	33.4(-0.3)	44.0(0)
State Totals (8)								
W/O P/L (8)	9416(-396) (7)	10642(-117)	9899(-494)	10642(-117)	10348(-586)	10642(-1327)	10806(-689)	11250(-718)
W P/L	9416(-396) (7)		9899(-494)		10383(-551)		10936(-559)	

NOTES:
(1) Generation in Pennsylvania included
(2) Baltimore Group Load
(3) Numbers in parentheses indicates changes from 1977 Plan
(4) Load data are shown on Attachment No. 2A
(5) Includes all customers including Sales For Resal
(6) Data from 1976 Plan
(7) Non-coincident peak load totals
(8) Eastalco 3rd pot line

ATTACHMENT NO. 2, continued

UTILITY	1982 PEAK LOAD	1982 GEN. CAP.	1983 PEAK LOAD	1983 GEN. CAP.	1984 PEAK LOAD	1984 GEN. CAP.	1985 PEAK LOAD	1985 GEN. CAP.
B G & E	5000(-130)	5721(-730)	5260(-140)	6331(-120)	5530(-140)	6331(-320)	5800(-140)	6731(-220)
PEPCO	4453(-536)	5613(-797)	4594(-551)	5613(-797)	4749(-552)	5613(-797)	4866(-590)	6013(-1575)
Hagerstown	65	20	69	20	73	20	74	20
Potomac Edison	(4)	139	(4)	139	(4)	139	(4)	139
South. MD Elec. Coop., Inc.	310(-40)	0	329(-59)	0	343(-87)	0	366(-109)	0
A & N	2	1	2	1	2	1	2	1
Berlin	N/A	4	N/A	4	N/A	4	N/A	4
Conowingo	103	0	107	0	112	0	117	0
Delmarva	490(-82)	258(0)	515(-102)	258(0)	545(-121)	258(0)	575(-144)	258(0)
Easton	36.2(-0.2)	56.5(0)	39.3(-0.1)	56.5(0)	42.6(0)	56.0(0)	46.1(0)	56.0(0)
State Totals W/O P/L	11340(-747)	11674(-1665)	11817(-793)	12283(-1056)	12363(-813)	12283(-1256)	12869(-874)	13083(-1934)
W P/L	11470(-617)		11947(-663)		12493(-683)		12999(-744)	

ATTACHMENT NO. 2, concluded

UTILITY	1986 PEAK LOAD	1986 GEN. CAP.	1987 PEAK LOAD	1987 GEN. CAP.	AVERAGE OVERALL GROWTH %/Yr. PEAK LOAD	AVERAGE OVERALL GROWTH %/Yr. GEN. CAP.	DOUBLING TIME YEARS PEAK LOAD	DOUBLING TIME YEARS GEN. CAP.
B G & E	6080(-150)	6956(-1195)	6370	7698	5.2	4.5	13.6	15.6
PEPCO	4983(-703)	6013(-1575)	5103	6013	3.1	2.0	22.9	34.3
Hagerstown	N/A	N/A	N/A	N/A				
Potomac Edison	(4)	139	(4)	139	(4)	0	(4)	-
South. MD Elec. Coop., Inc.	390(-125)	0	413	0	6.1	-	11.7	-
A & N	2	1	2	1	8.0	0	9.0	-
Berlin	N/A	4	N/A	4	N/A	0	-	-
Conowingo	122	0	128	0	4.5	-	15.7	-
Delmarva	605(-171)	258(0)	635	258	5.6	0	12.8	-
Easton	50.0(+0.2)	81.0(0)	54.2	80.4	8.4	6.8	8.6	10.6
State Totals								
W/O P/L	13332(-1091)	12676(-3546)	13888	14054	4.4	3.1	16.1	22.4
W P/L	13462(-961)		14018		4.5		15.7	

ATTACHMENT NO. 2A

PROJECTED TEN-YEAR GROWTH IN PEAK ELECTRIC
DEMAND AND IN INSTALLED GENERATING CAPACITY IN MARYLAND
1978-1987 PERIOD
MEGAWATTS

THE POTOMAC EDISON COMPANY

	Winter 1977/78		Winter 1978/79		Winter 1979/80		Winter 1980/81	
	PEAK LOAD	GEN. CAP.	PEAK LOAD	GEN. CAP.	PEAK LOAD	GEN. CAP.	PEAK LOAD	GEN. CAP.
Without 3rd Potline, Eastalco, Frederick Co.	1008(0)	139	1072(0)	139	1136(0)	139	1194(0)	139
With 3rd Potline, Eastalco, Frederick Co.	1008(0)	139	1072(0)	139	1171(+35)	139	1324(+130)	139

Winter 1981/82		Winter 1982/83		Winter 1983/84		Winter 1984/85	
1256(0)	139	1300(0)	139	1382(0)	139	1463(0)	139
1386(+130)	139	1430(+130)	139	1512(+130)	139	1593(+130)	139

Winter 1985/86		Winter 1986/87		Average Overall Growth %/Yr.		Doubling Time Years	
1554(0)	139	1663	139	5.7	0	12.5	-
1684(+130)	139	1793	139	7.2	0	10.0	-

Notes: Includes all customers in Maryland, including 3 Sales for Resale customers, Hagerstown, Thurmont and Williamsport
Numbers in parenthesis indicate changes from 1977 Ten-Year Plan figures

