# CHAPTER I

## ELECTRIC POWER SUPPLY AND DEMAND

Important changes have taken place in recent years in the usage and supply of electricity and other energy forms in the State of Maryland. The most important of these changes is a sharp reduction in the rate of increase in the demand for electricity. For some forms of energy absolute reductions have occurred. The demand slowdown represents a change from past trends, and the sharpness of the demand reduction had been largely unanticipated.

This unexpected slowdown has had both positive and negative consequences. On the positive side it has meant less oil dependence for the State and greater security of energy supply. For electric utilities, demand growth reductions have produced excess generating capacity that will persist for the next several years. This situation has led to major changes in capacity addition schedules.

This chapter focuses on the outlook for power demands in Maryland and the plans formulated by Maryland utilities to meet these demands. The utilities are currently considering and implementing various programs to satisfy power demand growth using substitutes for conventional power plants. These programs and other aspects of capacity planning are considered in some detail in Chapter II. To place our discussion of electric power in its proper context, trends in national energy markets are compared with those in Maryland. Next, an overview of the electric utility industry in Maryland is presented along with brief descriptions of the State's largest electric utilities.

The principal purpose of the chapter is to present the capacity expansion plans of the Maryland utilities and to assess the adequacy of these plans for providing a reliable supply of power to Maryland businesses and households. This chapter examines available projections of future power demand for each utility and compares them to the utility's plan for installed capacity over the next decade.

### A. Trends in National Energy Markets

Prices and supplies of competing sources of energy are determined by regional, national and even international markets. National policy decisions influence the operations of these markets, and as a consequence they shape energy options in Maryland. It is therefore helpful to consider the national energy framework within which Maryland energy markets and utilities must operate. Further, it is important to understand

or at least consider future energy market trends. Such trends will affect the appropriate timing for new electric utility capacity.

During the decades prior to the early 1970s, U.S. energy production grew steadily while energy prices remained stable or even declined somewhat in inflation-adjusted terms. The factors contributing to this growth in demand included rising living standards; increased population; the tendency in industry to substitute energy-using capital for labor; increased adoption of air conditioning; and the expansion of certain very energy-intensive industries such as aluminum, paper and chemicals. The stable and declining energy prices that contributed to the demand growth were made possible by productivity advances in the production of energy and new energy resource discoveries. Another important factor in holding down energy prices during this period was the importation of large quantities of inexpensive foreign oil, particularly from the Middle East.

The Arab oil embargo of 1973-1974 and subsequent developments brought this trend to an abrupt halt. The embargo meant an immediate elimination of one of the key factors that had buoyed demand growth over the previous two decades -- cheap, abundant imported oil. Oil and gas (and to a lesser extent coal) prices skyrocketed, and availability, in some instances, became a problem. Coupled with the severe 1974-1975 recession these developments brought about a temporary interruption in the growth of energy. Growth in energy demand resumed after 1975 (albeit at a much slower pace) only to be interrupted again in 1979 -- again coinciding with an oil import interruption and economic recession. The combination of the oil import embargo, a prolonged recession and sharply higher energy prices has resulted in a steady decline in U.S. consumption since 1979. That year was the high-water mark for U.S. consumption of energy.

The broad energy consumption trends discussed above are shown in Figure I-1. Table I-1 provides a more detailed breakdown of the recent decade. Between 1960 and 1973, U.S. primary energy consumption rose by 4.1 percent annually, compared to -0.6 percent annually since 1973. Coal (whose consumption is largely linked to the electric power industry) was the only large sector able to sustain its previous growth. Petroleum usage has declined as a result of fuel switching or displacement by utilities and automobile gasoline efficiency improvements. A sizeable decline has also occurred in the consumption of natural gas.

Table I-1 also shows the latest projections of energy consumption and producer prices for 1985 and 1990 prepared by the Energy Information Administration (EIA), U.S. Department of Energy. The projected growth rates for the 1980s fall somewhere between the growth rates in the decades preceding 1973 and following 1973. Overall, the outlook is for moderate growth in energy usage. However, the 1990 U.S. primary energy consumption of 80.8 quads (i.e., quadrillion Btus) exceeds the 1979 histori-

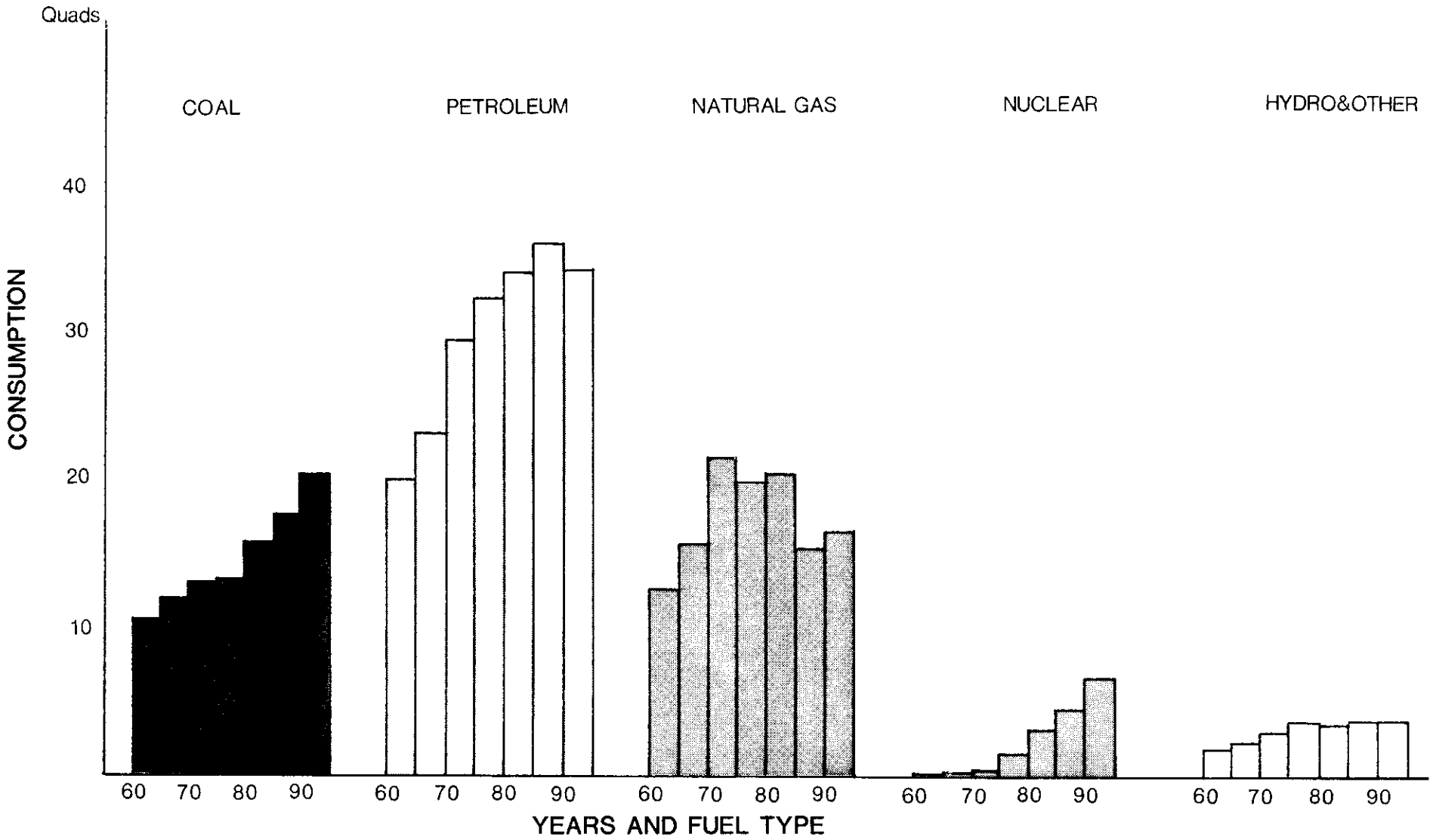


FIGURE I-1. U.S. ENERGY CONSUMPTION BY PRIMARY ENERGY TYPE

(data from Table I-1)

