

News and Commentary

Electricity costs and the Maine economy: Review and prospects

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Rising electricity costs over the past several years have set off alarm bells about the possible effects on economic growth in Maine. Efforts to confront the "current crisis," as one business group dubbed it, have replaced the workers' comp crisis in the forefront of public debate about Maine's business climate. Efforts to at least reduce the rate of growth of electricity prices have led to charges and countercharges between the state's largest utility and many of the non-utility generators (NUG's), and resulted in major battles in the recent session of the Maine Legislature.

In all of the discussion, however, there has been little information about two key questions: How high are Maine's electricity costs relative to other areas, and how sensitive is the Maine economy to changes in electricity costs? This article offers some answers to these questions based on the most recent data available on comparative costs and on an analysis of the Maine economy using a computer simulation.

To answer the first question, average prices were calculated for Maine and the New England states using data from the Electric Council of New England and for the rest of the United States using the Edison Electric Institute Statistical Yearbook 1992. Since electric rates vary greatly depending on customer size, time of day and other customer characteristics, average prices are really the only way of comparing costs across states. Average price equals the revenue from all sales in a sector (residential, commercial, industrial, or total) in a given state divided by the total kilowatt hours sold to that sector.

Figures 1 through 4 (pages 67-68) compare Maine's average electricity prices with those of the rest of New England (Massachusetts, Rhode Island, Connecticut, New Hampshire, and Vermont) and with the average for the entire United States (including the District of Columbia) for the period from 1978 to 1992, the latest year for which data are available. As [Figure 1](#) shows, Maine enjoyed relatively competitive prices compared to New England for some time, with rates much closer to the national average. This pattern began to change about 1988, and Maine average prices have climbed steadily since then, so that rates have moved away from the rest of the country and towards the other states in New England. The recent Central Maine Power Company rate case will probably close the gap still further, although it should be remembered that rate increases elsewhere make it impossible to measure the gap without updated data.

Figures 2 through 4 show that Maine's average prices have increased the most for the residential sector, followed by the commercial sector and then the industrial sector. Average prices for Maine residential customers were higher than in the rest of New England as of 1992, and significantly above those of the rest of the country (more than 20 higher). Commercial prices have been the most erratic over the period (Figure 3), and are now essentially equal to those in the rest of New England. Only industrial prices have stayed below the rest of New England, although they are now significantly higher than U.S. industrial prices, a fact which was not true until 1988 (Figure 4).

Table 1 presents the growth rates over the period 1988-1992 for Maine and the other New England states. Maine's average electricity price increased almost as fast as New Hampshire, the fastest increasing of all the New England states. Maine residential and industrial price increases were faster than all other New England states, including New Hampshire. Only in the commercial sector were price increases relatively moderate in comparison with other states.

Average kilowatt-hour prices are a useful comparison, but they do not tell the whole story. Figure 5 (page 69) shows the average price per kilowatt-hour (on the right axis and in the dark bars) and the annual usage for the average customer (on the left axis and light bars) for each of the ten major census regions in 1992. As can be seen, New England has the highest average price of all regions, ahead of both Alaska/Hawaii and the mid-Atlantic states. But these higher prices force much lower usage than in other regions. Average use in New England is almost half of what it is in the east south central region (Tennessee, Kentucky, Alabama, and Mississippi). This suggests that inter-regional electricity cost comparisons are somewhat more complex than simple comparisons of average prices.

These figures are shown in Table 2 (page 65), along with the rank ordering of Maine for each category. On an average cost per kilowatt hour basis, Maine's electric costs appear very high. Maine's average costs are higher overall and in all three electricity consumption sectors than the national average. Overall, Maine ranks tenth highest and a rather appalling second highest in the nation (after New York) for residential rates. However, when the generally much lower usage in Maine is factored in, Maine does not appear quite as seriously disadvantaged. Maine's average costs per customer are actually lower than the U.S. mean costs in all three sectors and overall. Maine's rank among the fifty-one jurisdictions falls to twenty-eighth overall. Residential costs are twenty-second highest in comparison with the second highest ranking on an average price basis.

