BEFORE
THE PUBLIC UTILITIES COMMISSION OF OHIO

In The Matter Of Commission's Investigation Into The Value of Continued Participation in Regional Transmission Organizations.	))))	Case No. 09-90-EL-COI

COMMENTS
BY
THE OFFICE OF THE OHIO CONSUMERS' COUNSEL

I. INTRODUCTION

The Office of the Ohio Consumers' Counsel ("OCC") is pleased to provide these comments to the Public Utilities Commission of Ohio ("PUCO" or "Commission") in this case where the interests of Ohioans in Regional Transmission Organizations (RTOs) are being considered in the above-captioned proceeding. The value that RTOs may provide to Ohioans comes from their ability to reliably and efficiently manage the integrated electric bulk power system. OCC's comments are organized in two sections: an Introduction section that provides general comments on Regional Transmission Organizations and a section that provides answers to the specific questions posed by the PUCO in its opening Entry.

OCC will review the comments filed by other parties to this proceeding and will provide reply comments as specified in the amended schedule for this proceeding. OCC reserves the right to address issues in its reply comments that have not been identified in these initial comments.

II. BACKGROUND

RTOs have been a part of the U.S. electricity sector landscape since the 1990s. Their introduction and growth has been encouraged by the Federal Energy Regulatory Commission ("FERC") in order to ensure equal access to the power grid, enhance the reliability of the transmission system, eliminate inefficient transmission cost structures such as "rate pancaking," and operate wholesale electricity markets.

In 1999, the FERC issued Order 2000 which set forth their vision of RTO characteristics and functions.[1] The four minimum characteristics of an RTO 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

The eight minimum functions of an RTO include:[2]

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 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 Open-Access Same-Time Information System ("OASIS")[3] site for all transmission facilities under its control with responsibility for independently calculating

[1] Order 2000, December 20, 1999, 89 FERC ¶ 61,285, Docket RM99-2-000.

[2] Id. at 152 (four characteristics); at 323-324 (eight functions).

[3] Open-Access Same-Time Information System, for posting available transmission capacity and related information such that all market participants have access to complete, up-to-date market information.

Total Transmission Capacity ("TTC") and Available Transmission Capacity ("ATC");

6) monitor markets to identify design flaws and market power;

7) plan and coordinate necessary transmission additions and upgrades; and

8) interregional coordination

More recently, FERC issued Order 719 "amending its regulations under the Federal Power Act to improve the operation of organized wholesale electric markets in the areas of: (1) demand response and market pricing during periods of operating reserve shortage; (2) long-term power contracting; (3) market-monitoring policies; and (4) the responsiveness of Regional Transmission Organizations ("RTOs") and independent system operators ("ISOs") to their customers and other stakeholders, and ultimately to the consumers who benefit from and pay for electricity services."[4]

The questions posed by the Commission in this proceeding encompass most, if not all, of the above characteristics and functions. The stated goal of this proceeding is to "Examine the value of the participation of the State of Ohio's electric utilities in Regional Transmission Organizations (RTOs)" and to determine whether the continued participation in RTOs is in the interest of the State's electric customers. We predicate all our comments on RTOs in this proceeding on the assumption that RTOs must meet the minimum functions and characteristics delineated in Order 2000 and as developed in subsequent proceedings of the FERC, including the recent Order 719.

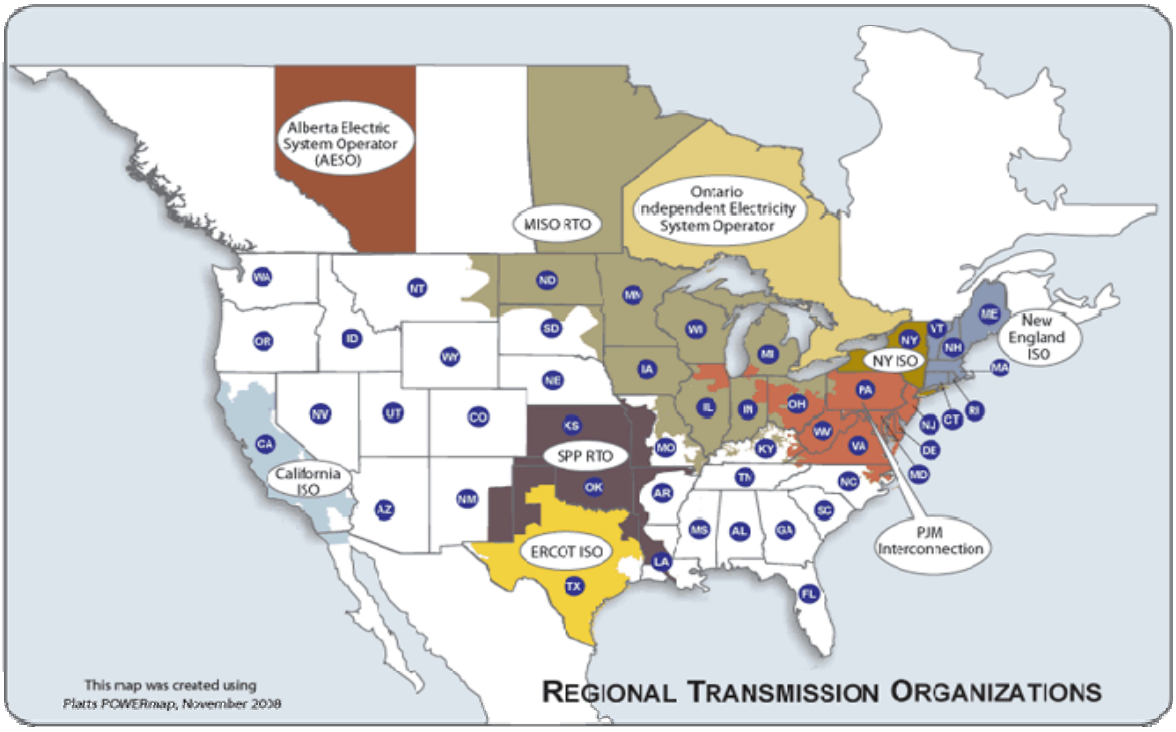
OCC strongly supports this examination. RTOs were formed to achieve better coordination in the provision of electric services, provide equal access for all resources to

[4] Order 719, October 17, 2008, 125 FERC ¶61.071, Docket Nos. RM07-19-000 and AD07-7-000 at ¶12, ¶478, ¶556. Summary available at http://www.ferc.gov/whats-new/comm-meet/2008/101608/E-1.pdf.

the power grid, to improve the reliable operation of the bulk power system, to eliminate inefficient transmission cost structures, and to provide trading platforms that would improve the overall economic efficiency of electricity production. These overall goals are relevant today. After some years of operation, RTOs now have a track record of things they do well and challenges that they still need to address.

As our comments will demonstrate, RTOs serve an important role in administering spot electricity markets, dispatching generating resources efficiently, ensuring system reliability, and developing regional transmission plans. They are less focused on ensuring customer value in electricity services as will be discussed in detail in response to specific questions in these comments. It is crucial that the Commission and the State of Ohio encourage Ohio utilities to take advantage of RTO membership for the benefits that it can provide. At the same time, changes to RTO structures may be needed to protect Ohio's electric customers from unjust and unreasonable electricity service costs.

The map below shows the existing RTO regions in the US and Canada.



RTOs developed in tight power pools (New England, New York), integrated pools (PJM, SPP, ERCOT) and loosely connected regions (California and MISO).[5] Ohio is served by two RTOs: PJM and MISO. PJM, with two AEP-affiliated Ohio utilities and Dayton Power & Light, serves approximately 11,700 MW of Ohio peak load while MISO, with three FirstEnergy-affiliated utilities and Duke Energy, serves an additional 15,200 MW of Ohio peak load.

OCC has included a Table of Authorities to these comments, identified as Attachment 1.

[5] The "tightness" of a power pool is determined by the level of coordination and central dispatch provided by the pool operator. New York and New England had central dispatch for reliability and economic purposes prior to becoming RTOs. PJM performed coordination functions but did not dispatch the entire interconnection until it assumed RTO status. MISO was formed from dozens of separate control centers and is just now achieving a fully coordinated and centralized dispatch system.

