Public Ownership vs. Energy Conservation: A Paradox of Utility Regulation

James Q. Wilson and Louise Richardson

GOVERNMENTS CONSTANTLY FACE the choice of whether to achieve their objectives indirectly, through the regulation of an industry, or directly, through public ownership of firms in the industry. In the case of electric power, public ownership has traditionally been invoked as a way to achieve lower prices, not only because government power producers were expected to charge lower rates than their private counterparts, but because their rates could serve as a "yardstick" by which regulators could judge the reasonableness of private utility pricing.

More recently, government's objectives have grown more complicated. Low prices are no longer the only major demand government places on utilities. Today utilities, both public and private, have come under pressure to engage in conservation, broadly defined—pressure to encourage their consumers to reduce energy use, exploit "softer" or "renewable" energy sources (such as geothermal, wind, or solar power), buy power from cogeneration sources, and thus postpone or cancel the building of large new generating plants.* How have the two kinds of utilities responded to these demands? In a study of three public and three private utilities completed in 1982, we found that privately owned utilities have done more than their public counterparts to encourage conservation and develop alternative energy sources.

This conclusion is based entirely on interviews with key management personnel of both kinds of utilities and with members of the appropriate regulatory and government bodies. There are virtually no reliable quantitative data that would bear on this issue because utilities are not required to publish in standardized form any measures of their investments in conservation and alternative energy. And such figures as do exist (for example, personnel employed in or dollars spent on conservation) are difficult to interpret: a figure may represent an investment in public relations, or in a productive program; a small investment in load management may yield a large return, whereas a large investment in wind power may yield a small one (or vice versa). Nonetheless, the differences we found in the organizational com-

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*Cogeneration refers to the production of electricity using the steam generated for other purposes, such as heating a building, to operate a turbine. Industrial cogeneration has a long history: for example, paper and pulp mills have cogenerated steam and electricity for decades.

mitment to conservation and alternative energy development are so striking, and so readily agreed to by most of the personnel involved, that we are reasonably confident of our conclusion.

How one judges these findings depends largely on the value one attaches to conservation and the development of "soft" energy sources. Some, including many environmentalists, are convinced that building more large fossil-fueled or nuclear plants would be a costly mistake. Others, including some utility executives and economists, view the "soft path" as an intellectual fad that diverts attention from the energy shortage that will develop unless we build large new generating stations. We take no position on this controversy; our interest is in why one pattern of ownership has apparently led to such different results from the other.

Happy Days for Regulators

Early in this century, after the advent of alternating current had made it possible to transmit power economically over great distances, it was observed that the cost of serving the last customer added to a distribution system (the marginal cost) was often well below the average cost of generating and distributing power throughout the system. When marginal costs in an industry are below average costs, the producer with the lowest average cost will be the one that serves the most customers (or, in electric power terms, has the largest load). In this circumstance, a firm has an incentive to buy out its competitors or drive them out of business by underpricing them. That was just what happened in most communities, and economists along with policy makers were led to conclude that electric utilities were natural monopolies.

Some state and local governments adopted regulation as a way to keep private utilities from charging monopoly prices. Others, along with the federal government, created publicly owned utilities to supply electricity at what their proponents hoped would be lower prices. These public systems grew to assume a significant but not dominant role in the industry: they now serve about a quarter of all U.S. customers. Municipally owned utilities generate less than 4 percent of all the electric power produced in this country; of the roughly 3,000 municipal and cooperative utilities, most are small, city-owned distribution systems that buy electricity wholesale from a private utility and retail it to local customers. But there are a few large public systems that are fully integrated—that is, they both generate and distribute power. As Sam Peltzman and Robert Spann (among others) have shown, the advocates of public power were generally correct in thinking that these public systems would be able to underprice the private utilities. In large part, however, the lower prices simply reflect the fact that municipally owned utilities are tax-exempt and can raise capital cheaply through the municipal bond market.

The same economies of scale that led to the creation of public and private monopolies also made the running and the regulating of utilities fairly easy. As larger and more efficient generators were installed to meet increased demand, the cost per kilowatt hour of electricity fell. Declining costs meant declining rates, making it possible to reduce the price of electricity to the ultimate consumer as usage went up. Rarely did the larger utilities have to ask their regulatory agencies for permission to increase prices and frequently they found that they could offer to decrease them as a way of stimulating demand.

