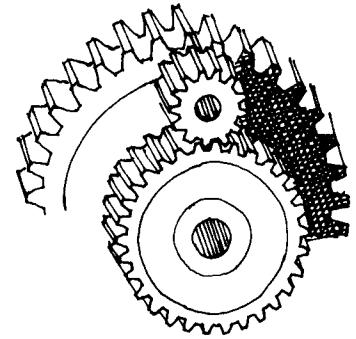


Productivity Reports



Pilot study measures productivity of State, local electric utilities

DONALD M. FISK

State and local government electric power output per employee increased 52 percent between 1967 and 1978, in line with the productivity advance of private utilities and more than double the increase in the private economy.¹ (See table 1.)

The electric utilities owned by States, counties, and municipalities posted an average annual increase of about 3 percent over the 12-year period, according to a pilot study by the Bureau of Labor Statistics. Between 1967 and 1972, the average annual increase was 6.7 percent but fell to 2.8 percent between 1973 and 1978, in response to the sharp increase in fuel costs, higher interest rates, uncertainty concerning future demand, rising construction costs, regulatory delay, and new environmental protection requirements.

The data were developed as part of an investigation into the feasibility of calculating a series of State and local government productivity indexes. Currently, no national productivity indexes exist for State and local governments, which employ 13.4 million persons, or 13 percent of the civilian labor force.

Electric power generation and distribution was selected as one of the first services to be examined because of its readily identifiable output, good base of analytic knowledge, ongoing data collection system, and private sector measurements. The methodological approach followed that used for private sector utilities.

Rise in output uneven

The number of kilowatt hours sold by State and local government electric utilities to "ultimate customers" (electricity users or consumers) increased 64 percent between 1967 and 1978. The average annual increase was 4.0 percent. Output increased every year, although the growth between 1971 and 1975 was not as large as in

the preceding and subsequent years. The average annual increase between 1967 and 1971 was 8.3 percent; between 1971 and 1975, it was 1.3 percent; and between 1975 and 1978, it was 4.4 percent.

Like kilowatt hours, the number of customers served and the amount of revenue earned by State and local electric utilities increased in every year between 1967 and 1978. The average increase in customers was relatively constant at 2.3 percent per year. The annual average increase in revenue was 11.7 percent (unadjusted for price change) with rapid acceleration in the latter part of the period. The average annual increase between 1973 and 1978 was 17.9 percent.

State and local systems sell about 37 percent of their kilowatt hours to residential users, 56 percent to industrial or commercial users, and 7 percent to other users, such as railroads and highway and street lighting authorities. These percentages were virtually unchanged throughout the period.

Output of the 33 largest utilities—those with over 1 billion kilowatt hour sales in 1978—increased 6 percent, or faster than total output. In absolute terms, the growth in sales was 95 percent, compared with 64 percent for all public utilities.

Table 1. Output per employee, output, and employees of State and local government electric utilities, 1967-78

[1967 = 100]

Year	All utilities			Large utilities		
	Output per employee	Output	Employees	Output per employee	Output	Employees
Index:						
1967	100.0	100.0	100.0	100.0	100.0	100.0
1968	110.5	108.7	98.4	104.9	105.5	100.6
1969	127.1	118.8	93.5	111.1	114.9	103.4
1970	129.9	128.2	98.7	116.1	124.0	106.8
1971	136.6	137.3	100.5	117.1	130.0	111.0
1972	137.9	138.9	100.7	126.2	140.1	111.0
1973	135.9	141.6	104.2	135.7	153.5	113.1
1974	135.1	143.3	106.1	132.5	152.8	115.3
1975	135.4	143.9	106.3	135.8	156.5	115.2
1976	144.2	151.4	105.0	144.0	165.7	115.1
1977	151.4	157.3	103.9	159.4	183.9	115.4
1978	152.4	164.1	107.7	164.0	195.3	119.1
Average annual percent change:						
1967-1978	3.0	4.0	0.9	4.4	6.0	1.6
1973-1978	2.8	3.1	.3	4.6	5.3	.7

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Employment growth slows

Employment in State and local government electric power utilities increased about 8 percent between 1967 and 1978, an average annual rate of increase of 0.9 percent. Between 1973 and 1978, the rate declined to 0.3 percent. In 1978, these utilities employed about 66,000 persons, 7 percent of whom worked part time.

