

# ENERGY AND ENVIRONMENT



## **44. Electricity Policy**

### ***Congress should***

- repeal the Federal Power Act of 1935 and abolish the Federal Energy Regulatory Commission (FERC);
- repeal the 1935 Public Utility Holding Company Act (PUHCA) and the 1978 Public Utility Regulatory Policy Act (PURPA);
- privatize federal power marketing authorities, the Tennessee Valley Authority, and all federal power generation facilities;
- eliminate all tax preferences applicable to municipal power companies and electricity cooperatives; and
- declare that any state or municipal regulation of the generation, transmission, distribution, or retail sale of electricity interferes with interstate trade and is a violation of the U.S. Constitution's Commerce Clause.

The debate over electricity regulation is primarily a debate over the regulatory restructuring efforts of the 1990s. At the federal level, the discussion is about (1) the extent to which the federal government should mandate restructuring on states that have yet to give up the old regulatory regime and (2) whether the federal government should impose institutional and regulatory order on an industry still largely under the purview of state governments. At the state level, the debate is moving in the opposite direction; it is about whether and to what extent the entire restructuring experiment ought to be reversed.

Accordingly, a review of the merits of restructuring (sometimes erroneously called “deregulation”) is necessary. While most advocates of free markets and competition have embraced electric utility restructuring and favor further steps in that direction, we are skeptical about the merits of those reforms. They are not steps toward a more deregulated market, just a differently regulated market, and they almost certainly introduce more economic complications than they remedy.

## ***Electric Utility Restructuring 101***

Electric utility restructuring was a political answer to the problem of high-cost electricity in the Northeast and California. By the early 1990s, firms were threatening to leave those states where power costs were far above the national average. The high-cost states attempted to bring low-cost electricity to the firms by ending the monopoly that local utilities had on local customers. In theory, distant (lower-cost) generators as well as new local entrants would compete against the local power companies. Consequently, rates (it was hoped) would fall.

Economists generally put little faith in the hope that competition per se would significantly reduce rates for reasons that we will explain below. Nonetheless, most supported restructuring on two entirely different grounds. First, they believed that restructuring would promote pricing regimes that reflected minute-by-minute changes in supply and demand. “Real-time pricing,” as it is known in the trade, could lead (according to one estimate) to a 25 percent increase in power production and a similar percentage decrease in price were it implemented throughout the country. Second, economists believed that restructuring would discourage high-cost generating capacity, a phenomenon that was a major reason why rates were so high in some states in the first place.

Nearly a decade later, it appears that restructuring has indeed improved the performance of the generation sector. Fixed power plant operating costs, for example, have declined in those states that undertook regulatory reforms. Moreover, widespread bankruptcies triggered by low wholesale power prices have reminded investors that returns are no longer guaranteed.

Restructuring, however, has had little observable effect on retail electricity prices. Electricity is still relatively expensive in the high-cost states that undertook restructuring in the 1990s. Whatever price declines have occurred are as much the result of the glut of generation capacity added during the 1990s because of irrational investor exuberance as the result of any permanent effect of regulatory restructuring. Meanwhile, real-time pricing (the development that economists thought would offer the largest efficiency gains from restructuring) has not been implemented on a large scale anywhere.

### ***Why Can't Competition Cut Prices?***

Politicians in the high-cost states supported restructuring in the hope that electricity from states like Kentucky (4.3 cents per kilowatt-hour in

2002) would end up being sold in states like New York (11.3 cents per kWh in 2002). Politicians in the low-cost states, however, have resisted efforts to create the sort of integrated national market for electricity that would allow such a thing to happen. Given how electricity prices are set under most state regulatory systems, the resistance is rational.

Because Kentucky's low prices reflect the cost of electricity *on average* rather than the cost of electricity at the margin, it's unlikely that Kentucky's utilities could produce enough low-cost electricity to serve both its domestic customers and its potential new customers in New York. Expanded output in Kentucky would probably have costs greater than 4.3 cents per kWh because the main source of low-cost electricity in Kentucky is lightly regulated old coal-fired power plants the output of which is strictly controlled under the federal Clean Air Act. Accordingly, politicians in Kentucky resist allowing their utilities to sell to customers in the high-cost states, given the understandable fear that doing so would result in increased electricity costs for domestic consumers. There is, after all, only so much low-cost power to go around, given the regulatory peculiarities of the Clean Air Act, and selling that power to the highest bidder would remove some or much of it from the reach of in-state consumers.

Many economists were skeptical about the prospects for competition reducing retail prices in electricity markets because of the generalizability of the Kentucky story—expanded output would have similar costs everywhere. In a deregulated market, the price of electricity is set by the highest-cost source of supply necessary to meet demand. In all markets and in all regions, that source happens to be natural gas-fired electricity, and the most important factor in gas-fired electricity costs is the cost of natural gas itself, which varies across locations only because of transmission costs.