This comparison would suggest that Maine's relative electricity costs are not as high as the average price calculations indicate, but if the average price comparison overstates costs, the total cost comparison understates them. Maine achieves its somewhat lower usage by investing in conservation technologies, and the capital costs of these technologies must be factored into the overall cost equation. A business or a homeowner in Maine may make investments in conservation that are cost effective in reducing their electricity demand, but their overall energy expenditures combining both the conservation investment and electricity prices may still be higher than in other regions. Recent electricity price increases may eventually be offset by new conservation investments, but the combination of expenditures must come out of discretionary

income for consumers or out of other investments for businesses, with adverse consequences for the economy from both consumer and business effects.

This raises the second question of the implications of rising costs for the economy. For this analysis, the USM Center for Business and Economic Research's (CBER) long term model of the Maine economy and selected regional economies within the state was used. This model was developed for CBER by Regional Economic Models, Inc. (REMI) of Amherst, Massachusetts. The REMI model is a widely used econometric model. In Maine, the State Planning Office has used the model for more than fourteen years, while Central Maine Power has also used the model for its forecasting.

In the REMI model, increasing electricity costs affect a regional economy in two ways. If electricity costs in a region are higher than that of the nation, production costs in the commercial and industrial sectors will increase in Maine relative to the same industry in the nation, resulting in a loss of competitiveness for those firms selling outside Maine. This results in lost sales for exporting firms, which further reduces the demand for inputs from Maine and reduces wages and salaries paid, and so on. The second effect is that consumer purchasing power is reduced as a result of increasing residential electric costs, which reduces demand for consumption purchases in the state.

In order to analyze the effects, this analysis assumed that electricity costs increased in Maine by 10 percent above 1992 levels and that this resulted in an additional 10 percent cost differential between Maine and the rest of the U.S. This increase also resulted in a \$44 million reduction in consumer purchasing power, based on 1992 residential electricity expenditures. [Because the CBER model is actually three linked models for Cumberland and Sagadahoc counties, York County and the Rest of Maine, this decrease in purchasing power was apportioned among the regions based on total consumption expenditures in 1992.] The model was reforecast using these assumptions, and the difference between the base-line and simulation forecasts was used to measure electric cost impacts.

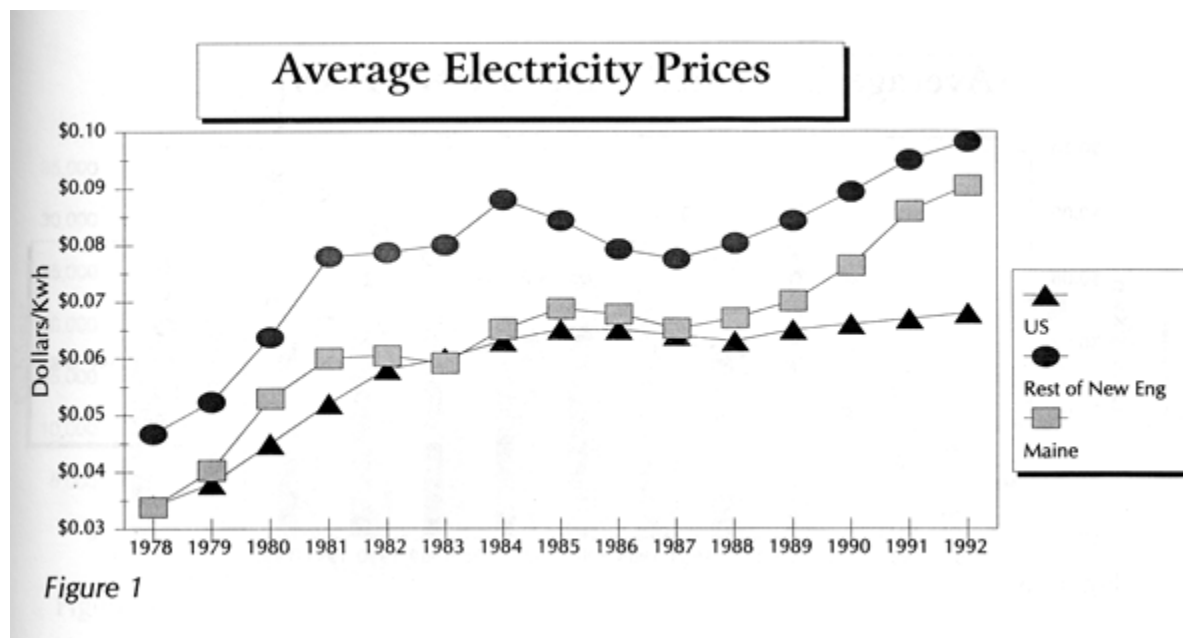
The impacts were calculated for the changes in the economy that occur as of 2000, reflecting the time it takes for the impacts to work their way through the economy. The calculated impacts resulting from the 10 percent increase in electric costs for the entire state were -0.23 percent for employment, -0.27 percent for output (measured by gross regional product), and -0.19 percent for personal income. These figures represent a reduction of more than 1,700 jobs from what would otherwise have been the Maine employment level in the baseline forecast with accompanying losses of \$75 million in output and \$68 million in personal income.

