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Regulating Transmission

Why System Operators Must Be Truly Independent

Which is best for effective competition in power sectors, a separate transmission system operator, a joint owner-operator, or some combination of the two? This question is being hotly debated among power reformers. The answer? Both types of system operators can be made to work, singly or in combination. What is critical is that the system operators be truly independent of ownership and control by market participants—generators, distributors, and suppliers. But in many countries they have not been.

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Over the past 10 years separate transmission system operators ("TSOs") have been created or proposed in more than 30 countries reforming their power sectors. Two kinds of operators dominate: transcos and independent system operators ("ISOs"). Transcos are joint owner-operators of the high-voltage grid. Independent system operators are separate operators of grid facilities owned and maintained by others, such as vertically integrated power enterprises or stand-alone owners of transmission facilities usually referred to as wirecos (table 1).[1] To achieve a competitive power sector, a transmission system operator, whether a transco or an independent system operator, must act as an impartial policeman, not as someone's private army.

Which kind of operator is best?

Proponents of independent system operators argue that they are preferable because a transco

Box 1 The job of the transmission system operator

The job of the transmission system operator is to ensure the electrical stability of the interconnected system so that bulk power can be transported from generators to distribution networks. The operator—whether a transco or an independent system operator—provides open access to the transmission system, monitors and controls system operations to ensure a moment-to-moment energy balance, manages congestion, schedules generation (or reviews the technical feasibility of schedules submitted by others), acquires ancillary services such as operating reserves and voltage support, and plans or approves requests for maintenance of transmission and generation facilities. Many system operators also administer spot and real-time balancing energy markets. These operators generally perform metering, accounting, settlement, and billing for the markets.

Table 1 **Functions of transmission entities (owners and operators) by type**

Type of entity and example	Maintains real-time control of system operations	Maintains transmission facilities	Controls grid investments	Owns or leases transmission facilities
Independent system operator Cammesa (Argentina), PJM (U.S.), ONS (Brazil), NEMMCO (Australia)	●		◒	
Wireco Transener (Argentina), Transelec (Chile), GPU PowerNet (Victoria, Australia)		●	◒	●
Transco National Grid Company (England and Wales), Statnett (Norway), Polish Power Grid (Poland)	●	●	●	●

● Full responsibility. ◒ Shared responsibility.
Source: Based on unpublished work of Steve Stoft (University of California Energy Institute) and Carolyn Berry (National Economic Research Associates).

will favor its own commercial interests over the interests of market participants. They point to the difficulties of designing incentives to induce a transco to minimize the total costs of electricity production rather than just congestion costs. They claim that faced with an operating or congestion problem, a transco will almost always choose a solution centered on transmission (building a new line, for example) even if there are less costly alternatives (paying a new generator to build at another location).

Proponents of transcos claim that independent system operators are inherently inefficient because they are usually nonprofit organizations requiring complex systems of governance. They point to the difficulties of writing and enforcing contracts that ensure that an independent system operator will efficiently and reliably operate transmission assets owned by others. They argue that transcos are preferable in the early stages of reform because they are easier to create from state-owned utilities and may counteract the political power of generators and distributors.

No clear-cut evidence has yet emerged that conclusively supports the arguments of either group. Properly designed, both types of institutions can work, singly or in combination.

The why and how of independence

Key to the success of a transmission system operator—no matter the type—is independence from ownership and control by market participants, so that the operator does not favor one over another. Independence is not just a matter of fairness—it has real consequences. Private investors will be reluctant to build new generation or distribution facilities or buy existing ones if they do not believe that the system operator will be truly independent. Independence has several dimensions.

Ownership

Ownership usually conveys control, so there must be restrictions on who owns the system operator. Ownership restrictions must also go in the other direction: just as market participants cannot have financial interests in the system operator, the system operator cannot have financial interests in market participants.

The first restriction prohibits market participants from having equity interests in the operator. For example, the corporate charter of the National Grid Company, the privately owned transco serving England and Wales, prohibits "restricted persons" (market participants) from owning more than 1 percent of the company's voting equity. The second restriction must apply not only to the operator but also to its directors, managers, and employees.

Decisionmaking control

Control can be achieved even without ownership if market participants can direct the system operator's decisionmaking process. Particularly when an operator is a nonprofit or cooperative organization (the typical structures for an independent system operator), close attention must

be paid to its governance—what decisions are made, who makes them, how decisions are enforced, and how disputes are resolved. The key to governance lies in the composition and voting rules of the operator's governing board.

Governing boards

An operator's governing board can consist of stakeholders, nonstakeholders, or a combination of the two. The stakeholder board, the dominant model in Latin America, allows each class of market participants (generators, distributors, suppliers) one or more representatives on the decisionmaking board. Board members are permitted to directly and openly represent the economic interests of their organization or constituency within the operator's regulatory framework and rules. If no one entity or class can dominate board decisions, independence can be achieved—an "independence through balance of power."

For the nonstakeholder, or "classless," board, the dominant model in the United States, members are chosen to be independent rather than to represent stakeholders. Members are prohibited from having current and sometimes future financial interests in market participants. Board seats may be reserved for those with particular skills (system operations and planning, finance and accounting, law and regulation). To avoid isolation, the board is usually advised by one or more committees of stakeholders.

