An Update on North American Electricity Markets: Still Coming Together at the Seams?

*By Michael Bailey and Christopher Eaton**

The past few years have witnessed an unprecedented move toward wholesale electricity markets around the globe. Several regions in North America have implemented or are planning to implement electricity trading arrangements and market infrastructure – including independent system operators (ISOs) and power exchanges (PXs) – to capture economic efficiencies while maintaining reliable delivery of electrical energy.[1] Efforts to restructure the electricity industry across market regions have taken on a diverse set of characteristics and met with varying degrees of participation and success. By any measure, wholesale electricity markets have experienced considerable challenges in achieving their two primary objectives – economic efficiency and reliable energy delivery.[2] One of the most pressing challenges facing the industry today involves divergent legislation, regulatory policies, market rules, business practices, and information technology and their adverse impacts on interregional trade in and delivery of wholesale electricity and related products. These issues are commonly referred to as "seams issues."

For our purposes, a "seam" can be defined as a line formed by the abutment of two or more contiguous regional markets which creates a weak or vulnerable area or gap. Thus, we define seams issues as *impediments to interregional trade in and delivery of electricity and related products and services which result in economic inefficiency and/or a threat to reliability*. From the economist's perspective, these issues may take the form of transaction costs, barriers to trade, or negative externalities. They are interesting because of their adverse effects on efficiency and reliability and associated policy challenges. At a time when jurisdictions across North America are continuing to move toward wholesale electricity markets as the preferred model, seams issues have emerged as critical obstacles to success by threatening both efficiency and reliability objectives. In an attempt to address these concerns, the U.S. Federal Energy Regulatory Commission (FERC) made the elimination of seams issues a major part of Order No. 2000, an order designed to bolster the development of wholesale electricity markets by encouraging the formation of large-scale regional transmission organizations (RTOs).[3]

There is ample evidence linking seams issues with transaction costs and other sources of market inefficiency and threats to reliability. Regulatory orders and studies of the wholesale electricity markets in the United States recognize progress that has been made to facilitate interregional trade, but also point to several seams-related areas for improvement.[4] Assessments by reliability groups show that market-based business practices and trading patterns are increasingly straining the capabilities of North America's transmission grid.[5] Industry observers and participants acknowledge the importance of resolving seams issues and are working toward solutions.[6] There is widespread agreement on the prevalence of seams issues and their adverse effects and some steps have been taken to identify and address these issues. In a previous paper, the authors introduced a seams issues analytical framework, applied this framework to several seams issues, and discussed policy responses. Our purpose here is to provide an update on whether North American electricity markets continue to move toward a seamless electricity market environment – i.e., whether they are still "coming together at the seams" – and to advance the policy debate.

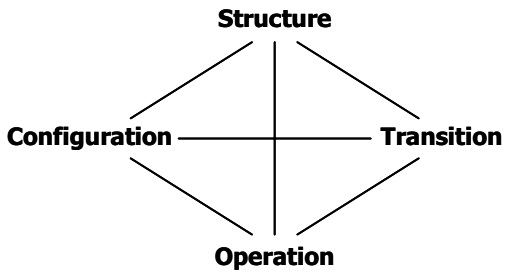
Seams Issues Examined

Whatever their underlying form, seams issues threaten to hinder the development of regional wholesale electricity markets and limit their ability to deliver efficiency and reliability benefits. The considerable volume, diversity and complexity of seams issues has frustrated many attempts to perform structured analysis and formulate appropriate policy alternatives.

Analytical Framework

To facilitate discussion and analysis of seams issues, we have developed the following analytical framework that divides seams issues along two axes: *configuration/transition* and *structure/operation* (refer to Figure 1). Issues along the configuration/transition axis are primarily related to the ongoing effort to establish regional wholesale electricity markets to meet efficiency and reliability objectives. Issues along the structure/operation axis are primarily related to the convergence of market structure and harmonization of market rules and business practices.

Figure 1
Seams Issues Analytical Framework



To date, most efforts to identify and address seams issues have focused on structure/operation seams issues, while detailed analysis of configuration/transition issues has been reserved for a broader discussion around the evolution of regional markets. This analytical framework is designed to stimulate a balanced debate between strategic or "evolution"-oriented issues (i.e., those along the configuration/transition continuum) and tactical or "snapshot"-oriented issues (i.e., those along the structure/operation continuum). It is also designed to help distinguish between seams issues which

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This paper is based on the authors' earlier paper – entitled "North American Electricity Markets: Coming Together at the Seams?" – prepared for the 24th Annual International Conference of the International Association for Energy Economics and published in the conference proceedings. The original IAEE paper has been modified to address recent developments in the move toward seamless energy markets in North America. Some concepts and material were drawn from related articles published in *The Electricity Journal*.

