

Moving Power

By Vito Stagliano*

Precis

A decade ago, the U.S. Congress set out to break the monopoly that for the previous fifty years had produced and delivered electric energy to most Americans. The Energy Policy Act (EPA) of 1992 created the independent power generation industry and shifted the burden, as well as the financial risk of new plant construction from ratepayers to shareholders. EPA also authorized the Federal Energy Regulatory Commission (FERC) to order incumbent utilities to interconnect independent generators to the transmission grid and to provide transport service. In 1996, the FERC issued order 888 to ensure open access to the grid, and followed it in 1999 with Order 2000, which directs transmission owners – mainly vertically integrated utilities – to relinquish control over the grid's operation to an independent agent.

With independent producers currently accounting for near 20% of national generation capacity, the Congressional intent of a vibrantly competitive power sector has been largely achieved. The regulatory intent of open access to transmission, so that *all* power can reach markets at reasonable cost, remains problematic. The interstate transmission system is the new regulatory battleground for the jurisdictional divide that has always separated State and Federal authority over the national electric system. FERC's transmission policy - and the States' response – will determine if and how the markets for power will be organized and managed by Regional Transmission Organizations (RTOs). It will also determine whether the power sector's restructuring process will be brought to a successful conclusion.

Context of Transmission Decisions & Response

In Order 888, the FERC sought to impose upon transmission owners the requirement that they provide transmission service to others of the same quality that they provided to themselves. In the East, the order led to the further evolution of long-existing, tight pool organizations into Independent System Operators (ISOs). The first ISO was the PJM Interconnection, which also designed the first real time market for energy in the United States. California moved next to create the statist CaISO as part of a legislated restructuring process that was to prove disastrous. The Electric Reliability Council of Texas (ERCOT), which is, uniquely in the U.S., almost entirely under the jurisdiction of the State Public Utility Commission, transformed itself from a regional reliability council into an independent system operator in late 1996. New York and the six New England states followed suit, albeit with a more problematic history of market design.

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No other ISOs beyond the original four (plus ERCOT) were conceived or proposed to the FERC in the latter 1990s, although transmission owners in the Midwest entered into what proved to be a slow-moving process to organize the Midwest ISO (MISO). Given its limited authority to wrest control of transmission assets through divestiture, or to force ISO creation by other means, the FERC eventually sought to jawbone compliance to its vision of open and non-discriminatory access to the national transmission system by means of Order 2000. The Order, which was issued in December 1999, directed FERC-jurisdictional utilities to voluntarily participate in a Regional Transmission Organization (RTO) of their choice, or justify to the FERC why they should not. Order 2000 spurred a flurry of fresh negotiations, but no deterministic filings, to form the Alliance RTO (RTO) in the Midwest, Grid Florida, Grid South, Desert Star (later West Connect), SE-Trans and RTO-West.

Under new leadership, frustrated by the slow pace of negotiations for RTO formation and by the scope and configuration of the resulting organizations, the FERC in 2001 took the unusual step of ordering two settlement conferences, under the leadership of senior Administrative Law Judges (ALJs). The ALJ for the Northeast conference sought to orchestrate a merger of ISO-NE, NY-ISO and PJM-Interconnection, to thereby create a unified RTO covering a substantial U.S. and Canadian market geography. New England transmission owners complicated the already complex proceedings by tabling a proposal to create a for-profit independent transmission company that would operate under RTO oversight. In the Southeast, the ALJ intended to bring together RTO proposals that were still nascent, and seek a unified organization for Grid-Florida, Grid-South and SE-Trans.