Table I-1. U.S. Energy Consumption and Price by Primary Energy Type, 1960-1990

| Year | Coal Quads | Coal Price | Petroleum Quads | Petroleum Price | Natural Gas Quads | Natural Gas Price | Nuclear Quads | Hydro & Other Quads | Total Quads |
|---|---|---|---|---|---|---|---|---|---|
| 1960 | 10.1 | $0.40 | 20.0 | $0.83 | 12.4 | $0.21 | 0.01 | 1.7 | 44.2 |
| 1965 | 11.9 | 0.34 | 23.2 | 0.76 | 15.8 | 0.21 | 0.04 | 2.1 | 53.0 |
| 1970 | 12.7 | 0.35 | 29.5 | 0.68 | 21.8 | 0.19 | 0.2 | 2.6 | 66.8 |
| 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 | 1.3 | 3.4 | 72.8 |
| 1975 | 12.8 | 0.62 | 32.7 | 1.50 | 19.9 | 0.35 | 1.9 | 3.3 | 70.6 |
| 1976 | 13.7 | 0.62 | 35.1 | 1.50 | 20.3 | 0.43 | 2.1 | 3.2 | 74.4 |
| 1977 | 14.0 | 0.64 | 37.0 | 1.56 | 19.9 | 0.55 | 2.7 | 2.6 | 76.2 |
| 1978 | 13.9 | 0.70 | 38.0 | 1.51 | 20.0 | 0.59 | 3.0 | 3.3 | 78.2 |
| 1979 | 15.1 | 0.71 | 37.1 | 1.98 | 20.7 | 0.71 | 2.7 | 3.3 | 78.9 |
| 1980 | 15.5 | 0.74 | 34.2 | 2.87 | 20.4 | 0.88 | 2.7 | 3.2 | 76.0 |
| 1981 | 16.0 | 0.76 | 31.9 | 3.31 | 19.9 | 1.00 | 3.0 | 3.2 | 74.0 |
| 1982 | 15.4 | 0.78 | 30.3 | 2.83 | 18.4 | 1.15 | 3.1 | 3.7 | 70.9 |
| 1985 | 17.5 | 0.76 | 36.2 | 2.26 | 15.4 | 1.74 | 4.1 | 3.5 | 76.7 |
| 1990 | 20.1 | 0.81 | 34.3 | 3.25 | 16.5 | 2.50 | 6.3 | 3.6 | 80.8 |
| | | | | | Annual Rates of Growth (%) | | | | |
| 1960-1973 | 2.1% | -0.4% | 4.4% | -1.2% | 4.7% | 0.0% | 41.4% | 4.5% | 4.1% |
| 1973-1982 | 1.6 | 8.3 | -1.6 | 16.6 | -2.2 | 20.8 | 14.7 | 2.4 | -0.6 |
| 1982-1985 | 4.4 | -0.9 | 6.1 | -7.2 | -5.8 | 14.8 | 9.8 | -1.8 | 2.7 |
| 1982-1990 | 3.4 | 0.5 | 1.6 | 1.7 | -1.4 | 10.2 | 9.3 | -0.3 | 1.5 |

Notes:
(a) Data from Ref. 1 and 2.
(b) Quad = Quadrillion Btu's = $10^{15}$ Btu.
(c) Prices are deflated in 1972 dollars by the GNP deflator (1972 = 100, 1982 = 207.15). Prices are expressed in dollars per million Btu.
(d) Coal prices are bituminous delivered prices to electric utilities. Petroleum prices are refiner acquisition prices, and projections are world oil prices. Gas prices are domestic well head prices.
(e) All projections are the Energy Information Administration mid-price case.
(f) 1982 numbers are preliminary actuals.

cal peak by a scant 2.4 percent. Energy consumption is expected to rise from 1982 to 1990 in all sectors except natural gas, which is expected to continue on its declining trend. A significant increase in nuclear power is expected, rising from 3.1 to 6.3 quads over this period. EIA expects that renewable energy sources (e.g., solar, geothermal, biomass) will be only a very small part of energy consumption by 1990. The figure in the "Hydro & Other" column for 1990 is almost identical to that for 1982.

EIA also expects a moderate real (i.e., inflation-adjusted) increase in energy prices in the 1990s for coal and petroleum (2). Natural gas, however, is expected to increase in price dramatically -- by 10 percent per year in real terms. Despite the rapid escalation projected for gas prices, the producer (i.e., wellhead) price for natural gas is still expected to be considerably below that of oil by 1990 (on a per-MBtu basis). The moderate price increase scenario for petroleum shows a considerable amount of instability, falling from $3.31 per MBtu in 1981 to $2.26 in 1985 and then rising again to $3.25 per MBtu in 1990. This is consistent with the recent declines in world oil prices from $34 to $29 per barrel.

It should be noted that the prices quoted in Table I-1 are in constant 1972 dollars. The 1982 actual prices (at the producer level) are approximately $1.62 per MBtu for coal, $5.86 per MBtu for petroleum and $2.38 per MBtu for natural gas.

Table I-2 provides further information on energy consumption with end-use detail.[1] The trends and projections shown on this table differ somewhat from Table I-1. All (i.e., residential, commercial, transportation and industrial) energy usage grew rapidly until 1973, but fell off sharply in the late 70's -- from 62.9 quads in 1978 to 54.9 quads in 1980. Virtually no growth is expected at end-use during the 1980s; the modest growth projected for commercial and industrial sectors is offset by a significant decline in transportation use. Electricity consumption, however, is expected to grow significantly in all sectors. Because of the energy conversion losses in utility boilers, electricity demand growth will cause primary energy demand to increase more rapidly than end-use energy demand.

Table I-3 focuses specifically on electricity consumption. With the exception of small reductions in 1974 and 1982, extraordinarily depressed years, electricity sales have in-

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[1] The reader should note that the energy consumption totals in Table I-2 do not match those in Table I-1. The major reason for the difference is the loss of energy (usually in the form of waste heat) in the conversion of energy from its primary form to end-use. This is most important in the electric industry where approximately two-thirds of the primary energy consumed in utility boilers is lost in the conversion process. For this reason, Table I-2 tends to understate the importance of electricity in the overall energy sector.

Table I-2. Energy Consumption by End-Use and Fuel Type[a] (Quadrillion Btu)

| | 1965 | 1973 | 1978 | 1980 | 1985 | 1990 |
|---|---|---|---|---|---|---|
| Residential[b] | | | | | | |
| Oil | 3.1 | 3.8 | 3.4 | 1.4 | 1.9 | 1.9 |
| Gas | 4.2 | 5.2 | 5.2 | 5.6 | 4.6 | 4.4 |
| Electricity | 1.0 | 2.0 | 2.4 | 2.4 | 2.6 | 3.0 |
| Total[c] | 8.6 | 11.2 | 11.1 | 9.3 | 9.2 | 9.3 |
| Commercial | | | | | | |
| Oil | 2.0 | 2.4 | 2.3 | 1.1 | 1.3 | 1.5 |
| Gas | 1.4 | 2.4 | 2.4 | 2.7 | 1.4 | 2.5 |
| Electricity | 0.8 | 1.5 | 1.7 | 1.9 | 2.4 | 2.8 |
| Total[c] | 5.4 | 7.7 | 7.7 | 5.9 | 6.6 | 6.9 |
| Transportation | | | | | | |
| Total[c] | 12.8 | 18.9 | 20.9 | 19.7 | 18.6 | 16.9 |
| Industrial | | | | | | |
| Oil | 3.7 | 5.2 | 6.5 | 5.5 | 6.3 | 6.4 |
| Gas | 7.3 | 10.4 | 8.5 | 6.5 | 4.9 | 5.6 |
| Coal | 5.4 | 4.4 | 3.4 | 1.4 | 3.1 | 2.3 |
| Electricity | 1.5 | 2.3 | 2.7 | 2.8 | 3.1 | 3.8 |
| Total[c] | 19.1 | 24.0 | 23.2 | 20.0 | 19.6 | 21.7 |
| GRAND TOTAL[c] | 45.9 | 61.8 | 62.9 | 54.9 | 54.0 | 54.8 |

(a) Forecasts are Energy Information Administration mid-oil price case. Data from Ref. 2 and 3.

(b) Master metered apartments are listed as residential.

(c) Totals include all energy sources.

Table I-3. Sales of Electricity by Customer Class in the U.S.[a] (Billions of kWh)

| Year | Residential | Commercial | Industrial | Other | Total |
|---|---|---|---|---|---|
| 1960 | 201 | 131 | 324 | 32 | 688 |
| 1970 | 466 | 307 | 571 | 48 | 1,392 |
| 1973 | 579 | 388 | 686 | 59 | 1,712 |
| 1974 | 578 | 385 | 685 | 58 | 1,706 |
| 1975 | 588 | 403 | 688 | 68 | 1,747 |
| 1976 | 606 | 425 | 754 | 70 | 1,855 |
| 1977 | 645 | 447 | 786 | 71 | 1,949 |
| 1978 | 674 | 461 | 809 | 73 | 2,017 |
| 1979 | 683 | 473 | 842 | 73 | 2,071 |
| 1980 | 717 | 488 | 815 | 74 | 2,094 |
| 1981 | 722 | 514 | 826 | 85 | 2,147 |
| 1982[b] | 730 | 526 | 745 | 86 | 2,087 |
| 1985 | 718 | 692 | 894 | -- | 2,307 |
| 1990 | 880 | 815 | 1,114 | -- | 2,812 |
| Annual Rates of Growth | | | | | |
| 1960-1973 | 8.5% | 8.7% | 5.9% | 4.8% | 7.3% |
| 1973-1982 | 2.6 | 3.4 | 0.9 | 4.3 | 2.2 |
| 1982-1990 | 2.4 | 5.6 | 5.2 | -- | 3.8 |

(a) Data from Ref. 1 and 2.