See footnotes at end of text.

require different types of policy responses in terms of scope and scale, objectives, players, roles, instruments, and activities. While this analytical framework brings some needed structure to support rigorous policy analysis, it should be noted that seams issues are interrelated and may not fall wholly along a particular axis or within a particular category. The value of this framework resides in its usefulness as a tool to add structure to the policy debate on seams issues by identifying relevant analytical dimensions and links. Below we use this framework to discuss eight prominent types of seams issues, four along each axis. The analysis and policy review rely heavily on FERC's Order No. 2000, related RTO compliance filings, and subsequent FERC orders.

Configuration/Transition Issues

Issues along the configuration/transition axis are concerned with the number and location of seams and the process through which seams will likely change over time. Configuration decisions (e.g., where regional market boundaries should be drawn) will determine which seams are internalized into a single region and which seams issues will have to be resolved among neighboring RTOs. A loosely coordinated transition toward RTOs may result in more seams issues and a larger adverse effect on interregional trade. Anticipating and addressing issues will likely result in a smoother transition. Major categories of seams issues along this axis include scope and regional configuration, jurisdiction and governance, super-regional functions, and transition program.

In Order No. 2000, FERC did not prescribe initial boundaries for RTOs, leaving much of this critical *scope and regional configuration* decision up to transmission owners, market participants, and other industry stakeholders. This mode of decision-making contributed to a patchy and disconnected set of 12-15 relatively small proposed RTOs.[7] The number of RTOs is positively correlated with the number of seams and, quite likely, with the number of related seams issues. A lack of early FERC guidance likely increased the time necessary to obtain final RTO approval, as compliance filings were rejected because of inappropriate initial scope and regional configuration. Certain public utilities chose to take advantage of the voluntary nature of the RTO process and defer participation, leaving gaps in the RTO topography and creating seams issues that will be difficult to remedy through interregional coordination initiatives. Since July 2001, FERC has pressed for the development of four large RTOs across North America, one for each of the West, Midwest, Northeast, and Southeast regions.[8] This preference has been further refined through stakeholder consultation and subsequent orders.[9] (Refer to Figure 2 for an overview of potential regional electricity markets in North America and the RTO candidates they would likely encompass).