The settlement proceedings proved a failure, and served in the end to galvanize State opposition to what was interpreted as FERC over-reach in regard to the type of RTO that the States should have to support. An unexpected result of the conferences, however, was the decision of PJM-Interconnection to study its trading patterns and reach conclusions substantially at odds with the FERC's settlement conference objectives. PJM-Interconnection determined, in fact, that the more economically efficient "merger" prospect lay to the West rather than to the North. It consequently entered into an agreement with the MISO to form a common market – eventually the largest in the world – while retaining separate operational and corporate structures. Later, the NY-ISO and the ISO-NE also undertook a union, having discovered by cost benefit analysis that their merger could produce economic benefits in excess of a quarter million dollars per year.¹

In 2002, further turmoil erupted when the FERC determined that the ARTO proposal, which from the beginning had been in competition with the MISO, did not meet Order 2000 criteria for scope, size and configuration. The FERC ordered the ARTO members, many² of whom had earlier withdrawn from the non-profit MISO to join the for-profit ARTO, to negotiate entry either into MISO or into PJM-Interconnection. The FERC also rejected the RTO application of the members of the Southwest Power Pool (SPP) and ordered its largest participant, Entergy, to either join the MISO or the SE-Trans. In the wake of these orders, SPP joined MISO, Entergy joined Southern in SE-Trans,

¹ See endnotes at end of text.

and American Electric Power (AEP), the driving force of ARTO, looks ready to join PJM-Interconnection. In the Midwest, an unusual union of Xcel³, Alliant, MidAmerican, Omaha Public Power, Nebraska Public Power, and Lincoln Electric Cooperative joined to form TRANSLink, an independent, for-profit transmission company that will operate under the oversight of the MISO. Also operating under the MISO umbrella are the American Transmission Company of Wisconsin and the International Transmission Company of Michigan.

In sum, after a decade of effort, the three Northeast ISOs are fully operational, with associated markets that work reasonably well. A fourth, MISO, is functional if not fully operational, albeit without an organized real time market. The fifth, CaISO⁴, functions without FERC approval, under the direct jurisdiction of the State of California, and without a real time market. In all other areas of the nation, RTOs remain works in progress.

Policy Theory & Practice

A simple majority of three Commissioners is all that is required to set policy for the \$250 billion electric power industry. It is notable that no Commissioner in living memory has brought to the five-member FERC direct experience in the generation, transmission, distribution or marketing of electric energy. The FERC's sweeping statutory authority, granted by the Federal Power Act of 1935, extended by the National Energy Act of 1979, broadened by EPA Act in 1992, is nearly Olympian. FERC decisions are of course reviewed by the Courts, which have historically affirmed the Commission's decisions. FERC's major policy initiatives have been remarkably few in its 67-year history⁵, all the more surprising its activism of the last decade, both in regard to the electricity sector and the natural gas industry.

It is notable that the FERC successfully restructured the natural gas interstate pipelines in the mid-1990s with Order 636. The positive experience of Order 636 may have given the Commission a false sense of confidence in regard to what it could accomplish with the power sector, and on what model. Two critical differences in the respective legislative mandates for natural gas and electricity reform illuminate the ease of restructuring the former and the difficulty of restructuring the latter. First, Congress deregulated natural gas wellhead prices in 1989, leaving no role for FERC to determine, as it must for electricity, what is a just and reasonable price for gas at wholesale. Second, the FERC has unequivocal power of eminent domain in regard to gas pipelines, which it lacks for interstate transmission lines.

An old adage states that to make policy is divine, to implement it human. The well intentioned, if timid Order 888 is a case in point. The FERC's clear intent to eliminate discriminatory access to transmission access had to be carried out by the very investor-owned utilities (IOUs) that were the target of the Order. Needless to say, the IOUs moved with something less than alacrity to change their traditional practices and allow open access to their portion of their grid. They were aided and abetted in their selective application of Order 888 by the implied (and overt) protection afforded by their States' regulators. State's protection of discriminatory behavior by native utilities can only be explained by jurisdictional jealousy, since it cannot be explained by justified on economic grounds, given the direct connection between open access and price competition.