(b) 1982 numbers are preliminary.

creased every year compared to the previous year's levels. This table also shows that the growth since 1973, only 2.2 percent annually, is far slower than the growth trend prior to that year. EIA is projecting electricity demand to increase by 3.8 percent per year between 1982 and 1990. The 5.2 percent projection for the industrial sector would be a dramatic change from the 0.9 percent growth rate for the previous ten years.

As one would expect, domestic supply has both responded to and influenced the U.S. demand for energy. Increasing demands for energy during the 1950s, 1960s and early 1970s were met principally by increases in natural gas and oil production and by higher levels of imports of these fuels. After the early 1973 oil embargo the supply shifted toward far greater reliance on coal and nuclear energy --more than one-quarter of today's primary energy is from those two sources. In 1973 they accounted for less than one-fifth of U.S. primary energy supply. This shift represents an adjustment to the significantly higher price of petroleum (both absolutely and relative to other fuels) at the end of the 1970s compared to the pre-embargo years. EIA projects this shift to continue, with coal and nuclear accounting for approximately one third of primary energy by 1990.

The pattern of electric power supply in the U.S. reflects both the conditions in primary energy markets (including the slow down in demand growth for electricity) and changes in the regulatory environment. The Power Plant and Industrial Fuel Use Act of 1978 (Public Law 95-620) prohibits the use of oil or natural gas as a primary fuel for new electric generating units and for existing units which can be converted from oil to coal.[1] The Act also restricts the use of natural gas in existing power plants. Unless a utility submits a plan for reducing its consumption of natural gas by 1990 to 20 percent of the gas consumed in 1976, it is prohibited from using any natural gas after January 1990. Additionally, the proportion of natural gas consumed by an electric utility in any year prior to 1990 cannot exceed the average proportion consumed in the period from 1974 through 1976.

While exemptions from the Fuel Use Act guidelines may be granted for reasons of excessive cost of converting from oil to coal, fuel availability or environmental reasons, the combined effect of the Fuel Use Act and higher oil and gas prices is clear: the future fuel mix used by electric utilities will show far greater use of coal and nuclear than in past years. Coal and nuclear fuel used by electric utilities is projected by EIA to rise from 48.2 percent in 1973 to 69.3 percent in 1990 (see Figure I-2). National projections of electric utility capacity by fuel type (Table I-4) show a similar trend toward diminished reliance upon oil and natural gas.

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[1]The Act provides a mechanism for obtaining exemptions for "peaking units," such as combustion turbines.

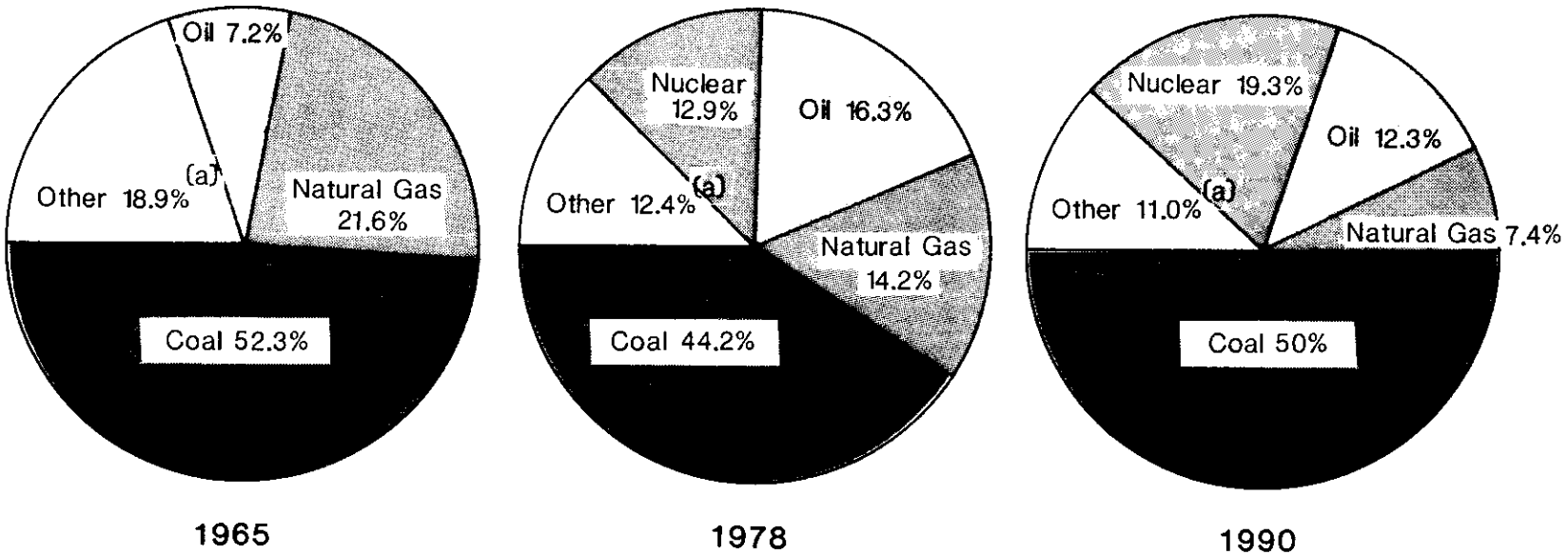
An important focus of national energy policy over the past decade has been the problem of U.S. dependency upon fuel imports. Since the late 1950s, imports of oil have been growing rapidly and have grown as a percentage of total U.S. oil consumption. During the late 1970s, imports reached their peak and accounted for nearly half of this nation's oil usage. As a result of responses to sharply higher oil prices, explicit conservation efforts, increased U.S. production and economic recession, oil imports (excluding those for the Strategic Petroleum Reserve) have been cut from 8.8 million barrels per day in 1977 to 4.2 million in 1982. According to EIA, however, this trend toward less oil import dependency may be short-lived. As economic recovery progresses the demand for petroleum will increase. Imports under EIA's mid-price scenario will rise to 7.1 million barrels a day by 1990 (2). Oil import dependency will continue to be a major issue over the rest of this decade.

## B. Energy Trends in Maryland

Trends of energy usage in Maryland have paralleled national patterns. Tables I-5 and I-6 compare patterns of energy usage in the U.S. and Maryland for the period 1960 through 1980. Overall energy end-use in Maryland (excluding electric utility energy conversion losses) increased by 38 percent over those two decades compared with a 53 percent increase for the U.S. However, all of this growth occurred between 1960 and 1973; the 1980 figure for Maryland was actually 13.4 percent lower than energy consumption in 1973.

In Table I-6 the section labeled "Fuel Shares" shows the percentage each fuel type comprises of total energy consumption, while the section labeled "End-Use Shares" shows the consumption by type of customer. It is worth noting that Maryland's total energy consumption as a percent of U.S. has fallen somewhat since 1973. This decline occurs in coal and petroleum usage. Closer inspection reveals that nearly all of this decline is in the industrial sector, reflecting the weakness of the Maryland manufacturing sector over the past decade.

The energy sector share data for 1980 shown on Table I-6 demonstrate that Maryland's energy usage differs somewhat from the rest of the U.S. The residential sector is relatively more important in Maryland (19.4 percent versus 15.9 percent for the U.S.), and the industrial sector relatively less important (33.6 percent versus 40.3 percent for the U.S.). Maryland is also somewhat more oil-dependent than the rest of the Nation, with petroleum accounting for 58.2 percent of all end-use energy. The corresponding U.S. figure for 1980 was 53.8 percent. Natural gas accounts for only 18.5 percent of Maryland's energy, which is far below the national figure of 28.3 percent. Electricity's share of Maryland end-use energy (13.6 percent in 1980) somewhat exceeds a nationwide figure of 12.2 percent. Maryland's relative




## FIGURE I-2.
## FUEL CONSUMPTION BY THE U.S. ELECTRIC UTILITY INDUSTRY

## (data from Ref.1 & 2)

(a) "Other" Consists of hydro, geothermal and wood waste technologies. The projections include the following renewable resources: geothermal, wind, solar, thermal, solar photovol taics, biomass and oceanthermal.

Table I-4. Electric Utility Generating Capacity and Reserve Margins, 1965-1990[a] (Gigawatts)

| | 1965 | 1973 | 1980 | 1985 | 1990 |
|---|---|---|---|---|---|
| Fossil Fuels | | | | | |
| Oil | NA | NA | 102.1 | 104.9 | 104.9 |
| Natural Gas | NA | NA | 41.0 | 41.0 | 41.0 |
| Coal | NA | NA | 249.1 | 297.6 | 338.4 |
| Subtotal | 187.0 | 321.0 | 392.2 | 443.5 | 484.3 |
| Nuclear | 1.0 | 21.0 | 50.2 | 77.9 | 113.9 |
| Hydroelectric | 44.0 | 62.0 | 88.2 | 86.3 | 93.5 |
| Combined Cycle | 0.1 | 0.1 | 7.8 | 7.9 | 7.9 |
| Combustion Turbine | 5.0 | 38.0 | 103.8 | 105.8 | 106.3 |
| Total Capacity | 237.0 | 442.0 | 642.2 | 721.4 | 805.9 |
| Peak Demand[b] | 186.0 | 344.0 | 422.1 | 479.7 | 570.5 |
| Reserve Margin(%) | 27.4 | 28.5 | 52.1 | 50.4 | 41.3 |
| Total Production (million Mwh's) | 1,055.0 | 1,861.0 | 2,287.6 | 2,592.9 | 3,083.3 |

(a) Data from Ref. 1, 2 and 3.