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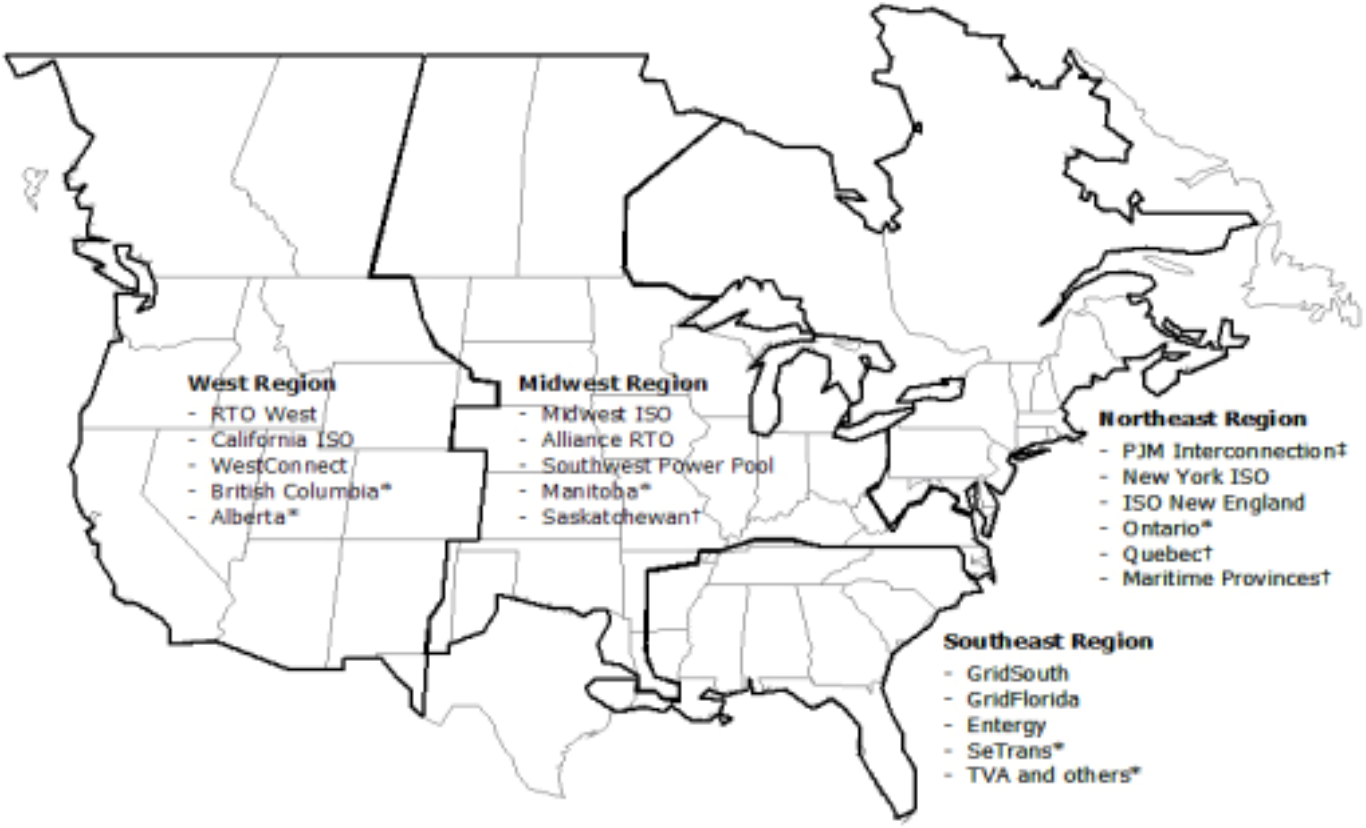
Figure 2
Potential Electricity Markets & Regional Transmission Organizations (RTOs)



Source: Complied by the authors from various sources, including RTO compliance filings, public Web sites, FERC orders and market reports.
* Entities have expressed an interest in becoming a participant and/or participated in significant proceedings.
† Entities may be eligible to become a participant based on RTO scope and regional configuration criteria.
‡ Includes PJM West.

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With Order No. 2000, FERC encouraged Canadian and Mexican entities as well as U.S. public power entities and cooperatives outside its jurisdiction to participate in RTOs. It also required that RTOs perform functions that interface with state regulators' responsibilities. More recently, FERC's efforts to consolidate RTO candidates – i.e., particularly in the Northeast and Southeast – have experienced governance obstacles. Together, these elements represent *jurisdiction and governance* issues to participation in RTOs. International entities face sovereignty and regulatory challenges in order to participate.[10] Likewise, jurisdictional issues will make it difficult for important public power entities such as Tennessee Valley Authority (TVA) and Bonneville Power Administration (BPA) to participate. Uncertainty surrounding the allocation of authority and working relationships between RTOs and state regulators may also hamper the development of RTO capabilities, particularly in the area of transmission planning and expansion. Finally, differences of opinion on questions of governance (e.g., composition of the RTO's board of directors and role of the for-profit transmission companies) could lead to delays or outright failure of the RTO to be formed. If left unresolved, these jurisdiction and governance issues may adversely affect the overall transition to such an extent that few benefits of large regional markets and RTOs are realized.

In Order No. 2000, FERC did not require each RTO to perform all of the minimum functions directly. In some cases, RTOs may satisfy functional requirements by coordinating to jointly perform *super-regional functions*. Such arrangements may be justified in terms of minimum efficient scope and/or scale (e.g., market monitoring) or consistent application of business practices across regions (e.g., transmission planning and expansion). If development and implementation efforts for these functions are not coordinated, they may fail to meet RTO requirements. Alternatively, each RTO may not invest enough time and resources because of a lack of incentive to carry the effort. Questions also remain about whether super-regional functions will actually lead to duplication of effort and resource allocation and whether they are appropriate for larger, more complex functions. If super-regional functions are pursued as part of the RTO development strategy but fail to be implemented for the reasons provided above, the transition program will ultimately suffer and some RTO benefits will likely be lost.