The OCC has engaged Synapse Energy to address the numerous issues identified by the Commission as important to this investigation. The Synapse report (Report") is attached to these comments as Exhibit 1. The Report addresses all questions propounded in the Entry. OCC reserves the right to further address these issues in reply comments, as well as other comments filed in this case.

Respectfully submitted,

JANINE L. MIGDEN-OSTRANDER
CONSUMERS' COUNSEL

_____

Jacqueline Lake Roberts
Assistant Consumers' Counsel

Office of the Ohio Consumers' Counsel
10 West Broad Street, Suite 1800
Columbus, Ohio 43215-3485
614-466-8574 (Telephone)
roberts@occ.state.oh.us

CERTIFICATE OF SERVICE

I hereby certify that a copy of the Comments by the Office of the Ohio Consumers' Counsel has been served upon the following parties via regular U.S. Mail, postage prepaid, this 26th day of May, 2009.

_____
Jacqueline Lake Roberts
Assistant Consumers' Counsel

SERVICE LIST

Duane Luckey
Attorney General's Office
Public Utilities Commission of Ohio
180 E. Broad Street, 9th Fl.
Columbus, Ohio 43215

David F. Boehm, Esq.
Michael L. Kurtz, Esq.
BOEHM, KURTZ & LOWRY
36 East Seventh Street, Suite 1510
Cincinnati, Ohio 45202

Counsel For The Ohio Energy Group

Daniel Shields
Federal Energy Advocate
Public Utilities Commission of Ohio
180 E. Broad Street, 6th Fl.
Columbus, Ohio 43215

Dan Dolan
Vice President, Policy Research/Analysis
Electric Power Supply Association
1401 New York Ave, N.W.
11th Floor
Washington, D.C. 20005

Glen Thomas
PJM Power Providers Group
1060 First Avenue, Suite 400
King of Prussia, PA 19406

William Massey
Covington & Burling LLP
1201 Pennsylvania Avenue, NW
Washington, DC 20004-2401

Attorney for The COMPETE Coalition

Joseph Meissner
Matthew Vincel
The Legal Aid Society of Cleveland
1223 West 6th St.
Cleveland, OH 44113

Attorneys for the Citizens Coalition

EXHIBIT 1

BEFORE
THE PUBLIC UTILITIES COMMISSION OF OHIO

In The Matter Of Commission's Investigation Into The Value of Continued Participation in Regional Transmission Organizations.	Case No. 09-90-EL-COI

THE PUBLIC UTILITIES COMMISSION OF OHIO

Case No. 09-90-EL-COI

REPORT OF

SYNAPSE ENERGY ECONOMICS, INC.

FOR THE OFFICE OF THE OHIO CONSUMERS' COUNSEL

AUTHORS

Paul Peterson
Ezra Hausman
Robert Fagan
Vladlena Sabodash

TABLE OF CONTENTS

PAGE

I. KEY RTO RESPONSIBILITIES

A. Short-term Dispatch

RTOs can provide benefits in terms of efficient dispatch, enhanced reliability, and coordinated planning. The primary benefit of an RTO derives from the coordinated dispatch function, whereby a single entity can ensure the most efficient and economical use of generation and transmission resources on a moment-to-moment basis. Most RTOs today use the Locational Marginal Pricing ("LMP") system both to manage transmission congestion and to ensure that the least-cost generation possible is used to meet load. LMP is a system by which the wholesale transaction price of electricity at every point in the grid is set equal to the incremental cost of supplying power to that location, calculated at frequent (five-minute to hourly) intervals.

Both PJM and MISO, the two RTOs that operate electricity markets and transmission in Ohio, have gone beyond the real-time balancing market to provide and administer LMP-based day-ahead power markets. The day-ahead market is a spot market for hourly wholesale electricity transactions conducted a day in advance of the delivery day. This is the market in which most power in these RTOs is transacted, and it is against the day-ahead market that congestion-hedging instruments (i.e., financial transmission rights or ("FTRs") are settled. As will be discussed below, FTRs are financial hedges that have replaced firm transmission rights in protecting load-serving entities from exposure to volatile congestion costs.

Because the RTOs administer these large energy spot markets, they have a far greater responsibility for market monitoring and controlling anticompetitive behavior than they would if they were administering only balancing markets. (In this context, a balancing market is one in which load-serving entities could adjust their power positions

in real-time to remedy any imbalance between power purchases and load obligations.) In addition, as will be discussed below, the dominance of these day-ahead markets has come at the expense of bilateral transactions (a contract between a buyer and a seller for a negotiated quantity of power at a negotiated price, often months to years in duration) in RTO-administered markets.[6] Even when such transactions occur, their terms are now generally dominated by the expectation of the RTO spot market price, including the expected impact of anticompetitive bidding.[7] Thus the benefits of efficient dispatch in the day-ahead market may have been achieved at the expenses of long-term bilateral transactions and the benefits that such contracts provide. Long-term contracts can provide price stability and risk management options relative to short-term spot purchases of marginal units.

B. Transmission System Planning

Another important role for RTOs is the obligation to develop regional transmission plans. Both PJM and MISO engage in long-term transmission planning processes, anticipating future transmission needs and performing cost-benefit studies for upgrading the high-voltage interstate system. When lines are deemed to be needed, the RTO will assign responsibility both for constructing the lines and for shares of the cost.

In general, the role of the RTO in directing high-voltage transmission enhancements is widely accepted to the extent that such upgrades are needed for reliability reasons. There is more dispute regarding lines that are needed for economic efficiency purposes. In RTO proceedings on this matter, generating companies have

[6] Synapse Energy Economics, "Bilateral Contracting in Deregulated Electricity Markets", report to the American Public Power Association (APPA), 2008.

[7] Id.

argued that “the market” should determine whether or not such lines are built, and that for the RTO to mandate such lines means that the RTO itself is competing against generation responses to price signals. Synapse has seen no evidence that the wholesale electricity market is capable of responding to such signals with transmission or generation in a way that will maximize benefit for electric customers. Thus we believe that the RTOs must maintain their traditional role in forecasting congestion and directing transmission enhancements for both reliability and economic efficiency purposes, imperfect though their foresight may be. However, we believe that their approaches to cost allocation for transmission enhancements should be reviewed, For example, it is a mystery why the costs of transmission enhancements are routinely allocated only to load (customers), when certain generators (including public utility generators) could be easily identified who will also benefit handsomely from any transmission upgrade.

C. Resource Adequacy

The day-ahead LMP markets have a fundamental conceptual flaw for the provision of long-term price signals in that they form prices based only on short-term market conditions. Numerous factors can impact local price signals on the timescale needed for new generating plants, including migration of load, transmission upgrades, demand management initiatives, and changes in other generating plants. Day-ahead LMP markets were originally thought to provide price signals that would spur long-term (multi-year or decadal) infrastructure investment. Indeed, the very presence of new generation where price signals say it is “needed” can degrade that very price signal, meaning that the new generating plant will never recover the premium price that enticed it in the first place.

Partly in response to this flaw, a number of RTO-administered markets (including PJM) have initiated locational clearing price "capacity" markets that provide a subsidy for generation, designed to ensure that new generation can recover its fixed costs if it is built where needed. In PJM, this structure is intended to replace the use of "Reliability Must-Run" or RMR contracts to guarantee a minimum payment to generators that are needed for reliability purposes but that cannot make enough money to cover their fixed costs in the energy market. The new structure is more expensive for consumers: in the guise of taking a "market-based" approach, PJM has elected to pay *all* generators the same on a per-kW-year basis in comparison to other schemes that just support the small number of generators needed for reliability purposes.