ATTACHMENT NO. 3

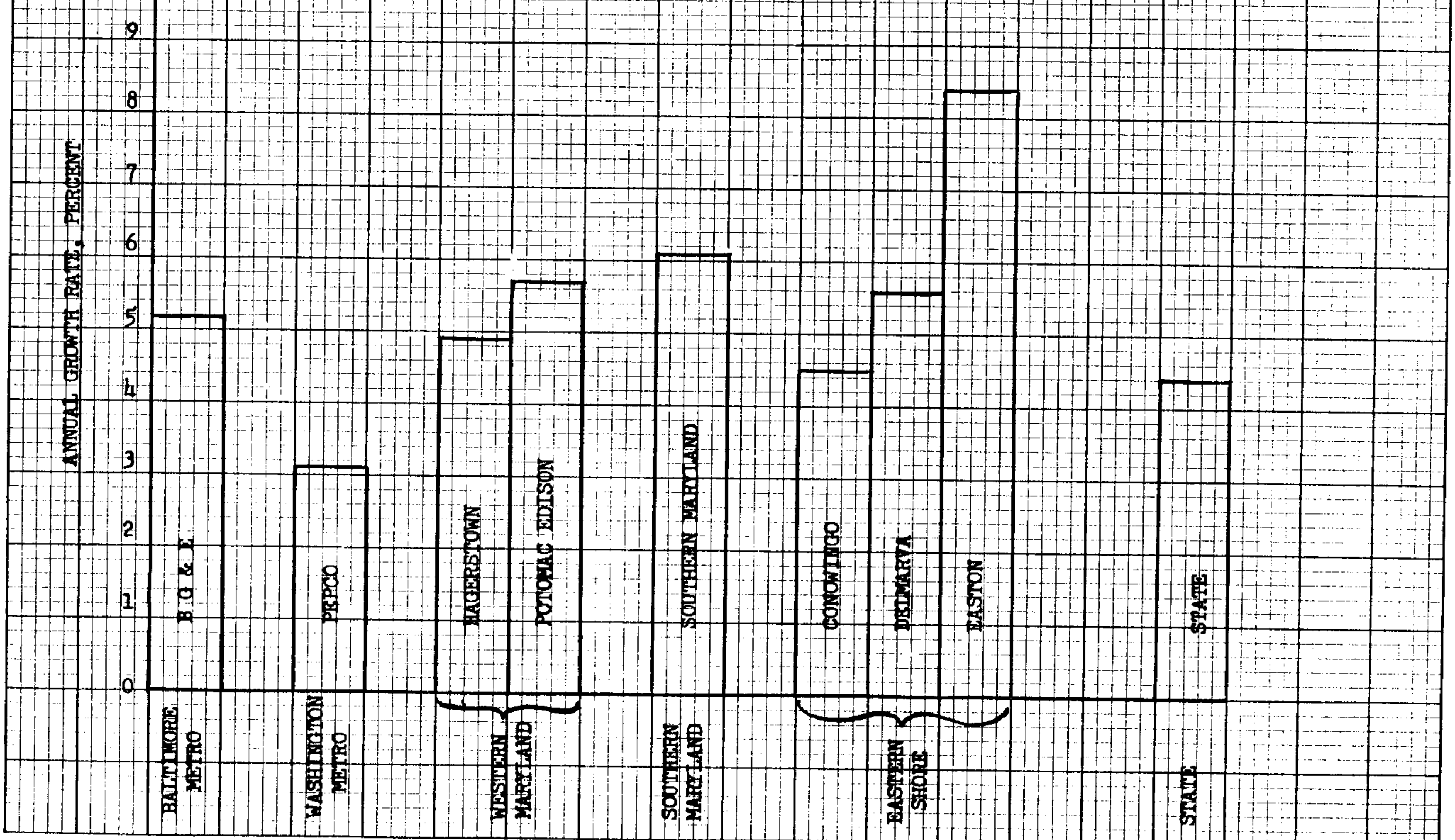
COMPARISON OF PROJECTED ANNUAL GROWTH RATES
IN PEAK DEMAND AND INSTALLED GENERATING CAPACITY
AS PRESENTED IN THE
1976, 1977 AND 1978 TEN-YEAR PLANS
PERCENT PER YEAR

	1976 TEN-YEAR PLAN (1976-1985)		1977 TEN-YEAR PLAN (1977-1986)		1978 TEN-YEAR PLAN (1978-1987)	
	Peak Load	Gen. Cap.	Peak Load	Gen. Cap.	Peak Load	Gen. Cap.
REGION						
Baltimore Metro						
B G & E	6.0	7.3	5.4	5.0	5.2	4.5
Washington Metro						
PEPCO	4.2	4.7	4.0	4.7	3.1	2.0
Western Maryland						
Hagerstown	4.9	0	4.9	0	4.9	0
Potomac Edison	5.8	(-3.6)	5.6	0	5.7 (1) 7.2 (2)	0
Southern Maryland						
Southern Maryland	10.7	-	10.5	-	6.1	-
Eastern Shore						
Conowingo	7.0	-	4.5	-	4.5	-
Delmarva	6.8	0	8.4	0	5.6	0
Easton	9.7	6.2	8.2	6.9	8.4	6.8
Entire State						
Percentage	5.3	5.8	5.1	4.7	4.4 (1) 4.5 (2)	3.1
Years to Double	13.4	12.4	14.0	15.1	16.1 (1) 15.7 (2)	22.4

Notes: (1) Without 3rd Potline installed at Eastalco, Frederick County
(2) With 3rd Potline installed at Eastalco, Frederick County

ATTACHMENT NO. 4

PROJECTED ANNUAL GROWTH RATES IN PEAK DEMAND 1978 - 1987 PERIOD



ATTACHMENT NO. 5

TEN-YEAR PROJECTIONS OF PEAK ELECTRIC DEMAND, INSTALLED CAPACITY, AND RESERVE MARGIN, 1977 and 1978 TEN-YEAR PLANS OF BALTIMORE GAS AND ELECTRIC COMPANY AND POTOMAC ELECTRIC POWER COMPANY

	1978			1979			1980			1981		
	Peak Load MW	Gen. Cap. MW	Res. Margin %	Peak Load MW	Gen. Cap. MW	Res. Margin %	Peak Load MW	Gen. Cap. MW	Res. Margin %	Peak Load MW	Gen. Cap. MW	Res. Margin %
Baltimore Gas & Electric												
1978 Plan	4020	5162	28.4	4280	5162	20.6	4510	5162	14.5	4750	5772	21.5
1977 Plan	4130	5282	27.9	4390	5282	20.3	4630	5892	27.3	4880	5892	20.7
Difference	-110	-120	0.5	-110	-120	0.3	-120	-730	-12.8	-130	-120	0.8
Potomac Electric Power Company (1)												
1978 Plan	3885	5013	29.0	4017	5013	24.8	4142	5013	21.0	4269	5013	17.4
1977 Plan	4151	5010	20.7	4363	5010	14.8	4551	5610	23.3	4757	5610	17.9
Difference	-266	3	8.3	-346	3	10.0	-409	-597	-2.3	-488	-591	-0.5