### ***Has Restructuring Made Crises More Likely?***

Although regulatory restructuring was widely embraced in high-cost states during most of the 1990s, resistance is now widespread because most Americans associate electricity restructuring with the California electricity crisis of 2000–2001. That association in the public mind is not entirely unfair.

To be sure, the California electricity crisis was caused by an unusual confluence of events that had nothing to do with restructuring. A severe drought reduced Pacific Northwest hydropower at the same time that demand was increasing because of a hot summer and then a cold winter.

Throw in tightening air emissions regulations on gas-fired power generators in the LA Basin and the crisis was on.

Although no regulatory system could have averted the wholesale electricity price increases that followed, the restructuring plan then in place in California exacerbated the crisis. First, the convoluted state-managed wholesale power market left lots of room for generators to game the system and receive prices above what one might expect. Second, retail price controls that were adopted in the course of restructuring removed incentives for generators to price reasonably. Moreover, retail price controls ensured the bankruptcy of the public utility companies because they were prohibited from passing on the prices they paid for wholesale power to retail customers. The declining financial health of California electric utility companies forced wholesale suppliers to mark up the price of their electricity even further because of the increasing risk of nonpayment.

How much did restructuring contribute to the crisis? MIT electricity economist Paul Joskow thinks that about half of the wholesale price increases experienced during the shock can be attributed to poor market design. Other electricity economists, such as Harvard's William Hogan, think that the true figure is much smaller. Still, there is general agreement among economists that restructuring on balance made matters worse.

An important consequence of the California electricity crisis has been the quiet reemergence in many states that have restructured of regulations that require utility companies to maintain adequate reserve generating capacity and socialize the cost among all ratepayers during all hours of electricity use rather than just peak power users. This restores one of the main defects of the old regulated regime (the use of average rather than marginal costs as a basis for prices and the "need" to meet excessive peak demand that necessarily results) and undermines an essential rationale for restructuring.

### ***Restructuring and the Public Commons***

Before restructuring, the costs of maintaining the power grid and moving power along it were largely internal to companies engaged in generation, transmission, and distribution and paid for by ratepayers in a cost-plus system. Under restructuring and the accompanying separation of generation from the other two components, however, the power grid is the locus of endless battles about investment and cost allocation to which there is no intellectually compelling, nonarbitrary answer. Such battles are a recipe for continuing political intervention and turmoil.

The most important characteristic of electricity systems is the “commons” nature of the alternating current (AC) grid. That is, the physical reality of the grid does not coincide with private property rights or the 50 state regulatory schemes that govern the grid. Power added by any generator on an AC transmission system follows all paths, favoring those with least resistance rather than the shortest distance between generator and customer. Thus bilateral contracts between any willing seller and buyer of electricity involve legal fiction. That is, the power that the buyer is consuming almost certainly does not come from the designated “seller.” Moreover, putting power onto the grid and taking it off affects all other parties on the system in ways that are not captured by prices—the textbook definition of “externality.” The proper way to manage those externalities is the subject of great dispute and has no obvious answer. Likewise, transmission *additions* confer benefits across all generators and consumers on the grid and thus have public good characteristics. The development of property rights and prices that internalize those characteristics is very difficult.

Prior to restructuring, the commons problem was addressed by allowing one company to service a set block of consumers with generation, transmission, and distribution services. Trade between such companies was never very large and was governed by barter arrangements rather than markets. Where trade was extensive, voluntary arrangements such as the Pennsylvania–New Jersey–Maryland transmission pool arose to manage the flows across separately owned transmission systems through contract. Thus, historically, the “commons” characteristics of the grid did not create large externality issues. Most costs and benefits were borne by the same entity.

The Energy Policy Act of 1992 and orders 888 and 889 from the Federal Energy Regulatory Commission (FERC) changed all that. The law and regulations facilitated (and in some cases, actually ordered) the development of widespread trading on the grid. The mismatch between the physical reality of the grid and its current governance structure has become a matter of serious concern. Unless remedied, it will lead to deterioration of the transmission system, increasingly unstable supplies, and excessively costly power.

### ***Solving the Public Goods Problem***

What governance system can best address transmission externalities? The most commonly discussed possibility is aggressive regulation by FERC through mandatory utility participation in regional transmission

organizations (RTOs). The RTOs would be responsible for long-term management of the electricity grid. FERC also favors a standard market design for the industry in order to eliminate the discrepancy between the commons nature of the transmission system and the current fragmented system that governs it.

Many of the standard market design rules would be adopted by utilities that wanted to *voluntarily* engage in interstate trade. The problem with that caveat is that many utilities don't really want to engage in interstate trade or allow it to occur over their wires. That's because they own the grid over which trade would take place, and they don't want to be responsible for investment in transmission from which others benefit without payment.

Another problem with FERC's proposals is that they leave state-level regulation intact. Much of that regulation, unfortunately, works to impede electricity trading and ignores the regional spillover effects of transmission investment. The federal solution also takes responsibility for the grid away from its multiple owners and gives it instead to nonprofit corporations, introducing incentives for poor management by separating ownership from control.