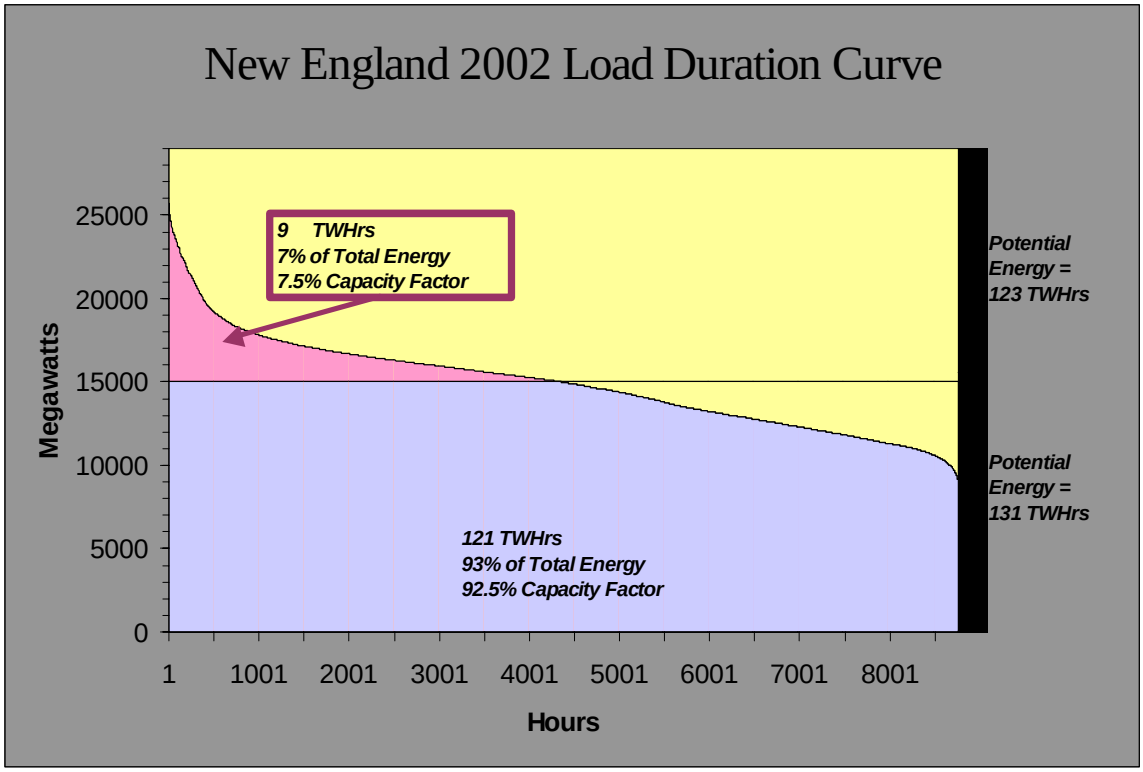
D. Integrating Demand Resources

RTOs perform poorly with respect to support of economic demand side resources.[8] While generators are paid for every MWh they produce (and often for every kW-year of capacity) for the life of each resource, demand resources are paid for only a few years at most before they are assumed out of existence. Market rules and reliability requirements are generally designed with a primary focus on generation and transmission, with demand resources often an afterthought. We understand that it is difficult to quantify the costs and benefits of demand resources, and the risk of double-counting or double-payment exists in certain circumstances. What is vexing is that the risk of "overpaying" for the least cost and cleanest electricity resource is often taken as a reason to ignore it and thereby leave considerable value on the table. At the same time the risk of paying hundreds of times over for generating capacity (e.g., through capacity procurement

[8] Demand resources are all resources on the retail customer side of the meter. They include energy efficiency, demand response, load management, and distributed generation resources.

systems such as PJM's RPM market) does not seem to perturb RTO management and RTO stakeholders though it is the retail consumer that ultimately foots this bill.

Both PJM and MISO have bulk power systems that are inefficient in their utilization of resources. Annual load duration curves show that approximately 60% of the capacity resources meet over 90% of the system energy needs.[9] The remaining 40% of resources supply less than 10% of the system energy needs. The chart below provides an example of this overall inefficiency for the New England system from 2002.[10]



[9] The PJM and MISO Load Duration Curves are shown in Appendix C.

[10] The graph is from a presentation by Con Edison Energy on January 26, 2004, that shows the New England load duration curve for 2002. We have included additional examples of load duration curves for PJM (2004-2008); New England 2003-2007); and MISO. While the curves vary slightly from year-to-year and system-to-system, they are all remarkably similar and support the 90-10 split (Appendix C).

This results in enormous investments in traditional capacity resources that are idle most of the time: a very inefficient system design driven by decades of assumptions about load being inflexible in general and inelastic to price in particular. And the trend line for load duration curves show that, rather than improving, average annual capacity factors are slipping below 60 % as shown in the detailed New England analysis below.[11]

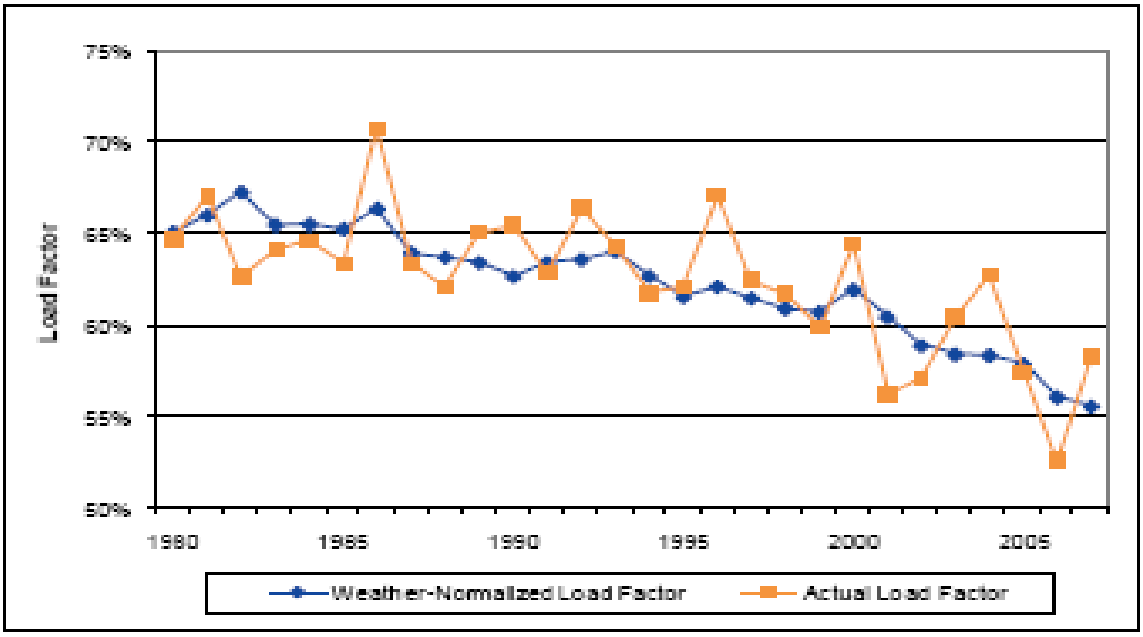


Figure 2-5: New England summer-peak load factors, 1980 to 2007.

Demand resources can improve the performance of the bulk power system in several significant ways. First, energy efficiency resources can "unload" the existing transmission and distribution infrastructure by reducing base, intermediate, and peaking loads. Second, demand response resources can provide an alternative to generation resources during high-priced or reliability stressed hours. Third, demand resources can provide load shifting and energy storage options that can shift consumption to hours

[11] From *2007 Annual Markets Report*, ISO New England, June 2008 at page 29. The detailed analysis of weather adjusted peak loads for New England is representative of the trend in most regions of the country. Much of the increased summer peak load is attributed to greater penetration of air conditioning appliances for both commercial and residential retail customers.

when more efficient (and less costly) resources are available. Fourth, small scale generation projects behind customer meters can provide greater flexibility to system operators depending on whether they operate as load following, peaking, or load shifting resources. All else being equal, improving load duration curves will result in much greater overall economic efficiency. Integrating demand resources into all aspects of RTO operations is a key element to achieving system efficiency improvements.

E. Representation of Retail Customers in RTO Governance

We are concerned that today's RTOs place little emphasis on retail electric customer value. Part of the reason is the historical culture of transmission owners, whose job was to "keep the lights on" above all else. This culture was incubated in a pre-market environment in which retail consumers in each control area were charged on an average-cost basis, and in which transmission and generation were built and controlled by a single entity. The question of whether a "market structure" produced a reasonable allocation of resources and adequate value for retail electric customers was never addressed.

