PPSP-CEIR-3

POWER PLANT CUMULATIVE ENVIRONMENTAL IMPACT REPORT

February 1982

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JAMES B. COULTER
SECRETARY

STATE OF MARYLAND
DEPARTMENT OF NATURAL RESOURCES
TAWES STATE OFFICE BUILDING
ANNAPOLIS 21401

LOUIS N. PHIPPS, JR.
DEPUTY SECRETARY

March 19, 1982

The Honorable Harry Hughes
Executive Department
Office of the Governor
State House
Annapolis, MD 21404

Dear Governor Hughes:

The 1981 Cumulative Environmental Impact Report prepared pursuant to the Maryland Power Plant Siting Act is forwarded. The Report is an analysis of the cumulative impact of electric power plants on Maryland's environment.

Eighty-seven percent of Maryland's electricity is currently generated using coal and nuclear fuels and it is likely that coal will displace even more oil by the end of the decade. Increased coal use with its concommitant potential for air, groundwater and surface water impacts from combustion, transport and disposal will require thorough investigation in determining appropriate conditions on the construction and operation of coal-fired power plants.

Monitoring results show that nuclear plants (Calvert Cliffs, Peach Bottom and Three Mile Island) are not exceeding regulatory constraints. Establishment of a functioning system by the federal government for handling spent nuclear fuel and high level radioactive waste is critical for the continued operation of nuclear power plants in the United States beyond the early 1990's. The federal government should be encouraged to determine methods and locations for these wastes as soon as possible.

The information contained in this report demonstrates the importance of the State's capability to collect and analyze technical data to insure that Maryland continues to have an adequate supply of electricity without degrading its natural resources or the human environment.

Sincerely yours,

James B. Coulter

James B. Coulter

JBC/kss
Enclosure

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POWER PLANT

CUMULATIVE ENVIRONMENTAL

IMPACT REPORT

FEBRUARY 1982

Maryland Department of Natural Resources

Comments and requests for additional copies should be addressed to Editor, Cumulative Environmental Impact Report, Power Plant Siting Program, Maryland Department of Natural Resources, Tawes State Office Building, Annapolis, Maryland 21401

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FOREWORD

The Cumulative Environmental Impact Report is issued every two years as required by the Maryland Power Plant Siting Act. It is a compilation of all studies relating to the cumulative impact of power plants on Maryland's environment. Chapters were prepared under contract with principal responsibility for content and completion vested in a member of the Power Plant Siting Program Staff. Principal authors and their PPSP staff counter parts are herewith acknowledged for their contribution to this effort:

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I gratefully acknowledge Dr. Jorgen Jensen for his contributions in putting this publication together; Karen Spencer and Daphne Heaphy for their patient, competent, and cheerful typing of numerous drafts; the many others without whose contributions this publication could never have been completed. Thank you.

P E Miller

Paul E. Miller
Editor, CEIR-III

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SUMMARY

Chapter I - Power Demands in the State of Maryland

For decades prior to the early 1970's energy consumption grew steadily in the United States while energy prices remained stable. The most important factor sustaining this pattern was the availability of inexpensive oil, imported mainly from the Middle East. These trends were brought to an abrupt end in 1973 by the Arab oil embargo and subsequent events. Skyrocketing prices and limited availability brought about sharp declines in energy usage. Thus by 1980 the energy consumption was only marginally higher than in 1973.

The transient effects of the 1973 embargo have largely died out, and new trends in the pattern of energy production and consumption have emerged. The long range annual growth rate for total energy consumption has fallen from 4.1 percent for the 1960-1973 period to an expected 1.6 percent for the 1980-1995 period.

Prior to 1973 the national annual growth rate for electric energy was about 7.3 percent. It is projected that the demand will grow by 3.2 percent per year through 1995, while the demand for the other energy forms will stagnate. Increased demand for electric energy coupled with increased coal utilization by the industry is largely responsible for the proportional increase in coal usage over other primary fuels.

This Chapter presents a detailed discussion of the electric utility industry in Maryland. Projections of the future demand for electricity, utilizing econometric models, are presented. The total of the peak demands of the utilities serving Maryland is forecast to increase at an annual rate of 2.5% through 1990.

The potential for reduction of the growth rate of electricity demand through implementation of conservation measures and load management is discussed. Load management can be accomplished through use of devices such as radio controlled water heaters or through a ratemaking policy reflecting the time-varying marginal cost of producing electricity.

Chapter II - Power Supply in the State of Maryland

The increasing demand for energy prior to the early 1970's was met primarily by increasing natural gas and petroleum production and by higher imports of petroleum. As a consequence of the 1973 oil embargo the nation's supply of primary energy has shifted toward greater reliance on coal and nuclear energy. In 1973 oil and gas accounted for about 78 percent of the primary energy supply while coal and nuclear energy combined provided 19 percent of the supply. By 1985 it is expected that these percentages will be 62 and 33 respectively.

The pattern of electric power supply in the United States reflects the conditions of the primary energy market (slower demand growth and higher fuel prices) as well as changes in the regulatory environment. The Fuel Use Act of 1978 prohibits use of oil or natural gas as a primary fuel for new generating units and for existing units which can be converted from oil to

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coal. These various factors are expected to cause the nation's electric utilities to increase the use of coal and nuclear fuel from about 48 percent in 1973 to about 74 percent and about 81 percent in 1985 and 1990 respectively.

Generation capacity of utilities serving Maryland is 33 percent oil and gas fired and 66 percent from coal and nuclear. Since oil and gas fired plants are operated less often than coal and nuclear power plants, the electricity actually produced by oil and gas fired plants amounted to only 12% of the total, compared to 87% produced by coal and nuclear power plants. By 1990, installed capacity is expected to be 25 percent oil and gas fired and 70 percent fired by coal and nuclear.

The generation profile and capacity expansion plan for each of the utilities serving Maryland are presented in this Chapter. These plans provide for adequate capacity reserve margins throughout the period of the current Ten-Year Plan.

Chapter III - Air Impact

Power plants contribute about 30 percent of the particulates, about 63 percent of the sulfur oxides, and about 28 percent of the nitrogen oxides emitted by all sources in Maryland. Only negligible amounts of carbon monoxide and hydrocarbons are contributed by the power plants.

For the three major pollutants emitted by power plants, air quality shows a trend toward improvement for particulates and sulfur oxides, while the level of nitrogen oxides has been relatively constant during recent years. All areas of the State are in compliance with the National Ambient Air Quality Standards for sulfur and nitrogen oxides. A state implementation plan has been prepared to bring the Baltimore Metropolitan nonattainment region into compliance with the primary federal standards by 1982 and the secondary (and more stringent) standards by 1986.

The theoretical and experimental work on mathematical models for predicting air quality impacts is discussed in this Chapter.

Federal regulatory measures have impacted Maryland in two ways. The first relates to the "emission offsets" policy of the Clean Air Act. The State is presently exploring the establishment of an offset "market" for the Baltimore area. The second area of impact relates to coal conversion. Eight units of the Baltimore Gas and Electric Company are under "prohibition orders" which, should they become final, will prohibit burning of oil or natural gas at these units. Since six of the units are located in or near nonattainment areas for particulates the environmental consequences of these conversions must be carefully examined.

Chapter IV - Aquatic Impact

Power plants can cause aquatic impact in several ways: 1) by entraining fish eggs, larvae or other organisms into the cooling system where they will be exposed to thermal, mechanical and thermal stresses; 2) by impinging fish and crabs on intake screens; and 3) by discharging heat and chemicals into receiving waters.

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Since aquatic communities generally are characteristic of the salinity zones they inhabit, the cumulative impact of power plant operations has been assessed by salinity/habitat zones.

Because of the high reproductive rates of the plankton and good tidal mixing at the existing plants in mesohaline regions of the Bay (Chalk Point, Morgantown, Calvert Cliffs and Wagner), significant depletion of plankton populations has not occurred. Ichthyoplankton is entrained by these plants, but spawning occurs throughout the Bay for the species of fish present here, so local depletions are insufficient to decrease Bay populations. Impingement totals are small compared to mortality due to other causes. In addition, efforts to reduce these totals are now underway at all major plants. Habitat modification effects, usually more subtle in nature, have minor, localized impacts as described in this chapter. Coupled together, the power plant monitoring studies show a low cumulative impact on the mesohaline environment.