(1) Entire System

ATTACHMENT NO. 5, continued

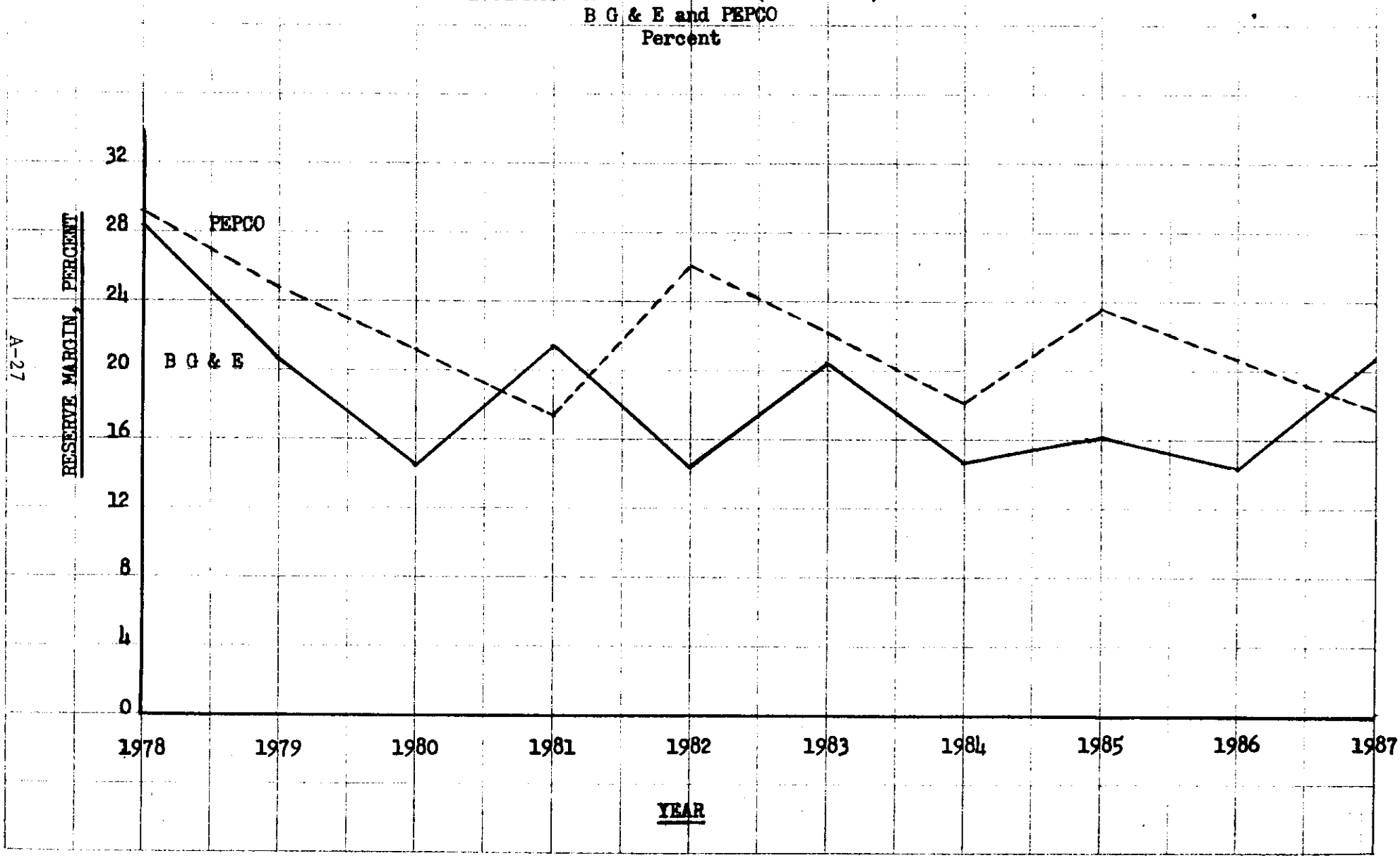
	1982			1983			1984		
	Peak Load MW	Gen. Cap. MW	Res. Margin %	Peak Load MW	Gen. Cap. MW	Res. Margin %	Peak Load MW	Gen. Cap. MW	Res. Margin %
Baltimore Gas & Electric									
1978 Plan	5000	5721	14.4	5260	6331	20.4	5530	6331	14.5
1977 Plan	5130	6451	25.7	5400	6451	19.5	5670	6651	17.3
Difference	-130	-730	-11.3	-140	-120	0.9	-140	-320	-2.8
Potomac Electric Power Company									
1978 Plan	4453	5613	26.0	4594	5613	22.2	4749	5613	18.2
1977 Plan	4989	6410	28.5	5145	6410	24.6	5301	6410	20.9
Difference	-536	-797	-2.5	-551	-797	-2.4	-552	-797	-2.7

ATTACHMENT NO. 5, concluded

	1985			1986			1987		
	Peak Load MW	Gen. Cap. MW	Res. Margin %	Peak Load MW	Gen. Cap. MW	Res. Margin %	Peak Load MW	Gen. Cap. MW	Res. Margin %
Baltimore Gas & Electric									
1978 Plan	5800	6731	16.1	6080	6956	14.4	6370	7698	20.8
1977 Plan	5940	6951	17.0	6230	8151	30.8	-	-	-
Difference	-140	-220	-0.9	-150	-1195	-16.4	-	-	-
Potomac Electric Power Company									
1978 Plan	4866	6013	23.6	4983	6013	20.7	5103	6013	17.8
1977 Plan	5456	7588	39.1	5691	7588	33.3	-	-	-
Difference	-590	-1575	-15.5	-708	-1575	-12.6	-	-	-