There has been considerable debate as to whether government—either as regulator of private utilities or owner of public ones—had much effect in keeping electricity prices down during this period. (George Stigler and Claire Friedland argued in a 1962 article that regulation had little effect; Louis D'Alessi, in 1974, disputed this view.) In any event, until rather recently most regulatory bodies and city councils could concentrate on what Douglas D. Anderson has called the "happy task of watching the industry become more efficient and, on occasion, of negotiating rate reductions."

The New Energy Environment

Those happy days ended in the early 1970s when two things happened: the price of oil began increasing dramatically, and utilities found that there were no longer easy opportunities for major new economies of scale. Before long private utilities began asking their regulators for rate increases. But the agencies that had been

quick to lower rates were slow to raise them and often raised them less than was requested —leaving both consumers and the utilities unhappy. Even so, between 1970 and 1975 electric rates rose an average of 90 percent nationwide.

Aside from the oil-price and the scale-economies problems, several other factors were operating to drive up rates. The construction of some nuclear power plants was associated with huge cost overruns. Utilities were required to adopt costly new measures to reduce their smokestack emissions. Consumer groups began pressing for "lifeline" plans by which rates for small residential customers would be held down at the expense of general rates. To save fuel costs, many utilities began switching from high-priced oil to lower-priced coal, but the conversion process was itself expensive.

Suddenly the game had changed: new demand for electricity and new plants to meet that demand threatened to raise rates for existing customers instead of lowering them. One way to avert the need for such plants seemed to lie in getting utilities to encourage conservation on the part of their customers in order to reduce demand for electricity to the point where new plant construction would be unnecessary. Some regulatory boards, along with environmentalists (who had their own reasons to oppose new plants), began taking this line.

One might suppose that the investor-owned utilities would have opposed this initiative and instead favored continued growth of generating capacity. But many of these firms had themselves come to favor minimizing new plant construction and encouraging conservation. Previously, utility executives had been eager to make new capital investments (after all, the cost of the capital would increase the rate base on which state regulators calculated the allowed rate of return). But now government regulators were increasingly refusing to allow a company to recover the full cost of a canceled plant or to charge the full price of electricity from a completed one. More demand meant more plant construction, which meant more denials of cost recovery and lower earnings.

Whereas in the 1960s rising demand for electricity had been an occasion for joy in a utility board room, in the 1970s it became an occasion for gloom. Gone were the days when "Reddy Kilowatt" appeared on television urging people to buy more electricity and when slick magazine ads extolled the virtues of "living better electrically." Instead utilities tended to adopt a "capital minimization" strategy.

Whether voluntarily or through arm-twisting, it is undeniable that utilities began pursuing many new conservation practices during this period. Some managements adopted pricing policies designed to encourage conservation —including time-of-day and seasonal rates, which require customers to pay more for power during those times (for example, mid-day) and seasons (for example, summer) when demand is greatest, and interruptible rates, which provide lower rates to industrial or commercial customers that allow the utility to shut off power to certain machines at certain times of day. (The Public Utility Regulatory Policy Act of 1978 requires state public utility commissions to consider these and other regulatory standards in setting rates.) Other managements offered rate reductions or low-interest loans to customers who installed insulation, weatherstripping, and more efficient appliances. Finally, still others began experimenting with schemes to generate power from solar, wind, and geothermal sources, and some resorted to buying power from cogeneration plants. These steps were favored by many environmentalists and regulators not because of economic efficiency (usually, electricity from all these sources is more expensive than electricity from large coal-fired plants) but because of a belief that such sources were environmentally benign or naturally renewable. This argument was supplemented, in some cases, by a desire to decentralize energy production and weaken the economic and political power of the large utilities.

There are, of course, great variations among private utilities in how they have responded to the new energy environment. Some utilities are located in areas where demand is growing so rapidly that new plant construction is unavoidable. Others are able to meet increased demand in part by importing electric power from other states or nations. New England and New York, for example, are increasingly dependent on power shipped south from Canada by Hydro-Quebec. And in New Mexico large new plants are being built, not to supply New Mexicans with more power (they have plenty), but to export power to Southern California where demand is expected to outstrip

supply. In general, however, utilities now seek to minimize their capital investments, especially in large, central power stations.

How Public and Private Utilities Responded

There is very little systematic information on public-private differences in responding to the demands of the new energy environment. One study, conducted by the Electric Power Research Institute in 1983, found that more than half of all investor-owned utilities had adopted innovative rate structures (primarily peak-load pricing), compared with only 6 percent of all publicly owned utilities. But since the study compares a few large private systems with many small municipal distribution systems, its results may be misleading.