Between 1967 and 1978, employment by large utilities increased about 19 percent, an average annual change of 1.6 percent, or double the industry average. The rate decreased to 0.7 percent between 1973 and 1978.

Statistics are not available to compute a public electric utility hours index but other data suggest that such an index would parallel the total employee index. The trend of the number of full-time equivalent employees, for example, matches the trend of total employment. Also, the trends of labor hours and total employment closely parallel each other for the private electric utilities (table 2).

Wages and salaries of the public utility employees increased 117 percent between 1967 and 1978, an average annual rate of increase of 7.8 percent. Between 1967 and 1972, the rate was 6.6 percent, almost the same as the increase in output per employee. Between 1973 and 1978, the average annual increase was 7.5 percent, while output per employee dropped to 2.8 percent per year.

Market share

There are about 2,220 State and local government electric power utilities in the United States today. Every State except Hawaii and Montana has at least one government-owned utility. Iowa, Kansas, Minnesota, and Nebraska each have more than 100. Almost all are operated by local governments. Of the several dozen State-

operated utilities, four account for most of the sales to ultimate customers. They are located in New York, South Carolina, Oklahoma, and Texas.

State and local government utilities sell about 12 percent of the Nation's kilowatt hours, serve about 14 percent of the electric utility customers and own about 12 percent of the industry's plant and equipment. Most of the government utilities are small, having on the average about 30 employees.

By contrast, the 1,160 utilities owned by investors and cooperatives have on the average about 435 employees each. They sell 84 percent of the Nation's power, serve 86 percent of the market and own 80 percent of the industry's plant and equipment.

The Federal Government, which is primarily a generator and wholesaler of electricity, accounts for the balance.

In 1967, State and local government generating capacity was divided among steam, 66 percent, hydroelectric, 29 percent, and internal combustion, 5 percent. By 1978, in a shift away from steam, nuclear power accounted for 8 percent of capacity.

Today, State and local governments generate almost as much electricity as they distribute and sell. As recently as 1970, they purchased about 30 percent of the power they sold.

Large systems dominate sales and service. The top 10 account for about 35 percent of the kilowatt sales, the top 25, about 50 percent, and the top 150, about 85 percent. The 25 largest utilities employ, on the average, 1,150 employees.

The smaller utilities are increasingly joining forces to capture some of the economies enjoyed by the large utilities. There are 51 joint public action agencies in 31 States involving more than half of the 2,220 public power systems. Joint action projects range from joint purchasing to joint ownership of generating and transmission facilities.

Private utilities

As noted, aggregate growth in output per electric utility employee between 1967 and 1978 was about the same in the private utilities as in State and local government, or 50 percent compared with 52 percent. However, the annual growth rates of the two types of enterprises varied substantially by subperiod.

Private output and employment grew much faster. (See table 2.) For output, the increase was 92 percent compared with 64 percent, and for employment, 28 percent compared with 8 percent.

A somewhat different picture emerges when the large State and local utilities are compared with all private utilities. The big public systems have about 925 employees each, compared with 435 in the private utilities. Output per employee grew faster in the government

Table 2. Output per employee, output, employees and employee hours of private-sector electric utilities, 1967-68
[1967=100]

Year	Output per employee	Output	Employees	Employee hours
Index:				
1967	100.0	100.0	100.0	100.0
1968	107.7	110.1	102.2	102.3
1969	114.7	120.6	105.1	105.8
1970	118.7	129.5	109.1	109.4
1971	125.1	138.0	110.3	110.3
1972	132.1	149.7	113.3	113.8
1973	137.7	161.5	117.3	118.9
1974	134.3	161.3	120.1	120.6
1975	139.7	165.3	118.3	116.9
1976	145.2	172.9	119.1	118.3
1977	151.6	184.2	121.5	121.0
1978	150.0	191.6	127.7	129.5
Average annual percent change:				
1967-1978	3.7	5.8	2.1	2.0
1973-1978	2.4	3.9	1.3	1.3

utilities, 64 percent compared with 50 percent. The average annual increases were 4.4 percent and 3.7 percent.

