

CHAPTER 8

Electric Power*

The U.S. electric utility industry has grown from an infant born in the 1880's to a giant ranked the largest in the Nation today. It has expanded at a pace nearly twice that of the overall economy, doubling roughly every 10 years and increasing at an annual compound rate of about 7 percent. Electricity provides over 22 percent of the basic energy needs in the United States today and is expected to supply nearly 28 percent by 1975. Total electric plant investment of all electric utilities in the country, both privately and publicly owned, amounted to approximately \$82 billion at the end of 1965.

A. NATURE AND COMPOSITION OF ELECTRIC POWER FACILITIES

1. DESCRIPTION

An electric power supply system is composed of many interdependent parts that serve three more-or-less distinct major functions—generation, transmission, and distribution. The significance of these functions on cost to the consumer, based on composite national statistics for 1962, is shown in table 1.

TABLE 1.—Total delivered cost of power, 1962

[Composition in percent]

	Fixed charges	Operating expenses	Total cost
Generation.....	28.2	22.8	51.0
Transmission.....	7.9	2.0	9.9
Distribution.....	22.8	16.3	39.1
Total.....	58.9	41.1	100.0

Generating plants fall into five principal types: steamplants (fossil fuel and nuclear), conventional hydroelectric stations, pumped-storage projects, internal combustion units, and gas turbines.

Steamplants generate electricity from the energy in fossil fuels or nuclear sources by heating water to steam and using the steam, under pressure, to drive turbines which convert the energy into electrical form.

Hydroelectric plants develop the water power potential of our rivers by using the energy of falling water to drive turbines that turn the generators.

Pumped-storage plants are a type of hydroelectric development, where low-cost energy produced for the most part at steam-electric

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