A realistic look at the performance of Independent System Operators

Can Nonprofit Transmission Be Independent?

By Robert J. Michaels

Competitive markets for the production of electrical energy are growing, but the facilities that transmit and distribute it remain technological monopolies. Through the 1970s most utilities were self-sufficient in generation, and power trades between them were small. Transmission was supplied largely at the discretion of its owners and was priced at cost-recovering rates approved by the Federal Energy Regulatory Commission (FERC). As these inter-utility ("wholesale") markets grew during the 1980s, the courts ruled that FERC could impose "open access" requirements on transmission owners that would, in principle, end discrimination by their owners against parties who wished to use the lines for their own transactions. Shortly afterward, the Energy Policy Act of 1992 gave FERC new powers to order transmission, sometimes called wheeling, for wholesale transactions. Through all those changes, consumers of all types remained under state jurisdiction, where regulatory commissions universally denied them the right to trade on their own accounts in wholesale markets. However, by 1999, California, Pennsylvania, Massachusetts, and several other states had begun allowing residents to bypass their utilities. FERC has since held that transmission owners cannot in general discriminate against consumers who seek wheeling service on lines that are under its jurisdiction.

The physics of electricity immensely complicates transmission management. If a producer in Wyoming injects 100 megawatts of power into the Western Interconnection for a customer in New Mexico, 14 megawatts will end up in Washington State, 24 in southern California, and 18 in Utah, among other places. The customer will get the amount promised, but most of the energy it receives will have been produced elsewhere. Since power does not move along a well-defined "contract path," how should this buyer and seller compensate the numerous transmission owners whose lines they actually used? What if their deal congests those lines and forecloses their owners from advantageous transactions of their own?

As transactions by non-transmission owners have grown, the reciprocity and ad hoc payment rules that worked when markets were restricted to utilities have become unsustainable. If non-utility power plants compete for sales with utility-owned plants, utilities might benefit by denying non-utilities access to necessary transmission. Because electrical operating decisions must often be judgment calls made in real time, regulators will have difficulty distinguishing denials of access that are needed to maintain reliability from ones whose purpose is to harm competitors. In response, FERC's recent Orders 888 and 2000 have set out standards for forming regional transmission organizations to operate aggregates of facilities that utilities will continue to own.

The form that the organizations will take is the subject of intense debate. Some interests favor nonprofit Independent System Operators (ISOs), while others are proponents of transmission companies (Transcos) that will own or lease the lines from their owners. Both ISOs and Transcos will price their services at FERC-regulated rates that average the costs of all the lines in the system. Views of the partisans are predictable: ISO backers fear that Transcos will be incorrigible monopolists, while Transco advocates expect that ISOs without a profit motive will operate inefficiently.

Monopoly and efficiency matter, but equally impor-

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tant issues remain virtually unexplored. We need to know which organization will be more innovative, which will be a better long-term planner, and which is more likely to make consistent decisions. The logic of assertions that ISOs, unlike Transcos, will require only "light-handed" regulation requires testing. Insights from the economics of transaction costs, corporate organization, and voting have been conspicuous by their absence from the ISO-Transco debate, which has become a standoff between opponents of inefficiency and opponents of monopoly.

THE CORPORATE ORGANIZATION

COMPETITION AMONG ORGANIZATIONAL FORMS HELPS determine the internal structures and financial characteristics of successful business firms. Profit-seeking entities can be corporations, partnerships, or proprietorships, and much variation (particularly as regards liability) is possible within the forms. Nonprofit institutions such as colleges, cooperatives and municipal utilities also survive, sometimes in competition with profit-seekers. Decision-making authority can be in the hands of shareholders (corporations), workers (employee-owned firms), suppliers (agricultural co-ops), or customers (rural electric co-ops). Businesses can be financed by debt or equity, which may or may not be publicly traded.