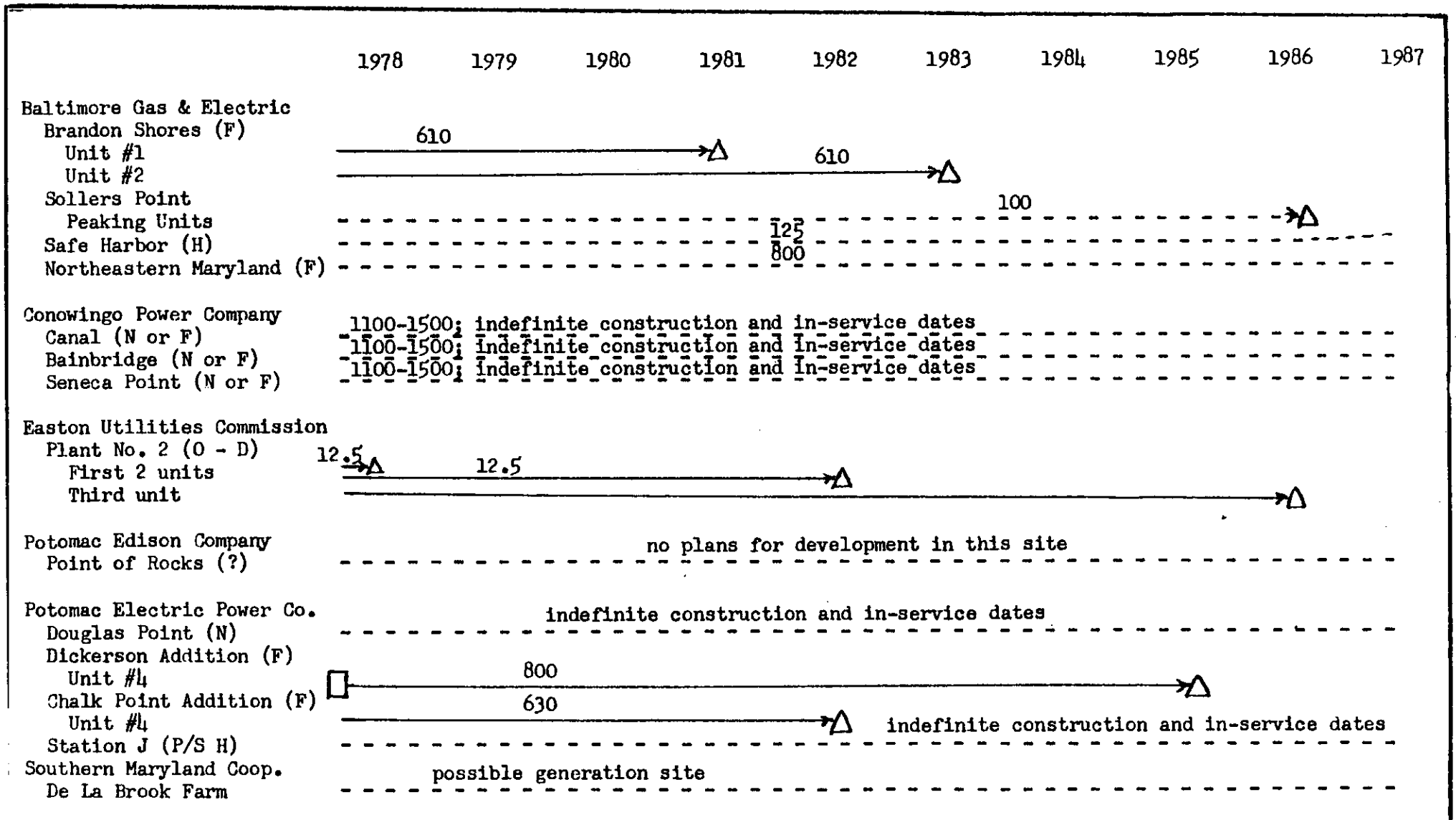
ATTACHMENT NO. 6

ESTIMATED RESERVE MARGIN (INSTALLED)
B G & E and PEPCO
Percent



ATTACHMENT NO. 7

TIME SCHEDULE FOR IMPLEMENTING
NEW ELECTRIC GENERATING PLANTS IN MARYLAND,
1978 - 1987 Period



ATTACHMENT NO. 7, concluded

KEY

□ - Date of Initial Construction

△ - In-Service Dates

(N) - Nuclear-Fueled

(F) - Fossil-Fueled

(O - D) - Oil-Fired Diesel

(P/S H) - Pumped Storage Hydroelectric

(?) - Type of Fuel Undecided

Numbers on horizontal lines denote planned capacity in megawatts.

APPENDIX B

ELECTRICITY CONSUMPTION IN MARYLAND

THE NEXT TEN YEARS

Prepared by

The Electrical Energy Forecasting Unit,
Division of Planning Research Programs,
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INTRODUCTION

Over the years, the demand for electricity in the State of Maryland has remained generally consistent with national trends, and this consistency is anticipated for the future. In the decade preceding the 1973 oil embargo, rising incomes, gererally steady electricity prices, industrial expansion, and a growing population caused rapid growth in Maryland's consumption of electric energy. As Table B-1 indicates, the State experienced a growth rate even higher than that of the nation as a whole. Between 1962 and 1973 national consumption rose 8.5% in the residential sector and 6.9% in the nonresidential sector, while the State of Maryland recorded growth rates of 10.39% and 9.29% respectively in these two sectors.

This steady and rapid exponential growth was ended in 1974 by sharp energy price increases and the deep recession which followed. Both national and State electrical energy consumption figures exhibit virtually no growth between 1973 and 1975. The impact of these events upon energy usage was greater in Maryland than for the rest of the nation. Since 1975, State and national consumption has again resumed growth, largely due to the expansion of the economy and the moderation of the rates of increase in electricity prices. Despite the resumption in the growth of demand, however, it is not generally expanding at rates approaching the pre-1973 era, and as Table B-2 clearly indicates, forecasters at both the national and State level expect the rate of future expansion to be far below that of the 1960's. In fact, expansion over the next ten years is expected to proceed at rates slightly lower than those over the last two years, since the 1975-1977 growth rate reflects the extraordinarily depressed base figure recorded for 1975.

Electric energy is normally measured in kilowatt hours. One kilowatt hour (kWh) is the amount of electricity required to power a 100 watt light bulb for ten hours. This is the unit in which electricity is normally sold to consumers. It is also common for utilities to express total sales in megawatt-hour units (MWh), where one megawatt-hour equals 1,000 kilowatt hours.

Although an annual kilowatt-hour forecast indicates a community's future energy needs, a planner is also interested in "demand" -- the amount of power being drawn from a system by electricity consumers at any given instant in time. Peak demand refers to the maximum level of demand on a utility system within a specified time period (for example, a year). It is commonly measured in kilowatts (kW) or megawatts (MW). Peak demand is an important concept because it indicates the total electricity generating capacity required to service the needs of electric power customers.

The following pages briefly examine the basic factors which govern energy consumption, and which determine the methods and accuracy of forecasting energy demand in the State.