The major area of concern within the tidal fresh/oligohaline region is the impact of cooling water withdrawals upon the nursery and spawning areas of striped bass and other anadromous species. Possum Point and Vienna have the highest potential for impact. The estimated maximum total annual striped bass loss would be about 1.0 percent of the adult population in the Maryland portion of the Bay.

Data collected recently at Baltimore Harbor plants show that there are abundant and diverse biota present in their vicinity. Measured impacts due to entrainment, impingement, and habitat modification are uniformly small or not present and restricted to the vicinity of the discharge. No evidence of cumulative impact on the Bay ecosystem has been found. Temporally cumulative impacts observed have been restricted to the immediate vicinity of discharge and in some cases have been beneficial rather than deleterious.

Recent data from riverine plants have revealed impacts localized to the discharge area. No cumulative river-wide effects are evident on the Potomac River. The role of the Conowingo hydroelectric facility in the decline of fisheries in the Susquehanna River remains a significant concern. Studies currently underway address this issue.

Chapter V - Radiological Impact

The nuclear power plants affecting Maryland are Calvert Cliffs, on the Chesapeake Bay (the only nuclear plant operating in Maryland), Peach Bottom, and Three Mile Island, both on the Susquehanna River in Pennsylvania. Data used in the assessment of the radiological impact of these plants come from several monitoring programs described in this Chapter. Because the amount of radioactivity released under stringent regulatory control is very small, determination of power plant impact is complicated by the problem of separating power plant effects from the background due to radioactivity from natural sources or weapons-test fallout. For instance, fall-out from weapons testing by the Chinese in 1978 introduced a dominant factor into the monitoring measurements.

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Releases of gaseous and liquid effluents from the plants, and the atmospheric and aquatic distribution of radionuclides, as determined from the monitoring programs, are presented. For the Calvert Cliffs plant it was found that Sr-89 is the only radionuclide detectable in the atmosphere that can be attributed to plant releases. The impact of the very low concentrations of this element is deemed insignificant. Several power plant related bioaccumulable radionuclides (Co-58, Co-60, Zn-65, and Ag-110m) are routinely detected at low levels in Bay biota, with the exception of edible finfish. The maximum detected concentrations would result in radiation doses to man which are orders of magnitude below doses resulting from the natural radioactive sources in the Bay environment. Consumption of seafood containing the highest radionuclide concentrations measured would result in a plant-related increment of less than 0.2 percent of the dose due to the natural background.

At Peach Bottom, I-131 attributable to the plant has been detected in the air and in milk on several occasions. I-131 from the Chinese weapons test and apparently from Three Mile Island has also been detected at the same locations. Radiation doses from all these low I-131 levels are, however, well within the federal guidelines for power plant operations.

Liquid effluents containing power plant radionuclides have produced detectable concentrations (of Zn-65, Cs-134, and Cs-137) in sediments and biota of the Conowingo Pond, the lower Susquehanna River, and the upper Bay. Consumption of Conowingo Pond water and contaminated finfish exclusively at the highest radionuclide concentrations would represent about 1 percent of the natural background radiation dose.

The accident at Three Mile Island resulted in detectable, low level concentrations of Xe-133 and I-131 in air samples in Maryland. I-131 was not detected in cow's milk in Maryland nor were radionuclides attributed to that power plant detected in the Susquehanna River in Maryland. The plant is currently prohibited from discharging any accident-related water.

This chapter also discusses the radiological on-site and off-site planning required by Federal regulations.

Spent fuel is currently stored at the nuclear power plants because spent fuel reprocessing was prohibited from 1977 to 1981 in this country. Although this prohibition is now lifted it is not expected that reprocessing or off-site storage of spent fuel will be possible until middle or late 1980's. Storage of spent fuel is not considered to present a significant environmental threat. Assuming present licensed capacity, and retaining the capacity to discharge one full core, the projected date of the last refueling that can be discharged to the spent fuel pool at Calvert Cliffs is April 1990. Under the same conditions, Peach Bottom has ability to store fuel on-site until 1986 for Unit 2, and 1987 for Unit 3.

Chapter VI - Socioeconomic Impact

The construction and operation of a power plant may have significant economic and social impact upon the community where it is located. The effects include changes in population and land use patterns, traffic congestion, changes in income, employment, and business activity, as well as

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changes in local government tax revenues and spending. The magnitude of these changes depends on the size, location, and composition of the affected communities.

Early studies of the impacts caused by the Calvert Cliffs plant construction showed the needs for a means of predicting impacts on the predominantly rural communities which are the proposed sites for future power plants in Maryland. A computerized model was developed and subsequently used to estimate the social and economic effects of the expansion of the Vienna power plant. The plant is located on the border between Dorchester and Wicomico counties. These counties and their urban centers, Cambridge and Salisbury, will be affected.

The conclusions of this study are that: 1) the local economy can well absorb the effects of increased employment during construction; 2) the demand for additional housing can easily be met; 3) additional public services can be provided within the existing frame work; 4) traffic congestion will be minimal; 5) during the construction period neither Vienna nor Cambridge will experience significant fiscal effects while Wicomico and Dorchester counties will have a net increase in revenues, Salisbury is expected to suffer a small construction period deficit; 6) during the operating period Dorchester County will have a substantial net surplus whereas the effect on Wicomico County and the cities will be negligible.

Expansion of the Vienna plant will lead to the strengthening of Eastern Shore rail traffic because of the need for coal transport.

Chapter VII - Noise Impact

Noise associated with power plants can come from the primary generating facility, from cooling towers, from coal handling equipment, or from vehicular traffic associated with the plant operation.

A procedure for evaluating the impact of noise on people has been developed by the U.S. Environmental Protection Agency. The State of Maryland has established regulations restricting the noise levels.

The results of a noise evaluations at six proposed and existing Maryland power facilities are described in this Chapter.

Chapter VIII - Solid Waste Management

Power plant operation generate large quantities of solid waste, mainly flyash and scrubber sludge, and to a lesser extent bottom ash and boiler slag. Waste product utilization is desirable and usually possible. Bottom ash and some flyash is currently being sold for reuse. The remaining quantities are placed in managed land fills. This chapter discusses the potential problems of managing solid waste disposal.

There are no utility flue gas desulfurization systems operating in Maryland and hence no sludge disposal impact. Flyash and bottom ash disposal methods vary among the utilities. BG&E markets some of its flyash. All utilities operate land fills at various places.

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Previously utilized disposal sites are currently being studied by the Power Plant Siting Program to determine if they are affecting the environment and if remedial measures are necessary.

Chapter IX - Groundwater

Four Maryland power plants use groundwater for their operation. The reduction of water available to other users and the lowering of the water level or "potentio-metric surface" surrounding the point of withdrawal is evaluated.

Withdrawal at the Calvert Cliffs and Vienna plants have no adverse effect on the aquifers involved. At the Morgantown plant the water level in the lower of the two aquifers used has dropped substantially but no other user is affected. At the Chalk Point plant the withdrawal from the Magothy Aquifer could have significant impact on other users in the area. PEPCO has indicated that future withdrawals will come mainly from new wells in the deeper Patapsco aquifer which is not tapped by other users in the areas, and which contains an adequate amount of water.

Chapter X - Transmission Lines

Construction of transmission lines has several impacts common to all major construction projects such as sediment run-off, disturbance of wild life habitats, and deforestation. In addition, electrical effects such as radio and television interference, audible noise, ozone production, and spark discharges can be present near transmission lines. Finally the presence of a transmission line may cause aesthetic impacts, possibly affecting property values.

The electric effects are only present at high voltage lines (500 KV and above) and even then only in the immediate vicinity of the line, usually within the power line right-of-way. The other effects can be minimized through judicious routing of the transmission corridor, avoiding as much as possible unique or environmentally sensitive areas.

This Chapter discusses the various factors that are important in the routing of transmission line corridors.