[Figure 6](#) (page 69) shows the impact on employment and gross regional product by major sector. While the vast majority of concern over rising electric rates has been expressed by industrial users, the econometric analysis shows the big sectoral losers to be the retail, services, and construction industries. This results primarily from the decline in consumer purchasing power, and secondarily from the indirect effects of losses in the export sectors. The non durables manufacturing sector suffers somewhat more in output than the durables sector, while the employment losses in both manufacturing sectors are roughly comparable. [Figure 7](#) (page 70) shows the regional impact for the three regions in the CBER model. The central and northern

areas of Maine are somewhat less sensitive in both employment and output terms than the three southern counties.

This analysis suggests that, while there is ample cause for concern by the industrial electricity users, rising electric costs in the residential, and to some extent in the commercial sector, may be of greatest concern in terms of the overall Maine economy. This is particularly the case when considering the relatively high residential electric costs in Maine. The analysis also suggests that rising electric costs may already have had some impact on the extent of Maine's recent recessionary experience, since significant increases in electric costs began just as the economy turned down. It is also likely, given cost increases not yet factored into the historical data, that more problems lie ahead. There remains a significant dispute over why electric costs have increased so much in Maine, but whatever the cause, electric costs have shifted from an historic source of competitive advantage to an emerging source of competitive disadvantage which needs to be addressed.

Full site: Colgan, Charles S.. May 1994. **Electricity costs and the Maine economy: Review and prospects.** Vol. 3(1): 61-68.