Another reason is the governance structure of the RTOs. While the RTOs themselves are supposed to be disinterested market administrators, their rules are developed through membership committees made up of generators, utilities, public power entities, state commission staff, state consumer advocates, and industrial users. Of these, the generators have access to and are willing to spend abundant resources on packing every RTO committee meeting with company representatives, technical and economic consultants, and attorneys. These producer interests invariably outnumber representatives of electric customer interests many times over, both in people and in resources, and are generally able to dominate the debate over market rules. RTOs often vote on a "sectoral"

basis in an attempt to rectify the lopsided representation advantage of the profit-motivated generation sector. The sector voting seems to only work in theory for several reasons, including that generation and transmission owners have the resources to fully participate while consumer representatives often do not. The load sectors remain at a considerable disadvantage however, both in terms of resources as noted above, and in terms of an asymmetry of interests. Electric customers are interested in both price and reliability, which means that they want to ensure rates are both stable and reasonable enough to support needed generation and transmission enhancements without unreasonably burdening customers. Generators have no corresponding inherent interest in ensuring that rates are low enough to support electric customer welfare.

II. KEY RECOMMENDATIONS

Based on the discussion of key RTO responsibilities above and in light of our responses to the specific questions below, a summary of key recommendations is provided for the PUCO to consider in evaluating the responses to the important issues raised in this proceeding.

A. Independence

The RTO needs to be independent of undue influence from market participants. This principle of independence "is the bedrock upon which the [RTO] must be built." Ideally, this would be a not-for-profit entity with a non-affiliated Board that has no financial interests in any market participants.

B. Governance

The RTO should include at least two slots on its board for members who represent retail consumers, at least one of whom should have had experience advocating for retail residential issues.

C. Mission Statement

There should be an explicit mission statement for the RTO that includes language on cost-effectiveness and overall system efficiency. The mission statement should also include language similar to the guidance that the FERC provided in Order 719 that: RTOs exist for the benefit of the ultimate consumers of the electric system, the retail electric customer.[12]

D. Stakeholder Process

There should be a stakeholder process that interacts with the RTO to help inform the RTO on its policies, procedures, rules, and performance. The stakeholder process should allow market participants to propose changes as well as to review and advise on changes proposed by the RTO. In situations where the stakeholders prefer a different rule or process than the one proposed by the RTO, there should be a mechanism for the stakeholder proposal to be included with the RTO proposal filed at the FERC.

E. Market Monitoring and Mitigation

Effective market monitoring and mitigation are essential features of an RTO. RTO markets do not have the elements necessary to rely on competition alone to establish appropriate prices. The RTO market monitors have described RTO-

[12] Order 719, *see* ¶478 and ¶556.

478. The Commission also directs each RTO and ISO to post on its web site its mission statement or organizational charter. The Commission encourages each RTO and ISO to set forth in these documents the organization's purpose, guiding principles, and commitment to responsiveness to customers and other stakeholders, and ultimately to the consumers who benefit from and pay for electricity services.

administered wholesale markets as "workably competitive", which means that they must be constantly monitored, and specific mitigation rules must be in place.[13] Therefore, the current market monitoring and mitigation must, at a minimum, be maintained and potentially improved.

F. System Planning

Transmission planning and expansion processes should include explicit evaluations of non-transmission alternatives as whole or partial solutions for both reliability and economic enhancements to the bulk power system. The bulk power system is an integrated system of loads, generation, and wires. Technological advances in metering, balancing, and control systems can provide opportunities for a "smarter" grid that balances load and generation in ways that improve reliability and overall economic efficiency without any diminution to the value and quality of electric services provided.

In summary, RTOs have an important role to play in ensuring efficient dispatch consistent with reliability needs, and they are well-equipped to perform this role. They are somewhat less equipped to perform their long-range planning role for the reasons identified above. They do not have as a primary focus the provision of value to electricity consumers, nor are they intended or directed to under the FERC orders that initiated and guided their development. The more electricity market functions are yielded to RTOs, the fewer opportunities states will have to ensure that customer interests are protected. A better delineation of roles and coordination between the RTOs, the state commissions, the state consumer advocates and other stakeholders is needed in order to provide value to customers.

[13] *2008 State of the Market Report for PJM*, Monitoring Analytics, March 2009 at pp. 2-6; *2007 State of the Markets Report for the Midwest ISO*, Potomac Economics, August 2008 at pp109-112; *2007 Annual Markets Report*, ISO New England, June 2008 at pp. 9-10.

III. OPTIONS FOR OHIO

The final questions presented by the Public Utilities Commission in this proceeding have to do with whether Ohio should wholly join PJM, wholly join MISO, form an Ohio-only RTO, or pursue some other course of action.

While there are concerns about the functioning of both MISO and PJM, we do not believe that creating an Ohio-only RTO would be beneficial to Ohio's electric utility customers. A single-state RTO would not have the ability to perform the functions that large-area RTOs do well, specifically to efficiently manage dispatch and congestion. Ohio is also not a well-defined area electrically, so such an RTO would be constantly working to deal with "seams" issues with both PJM and MISO. There is the possibility of additional costs and inefficiencies from the addition of wheeling charges between Ohio and the surrounding regions which would substantially reduce the value of an Ohio-only RTO. Finally, we would foresee a regulatory morass and challenges based on the interstate commerce clause of the constitution were Ohio to try to take over control of its own portion of the regional electricity market.[14]

We do not have an opinion on whether PJM or MISO provides better value for Ohio electricity consumers; this is an empirical issue which we recommend the Commission to pursue for a better determination of the value of PJM and MISO for Ohio consumers. Membership in PJM probably increases wholesale electricity prices in Ohio on average because it provides a closer connection to high-priced electricity markets in the East. At the same time, this increase may provide benefits to sellers of power in terms

[14] Only Texas has a single-state RTO which is not under FERC jurisdiction; however, Texas' transmission system is electrically separate from the AC electric grid of the surrounding states, connected only through DC lines which are directly controllable. Ohio, by contrast, is very tightly woven into its region's interconnected grid and inseparable from the interstate transactions on that grid.

of the ability to sell surplus power into these markets. This Commission should investigate ways to mitigate this adverse impact on consumers and consider to what extent and how this benefit should be passed through to consumers. If not, perhaps the sellers who profit from this benefit should pay the bulk of the PJM membership charges, or even provide consumer payments (through the local distribution utility) to offset the additional consumer costs. Ohio consumers should receive a fair share of the benefits of Ohio's current low-cost generation mix. Consumers should not be the net losers.

We are also concerned that PJM's RPM capacity market is not structured in a manner that provides greater benefits for consumers, especially for those whose distribution companies have divested their generation assets and, therefore, can not provide benefits to their customers from selling capacity into this market. Again, this may be at least partly rectified if those who benefit from this market structure pay for the RTO costs or are compelled to share the benefits through local distribution companies.

Even with these specific reservations about PJM, however, it is difficult to conclude at this time that Ohio should abandon this market completely and place the entire state within MISO. Such a decision would require much more comprehensive analysis of the costs and benefits of making this transition; of the resulting anticipated seams issues compared to those of today; and of the impact on regional transmission planning and costs. Ultimately, having well-conceived transmission planning, effective demand management, and efficient regional dispatch is more important than the question of which RTO Ohio is a member—as long as the state's consumers are protected by state policies and there is an effective stakeholder process. Ultimately, however, if the above issues could be addressed and the analysis showed that MISO was a less costly option

for consumers, then consideration of consolidating the state's utilities into one RTO, namely MISO, might make sense.

APPENDIX A: PJM AND MISO

QUESTIONS 1- 16

1. Are FERC's Order 2000 goals and objectives being realized to promote efficiency in wholesale electric markets and to ensure that electric consumers pay the lowest price possible for reliable service?