It is concluded that no health effects associated with transmission lines have been found. Electric effects can generally be avoided. Aesthetic impact and impact on land value have been studied and no conclusive results emerge.

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Chapter XI - Cooling Towers

Salt drift from the natural draft cooling tower at Chalk Point deposits less than 8 kg/ha-month off site. This rate is below the rate at which foliar damage was evident in commercial crops (20 kg/ha-month). Predicted off-site deposition rates for the tower proposed at DP&L's Vienna expansion are less than 25 kg/ha-month and reduction in crop yield is estimated to be a few percent at the power plant site boundary and smaller off-site.

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RECOMMENDATIONS

1. It is recommended that administrative or legislative methods be found to further consolidate and streamline the current regulatory procedures for power plants. When the Power Plant Siting Act was enacted in 1971, all state permits impinging on site suitability were incorporated under the Public Service Commission certificate so that there was a single regulatory proceeding for power plants in the State. Since 1971 new environmental requirements at the federal level have resulted in additional permits for water quality and solid waste disposal. Decisions on these permits are only partially incorporated in the PSC process.

2. Present requirements in law for a 10-year plan from each electric utility should be extended to 15-years. Present trends indicate that 8-10 years are required to locate, license, and construct a fossil-fueled plant and 10-15 years are required for a nuclear plant.

3. The continued disposal of low level radioactive waste and the establishment of national capability for high level radioactive waste disposal are critical to the continued operation of the Calvert Cliffs Nuclear Power Plant. Negotiations should be concluded which will allow Maryland to enter an interstate agreement for continued disposal of low level radioactive waste. After January 1, 1986, States which have concluded such regional agreements will be allowed by federal law to exclude waste from outside their region. In addition, the federal government should be encouraged to determine methods and locations for storage of high level wastes as soon as possible.

4. The present State policy of considering both the need and the proposed route for a given transmission line simultaneously has resulted in failure to consider these facilities until they are imminently needed. A preferable approach would be to identify and approve corridors needed for long term growth, with permission for construction granted at a later time, when short term need can be demonstrated. This would allow the selection of corridors which would be more acceptable from both environmental and developmental points of view. Incorporation of these corridors into county plans, on a basis similar to that used for identification of transportation corridors, would provide for orderly planning, and prevent land use conflicts.

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CONVERSION TABLE

1 inch = 2.54 cm	1 acre = 4,047 m^2
1 foot = 0.305 m	1 lb = 0.454 kg
1 st. mile = 1,609 m	1 Btu = 252 calories

1 cu ft = 28.3 liter = 28.3 x 10^{-3} m^3

1 gallon = 0.134 cu ft = 3.785 x 10^{-3} m^3

1 cfs = 449 gpm = 28.3 x 10^{-3} m^3/sec

10^6 gpm = 2.233 x 10^3 cfs = 63 m^3/sec

1 acre foot = 4.36 x 10^6 cu ft = 123 x 10^3 m^3

Concentration:

1 ppb by weight in water = 1 g/m^3

$$1 \text{ ppm by volume in air} = \left(\frac{0.0224}{\text{gram mol. weight}}\right) \times \left(\text{concentration in } \mu g/m^3\right)$$

Gram molecular weight:

O_2 = 30; O_3 = 45; SO_2 = 62; NO = 29; NO_2 = 44;

The following values depend on many factors and vary a great deal.

Approximate values:

Heat value for coal = 12,500 Btu/lb

oil = 148,000 Btu/gallon

gas = 1,000 Btu/cu ft

One barrel of oil = 42 gallons

A coal burning plant operating at full capacity burns about 10 tons of coal per day per MW of capacity and requires about 900 gpm = 2 cfs = 0.057 m^3/sec of once through cooling water (heated by $10^{\circ}F$) per MW.

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CHAPTER I

POWER DEMANDS IN THE STATE OF MARYLAND

The operation and planning of electric utilities are determined by their customers' power demands. The last few years have witnessed important changes in patterns of demand which will have important implications for the construction of additional power plants. The most important of these changes is the sharp reduction in both actual and forecasted long-range load growth rates which has lead in recent years to cancellations, size reductions and scheduling delays for new generating units. In many cases it has also left utilities with substantial excess generating capacity -- a burden which is ultimately borne by ratepayers.

This chapter discusses the power demands facing utilities in the State of Maryland. The supply of electric power is covered in Chapter II. To place the subject of power demands in perspective, long term U.S. and Maryland energy usage trends are discussed. The structural interelationships among Maryland utilities are presented along with the basic characteristics of the service territories of the major systems. The future outlook for power demands on these systems is considered. A brief look at the Power Plant Siting Program (PPSP) load forecasting activities is included, although a more detailed discussion of the PPSP load forecasting methodology is deferred to Appendix A of this Report. Finally, this chapter provides a survey of the various methods and techniques which can be used to "manage" the growth of power demands. Although these methods are not being extensively employed in Maryland at the present time, they have the potential to significantly reduce the expensive oil-fired generation and the need to build additional capacity.

A. Historical and Projected National Trends in Energy Usage

Prices and supplies of competing sources of energy are determined by regional, national and even international markets. National policy decisions influence the operation of those markets, and as a consequence they shape energy options available in Maryland. It is helpful, therefore, to consider the national energy framework within which Maryland energy markets operate.

During the decades prior to the early 1970's energy production and usage grew steadily while energy prices remained stable and even declined somewhat. Energy demand was stimulated by rising living standards; increased automobile dependence arising from suburbanization; the tendency in industry to replace labor with energy-using capital equipment; the growth of energy intensive industries such as chemicals, paper and aluminum; and the increasing adoption of air conditioning. Stable prices in the face of rapid demand growth were made possible by several factors, including productivity advances and new fuel resource discoveries. Most important, however, were the rapidly growing imports of inexpensive oil, mainly from the Middle East.

These trends were brought to an abrupt end in 1973 by the Arab oil embargo and subsequent events. The embargo meant an immediate elimination of the key ingredient to stable energy prices -- cheap, abundant imported oil. Oil and gas (and even coal) prices skyrocketed, and availability, in some instances, became

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a problem. These developments, coupled with the severe 1974-1975 recession, brought about sharp declines in energy usage. Although economic growth resumed in 1976, energy prices had risen to such an extent that energy users were still in the process of adjusting to the earlier price shocks. Thus, by 1977 U.S. primary energy consumption was approximately at the same level as in 1973.

Another round of energy price shocks (and oil scarcity) occurred in 1979 accompanying the Iranian Revolution. These further price increases along with increasing national and state government efforts to encourage conservation led to a further dampening of demand.

The general energy trends of the late 1970's -- rising real prices, sluggish consumption growth and greater reliance upon coal -- are expected to continue in the future. According to the U.S. Department of Energy, Energy Information Administration (EIA), energy prices will increase faster than the rate of inflation, while overall U.S. (primary) energy consumption will only increase by 1.6 percent per year. Also, by 1995 coal is expected to dramatically increase its share of primary energy to 40.0 percent from 20.6 percent in 1980. These projections along with historical trends since 1960 are shown in Table I-1. The prices indicated in this table (expressed in 1972 dollars) are those received by U. S. producers. In 1980, the price per million Btu's (MBtu) was roughly $1.26 for coal, $4.88 for oil and $1.39 for natural gas.

Energy consumption by major end-use sector and fuel type is shown in Table I-2[1]. As these figures indicate, only the industrial sector is expected to increase its energy usage significantly. Electricity demand is projected to grow noticeably in all sectors, while oil consumption is projected to decline among all customer groups, even in transportation which is almost entirely powered by oil.

Both tables reveal some important trends in energy consumption. From 1960-1973, energy usage grew steadily while real prices declined. These trends were interrupted in the mid-1970's; total energy usage in 1980 only marginally exceeded that in 1973. Overall energy demand is projected by EIA to grow in the future but only modestly, and energy prices are expected to increase signficantly.