Tensions between State and Federal regulation has seldom been as pronounced as it is with regard to the creation of RTOs. A majority of States have viewed RTOs as infringements on their jurisdictional powers, and have remained furthermore unconvinced that RTO-administered markets can result in prices equivalent to just and reasonable rates. States have not, however, been any more successful than has the FERC in organizing ISOs or markets within their state boundaries, nor in establishing viable retail markets for power, and not incidentally, also for natural gas. Indeed, the most economically catastrophic ISO experience of the last decade took place in California. There, the State, by a combination of legislation and regulation, created in 1996 an ISO and Power Exchange that proved so flawed⁶, in concept as well as execution, as to drive one of the nation's largest utilities into bankruptcy, and expose the State to over \$20 billion in remedial liability.

However, RTO policy remains problematic also because the structural model is antithetical to sound business practice. First, transmission owners, who are overwhelmingly vertically integrated utilities, have little incentive to divest their assets and organize them, as was done with natural gas interstate pipelines, into independent, diversified enterprises capable of earning a competitive return on equity. The FERC has been more miserly with equity returns on transmission - typically less than 10% - than it was when the gas pipelines were restructured.⁷ Second, in the absence of divestiture, the RTO model requires transmission owners to relinquish control over their assets, even as they retain ownership. This model, which has no equal in any other industry, establishes a disincentive for new investment on the part of both the owner and the operator because neither can claim unencumbered ownership rights. Third, the ISOs/RTOs thus far established are non-profit organizations that cannot be held to any meaningful legal accountability because they own no assets and are not liable for bad performance. The consequence of these economically questionable and regulatorily uncertain conditions is that investment in transmission has fallen dangerously behind investment in new generation, and is now barely \$2.0 billion per year⁸, mostly financed by independent generators for purposes of interconnection. Investment in maintenance may have fallen even more dramatically, as evidenced by the incidence of transmission loading relief.

RTOs are required by FERC to create and operate real time markets for energy. The designers of RTOs, and of concomitant market structures, are historically regulated utilities and their present day regulators, whose experience with open and competitive markets is limited at best, or entirely nonexistent. It is not therefore self-evident why these organizations, whose entire formative history was in the world of cost based rates, should be now charged with the task of creating America's competitive markets for power. Interestingly, those who are relegated to the periphery of RTO design are the independent generators and energy marketers, in other words those who have assumed the financial risk that was once carried entirely by ratepayers, and who presumably know something about competition, risk and reward. It may therefore be less than coincidental that, after a decade of effort, most of the nation's 158,000⁹ miles of high voltage wires remain more or less firmly under the control of the incumbent utilities, and that only three provincial markets of relatively modest size are functioning effectively.

What Matters

Markets have not historically been designed by government agencies. Rather, they have evolved from a common – private – interest in trade. Governments in due course have intervened to regulate the behavior of market participants, in order to secure the public interest that is expected to result from competition. It is therefore far from clear that the FERC will succeed in its effort to see that proper markets are created for the power sector, and that these function competitively. What is clear is that if the market structures are in any way flawed, then the remaining functions of the RTO matter little, if at all. This is because the complexity in transmission policy is not in the operation of the grid, for which expertise is available, tested, broad, and deep. Indeed, it is a credit to the skill of the hundreds of engineers who staff the nation's 140 control/dispatch centers that the transmission system has continued to function effectively, even as it has accommodated a virtual explosion of new transactions.

The policy complexity is almost entirely in the constitution of the markets. In restructuring parlance, glib mention is often made about the inevitable commoditization of electricity. The reality is that electrons do not behave like carbons or metals or pork bellies. There are laws of physics at play in the movement of electric energy over long and short distances, and there is the fact that electricity cannot be economically stored for later use. Furthermore, in no other market structure is there a requirement to balance supply and demand instantaneously, every instant.

Markets do not behave like engineered systems. Markets are messy, unpredictable, volatile, and sometimes irrational. However, as Churchill said of democracy, markets are superior to all other alternatives. Simply, no better means has been found to determine the economic value of things. Still, regulators accustomed to stable rates that can be fixed in time and space are unnerved by the behavior of markets. They wonder how markets can possibly deliver the equivalent of those just and reasonable rates that are their frame of reference. They are right to wonder. Markets can only deliver...prices.

