

# TRANSMISSION AT A CROSSROADS

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## I. INTRODUCTION

Transmission has more than a century of history as an essential function of the vertically integrated electric utility.<sup>1</sup> Weaving together interconnected conductor networks throughout North America, the growth of transmission has helped to bring utilities greater economy and consumers greater reliability.

With the issuance of the Federal Energy Regulatory Commission's (FERC or Commission) Order No. 2000,<sup>2</sup> the electric transmission industry

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1. A vertically integrated utility may be defined as an electric utility that owns generation, transmission, and distribution facilities and sells bundled service (delivered electric energy) to wholesale and retail customers. *See also* Order No. 888, *Promoting Wholesale Competition Through Open Access Non-Discriminatory Transmission Services by Public Utilities; Recovery of Stranded Costs by Public Utilities and Transmitting Utilities*, III F.E.R.C. STATS. & REGS. ¶ 31,036, at 31,693, 61 Fed. Reg. 21,540 (1996).

2. Regional Transmission Organization (RTO) was loosely defined in the Notice of Proposed Rulemaking on Regional Transmission Organizations as an entity that satisfies certain minimum "characteristics and functions." Final Rule, Order No. 2000, *Regional Transmission Organizations*, [Regs. Preambles] III F.E.R.C. STATS. & REGS. ¶ 31,089, 64 Fed. Reg. 809 (2000) [hereinafter Order No. 2000]. The minimum characteristics include:

- (1) independence from market participants;
- (2) appropriate scope and regional configuration;
- (3) possession of operational authority for all transmission facilities under the RTO's control; and
- (4) exclusive authority to maintain short-term reliability.

In addition, there are seven minimum functions that an RTO must perform. An RTO must:

- (1) administer its own tariff and employ a transmission pricing system that will promote efficient use and expansion of transmission and generation facilities;
- (2) create market mechanisms to manage transmission congestion;
- (3) develop and implement procedures to address parallel path flow issues;
- (4) serve as a supplier of last resort for all ancillary services required in Order No. 888 and subsequent orders;
- (5) operate a single OASIS site for all transmission facilities under its control with responsibility for independently calculating TTC [Total Transmission Capability] and ATC [Available Transmission Capability];
- (6) monitor markets to identify design flaws and market power; and

has reached yet another milestone in its evolution and now stands at a crossroads. The more than 140 transmission owners across the country are faced with the questions of whether to form or to join a Regional Transmission Organization (RTO)<sup>3</sup> and what are the financial implications of such a course of action. In many areas of the country, utilities must decide which RTO to join, given the multiple and, in many cases, competing RTOs. Transmission owners are also taking a hard look at transmission as a stand-alone business, and asking whether it will survive and prosper over the next five to ten years.

This article examines the evolution of the transmission business- how it started, where it is today, and where it must go to be successful in years ahead. The article identifies the key business drivers, and the actions needed to create a viable and vibrant stand-alone transmission business, which is able to attract the investment and talent needed to fulfill its critical role in the future.

## II. THE CHANGING BUSINESS OF ELECTRIC TRANSMISSION

### A. *Beginnings*

Over a century ago in the United States, electrifying a town meant building a power plant and stringing "distribution" wires on poles. Distribution wires are the "local streets" of electricity delivery, while transmission wires are the "highways."

In 1891, Dr. Cyrus Grandison Baldwin, President of Pomona College in California, organized San Antonio Power and Light Company to generate hydroelectric power at San Antonio Canyon for the town of Pomona fourteen miles away. Baldwin hired Almerian William Decker as the project engineer. Recognizing that the higher the voltage in a circuit, the lower the electrical losses,<sup>4</sup> Decker designed and built the first (single phase) commercial high voltage transmission line between San Antonio Canyon and Pomona. Oil-filled transformers stepped up voltage at the generator from 1,000 volts to 10,000 volts and then reduced voltage to 1,000 volts at the town border.

Today's high voltage transmission lines are wires strung high on lattice towers (or steel and cement poles) from strings of insulators, with voltages in the hundreds of thousands of volts. They can transport electricity for hundreds of miles without incurring excessive losses. Because power

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(7) plan and coordinate necessary transmission additions and upgrades.

IV F.E.R.C. STATS. & REGS. ¶ 32,541, 33,725, 64 Fed. Reg. 31,389 (1999).

3. *History and Reflections on the Way Things Were*, IEEE POWER ENGINEERING REVIEW, February, 1997, at 22.

4. Power lost is a function of the square of the current flowing through the line. Current flow is reduced proportionally to the increase in voltage so that increasing voltage by a factor of two decreases power losses by a factor of four. E.W. CONDON AND HUGH ODISHAW, HANDBOOK OF PHYSICS 4-36 (1967) (Equation 3.70 & 3.71).

plants are being constructed in remote locations, electricity has needed to be transported over increasingly greater distances. Factors such as the need for a water source to generate electric power or for power plant cooling, coal delivery cost, fewer environmental permitting restrictions, and more acceptable sites for nuclear plants have all influenced remote generator sites, and thus increased the demand for electric transmission lines.

### *B. Transmission Networks For Security Of Service*

No piece of equipment operates continuously. Power generating plants, for example, require periodic planned outages for refurbishment and also experience unplanned outages requiring repair. Nuclear plants eventually must be taken off-line for refueling or maintenance. This is also the case with electric transmission lines. However, transmission lines have evolved into transmission networks, a spider-web of electricity highways and superhighways. These highways and superhighways are engineered and designed so that customer power loss, due to the unplanned failure of any one transmission or generating component, would occur only once in ten years.<sup>5</sup> This standard requires generation reserves that would cover the loss of the largest plant and that would meet unusual load demands during events such as heat waves.