Table B-1. Electric energy sales in Maryland and the US

Year	U.S. (Billions of kWh)		Maryland (Millions of kWh)	
	Residential	Non-Residential	Residential	Non-Residential
1962	226.4	549.7	3,145	6,879
1963	241.7	589.9	3,425	7,491
1964	262.0	628.3	3,789	8,307
1965	281.0	672.4	4,229	9,081
1966	306.6	732.4	4,792	10,220
1967	331.5	775.5	5,196	11,209
1968	367.7	834.6	5,990	12,268
1969	407.9	899.3	6,700	13,497
1970	447.8	943.6	7,483	15,004
1971	479.1	987.4	7,919	16,311
1972	511.4	1,066.3	8,406	17,005
1973	554.2	1,149.0	9,330	18,270
1974	555.0	1,145.8	9,200	17,910
1975	586.1	1,146.9	9,598	17,859
1976	613.1	1,236.6	10,064	19,837*
1977	652.3	1,298.5	10,718	20,935
	Average Annual Compound Growth Rates			
1962-73	8.5%	6.9%	10.39	9.29
1973-75	2.8%	- .1%	1.43	-1.13
1975-77	5.8%	6.2%	5.67	8.27*

* Service to the Eastalco aluminum plant was initiated in 1976.

Sources: CEIR 1975 Table 2.1; Electric World (3/15/78 and 3/15/73); Annual Reports of the Electric Utilities in Maryland, Edison Electric Institute, Statistical Yearbook of the Electric Utility Industry 1976

Table B-2. National and Maryland projected electric energy consumption and peak demand (consumption in billions of kilowatt hours and peak demands in millions of kilowatts)

	National				State			
Year	Residential	Non-Residential	Total	Peak Demand	Residential	Non-Residential	Total	Peak Demand
1977*	656.5	1,292.7	1,949.2	398.2	10.718	20.935	31.653	9.438
1980	764.3	1,473.1	2,237.4	474.9	11.990	24.858	36.847	10.186
1985	958.8	1,873.7	2,832.5	621.3	15.626	31.542	47.168	12.179
1987	1,039.0	2,066.4	3,105.4	688.3	16.393	34.495	50.888	13.098
			Average Annual Compound Growth Rates					
1977-80	5.20	4.45	4.70	6.05	3.81	5.89	5.20	2.57
1980-85	4.64	4.93	4.83	5.52	5.44	4.88	5.06	3.64
1985-87	4.10	5.02	4.71	5.25	2.42	4.58	3.87	3.70
1977-87	4.70	4.80	4.77	5.63	4.34	5.12	4.86	3.33

*National peak demand for 1977 is estimated, and all other 1977 figures are actual

Sources: For Maryland, the PEPCO and BG&E portions are Maryland Department of State Planning forecasts, and the remainder are company projections

DETERMINING ELECTRICITY USAGE

During the pre-embargo years, utility planners and forecasters for Maryland and the nation could expect energy sales to increase at a predictable, steady rate. This is no longer the case, and forecasting has become far more difficult and complex than in the past. At the same time, accurate demand projections have never been more important. Failure to anticipate and plan for increased demand may result in disruptions of service to customers, in undue cost increases if there is a shortage of total generation capacity, or in inefficient mix of generating plants. On the other hand, overestimating future demand risks imposing an unnecessary burden on the community for supporting the additional cost of idle generating capacity that has been constructed too far ahead of demand. In this context, it is necessary to focus sharply on the underlying determinants of both past and future consumption.

As mentioned previously, it is no longer reasonable to believe that electric energy consumption will continue to grow as rapidly or steadily as in the pre-embargo past. The nation's experience from 1973 to 1975 serves as convincing evidence that consumption patterns are highly sensitive to such factors as electricity price and income. As Table B-3 illustrates, a considerable rise in electricity price has occurred in Maryland since 1973. Moreover, the bulk of this price increase took place between 1972 and 1975, with only moderate increases in price in the following two years. Correspondingly, we observe stagnant demand over the 1973-1975 period and moderate recovery thereafter. This pattern, of course, cannot be attributed solely to price changes; it is also a function of the general behavior of the U.S. economy.

Residential consumption of electricity is based largely upon housing characteristics (e.g., percentage of apartment units), and the extent of the use of electric appliances, which, in turn, is likely to be dependent upon household income, the price of electricity, and, for certain appliances, the price of alternative fuels (e.g., consumers decide on the basis of relative fuel prices between gas and electric heating). Recently, the availability of natural gas, as well as its price, has become a significant influence.

For a given stock of electrical appliances, electricity prices and weather conditions will determine the extent to which the stock is utilized, and changes in these factors will determine the short run changes in the residential use of electricity. For example, an increase in electricity price will induce consumers to run airconditioners less frequently. Finally, it may be assumed that a "conservation ethic," distinct from high energy prices, may also influence residential consumption.

Energy consumption in the nonresidential sector is obviously closely related to the total output of the economy, and consequently does not exhibit rapid growth during slowdowns in overall economic activity. In addition, the nonresidential sector is extremely heterogenous, consisting of such diverse subsectors as government, farming, manufacturing, trade, and services, some of which are greater energy users than others. Thus, as shares of output shift among these subsectors, electricity consumption growth is correspondingly

Table B-3. Typical monthly electric bills 1972, 1974, 1977 (current year dollars)

Company	1972	1975	1977	% Change 1972-1975	% Change 1975-1977
BG&E					
Residential	15.30	23.39	24.07	42%	3%
Commercial	61.20	87.12	93.53	35%	7%
Industrial	1,449	2,387	2,375	49%	1%
PEPCO					
Residential	10.35	18.65	19.77	57%	6%
Commercial	47.85	76.65	84.97	46%	10%
Industrial	1,297	2,381	2,868	59%	19%
Delmarva					
Residential	13.19	22.93	23.17	54%	1%
Potomac Edison					
Residential	10.62	18.35	17.57	53%	- 4%
State of Maryland					
Residential	13.83	21.97	22.78	45%	4%
Commercial	59.05	85.44	92.15	37%	8%
Industrial	1,425	2,386	2,454	50%	3%

Source: Typical Electric Bills, Federal Power Commission, 1972, 1975, and 1977

Definitions: Bills are based on prevailing rates on the first day of that year. Residential, 500 kWh per month; Commercial, 1,500 kWh and 12 kW per month; Industrial, 60,000 kWh and 300 kW per month

affected. A decline in the relative size of the primary metals industry, for example, would probably serve to restrain energy demand growth despite overall growth of the national economy. In addition, a corporation is not necessarily committed to a fixed electricity-to-output ratio, and can alter it by adopting different and possibly improved technologies. The decision to switch techniques (and thus energy usage) is influenced by the price of electricity relative to the price of competing inputs -- the prices of labor, capital, and substitute fuels. For example, if the price of electricity rises relative to the cost of capital, firms might respond by improving building insulation. This would tend to save on electricity usage while using more capital.