To look at this matter more closely, we examined the three pairs of large utilities shown in Table 1. Each pair consists of a public and a private utility located in the same state and serving comparable markets. The pairs were chosen by virtually exhausting the universe of large, integrated firms serving comparable markets in the same state. At the time of our initial research (1982), the firms in each state were of roughly comparable size.** Operating statistics for the six firms as of the end of their 1983 fiscal years are shown in Table 2.

Table 1
UTILITIES SURVEYED

State	Public Utility	Private Utility
California	Los Angeles Department of Water and Power (LADWP)	Southern California Edison (SCE)
Florida	Jacksonville Electric Authority (JEA)	Tampa Electric Company (TECO)
Texas	City Public Service Board of San Antonio (CPS)	Dallas Power and Light (DP&L)

Each private utility is regulated by a state public utility commission (PUC) or other public body. Each public utility is an instrument of the municipal government, with its policy set by an appointed board subject to city council review. In all three states involved in our study, regulators and public interest groups have pressed hard for conservation in order to reduce the growing demand for electricity. In California and Florida, there have also been pressures to develop alternative energy sources to reduce reliance on expensive and undependable foreign oil (Texas is relatively self-sufficient in fuel, especially natural gas). In California, in addition, there has been substantial interest in using "soft" or renewable energy sources, such as wind and geothermal power. Our survey turned up similar patterns of public-private responses in all three states.

In California, the private Southern California Edison (SCE) has adopted an aggressive conservation and renewable energy program and is committed to generating over 2,000 megawatts from renewable sources by 1990. As of the end of 1983, it had 1,400 megawatts from such sources either in place or under construction or under contract. SCE already produces power from nine different sources (including wind, biomass, solar, and geothermal), more sources than any other utility in the world. In 1982, it had 74 employees in its research department and 500 in conservation and local management. In 1981, its conservation program saved an estimated 4.2 billion kilowatt-hours of electricity. As a result of these efforts, SCE was able to defer construction of a major coal-fired plant.

By contrast, the Los Angeles Department of Water and Power (LADWP) has been less than enthusiastic about conservation. Though it conducted a time-of-day pricing experiment and has made some efforts to conserve and to develop alternative technologies, it clearly does not expect these efforts to materially affect its load planning or fuel mix. One LADWP official told us that "conservation is counterproductive to unit costs," and another commented that the gains likely to be had from conservation would "make no difference to fuel planning." According to a key city official, LADWP was "never really committed" to the city's comprehensive energy plan and hopes "it will go away." LADWP has consistently planned to meet its growing power needs with new large plants. Although state policies have often kept LADWP from building plants, its management has accomplished the same purpose by buying into two coal-fired plants in Utah and Nevada and a nuclear plant in Arizona; it has also acquired an interest in a solar and a geothermal plant that SCE had built and put in operation.

**In January 1984, Dallas Power and Light fully merged into the much larger Texas Utilities Company, making its operations harder to compare with City Public Service of San Antonio. Our generalizations are based on 1982 data.

The contrast between LADWP and SCE on conservation issues is much remarked by local utility observers. A city official, critical of LADWP, called it "more private than the privates." In turn an LADWP executive, contemptuous of SCE's eagerness to serve what he regards as the whims of energy planners, said: "If the PUC tells them to make electricity from widgets, then they must make electricity from widgets."

In Florida, utility executives are skeptical about renewable energy sources but very keen on keeping rates down by shifting to lower-cost fuels and encouraging conservation. The private Tampa Electric (TECO) is well positioned to address these concerns. Owing to plans made many years ago, by 1982 it was able to generate 80 percent of its power from coal that it buys on long-term contract and ships into the state using its own transportation subsidiaries. (Incidentally, it also owns a coal mine.) By 1984, coal-fired plants accounted for 95 percent of its generation capacity. TECO expects to reduce the growth in its peak kilowatt demand from 4.2 percent a year in 1982 to 2.7 percent in 1990, and to do this in spite of annual population growth of about 3 percent. Its conservation measures have enabled it to postpone construction of a new generation plant.

Jacksonville Electric Authority (JEA), unlike TECO, is heavily dependent on foreign oil: in 1981, it generated only 14 percent of its output from coal. Although JEA uses high-cost fuel, it has shown relatively little interest in conservation. Its executives seem to feel that since the utility already can generate more electricity than it can sell, conservation would simply cost it revenue. A JEA employee observed that conservation must be pursued to some degree because it is "like motherhood and apple pie," but that the pursuit is not very vigorous. Whereas TECO had at the time of our study fifty employees working in its conservation division, JEA had but twelve, only one of which was assigned to explore alternative energy sources. "It is not our role to do research," a JEA official said. "We don't experiment."