Almost from the beginning, the array of generators supplying power represented a mix of technologies and fuels. Efficiency of fuel use varied from plant to plant, as did the cost of fuel from region to region. Once utilities had interconnected their plants with the transmission network, they naturally sought to operate the plants in a manner that would maximize the output levels at the lowest aggregate operating cost.<sup>6</sup> With transmission lines of increasingly high voltage available (both traditional alternating current (AC) and direct current (DC) technologies), transmission of electricity over long distances and even between widely separated regions has become possible.<sup>7</sup> For example, the Bonneville Power Authority built the Pacific Inter-tie which brought southern California power north to the state of Washington, to "feed" electric heaters in the winter, and in the summer months it delivered relatively

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5. This is sometimes referred to as the "Loss of Load Probability" criterion. Recommended by the North American Electricity Reliability Council following the 1965 Northeast Blackout, it has been almost universally adopted as a utility planning requirement. *See also* Electricity Restructuring: Implications for Air Quality, ULR, July 10, 1998, 615.

6. The PJM Power Pool, which was founded in 1927, allowed participating utilities, interconnected by transmission, to share needed generation reserve, thereby reducing customer costs. Over time, PJM interconnected its transmission lines to neighboring utilities, permitting PJM to again reduce its generating reserve requirements. This sharing of generating reserves enabled individual PJM utilities to reduce their reserve requirement by as much as 50%.

7. Power solid-state devices allow for conversion between AC and DC power. Direct current transmission lines are economical over long distances because they require two wires rather than three, and because they lose less power along the way at a given level of insulation. *Electrical Engineering Handbook* 1233 (1993).

inexpensive hydroelectric power from Washington south to southern California to "feed" air conditioners.

Many large commodity businesses operate delivery services. Their trucks bear the company logo and move products from the site of production to warehouses, stores, and consumers. The delivery function rarely gets attention, but it is as essential as the production and sales of the goods. The case is the same with electric transmission. While providing flexibility for power plant location, electric system security, and economy of energy supply, transmission has long played a supporting role for the generation and sales of electricity. Indeed, prior to the energy crises of the 1970s, electric utilities were regarded as useful, reliable, and inexpensive.

### C. FERC Order Nos. 888 and 889

When the FERC issued Order Nos. 888<sup>8</sup> and 889<sup>9</sup> in 1996, it had a dramatic impact on the traditional transmission business. For the first time in history, transmission was treated by the regulating authority as a separate, stand-alone entity, i.e., a "transmission provider," furnishing an industry-generic service to customers, pursuant to *pro forma* tariff terms and conditions.<sup>10</sup> "Open access" and "nondiscriminatory" treatment, familiar concepts in the natural gas pipeline industry, were applied to electric transmission service under Order No. 888.

At the same time, Order Nos. 888 and 889 required functional separation of the "transmission" function from the "merchant" function in the vertically integrated electric utility, and placed significant new restrictions on communications and information flow between transmission employees and merchant employees. This forced a sea of change within the vertically integrated utility, both in behavioral and in organizational terms. Transmission no longer viewed itself as an extension of the electric generation business or as a connector between a company-owned generation facility and a franchised service territory. It now stood as a separate line of business which was more visible and more accountable for maintaining the required separation of its transmission functions from the utility merchant functions.

The new array of regulatory requirements provided the impetus for

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8. Order No. 888, *Promoting Wholesale Competition Through Open Access Non-Discriminatory Transmission Services by Public Utilities; Recovery of Stranded Costs by Public Utilities and Transmitting Utilities*, III F.E.R.C. STATS. & REGS. ¶ 31,036, 61 Fed. Reg. 21,540 (1996) [hereinafter Order No. 888].

9. Order No. 889, *Open Access Same-Time Information System (formerly Real-Time Information Networks and Standards of Conduct)*, III F.E.R.C. STATS. & REGS. ¶ 31,035, 61 Fed. Reg. 21,737 (1996) [hereinafter Order No. 889].

10. The impact of requiring adoption of a *pro forma* transmission tariff was particularly hard felt by integrated electric utilities. Previously, transmission contracts were individually negotiated arrangements, sometimes as part of a much larger transaction, like a wholesale purchase agreement or a utility-to-utility interconnection agreement. The replacement of this old way of doing business with a generic, standardized transmission service tariff meant that transmission could no longer be used as a "bargaining chip" in the burgeoning business of bulk power sales.

the inevitable emergence of independent transmission operators. Physical infrastructure, including computer system access, location of employees, and communication protocols were all modified to conform with Order No. 889's functional separation regime. As a result, many of the familiar communication paths and interdependent relationships were dramatically altered, if not permanently terminated.

#### D. The Advent of ISOs

As the filing deadline approached for compliance with Order No. 888, those utilities that had operated for decades as a "tight power pool"<sup>11</sup> came to the realization that compliance with Order No. 888 was an opportunity to advance the efficiencies and consumer benefits of the tight power pools. Compliance with Order No. 888 is acquired by using an Independent System Operator (ISO) to operate the transmission system on behalf of the transmission owning participants in the power pool. This concept soon grew into a broader scheme under which other major stakeholders, such as generators and marketers, had a say in the rules of the road.<sup>12</sup> Because tight power pools integrated transmission operations with least-cost dispatch of generation, the generator, the marketer, and the load serving entities all required representation in the ISO "governance" process. What emerged was yet another entity, separate from the transmission owner, responsible primarily to the stakeholders for operating the system and for implementing the "governance" of the regional marketplace.

From the integrated utilities' perspective, this new way of doing business—through an ISO-dominated, quasi-governmental process—was a major paradigm shift. They had effectively relinquished control of their transmission assets to a disinterested third-party and some felt they had lost the ability to influence its financial success.<sup>13</sup>

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11. In Order No. 888, the Commission recognized the special problems presented for tight power pools' compliance, and although it declined to require formation of an ISO to remedy undue discrimination, it encouraged this result and provided "guidance" on the minimum ISO characteristics. Order No. 888, *supra* note 8, at 31,727.