With so many alternatives, it is remarkable that publicly traded corporations dominate so many sectors of the economy. In the competition among organizational forms, however, the corporation has advantages beyond pooling the resources of small investors and limiting their liability. The corporate form facilitates risk management by allowing investors to diversify in accordance with their individual preferences and to change their exposures on short notice. Comparisons of stock prices help investors evaluate the managers that they have voted into office. Because shareholders are residual claimants to corporate wealth with rights to choose management, their nearly unanimous goal will be to seek profit and operate efficiently, subject to market competition and legal constraints. Shareholders sometimes have difficulties controlling management, but their intention that management act to maximize shareholder wealth is almost always unambiguous.

Corporations fail to dominate activities that are better governed by other organizational forms. Non-corporate organizations survive where non-shareholders are more likely to make efficient decisions than shareholders. Partnerships are common in the professions, where non-specialist shareholders are less likely to be competent judges of performance than specialists themselves. Non-corporate forms are more feasible where those who govern have identical interests and voting power varies with their stakes in the outcome. A marketing cooperative where farmers' voting rights depend on their acreage is a common example. An organization's boundaries are set where unanimity is unlikely to prevail. After income is distributed to members of the co-op, they individually decide how to consume or reinvest it. Collective determination of investment would lead to conflicts over distribution of the private benefits. These conflicts are negative-sum, since they both affect incentives and foster strategic behavior by coalitions attempting to expropriate from one another.

THE GOVERNANCE OF ISOS

ISOs CURRENTLY OPERATE IN NEW ENGLAND, NEW YORK State, Pennsylvania-New Jersey-Maryland, Texas, and California, and FERC is in the process of approving others. No Transcos currently operate, but Entergy, a large holding company in the Southeast, has applied to spin its facilities off into a Transco. The organizational details of the ISOs vary, but all of them arrive at decisions by counting the votes of heterogeneous interests ("stakeholders") whose relative strengths are determined by politics. The California ISO's Board of Governors numbers 25 individuals from 13 categories. There were originally to be only five categories, but legislation and negotiation resulted in the current number. The categories include industrial and residential consumers, governmental buyers, marketers, independent power producers, public interest groups (two environmentalists), and "non-market participants." One non-market member represents the utility workers' union and the other a power plant contractor. Staff members of the California Public Utilities Commission and Energy Commission have sought non-market participant seats, and my own candicacy was recently rejected. Corporate utilities have three votes (one for each major system), while municipal utilities, which serve under 30 percent of the state, have four.

The heterogeneous interests governing an ISO do not have the single-minded wealth-maximization objective of a corporation's shareholders. Members of an ISO board can increase the wealth of those they represent either by promulgating efficient policies or by constructing winning coalitions to expropriate wealth from others. The ISO itself is a nonprofit organization. Its policies, however, are set by representatives of entities whose fortunes are affected by the organization's choices.

THE ISO'S CONSTITUTION

IN THE LANGUAGE OF PUBLIC CHOICE ECONOMICS, AN ISO IS analogous to a government, and like a government it must have a constitution that determines its organization and operating rules. The ISO's constitution, however, will itself be drafted by parties strongly interested in the policies that it implements. Public-choice theory helps predict which interests will dominate the drafting process, and the development of ISOs thus far validates those predictions.

Organizations whose members have few conflicts among themselves, large individual amounts at stake, and low costs of influencing the constitutional process will participate more intensively in writing the constitution than others. Organizations that face similar problems will have an easier time reaching agreement on how to deal with them, and larger organizations face fewer "free rider" problems over contributions to their joint effort. Established

transmission-owning utilities clearly have the requisite attributes. They are large entities with exclusive territories that foreclose most competition among themselves, and regulators generally guarantee that their costs of participating in the ISO process are recoverable in the rates they charge all customers, including those who buy energy elsewhere. Less well-organized interests whose members compete among themselves and whose costs are not recoverable by regulation have generally been smaller presences in ISO formations. Some large independent power producers and marketers do nevertheless participate despite the benefits their efforts confer on smaller competitors. Small consumers with low individual stakes are least likely to represent themselves, save for advocacy groups whose membership is relatively small.