It is also important to recognize the shifts in fuel mix which have taken place and will continue to occur in the future. Up until the mid 1970's, oil and gas had been gradually and steadily displacing coal usage, particularly for transporation and building heating applications. Oil also began to replace coal in existing utility boilers as the result of State and Federal air pollution legislation and regulations, principally the Clean Air Act Amendments of 1970. Also, a large percentage of the new generating units brought on-line during this period was oil-fired. Trends in utility generation mix will be discussed in more detail in Chapter II.

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[1]The major difference between Table I-1 and I-2 is the "energy conversion" loss. Table 1-1 is primary energy while Table I-2 is end-use energy and is therefore net of conversions. This is most important in the electric utility industry where fuels are burned to generate electricity, and about two-thirds of the original energy is lost in the conversion process. Thus, the 1995 total energy usage in Table I-2 is 65.7 quads compared to 93.5 quads of primary energy. Nearly a third of primary energy is lost in the conversion process and most of that is in the electric utility sector. This furthur emphasizes the prominent role of that industry in the energy sector.

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Table I-1

U.S. Energy Consumption and Price by Primary Energy Type 1960-1995

	Coal		Petroleum		Natural Gas		Nuclear	Hydroelectric	Total
Year	Quads	Price	Quads	Price	Quads	Price	Quads	Quads	Quads
1960	10.1	$0.40	20.0	$0.83	12.7	0.21	0.1	1.6	44.5
1965	11.9	0.34	23.2	0.76	16.1	0.21	0.1	2.0	53.3
1970	12.7	0.35	29.5	0.68	22.0	0.19	0.2	2.6	67.1
1973	13.3	0.38	34.9	0.71	22.5	0.21	0.9	3.0	74.6
1974	12.9	0.60	33.5	1.43	21.7	0.27	1.2	3.3	72.6
1975	12.8	0.62	32.7	1.50	19.9	0.35	1.8	3.2	70.6
1976	13.7	0.62	35.1	1.50	20.3	0.43	2.0	3.0	74.4
1977	14.1	0.64	37.0	1.56	19.6	0.55	2.7	2.4	75.8
1978	13.9	0.70	38.0	1.51	20.0	0.59	3.0	3.2	78.1
1979	15.1	0.71	37.1	1.98	20.7	0.71	2.8	3.2	78.9
1980	15.7	0.74	34.3	2.87	20.4	0.82	2.7	3.1	76.2
1985	20.6	0.90	30.3	4.13	18.1	1.96	5.6	3.2	77.8
1990	27.6	0.94	30.7	4.58	17.4	2.06	8.0	3.2	86.9
1995	35.0	1.00	29.1	5.58	17.0	2.51	9.1	3.3	93.5

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Table 1-1 (Continued)

Annual Rates of Growth (%)

	Coal		Petroleum		Natural Gas		Nuclear	Hydroelectric	Total
	Quads	Price	Quads	Price	Quads	Price	Quads	Quads	Quads
1960-1973	2.1%	-0.5%	4.4%	-1.1%	4.5%	0.0%		5.0%	4.1%
1973-1980	2.4	10.1	-0.3	22.0	-1.4	22.4	17.0	0.5	0.3
1980-1985	5.6	4.4	-2.5	7.5	-2.4	19.0	15.7	0.6	0.4
1980-1995	5.5	2.0	-1.1	4.5	-1.2	7.7	8.4	0.4	1.4

Notes : (a) Quad = Quadrillion Btu's = 10^{15} Btu.
(b) Prices are deflated to 1972 dollars by the GNP Deflator. Prices are expressed in dollar per million Btu.
(c) Coal prices are bituminous delivered prices to electric utilities. Petroleum prices are refiner aquisition prices, and projections are world oil prices. Gas prices are domestic well head prices.
(d) All projections are the EIA "mid" case projections.

Source: (1), (2)

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Table I-2

Energy Consumption by End-Use and Fuel Type
(Quadrillion Btu's)

	1965	1973	1978	1985 [a]	1995 [a]
Residential [b]					
Oil	3.1	3.8	3.4	2.6	1.9
Gas	4.2	5.2	5.2	5.0	5.1
Electricity	1.0	2.0	2.4	2.8	3.5
Total**	8.6	11.2	11.1	10.6	10.6
Commercial [b]					
Oil	2.0	2.4	2.3	1.4	1.0
Gas	1.4	2.4	2.4	2.3	2.8
Electricity	0.8	1.5	1.7	2.0	2.7
Total (c)	5.4	7.7	7.7	7.1	8.1
Transportation					
Total	12.8	18.9	20.9	18.3	18.7
Industrial					
Oil	3.7	5.2	6.5	3.5	4.0
Gas	7.3	10.4	8.5	8.6	9.3
Coal	5.4	4.4	3.4	4.7	7.3
Electricity	1.5	2.3	2.7	3.4	5.1
Total (c)	19.1	24.0	23.2	22.5	28.3

(a) Forecasts are EIA mid-price case.

(b) Master metered apartments are here listed as residential.

(c) Total includes all energy sources, not merely those listed in the table.

Source: (2)

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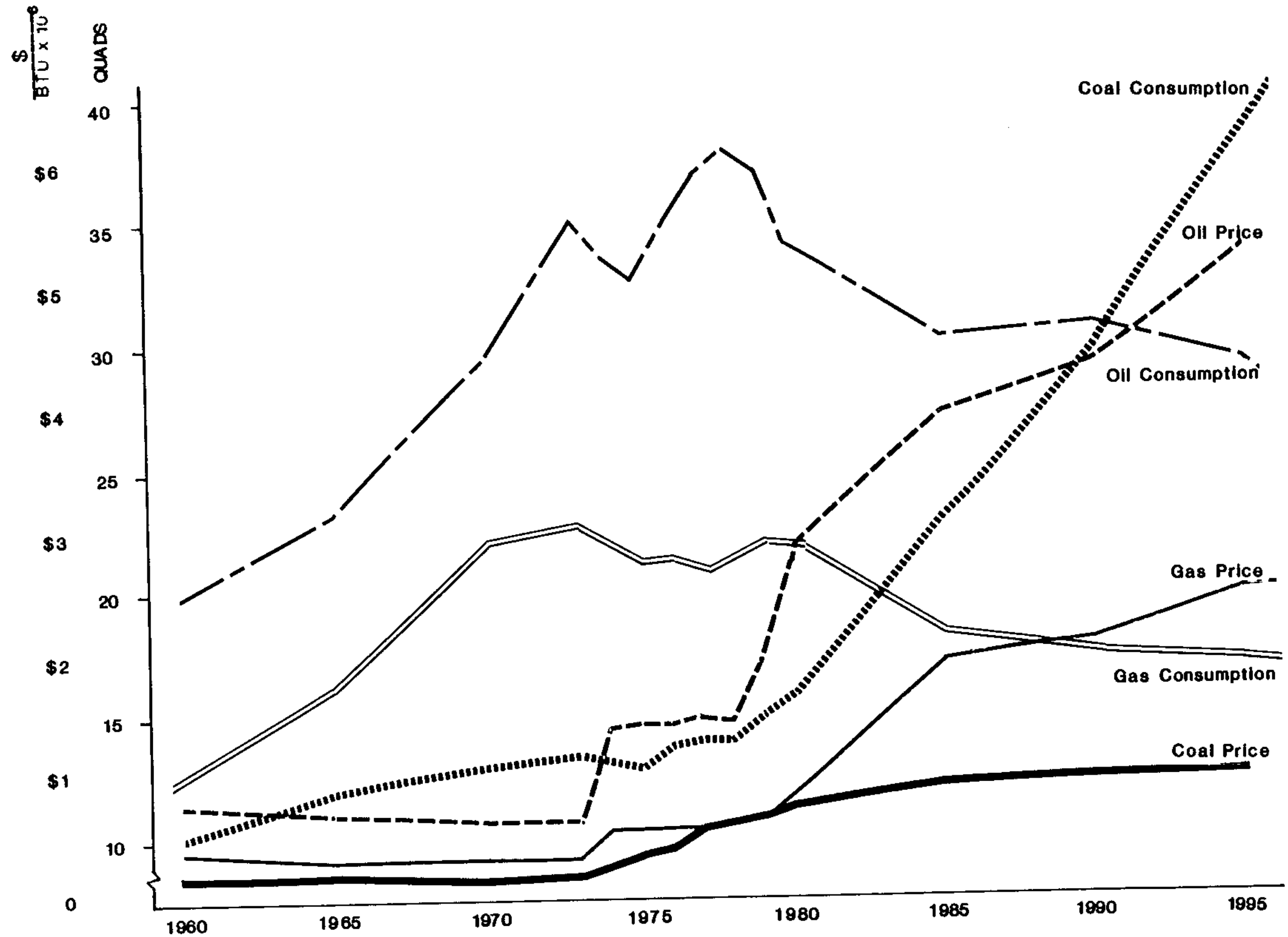

Figure I-1. U.S. primary energy consumption and prices in 1972 dollars.
Prices quoted in text are in 1980 dollars.