Although such factors as relative prices and income affect electricity usage, a long period of adjustment is normally required before the full effect, or even most of the impact, is fully manifested. If gas prices rise relative to electricity, households will not simply abandon gas appliances. Consumers do not immediately translate higher incomes into larger houses. Businesses cannot instantly install electricity-conserving equipment in response to current price increases for electricity. These responses do come, but they are spread out over time, and in some cases extremly long periods of time are required.

It is interesting to note in Tables B-3 and B-5 that electricity price increases in the 1975-1977 period have been quite modest (in fact, less than the overall rate of inflation) and income gains considerable, yet consumption growth is considerably slower than the pre-embargo period. This result stems in part from the fact that customers were adjusting to the massive price increases of an earlier period. Moreover, even during the next several years, consumers and businesses will be in the process of completing their adjustments to price changes of the early 1970's.

FORECASTING FUTURE USAGE

THE NEXT TEN YEARS

The Electrical Energy Forecasting Unit of the Maryland Department of State Planning, is preparing forecasts for the major utility systems operating in the State of Maryland. To date, forecasts on Potomac Electric Power Company and Baltimore Gas and Electric Company have been completed. These forecasts use statistical models to estimate the various impacts of the aforementioned factors (e.g., electricity price, income, etc.) on electricity usage patterns. Future values of these factors, based both on judgment and official government projections are then inserted into the statistical model to produce projections of future electricity consumption. This method is commonly referred to as a structural econometric approach, and possesses the advantage of explicitly and quantitatively expressing the impacts of important determinants on electric energy consumption.

Since the Department of State Planning has not yet made projections on the other Maryland utility systems -- Delmarva Power and Light Company of Maryland, Potomac Edison Company, Easton Utilities Commission, and Conowingo Power Company -- the forecasts prepared by the companies themselves are presented in Table B-5 In some cases, minor adjustments to company figures were required in order to

achieve consistency in the presentation. These companies used various techniques to make their forecasts. Potomac Edison and Easton Utilities relied heavily on time trending, assuming that future growth will proceed at the same rate as past assuming that future growth will proceed at the same rate as past growth. Delmarva employs a methodology that is similar in some respects with that used and advocated by the Maryland Department of State Planning. Statistical models were used to determine the impact on electricity consumption of various factors including population, employment, manufacturing and non-manufacturing earnings, weather conditions, disposable income, use of air conditioners, and electricity prices. To project peak demand, the data were weather-adjusted to historically normal conditions, and the historical relationship was ascertained between peak demand, income, and air-conditioner ownership. These estimated relationships were then used as the basis for the company's forecasts.

The following tables present past and forecasted electric energy sales and the annual peak demand for the five major bulk suppliers of electricity in the State. Energy sales are measured in megawatt hours (each megawatt hour equals 1,000 kilowatt-hours), and the peak demand figures are in megawatts. The final table compiles the State-wide totals from the five suppliers.

In addition, many Maryland households and businesses purchase their electricity from municipally owned systems and electric power cooperatives. However, these municipal systems and cooperatives purchase power wholesale from one of three major suppliers -- Delmarva, Potomac Edison, or PEPCO, and then sell the power to their own retail customers. Thus, the figures presented for these three companies include the bulk sales to municipal systems and cooperatives, which, in turn, were divided into residential and nonresidential segments according to the same proportion as was found to exist (or projected to exist) in the retail sales of the bulk supplier.

It was explained earlier that a utility's annual peak demand is the maximum amount of demand for power during the year. Although this definition applies for each of the five systems, it is not true for the State as a whole, since the individual systems annual peaks used to tabulate the State total do not occur simultaneously. For example, PEPCO's peak normally occurs in July or August while Potomac Edison's occurs in December or January. In other words, the State peak demand figure should not be interpreted as the maximum amount of demand for power in Maryland at any one time during the year. It is merely the sum of the annual peak demands of the five systems operating in the State. However, the statewide figures are still useful for making year-to-year comparisons. Also, peak demand is measured as the maximum system power sent out at any hour during the year. This system peak cannot be broken down geographically with precision, and most utilities do not even attempt to do so. Thus, the peak demand figures for PEPCO and Potomac Edison, multistate companies, are systemwide and therefore extend beyond Maryland's boundaries. Thus, the Maryland total also includes the D.C., Virginia, and Pennsylvania portions of the PEPCO and Potomac Edison load.

The forecasts presented in Table B-5 are based upon certain expectations concerning the underlying determinants of electricty consumption. The econometric forecasts reflect these expectations explicitly, and other methods embody other implicitly formulated assumptions. Table B-4 presents the projections on population, employment, and real per capita income prepared by authoritative sources. All three variables are projected to increase, but at rates somewhat less than the rapid expansion experienced during the pre-embargo

Table B-4. Projected average annual compound growth rates on population, employment, and real per capita income

Region	1975-80	1980-1985	1985-1990
A. Population			
Baltimore Area	1.19	1.22	1.28
Easton Shore	.83	1.18	1.15
Southern Maryland	1.08	2.14	1.54
Washington Suburban	1.48	1.47	1.75
Western Maryland	.40	.61	.73
State of Maryland	1.19	1.26	1.39
B. Employment			
Baltimore Area	1.68	1.60	1.39
Eastern Shore	2.02	1.30	1.38
Southern Maryland	.82	1.46	1.67
Washington Suburban	3.39	2.72	2.30
Western Maryland	1.68	1.13	1.08
State of Maryland	2.16	1.88	1.65
C. Real Per Capita Income			
State of Maryland	3.25	2.60	2.60

Sources: Maryland Projection Series Population and Employment 1975-1990, Maryland Department of State Planning, 1977; 1972 OBERS Projections of Regional Economic Activity in the U.S., U.S. Water Resources Council, 1972