As noted in the Introduction to these comments, in Order 2000 the FERC identified four minimum characteristics and eight minimum functions for RTOs. Both PJM and MISO have been approved by the FERC as RTOs. Therefore, by definition, they are meeting the minimum characteristics and functions as determined by the FERC.

In Order 719, the FERC required RTOs to make compliance filings that responded to several distinct elements of the core characteristics and functions listed in Order 2000. One of the broad areas identified for compliance in Order 719 was the issue of RTO responsiveness to customers and other stakeholders. Within this broad category, there is a specific issue related to the RTO mission statement. The FERC encourages "each RTO and ISO to include in its mission statement, among other things, the organization's purpose, guiding principles, and commitment to responsiveness to customers and other stakeholders, and *ultimately to the consumers who benefit from and pay for electricity services."*[15] [emphasis added]

Neither MISO nor PJM have modified their Mission Statements with FERC' suggested language. MISO's Mission Statement is:

> The Midwest ISO will provide our customers with valued services, reliable systems and operations, dependable and transparent pricing, open access to markets, and planning for long-term efficiency.

[15] Order 719 at ¶478 and ¶556.

PJM's "Mission Statement" is also completely lacking in this area, including only the following four bullets:[16]

- As the primary task, to ensure the safety, reliability and security of the bulk electric power system.
- Create and operate robust, competitive and non-discriminatory electric power markets.
- Understand customer needs and deliver valued service to meet those needs in a cost-efficient manner.
- Achieve productivity through the efficient union of superior knowledge workers and technology advances.

FERC's acknowledgment that the entire purpose of RTO development was to better deliver reliable electricity service at just and reasonable rates is an important concept to include in the mission statements of all RTOs and ISOs. We recommend that PUCO direct its jurisdictional utilities to request that PJM and MISO include in their mission statements an affirmative statement that captures the intent of the FERC language cited above. For example, the mission statements of PJM and MISO should include the following language:

> In recognition that it is ultimately the consumers who benefit from and pay for electricity services, [the RTO will] be responsive to those customers' interests and will maximize value for customers in the design and implementation of markets.

To further comply with the FERC responsiveness criteria, we also recommend that PJM and MISO include at least two slots on their respective boards for people who have direct experience in retail consumer advocacy, and at least one should have experience in residential consumer advocacy. Synapse believes that increasing retail electric consumer representation on the RTO boards is a crucial first step in changing the

[16] http://www.pjm.com/about-pjm/who-we-are/mission-vision.aspx.

RTO culture so that it can better address shortcomings in RTOs providing value to customers in Ohio and elsewhere.

2. Are RTOs providing value to Ohio's customers through more effective management and use of the grid by:

(a) Addressing discrimination in access to transmission service?

(b) Eliminating of pancaked transmission rates?

(c) Regional transmission scheduling, tariff administration, and settlements?

(d) Enhancing reliability?

(e) Improved utilization of transmission assets and management of transmission congestion?

(f) Regional unit commitment and security constrained economic dispatch?

The general response to the above list of questions is that both PJM and MISO have done a good job to date developing the procedures, rules, and mechanisms that can provide more effective management of the transmission grid.[17] Considering the lack of regional coordination in both dispatch and planning, the proliferation of seams issues, rate pancaking, and multiple reliability assessments, present in the MISO footprint prior to the development of MISO in 2003, these achievements to date are impressive. The same is true for PJM, although PJM had the benefits of a tighter pool arrangement for its mid-Atlantic members prior to its 1997 RTO status.

[17] *See,* MISO Value Proposition at http://www.midwestiso.org/page/Value%20Proposition and PJM Value Proposition at http://www.pjm.com/~/media/documents/presentations/pjm-value-proposition.ashx.

3. Are the RTOs' locational marginal pricing (LMP) policies providing value to Ohio's consumers?

Both MISO and PJM, like most RTOs today, use the Locational Marginal Pricing ("LMP") system both to manage transmission congestion and to ensure that the least-cost generation available is used to meet load, subject to transmission availability and line losses.

Under ideal conditions, LMP would produce both the socially-optimal use of the electric system, and the precise marginal cost of meeting incremental load at any location at any point in time. Such ideal conditions would include: all generators offering their power at marginal production cost; all load offering to purchase at a price representing the value of power to their welfare; perfect representation of transmission system conditions and limits in the dispatch computer system; and instantaneously dispatchable generation and load. As very few of these conditions are ever met, LMP must be considered an *approximation* of both optimal resource use and marginal cost of meeting load. The two most significant deviations from these ideal conditions are that sellers do not have to bid at their production cost, but in fact generally bid above this level (in PJM they are allowed to offer at 110% of cost, for example) and that most load does not see and cannot respond to price signals.

Thus, LMP probably remains the best way of dispatching generators to meet load. Using alternative techniques, such as pay as bid,[18] have been demonstrated to create greater inefficiencies in price formation. However, LMP could provide more value to Ohio's customers if dispatch were based on production cost, and if the RTOs and Ohio's

[18] "Pay as bid" refers to a market in which successful sellers are paid their actual bid price, as opposed to the market clearing price. However, in such markets sellers will try to "guess" the clearing price, leading to a loss of merit-order dispatch and a resulting societal loss of value that more then offsets any expected consumer savings.

utilities pursued differentiated rate structures[19] and cost-effective technology to allow price-responsive load to participate more fully in the spot market.

LMP provides a mechanism for efficient dispatch of the bulk power system; it provides information to the system planning process; and it may assist some retail consumers in managing their loads. One way that the PUCO can assist efficient pricing would be by encouraging retail rate structures and pricing mechanisms that can provide retail customers with price signals that reflect LMP values, thereby increasing opportunities for a more functional, two-sided electricity market wherever possible. PUCO should convene a collaborative process or a technical conference and hire experts to assist in evaluating how to implement changes to rate structures.

From a wholesale competitive market perspective, LMP is an effective approach for determining the incremental or marginal offer, of the next unit of a resource to meet an additional increment of load.

4. Are the RTOs' ancillary services markets and the integration or co-optimization of those markets with the RTOs' energy markets efficient and providing benefits to Ohio's consumers?

The purpose of ancillary services markets is to provide a competitive process for procuring reserves, regulation, and other services (such as black start capability) from market participants. Co-optimization refers to the linking of prices in the ancillary services markets with other markets (such as energy and capacity) in order to achieve an efficient and presumably "least cost" dispatch of all resources needed to meet energy, demand, reserves, regulation, and emergency requirements in a given hour or over the

[19] Differentiated rate structures can include hourly prices, peak, off-peak,, and critical peak prices as well as other innovative approaches.

course of the day. In some cases, in particular the reserve and regulation markets, the co-optimization may be on a five-minute interval.

The software programs used to achieve co-optimization are complex and evolving. PJM is further along in its efforts to co-optimize its ancillary services markets than MISO, but both entities have a lot of work still to do. In theory, the integration or co-optimization of ancillary service markets with other markets will improve the efficient use of system resources and should provide benefits to Ohio's consumers. However, the ultimate benefits and efficiency of these approaches is an empirical question that would require further investigation. We recommend that PUCO seek unbiased, expert technical analysis of this issue, followed by a public comment period on the analysis results, before taking a position with the RTOs on such co-optimization.

5. Are the RTOs' market monitoring and mitigation policies effective in ensuring competitive prices and providing value to Ohio's consumers?

Effective and independent monitoring of RTO markets is an essential function to increase the competitiveness of electricity markets. In general, the market monitors for both MISO and PJM have declared the various RTO-administered markets to be workably competitive in their annual State of the Market reports,[20] subject to existing market power mitigation and rigorous daily monitoring. The criteria for full and robust competition in unmitigated electricity markets are not present today, and may not ever be fully developed.[21] So the short answer to the question of benefits to Ohio consumers is

[20] For PJM: http://www.monitoringanalytics.com/reports/PJM_State_of_the_Market/2008.shtml; and for MISO: http://www.midwestmarket.org/publish/Folder/10b1ff_101f945f78e_-75e40a48324a.

[21] These criteria include ease of entry into the market, the presence of many small competitors, the ability to effectively store electricity during times of surplus (and low prices), readily available substitutes for electricity, robust demand response, etc.

that they would be worse off without today's monitoring and mitigation, but these current efforts can also be improved upon to provide more value to Ohioans.