(b) Estimated for 1980, 1985 and 1990 using a 61.7% load factor derived from 1978 loads. Projections based on Energy Information Administration mid-price scenario.

Table I-5. Maryland End-Use Energy Consumption, 1960-1980 (Trillion Btus)[a]

| | 1960 | | 1973 | | 1980 | |
|---|---|---|---|---|---|---|
| | % of U.S. | Md. | % of U.S. | Md. | % of U.S. | Md. |
| **Residential**[b] | | | | | | |
| Petroleum | 2.26% | 51.0 | 2.14% | 59.3 | 3.09% | 60.5 |
| Gas | 1.48 | 47.5 | 1.49 | 74.3 | 1.45 | 70.4 |
| Electricity | 1.22 | 8.4 | 1.50 | 29.7 | 1.53 | 37.5 |
| Total[c] | 1.71 | 112.6 | 1.67 | 163.9 | 1.81 | 168.6 |
| **Commercial**[b] | | | | | | |
| Petroleum | 2.31 | 30.5 | 2.39 | 37.1 | 1.93 | 25.5 |
| Gas | 0.78 | 8.3 | 1.14 | 30.2 | 1.13 | 30.3 |
| Electricity | 1.76 | 9.6 | 1.88 | 28.5 | 1.78 | 33.9 |
| Total[c] | 1.54 | 54.6 | 1.64 | 96.6 | 1.50 | 90.2 |
| **Industrial** | | | | | | |
| Petroleum | 2.15 | 123.5 | 1.95 | 177.5 | 1.14 | 105.6 |
| Coal | 2.97 | 140.3 | 3.75 | 163.1 | 2.63 | 83.6 |
| Gas | 0.28 | 16.6 | 0.59 | 61.7 | 0.66 | 55.6 |
| Electricity | 1.03 | 11.8 | 1.56 | 36.5 | 1.66 | 46.6 |
| Total[c] | 1.66 | 292.3 | 1.67 | 438.7 | 1.23 | 291.4 |
| **Transport** | | | | | | |
| Total[c] | 1.62 | 170.0 | 1.64 | 302.8 | 1.62 | 317.5 |
| **Totals** | | | | | | |
| Petroleum | 1.94 | 374.6 | 1.84 | 574.2 | 1.60 | 505.0 |
| Gas | 0.69 | 73.4 | 0.90 | 168.6 | 0.97 | 160.3 |
| Electricity | 1.25 | 29.8 | 1.62 | 94.8 | 1.64 | 118.0 |
| Coal | 2.17 | 154.7 | 3.55 | 164.7 | 2.53 | 84.4 |
| GRAND TOTAL[c] | 1.65 | 629.5 | 1.66 | 1,002.0 | 1.48 | 867.7 |

(a) Excludes energy losses incurred in electricity production. Data from Ref. 1 and 3.

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

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

Table I-6. U.S. and Maryland Energy Consumption, 1960-1980[1](a)

| | Fuel Type and End-Use Sector Shares (1980) | | Percent Annual Consumption Growth Rates | | | | | |
|---|---|---|---|---|---|---|---|---|
| | | | 1960-1973 | | 1973-1980 | | 1960-1980 | |
| | U.S. | Md. | U.S. | Md. | U.S. | Md. | U.S. | Md. |
| **Residential** | | | | | | | | |
| Petroleum | 21.0% | 35.9% | 1.60% | 1.17% | -4.84% | 0.28% | -0.70 | 0.86 |
| Gas | 52.1 | 41.8 | 3.43 | 3.50 | -0.32 | -0.76 | 2.10 | 1.99 |
| Electricity | 26.2 | 22.2 | 8.45 | 10.2 | 3.10 | 3.38 | 6.55 | 7.77 |
| **Commercial** | | | | | | | | |
| Petroleum | 22.1 | 28.3 | 1.24 | 1.52 | -2.24 | -5.22 | 0.01 | -0.89 |
| Gas | 44.6 | 33.6 | 7.33 | 10.44 | 0.13 | 0.05 | 4.75 | 6.69 |
| Electricity | 31.8 | 37.6 | 8.23 | 8.73 | 3.30 | 2.51 | 6.48 | 6.51 |
| **Industrial** | | | | | | | | |
| Petroleum | 39.3 | 36.2 | 3.62 | 2.83 | 0.26 | -7.15 | 2.44 | -0.78 |
| Gas | 35.5 | 19.1 | 4.34 | 10.6 | -3.00 | -1.47 | 1.72 | 6.23 |
| Electricity | 11.9 | 16.0 | 5.64 | 9.07 | 2.66 | 3.55 | 4.59 | 7.11 |
| Coal | 13.5 | 28.7 | -0.64 | 1.16 | -4.36 | -9.11 | -1.96 | -2.56 |
| **Fuel Shares** | | | | | | | | |
| Petroleum | 53.8 | 58.2 | 3.73 | 3.34 | 0.17 | -1.82 | 2.48 | 1.50 |
| Gas | 28.3 | 18.5 | 4.48 | 6.60 | -1.74 | -0.72 | 2.26 | 3.98 |
| Electricity | 12.2 | 13.6 | 7.12 | 9.31 | 2.98 | 3.17 | 5.66 | 7.12 |
| Coal | 5.7 | 9.7 | -3.23 | 0.48 | -4.59 | -9.11 | -3.71 | -2.98 |
| **End-Use Shares** | | | | | | | | |
| Residential | 15.9 | 19.4 | 3.13 | 2.92 | -0.75 | 0.40 | 1.75 | 2.04 |
| Commercial | 10.2 | 10.4 | 3.97 | 4.49 | 0.26 | -0.97 | 2.65 | 2.89 |
| Industrial | 40.3 | 33.6 | 3.12 | 3.17 | -1.47 | -5.68 | 1.49 | -0.02 |
| Transportation | 33.5 | 36.6 | 4.46 | 4.54 | 0.87 | 0.67 | 3.19 | 3.17 |

(a) Data from Ref. 1 and 3.

coal usage (9.7 percent) is far above the national average, due largely to Bethlehem Steel's massive facility at Sparrow's Point near Baltimore.

Energy usage grew rapidly in Maryland between 1960 and 1973, though less rapidly than the rest of the U.S., for all major energy forms with the exception of the industrial usage of coal. Electricity demand grew particularly rapidly. Although there has been an overall fall-off in energy demand since 1973, electricity consumption has continued to increase, albeit at a considerably slower rate. This post-1973 conservation has occurred, both for Maryland and the rest of the Nation, in all major end-use classes. The demand reduction by Maryland industry is attributable to both energy conservation efforts and the decline in manufacturing activity in the State over the past ten years.

Maryland imports the vast majority of the primary energy it consumes. The only type of primary energy (other than hydroelectricity) produced in Maryland is coal. In 1980 approximately 3.8 million tons were mined in Garrett and Allegheny Counties, while the total consumed in the State (including utility boiler usage) amounted to 9.3 million tons (6). Only very small amounts of natural gas and no oil are produced in the State.

Although Maryland is heavily dependent upon imports for its primary energy (includes all forms of energy consumed), it is, for all practical purposes, able to generate most of the electric energy required in the State. The important trend in electric power supply is the tendency to move away from oil- and gas-fired generation to greater emphasis on coal and hydroelectricity. This trend is illustrated in Table I-7, which shows generating capacity by fuel types for electric utilities operating in Maryland for the year 1982 and projections for 1992. The figures in this table include generating units owned by Maryland utilities located out of State. In 1982 approximately 59 percent of capacity was coal-fired and 28 percent oil- or gas-fired. As a result of new additions, retirements and coal conversions, 61.9 percent of generating capacity will be coal-fired by 1992, while oil-fired capacity falls to 22.5 percent.

Table I-7. Electric Utility Generation Capacity, Maryland Utility Systems, 1982 and 1992[a] (Megawatts)

| | 1982 | | 1992 | |
|---|---|---|---|---|
| | MW | % | MW | % |
| Oil/Gas | 5,935 | 28.5% | 5,215 | 22.5% |
| Coal | 12,208 | 58.6 | 14,345 | 61.8 |
| Hydroelectric | 708 | 3.4 | 1,673 | 7.2 |
| Nuclear | 1,969 | 9.5 | 1,969 | 8.5 |
| Total | 20,820 | | 23,202 | |

(a) Based on Summer 1982 capacity; projections based on planned additions and retirements. Data from Ref. 4.

In addition to a trend toward greater coal usage, hydroelectric capacity will also increase substantially over the next decade, due principally to the Bath County pumped storage project. APS owns 20 percent of this project, with the option of increasing its ownership to 50 percent by late 1984. By 1992 hydro will account for approximately 7 percent of total capacity in Maryland, well below the projected nationwide figure of 12 percent (2).