The *transition program* refers to the RTO implementation timeline and potential challenges arising from the "open architecture" provision of Order No. 2000. FERC outlined an aggressive implementation timeline, requiring public utilities to make compliance filings by late-2000 or early-2001 and RTOs to be operational by December 15, 2001. This implementation timeline proved to be overly optimistic, especially for RTO candidates not emerging from an existing FERC-approved ISO.[11] FERC has since indicated that December 15, 2001 is now the date by which all jurisdictional entities should identify the RTO candidate they plan to join.[12] In Order No. 2000, FERC also allowed a staggered implementation timeline for certain functions.[13] Such an approach may lead to greater coordination challenges if neighboring RTOs move ahead with these functions at different rates. Finally, the open architecture provision gives RTOs the flexibility – subject to FERC approval – to improve their organizations in terms of structure, geographic scope, and market offerings. This provision is intended to ensure that RTOs do not preclude natural and reasonable evolution; however, vagueness around its interpretation and potential uses may result in seams issues. Taken together, these issues cast uncertainty on the transition program.

Structure/Operation Issues

Issues along the structure/operation axis represent perhaps the most obvious examples of seams problems and generally lead to increased transaction costs and reliability challenges. In contrast to configuration/transition issues, seams issues on this axis are generally related to specific market characteristics or business practices. Major categories include market design and structure, market operations, power system operations, and market facilitation.

Each wholesale electricity market developed to date possesses a unique *market design and structure*. The resulting regional differences tend to increase transaction costs and may create problems related to power system reliability. One

Table 1
Select Northeast Market Design Attributes

	ISO New England†	New York ISO	PJM Interconnection	Ontario IMO*
Day-Ahead Energy	N/A	Auction	Auction	N/A
Real-Time Energy	Auction	Auction	Auction	Auction
Regulation	Auction	Auction	Auction	Procurement
10-Minute Spinning Reserve	Auction	Auction	Procurement	Auction
10-Minute Non-Spinning Reserve	Auction	Auction	Procurement	Auction
30-Minute Operating Reserve	Auction	Auction	Procurement	Auction
Installed Capacity‡	Deficiency	Auction	Auction	N/A
Congestion Management	Uplift	Full LMP	Full LMP	Partial LMP
Transmission Rights	Right/Obligation	Right/Obligation	Right/Obligation	Option

† Capabilities to support day-ahead energy market, locational marginal pricing (LMP), and financial congestion rights (FCRs) are under development.
* Scheduled to become operational in May 2002; information reflects structure planned for market commencement.
‡ Product definitions for installed capacity vary widely between markets.

of the underlying assumptions of efficient wholesale electricity markets is that price differences between regional markets are removed by participants transacting across regions. Unfortunately, misalignment between products, services, and business practices has resulted in high transaction costs, inefficient use of operating reserves, reliability events, and unnecessary price volatility.[14] Specific problems related to divergent business practices are addressed in the sections below. To illustrate some of the more obvious differences in market design, Table 1 provides a comparison of select market design attributes of wholesale electricity markets in the Northeast.

The overall set of electricity trading arrangements and market rules (i.e., permitted market participants and modes of transacting) can also exacerbate seams issues. Structural rigidities and overly restrictive market rules can lead to efficiency and reliability problems to the extent that they constrain interregional trade and delivery.

Differences in *market operations* business practices (e.g., transaction management, market clearing, financial risk management, settlement and billing, and market information) continue to exacerbate the negative impacts of seams issues. In Order No. 2000, FERC required RTOs to operate an imbalance energy market and encouraged them to adopt market-based mechanisms for congestion management and the provision of ancillary services. In recent months, FERC has sent mixed signals as to whether the RTO should operate additional markets (e.g., day-ahead energy and/or installed capacity). Aside from this high-level guidance, RTOs retain significant latitude to develop and implement market operations business practices that are inconsistent or incompatible between regions. For example, one need only compare prevailing timelines and procedures governing transaction management and settlement and billing in existing wholesale electricity markets to demonstrate this point. Additional evidence to this effect illustrates how market operations business practices may diverge and how efficiency and reliability benefits may be eroded as a result.[15] Considerable disagreement remains as to the appropriate business practices for several of the major market operations areas.[16]

Similarly, differences in *power system operations* business practices (e.g., forecasting and availability, transmission services, ancillary services, scheduling and dispatching, security and reliability, and metering and measurement) also present obstacles to the elimination of seams issues across regional markets. In Order No. 2000, FERC outlined several RTO requirements in this area but did not address preferred business practices or procedures. Even within the reliability guidelines established by the North American Electric Reliability Council (NERC) and regional transmission groups, RTOs may develop and implement divergent power system operations business practices. For example, one need only examine differences in the calculation and application of total transmission capability (TTC) and available transmission capability (ATC) in existing wholesale electricity markets to demonstrate this point. As with the market operations business practices discussed above, much additional evidence points to divergent power system operations business practices, losses of efficiency and reliability benefits, and disagreement as to the most appropriate business practices.