PJM's markets have *required* extensive mitigation since PJM began RTO operations in 1997. They still require extensive mitigation today. This is due to structural issues regarding both the quantity and ownership of generation resources in many, if not most, of the PJM load zones. Even where utilities have divested or spun off their portfolios of generation, market concentration remains high and results in automatic mitigation of offers by the PJM Market Monitoring Unit. Over the past few years, there has been significant controversy over the basic authority for developing and applying mitigation rules with PJM suggesting that it is in the best position for determining when and how mitigation should be applied. The independent PJM Market Monitor, meanwhile, has insisted that the entity that develops the market rules and dispatches the system (in this case PJM) should not be the entity entrusted with developing and implementing mitigation policies.[22] This issue continues to be debated today in PJM.

Both PJM and MISO provide annual assessments of their markets. These are essential and important reports that examine a wide range of market and price-setting activities.

Among the critical issues regarding effective monitoring and mitigation are:

- Market Monitoring Unit ("MMU") independence from the RTO and its Board

[22] *See*, Monitoring Analytics website describing settlement between PJM and MMU http://monitoringanalytics.com/reports/Reports/MMU_Orders_and_Responses/faq-regarding-mmu-settlement.pdf.

.

- MMU access, in a timely manner, to any and all data from the RTO that the MMU believes is necessary in fulfilling its function

- MMU direct access to the FERC for issues relating to the conduct of market participants, changes to existing market structures and rules, and the development and evaluation of new market structures and rules.

The precise structure of internal and external market monitoring capabilities can vary from one RTO to another. Both internal and external reviews are essential.

6. Are the RTOs' resource adequacy requirements and the resulting capacity markets (or, in the case of PJM, its Reliability Pricing Model and Fixed Resource Requirement) reasonable and providing benefits to Ohio's consumers? Are these policies effective in promoting needed resource investment and long-term contracts which could help finance such investment? Do these policies promote an appropriate level of investment that is consistent with the needs and preferences of Ohio consumers?

Both PJM and MISO have developed resource adequacy requirements and procedures to assess and ensure resource adequacy for meeting peak load even under extreme conditions. In both RTOs, reserve margin analysis considers factors including generator forced outage rates, generator planned outages, uncertainty in forecasted demand for each Load-Serving Entity ("LSE"), system operating reserve requirements, transmission congestion, external capacity sales and available import capability, and expected performance of load modifying resources. However, when considering load modifying resources, their performance is projected based on last year's performance. Instead, both PJM and MISO should pay more attention to the incorporation of current

state plans regarding Demand Response ("DR") and Energy Efficiency ("EE")[23] in their load forecasting, just as they consider new and planned generation.

The general requirements and obligations concerning PJM resource adequacy are defined in the Reliability Assurance Agreement ("RAA") Among Load Serving Entities in the PJM Region. The Resource Adequacy Planning process includes establishing planning parameters such as the reserve margin requirement, forecasting the peak load, establishing the reliability requirement (reserve margin times forecast peak load) and conducting a Base Residual Auction to procure resources required.[24]

PJM is responsible for calculating the reserve margin value and the amount of generating capacity required to meet the defined reliability criteria. The final reserve margin value is then the basis for defining the RTO Reliability Requirement for use in the Reliability Pricing Model ("RPM") Base Residual Auction conducted three years prior to the delivery year. The total capacity procured in the auction is allocated as a capacity obligation to all LSEs within PJM. All LSEs are charged a Locational Reliability Charge associated with their capacity obligation.

One of the goals of the PJM capacity market was to create incentives for investments in new generation. However, under the RPM approach, owners of existing generation would receive the RPM capacity payment whether or not they build new generation. Today, RPM provides a windfall to owners of existing generation, including the owners of resources that have been fully depreciated and paid for by ratepayers prior

[23] Demand Response refers to programs by which certain customers agree to reduce their load in order to help meet very high levels of system demand, thus serving as capacity resources and reducing the need for power plants to serve this function. Energy Efficiency refers to proactive measures taken by electric customers, sometimes partially or fully funded through utility programs, to reduce energy use on a baseload basis (reducing the both peak load and overall energy use.) Together these are sometimes referred to as Demand-Side Management, or DSM.

[24] For more details, refer to "PJM Manual 20: PJM Resource Adequacy Analysis".

to market restructuring. However, some contend that this is just a transition issue from a regulated to a competitive process, and that once the market reaches equilibrium RPM will provide the right price signals for both new and existing capacity. Even if the capacity payment is enough to support the development of new generation to meet future demand, there is no obligation to build in return for taking the capacity payment. Mechanisms need to be explored that provide the appropriate incentives for new construction without providing windfalls for existing generation.

MISO collects load projections reported by Network Customers under the Resource Adequacy section (Module E) of the Energy Markets Tariff ("EMT")[25] MISO then performs a technical analysis on an annual basis to establish the planning reserve margins ("PRMs") for each LSE in the Transmission Provider Region. In accordance with this module, each LSE shall confirm that it has sufficient Capacity Resources to meet its Forecast LSE Requirement multiplied by one plus the applicable PRM established for this LSE.

In October 2008, FERC accepted the MISO's proposal for monthly voluntary actions to procure needed capacity, to allow LSEs that have insufficient capacity for the month to satisfy their resource adequacy requirements with planning resources from market participants that have excess planning resources. This voluntary capacity auction allows LSEs to offset their deficiencies and avoid financial penalties.[26] Voluntary capacity auctions raise some concerns regarding potential market power from incentives to withhold capacity in order to receive higher deficiency charge payments, as well as harm to bilateral markets. However, MISO developed mitigation procedures and strong

[25] http://www.midwestmarket.org/publish/Folder/2b8a32_103ef711180_-75b60a48324a?rev=12.

[26] Docket No. ER08-394-003, Order of October 20, 2008, 125 FERC ¶ 61,060.

economic incentives for the voluntary capacity market to be competitive and assist small LSEs who might find it difficult to procure needed capacity in the bilateral capacity market.

Both PJM and MISO have bulk power systems that are inefficient in their utilization of resources. Annual load duration curves show that approximately 60% of the capacity resources meet over 90% of the system energy needs. The remaining 40% of resources supply less than 10% of the system energy needs.[27] This results in enormous investments in traditional capacity resources that are idle most of the time: a very inefficient system design driven by decades of assumptions about load being inflexible and inelastic to price. And the trend line for load duration curves show that, rather than improving, average annual capacity factors are slipping below 60 %.

Demand resources can improve the performance of the bulk power system in several significant ways. First, energy efficiency resources can "unload" the existing transmission and distribution infrastructure by reducing base, intermediate, and peaking loads. Second, demand response resources can provide an alternative to generation resources during high-priced or reliability stressed hours. Third, demand resources can provide load shifting and energy storage options that can shift consumption to hours when more efficient (and less costly) resources are available. Fourth, small scale generation projects behind customer meters can provide greater flexibility to system operators depending upon whether they operate as load following, peaking, or load shifting resources. All else being equal, improving load duration curves will result in

[27] *See*, load duration curves attached to this report as Appendix C.

much greater overall economic efficiency. Integrating demand resources into all aspects of RTO operations is a key element to achieving system efficiency improvements.

In summary, the PJM capacity model is not proving a reasonable value to Ohioans; it is too expensive; the MISO approach has not had time to demonstrate its usefulness. Neither capacity approach by PJM or MISO can demonstrate a strong link to incenting the development of new resources or promoting long-term contracts. The needs of Ohioans for reliable and affordable electricity services may be best met through the integration of demand resources and distributed generation.

7. Are RTOs effective in facilitating transmission planning and needed transmission investments that benefit Ohio's consumers? Are they effective in facilitating transmission planning and investment that may be needed for the development of renewable energy resources?

Both PJM and MISO have developed transmission expansion planning processes that are reasonable mechanisms for addressing transmission needs. They project future needs (energy and demand) and model the ability of the existing transmission system to meet the one-day-in-ten-years loss of load reliability standard. When reliability violations are found, the planning process evaluates the sufficiency and cost of transmission enhancements.

