

**PROMOTING EFFICIENCY IN THE
ELECTRIC UTILITY SECTOR**

**The Congress of the United States
Congressional Budget Office**

PREFACE

The electric utility industry consumes a large amount of oil and gas in the production of electricity--the equivalent of 2.6 million barrels per day. In many cases electricity could be produced more economically if greater use was made of alternative energy sources, notably of coal. A shift to alternative fuels would mean retiring oil- and gas-fired generating equipment or converting it to coal, as well as speeding up the construction of new generating capacity. The utility industry may have been handicapped in making the shift by regulatory constraints. To be sure, other factors such as the slow and erratic growth in demand for electricity have contributed to this situation. Yet to the extent that the regulatory process prevents the utility industry from responding to economic signals regarding fuel choice, a case may be made for a change in public policy. The issue is whether regulatory changes would help to increase the flexibility of utilities in altering their generating capacity, resulting in more adequate future supplies and lower long-term electricity prices.

At the request of the minority staff of the Senate Committee on Energy and Natural Resources, the Congressional Budget Office has prepared this analysis of the regulatory treatment of electric utilities and its relation to the efficiency of the electric utility industry in general and utility fuel choice in particular. In keeping with CBO's mandate to provide objective analysis, the report contains no recommendations.

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SUMMARY

The economic performance of the electric utility industry is strongly influenced by its financial prospects and by the way it is regulated. The general financial decline of electric utilities during the 1970s, coupled with certain regulatory practices of state public utility commissions, may inhibit utilities in adjusting to the demands of the 1980s. This paper examines the sources of inefficiency in the electric utility sector--particularly as they affect the choice of fuels--and discusses some policy options that might promote greater efficiency in the generation of electricity.

REGULATION AND UTILITY FUEL CHOICE

Present-day regulation of electric utilities is premised on a 1944 Supreme Court decision in the case of Federal Power Commission v. Hope Natural Gas Company, 320 U.S. 591. The court held that the purpose of regulation is to provide the utility with a rate of return sufficient to attract capital and to reward investors commensurate with their risks. This ruling gave the state Public Utility Commissions (PUCs), which regulate intra-state electricity sales, considerable discretionary authority. During the 1960s, utilities prospered in their regulatory environment, largely because of continual cost decreases associated with technological progress and larger-scale operations. This situation was reversed in the 1970s. Fuel prices rose in response to the 1973-1974 and 1979-1980 oil price shocks. New costs for environmental protection were imposed on utilities by the Clean Air Act. Construction costs rose rapidly. Moreover, as prices rose and profits fell, electric utility regulation became lengthier and more contentious; the slowness of the regulatory process combined with inflation to erode the rate of return allowed utilities. Thus in 1980, while the cost of capital had risen to about 16 percent, utilities were being allowed an average 14 percent rate of return and realizing a return of only 12 percent.

The deteriorating financial condition of electric utilities, coupled with the way they are regulated, has impaired the industry's ability to make new investments in generating plants. To be sure, many of the recent cancellations or deferrals of new generating capacity have been related to the fact that growth in electricity demand has been slower and more erratic than expected. Yet there is also evidence that much new capacity is being deferred that would be economic.

In 1981, for example, over 2.6 million barrels per day of oil and gas (equivalent) were burned under utility boilers. About two-thirds of this amount is uneconomic at current oil prices. Where oil and gas are used for baseload generation, the long-run cost of new generating capacity using alternative fuels, most often coal, is frequently lower than the cost of continued baseload generation with oil and gas. This is because the capital and fuel cost of a new power plant is less than the fuel cost of oil or gas for the existing power plants. Thus while the efficient combination of capital and fuel varies sharply with the characteristics of the individual utility, much of the electric sector may be now far from its most efficient configuration.

Several interrelated factors inhibit reductions in utility oil and gas consumption. First, it is administratively simple for most utilities to pass fuel costs through to customers. In the 1970s, most state regulators provided their utilities with "fuel adjustment clauses" in response to the rapid increases in fuel prices. These provisions allowed a utility to recover its fuel costs rapidly enough to prevent a cash flow crisis. But they also reduced the utility's incentive to retire or convert oil- and gas-fired units. Adding new or replacement capacity requires the utility to incur capital costs, and lengthy and uncertain regulatory proceedings must take place before their recovery.