Table 2

OPERATING STATISTICS FOR SIX ELECTRIC UTILITIES, 1983

	California		Florida		Texas	
	LADWP*	SCE	JEA	TECO	CPSB	DP&L
Customers	1,231,929	3,325,308	236,580	364,668	398,683	326,948
Employees	4,931	16,292	1,500	3,148	3,100	2,477
Sales (millions of kwh)	18,913	59,893	5,927	10,527	8,293	12,323
Operating revenues (millions of dollars)	1,106	4,464	389	654	521	702
Monthly electric bills (1/1/84)						
Residential (500 kwh)	$33	$39	$38	$40	$37	$37
Commercial (6,000 kwh)	$410	$531	$444	$408	$441	$408
Industrial (120 mwh)	$7,606	$9,263	$7,939	$6,301	$6,083	$6,894

*Power division only.

Sources: *Moody's Municipal and Government Manual; Moody's Public Utility Manual;* U.S. Department of Energy, *Typical Electric Bills, January 1, 1984;* American Public Power Association, Washington, D.C.

In Texas, investor-owned utilities have energetically promoted conservation. Five years ago, Dallas Power and Light (DP&L) and two other major firms committed themselves to reduce peak load by 1,000 megawatts by this year. To DP&L, conservation makes good financial sense. Although it may cost $50 per kilowatt to reduce consumption by giving money incentives to builders and home owners who switch to energy-efficient appliances, it would cost $1,000 to $1,500 per kilowatt to build new capacity (as of the time of this study). City Public Service of San Antonio (CPS), on the other hand, has not aggressively offered money incentives for conservation, and its efforts to diversify its fuel mix have met with only limited success. The firm's conservation programs have had little effect on the growth in the demand for electricity. Indeed, a city councilman said that CPS had "no conservation goals;" another city official explained that, given its excess generating capacity, CPS feels "no great urgency" about conservation or load management.

Explaining the Response

To defenders of public ownership, it must be especially baffling that investor-owned utilities have done so much more than publicly owned ones in promoting conservation and the shift

(*Continues on page 36*)

Public Ownership vs. Energy Conservation
James Q. Wilson and Louise Richardson
(*Continued from page 17*)

to lower-cost fuels. After all, presumably firms that are governed by political authorities would be more open to such popular concerns as energy conservation. But the presumption seems wrong. Public ownership appears, if anything, to insulate utility managements from such political pressures.

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One reason for the difference lies in the changing nature of private utility regulation, as state public utility commissions have grown in technical competence and political assertiveness. At one time, many of the PUC seats were sinecures for undistinguished political appointees who looked forward to growing old gracefully in jobs that made few demands on their time. But, as energy costs became hot political issues, governors began appointing ambitious activists to the commissions and they, in turn, began selecting staff and organizing hearings in ways that placed requests for rate increases and new plant authorizations under close and critical scrutiny. Rate increases were often approved only on condition that the firm take strong conservation steps.

Even where private utilities were allowed to recover their cost of construction, they often could not do so until after the plant was in use, and the rate of return on equity allowed by regulatory agencies was often below the market interest rate. Borrowing to build new plants made little sense under these circumstances. And issuing new stock to raise capital was equally unattractive: with the market value of the company's outstanding equity often below its book value, new stock issues would simply dilute earnings. The alternative was to delay or cancel new plants and instead offer incentives to customers who practiced conservation.

The high cost of capital and the uncertainties of the regulatory environment have changed the extent to which private regulated utilities are subject to what economists call the Averch-Johnson effect (described in a 1962 article by Harvey Averch and Leland Johnson). Averch and Johnson observed that such utilities tend to overinvest in capital, largely because new plant and equipment become part of the rate base of the utility on which it is allowed to earn a certain rate of return. Clearly, the bigger the rate base, the greater the earnings for a given rate of return. To the extent the Averch-Johnson effect operates, the utilities will spend too much on power capacity, and the price of electricity to the consumer will be higher than it need be. Today, however, the Averch-Johnson effect has been reversed—that is, private utility executives may now have an incentive to *under*-invest in new plants.

Neither the market nor the regulators place the same sort of constraints on municipal utilities that they place on investor-owned utilities. A municipal utility can finance new plant construction through tax-exempt bonds carrying much lower interest rates than the investor-owned utilities have to pay. The prices at which they sell electricity are regulated not by PUC professionals but by lay boards or city councils that have virtually no staff at all. An LADWP official told our interviewer that his organization is subject to "very little public . . . scrutiny —we educate the board."