During 1967–78, both private and government output per employee grew more than twice as fast as that of the overall economy, which registered an increase of only 21 percent.

But the slowdown in productivity growth so often observed and discussed in the overall economy was also in evidence in the electric power industry. The private business sector posted a 1.1-percent rise in output per employee from 1967 through 1972 and 0.8 percent from 1973 through 1978. The deceleration was sharper for electric utilities, from 5.5 percent in 1967–72 to 2.4 percent in 1973–78 for private utilities and 6.7 percent to 2.8 percent for State and local government utilities. □

— FOOTNOTE —

¹ Includes States and local governments or political subdivisions that engage in the generation, transmission, or distribution of electric energy for sale. The industry is designated as SIC 4911 in the *Standard Industrial Classification Manual, 1972*. All average annual rates of change are based on the linear least squares trend of the logarithms of the index numbers.

APPENDIX: Measurement techniques

Indexes of output per employee measure changes in the relationship between the output of a function and the employment expended on the output. The index of output per employee is derived by dividing the index of output by the index of functional employment.

The preferred output for the electric power index would be the kilowatt hours sold to ultimate customers separated by class of service provided—residential, commercial and industrial, and other—each weighted by the number of employees required to produce one unit in the specified base period. Thus, those services which require more labor time to produce are given more importance in the index.

In the absence of the number of employees by class of service, unit revenues have been used as weights in calculating outputs for the private and large government utilities. Class of service is not available for total State and local government output so this index is not weighted by that factor.

Employment indexes were derived from Bureau of Census, Bureau of Labor Statistics, and individual utility data. Employees and employee hours are each considered homogenous and additive, and thus do not reflect changes in the qualitative aspects of labor such as skill and experience.

The indexes of output per employee do not measure any specific contribution, such as that of labor or capital. Rather, they reflect the joint effect of factors, for example, changes in technology, capital investment, capacity utilization, plant design and layout, skill and effort of the work force, managerial ability, and labor management relations.

Labor and material requirements for Federal building construction

JOHN G. OLSEN

Continuing a long-term trend, the number of employee hours required per constant dollar of expenditure for Federal building construction is declining. Each \$1,000 (in 1959 dollars) spent on Federal building projects in 1976 generated about 68 onsite employee hours, compared with 72 employee hours in 1973 and 97 hours in 1959 (table 1).¹ Assuming a continuation of this trend, an estimated 64 onsite employee hours per 1,000 (1959) dollars would have been generated in 1980.²

In terms of employment, each \$1 billion spent on Federal building construction during 1980 generated the equivalent of about 24,900 year-long, full-time jobs throughout the economy.³ About 11,000 of these would be in the construction industry, 9,700 onsite and 1,400 offsite.⁴ In addition, about 13,900 jobs would be in industries that produce, transport, and sell the materials, equipment, and supplies used in Federal building construction.⁵ In comparison, during 1980, for each \$1 billion expended for commercial office building construction about 21,900 jobs were generated, and about 23,200 jobs were generated per \$1 billion spent on elementary school and secondary school construction.⁶

These data are from a study of all Federal buildings completed in the continental United States in 1976 and 1977 under the auspices of the Public Buildings Service, General Services Administration.⁷ The study originally comprised 33 projects, but was reduced to 24 due to lack of cooperation by contractors and because some projects were judged to be out of the scope of this survey. Lack of cooperation in supplying data was particularly acute in the West.⁸ As a result, data for the West are not sufficiently reliable to permit publication of separate figures for that region. However, data for the West were adjusted for nonresponse and were included in national totals. Projects in the study included regular Federal and Social Security Administration office buildings, border stations, and other buildings included in the last two BLS studies on Federal building construction. Federal and Social Security Administration office buildings accounted for about 80 percent of all projects in 1973 and 1976. Although all three of these surveys are essentially studies of office buildings, several factors make comparisons among them difficult.

The average building size, for example, varies considerably among the studies. In 1959 (1962 study), the av-

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