12. This was one of the "lessons learned" by the PJM Regional Transmission Owners (RTOs) who sponsored the restructuring of the PJM power pool. In its "guidance order" on the RTOs' initial proposal to restructure PJM, the FERC declined to accept it because, among other things, the RTOs had not worked together, with all stakeholders, to craft a single ISO proposal. *See also Atlantic City Electric Co.*, 77 F.E.R.C. ¶ 61,148, at 61,573 (1996). The RTOs thereafter embarked upon an extensive, inclusive stakeholder review process, which eventually resulted in a second filing that the FERC found acceptable, subject to certain modifications. *Atlantic City Electric Co.*, 81 F.E.R.C. ¶ 61,257 (1997), *appeal docketed* No. 97-1097 (D.C. Cir. 1997).

13. The willingness of transmission owners to voluntarily join ISOs or RTOs may have been seriously undermined by the FERC's legal conclusions that: (1) creation of an ISO or RTO must proceed under section 203 of the Federal Power Act (*id.* at 61,512); and (2) once the transmission owner becomes part of an ISO or RTO, that only the ISO or RTO can file for changes in the transmission owners' rate design (Order No. 2000, *Regional Transmission Organizations*, F.E.R.C. STATS. & REGS. ¶ 32,541, 33,729 (1999), *reh'g. denied*) (appeal pending). Both of these rulings are viewed by certain transmission owners as having far reaching financial implications because they directly affect their ability to change strategic direction and to influence earnings. *See also* Carmen L. Gentile, *Another viewpoint on Order 2000: Let the IOUs lead the RTO*, PUB. UTILS. FORT., Mar. 15,

From the other stakeholders' perspective, this new structure was a vast improvement over the status quo. Public power, generators, marketers, and public interest groups were all given a vote, or at least a voice, in how the transmission provider's business was conducted and how the energy market was run.

From the state regulators' standpoint, this new structure was attractive. It allowed them to have another, perhaps more direct means of influencing how public utilities operating within their jurisdictions conducted business in the wholesale market. In those states where some form of retail access was being introduced, it helped to provide a broader platform for its implementation. State commissions also benefited from a new, more direct relationship with the ISO.<sup>14</sup>

### III. DOES STRUCTURE REALLY MATTER?

#### A. Proposed Transmission Structures

We now turn to an examination of the transmission structures currently under consideration by the industry to determine whether one platform is better than another for the transmission business of the future.

There are currently three basic structural transmission models: the ISO, the Gridco, and the Transco. We define them as follows:

*ISO*: An ISO is responsible for the control of the power dispatched from supply generating facilities, the operation of the transmission system, and for the reliable operation and planned expansion of the bulk power grid. The ISO is a not-for-profit entity.<sup>15</sup> The ISO management is accountable to an independent or industry sector board of directors. A set of investors, other than the ISO, owns the transmission lines, towers, and transformers.

*Gridco*: A Gridco is composed of transmission system owners. The Gridco is responsible for maintenance and investment in the bulk power grid. The Gridco is also accountable for asset condition and performance.

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14. The due process implications of this more direct off-the-record relationship between the ISO and the state regulatory authorities are significant. Normally, actions by state regulatory agencies are judicially reviewable. The interposition of an ISO between the regulated entity and the regulator creates the potential for action being taken by the regulator based on information and/or opinions supplied by the ISO—which the regulated entity may have no opportunity to correct, clarify, or respond. Order No. 2000 indicates that the FERC will not question RTO proposals up to 5% ownership for a single market participant and 15% for any one competitive sector. Order No. 2000, *supra* note 2, at 31,069-71. On rehearing of Order No. 2000, the Commission clarified that the 5% restriction does not apply to a single transmission entity, unaffiliated with another market participant. Order No. 2000-A, *Regional Transmission Organization*, [Regs. Preambles] III F.E.R.C. STATS. & REGS. ¶ 31,092, 31,361 [hereinafter Order No. 2000-A].

15. There may be some small part of the ISO that has some profit potential related to the marketing of ISO services and software products. In the PJM, for example, the ISO has pursued a number of such outside activities including providing consulting and training services, marketing of ISO business rules and software tools. The profitability of these activities is as yet undetermined.

The Gridco could function as part or all of a single ISO, or as part of multiple ISOs,<sup>16</sup> and might be owned by one or more electric (or other) companies. The operation of an ISO provides the required independence from market participants with which the Gridco owners may be corporately affiliated. A Gridco is not in the same business as an ISO. Therefore, a Gridco will not interfere with the ISO's independence.

*Transco*: A Transco combines the responsibilities of an ISO with a Gridco. A Transco operates, maintains, and invests in the bulk power grid, and bears accountability for both asset condition and performance. A generating company could potentially have an ownership interest in a Transco, but independence is preserved by the *de minimus*<sup>17</sup> ownership criteria defined in Order No. 2000.

While there may be variations or hybrids of the above models, we will focus the analysis that follows on these three basic structures.

### *B. ISO, Gridco, and Transco Compared and Contrasted*

The table below compares two models: the ISO-Gridco and the Transco. The comparison assumes utilization of performance-based rates for the Transco and (under the ISO-Gridco model) the Gridco.<sup>18</sup> Under the ISO-Gridco, the ISO controls tariff pricing and contracts for services from the Gridco using performance-based rates.<sup>19</sup> Where the ISO and Gridco provide complimentary strengths and weaknesses, they are shown as either "yes/no" or "no/yes" depending on the relative strengths and weaknesses of the ISO and Gridco combination.