Average Residential Electricity Prices

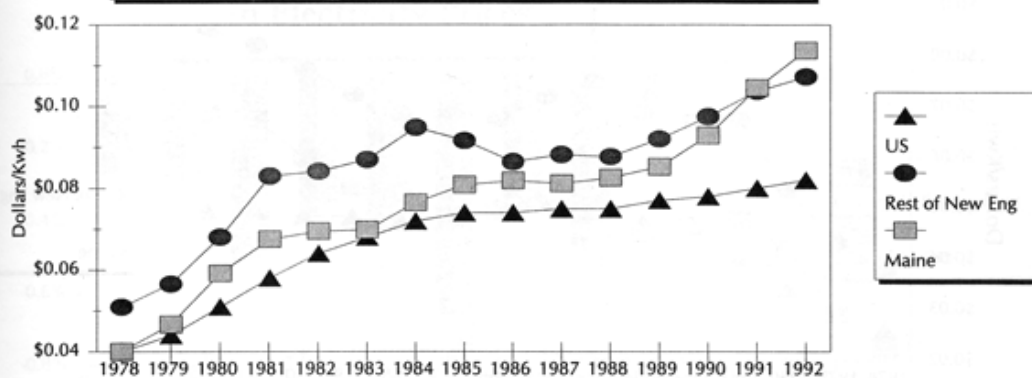


Figure 2

Average Commercial Electricity Prices

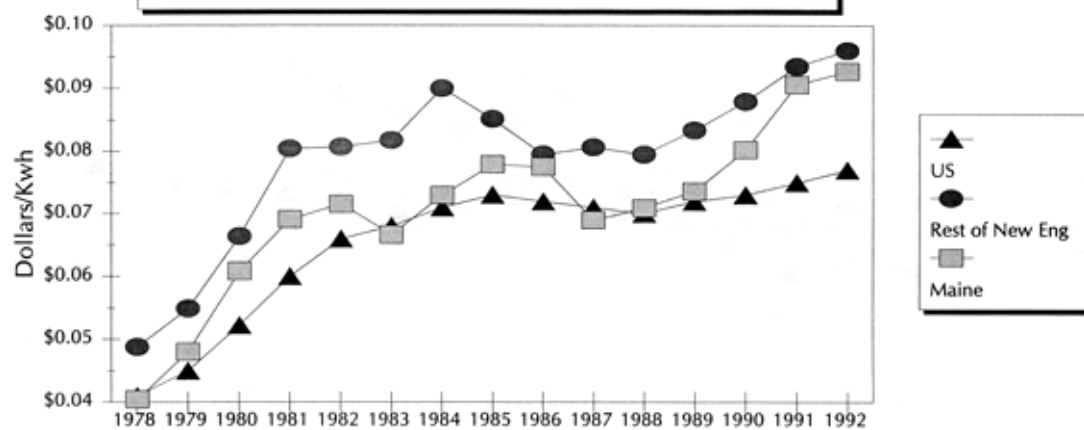


Figure 3

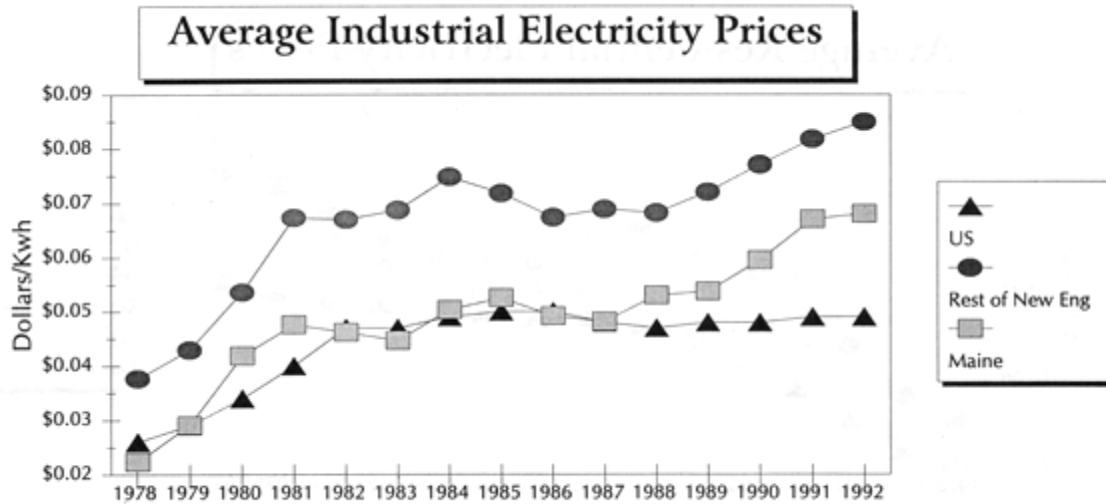


Figure 4

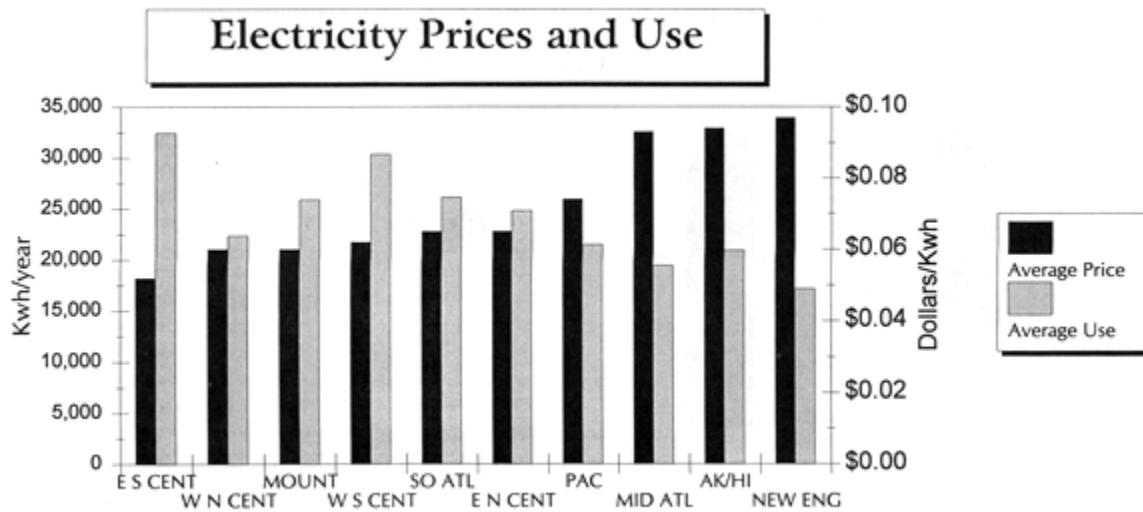


Figure 5

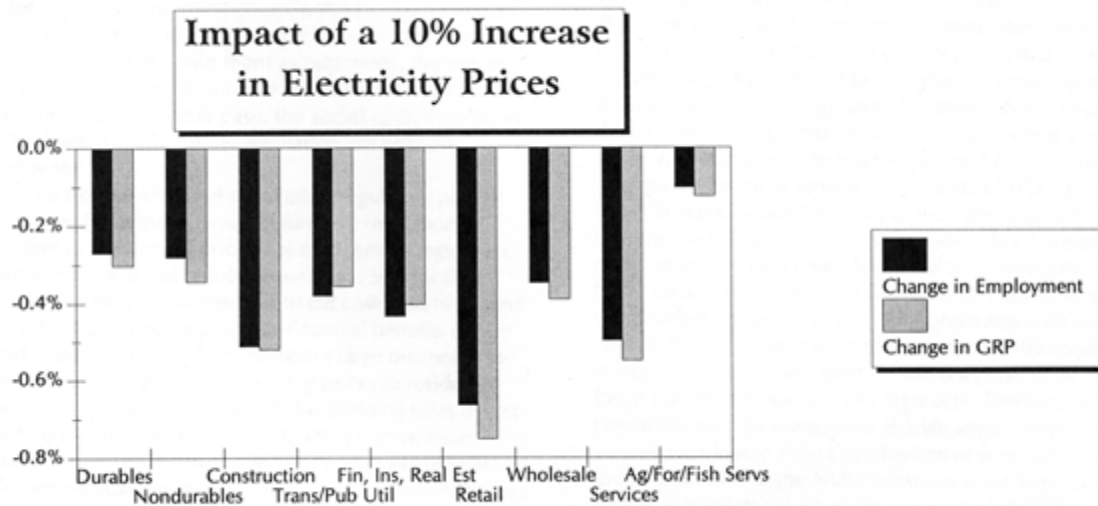


Figure 6

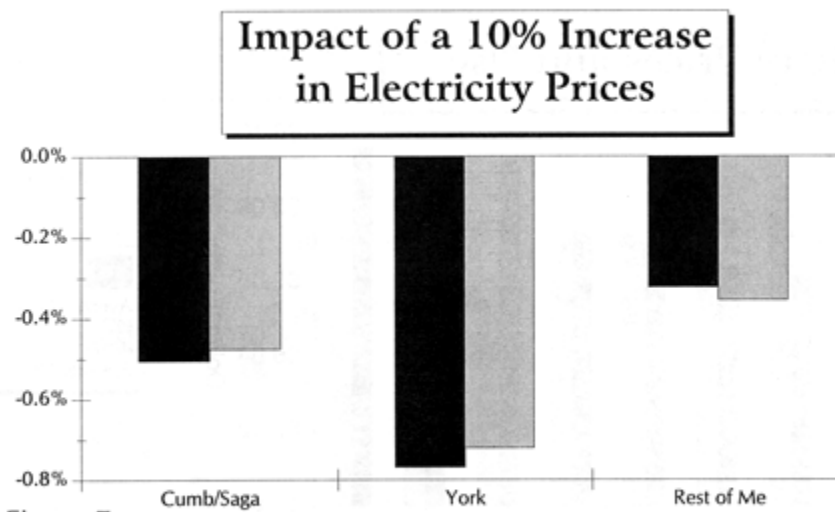


Figure 7

TABLE 1
Electricity Average Price Growth Rates, 1987-1992

	Total	Residential	Commercial	Industrial
ME	33.5%	39.1%	19.7%	38.4%
NH	33.8%	32.8%	31.5%	37.4%
VT	15.3%	19.7%	15.9%	5.9%
MA	250.%	27.7%	20.3%	29.6%
RI	28.6%	28.0%	29.4%	26.3%
CT	19.8%	19.1%	18.4%	19.0%

TABLE 2
Comparative Average Prices and Average Expenditures

Average Electricity prices (\$/Kwh)

	Total	Residential	Commercial	Industrial
Maine	\$.091	\$.114	\$.093	\$.069
United States	\$.067	\$.080	\$.072	\$.052
Maine Rank*	10	2	9	10

Average Cost/Customer

	Total	Residential	Commercial	Industrial
Maine	\$1,603	\$753	\$3,671	\$109,035
United States	\$1,626	\$883	\$4,425	\$140,954
Maine Rank*	28	22	31	19

* of 50 states plus District of Columbia