The scope, size and configuration of power markets are the critical factors in the formation of RTOs. The FERC, which had been focused almost entirely on the system operation part of the RTO equation until recently, finally has recognized the need to provide guidance as to what constitutes an acceptable market structure. The Commission will soon issue a notice of proposed rule on a standard market design (SMD), which will presumably incorporate the best elements of the nation's cumulative experience. Some analysts fear that the experience reflected in the proposed rule is limited, and perhaps overly reliant on the PJM model. It should therefore not come as a surprise that the RTOs, especially those without tight pool experience, will take the SMD as more guidance than blueprint. States are already claiming the right to local exceptions and are warning, in some cases, that the FERC may not impose a market structure of any kind unless it first demonstrates that its benefits will outweigh the costs.

What has been learned so far about market structure and governance is probably sufficient to at least theoretically avoid a repetition of the markets that have failed. In sum:

- Multiple trading elements are necessary to constitute a

competitive power market:

- 1 A real time physical market for energy, administered by the RTO,
 - 2 Management of congestion by market means: locational pricing, financial transmission rights (FTRs) that are auctioned massively and frequently, and a secondary market for FTRs,
 - 3 A competitive market for ancillary services,
 - 4 Day ahead and forward markets for energy, preferably larger than any single RTO's geography, and administered by independent market operators,
 - 5 Futures/forwards (financial derivatives) markets to manage price risk.
- Markets confined to a single State are likely to be less competitive than those that encompass broader regions. Liquidity is the key to competitive prices, and this requires a significant number of market participants engaged in statistically significant number of transactions.
 - Markets for power should be greater than the mere aggregation of pre-existing franchises, otherwise the dominant franchisee – typically the incumbent utility – will merely transform itself from monopolist to monopsonist.
 - Markets should provide reliable price signals for new investment to *solve* constraints and congestion, and not merely to reflect their cost in the cost of doing business.
 - Markets should have clear and enforceable rules.

Policy Priorities

The first rule of policy is to above all do no harm. Much harm has been done in the last decade of trial and error in the quest for the power sector's competitive end state. The next steps in the restructuring process should be deliberately, carefully taken, with a view to limiting further institutional experimentation, among other reasons because public institutions are expensive to establish and difficult to reform once bureaucratized. The FERC should therefore be commended for having thus far settled the mantle of legitimacy on only one RTO, the MISO. On the other hand, the fact that PJM, NY and NE ISOs have not been granted RTO status, though they have accumulated greater operational experience than has MISO, is not easily explained. It is worth emphasizing, in support of FERC caution, that those who file to create RTOs are the incumbent transmission-owning utilities. These are not disinterested parties, their motives understandably to protect the interests of their shareholders.

The self-interest of the native utilities must be weighed against the public interest, however, if the FERC is to achieve the policy goals that have eluded the nation for a decade. To that end, an RTO's filing utilities should be made to relinquish decision-making over the RTO-to-be as soon as the initial proposal is accepted by the FERC. Second, for economic efficiency, transitions from company rates to RTO rates should take no more than five years to accomplish. Third, to ensure system reliability and operational efficiency, RTOs should be required to achieve full functionality within one year of approval by the FERC. Fourth, markets should become operational concurrently with RTOs, and this can be accomplished most efficiently by widespread use of already developed and

tested software. Finally, jurisdictional utilities that fail to comply with RTO adherence and market organization policy should forfeit their right to market based wholesale rates.

In the end, the actual number of RTOs that will assume control of the national grid is less important than the size and liquidity of the markets that evolve around each of them. Indeed, the more competitive the market, the greater the number of RTOs, or independent transmission companies, that can be accommodated within it. The goal should be the achievement of the largest, most competitive regional market, not necessarily the largest RTO. In cases where the size and scope of the RTO is likely to produce a sub-optimal market, the FERC should impose common markets upon multiple RTOs.