ISOs must file their constitutions (charters), bylaws, and rate determinations at FERC before operating under them, and the commission has often rejected important parts of the filings. It has taken years for the three ISOs in the Northeast to get past the FERC's objections to provisions giving transmission owners unacceptable dominance of important committees and voting procedures. California's three major transmission owners were the only parties allowed to vote during its ISO design process, and votes could be taken in nonpublic meetings. ISO governance in the state was effectively frozen for more than a year of court and regulatory proceedings before compromise on a residency requirement for board members that was backed by utilities.

GOVERNANCE BY COLLECTIVE CHOICE

BEFORE ISOS, INTERESTED PARTIES TOOK THEIR DIFFERences to regulators. Now they will directly vote their interests as governors. The economic theory of voting suggests that the change will have adverse consequences for efficiency. According to Nobelist Kenneth Arrow's famous theorem, it is simply impossible to design collective institutions and decisionmaking methods that will always produce outcomes that satisfy certain standards of consistency and rationality. For example, every conceivable decision method (e.g., pairwise elections, elimination of least-desired alternatives, point-count voting, etc.) will at times produce inconsistent ("intransitive") outcomes. (In pairwise votes, a body with three choices can at times pick option A over B, B over C, and C over A.) Likewise, no voting method guarantees that individual preferences are mirrored in the outcome. (If one voter changes from ranking A above B to ranking B above A, the collective choice may still change from B to A.) Closely related is the concept of strategy-proofness. Regardless of the voting method, there will invariably be situations in which some coalition can get a better final outcome for itself if its members do not vote their true preferences.

Transcos Have Single-Peaked Preferences The Impossibility and Strategy-Proofness Theorems assure us that it is impossible, rather than just difficult, to find a collective choice process that meets the standards of consistency and rationality for all possible configurations of voter preferences. One consequence is that at times the sequence in which votes are taken determines the outcome. When this situation occurs, the person who sets the group's agenda has some power over its final choice. Economists and mathematicians have shown that if the preferences of voters take certain forms, the paradoxes vanish, agenda control becomes unimportant, and consistent methods of voting exist. The condition most relevant to majority voting in ISOs and Transcos is known as single-peakedness. Single-peaked preferences mean that each voter has a most-preferred policy, and dissatisfaction with an alternative increases the farther it lies in either direction from the most-preferred one. (For example, if I most prefer a $5 budget for the group, I find a $7 budget inferior and a $9 budget less desirable than $7.)

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If all voters are single-peaked, the paradoxes cannot occur under majority or super-majority voting. With a single-minded interest in maximizing the value of their company, the shareholders of a Transco (and probably its directors) will have single-peaked preferences over different levels of profit. Single-peakedness is less likely in an ISO, where the rewards of an interest group need not move uniformly upward or downward with the amounts being voted on. Consider an ISO choosing the amount of transmission capacity it will make available or order to be constructed. A power marketer will probably have single-peaked preferences, invariably preferring more capacity to less. An independent power producer may instead prefer either a high or low amount of transmission capacity to some intermediate amount, violating single-peakedness. If capacity is low, the independent producer faces little competition from imported power, and if it is high, that producer can sell its output over a wider area. An intermediate capacity, however, neither expands its market nor maintains local pricing power. An environmentalist might have a similar ranking, since high transmisssion capacity allows imports that reduce local pollution, low capacity advances local demand-management initiatives, and intermediate capacity facilitates neither.

The more voters whose preferences are not single-peaked, the more likely are inconsistent outcomes, strategic behavior, and inefficient policy choices. With a larger gov-

erning board, the number of possible strategic coalitions and countercoalitions on it increases rapidly. More possible coalitions mean more possible policy packages and a greater likelihood that the content of whatever package passes will be economically inefficient.