Despite the incentives created by rising oil and gas prices, nuclear's share of total generating capacity is expected to fall. This contrasts with a substantial projected increase in nuclear power nationwide. None of the Maryland utilities have any plans for new nuclear capacity over the next decade. Nationally, there are many nuclear units under construction that will be coming on-line in the next few years. As shown on Table I-7, nuclear is now 9.5 percent of generating capacity of Maryland utilities and is expected to account for 8.5 percent in 1992. For the U.S., nuclear is expected to account for 14 percent of capacity in 1990.

## C. The Electric Utility Industry in Maryland

Households and businesses in Maryland obtain electric services from four large and several small utilities. The Maryland service areas of these utilities are shown in Figure I-3. Each of these utilities can be placed into one of three main categories:

(1) 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. The majority of Maryland electric customers are served directly at retail by these utilities, and they produce almost all the power consumed in Maryland.

(2) Municipal utilities -- Several medium-sized and small towns in the State own and operate their own utility systems. With one notable exception, municipal utilities in Maryland purchase nearly all their power at bulk from the investor-owned utilities and perform only a retail distribution function. Despite the fact that they are publically owned, the municipal utilities are subject to Maryland Public Service Commission regulation.

(3) Rural electric cooperatives -- Like municipals, coops are operated as nonprofit utilities. Just as municipals are "owned" by the voters, the coop is operated by and for the coop members, with financial assistance from the Federal Rural Electrification Administration. Coops are also subject to regulation by the Maryland Commission. The geographic area served by coops is typically rural, but it also includes some small and medium-sized towns.

With the resurgence of interest in cogeneration and small power production (discussed in Chapter II), some large power users (and even some households) may satisfy some or all of their power needs with their own power production. Currently, the Bethlehem Steel facility at Sparrows Point and the Westvaco Corporation in Luke, Maryland generate much of their own power requirements.

This section identifies and provides some background on the various utilities providing electric service in Maryland. As will be shown, there is considerable interaction amongst the Maryland utilities and with utilities operating in other states. To understand how the electric utility industry in Maryland functions it is necessary to explore these interrelationships.

## The Investor-Owned Utilities

Seven investor-owned utilities operate in Maryland. However, only four of the seven function in Maryland as fully integrated systems producing, transmitting and distributing power to retail customers. Operating data for each utility are summarized in Table I-8; each utility is briefly described below.

Baltimore Gas & Electric Company (BG&E) -- BG&E serves over 850,000 electric customers in the Baltimore Metropolitan Area. Unlike all other investor-owned utilities in the State, BG&E's entire service territory is in Maryland, and it has no wholesale

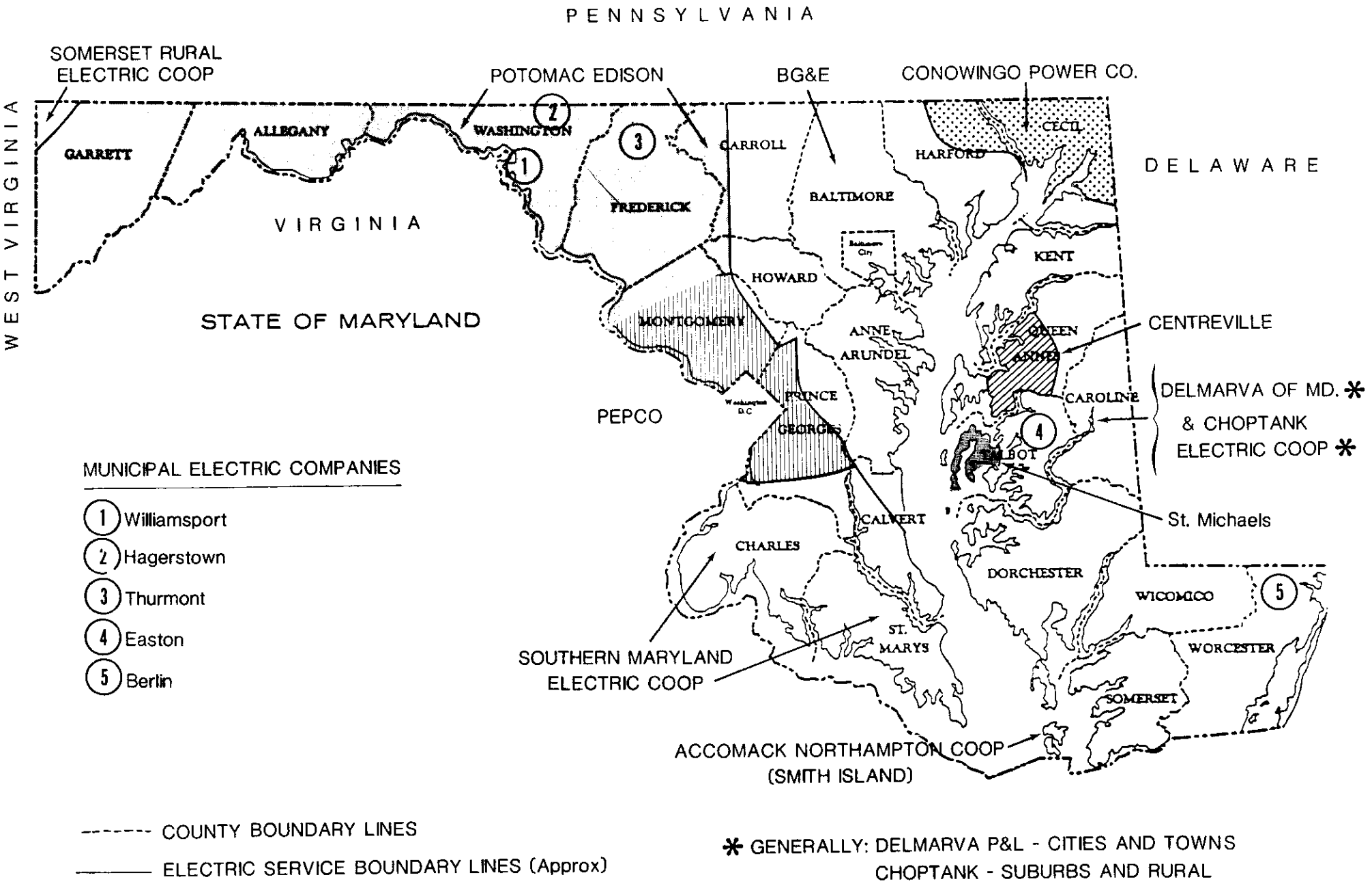



Figure I-3. Service areas of Maryland electric utilities.

customers (i.e., it does not serve any municipals or cooperatives). BG&E is also the State's only investor-owned combined gas/electric utility. In 1982 it experienced a peak load of 3,924 megawatts with an installed capacity of 5,025 megawatts.

Delmarva Power & Light Company (DP&L) -- DP&L, directly or indirectly, provides almost all of the power consumed on the Delmarva Peninsula (and thus Maryland's Eastern Shore) with the exception of Cecil County, the City of Dover (Delaware) and the Town of Easton (Maryland). DP&L serves roughly three-quarters of the Peninsula at retail (about 289,000 customers) and the remainder at wholesale, except for the areas noted above. In 1982 the Company experienced a peak of 1,523 megawatts with an installed capacity of 2,303 megawatts. Maryland currently accounts for approximately one-quarter of DP&L's load, but less than 10 percent of the Company's generating capacity is located in Maryland.

Potomac Electric Power Company (PEPCO) -- PEPCO serves over 527,000 customers at retail in the District of Columbia and the Maryland suburbs of Prince George's and Montgomery counties. It indirectly serves the Southern Maryland counties (Charles, St. Mary's and Calvert) through its wholesale sales to the Southern Maryland Electric Cooperative (SMECO). It also serves a small number of retail customers in Northern Virginia. PEPCO's 1982 peak demand was 4,146 megawatts with installed capacity of 5,343 megawatts.

Potomac Edison Company (PE) -- PE, the Maryland operating subsidiary of the Allegheny Power System (APS), provides power to the Western Maryland counties and contiguous areas in Virginia and West Virginia. The other two operating subsidiaries, Monongahela Power and West Penn Power, serve the northern half of West Virginia and southwestern Pennsylvania, respectively. APS currently has 7,514 megawatts of installed capacity, and during the winter of 1982/1983 it experienced a peak demand of 5,022 megawatts. During the winter of 1981/ 1982 APS experienced a peak of 5,720 megawatts. (APS and all three operating subsidiaries are winter peaking.) PE accounts for approximately 30 percent of the APS load and capacity.

Conowingo Power Company -- Conowingo is the Maryland operating subsidiary of the Philadelphia Electric Company, a large, integrated utility. In 1982 it served about 26,000 customers in Cecil County in the extreme northeast part of the State and experienced an annual (winter) peak load of 107 megawatts. Conowingo owns no generating capacity and purchases all of its power requirements from Philadelphia Electric (or Susquehanna Power, a corporate affiliate).