Finally, divergent business practices in *market facilitation* (e.g., tariff design and administration, market monitoring, market development, transmission planning and expansion, interregional coordination, dispute resolution, and market governance) also contribute to seams issues, albeit to a lesser extent. In Order No. 2000, FERC indicated that RTOs should play a role in designing and administering its own open-access transmission tariff, monitoring and developing its markets, enhancing the power system, and coordinating with neighboring RTOs. Based on experience with existing electricity markets, one can also postulate that RTOs will also require some capabilities to provide customer services such as dispute resolution and ongoing market governance.[17] Some progress has been made to develop consistent and compatible business practices in these areas, but a substantial amount of work remains to resolve existing and potential seams issues. Of particular concern are business practices related to transmission planning and expansion, tariff design and administration, and market monitoring because of their relative importance in supporting market operations.

Policy Responses

To the extent practicable, policy responses for seams issues should leverage the work and expertise of existing regional coordination efforts and groups. This will require coordination among several entities, including FERC, RTO candidates, market participants, energy industry standards authorities, federal departments, state regulators, relevant Canadian and Mexican entities, and other industry stakeholders. The discussion below covers objectives, key players, policy instruments, and execution for each major category of seams issue.

Configuration/Transition Issues

Configuration/transition seams issues generally require policy responses involving coordination at the highest levels, broad stakeholder participation, and a "front-loaded" effort. In most cases, the appropriate policy response will require contributions by FERC, RTO candidates, state regulators, relevant Canadian and Mexican entities, market participants, energy industry standards authorities, and other industry stakeholder groups.

The most pressing *scope and regional configuration* seams issues include the size and shape of desired regional wholesale electricity markets and respective RTOs, the manner in which FERC evaluates each RTO candidate to determine appropriateness, and the extent to which promised efforts to resolve seams issues are acceptable as substitutes for appropriate scope and regional configuration. These issues are best addressed by representatives from FERC, RTO candidates, state regulators, market participants, and Canadian and Mexican entities, with input from energy industry standards authorities and other industry stakeholder groups. In the July 12th Orders and subsequent issuances, FERC took an important step in this area by outlining its preference for one RTO in each of the West, Midwest, Northeast, and Southeast regions. It remains to be seen whether FERC will maintain this policy direction, especially for the Western and Southeastern regions which have expressed perhaps the greatest level of discontent.[18] FERC should also continue to involve state regulators in discussions on appropriate RTO scope and regional configuration and

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take steps to analyze the technical feasibility of implementing large-scale RTOs.[19]

The policy response for *jurisdiction and governance* issues should be tailored to meet the coordination, agreement, and participation needs of international, public power and cooperative (i.e., non-jurisdictional), and state entities. RTOs with international members will require clarification on shared jurisdiction between two or more regulators and contractual and other agreements to facilitate cross-border participation. FERC should work with regulators and other authorities in Canada and Mexico to expedite negotiation of the necessary legal and regulatory agreements.[20]

FERC should also work with federal and state agencies to help remove legal and regulatory obstacles and press for enabling legislation where necessary. Finally, state entities and RTOs should continue to seek agreement on shared responsibilities, with support from FERC and energy industry standards authorities.

With respect to *super-regional functions*, FERC could sponsor a technical conference to address the costs, benefits, risks, and feasibility of pursuing super-regional functions for ancillary services, market monitoring, transmission services, and other relevant functions. Considering the potential impact of these issues on RTO evolution, FERC should act quickly to help ensure that any findings may be included in regional market designs and RTO implementation efforts. FERC could also provide detailed guidance on any super-regional functions that are included in RTO candidates' compliance filings so that others may benefit from their insight.[21]

With respect to the *transition program*, FERC should provide clear guidance on new RTO implementation deadline(s), along with contingency plans and consequences of not meeting the new deadline(s). Second, FERC and energy industry standards authorities should provide ongoing monitoring, assessment and reporting on the potential impacts of staggered implementation timelines – i.e., for market-based congestion management (one year) and both parallel path flow and planning and expansion (three years) – and coordinate efforts to overcome common implementation challenges. Finally, with respect to open architecture, FERC should provide ongoing monitoring and assessment of the potential impact of open architecture on market certainty and confidence.