The comparison shows little difference in many of the features. With respect to mitigating generator market power, the models are surprisingly

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16. For example, an alternative to the geographically aggregated transmission ownership model is a "situational-niche" Gridco which specializes in asset management of a particular type of transmission systems. Under this model, a group of forward looking urban transmission systems, combining diverse skills and practices focused on urban transmission systems, assembled by purchase or merger, created a core transmission company possessing very efficient methodologies for asset management of urban systems. If these methodologies could be exported to other urban systems, the "UrbanTrans" niche, Gridco might now start acquiring less efficiently operated urban systems, or systems of companies wishing to exit the transmission business, with agreement from the FERC that the Gridco could retain a reasonable share of cost improvements made. The cost improvements are thus shared between customers and the shareholders of UrbanTrans. As the horizontally integrated system grows, it can continue to leverage development costs of productivity methods and investment in advanced transmission technologies over a progressively larger company. Companies not horizontally integrated, and possibly wishing to exit the business, become purchase opportunities for companies capable of adding value through greater productivity. See, e.g., ADRIAN J. SLYWOTZKY, VALUE MIGRATION: HOW TO THINK SEVERAL MOVES AHEAD OF THE COMPETITION (1996).

17. Order No. 2000 indicated that the FERC will not question an RTO proposals of up to 5% ownership for a single market participant and 15% for any one competitive sector. Order No. 2000, *supra* note 2, at 31,069-71. On rehearing of Order No. 2000, the Commission clarified that the 5% restriction does not apply to a single transmission entity, unaffiliated with another market participant. Order No. 200-A, *supra* note 14, at 31,361.

18. This assumption was adopted because it will encourage greater utilization of the transmission system while also incenting preservation of reliability.

19. See also Order No. 2000, *supra* note 2, at 31,075-76.

similar. The ISO-Gridco model is more impartial to competition between Gridco transmission owners, merchant transmission, and generation at the cost of casting the ISO as the quasi-regulator of some market power-related issues. The Transco model would, by contrast, have the FERC regulate all market power-related issues. Regarding financial investment and operations, the use of a non-profit ISO may provide less incentive to minimize its own operating costs. However, an ISO will have more incentive to allow its customers to achieve cost saving in other areas.<sup>20</sup>

Feature	ISO-Gridco	Transco
<b>General:</b>		
Elimination of pancaked transmission rates	YES	YES
Better constraint control	YES	YES
Potential to increase region-to-region transfer capability	YES	YES
Specialize in maintenance and investment in the bulk power grid	YES	YES
Prevents "orphaning" of the transmission business within the integrated utility <sup>21</sup>	YES	YES
Familiarity by many market participants <sup>22</sup>	YES	NO
Ease of Initial Implementation <sup>23</sup>	YES/NO	NO
<b>Market Power:</b>		
Mitigation of market power in generation	YES	YES
Enhances the separation of transmission from merchant and generation functions	YES	YES
Can be impartial in operational and investment competition between transmission, merchant transmission and generation	YES/NO	NO
<b>Financial - Investment:</b>		
Incentive for system expansion to "grow the business" or to organize or facilitate needed enhancements <sup>24</sup>	NO/YES	YES
Incentive to maintain plant and meet reliability standards	YES	YES

20. For example, litigation costs and convenience services such as electronic markets and financial security clearance could be cost savings opportunities.

21. If the original parent company becomes diversified, individual transmission ownership will become a small part of larger parent company's operations.

22. Many new market participants are affiliates of utilities and, given the experience with existing ISOs, they should be more familiar with the rules of the game under an ISO than a Transco.

23. In contrast to Transco formation, ISO formation does not require the initial divestiture of transmission assets.

24. See *infra* note 52 and accompanying text, discussing various disincentives for vertically integrated utilities to invest in transmission. Generation strategy might drive transmission investment decisions. The other ISO stakeholders, with pressure and mandate from the FERC, will counteract such pressures. Further, since most transmission revenue requirements are currently recovered from rates of retail customers, retail rate caps provide a disincentive for investing in either model since rate cap revenue limitations will probably follow the transmission provider.



Commercial failure of any one transmission owner will have a limited effect on the energy market	YES	NO
<b>Financial - Operations:</b>		
Incentive to minimize operating costs <sup>25</sup>	NO/YES	YES
Investment and operation costs totally integrated and minimized <sup>26</sup>	NO	YES
Incentive to operate to "grow the business"	NO/YES	YES
Transmission customer class value of availability and reliability cost optimized	NO <sup>27</sup>	YES
Strong price signals between transmission customers and transmission owners and operators	NO <sup>28</sup>	YES
Can exploit niche business models or efficiencies <sup>29</sup>	NO/YES	YES
Specifically fosters and motivates innovative thinking	NO/YES	YES
State-of-the art technology and work creatively to drive costs down <sup>30</sup>	NO/YES	YES
Incentive to have efficient and understandable policies <sup>31</sup>	NO/YES	YES

### C. The Debate

The movement from Regional Transmission Groups (RTGs) to ISOs to RTOs as either an ISO-Gridco or Transco raises a question as to whether the RTO is just another step in the evolutionary process. The debate has now moved to whether, as the FERC Chairman Hoecker put it, "[p]roperly structured, ISOs (like Transcos) can have an incentive to maximize throughput, be accountable and identify opportunities."<sup>32</sup> However, Messrs. Awerbuch, Hyman, and Vesey, who collectively authored "A Blueprint for Transmission,"<sup>33</sup> believe otherwise:

25. The ISO's non-profit status does not provide an incentive to minimize its own costs; all costs are passed through to transmission customers. Gridcos, on the other hand, will seek to minimize their own costs as a way of increasing return to shareholders.