Pennsylvania Electric Company (Penn Elec) -- Penn Elec is a large, integrated utility and is a subsidiary of General Public Utilities (GPU). However, it has no retail service territory in Maryland, nor does it have any firm wholesale customers in the State. It is classified as a Maryland utility since it operates

Table I-8. Maryland Investor-Owned Utilities, 1982[a]

| Utility | Sales (Thousand MWh) Residential | Nonresidential | Total | Generation (Thousand MWh) | Peak Demand (MW) (c) | Installed Capacity (MW) | Customers |
|---|---|---|---|---|---|---|---|
| APS | 8,834 | 18,706 | 27,540 | 36,821 | 5,022 (w) | 7,514 | 1,140,909 |
| BG&E | 6,102 | 11,190 | 17,292 | 17,184 | 3,924 (s) | 5,025 | 853,592 |
| Conowingo | 223 | 244 | 467 | -0- | 107 (w) | -0- | 26,028 |
| DP&L | 2,026 | 5,223 | 7,249 | 9,112 | 1,523 (s) | 2,303 | 288,607 |
| Penn Elec | -0- | -0- | -0- | 26 | -0- | 19 | -0- |
| PEPCO | 4,095[b] | 11,882[b] | 15,977[b] | 16,463 | 4,146 (s) | 5,343 | 527,350[b] |
| Susquehanna | -0- | -0- | -0- | 1,581 | -0- | 475 | 2 |
| Total | 21,280 | 47,245 | 68,525 | 76,877 | | 20,679 | 2,836,488 |

(a) With the exception of Penn Elec, figures include non-Maryland portions of the system. Data from Ref. 7.

(b) Excludes SMECO sales and customers but includes SMECO's load at the time of the PEPCO peak and SMECO's proportionate share of system generation.

(c) "w" denotes winter peak, and "s" denotes summer peak.

a 19-megawatt hydroelectric facility at the Deep Creek site in Garrett County. This power is exported to its Pennsylvania service area.

Susquehanna Electric Company -- Susquehanna Electric Company operates the 475-megawatt Conowingo hydro project which it leases from Susquehanna Power Company. Both Susquehanna Electric and Susquehanna Power are subsidaries of Philadelphia Electric Company which purchases all of the power generated by Susquehanna. Susquehanna Electric Company has no retail customers, and it sells virtually all the power generated at Conowingo to its parent, Philadelphia Electric.

## The Municipals and Cooperatives

The municipal utilities and rural electric cooperatives operating in Maryland are listed on Table I-9, along with summary operating data. Taken as a group these utilities serve about 115,000 of the roughly 1.3 million electric customers in the State. Their 1982 sales were 1.8 million MWhs with a combined (non-coincident) peak demand of 431 megawatts. SMECO accounts for more than half of the sales and customers. With only 74 megawatts of capacity these utilities are heavily dependent upon outside sources of power. Moreover, in 1982 they generated only 48,712 megawatt hours (or 5.6 megawatts per hour) for a capacity factor of 7.5 percent. Thus the 48,712 megawatt-hours generated account for only 3 percent of their own 1982 requirements. It should be noted that wholesale (or interchange) power transactions between the investor-owned utilities and the municipals or cooperatives is not subject to regulation by the Maryland Public Service Commission. They fall under the jurisdiction of the Federal Energy Regulatory Commission (FERC).

There are currently five municipals in Maryland -- the towns of Berlin, Easton, Hagerstown, Thurmont and Williamsport. Berlin, located on the Eastern Shore near Ocean City, serves 1,225 customers and experienced a 1982 winter peak of 5.4 megawatts. It obtains nearly all of its power from DP&L but maintains 3.6 megawatts of combustion turbine capacity that it uses for peaking purposes. The towns of St. Michaels and Centreville on the Eastern Shore previously operated municipal distribution systems, but their facilities were recently absorbed by DP&L.

Easton Utilities provides electric and gas service to 5,600 customers near the Bay side of the Eastern Shore. Easton owns 48 megawatts of capacity which is well in excess of its 1982 peak load (winter) of 27 megawatts. In 1982 it produced only about one-third of its power requirements from its own plants, purchasing the remainder on an interchange basis from DP&L. It purchases most of its power needs because for most of the year buying interchange power is less expensive than operating its own units. Easton currently has an application before the Public Service Commission to switch from expensive distillate fuel to

Table I-9. Municipal Utilities and Rural Electric Cooperatives in Maryland, 1982[a]

| Utility | Sales (MWh) Residential | Sales (MWh) Nonresidential | Sales (MWh) Total | Peak Demand (MW) (b) | Installed Capacity (MW) | Generation (MWh) | Retail Customers | Power Supply |
|---|---|---|---|---|---|---|---|---|
| Municipals | | | | | | | | |
| Berlin | 7,727 | 16,288 | 24,015 | 5.4 (w) | 3.6 | 1,424 | 1,225 | DP&L |
| Easton | 34,155 | 77,548 | 111,703 | 27.0 (w) | 47.8 | 47,288 | 5,592 | DP&L |
| Hagerstown | 81,755 | 124,421 | 206,176 | 43.9 (s) | 23.0 | -0- | 16,921 | PE |
| Thurmont | 12,632 | 20,221 | 32,853 | 8.2 (w) | -0- | -0- | 1,433 | PE |
| Williamsport | 7,242 | 4,945 | 12,187 | 3.7 (w) | -0- | -0- | 777 | PE |
| Cooperatives | | | | | | | | |
| A&N[c] | 49,899 | 47,455 | 97,354 | 21.4 (s) | 2.8 | 14 | 7,970 | DP&L |
| Choptank | 223,951 | 77,960 | 301,911 | 78.0 (w) | -0- | -0- | 24,841 | DP&L |
| Somerset[c] | 83,851 | 69,049 | 152,900 | 44.6 (w) | -0- | -0- | 8,908 | Alleg. Coop |
| SMECO | 637,630 | 425,662 | 1,063,292 | 264.7 (s) | -0- | -0- | 64,191 | PEPCO |
| Total[d] | 1,005,092 | 747,045 | 1,752,137 | 430.9 | 74.4 | 48,712 | 114,980 | |

(a) Data from Ref. 7.

(b) "w" denotes winter peak, and "s" denotes summer peak.

(c) Figures for A&N and Somerset include their non-Maryland operations.

(d) Excludes A&N and Somerset.

less expensive residual oil. This change will probably result in greater usage of Easton's units. Easton plans to retire 4 megawatts of capacity over the next ten years and add 6.25 megawatts in 1993.

Thurmont and Williamsport serve about 1,500 and 800 customers, respectively, in Western Maryland. Both utilities obtain all of their power from PE. Williamsport, however, has expressed interest in a small-scale hydroelectric project which potentially could displace some of the power purchased at retail from PE. In 1982 Thurmont experienced a peak demand of 8.2 megawatts compared to 3.7 megawatts for Williamsport.

Hagerstown is the largest municipal utility in Maryland, serving nearly 17,000 customers and selling over 200,000 megawatt hours in 1982. The City owns 23 megawatts of oil-fired capacity, approximately half of its 1982 peak demand of 44 megawatts, but it produced no power in 1982. Hagerstown's capacity is oil-fired, and it is less expensive to purchase the predominantly coal-fired electricity from PE.

Four rural electric cooperatives operate in Maryland -- A&N, Choptank, Somerset and SMECO. However, A&N and Somerset have only very small service areas in Maryland. A&N serves nearly 8,000 customers on Virginia's Eastern Shore (Accomack and Northampton Counties) and serves a few hundred customers on Maryland's Smith Island. The Island owns 800 kW of generating capacity which it uses only on a standby basis. Nearly all of A&N's power requirements are served by DP&L in both Maryland and Virginia. Somerset operates mainly in southcentral Pennsylvania and serves a few hundred Maryland customers in Garrett County. It obtains its power from the Allegheny Electric Cooperative.

Choptank serves nearly 25,000 customers spread over much of Maryland's Eastern Shore. It is currently a full-requirements customer of DP&L. Its parent organization, the Old Dominion Electric Cooperative, plans to acquire 50 megawatts of DP&L's Vienna 9 coal-fired unit, now planned for 1995. The 50 megawatts will be apportioned among A&N, Choptank and the Delaware Electric Cooperative and will thereby reduce wholesale purchases. Choptank's 1982 peak load was 78 megawatts.

SMECO is the largest public power entity operating in Maryland. In 1982 it sold 1.1 million megawatt hours to its 65,000 customers. SMECO is a full requirements, wholesale customer of PEPCO. Although SMECO has no generating facilities, it is attempting to meet some of its power needs through a direct load control program (see Chapter II). SMECO's 1982 peak demand was 265 megawatts, which makes it approximately 7 percent of the total PEPCO system.

Structural Interrelationships

Electric utilities in Maryland do not operate as isolated entities but engage in extensive power transactions with other utility systems. Moreover, with the exception of BG&E all of the major utilities in the State are part of multi-state utility systems.