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With the dramatic increases in gas and oil prices relative to coal, and the perception of gas and oil as insecure, industry and utilities began switching toward coal. At the same time the household and transportation sectors have been increasing their efforts to conserve on oil and gas usage. With natural gas in short supply in the early and mid 1970's, federal and state authorities implemented curtailment plans. Many industrial users were curtailed, and in many areas of the country (including Maryland) restrictions on new residential and commercial hook-ups were imposed. As a result, the natural gas share of total energy usage fell sharply within the space of just a few years.

During the decade of the 1970's, coal's decline was arrested and even moderately reversed. Over the next 15 years EIA expects an enormous relative and absolute increase in coal usage as both industrial and utility boilers shift away from oil and gas. Since most coal (over 70 percent) is consumed by the electric utility industry, and since coal is already the most important fuel in that industry, electricity demand growth will help to drive this process.

EIA projects that electricity demand will grow by roughly three percent per year while the end-use demand for other energy forms will stagnate. Industrial usage of coal will increase, but that will be more than offset by reductions in oil and gas, mainly in the nonindustrial sectors. Electricity will therefore become more and more heavily relied upon to serve this nation's future energy needs. The increasing relative importance of electricity is also largely responsible for the growth of coal's share of total primary energy.

Historical and projected electrical energy demand are shown in Table I-3. Electricity sales, particularly to residential and commercial customers, grew rapidly prior to 1973. Since 1973 sales growth has been moderate. EIA projects that a change in growth patterns will occur over the next 15 years. Whereas in the past there has been a fairly clear tendency for the residential and commercial demands to grow more rapidly than industrial, in the future the industrial sector is expected to grow more rapidly. The projected industrial growth rate of 4.2 percent annually is nearly double the combined residential/commercial rate of 2.3 percent.

B. Energy Usage in Maryland

Comparisons of historical energy usage patterns between the U.S. and Maryland through 1977 are presented in Tables I-4 and I-5. These tables present energy consumption at the end-use level by major customer groups and major fuels. It does not include energy consumed in the process of producing electricity. In addition to percentage breakdowns for the various fuel-types and end-use groups, Table I-5 shows consumption growth rates for 1960-1973, 1973-1977 and 1960-1977.

Although similar in many respects, there are some noticeable differences between Maryland and the U.S. in patterns of energy usage. In Maryland, the residential, commercial and transportation sectors are relatively more prominent energy users, whereas the industrial sector is substantially less energy intensive than nationwide. Natural gas is relatively less important in Maryland (15.9 percent of total energy consumption compared to 26.7 percent nationwide in 1977), but petroleum is noticeably more important. Nearly 60 percent of all energy consumed in Maryland at the end-use level is petroleum compared to

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Table I-3

Sales of Electricty by Customer Class in the U.S
(Billions of kWh)

Year	Residential	Commercial	Industrial	Other	Total
1960	202	131	325	32	689
1970	466	307	571	48	1,392
1973	579	388	686	59	1,713
1974	578	385	685	58	1,706
1975	585	402	675	68	1,730
1976	603	424	740	70	1,836
1977	641	445	772	70	1,929
1978	671	460	801	73	2,005
1979	683	473	842	73	2,071
1980	717	488	815	74	2,094
1985	784	524	1,002	--	2,418
1990	881	612	1,231	--	2,831
1995	989	713	1,504	--	3,332
		Annual Rates of Growth			
1960-1973	8.4%	8.7%	5.9%	4.8%	7.3%
1973-1980	3.1	3.3	2.5	3.3	2.9
1980-1995	2.2	2.6	4.2	---	3.2

Source: (1), (2)

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Table I-4

U.S. and Maryland Energy Consumption, 1960-1977
(Trillion Btu's) (a)

	1960		1973		1977	
Residential (b)	US	MD	US	MD	US	MD
Petroleum	2,638	52.7	3,195	57.9	2,990	56.4
Gas	3,202	47.4	5,036	75.4	4,983	67.3
Electricity	670	9.3	1,890	32.4	2,226	36.7
Total (c)	7,183	117.1	10,303	166.4	10,283	160.7
Commercial (b)						
Petroleum	2,497	61.9	3,739	90.6	3,515	72.4
Gas	1,053	8.3	2,680	30.8	2,577	28.9
Electricity	468	4.0	1,561	25.0	1,832	26.1
Total (c)	4,398	78.8	8,083	147.0	7,973	127.6
Industrial						
Petroleum	2,319	59.2	3,184	73.8	3,694	49.8
Coal	4,685	140.0	4,270	160.7	3,823	84.6
Gas	4,481	17.2	10,567	62.7	8,740	39.1
Electric	1,176	16.5	2,345	37.6	2,583	44.1
Total (c)	15,386	257.2	24,679	365.0	23,216	243.3
Transport						
Total (c)	9,639	163.6	18,311	302.7	19,515	318.3
Totals						
Petroleum	17,093	337.4	28,429	525.0	29,714	496.9
Gas	8,736	72.9	18,283	168.9	16,300	135.3
Electricity	2,331	29.8	5,811	95.0	6,656	106.9
Coal	5,738	152.3	4,555	162.3	3,957	85.2
Grand Total (c)	36,606	616.7	61,376	981.1	60,987	849.9

(a) Excludes energy used to produce electricity.

(b) Master metered apartments are here listed as commercial.

(c) Totals include all sources of energy production and consumption and not only those listed.

Source: (3)

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Table I-5

U.S. and Maryland Energy Consumption, 1960-1977

	Fuel Type and End-Use Sector Shares (1977)		% Annual Consumption Growth Rates					
			1960-1973		1973-1977		1960-1977	
	U.S	MD.	U.S.	MD.	U.S.	MD.	U.S.	MD.
Residential								
Petroleum	29.1%	35.1%	1.5%	0.7%	-1.6%	-0.7%	0.8%	0.4%
Gas	48.5	41.9	3.5	3.6	-0.3	-2.8	2.6	2.1
Electricity	21.7	22.8	8.3	10.1	4.2	3.2	7.3	8.4
Commercial								
Petroleum	44.1	56.7	3.2	3.0	-1.5	-5.5	2.0	0.9
Gas	32.3	22.7	7.5	10.6	-1.0	-1.6	5.4	7.6
Electricity	23.0	20.5	9.7	15.1	4.1	1.1	8.4	11.7
Industrial								
Petroleum	15.9	20.5	2.5	1.7	3.8	-9.4	2.8	-1.0
Gas	37.7	16.1	6.8	10.5	-4.5	-11.1	4.0	5.0
Electricity	11.1	18.1	5.5	6.5	2.5	4.1	4.7	6.0
Coal	16.5	34.8	-0.7	1.1	-2.7	-14.8	-1.2	-2.9
Fuel Shares								
Petroleum	48.7	58.5	4.0	3.5	1.1	-1.4	3.3	2.3
Gas	26.7	15.9	5.9	6.7	-2.8	-5.4	3.7	3.7
Electricity	10.9	12.6	7.3	9.3	3.5	3.0	6.4	7.8
Coal	6.5	10.0	-1.8	0.5	-3.5	-14.9	-2.2	-3.4
End-Use Shares								
Residential	16.9	18.9	2.8	2.7	-0.1	-0.9	2.1	1.9
Commercial	13.1	15.0	4.8	4.9	-0.3	-3.5	3.6	2.9
Industrial	38.1	28.6	3.7	2.7	-1.5	-9.6	2.5	-0.3
Transportation	32.0	37.5	5.1	4.9	1.6	1.3	4.2	4.0

Source: Table I-4

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approximately 50 percent for the entire U.S. Maryland's relatively heavy oil dependence is characteristic of most of the Northeast part of the country.