Their processes, however, are not very robust in their consideration of **system** needs. Such system planning is the traditional domain of Integrated Resource Planning, a process in which vertically integrated utilities proposed, and the state Commission reviewed, an overall plan for expansion of transmission, generation, and other resources to meet future energy needs while attempting to account for external costs. RTOs have taken over only a small part of this role in analyzing future regional transmission needs. Because they focus only on transmission enhancements, neither the PJM nor MISO

expansion plans adequately evaluate non-transmission alternatives. A non-transmission alternative could be a generation addition, a load reduction program, distributed generation, a targeted energy efficiency program, or a combination of approaches. A robust planning process that evaluates all resource options, and combinations of options, could more effectively identify lower cost alternatives that could improve the efficiency of the bulk power system and deliver electricity to ultimate consumers at less cost.

A **system** (in contrast to a transmission only) planning process can be coordinated with a resource acquisition process to select the lowest cost resources that can reliably meet system needs. The resource acquisition process can be through a market mechanism (such as RPM for the PJM RTO) or through a monthly auction process with deficiency penalties (such as the MISO process). The essential component of either process is a level playing field where all supply and demand resource options can compete to meet future electricity needs with the lowest cost combination of transmission, generation, and demand-side solutions.

Recently, concerns about the carbon footprint of the electric industry, proposals for a national renewable portfolio standard ("RPS"), and interest in large scale transmission projects (on an Eastern or Western interconnection basis) have provided additional issues that could have significant impacts on transmission, or system, planning efforts. Any of these developments has the potential to radically alter the use of the bulk transmission grid, for example by significantly changing the economics of dispatch for carbon-intensive fuels. It is imperative that the PUCO, the utilities, and the RTOs consider the implications of these and other game-changing future developments in the electricity marketplace in their long-term planning processes. Failure to do so will invite

costly but misplaced investments in unneeded and uneconomic infrastructure, while missing opportunities to anticipate and plan for the energy grid of the future.

8. Are the RTOs policies and practices effective in facilitating long-term contracts between load serving entities and generation developers or suppliers that may be needed to support the construction of additional base load generation facilities?

A bilateral contract in an electricity market is an agreement between a willing buyer and a willing seller to exchange electricity, rights to generating capacity, or a related product under mutually agreeable terms for a specified period of time. Most economists agree that such arrangements are necessary to the functioning of electricity markets, because they allow both parties to have the price stability required to perform long-term planning and to make rational and socially optimal investments.

While bilateral contracts are widely recognized as crucial to the functioning of competitive electricity markets, RTOs have failed to create an environment conducive to the vigorous, competitive, long-term bilateral contracting that would provide the most benefits to consumers. In current organized markets, spot market transactions significantly dominate bilateral contracts. In a recent report to the American Public Power Association,[28] Synapse Energy Economics identified the following shortcomings within RTOs with regard to long-term bilateral contracting:

- Over reliance on spot markets has resulted in an asymmetry of risk to the advantage of sellers of existing generation over buyers, distorting the bilateral market. This is because there is no incentive for the owners of low cost generation to sell their output at any price lower than what they would expect to receive on average in the spot market at which buyers are captive.

[28] Synapse Energy Economics, *"Bilateral Contracting in Deregulated Electricity Markets,"* report to the American Public Power Association (APPA) 2008.

- There is evidence that consumers are paying a significant price premium for stability when using bilateral contracts.
- Retail Standard Offer Service customers are protected from some wholesale electric energy price volatility, but are still at risk.
- The price of electric energy acquired under short-term (three years or less) bilateral contracts will reflect the expected average price of electric energy acquired from the spot market, and is likely to include a risk premium and other adders.
- It is possible that LSEs may be able to acquire electric energy at a price closer to average production cost under longer-term (longer than five years) bilateral contracts with suppliers who wish to develop new resources. However, this potential for bilateral contracts to help stabilize retail prices and minimize retail supply costs is not being fully tapped.
- Bilateral contracts have been used to support some new resources, including renewable resources. In this case both parties have a strong interest in transacting bilaterally, and these resource developers will agree to prices that enable them to get the project financed and to earn an acceptable rate of return but require them to forgo the opportunity to profit from scarcity rents in the wholesale market.
- Use of bilateral contracts to support development of new generation resources has not been sufficient to meet reliability needs. This has particularly been the case with development of base load capacity. At the same time, contracts that support retail service auction obligations are far too short in duration (one to three years) to provide new capital-intensive capacity with the revenue guarantees necessary to support favorable financing terms.

Finally, the potential for bilateral contracts to help mitigate market power is not being fully realized. In order for bilateral market to help to mitigate market power for both bilateral and spot transactions in energy markets, there has to be a sufficient incentive for both parties to transact in the bilateral market. These conditions will not be met as long as sellers can be confident of high profits in the spot markets for capacity and energy.

Long term contracting is more amenable to resolution through state determined policies that can establish the parameters for load serving entities under state jurisdiction to enter into long term contracts. It is important to understand that in Ohio, neither the PUCO nor the Ohio Power Siting Board (OPSB) is legally obligated to facilitate long term power-supply contracts. The PUCO may want to convene a statewide collaborative to investigate this issue and develop the standards and criteria. FERC has raised this issue in its Order 719. Each transmission service provider (including RTOs) filed comments with the FERC on certain aspects of this issue on April 28, 2009. One of the proposals suggested an RTO maintained "bulletin board" that could act as an information clearinghouse for entities that can offer long-term contracts and entitles that are seeking long-term contracts.[29] While not a full solution, this is an option worth pursuing.

9. Are the RTOs' transmission cost allocation methodologies and policies resulting in value for Ohio's consumers?

In the past, new transmission costs were allocated to the beneficiaries of this new transmission. Based on recent FERC determinations and subsequent compliance filings cost allocation has changed such that all new facilities that operate at or above 500 kilovolts – both reliability projects and economic projects – must be shared on a region-wide basis. Since existing generation remains allocated to beneficiaries, Ohio now pays for all its existing transmission as well as for a portion of all new transmission, even if Ohio does not benefit from it. Absent significant investment in new transmission in Ohio, this will significantly increase costs to Ohio consumers.

[29]Docket No. ER09-1051-000, ISO New England Compliance Filing for Order 719 at 58 (April 28, 2009); Docket No ER09-1063, PJM Compliance Filing for Order 719 at 33 (April 29, 2009); Docket No. ER09-1049-000, MISO Compliance Filing for Order 719, April 28, 2009, at p.28-29.
.

In comments prepared for the FERC, the PUCO noted that as a result of system-wide cost allocation consumers in Ohio are now required to pay a disproportionate share of costs, since Ohio consumers represent only 17% of the MISO's load and 10% of PJM load. For example, in the MISO Transmission Expansion Plans ("MTEP") of 2007 and 2008 First Energy and Duke only received $3.5 million in payments from other entities for their transmission projects, while they had to pay $100 million for other projects in the MISO footprint. Most of the upgrades in MISO have been driven by the need for investment in reliability. While some MISO members, like Ohio utilities, had minimal planned upgrades in MTEP, members in the western MISO states had much more extensive and costly projects. As a result, under this new system-wide cost allocation, Ohio consumers will be paying for transmission needed in other areas, while reliability benefits to Ohio are likely to be small.[30] This is in sharp contrast to the previous methods FERC used to allocate transmission costs where the beneficiaries of the projects paid to costs.

Transmission costs can be minimized by efficient planning. The transmission planning process should be required to incorporate least-cost planning in transmission investment. This could be a formal requirement "achieved through a policy change at the Ohio Power Siting Board (2005, 42) in the interpretation of the statutory criteria of need, 'minimum adverse environmental impact, considering the technology that is available and the nature and economics of alternatives,' serving 'the interests of electric system economy and reliability,' and serving 'the public interest, convenience, and necessity."[31]

[30] Comments of the Public Utilities Commission of Ohio http://www.ferc.gov/eventcalendar/Files/20090306163843-Schriber,%20PUCO.pdf.