26. Given the ISO's primary role of ensuring reliability, it may do so at increased cost to consumers by restricting entry of lower priced energy in the market to preserve reliability. On the other hand, given the Transco's financial incentive to increase transmission usage, it may stretch the capability of the transmission system, taking the risk of a penalty for not meeting reliability performance measures.

27. See *infra* note 28.

28. The Gridco does not directly control pricing, and therefore cannot directly respond to market incentives for regional investment. As a participant in the market, a Gridco's only interaction is indirect and through an ISO and the regional planning process.

29. See *supra* note 16.

30. The ISO's non-profit status does not provide it an incentive to minimize costs, but Gridco incentive rates will.

31. While the ISO will have incentive from its constituents, and from the advocacy of the Transco proponents, the ISO has no intrinsic incentive to have efficient and understandable policies.

32. James J. Hoecker, Order 2000: First Impressions as the Rubber Meets the Road, Gainesville, FL., (Feb. 25, 2000) speech available at <<http://www.ferc.fed.us/intro/oea/speeches.htm>>.

33. Shimon Awerbuch, et al., *A Blueprint for Transmission*, PUR Inc. at 39, Nov. 1999.

The real question is whether a regulatory regime that has shown so little ability to encourage efficiency in the past somehow can do so now simply by creating yet another breed of financially unmotivated organization[s] and ordering it to act efficiently. The odds seem against such success. Thus, the ISO could attain its stated goals, without achieving the optimal level of market activity or costs that would satisfy its customers.<sup>34</sup>

Messrs. Awerbuch, Hyman, and Vesey also offer the FERC Commissioner William L. Massey's "prescriptive-regulatory approach" in questioning the need to incentivize efficiency and whether incentives degrade reliability:

An ISO . . . will be required through its charter to run the grid efficiently and economically. . . . It is bunk to argue that such an entity will not have the incentive to operate efficiently. Surely, transco proponents don't mean that they will achieve more throughput by driving their systems harder and risking the violation of reliability rules. That's the only way they can squeeze more capacity out of the transmission system.<sup>35</sup>

#### *D. Structure May Not Be a Key Determinant*

As indicated above, the issue may not be as clear-cut as the proponents of particular structures argue. The "profit-making, market oriented" Transco entity must still be regulated since those who want to transmit power have little choice but to use it and investment recovery times are often well beyond the predictive horizon.<sup>36</sup> Results will depend on incentives and guarantees offered to the various structure participants. The real evaluation may turn on whether one of the following processes is significantly better:

- As a Transco, changes can be effected by making necessary filings at the FERC regarding tariffs, rate structures, and market rules. The FERC may or may not approve the filing, and interveners

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[hereinafter *Blueprint*].

34. *Id.* "Policymakers, regulators, consumers[,] and utilities must choose between a bureaucratic non-profit organization that cannot create an efficient and expanding transmission sector, and a profit-making, market oriented entity that can. The options are not the same. Structure does make a difference". *Blueprint*, *supra* note 33, at 15.

35. William L. Massey, RTO Policy: Five Pitfalls FERC Must Avoid, Power Markets Week Day of the Trader 1998, New Orleans, LA., (Dec. 7, 1998) speech available at <<http://www.ferc.fed.us/intro/oea/speeches.htm>>.

36. See William Hogan, Supplemental Comments on Testimony Before FERC ISO Inquiry, Docket No. PL98-5-00, (May 1, 1998), available at <<http://ksgwww.harvard.edu/people/whogan>>.

It is not likely that the T[ransco] incentives could be developed so easily so as to leave the design of the system operation rules and pricing to the T[ransco] monopoly alone. Far more likely is the outcome described by Fiona Woolf in her characterization of Transco's she has worked with in other countries. (Fiona Woolf, Cameron McKenna, comments on panel 3, "Regulation, Governance and Independence," FERC Public Policy Concerning the Commissions Policy on Independent System Operators, Apr. 16, 1998.) Somewhere in the [Transco] company will be a system operator that must be "ring fenced" from the rest of the corporation, to have its own independent rules and pricing structures that support the public interest in a competitive market.

*Id.* at 3.

have the opportunity to file a protest. In that case, settlement conferences are scheduled and if there is no settlement, cases are directed to a hearing where the proposed changes are examined through data requests, testimony, cross examination, rebuttal, and litigated outcomes.

- As an ISO-Gridco, changes can be effected by creating a process for stakeholders to propose changes (for existing ISOs, this is already in place), debate rules change throughout the ISO process, and a consensus is reached before filing. The FERC only addresses the non-consensus issues.<sup>37</sup>

Thus, a preference for either structure may depend more on how the rules are established, interpreted, and implemented than on the structure itself. As always, market participants will attempt to exploit rule differences to their advantage. It is the rule process, i.e., establishment, interpretation, and implementation, that matters. Transcos are clearly preferable due to their inherent business incentives for efficient operations. Transcos, however, may exclude geographically dispersed asset management niches of Gridcos and may lack the ISO consensus-reaching benefits of the ISO-Gridco model.<sup>38</sup>

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37. Order No. 2000, *supra* note 2, at 31,076.

38. The FERC Commissioner Massey, has an intriguing convergence of the structures, which might be called the Transco/ISO, i.e., the RTO is a Transco, but is has within it an ISO responsible for operation and stakeholder involvement.

Let's start with the ISO. What are its strengths? First, the ISO can more quickly achieve size standards because they are easier to form and to expand. It is simply easier for a transmission owner to join an ISO than to divest transmission. Second, because of the better potential for large size and appropriate shape, the ISO gives us the reliability boost we want and can better eliminate pancaked transmission rates over a broader region. Third, it may be easier for public power to join an ISO than a [T]ransco, and there must be a seat at the RTO table for public power. Fourth, because of their governing structure representing all stakeholders, an ISO may be more likely to act in the public interest and can therefore be regulated in a more light-handed way. Fifth, the ISO governing structure makes market monitoring a better fit with the ISO. Effective market monitoring has been crucial to our understanding of the infirmities in the California ancillary services market, and similar market structure issues will arise in all regions. And sixth, since an ISO has input from a broad array of users of the system, it can probably make a more politically compelling case to state regulators for transmission siting.