While it's certainly true that the FERC could improve matters along the grid by assuming the regulatory powers currently exercised by 47 separate state governments (Texas is the exception because the transmission system there is entirely independent of systems elsewhere), if the existing balkanized system impedes gains to trade. But there may be few gains to trade to be had. Because natural gas is the marginal source of electricity everywhere, efficiency gains from long-distance trade exist only if the transmission costs of gas-fired electricity (from low-cost rural locations) are less than the higher fixed costs (land and labor) of locating generation near urban consumers. Unfortunately, there is little evidence of that. The other potential source of efficiency gains is real-time pricing. But mandatory open access and restructuring have not involved the use of real-time pricing, and states could implement real-time pricing without deregulation and without FERC intervention if they were so inclined.

### ***Back to the Future?***

Vertical integration (under which the same company owns both generation and transmission) may be the most efficient form of industrial organization for the electricity industry. Forcing the industry to disaggregate the business of making electricity from the business of moving electricity in order to create competition in the generating sector requires a great deal

of regulatory oversight to govern the interaction of independent generators and the public commons that is the current transmission system. Even if some efficiency gains result from the imposition of competition in the generating sector, the revival of installed capacity requirements re-creates the costs of excess capacity that led to the call for generation competition in the first place.

If the static efficiency gains from mandatory open access are smaller than advertised and the costs created by the regulatory apparatus necessary to achieve them are large, what should we do? Traditional vertically integrated utilities are often rather low-cost providers of electricity, but they restrict trade and tend to form state-based cartels. If such firms were totally deregulated (including transmission and distribution), they probably wouldn't change their behavior very much because entry and rivalry are difficult as long as they control the "highways" over which the electricity trade takes place. The only competition they would face would be from large customers who would generate their own power from natural gas cogeneration, but that threat has been considerably weakened by the doubling of natural gas prices in the early part of this decade.

The lack of competition that would occur naturally as the result of simple deregulation led many well-meaning people to propose and implement mandatory open access to "force" competition to occur. But that has required the substitution of legal orders for vertical integration to manage transmission externalities and led to games about transmission investment in which the players all argue that someone else should pay for extra capacity.

Two other scenarios are possible. One is a return to the old model: regulatory oversight of electric power companies (oversight that would include utility prices and investment decisions) combined with management of the transmission commons through vertical integration. The second is complete deregulation. Ironically, the substantive differences between those two radically different approaches are less significant than one might think.

In an unregulated world, the relationship between electric firms and consumers would almost certainly be governed by long-term contracts. That's because the high cost and immobility of electricity generation and transmission assets, and the lack of alternative uses for those assets, would allow producers and consumers to hold each other up—the classic condition under which long-term contracts make the most sense for both parties. Accordingly, the probable relationship between firms and consumers in

a deregulated electricity market might very well resemble the regulatory architecture of the old regime—utilities would receive a guaranteed rate of return and consumers some degree of price protection.

But what if residential consumers find it difficult or impossible to negotiate as a group with the electric utility company? Scholars who have examined pricing behavior by power companies under the old regime have discovered that, even when supervised by public regulators, utilities charged profit-maximizing prices for electricity. In short, there's good reason to believe that under normal circumstances rates would be no higher without regulatory supervision than they are with regulatory supervision.

Accordingly, legislators should completely deregulate the electricity sector and not worry about the market power of incumbent utilities. Although complete deregulation may not hold out the promise for static efficiency gains greater than those that might be achieved through a return to the old regime, it does hold out the promise of dynamic efficiency. Market actors do not have the freedom to experiment easily with different business arrangements and contractual relationships under regulation.

If complete deregulation is politically unachievable, legislators should end the experiment in regulatory restructuring and return to the old regime. Fortunately, the economic problems posed by rate regulation are fewer today than they were 30 or 40 years ago because incentive-based regulation has replaced traditional rate-of-return regulation. Under incentive-based regulation, owners have an incentive to reduce costs rather than to pad them and, more to the point, to avoid capital-intensive generating facilities.

## **Conclusion**

Electricity restructuring was originally embraced by many economists because it was believed that reforms would reduce the incentive to build excess generating capacity, eliminate the incentive to build capital-intensive generating facilities, and lead to an introduction of real-time pricing. Only the second of those expectations has been realized.

In addition, restructuring has created problems previously unknown in the electricity sector. Those problems generally arose because electricity restructuring

- focused on generation competition and ignored the pricing and incentive issues involved in managing the transmission system and its public commons characteristics,

- grafted a relatively free wholesale market onto a still heavily regulated retail market, and
- established artificial market institutions that invited manipulation and abuse.

The end result has proven far from satisfactory.

There is little reason to think that the restructuring experiment will produce improved results in the future. The problems with the current regime are systematic. Regulations requiring set amounts of reserve generating capacity essentially return us to the old status quo without saying so.

### **Suggested Readings**

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