Structure/Operation Issues

FERC provided the primary policy response for structure/operation seams issues by including interregional coordination as a minimum RTO function. Working groups established by RTO candidates, market participants, and energy industry standards authorities have already started to identify and address seams issues and will likely evolve into the interregional coordination mechanisms required by Order No. 2000. However, despite substantial effort devoted to address structure/operation seams issues, little progress has been made to implement necessary market enhancements. In most cases, making the desired changes will require a focused effort by FERC, RTO candidates, energy industry standards authorities, market participants, state regulators, relevant Canadian and Mexican entities, and other industry stakeholder groups.

Resolving *market design and structure*, *market operations*, and *power system operations* will continue to involve a balancing act, requiring contributions from FERC, RTO candidates, market participants, energy industry standards authorities, state regulators, and other industry stakeholders. To address market design and structure seams issues, FERC should continue to work with energy industry representatives to develop guidelines for a standard market design based on best practices.[22] To address market operations and power system operations seams issues, FERC should also work with the U.S. Department of Energy to encourage the creation of a North American energy industry standards authority and define its role in this area. The North American Electric Reliability Council (NERC) continues to provide guidance in these areas and has recently expressed an interest in expanding its current role – as has the Gas Industry Standards Board (GISB) – to serve in the capacity of an energy industry standards authority.[23] If properly designed and implemented, such an organization would likely provide the most appropriate avenue to collect input from and build consensus among key industry stakeholders to resolve seams issues in these areas.

Policy responses for *market facilitation* – encompassing both regional development and customer services areas of RTO operations – will likely require contributions from FERC, state entities, RTO candidates, market participants, energy industry standards authorities, and a variety of industry stakeholder groups. High-level policy questions – perhaps leading to legislation – may be addressed by the U.S. Department of Energy's Electricity Advisory Board.[24] To address transmission planning and expansion seams issues, FERC should continue to work with state regulators to define the allocation of responsibilities between state regulatory commissions and RTOs.[25] To address seams issues related to interregional coordination and ongoing market governance, FERC should require that RTOs file agreements and plans on how they will participate in working groups and provide estimates of time and resources required to resolve outstanding seams issues in these areas. Finally, to address market monitoring and tariff design and administration issues, FERC should provide guidance through a revised *pro forma* open-access transmission tariff (OATT) that is based on the upcoming standard market design rulemaking.

Conclusions

The purpose of this paper was to assess whether North American electricity markets are converging toward a seamless electricity trading and transmission environment – i.e., whether these markets are still "coming together at the seams" – and to stimulate a policy discussion on what should be done to facilitate the transition. To do this, we defined seams issues as *impediments to interregional trade in and delivery of electricity and related products and services which result in economic inefficiency and/or a threat to reliability*. We then proposed an analytical framework comprised of two axes – configuration/transition and structure/operation – and applied it to eight categories of seams issues. Along the configuration/transition axis, we examined scope and regional configuration, jurisdiction and governance, super-regional functions, and transition program. Along the structure/operation axis, we examined market design and

structure, market operations, power system operations, and market facilitation. We then reviewed current policy efforts and suggested additional responses to help facilitate the transition. Our analysis and review drew on current activities in the ongoing transition toward RTOs encouraged by FERC's Order No. 2000 and related issuances.

Seams issues are the bane of electricity markets and the situation will likely worsen before it improves. It is widely acknowledged that these issues threaten efficiency and reliability, the objectives of most industry restructuring programs and wholesale electricity markets. Not surprisingly, the focus of most analysis performed to date has been biased toward tactical issues, along what we have labeled the structure/operation axis. Relatively little work has been done to address the long-term configuration/transition challenges whose impact on the industry in coming years will be less obvious but probably more profound. FERC's RTO initiative presents us with an opportunity to re-focus analysis and debate to develop a more balanced view of the transition toward regional markets, one that explicitly acknowledges interrelationships between configuration/transition issues and structure/operation issues. Our analysis indicates that seams issues along the configuration/transition axis represent a significant threat to long-term convergence and the evolution of regional markets into a seamless environment. Seams issues along the structure/operation axis, while no less menacing, are better understood and may be more easily addressed.