Second, there is an asymmetry of risk between the principal stakeholders in utility ratemaking: ratepayers and stockholders. Utilities that undertake the building of new plants to replace oil and gas capacity must generally pass the resulting savings on to ratepayers if all goes well. But if difficulties arise with the new plant, the costs are borne first by the stockholders and only later by the ratepayers. Thus, the rewards of new investment tend to accrue to ratepayers rather than to stockholders, while the risks are shared by both. This imbalance tends to bias investment decisions away from projects involving significant capital expenditures or innovative technologies. In contrast, ratepayers absorb most of the cost of increased oil prices through the use of fuel adjustment clauses.

The replacement of oil- and gas-fired capacity is also inhibited by the regulatory treatment of construction costs. If utilities are to recoup their construction costs as they are incurred, they must raise electricity rates. While the construction may lead to lower costs in the long term, state regulators are often unwilling to allow rates to rise in the short term. Thus, rather than allow recoupment of costs as they are incurred, PUCs generally provide utilities with an "allowance for funds used during construction" (AFUDC). Under this procedure, construction costs are included in a special account that earns interest but is not allowed into the utility's rate base until the project is complete. Even though AFUDC accounts are not

realized as cash by the utility, they are treated as income by regulators. The effect of this procedure can be seen by subtracting AFUDC accounts from stated earnings. When this is done, the rate of return for utilities in 1980 falls from about 12.0 to 6.4 percent. In contrast, the rate of return earned in all manufacturing in that year was 16.4 percent.

These regulatory practices may have the effect of biasing electric utilities against capital-intensive projects. This would tend to lock the electric generating sector into capital equipment that is economically obsolete, with two consequences: the uneconomic use of fuels in generating, and an unnecessary limitation on future supplies of energy.

POLICY OPTIONS

The proper objective of policy is neither the promotion nor the discouragement of electric energy use. Rather, it should be the provision of energy-based services at the lowest real cost to the economy when all external effects are considered. The nation's ability to reach this goal depends in large part on the ability of the utility sector to make timely adjustments to its capital equipment and to use the least-cost combination of fuels. This does not mean displacing oil and gas in all their applications in the electric sector, but rather allowing utilities to displace oil and gas in favor of alternative fuels when warranted by economic considerations.

While allowing economic considerations full sway may be an appropriate goal of public policy, the federal role in pursuing this goal is limited. The states have the reserved legal right to regulate the conduct of utilities within their boundaries. Any policy thrust that seeks to influence the regulatory process, therefore, requires that the federal government preempt this right. This may make policy options aimed at improving the regulatory process difficult to enact; it should be noted that comparable legislation, such as the Public Utility Regulatory Policy Act, has been under challenge in the courts.

Despite this limitation, a number of policy options are available that may facilitate capacity adjustment by electric utilities. These options can be divided into two groups--those that would affect the conduct of the regulatory process and those that would not. The latter include:

- o Reliance on general economic recovery. Improved economic conditions may lower the rates of inflation and interest, making new capital projects less expensive. In that case, no specific policy may be necessary beyond those now in place.

- o Subsidization. Privately-owned utilities could be subsidized in making capacity adjustments, particularly if they involve substituting new baseload capacity for oil and gas. This could be done either through cash subsidies or by further liberalizing the investment tax credit and accelerated depreciation.

Another set of options would amend regulatory practices. These include:

- o Imposing federal rulemaking on state regulatory commissions. The federal government could determine rules regarding specific regulatory practices (such as the use of AFUDC or fuel adjustment clauses, or the determination of allowed rates of return) that states would be compelled, or induced, to adhere to.
- o Regional capacity planning. Capacity planning could be done on a regional rather than local basis to achieve greater efficiency and lower requirements for reserve margins.
- o Introducing more competition through deregulating the generation stage of electricity production. The franchised monopoly position of electricity generation could be amended to allow free competition among bulk suppliers of electricity. Transmission and distribution would remain subject to regulation.

It should be noted that these regulatory options are not mutually exclusive. Some, in fact, are complementary, and can be considered in conjunction.

The Policies Compared

Each option would have different implications from the standpoints of efficiency and fairness. The efficiency of a policy would depend upon its cost-effectiveness and the rapidity with which it achieved economic capacity adjustments. A policy is fair to the extent that those who benefit from changes in generating capacity would pay for them.

Efficiency. The three regulatory reform options may offer significant advantages over the others. A subsidy might confer windfalls on utilities that would have been able to adjust with less subsidization, while neglecting some utilities that might require more. A subsidy also rewards managerial inefficiency. Moreover, subsidies only treat the symptoms and not the causes of financial weakness. In that case they might not improve the financial rating of utilities and reduce their capital charges. Furthermore, a

subsidy shields ratepayers from the true cost of energy at a time when economic efficiency requires the appropriate use of price signals. If half the oil- and gas-fired capacity that cannot be converted to coal were retired ahead of schedule and 10 percent of their replacement capital costs were defrayed through subsidy, the cost to the federal government would exceed \$6 billion.