Energy usage grew rapidly in Maryland (as in the rest of the nation) between 1960 and 1973 for all major fuels (except coal at end-use). The decline in coal consumption (excluding its use in generating electricity) was more than offset by large increases in the consumption of gas, oil and electricity. Electricity demand more than tripled in Maryland during this period. Since 1973 energy demand has fallen sharply, more sharply than for the nation as a whole. An important exception to this trend is electricity usage which grew by 3 percent per year. However, even this growth is very modest compared to the pre-1973 annual growth rate of over 9 percent. This post-1973 conservation has occurred, both in Maryland and the rest of the nation, in all major end-use classes except transportation. The exceptionally sharp reduction in energy consumption by Maryland industry has been due to both conservation efforts and a longer term tendency for economic activity in the heavy industry (i.e., energy intensive) sectors in the State to decline.

C. The Electric Utility Industry in Maryland

Households and business in the State of Maryland receive electric power from four large and several small utilities operating in the State. Generally speaking, these utilities fall into three main categories:

(a) Investor owned utilities -- Typically, these are large, integrated electric systems engaged in the production, transmission and sale of electricity. Such systems often operate in more than one regulatory jurisdiction and may sell power on a firm basis to smaller power distributors.[1] Most Maryland customers are served by one of four such systems.

(b) Municipal utilities -- Several medium-size and small towns in the State own and operate their own utility systems. In most instances Maryland municipals have operated as distribution systems only, purchasing bulk power from the investor-owned utilities.

(c) Rural Electric Cooperatives -- Coops are similar in many respects to municipal utilities in that they are not set up as profit making ventures. Just as municipals are "owned" by the voters, coops are operated by the ratepayers with financial assistance from the Federal government's Rural Electrification Administration. Coops serve predominantly rural areas, although they often also serve the towns within their geographic service areas. Two major rural electric cooperatives operate in Maryland.[2]

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1 Two investor owned utilities in Maryland, the Susquehanna Power Company (a subsidiary of Philadelphia Electric) and Pennsylvania Electric Company have hydroelectric facilities in Maryland at Conowingo Dam and Deep Creek Lake, respectively. Neither utility sells power on a retail basis in Maryland. Conowingo Power Company (also a Philadelphia Electric subsidiary) serves most of Cecil County but has no generating capacity of its own.

2 In addition, A&N and Somerset Rural Electric Cooperatives serve a very small number of customers on Smith Island and in Garrett County, respectively.

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With the resurgence of interest in cogeneration (discussed in Chapter II) and small power production, many large power users (and perhaps even some households) may satisfy some or all of their requirements by producing their own power. Currently, the Sparrows Point Bethlehem Steel plant produces much of the electricity it consumes.

Four major investor-owned utilities serve the majority of the customers in the State and produce nearly all of the electricity consumed. These utilities are:

- Baltimore Gas & Electric Company (BG&E). -- BG&E serves nearly 750,000 customers in the Baltimore metropolitan area. In 1980 BG&E's annual peak was 3,969 megawatts compared to installed generating capacity of 4,995 at the time of the peak. Unlike the other large utilities in the State, BG&E has no service territory outside of Maryland nor does it provide power to any municipals or cooperatives.

- Delmarva Power & Light Company (DP&L). -- DP&L, directly or indirectly, provides almost all of the power consumed on the Delmarva Peninsula (and thus the Eastern Shore of Maryland) with the exceptions of Cecil County, the City of Dover and the Town of Easton. DP&L serves nearly three-quarters of the Peninsula electric customers at retail, and it provides bulk power as a wholesaler to the numerous municipals and coops which directly serve the rest. In 1980 DP&L experienced a systemwide peak demand of 1,581 megawatts and a Maryland portion peak of 410 megawatts.[1] At the time of the peak the Company owned 2,062 megawatts of generating capacity systemwide with only 252 megawatts located in Maryland. Thus, the bulk of the customers, load and service territory is located in Delaware.

- Potomac Electric Power Company (Pepco). -- Pepco serves approximately 500,000 customers at retail in the District of Columbia and its Maryland suburbs. In addition, it indirectly serves most of St. Mary's, Calvert and Charles Counties through its wholesale sales to the Southern Maryland Electric Cooperative (SMECO). It also serves a small number of customers in the Northern Virginia suburbs. Maryland sales comprise slightly more than half the entire Pepco system. In 1980 Pepco experienced a peak demand of 4,142 megawatts compared to an installed generating capacity of 4,999 megawatts.

- Potomac Edison Company (PE). -- PE provides power to Western Maryland along with contiguous areas in Virginia and West Virginia. PE is one of the three utility subsidiaries of the Allegheny Power System (APS). The other two, Monongahela and West Penn Power, serve the northern half of West Virginia and southwestern Pennsylvania, respectively. APS experienced a peak of 5,564 megawatts for the winter of 1980/1981 (both APS and PE are winter peaking) while having 7,671 megawatts of generating capacity. The Maryland portion of PE comprises approximately a fifth of the APS load, but only 117 megawatts of generating capacity are located in the State. In addition to serving retail customers in the western counties, PE sells power on a wholesale basis to three Maryland municipals.

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[1] These peak demand figures include the loads of all municipals and cooperatives with the exception of Easton, Maryland and Dover, Delaware.

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Table I-6 presents the municipals and cooperatives operating in Maryland along with some basic descriptive data. In terms of sales, most of the municipals are quite small, and only Easton has been generating any significant amount of power.[1] It is also interesting to note that, in contrast to many investor-owned utilities, the majority of sales by municipals and cooperatives are made to residential customers. The residential sales figure of 1,020 million MWh represents 57 percent of total retail electricity sales of these companies. It should be noted that although Easton Utilities is not a wholesale customer, it is fully integrated with DP&L and engages in economy sales (and purchases) on an interchange basis. It is the only municipal or cooperative in the State which is not a wholesale customer of another utility.

Figure I-2 is a map of the State of Maryland identifying the areas of the State served by each utility. The DP&L service area is difficult to identify on the map since the Maryland Eastern Shore is also served by Choptank and the several municipals. The municipals are identified by numbered dots (except for Centreville). In the central portion of the Eastern Shore, most of the rural portions are served by Choptank while DP&L serves the towns.

Three of the four major utilities in Maryland are part of larger multistate, and in one case, multicompany systems. These four systems not only provide retail service to most of the State, they also provide nearly all of the bulk power to the municipal and cooperative power distributors. These systems do not function as totally isolated entities, however. There are many ways in which a utility can interact with other systems even if those other systems operate in other regulatory jurisdictions. Such arrangements may include integrated power pooling, joint ownership of generation or transmission facilities, sales of firm power, opportunistic economy sales and diversity power swapping arrangements. Maryland utilities routinely engage in bulk power transactions primarily through the Pennsylvania-New Jersey-Maryland Interconnection (PJM). With the exception of Potomac Edison (and the municipals it serves), all Maryland electric utilities are fully integrated with the PJM power pool. As a subsidiary, Potomac Edison participates fully in the APS power pooling arrangements. In addition, PJM and APS themselves conduct transactions with other utilities and power pools. For example, APS and The Virginia Electric Power Company (Vepco) engage in a diversity exchange whereby Vepco (a summer peaking utility) sends power to APS in the winter, and APS (a winter peaking utility) returns those kilowatt hours during the summer months.

To illustrate the importance of the off-system transactions, Table I-7 shows the quantity energy purchased and sold to other systems along with total power supplied to meet native load (i.e., retail and wholesale obligations). For purposes of comparison, power purchased is expressed as a percentage of total power supply, and power sold (off-system) is expressed as a percentage of system generation. As the figures indicate, Potomac Edison is a large net purchaser of power, but the three Maryland PJM utilities are net sellers to the pool.