So, are North American electricity markets still coming together at the seams? Much has been done to identify and address seams issues in the past few years. However, the remaining work to address issues along both axes is significant. In some regions RTO candidates have already taken steps toward implementing the interregional coordination function. In other regions, questions remain about various types of seams issues, from scope and regional configuration to market operations. There can be little doubt that initiating the transition toward larger regional markets and greater participation is a positive and necessary first step. But it is merely the first step in a journey. FERC, RTO candidates, energy industry standards authorities, market participants, and other industry stakeholders must take a more active role in defining the policy responses to issues raised here. Several of the required policy instruments are available, but relevant players have been slow to take up the charge. So far the response has been moderate but encouraging; from FERC's clarification of its preferred scope and regional configuration to industry stakeholders' call for increased discussion on seams issues. Our primary concern is that the coming years of frenzied RTO formation will exacerbate the seams problem to such an extent that the overall transition program will suffer. Nevertheless, based on current evidence and despite some misgivings, we believe markets are converging toward a seamless environment and we remain cautiously optimistic that it will be achieved within the next few years.

Footnotes

[1] For example, the mid-Atlantic region (PJM), California, the New England region, and New York in the United States and Alberta in Canada have all established bid/offer- or auction-based wholesale electricity markets within the past five years.

[2] Refer to Federal Energy Regulatory Commission (FERC), Investigation of Bulk Power Markets – Northeast Region, Washington, DC, November 1, 2000 (available at www.ferc.gov/electric/bulkpower/).

[3] FERC, *Regional Transmission Organizations, Order No. 2000*, Docket No. RM99-2-000, Washington, DC, December 20, 1999 (available at www.ferc.gov/electric/rto/post_rto.htm). With Order No. 2000, FERC encouraged electric utilities and independent system operators (ISOs) under its jurisdiction to participate in an approved regional transmission organization (RTO). This order outlined four minimum RTO characteristics – i.e., independence, scope and regional configuration, operational authority, and short-term reliability – and eight minimum RTO functions – i.e., tariff administration and design, congestion management, parallel path flow, ancillary services, open-access transmission administration, market monitoring, planning and expansion, and interregional coordination. It also specified guidelines for open architecture, ratemaking, and filing and implementation timelines.

[4] *Supra* notes 2 and 3.

[5] North American Electric Reliability Council (NERC), *2001 Summer Assessment: Reliability of the Bulk Electricity Supply in North America*, Princeton, NJ, May 2001 and *Reliability Assessment 2001-2010: The Reliability of Bulk Electric Systems in North America*, Princeton, NJ, October 16, 2001 (both available at www.nerc.com/~filez/rasreports.html).

[6] See, for example, Richard Stavros, "Transmission 2000: Can ISOs Iron Out the Seams?" *Public Utilities Fortnightly*, May 1, 2000, pp. 24-33, ISO Memorandum of Understanding (MOU) Business Practices Working Group, *Draft Seams Issues Matrix*, January 4, 2001 (available at www.isomou.com/working_groups/business_practices/documents/general/), and FERC, *In the Matter of RTO Interregional Coordination*, Docket No. PL01-5-000, Washington, DC, June 19, 2001 (available at www.ferc.gov/electric/rto/post_rto.htm).

[7] For example, entities in California, New York and Florida filed to seek approval for single-state RTOs, entities in New England and the mid-Atlantic sought approval for RTOs which represented current or slightly expanded geographic market regions, and entities in the Carolinas and the Southeast sought approval for RTOs with relatively small geographic footprints.

[8] Together commonly referred to as the "July 12th Orders" (available at www.ferc.gov/electric/rto/post_rto.htm).

[9] For example, FERC's RTO Week held in Washington, DC (October 15-19, 2001), the establishment of state-federal regional panels to consider RTO issues (November 9, 2001), and orders related to the emergence of a single Midwest RTO (December 20, 2001). Details on these items are available at www.ferc.gov/electric/rto/post_rto.htm.

[10] *Supra* note 3.