Transco Behavior Is More Predictable FERC is charged with regulating all nonfederal interstate transmisssion operators, be they utilities, ISOs, or Transcos. A majority of sitting commissioners have informally expressed their preferences for ISOs over Transcos, but both organizations must be regulated according to the standards of the Federal Power Act and commission precedent. The final outcome of any FERC action, however, depends on what the commission orders and on the response of the regulated entity. If so, a Transco may be easier to regulate than an ISO because the Transco's profit orientation makes its response to policy more predictable than that of an ISO whose response depends on the objectives of those in its governing coalition at the time. If that coalition shifts often, FERC will have more difficulty in framing regulations that elicit the behavior it desires and may need to engage in more intensive oversight once a regulation is in place.

The greater predictability of a Transco's response casts doubt on claims that the ISO's nonprofit status and its democratic governance make the ISO a better candidate for light-handed regulation. An ISO could, of course, respond predictably to FERC if one class of governors consistently dominated. Such an outcome, however, would frustrate the hopes of ISO backers that their organization be a forum in which all affected interests reach compromises. The ISO's consistency might in any case be that of a monopolist, since, as noted above, transmission owners are among the most likely candidates to dominate its governance.

To be sure, a Transco's shareholders may have difficulty monitoring the choices made by managers, and managers may choose self-serving or inefficient policies that fail to maximize the market value of the company. Mergers, takeovers, divestitures, and related corporate control transactions can, however, efficiently move decisionmaking power into the hands of those who can best manage the organization's assets. A corporation with widely dispersed shareholdings is more at risk of managerial self-indulgence because monitoring entails free-rider difficulties. A shareholder who investigates the company, determines that management is incompetent, and organizes its ouster bears the costs of these activities but benefits shareholders who choose not to participate in the effort. But evidence on the functioning of markets for corporate control indicates that the problem is not insuperable.

ISOs, however, are not subject to the potential discipline of the markets for corporate control. They do not have shareholders, and there are no analogues to mergers or takeovers. A constituency controls only its own representatives, and no existing ISO has provisions in its charter or bylaws for complete replacement of its governing board. Unlike corporate shareholders, those who lose from inefficient ISO decisions have no tradable claims on the organization's wealth that they can liquidate if dissatisfied. Free-rider problems, conflicts among represented interests, and the absence of a takeover mechanism all increase the likelihood that an ISO's own bureaucracy will come to control the organization's decisionmaking agenda, and quite possibly its policy decisions.

MARKET POWER AND COMPETITION

EVEN IF RATES ARE REGULATED, A UTILITY MIGHT PROFIT BY denying other generation owners access to its lines or raising their costs of obtaining access. Barring exceptional circumstances, a Transco that owns no generation has little incentive to act restrictively, and regulators can impose rate designs that reward it for increased volumes of business. Not all interests governing an ISO necessarily want to make access to transmission more open, such as generation owners who serve "load pockets" (areas of local monopoly) and have no good reason to let competitors into these areas. If anti-access groups can form a majority coalition, ISO policies can be as restrictive as those of any other monopolist. The ISO itself is without a profit motive, but those who make its decisions gain or lose wealth by their collective choices. Regulation may be unable to reach or even estimate the profits earned by non-utilities who succeed in using the ISO in this way.

A Transco, by contrast, is an organization whose assets have long been regulated, and its owners will use them in predictable ways, some possibly questionable. Like shareholders in other corporations, those of the Transco attempt to become wealthy subject to legal and regulatory constraints. The Transco, like the transmission-owning utility before it, will operate under familiar constraints that range from antitrust law to open-access requirements. It may wish to test or evade those limits, but violations (whether suspected or actual) can induce both governmental action and private litigation. The limits on liability and the antitrust status of a nonprofit ISO are by contrast still quite unclear, with boundaries that courts and regulators have hardly begun delineating. The Federal Trade Commission's testimonies in several dockets have expressed concern over Transcos while remaining silent on the possibility that an ISO majority will engage in anti-competitive conduct.