Now let me turn to the strengths of the [T]ransco structure. First, if the [T]ransco has no affiliation with owners of generation, there is a sharper unbundling of generation from transmission than there is with an ISO. Second, with a non-affiliated [T]ransco, there is greater potential for independence. Third, a [T]ransco presumably would place all uses of the transmission grid on the same tariff, both wholesale and retail, including retail native load, thereby ensuring comparability of service. Fourth, because the [T]ransco would be both the owner and the operator, it would have clear operational authority over the grid and could act more decisively. Fifth, since all transmission assets would be FERC jurisdictional, it may be easier with a [T]ransco to develop innovative transmission pricing proposals. And sixth, there may be potential with a [T]ransco to achieve operational efficiencies through performance-based rates.

Perhaps a region will achieve [the] FERC's public policy goals by choosing a model that combines the most attractive features of both institutions while avoiding their weaknesses. I believe this melding of the best features of both institutions is possible if we and the industry

On balance, we conclude that structure is not the key driver for making transmission a viable business. While locale, circumstances, and history may favor one structure over the other, either the Transco or the ISO/Gridco structure will probably work equally well.

#### IV. KEY DRIVERS FOR A VIABLE TRANSMISSION BUSINESS: RISKS AND RETURNS

##### A. *Transmission Business Risk*

###### 1. Transmission "Past" - Never So Risk Free

The picture of transmission "past" (i.e., Pre-Order Nos. 888 and 889), as risk-free due to the ability to pass costs through as an expense, and a guaranteed return on invested capital, probably never existed. The regulator set the rates charged to the customer, only after a determination of revenue requirements, based on a *pro forma* test period. The determined revenue requirement accounts for actual operating and maintenance (O&M) expenses, adjusted for events such as weather, sales growth, and one-time expenses, plus a return on plant invested. However, actual O&M expenses can radically increase with several poor weather years or major equipment failures. If a number of years intervene between rate cases, as frequently happens,<sup>39</sup> transmission could easily increase or decrease its revenue requirement recovery.

###### 2. Performance Based Rate Risk

Performance based rates (PBR) offer an "up-side" for "good" performance and a "down-side" for "poor" performance. In reality, transmission equipment is long-lived but also ages, which poses a very difficult challenge for its operators to find a cost-effective plan for replacement, maintenance, inspection, and diagnostics, while maintaining

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focus energetically on how to accomplish it. One obvious concept would be to set up an ISO in each region and allow it to evolve to a regional [T]ransco, or hybrid ISO/[T]ransco structure, if that is what market participants want. As the regional [T]ransco took over greater operational responsibility from the ISO, the ISO would remain as a residual institution retaining certain functions, including transmission planning, market monitoring, and some reliability functions. This would allow us to achieve size and independence more quickly through an ISO, while allowing, but not requiring, the evolution to a large regional [T]ransco as utilities divested transmission assets over time. In our state consultations, the New England Commissioners hinted that the possibility of a regional [T]ransco is on the table in New England. Nevertheless, they appeared very pleased that they have the ISO 'bird in the hand,' which can start more quickly but possibly evolve to a [T]ransco over time.

William Massey, Remarks at the 1999 NASUCA Capitol Hill Conference, Electric Utility Restructuring: Doing it Right for Consumers, or Not at All, (Mar. 16, 1999), *available at* <<http://www.ferc.fed.us/intro/oea/speeches/htm>>.

39. Under state regulation, the rate case determined the revenue requirements of the entire utility, and was frequently adversarial, costly, and pre-emptive of the resources of the utilities most able employees. Transmission, comprising only five percent of the customer's bill, had nothing to say about the time of rate cases, and simply took what came.

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an acceptable level of reliability. The FERC will probably establish benchmarks against which to establish incentive rates. While this may not matter so much for the traditional transmission business, which only provides five percent of the integrated utility's overall revenue, as a stand-alone company, transmission will bear this risk exposure entirely. Given inflation over thirty years or more, replacement equipment is considerably more expensive than the original equipment it replaces. Accordingly, rates may need to be increased to pay for expansion and replacement of the transmission system. However, the benefits of an enhanced and more reliable transmission system will result in a lower overall cost of delivered energy for the benefit of electricity customers.

### 3. Risk of Diversifying Risk

Horizontal integration within the industry by aggregation of transmission companies can leverage skills while diversifying risk.<sup>40</sup> Unfortunately, valuing an acquisition is itself a risk. In an acquisition, the risk of overpaying for a company in need of refurbishment and maintenance will prove to be a considerable factor on the way to horizontal integration.

### 4. Regulatory Risk

As the current re-regulation process encounters continuing delays and uncertainty in defining transmission company revenues, investors impute greater risk and lowered value in their promised stream of earnings. One credit rating firm has already warned of damage to the credit rating of transmission companies.<sup>41</sup>

### 5. Technology Risk

Given virtual competition between transmission companies based on incentive rates and benchmarks, technical solutions to equipment refurbishment employed by one large transmission firm would shift benchmarks and create a loss for "competing" firms. Of course, transmission companies in different service territories do not compete in the usual sense. However, given a benchmark-driven incentive rate system, those who do better than average will benefit, and those who do not do so well will be at a disadvantage. Therefore, incentive rates based on benchmarks create a form of virtual competition.