These interrelationships are shown in Figure I-4. The bottom portion of the figure lists the Maryland utilities. (Because of their small size in Maryland, A&N and Somerset are excluded.) Sales for resale are indicated by a single-headed arrow, interchanges are indicated by a bidirectional arrow,[1] and a heavy line indicates corporate affiliation. In the "Maryland" part of the figure, PE is shown selling power wholesale (single arrow) to three municipals. The heavy line indicates that PE is multi-state and part of a larger entity, the APS. Delmarva's relationship with Easton is an interchange, thus the double arrow. The middle part of the figure shows the non-Maryland portion of the utility systems. PE operates in three other states, PEPCO operates in the District of Columbia and Virginia, etc.

The third level of the figure attempts to show transactions between utilities and various power pooling arrangements. PE is part of the three-utility APS, which is both a holding company and a fully integrated power pool. As a holding company, APS is largely financially integrated and centrally planned; that is, generating unit additions are scheduled to meet the growth in the APS peaks, not the individual company peaks. Under the APS Power Supply Agreement (approved by FERC) ownership in new capacity added to meet the systemwide peak is allocated to the three companies in proportion to their peak demand growth. Operationally, generating units are dispatched on an economic basis to meet systemwide -- not company -- loads. Thus at any given time a company may be importing from or exporting power to a corporate affiliate rather than just meeting its own needs. The pricing of these power transfers is also governed by the Power Supply Agreement.

PEPCO, BG&E and Delmarva are members of the Pennsylvania-New Jersey-Maryland (PJM) power pool. In addition to the three Maryland utilities, the pool includes nearly all New Jersey utilities and Pennsylvania utilities operating in the central and eastern part of the State. PJM serves two principal purposes: it affords its members greater reliability (and thus reduces their required reserve margins) by enabling them access

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[1]Generally, interchange relationships potentially involve two-way flows of power. For example, during some hours the City of Dover sells power to DP&L, and at other times DP&L sells to Dover. Wholesale transactions are almost always one way. Moreover, interchange sales normally do not involve a long-run commitment to provide service on demand. Wholesale sales are typically considered "firm", i.e., obligations of the seller.

to the resources of the pool to meet emergency needs; and it serves to reduce energy costs through "economy dispatch." The members pool their operations so that the PJM-wide load, at any given moment, is met by the least expensive units to operate. The PJM Interconnection Office in Valley Forge, Pennsylvania facilitates this practice by collecting load and unit availability information from utilities on an hour-by-hour basis and signaling the dispatch running rates (i.e., the cost of operating the most expensive unit) to individual utility dispatching centers. The pool dispatches sufficient generation to meet the total PJM load. The member utilities determine after the fact how much energy was bought or sold each hour. Power transactions within PJM are normally priced at the "split-savings" rate, i.e., halfway between the running rate of the selling utility and the operating cost the buying utility would have incurred if it had not purchased the power. In addition to these intrapool transactions, each member may purchase coal-fired energy directly from APS on a weekly basis, which is then treated as their own capacity. Unlike APS, individual PJM - utilities perform their own generation and financial planning rather than have those functions performed at the pool level; however, the PJM Interconnection Office is a systemwide operational control center that also helps to coordinate generation planning and maintenance.

Taking the power pooling concept one step further, the Maryland utilities also belong to reliability councils. In the late 1960's, regional electric reliability councils were established to further augment the reliability and adequacy of bulk power facilities through a higher degree of coordinated planning of their generation and transmission facilities. The councils are voluntary associations of interconnected electric utilities with no association with the federal or state governments. Currently, there are nine such councils which cover the entire U.S. and portions of Canada. Their chief function is to (1) establish and review on a continuing basis planning principles, procedures and standards affecting reliability to bulk supply system, and (2) review and evaluate each member's planning for generation and transmission facilities for conformance with established principles. They also provide minimum criteria for operating reliability.

APS belongs to the East Central Area Reliability Council (ECAR) which includes 18 other electric systems. ECAR extends throughout Indiana, Michigan, Ohio, Kentucky, West Virginia and Virginia, in addition to APS' service area. The other Maryland utilities are members of the Mid-Atlantic Area Council (MAAC). The membership of this Council consists of PJM's members and the UGI Corporation.

Finally, the various power systems engage in transactions with other power systems outside the scope of power pooling. For example, in 1982 APS sold large quantities of power to the PJM companies. In addition to economy or opportunistic short-term transactions, it engaged in longer term firm power commitments

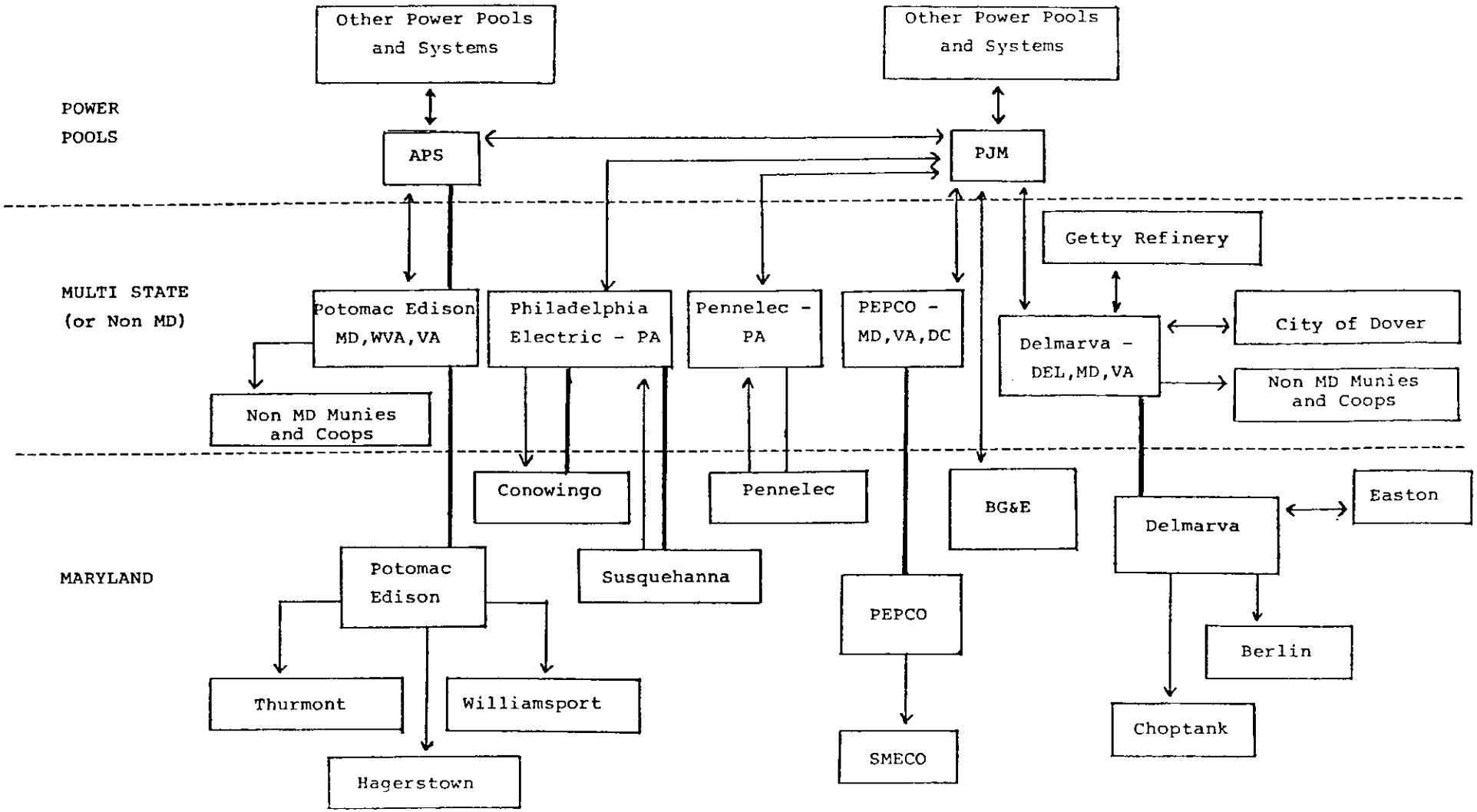


Figure I-4
Schematic diagram of the electric utility industry in Maryland

with Public Service Electric and Gas Company and Atlantic City Electric Company. For the past few years it has maintained a diversity exchange agreement with Virginia Electric Power Company (VEPCO). Under this agreement APS provides up to 300 megawatts of power to VEPCO during the summer months in exchange for a like amount of power in the winter months. PEPCO has recently concluded a power purchase arrangement with the Ohio Edison Company for 150 megawatts of power through the late 1980s. With utilities located in the Ohio Valley experiencing excess coal-fired capacity, west to east power transactions have become increasingly prevalent. They have greatly benefitted both the selling and purchasing utilities.

Power systems may also interact through joint construction ventures or shared ownership of capacity. Slow demand growth and the financial burden of constructing power plants have encouraged this trend. DP&L plans to jointly own the Vienna 9 unit with Atlantic City Electric (125 megawatts) and the Old Dominion Electric Cooperative (50 megawatts). APS has committed to a 20 percent ownership share in the Bath County pumped storage project. BG&E is considering a shared ownership arrangement for its possible future unit at Perryman (7,8).