INNOVATION, INVESTMENT, AND ORGANIZATIONAL CHANGE

THE DETAILS OF GOVERNANCE AFFECT BOTH SHORT-TERM economic efficiency and long-term investment and innovation. Even if an ISO and a Transco allocate transmission with equal efficiency today, their performance may diverge over the future. The coalitional structure of an ISO's governance may render it less receptive toward innovation than a Transco. A new market institution proposed by the transmission operator might, for example, benefit consumers and low-cost producers but impose losses on high-cost producers. The Transco's single-minded pursuit of profits will make it unconcerned with the fate of the inefficient. But in the politics of an ISO, sellers who don't want

the new market institution might be powerful enough to block the innovation or to devise ways to transfer some of the benefits to themselves if it is implemented. Bureaucratic employees of an ISO may also have influence over decisions that they do not have at a Transco, exerting pressure to keep certain activities in-house when their transfer to the market is warranted.

Investment Incentives ISO governance may also inhibit investment in new transmission. A Transco that owns all of the lines in a large area will have relatively little opportunity to exploit neighboring transmission owners by taking advantage of parallel flows along their lines to move power between points on its system. If a flow scheduled between two points on a Transco's system adversely affects operations in a distant part of that system, the Transco will bear the costs, and it will enjoy most of the benefits of investment at that critical point. The Transco will cover enough territory that free riding on the transmission investments of its neighbors cannot substitute for its own investment. By contrast, an ISO that operates several separately owned transmission systems as a unit must face the incentives of the individual owners to wait for each other to build new lines, as would happen in a regime of individual grids that cover relatively small areas. The problem is compounded if the ISO operator must charge all users of its system identically, leading to cost-shifting problems when one of its members adds new investments and the others do not.

The investment incentives of an ISO member utility might also be attenuated because it cannot be certain that ISO operation of its lines will give it the same benefits as self-operation would have. If the ISO rather than individual utilities makes a collective choice about where to build, the decision may be as much political as it is economic and there will be little reason to expect an efficient outcome.

The Federal Trade Commission has stated (without any evidence) that Transcos will invest excessively in transmission compared with ISOs. Even if true, this activity may be a product of rate-of-return regulation rather than a flaw in the Transco concept. The relevant comparison is between a real Transco and a real ISO, rather than a real Transco and an idealized ISO. Counsel for the California ISO recently stated that the organization's inability to induce utilities to build new transmission makes it dependent on costly "must-run" contracts with inefficient generators to maintain reliability.

Transmission policy can also raise barriers to competition among generators. The California ISO is currently divided over a proposal by its staff that will require a new generator to bear the entire cost of improvements (which benefit numerous others) if connecting its plant congests transmission. Supporters in the ISO say that the requirement "forces those companies who want to compete to be more efficient than their opponents," and "keeps fly-by-night companies out of the process by making sure that any competitive supplier has the revenue to invest in the grid." The Pennsylvania-New Jersey-Maryland ISO faces the same problem, compounded by the question of priority in a queue of generators (some owned by utilities) seeking to interconnect. There, an ISO source said that "the queue order was designed to prevent companies with little, if any, background in the industry from gaining access and threatening the reliability of the grid."

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Organizational Flexibility Electricity's future is uncertain, and no guarantee exists that any present-day regional organization has the size, geography, or membership needed to operate efficiently as markets change. Neither the ISO nor the Transco can easily change its form in this regulated industry, but the job is less difficult for the latter. A Transco can seek approval of shareholders and regulators (both state and federal) to change its form, but obstacles including bond indentures and the provisions of the Public Utility Holding Company Act make the change hard in this industry.