The other nonregulatory option--that of reliance on general economic recovery--would not bring about any improvement in regulatory policies. If the economy recovers, and interest and inflation rates drop, state PUCs may simply pass the bulk of these benefits directly to ratepayers without increasing the utilities' rate of return. This would do nothing to relieve the utilities' difficulty in raising new capital.

Changes in regulatory practices could do much to improve the financial position of electric utilities. In particular, federal standards that would grant utilities adequate rate relief might enable them to raise capital at less cost and pursue the necessary changes in capacity. Of special interest are provisions linking utility earnings and performance. If utility investments in new capacity or changes in their fuel mix resulted in lower generating costs, then utilities could be allowed some share of the avoided costs. This procedure would give utilities strong incentives to adjust their capital stock in the face of changing economic conditions.

Regional capacity planning would complement the other options. Utility systems have become increasingly integrated since 1965, but capacity planning is still done predominantly from a state perspective. Requiring capacity planning on a regional basis could lower the amount of capacity that state utilities must hold in reserve, without lowering reliability levels; it could also contribute to conservation and load management. Least-cost investments could be encouraged, such as substituting linkages to out-of-state power plants for new intrastate construction. Regional planning could also help to overcome two major obstacles to new power plant construction--the risks associated with demand uncertainty, and delays in siting and licensing.

Competition could be increased by deregulating the generation stage of electricity production. Distribution would still be regulated by state PUCs, while the transmission of electric power might be controlled by the Federal Energy Regulatory Commission. The efficiency effects of such deregulation are unclear. It might mean less service reliability, since independent generating companies would not be obligated (as they are now) to meet all levels of demand. Thus, they might forecast load growth conservatively and be unwilling to provide more expensive peak power. In addition, if state PUCs simply passed generation costs on through the

distribution stage, the incentive for price competition among generating companies could be blunted. On the other hand, deregulation might encourage greater efficiency since competition would give preference to least-cost generating options.

Fairness

As used here, fairness means that those who receive the benefits pay for them. If the Congress adopted no specific policy, then no additional direct costs would be imposed on anyone: ratepayers, utility stockholders, or taxpayers. Yet, this might be inequitable if it meant continuing the current state PUC practices. The failure of PUCs to make economic investment decisions imposes a burden of inefficiency upon those served by the utility system--in effect, a regressive tax.

Subsidies also pose fairness problems. If capacity adjustments are in the interest of ratepayers, it can be argued that they--rather than taxpayers--should bear the cost of making them.

The regulatory reform options appear more equitable in that they assign the costs of capital adjustment to the primary beneficiaries--ratepayers. The principal difficulty derives from the distribution of costs and benefits over time. Current ratepayers would finance capital stock adjustments that would benefit future ratepayers. This difficulty is offset by several considerations. First, current and future ratepayers are frequently the same people. Second, subsidies across time are hardly a new phenomenon. Schools, soil conservation, and research in childhood diseases are but a few of many examples of intergenerational subsidization. Finally, deferring the recovery of capital charges into the future--rather than assigning them to current ratepayers--makes the utility business more risky for investors, raising the cost of capital and causing utilities to postpone construction that would otherwise be economic. To the extent that current policy does this, it may impose special costs on future ratepayers. It is not clear that reversing the policy would be inequitable.

In sum, changes in certain regulatory practices might expedite needed capacity adjustment. This option would be strengthened if combined with regional regulation and the introduction of greater competition within the industry's present structure. Greater competition might pose certain risks, but it could give a powerful boost to least-cost generation of electricity.

Some Concluding Observations

The problem posed by the nation's electric utilities is that their financial condition and regulatory treatment blunt their incentive to reach the most efficient long-term combination of capital and fuels available to them. The result is not likely to be widespread electricity shortages. Rather, in the face of impending shortages, utilities would call up otherwise uneconomic peaking units--predominantly fired by oil and gas. Thus, the economic losses associated with an inefficient electric utility sector are the additional--and unnecessary--costs of this type of generating capacity. Electricity would simply cost more than it needs to.

The financial condition and regulatory treatment of electric utilities are intertwined. Thus, any policy proposal that seeks to address inefficiency in the electricity generating industry must address the regulatory process. But federal intervention in the regulatory process would necessarily reduce the discretion of states to regulate electricity prices as they see fit. Whether existing state prerogatives could be abridged without lengthy legal challenges is unclear. In the final analysis, the efficiency and equity advantages of regulatory reform options must be weighed against their impact upon the traditional rights of states to conduct electricity regulation.