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40. A large transmission company tends to offset the "good news" and the "bad news" among its parts, which in a small company, can spell either undreamed of profit or business failure.

41. DUFF & PHELPS CREDIT RATING CO. (DCR), SPECIAL REPORT: CREDIT IMPLICATIONS OF THE ISO-TRANSCO DEBATE (Apr. 1999).

A major debate is occurring over transmission control in the United States. . . . There are effectively two interest groups, namely Independent System Operator (ISO) proponents, and Transmission Company (Transco) advocates. . . . This paper suggests that bondholder risk is highest for transmission-owning entities in regions where grid management and control remains unresolved. . . . DCR does not advocate either an ISO or a [T]ransco. The issue is uncertainty surrounding the control, pricing[,] and ownership of transmission assets.

Distributed generation can threaten to reduce the market that transmission serves and pose a threat to the value of transmission at longer range.<sup>42</sup> Even assuming transmission companies would be compensated with higher rates in the face of reduced loads, growth potential and its attendant value would be lost, and equipment ordinarily replaced may be decommissioned, thus shrinking the rate base. Certainly, failure to achieve a well-functioning transmission system can lend financial encouragement to this competing technology.

#### 6. Transmission Sales Forecast/Expansion Risks

Transmission also faces considerable risk where transmission use sales forecasts may be affected by variables such as: generators and their locations, merchant transmission lines,<sup>43</sup> the setting of retail rates, and the implementation of local retail energy supplier choice. All of the foregoing can have a major impact on the viability of a transmission expansion plan. If a transmission owner overbuilds based on an imperfect forecast of transmission use, it may not be allowed to recover those stranded costs from customers.

#### 7. Certification Risk

Transmission expansion under existing law depends upon certification by the states where facilities are to be built. Failure to obtain certification can impact reliability and result in increased expenses, if there was a deferral in reimbursement of expenses, which is not otherwise accommodated within the tariffs.

Questions about cost responsibility often drive certification delay. Transmission owners are being asked to build the transmission system not only for local transmission needs but also for the needs of much broader regions. However, the pricing signal associated with the fundamental changes has not been reflected in transmission rates and cost-of-service studies to date. For example, if an upgrade was needed for transactions flowing through New Jersey, and there were not previous commitments for users to pay for the line, the network load customers within New Jersey would nonetheless incur most of the associated cost under the current PJM Open Access Transmission Tariff, while the real beneficiary of the upgrade would enjoy a free ride.

Accordingly, there is a fundamental need to separate "local" and "highway" services of the transmission system in order to give proper price

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42. Distributed generation is generally located on the premises of an electricity consumer and installed primarily to serve that customer's electricity needs at distribution voltage levels.

43. Merchant transmission lines can be installed between a source and a load market. Built by an entity other than the incumbent utilities and earning revenues by bidding into destination generation markets with generation purchased from the source market, thus earning arbitrage between the markets. When authorized, merchant line owners are allowed to earn these profits because they provide a competitive transmission source to the regulated utilities. See, e.g., *TransEnergie U.S., Ltd.*, 91 F.E.R.C. ¶ 61,230 (2000) (Commission authorization of a merchant transmission line across the Long Island Sound).

signals. If this does not occur, it will make any system upgrade a risky proposition due to opposition from those constituents who are asked to pay the costs but receive little in the way of benefits.

### *B. Transmission Returns*

In the past, transmission was generally built to deliver distant generation to the local loads of a vertically integrated utility. The value of transmission for the utility investor was integral with the return provided by generation and distribution. It was the generation prudence review by the state utility commissions that justified the investment in transmission expansion. Inter-ties with other utilities were built for reliability and not for the economic transportation of energy. "Network" transmission tariffs provided the mechanisms for recovery of residual revenue requirements.<sup>44</sup> Under this approach, the transmission owner was assured of recovering its revenue requirements.

If there is a concern that an inadequate new investment is being directed to transmission, the answer must be that relative to the risk. Greater returns on investment can be had elsewhere than in transmission investment. Compounding the issues currently faced by transmission owners is that of local retail rate caps. A number of electric utilities in the East are subject to state-imposed rate caps that effectively disallow recovery of new investment in transmission during the rate cap period by requiring the utility to offset any increase in its transmission rates by a corresponding reduction in its distribution rates. Obviously, transmission owners will be less than aggressive in their pursuit of a new investment if they are unable to earn any return on their investment because of those rate caps. Only the prospect of greater returns will bring about the needed construction.

In sum, the value proposition for transmission has changed. The uncertain situation and risks discussed above have created what could be described as a transmission enhancement gridlock. Whether we continue with rate base rate-of-return regulation or some modified version of it, or establish PBRs as the vehicle of producing returns, returns on transmission services must increase if needed transmission grids are going to be built.

## V. THE NEED FOR INCENTIVES

### *A. Incentive to Invest: Most Tools Have Been Provided For*

Order No. 2000 has provided several pricing options aimed at encouraging transmission owners to join an RTO as well as to stimulate investment in new transmission infrastructure. Implementation of these incentives is key to making transmission a viable business. Facilitating the construction of transmission to improve and enhance the transmission

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44. Residual revenue requirements equal total transmission revenue requirements less any revenue credits from other transmission services such as point-to-point or other special agreements.

infrastructure must be the primary goal. These approaches are best described as modifications to the existing rate base rate-of-return regulation. The most promising include: (1) enhanced rate-of-return to reflect the higher risk of transmission investment, as discussed above; (2) accelerated depreciation of new investments; and (3) incremental pricing of new investments.

Perhaps the most debated pricing proposal in Order No. 2000 is related to return-on-equity (ROE). The Commission stated in this Order that they

believe that allowing an RTO to propose a formula rate for determining its [ROE] [would be] consistent with [their] view that risks and rewards for transmission owners should reflect market-like forces to the greatest extent possible. Allowing formula rate of return would decouple a transmission owner's earnings from its own equity valuation, and<sup>45</sup> would tie it more to external standards such as industry-wide performance.