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[1] Choptank, through its parent organization, The Old Dominion Electric Cooperative, intends to share in 50 megawatts from the Vienna 9 coal-fired unit which has a planned in-service date of 1990.

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Table I-6

Maryland Municipal and Rural Electric Cooperatives (1980)

	Sales (MWh)			Power	Generation	Peak Demand	Generating Capacity
	Residential	Nonresidential	Total	Source	(MWh)	(MW)	(MW)
Municipals							
Berlin	7,369	15,971	23,340	DP&L	6,203	6.4	3.5
Centreville*	22,093	16,408	38,501	DP&L	0	8.8	0.0
Easton	34,659	72,054	106,713	Self & DP&L	93,400	23.6	47.8
Hagerstown	81,412	123,164	204,576	PE	0	48.9	20.0
St. Michaels*	20,395	13,084	33,479	DP&L	0	10.8	0
Thurmont	5,611	25,001	30,612	PE	0	6.8	0
Williamsport	6,053	5,775	11,828	PE	0	3.1	0
Cooperatives							
SMECO	616,788	415,947	1,032,735	Pepco	0	269.1	0
Choptank	225,406	70,905	296,311	DP&L	0	69.8	0
Total	1,019,786	758,309	1,778,095		99,603	447.3	71.3

* Centreville and St. Michaels are no longer independent municipal systems. They are now served at retail by DP&L.

Source: (4)

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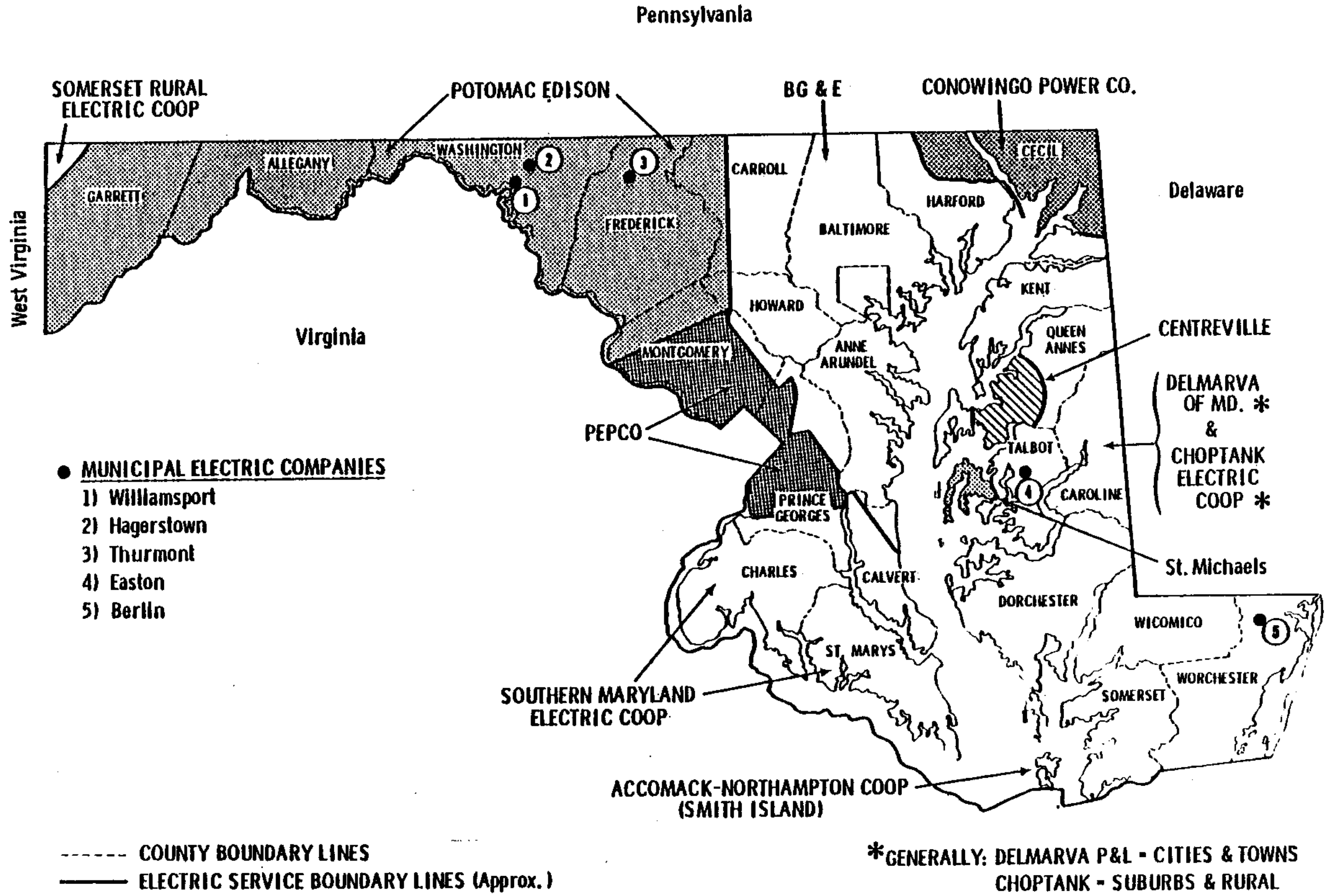

Figure I-2. Service territories of Maryland electric utilities

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Table I-7

Interchange Purchases and Sales, 1980
(Millions kWh)

	Purchases(a)		Sales (b)		Net Purchases	Total Power Supply
	Quantity	%	Quantity	%		
Pepco	4,832	27.4%	5,265	29.1%	-433	17,647
BG&E	1,665	9.0	3,013	15.1	-1,347	18,573
DP&L	696	8.7	1,059	12.6	-363	8,029
P.E.	2,681	25.5	1,590	16.9	1,091	10,499
Total	9,874	18.0	10,927	19.6	-1,052	54,748

(a) Purchases as a percentage of total power supply.

(b) Off-system sales as a percentage of system generation.

Source: (5)

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Of these three, BG&E is by far the largest net seller, both on an absolute and relative basis. For all four major Maryland utilities, power pool purchases and sales are a large percentage of system capability. Thus, off-system transactions constitutes a very important aspect of the operations of all major Maryland utilities.

The structure of the electric utility industry in Maryland is summarized in Figure I-3. The heavy, vertical lines (without arrows) indicate a corporate relationship; for example, Potomac Edison is a subsidiary of APS. Unidirectional arrows indicate power flows, generally sales for resale; while the bidirectional arrows indicate interchange sales.

D. Service Areas of the Major Maryland Electric Utilities

As discussed in the previous section, nearly all of Maryland is served, either directly or indirectly, by four major, integrated utilities -- BG&E, Pepco, DP&L and PE. With the exception of BG&E, each of these utilities possesses a very substantial amount of service territory outside of the State. In this section we shall examine the service areas of each utility, both the past development patterns and the future outlook. In particular, we shall examine the factors influencing the demand for electricity in each service area.

Baltimore Gas & Electric Company

BG&E serves a population of approximately 2.4 million people in a 2,300 square mile area. This area includes Baltimore City and eight surrounding counties. In addition to the City, the area contains most or all of Baltimore, Anne Arundel, Harford, Carroll and Howard Counties and very small portions of Calvert, Montgomery and Prince Georges Counties. Thus, the service area roughly corresponds to the Census Bureau's definition of the Baltimore Standard Metropolitan Statistical Area.

The economy of this region is diverse. Baltimore City and County contain considerable heavy and light manufacturing activity, and with one of the East Coast's largest international ports Baltimore is also a major commercial center.

The Baltimore area economy has been substantially dependent on its heavy manufacturing base but will probably be less so in the future. Manufacturing activity is not expected to grow rapidly; and the impetus for growth is instead expected come from the commercial sector. In 1970 manufacturing accounted for 22 percent of Baltimore region employment, but this percentage has fallen significantly over the past decade. The Maryland Department of State Planning projects that by 1990 manufacturing will comprise only 14 percent of total employment, while the service sector and government will experience large gains.