The ISO and transmission owners in it face the same regulatory problems, but collective governance adds a further complication. Changing the set of interests represented in an ISO and the assets under its control may upset existing political balances and hinder efficient organizational changes that would have more easily occurred in a corporate entity. After two years of negotiation, California has been unable to reach agreement on setting rates that will bring high-cost municipal transmission systems into its ISO. As of now, FERC cannot explicitly order entities into ISOs, but the value to some transmission owners of holding out is rapidly becoming clear.

Flexibility matters in transmission management because as competition grows organizational needs will change unpredictably. An organization's warranted size may shrink if generation of electricity on the premises of consumers becomes important, or it may grow if new long-distance transmission technologies are developed. Size and scope will also change with power markets, particularly if those markets move away from the short-term energy exchanges that are the focus of today's policy. Already, proposals for ISO areas range from single utilities to states to regional interconnections. There are plausible economic and engineering reasons to consolidate the New England, New York, and Pennsylvania-New Jersey-Maryland ISOs into a single

entity, and strong political reasons exist not to do so. Adaptability of the governing organization is critical if transmission is to be managed efficiently. Unlike the ISO, the Transco carries at least some of the attributes that have contributed to the adaptability and survival of the corporate form itself.

CONCLUSION

THE IDEA OF THE ISO ARRIVED WITH THE OPENING OF wholesale electric markets to the actual consumers of power. Among its strongest backers have been the most threatened utilities, whose market power the ISO would ostensibly control. The principal supporters of ISOs are a roster of opposing interests: corporate utilities, municipal utilities, small-consumer advocates, regulatory commissions, and environmentalists. Opposed are most independent power producers, marketers, and large consumers, who generally favor Transcos. Oddly, the new competitors who are the most likely victims of transmission monopoly have for the most part rejected the institution that utilities and regulators claim will best protect them. The list of the ISO's backers may explain why. They are for the most part interest groups experienced with the present regulatory system, and with politics in general. The opponents are market actors.

As experience accumulates, it is becoming clear that the ISO is a political solution to an economic problem. A Transco is an imperfect economic institution, but its imperfections are known, its underlying logic is the same as that of any regulated corporation, and its monopolistic aspects are at least familiar if not perfectly solvable. The structure of an ISO invites inefficient choices and dominance by transmission owners. Its nonprofit form is no more than a veil under which interests of all sorts can manipulate its governance process to obtain benefits for themselves. The strategic posturing in ISO filings thus far does not appear to have shaken the common but unfounded belief that nonprofit institutions will be intrinsically superior transmission operators. To the extent it worked at all, traditional regulation worked best in natural monopoly environments like transmission, where costs were easy to track and financial risk was a minor consideration. If the ISO is the alternative, there is a good deal to be said for the old ways.

The governance of ISOs may render them impervious to constitutional and organizational change. In particular, they are unlikely to be transitional institutions that Transcos will ultimately replace. Interests ranging from utility unions to the Sierra Club will have no direct say in the governance of a corporate Transco. They have no reason to give up their power in an ISO to a Transco that promises them nothing in return. Possibly the greatest hazard of ISOs is that they will be with us indefinitely, impossible to turn into another institutional form no matter how poorly they perform.

The ISO is quite possibly the strangest institution to have turned up in more than a century of regulatory experimentation. Nowhere has pressure been exerted from so many interests to radically change the governance of a major industry's most basic facilities, and to assume on faith that an organization superficially unconcerned with profits will provide a superior resolution to problems of monopoly and efficiency.

It is hard to believe that the telecommunications and gas industries would look better than they do today if only the most critical decisions about competition in them had been turned over to stakeholder committees. In gas, interstate pipelines are essentially Transcos. Innovative regulation and market competition moved them from ossification to efficiency, facilitating consumer choice and risk-management activities that were unimaginable only 10 years ago. Does anyone seriously believe that 10 years from now an ISO-dominated electricity industry will be performing half as well?

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