Order No. 2000 also suggested: "new approaches to compensat[e] transmission owners for different capital structure mixes may be warranted, including allowing a transmission owner to seek a return on invested capital, independent of its exact capital mix."<sup>46</sup> However, pricing proposals that involve ROEs that do not vary according to capital structure may not be included in RTO rates effective after January 1, 2005.<sup>47</sup>

Regarding accelerated depreciation and incremental pricing for new transmission investments, Order No. 2000 provides that the Commission will not give encouragement to accelerated depreciation for existing transmission assets since stranded costs are speculative at this point, and "nothing prevents proposals to recover prudent costs under traditional ratemaking policies."<sup>48</sup> For new transmission investments it will allow an RTO "the flexibility to propose that such assets follow non-traditional depreciation schedules" thereby removing a disincentive for the construction of new facilities.<sup>49</sup> Also, it will "provide flexibility for pricing of new facilities, such that proposals for pricing of new facilities that combine elements of incremental prices with embedded-cost access fees will be considered."<sup>50</sup> However, Order No. 2000 states that proposals must be carefully constructed since it has the potential to raise prices for new transmission services and result in over-investment in transmission where re-dispatch is the least-cost option.<sup>51</sup>

Transmission owners obviously will be reluctant to invest in transmission during the period of the state rate cap because they will have

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45. Order No. 2000, *supra* note 2, at 31,193.

46. *Id.*

47. Order No. 2000, *supra* note 2, at 31,193.

48. *Id.* at 31,194.

49. Order No. 2000, *supra* note 2, at 31,194.

50. *Id.* An incentive rate of return for a particular transmission project supported when the project is initiated appears to be a potential extension of this concept.

51. Order No. 2000, *supra* note 2, at 31,194.



no opportunity to fully recover their new investment. A deferral mechanism that would assure recovery of the investment in transmission expansion would serve to remove this very powerful disincentive.<sup>52</sup>

### *B. Performance Based Rates (PBR)*

The Commission would like to rely on market-like forces to the maximum extent possible and will encourage RTOs to consider use of PBR as a way of achieving that goal. RTOs may choose to propose PBR incentives that generally fall in two areas: (1) adjusting rates by an index that divorces the RTO's rates from its costs; and (2) setting performance benchmarks or targets that are linked to financial incentives.<sup>53</sup> The RTO Order endorses both of these types of performance-based incentives. However, the FERC does recognize the difficult analytical challenges that RTOs will face in developing its comprehensive<sup>54</sup> PBR proposals. In Order No. 2000, the Commission stated it would make its staff available through a pre-filing process to work with RTOs to help identify and resolve issues on an informal basis prior to their filing a PBR proposal.<sup>55</sup>

The FERC is also willing to consider a rate moratorium,<sup>56</sup> a specialized case of PBR, tied to the rates the transmission provider earns on transmission assets with respect to bundled retail power sales. The specialized case of PBR is needed in order to provide for a transition from bundled to unbundled retail power sales and the transition between state-jurisdictional to FERC-jurisdictional transmission service. A rate moratorium will also provide for transmission rate stability during a time of energy price uncertainty. The moratorium may be tied to the existing transmission rate level or to the existing return on equity. However, pricing proposals that involve a rate moratorium may not be included in RTO rates effective after January 1, 2005.

Over the long run, we see PBR as holding considerable promise as the preferred pricing option to provide an RTO with incentives to achieve economic efficiencies in short-term operations and long-term investment.

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52. Order No. 2000 recognizes the influence that transmission rates embedded in state retail rates can have by allowing for the FERC transmission rates to be set to the state transmission rate component for some period of time. Thus, the FERC recognized the need to remove any incentives that might exist for unbundled retail customers to leave the system if the FERC rates were lower than state rates for transmission. *Id.* at 31,183. Setting the FERC transmission rates equal to state transmission rates also removes any potential revenue losses associated with state unbundling rates.

53. Order No. 2000, *supra* note 2, at 31,193.

54. Order No. 2000 provided the following guidance for performance based rates: PBR programs should be comprehensive to prevent inefficient focus on part of the business, should include both rewards and penalties, and be carefully designed to avoid incentives to make inefficient decisions or compromise reliability. PBR programs must be designed to share benefits between transmission owner and customers, benchmarks must be known and measurable, may be applied in a ISO or Transco, and each participant is rewarded or penalized based on its own activities. *Id.* at 31,185.

55. Order No. 2000, *supra* note 2, at 31,185.

56. *Id.* at 31,193. This could have the effect of freezing rates at levels for time periods roughly consistent with existing rate caps imposed by state public utility commissions as part of various state retail restructuring initiatives.

Known and measurable benchmarks will be the key to the formulation and success of a comprehensive PBR. First, we need to identify and begin to track a consistent basis and reliable data, which may be used for the development of performance measures. In the short run, we see a mix of approaches integrating traditional transmission ratemaking with the incentives provided under Order No. 2000, including a rate moratorium and a deferred recovery mechanism for new investment. In any event, the overarching objective must be to increase profit margins commensurate with the increased risk now associated with the transmission business.

## VI. CONCLUSION

Adequate and reliable transmission remains the essential infrastructure upon which generation markets build customer economies. As transmission assets age and load increases, re-regulation must now motivate transmission performance and the investment needed to maintain, replenish, and enhance its assets. Order No. 2000 suggests elements of these needed incentives, but implementation of these incentives is the key to success. Building on its successes to date, in using a flexible approach, the FERC should now allow for experimentation in the use of transmission ratemaking incentives.