The importance of system participation and power transactions is illustrated in Tables I-10 and I-11. Table I-10 compares energy generated in Maryland with electric energy consumed in Maryland. Maryland consumes approximately 30 percent more electric power than it produces. PEPCO produces substantially more energy in Maryland than it consumes, exporting principally to its District of Columbia customers. The largest net importer is PE; its generating capacity in the State is only about 10 percent the size of its peak demand.

On a systemwide basis the power supply/demand relationships are far more balanced. Table I-11 shows power purchases and sales with other (nonassociated) utilities. The percentages on the table measure these transactions as a percentage of the utility system's entire operations. In general, they demonstrate that transactions with other utilities play a very major role in the way these systems actually operate. For example, 20.9 percent of APS' net power supply was exported to other utilities. BG&E and PEPCO were net importers of power in 1982, importing (net of exports) 1,688 and 1,224 thousand megawatt-hours, respectively. This is a major change from 1980 when both were net exporters of power and reflects the availability and attractiveness in 1982 of coal-fired power imported from the west.

### 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 has a very

Table I-10. Energy Capacity, Production and Consumption in Maryland, 1982[a]

| Utility | Capacity (MW) | Production (Thousand MWh) | Consumption[b] (Thousand MWh) | NetExports[c] (Thousand MWh) |
|---|---|---|---|---|
| PEPCO | 3,895 | 13,358 | 9,939 | 3,419 |
| BG&E | 4,337 | 14,212 | 18,285 | -4,073 |
| DP&L | 174 | 287 | 2,012 | -1,725 |
| PE (APS) | 117 | 514 | 5,837 | -5,323 |
| Total | 8,523 | 28,371 | 36,073 | -7,702 |

(a) Data from Ref. 4 and 5.

(b) Includes estimates of Maryland losses and sales for resale.

(c) Net Exports = Production - Consumption.

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Table I-11. 1982 Interchanges, Purchases and Sales[a] (Thousands of MWh)

| | PEPCO | BG&E | DP&L | APS | Total |
|---|---|---|---|---|---|
| Net Power Supply | 18,152 | 18,411 | 7,794 | 30,464 | 74,821 |
| System Generation | 16,463 | 17,187 | 9,112 | 36,821 | 79,583 |
| Off-System Power Sales and Purchases | | | | | |
| Power Purchases | 6,547 | 2,998 | 1,034 | 10,059 | 20,638 |
| % of Net Power Supply | 36.1% | 16.3% | 13.3% | 33.0% | 27.6% |
| Power Sales[b] | 4,859 | 1,774 | 2,352 | 16,416 | 25,401 |
| % of Net Power Supply | 26.8% | 9.6% | 30.2% | 53.9% | 34.0% |
| Net Exports[c] | -1,689 | -1,224 | 1,318 | 6,357 | 4,763 |
| % of Net Power Supply | 9.3% | 6.7% | 16.9% | 20.9% | 6.4% |

(a) Data from Ref. 4

(b) Sales to nonassociated utilities.

(c) Net Exports = Power Sales (off-system) - Power Purchases.

substantial amount of service territory outside of the State. This section examines the service areas of each utility. In particular, the factors influencing the demand for electricity in each service area are discussed.

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 George's 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 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; the impetus for growth is expected to come from the commercial sector. In 1970 manufacturing accounted for 22 percent of the 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 significant 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 in Table I-12 and Figure I-5, electricity demand growth slowed noticeably for each major customer class and for peak demand since 1973 which was the year of the oil embargo. The most dramatic change has been a decline in peak demand growth from 9.1 percent per year to 1.8 percent. However, two distinct trends have occurred since 1973. Significant load growth occurred in the late 1970s, and in the last few years very little growth took place. For example, BG&E's all time peak occurred in 1980. The system load factor decreased during the period 1966 to 1973 and has remained fairly constant since then.

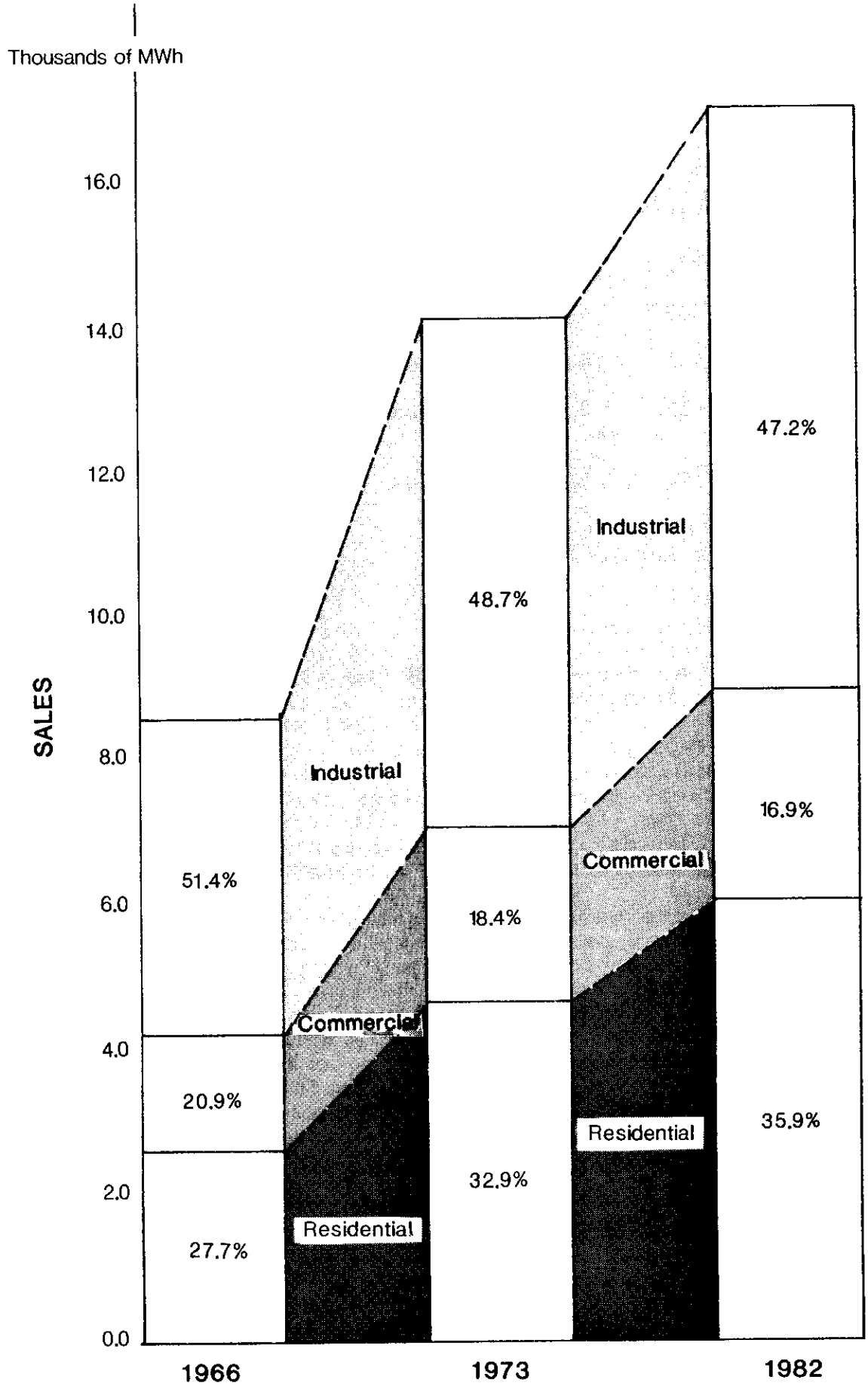


FIGURE I-5. GROWTH IN ENERGY ON THE BG&E SYSTEM

(data from Table I-12)

Table I-12. Growth in Energy and Peak Demand on the BG&E System[a] (Thousands of MWh)

| | 1966 | 1973 | 1982 | Annual Growth Rates 1966-1973 | 1973-1982 |
|---|---|---|---|---|---|
| Residential | 2,347 | 4,618 | 6,102 | 10.2% | 3.1% |
| Commercial | 1,771 | 2,582 | 2,880 | 5.5 | 1.2 |
| Industrial | 4,365 | 6,845 | 8,020 | 6.6 | 1.8 |
| Total | 8,653 | 14,341 | 17,292 | 7.5 | 2.1 |
| Peak Demand (MW) | 1,817 | 3,334 | 3,924 | 9.1 | 1.8 |
| Load Factor | 58.9% | 52.7% | 53.6% | | |

(a) Data from Ref. 3 and 7.

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, have been growing rapidly, and 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. Howard and Anne Arundel counties are expected to continue to grow considerably more rapidly than the rest of the State although at a slower rate than in the past. These trends toward a declining heavy manufacturing sector and increased suburbanization tend to offset to some degree the improvement in load factor afforded by increased saturation of electric space heating.

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