Electricity demand has reflected the changing economic conditions facing businesses and households. Prior to the mid-1970's electricity consumption grew rapidly in response to rapid growth in the economy and favorable electricity rates. Since then, economic growth has slowed considerably while electricity prices increased dramatically. As shown below, electricity demand growth slowed noticeably for each major customer class and for peak demand. The most dramatic change has been a decline in peak demand growth from 9.1 percent per year to 2.5 percent. The system load factor decreased from 1966 to 1973 and has remained fairly constant since then.

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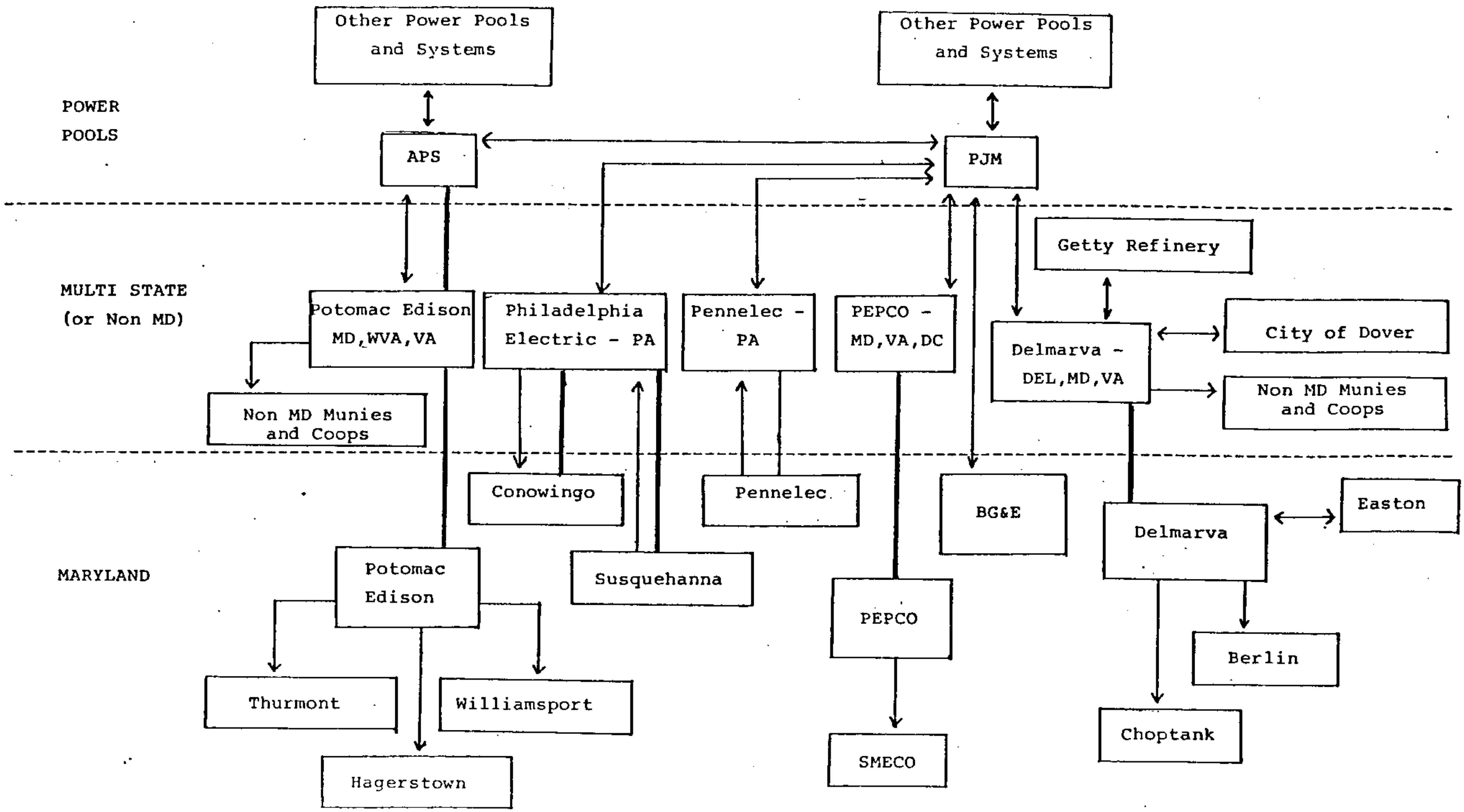

Figure I-3
Schematic diagram of the electric utility industry in Maryland

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Table I-8

Growth in Energy and Peak Demand on the BG&E System
(thousands of MWh)

	1966	1973	1980	Annual Growth Rates 1966-1973	1973-1980
Residential	2,347	4,618	6,005	10.2%	3.8%
Commercial	1,771	2,582	2,933	5.5	1.8
Industrial	4,365	6,845	7,962	6.6	2.2
Total	8,653	14,341	17,228	7.5	2.7
Peak Demand (MW)	1,817	3,334	3,969	9.1	2.5
Load Factor	58.9%	52.7%	53.0%		

Important economic and demographic shifts have taken place within the Baltimore region. The economies of Baltimore City and County, the two largest entities in the area served by BG&E, have been stagnant relative to the rest of the area. Over the past decade and a half the City has experienced a significant net loss of both employment and population. At the same time the newer, rapidly suburbanizing areas, particularly Anne Arundel and Howard Counties, are growing rapidly. To some extent these geographic trends mirror the sector trends. Heavy manufacturing, primarily located in Baltimore City and County, has been gradually declining in comparison to commercial activity and light manufacturing (and government).

These trends are expected to continue though not to the same extent as in the past. For example, the latest Maryland Department of State Planning projections expect that Baltimore City's population will continue to decline though at a slower rate than in the past (6). Howard and Anne Arundel Counties are expected to continue to grow considerably more rapidly than the rest of the State but also at a slower rate than in the past. These trends toward a declining heavy manufacturing sector and increased suburbanization make it unlikely that BG&E's rather low load factor will improve significantly over time.

Potomac Electric Power Company

Pepco serves a population of roughly two million persons in a 643 square mile area. This service area includes the entire District of Columbia, most of the Maryland suburban counties of Prince Georges and Montgomery, and a small section of Arlington County, Virginia. In addition, Pepco supplies all of the bulk power requirements of the Southern Maryland Electric Cooperative which serves all of Charles and St. Mary's Counties and most of Calvert County.

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The three principal regions which directly or indirectly comprise Pepco's service area have widely divergent characteristics. The District is a highly urbanized environment of government and commercial office buildings and large apartment complexes. The suburban Maryland region is a more affluent largely residential area, but with a large retail trade sector. The Southern Maryland region, which is served only indirectly by Pepco, is largely rural and small town though with some suburban development.

The distinguishing aspect of the Pepco area economy is the virtual absence of any significant manufacturing activity. In fact, Pepco is the only large utility in the nation without a large industrial load. That fact, along with the predominance of air conditioning in the Washington area, accounts for the relatively low system load factor which Pepco has experienced over the years.[1] The main "industry" in the area served by Pepco is the Federal government. Thus, the lack of a manufacturing base coupled with the Federal presence tends to insulate Pepco sales from the effects of the business cycle. Whereas the nationwide unemployment rate in 1980 was 7.1 percent, the Washington area averaged only 4.2 percent.

Table I-9 indicates the employment patterns within the Washington Metropolitan Area for selected years. These figures should be viewed cautiously since the geographic coverage of these data includes certain areas outside of the Pepco service area (e.g., Northern Virginia), and it excludes Southern Maryland. It nevertheless serves as a useful guide.

Over the past decade and a half major employment gains have taken place, but the sectoral shares have been remarkably stable. The only noticeable change has been a tendency in recent years for the service/finance sector to displace government employment. That tendency is, however, not dramatic and has little effect on energy demand. Manufacturing, which occupies roughly twenty percent of employment nationwide, accounts for less than four percent of Washington area jobs. Moreover, even this small amount tends to be in such activities as printing which use little energy. The combination of government and services/finance dominate employment in the Washington area comprising nearly 70 percent of the total.

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[1] In 1980 the Pepco system annual load factor was only 48.6 percent.

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