A stakeholder board can be "messy." But for countries trying to privatize and restructure their power sectors it is probably the best alternative—for three reasons. First, it gives new private investors some assurance that they will be able to influence decisions that could have a major financial impact on their investments. Second, finding enough knowledgeable individuals in the country who would be perceived as independent may be impossible. Third, nonstakeholders may be susceptible to "capture"—to bribes or to offers of future employment.

Worldwide experience suggests several requirements for a successful stakeholder board:

- *The board cannot be too large or it will be ineffective as a decisionmaking body.* Most Latin American boards are limited to 7 or 9 members. In California, however, the independent system operator's board has had 25 voting members. Federal authorities recently ordered that it be dissolved because it was too large and politicized.
- *The voting rules must ensure that one or two classes cannot control the board's decisions.* Rules should be designed to ensure that no one class can block a board action, no two classes can mandate board decisions, and no market participant can take part in more than one class. Until recently the board of the Chilean market operator was limited to large generators—virtually a cartel—and each member had veto power. The domination by large generators was so complete that other market participants did not know the details of the board's operational and dispatch rules.
- *The board must have real decisionmaking authority.* In Panama the manager of the system operator located within the transco—both government owned—was recently removed without the approval of the stakeholder board. A board excluded from such key decisions is merely an advisory body.
- *The regulator must be able to step in and make a decision if board members are at a deadlock.* This does not mean that the regulator must formally approve every board decision or arbitrate every dispute. That requirement would slow reform, especially early on, when changes are needed almost continually. But the regulator must have the legal right to intervene if there is an appeal by market participants or on the regulator's own initiative. If the governance system is well designed, the regulator will only rarely need to step in, and government regulation can be largely replaced by industry self-regulation.

Functional unbundling—the impossible dream

Some reformers have proposed functional unbundling as a second-best alternative to an independent transmission system operator. Functional unbundling allows the grid operator to remain within a larger power enterprise that owns generation and distribution facilities, but uses detailed conduct rules to try to ensure that the grid operator acts as if it were independent. These rules typically require the following:

- Separate accounts for grid operations.

- Separate management of grid operations.
- Restrictions on information flows between the grid operator and other divisions or affiliates of its parent enterprise.
- Nondiscriminatory provision of transmission service to all grid users under a published transmission tariff.

Functional unbundling has been tried in Europe and the United States. But it does not work for two reasons. First, it conflicts with the normal incentives of any commercial enterprise to try to protect the profits of a parent or affiliated company. In the United States market participants have widely alleged that system operators in vertically integrated companies have hurt competitors by "playing games"—issuing biased estimates of available transmission capacity, making questionable curtailments of transmission service for "security" reasons, and reserving excessive allocations of transmission import capacity for themselves. But proving these allegations has been difficult because the rules are necessarily general and can be applied with discretion.

Second, enforcing the rules is virtually impossible. Consider the common prohibition against the grid operator sharing information on available transmission capacity with its power marketing division or affiliate before sharing it with other market participants. Enforcing that rule would require a veritable army of regulators to monitor "who spoke to whom in the company cafeteria." Any unbundling scheme that requires the regulator to police conduct is doomed to fail.[2]

Institutionalizing change with outside coaches

The biggest danger in power sector reform is getting stuck with flawed grid or market rules. Those profiting from a flawed rule will usually cry discrimination if anyone proposes changing it. The challenge is to create a system that ensures efficient rule changes. Panama and the United States have adopted similar approaches, setting up market surveillance groups of independent outside experts to "institutionalize change."[3] Their experience suggests two lessons. First, the experts must be perceived as independent and objective. In small and even medium-size countries that probably means hiring experts from outside the country. Most knowledgeable people within the country will be perceived, at least initially, as biased because of past connections with the industry. Second, the experts must have a broad mandate. They should be charged with assessing not only the performance of the market, but also the performance of the system operator and the regulator. And they should be able to recommend changes in structure as well as in rules.

Conclusion

Power sector reform brings different specialists into close contact—engineers who like to operate sophisticated power systems, economists who like to think about optimal incentives, and lawyers who like to write rules and agreements. But unless these specialists work together in designing sustainable institutions, all of them will fail at their chosen task. A government that wants a competitive power sector must create an independent transmission system operator whose decisions are not controlled by market participants. It must also create an institutional mechanism that ensures that flawed grid and market rules can be changed after the initial reforms take effect.

Notes

1. Separate system operators are usually referred to as independent system operators in power parlance, but the independence may be more apparent than real.

2. For example, the U.S. Federal Energy Regulatory Commission has found it necessary to interpret and clarify its 1996 functional unbundling rule (Order 889) in 79 follow-up orders covering more than 1,300 pages. In December 1999 the commission concluded that functional unbundling was inefficient, unfair, and difficult to enforce.

3. Beatriz Arizu and James Barker, a colleague of William Dunn's, are two of the three outside experts in Panama's market surveillance group.

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