Table B-5a. Baltimore Gas and Electric*

Year	Energy (MWh)			Peak Demand (MW)
	Residential	Non-Residential	Total	
1966	2,347,000	6,306,000	8,653,000	1,817
1969	3,285,000	7,880,000	11,165,000	2,306
1972	4,102,000	8,889,000	12,991,000	2,960
1975	4,664,000	9,194,000	13,858,000	3,256
1977	5,231,000	10,231,000	15,462,000	3,588
1980	5,553,000	12,003,000	17,556,000	3,510
1985	7,175,000	15,886,000	23,061,000	4,418
1987	8,009,000	17,611,000	25,620,000	4,833
		Average Annual Compound Growth Rates		
1966-72	9.75%	5.89%	7.01%	8.47%
1972-75	4.37%	1.13%	2.18%	3.23%
1975-77	5.90%	5.49%	5.63%	4.97%
1977-80	1.99%	5.47%	4.32%	- .73%
1980-85	5.26%	5.77%	5.61%	4.71%
1977-87	4.35%	5.58%	5.18%	3.02%

*Forecasts are Maryland Department of State Planning figures

Table B-5b. Conowingo Power Company*

Year	Energy (MWh)			Peak Demand (MW)
	Residential	Non-Residential	Total	
1966	77,148	140,967	218,115	42
1969	107,195	175,886	283,081	56
1972	148,949	177,225	326,174	67
1975	193,741	185,488	379,229	78
1977	201,467	218,459	419,926	85
1980	242,000	240,686	482,686	94
1985	328,300	290,236	618,536	117
1987	366,200	313,956	680,156	128
	Average Annual Compound Growth Rates			
1966-72	11.59%	3.89%	6.94%	8.09%
1972-75	9.16%	1.53%	5.15%	5.20%
1975-77	1.97%	8.52%	5.23%	4.39%
1977-80	6.30%	3.28%	4.75%	3.41%
1980-85	6.29%	3.81%	5.08%	4.47%
1977-87	6.16%	3.69%	4.94%	4.18%

* Forecasts are company figures

Table B-5c. Easton utilities*

Year	Energy (MWh)			Peak Demand (MW)
	Residential	Non-Residential	Total	
1966	10,074	29,586	39,660	10
1969	15,456	39,999	55,455	13.5
1972	22,554	49,129	71,683	17.1
1975	26,925	59,080	86,005	20.4
1977	31,370	66,333	97,703	22.3
1980	42,189	89,211	131,400	30.9
1985	61,878	130,842	192,720	46.1
1987	72,847	154,037	226,884	54.2
	Average Annual Compound Growth Rates			
1966-72	14.38%	8.82%	10.37%	9.35%
1972-75	6.08%	6.34%	6.26%	6.06%
1975-77	7.94%	5.96%	6.58%	4.55%
1977-80	10.38%	10.38%	10.33%	11.49%
1980-85	7.96%	7.96%	7.96%	8.33%
1977-87	8.79%	8.79%	8.79%	9.29%

* Forecasts are Easton Utility Commission figures. Easton does not provide a residential/non-residential breakdown for its projected energy sales. These figures were obtained by multiplying the projected total by the 1977 actual proportions.

Table B-5d. Delmarva of Maryland*

Year	Energy (MWh)			Peak Demand (MW)
	Residential	Non-Residential	Total	
1966	263,935	397,602	661,537	141
1969	384,606	546,410	931,016	197
1972	527,652	692,019	1,219,671	278
1975	651,955	800,041	1,451,996	342
1977	793,521	933,030	1,726,551	400
1980	951,828	1,169,854	2,121,682	435
1985	1,291,274	1,579,392	2,870,666	575
1987	1,436,701	1,788,815	3,225,516	635
	Average Annual Compound Growth Rates			
1966-72	12.24%	9.68%	10.73%	11.98%
1972-75	7.31%	4.95%	5.98%	7.15%
1975-77	10.32%	7.99%	9.05%	8.15%
1977-80	6.25%	7.83%	7.11%	2.84%
1980-85	6.29%	6.19%	6.23%	5.74%
1977-87	6.12%	6.73%	6.45%	4.73%

* Forecasts are company figures

Table B-5e. Potomac Edison, Maryland Portion*

Year	Energy (MWh)			Peak Demand (MW)
	Residential	Non-Residential	Total	
1966	495,259	944,149	1,439,408	512
1969	681,153	1,251,144	1,932,297	673
1972	902,604	2,784,419	3,687,023	1,099
1975	1,131,080	2,792,257	3,923,337	1,359
1977*	1,291,892	4,312,187	5,604,079	1,486
1980	1,640,703	5,562,721	7,203,424	1,925
1985	2,411,833	7,231,537	9,643,370	2,630
1987	2,749,490	8,027,006	10,776,496	2,995
	Average Annual Compound Growth Rates			
1966-72	10.52%	19.75%	16.97%	13.58%
1972-75	7.81%	.09%	2.09%	7.33%
1975-77**	6.87%	24.27%	19.52%	4.57%
1977-80	8.29%	8.86%	8.73%	9.01%
1980-85	8.01%	5.39%	6.01%	6.44%
1977-87	7.85%	6.41%	6.76%	7.26%

* Forecasts are company figures. The company forecasts on a systemwide (multistate) basis only. To obtain the Maryland megawatt hour projections the systemwide forecasted growth rates are applied to actual 1977 Maryland consumption.

** In 1976 Potomac Edison initiated service to the Eastalco aluminum plant.

Table B-5f. Potomac Electric Power Company (Maryland Portion)

Year	Energy (MWh)*			Peak Demand (MW)
	Residential	Non-Residential	Total	
1966	1,488,701	2,371,608	3,860,309	2,123
1969	2,111,689	3,577,122	5,688,811	2,759
1972	2,589,262	4,491,480	7,080,742	3,479
1975	2,929,826	4,827,844	7,757,670	3,623
1977	3,168,272	5,173,975	8,342,247	3,857
1980	3,599,900	5,792,300	9,352,200	4,191
1985	4,357,700	6,423,600	10,781,300	4,393
1987	4,758,600	6,599,900	11,358,500	4,453
		Average Annual Compound Growth Rates		
1966-72	9.66%	11.23%	10.64%	8.58%
1972-75	4.21%	2.44%	3.09%	1.36%
1975-77	3.99%	3.52%	3.70%	3.18%
1977-80	3.96%	3.83%	3.88%	2.80%
1980-85	4.13%	2.09%	3.90%	.95%
1977-87	4.15%	2.46%	3.13%	1.45%

* Includes sales to SMECO. For future years projected sales to SMECO are broken down as residential and non-residential according to 1972 actual SMECO proportions.