[11] Efforts to develop and implement comparable power system and market operation infrastructure for the mid-Atlantic region (PJM Interconnection), California (California ISO and California Power Exchange), the New England region (ISO New England), and New York (New York ISO) have spanned several years. At the time of writing, only a few candidate RTOs had obtained FERC approval and were ready to initiate operations.

[12] FERC, *Order Providing Guidance on Continued Processing of RTO Filings*, Docket No. RM01-12-000, Washington, DC, November 7, 2001 (available at www.ferc.gov/electric/rto/post_rto.htm).

[13] *Supra* note 3. The original implementation deadline for a market-based congestion management was December 15, 2002 while the deadline for a functional parallel path flow regime and planning and expansion capabilities was December 15, 2004. These deadlines will presumably be updated (deferred) based on the new

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target RTO operational date.

[14] For example, FERC has indicated "…[t]he lack of 'universal' products in the northeast as well as the lack of harmonized or standardized procedures for buying and selling power across the region is a loss to the efficient functioning of the market," *supra* note 2 at 85.

[15] *Supra* notes 2 and 3.

[16] For example, refer to FERC, *Administrative Law Judge Mediator's Report to the Commission*, Docket No. RT01-99-000, Washington, DC, September 17, 2001 and *Business Plan for the Development and Implementation of a Single Regional Transmission Organization for the Northeastern United States* (available at www.ferc.gov/electric/rto/post_rto.htm).

[17] Note that "ongoing market governance" here refers to the process through which decisions are made by the RTO and its constituents on a regular basis. In contrast, "governance" in the Jurisdiction & Governance section above refers to the nature and characteristics of the RTO's organizational components and formal decision-making structures.

[18] See, for example, FERC, *Mediation Report for the Southeast RTO*, Docket No. RT01-100-000, Washington, DC, September 10, 2001 (available at www.ferc.gov/electric/rto/post_rto.htm).

[19] On state regulator involvement and the need for an analysis of technical feasibility, refer to FERC, *Order Announcing the Establishment of State-Federal Regional Panels to Discuss RTO Issues, Modifying the Application of Rule 2201 in the Captioned Documents, and Clarifying Order No. 607*, Docket Nos. RT02-2-000 *et al.*, Washington, DC, November 9, 2001 and *supra* note 16, respectively (both available at www.ferc.gov/electric/rto/post_rto.htm).

[20] At the time of writing, provincial entities in British Columbia, Alberta, Manitoba, and Ontario have expressed an interest in participating in a candidate RTO and/or participated in significant proceeding while Mexican entities have been less involved in the proceedings. For examples of progress in this area, refer to proposed arrangements by British Columbia and Alberta to enable Canadian entities to participate in RTO West (available at www.rtowest.org) and the recent Coordination Agreement between the Midwest ISO and Manitoba Hydro (available at www.midwestiso.org).

[21] For an example related to coordinated market monitoring in the Midwest region, refer to FERC, *Order Granting RTO Status and Accepting Supplemental Filings*, Docket No. RT01-87-000 *et al.*, Washington, DC, December 20, 2001, pp. 31-36.

[22] For background, refer to FERC, *Electricity Market Design and Structure: Staff Summary of Discussions*, Docket No. RM01-12-000, Washington, DC, October 22, 2001 and FERC, *Concept Discussion Paper for an Electric Industry Transmission and Market Rule*, Washington, DC, December 17, 2001 (both available at www.ferc.gov/electric/rto/post_rto.htm). Additional guidance should be provided in a FERC Notice of Proposed Rulemaking (NOPR) scheduled for issuance in January 2002.

[23] For details on each organization's proposal, refer to NERC, *Proposal for NERC to Develop and Operate the Wholesale Electric Standards Model (WESM)*, Princeton, NJ, December 4, 2001 (available at www.nerc.com) and GISB, *Strawman 2: In Consideration of An Energy Industry Standards Board*, Houston, TX, February 19, 2001 (available at www.gisb.org).

[24] Refer to announcement at www.energy.gov/HQPress/releases01/decpr/pr01205.htm.

[25] FERC's establishment of State-Federal Regional Panels to Discuss RTO Issues should facilitate this dialog (refer to note 19 above). Refer also to FERC, *Letter Inviting State Commissioners' Views on RTOs in the Northeast*, Docket Nos. RT01-2-001 *et al.*, Washington, DC, December 10, 2001 (available at www.ferc.gov/electric/rto/post_rto.htm).