Conclusion

The power sector touches every life in the nation. Indeed, life would be unimaginable without reliable and economic electric power. It is merely by an accident of history that the power to make policy for the economically critical electricity industry has been vested in a five-member regulatory agency. The burden of history is upon the FERC, which has indeed been transformed in the last decade by its role as an agent of change. The FERC has also been scarred by the unintended consequences of some of the decisions it has issued in the last three years, and by its inability to police the markets under its jurisdiction. The FERC is blamed, by and large unfairly, for California's electricity debacle, but with reason for having failed to correct California's market flaws. It is blamed, with greater justification, for the slow and unsteady pace of its deliberations on RTOs, and for its unwillingness to impose sanctions for non compliance with its stated policy of non discriminatory open access to the grid. In any case, what seems essential now, in order to successfully conclude the next phase of the restructuring process, is, in the words of T.S. Eliot, "a hand expert with sail and oar."

Endnotes

¹ NYISO-ISO-NE "RTO Costs and Benefits Analysis," released 15 May 2002

² The MISO members who withdrew from MISO in 2001 were: Commonwealth Edison, Illinois Power, and Ameren.

³ Xcel is a multi state holding company whose transmission assets straddle the Eastern and Western Interconnections. The proposed TRANSLink could therefore hold the key to transfer of power between the two Interconnections.

⁴ In May 2002, CalISO filed at the FERC a proposal for a new market structure that, if approved, would allow it to come into compliance with FERC Order 2000.

⁵ The Federal Energy Regulatory Commission was known as the three-member Federal Power Commission until reorganized during the Administration of Jimmy Carter and brought under the general jurisdiction of the Department of Energy in 1979.

⁶ California law required all power generators to bid into the Cal-PX run real time spot market. Utilities were prohibited from forward purchases to mitigate the high volatility of the spot market. The CAISO operated a flow model that prevented accounting for congestion in the day ahead schedules. Load serving entities were required to buy supply in the Cal-PX at market prices but charge their retail customers rates frozen by the PUC. The California market model provided no direct link between supply and demand functions, and made no provision for growth in demand to be met by investment

in new generation or transmission, or both.

⁷ In the early period of Order 666 implementation, the FERC granted to pipelines returns on equity as high as 15% in order to encourage vertical dis-aggregation and divestiture. The strategy was successful because the majority of pipelines are today profitable, diversified enterprises.

⁸ EIA data

⁹ EIA data for transmission above 230kV, both AC and DC.

USAAE 2002 – 2006 Strategic Plan – Overview

Throughout 2001, USAAE members of the Strategic Planning Group met and discussed with the USAAE Council a long range Strategic Plan for the association. At the January 2002 USAAE Council meeting, Council voted unanimously to accept the plan. Below please find the mission statement for the association as well as a brief overview of the tasks under development as well as their goals within the Strategic Planning Group.

MISSION STATEMENT

The United States Association for Energy Economics is a nationwide non-profit organization of business, government, academic and other professionals that advances the understanding and application of economics across all facets of energy development and use, including theory, business, public policy and environmental considerations.

To this end, the United States Association for Energy Economics:

- Provides a forum for the exchange of ideas, advancements and professional experiences.
- Promotes the development and education of energy professionals.
- Fosters an improved understanding of energy economics and energy related issues by all interested parties.

KEY STRATEGIES

- Increase and broaden our regular and sustaining membership base through improved member products and services and marketing outreach to other professional organizations concerned with energy.
- Support energy policy community dialogue by:
 - Hosting one or more daylong energy policy seminars each year on front-burner topics
 - Conducting regular member energy policy surveys and disseminating the results
- Stimulate North American Conference attendance and Sponsorships through improved programs and conference services, broader marketing, improved media coverage, increased student participation and expanding benefits of sponsoring organizations.
- Provide increased support to current Chapters and Chapter start-ups as needed.

If you are interested in becoming involved in one of the strategies listed above, please contact Dave Williams at USAAE Headquarters, email: usaee@usaee.org