Table B-5g. The State of Maryland

Year	Energy (MWh)			Peak* Demand (MW)
	Residential	Non-Residential	Total	
1966	4,682,117	10,189,912	14,872,029	4,645
1969	6,585,099	13,470,561	20,055,660	6,005
1972	8,293,021	17,083,272	25,376,293	7,900
1975	9,597,527	17,858,710	27,456,237	8,678
1977	10,717,522	20,934,984	31,652,506	9,438
1980	11,989,620	24,857,772	36,847,392	10,186
1985	15,625,985	31,541,607	47,167,592	12,179
1987	17,392,838	34,494,714	51,887,552	13,098
	Average Annual Compound Growth Rates			
1966-72	10.00%	8.99%	9.31%	9.25%
1972-75	4.99%	1.43%	2.66%	3.18%
1975-77	5.67%	8.27%	7.37%	4.29%
1977-80	3.81%	5.89%	5.20%	2.57%
1980-85	5.44%	4.88%	5.06%	3.64%
1977-87	4.96%	5.12%	5.07%	3.33%

* Peak demand digures include West Virginia, Virginia, D.C., and Pennsylvania loads in the PEPCO and Potomac Edison service territories.

decade. Inasmuch as there are no official projections on the future course of electricity price in the State of Maryland, it is assumed that future prices will probably rise at least modestly above the rate of inflation.* These factors, along with the delayed adjustments to 1972-1975 price increases, should serve to restrain demand below the pre-embargo growth rates.

Several factors are working the other way to increase future consumption. Although the population growth rate is expected to be lower in the future than in the past, the expected increase in the household formation rate will mean that the number of electricity customers is expected to grow considerably faster than population. Furthermore, natural gas, a major substitute for electricity, is expected to rise in price even faster than electricity, encouraging a corresponding fuel substitution. In addition, the supply restrictions on new gas hook-ups mandated in the early 1970's in Marland, are expected to continue over portions of the next ten years.

These observations apply to future growth of both energy consumption and peak demand. Peak demand is also expected to grow at a slower rate than in the pre-embargo past. As Table B-5 illustrates for most utilities and the State, it is expected to rise at a slightly lower rate than annual energy consumption. In the past, an important factor in the growth of peak demand has been the increasing utilization of air-conditioning in the residential and commercial sectors. However, in many areas of the State, particularly the wealthier suburban counties, the market for air-conditioners is reaching saturation. Thus, the impact of airconditioning on peak demand growth will be somewhat weaker than in the past. Additionally, for most Maryland utilities,** peak demand occurs during the summer months. Over the forecast period, electric space heating is expected to be installed in a large percentage of new homes -- far larger than in the past -- a trend based at least in part upon the price and availability problem associated with natural gas. This, of course, boosts the growth rate of electricity consumption, but will have little effect on peak demand in the summer peaking utility systems.

Considering the current lead times required for constructing new additions to generating capacity, electricity consumption and peak demand must be projected at least ten to fifteen years into the future. However, the state-of-the-art limits the forecaster's ability to produce reliable long-range projections. Since future demand depends on what happens to those factors that affect usage (i.e., energy prices, income, population, employment, etc.) predictions on future electricity usage can be no more reliable than the long-range projections of those factors. An accurate forecast of electric power usage in Marylad in 1987 requires precise information regarding the Maryland economy and energy prices over the next ten years.

Moreover, some of these determinants of electricity demand are subject to policy changes at both the national and state levels. Examples of public policies which will affect these factors include federal initiative to deregulate

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* See the discussion in Chapter 5 on electricity price in the forthcoming Projected Electric Power Demands for the Baltimore Gas and Electric Company, Maryland Department of State Planning, 1978.

** Potomac Edison is the only large winter peaking utility in the State.

interstate natural gas transactions, and the introduction of new building codes to alter insulation standards. Additionally, there is currently great interest in the reform of electric utility rates. Proposed changes would alter rate structures so as to price electricity according to season or time of day. The purpose of this proposed reform is to reduce the growth of peak demand. The difficulty of anticipating these kinds of policy actions introduces substantial uncertainty into the forecasts, even when the importance of such policies is fully appreciated.

It is within this environment of considerable uncertainty that demand forcasts must be formulated. It is no longer reasonable to assume that future demand growth will procede at the same rate as in the past. The Maryland Department of State Planning has produced forecasts of electric energy consumption and peak demand for two utility systems -- PEPCO and BG&E -- which specifically account for the impacts of the various major causal factors. Future efforts along similar methodological lines will result in the Department of State Planning's production of forecasts for Maryland's other two large electric utilities -- Delmarva Power and Light and Potomac Edison. Updates will also be periodically performed in order to incorporate the best and latest information available into the forecasts. Eventually, then, electricity usage in virtually the entire State of Maryland will be forecasted using structural econometric models.

REFERENCES -- APPENDIX B

1. Annual reports of the Maryland electric utilities - 1966, 1969, 1972, 1975, 1977.

2. Appendix to System Long Range Electric Load and Energy Forecast, Delmarva Power and Light, 1978.

3. Statistical Year Book of the Electric Utility Industry, Edison Electric Institute, 1976.

4. Electrical World, September 15, 1977 and March 15, 1978.

5. Typical Electric Bills, Federal Power Commission, 1972, 1975, 1977.

6. "Electric Power Consumption in Maryland and the U.S.," Maryland Department of State Planning, 1976 (draft report).

7. Maryland Projection Series - Population and Employment 1975-1999, Maryland Department of State Planning, 1977.

8. Projected Electric Power Demands for the Baltimore Gas and Electric Company, Maryland Department of State Planning, 1978 (forthcoming).

9. Projected Electric Power Demands for the Potomac Electric Power Company, Maryland Department of State Planning, 1975.

10. Cumulative Environmental Impact Report, Maryland Power Plant Siting Program, 1975.

11. "Ten-Year Plans of Maryland Electric Utilities, Possible and Proposed Power Plants, 1978 through 1987," the Public Service Commission of Maryland, 1978.

12. 1972 OBERS Projections of Regional Economic Activity in the U.S., U.S. Water Resources Council, 1974.