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Moreover, the municipality itself often has little incentive to encourage its utility to conserve. Each municipal utility pays a percentage of its gross revenues to the city treasury. For example, LADWP paid $55.3 million to the city of Los Angeles in fiscal year 1983–84, CPS paid an estimated $73 million to San Antonio in 1983, and JEA paid $25.9 million to Jacksonville in 1982. A city council is likely to be quite sensitive to rate increase proposals from the municipal utility, but quite indifferent to other actions by the utility as long as its cash contributions to the city treasury continue. Conservation by customers could conceivably endanger this revenue flow.

The legal constraints operating on government agencies also affect how the municipal utility will behave. Usually, it cannot form subsidiaries or enter unrelated businesses; hence, it cannot explore for oil, own coal mines, or run a transportation system to bring fuel to its generators. Its employees are hired, paid, and promoted in accordance with a civil service system that inhibits, if it does not prevent altogether, giving large financial rewards to employees who excel. (At LADWP, the top five posts are exempt from civil service rules.) By contrast, at DP&L, according to one of its officers, conservation goals are riveted into the organization "with a hammer." Although many municipal utilities, such as LADWP, have compiled outstanding engineering records, they cannot compete effectively for the ablest and most ambitious utility managers or reward significantly those managers who are most ingenious in devising conservation and load management techniques.

Finally, the municipal utility tends to be more insulated from political demands because few of its employees have a stake in coping with such matters. The regulated private utility, on the other hand, employs a small army of lawyers and economists to deal with its regulators and another army of financial specialists to deal with the capital market. In addition, the private utility must cultivate public opinion to foster a sympathetic regulatory environment, so it often retains specialists in opinion polling and public relations. These professionals not only represent the firm to the outside world, but represent that world to the firm. A municipal utility need employ far fewer lawyers, economists, and public relations specialists, since it does not have to deal with a state regulatory agency, and many fewer financial specialists, since it is in contact with only a small slice of the capital market. The municipal utility is owned by the city, and that ownership, its managers believe, exhausts its obligations to the political environment. Even if it should wish to cultivate public opinion or lobby elected officials, its status as a city agency would preclude it from spending much money on such efforts.

The paradox of public ownership is that such ownership tends to insulate the firm from its political environment rather than inject that environment into the firm's internal decision processes. Marc J. Roberts and Jeremy S. Bluhm make a similar point in their account of how public and private utilities cope with environmental issues. They found the Tennessee Valley Authority and LADWP to be far less open to the concerns of environmentalists than Pacific Gas and Electric or the Southern Company. In some instances TVA simply ignored state air pollution regulations. In another case LADWP began constructing a new power plant without first obtaining the necessary permit. "Private companies," the authors concluded, "may sometimes be more responsive to public demands than government-owned utilities." They found only one conspicuous exception: Ontario Hydro, a publicly owned Canadian utility, took more initiatives to meet environmental concerns than did either TVA or LADWP.

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The greater resistance of municipal utilities to pressures for energy conservation, environmental protection, and the development of alternative energy may or may not be a bad thing. People who ardently support those policies often deplore the record of municipal utilities. But a critic of the policies may well conclude that political insulation enjoyed by municipal utilities has protected them from the fads and fancies that seemed to have seized state public utility commissions.

HOWEVER ONE EVALUATES the consequences of this insulation, its existence is but a special illustration, it would seem, of the general proposition that government can regulate private firms more easily than it can regulate other government agencies (see James Wilson and Patricia Rachal, 1977). Government bureaus maintain themselves by ensuring the support of their principal political superiors—typically, key legislators and their allies—and not by developing mechanisms for sensing and responding to the preferences of groups that are not part of their central political support system. The managers of government bureaus are rewarded not for maximizing the long-term economic well-being of the organization but rather for protecting the organization's political autonomy.

To the extent that government bureaus have greater autonomy than private firms, it becomes easier for the dominant professional group in the bureau to manage the bureau's affairs in accordance with the ethos of that profession. LADWP, like TVA, has from its earliest days been dominated by engineers, often engineers of great skill and dedication. When the task of the utility has required an engineering solution—as in building a new plant or transmission line—LADWP and TVA have often performed brilliantly. But when these utilities have been faced with a demand that would require giving authority to nonengineers, or taking into account goals other than engineering efficiency, they have succeeded in mounting substantial resistance. Those environmentalists who are hostile to capitalism have much to ponder here, for it has been the capitalists, not the government bureaucrats, who have been most responsive to environmental demands. ■

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