[31] *Integrated Portfolio Management in a Restructured Supply Market. A Report to the Office of the Ohio Consumers' Counsel*. Synapse Energy Economics, Inc., and Resource Insight, Inc., June 30, 2006, p. 46.

Synapse further strongly recommends that the RTOs take a more active role in encouraging least-cost solutions to transmission system issues.

Given the long lead time necessary for transmission upgrades, non-transmission alternatives (many with short lead times) may often prove superior in terms of socialized benefits and should be given serious consideration in the reliability planning process. None of the RTO transmission cost allocation methodologies have a mechanism for evaluating non-transmission alternatives in a comparable analysis with transmission upgrades for reliability or economic purposes. Demand resources such as load management, demand response, and energy efficiency, and generation resources such as distributed generation are viewed as "market solutions" that will develop in response to congestion price signals. The RTOs should be actively incorporating these resources into their markets and can accommodate this through allowing participation of demand-side resource in existing energy, capacity, and operating-reserve markets. Specifically, RTOs should be including energy efficiency in capacity constructs (RPM or other approaches), as ISO-New England did in 2006[32] and PJM just began to implement this spring.[33]

10. Are the RTOs' Financial Transmission Rights and other transmission congestion hedging policies and practices effective and providing value to Ohio's consumers?

[Even if there are no congestion costs for Ohioans, FTRs still provide "value" as a hedge should congestion ever occur. Financial Transmission Rights ("FTRs") provide their holder with a stream of payments equal to the hourly LMP price differences between two points on the transmission system. If a load-serving entity ("LSE") had

[32] The settlement provides, "For the Forward Capacity Market, a distinct method shall be developed to allow energy efficiency and demand response resources (other than Real Time Demand Response) to be fully integrated as Qualified Capacity in the Forward Capacity Market" (§Part II.E.2.b). Order Accepting Proposed Settlement Agreement, Docket Nos. ER03-563-030 and ER03-563-055, June 16, 2006.

[33] Docket Nos. ER05-1410-000 *et al*, Order of March 26, 2009, 126 FERC ¶61,275 at ¶130-¶139.

traditional physical rights to use a part of the transmission system to serve its native load, under LMP they are given an FTR as the financial equivalent of that right. In this way, they and their customers are not exposed to congestion costs for serving this native load, even if the transmission pathway is congested.

Alternatively, LSE may elect (or be directed) to accept so-called Auction Revenue Rights, ("ARR"), in lieu of their FTRs so that the FTRs can be sold in the auction, with the proceeds returned to the original FTR holder. In addition, any available FTRs that are not allocated to LSEs are sold in an FTR auction.

In general, FTRs provide value to Ohio consumers by preserving some of the benefits of the existing transmission system (paid for by consumers) through hedging some of the congestion costs associated with hourly LMP prices. However, given growth in loads, the divestiture of generation in some jurisdictions, and changes to the physical structure of the bulk power system, Ohio consumers can never be fully hedged from congestion costs. Thus, there may be benefits to allowing them to be purely financial players in the congestion market, such that they can adjust their portfolio of hedges to more closely match their transmission usage.

On the other hand, the open market for hedges has attracted some financial players, and some of these market participants have profited handsomely. According to a recent draft report by the Midwest ISO Impact Working Group,[34] approximately $100 million in customer value is diverted to financial players annually in the MISO FTR market alone. It may be that financial players have an inherent advantage over distribution utilities in analyzing and assembling profitable portfolios of hedges, and that

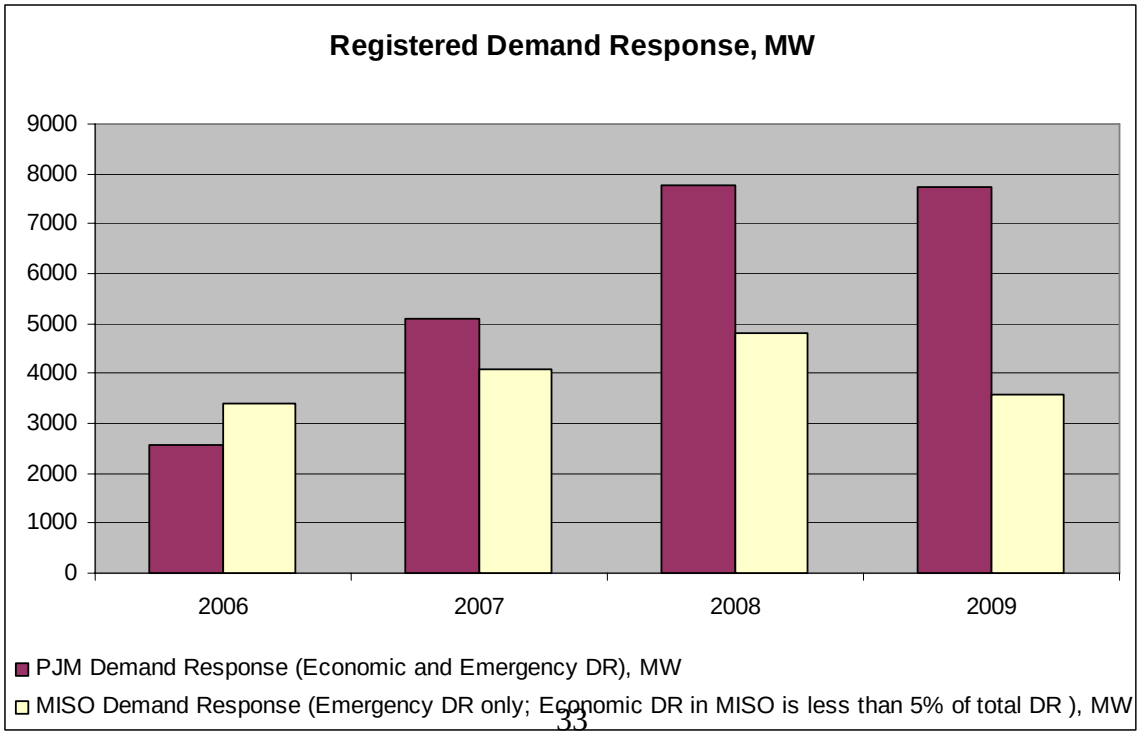
[34] Midwest ISO Impact Working Group Report to the Public Service Commission of Wisconsin Concerning Participation in Regional Transmission Organizations, Draft report dated February 8, 2008.

the utilities would be better off in general holding on to their FTRs or only trading bilaterally. Further analysis would be required to determine if the incremental value of a liquid FTR market justifies the diversion of wealth from customers to the financial marketplace.

Synapse has no specific recommendations at this time regarding the procedures and rules for managing congestion costs in MISO and PJM. However, we will review any proposed changes to these procedures and rules in the comments filed by other parties and provide responses to those comments as part our reply comments in this proceeding.

11. Are the RTOs demand response programs, policies toward behind-the-meter generation, and other Load Modifying Resources effective and providing value to Ohio's consumers over and above state sponsored programs?

Both MISO and PJM have developed programs to allow demand response resources to participate in energy markets. The chart below summarizes the progress each RTO has made in integrating these resources into its markets.



PJM filed market rule changes this spring to allow energy efficiency resource to qualify and be paid as capacity resource in its annual RPM auctions. However, neither PJM nor MISO has much understanding of the quantity of behind the meter generation and energy efficiency investments that are occurring on the retail level. As noted in our Introduction and responses to other questions, the effective integration of demand resources (demand response, energy efficiency, and local distributed generation) is essential to both the development of competitive markets and to the overall economic efficiency of the bulk power system. Demand resources are a low cost direct substitution for expensive generation resources that consumers must ultimately pay for. PUCO should direct Ohio utilities to actively pursue development of these resources and to work with the RTOs to ensure that they are fully integrated in the energy and capacity markets. Recognizing the efforts PJM and MISO have made in incorporating demand resources into their markets, the PUCO should require Ohio utilities to do the same. Additionally it is recommended that the PUCO commission a study to assess market barriers to demand resource participation in Ohio.

With recent developments in chip technology and communications systems, the capabilities exist today for direct load management of appliances and, eventually, electric vehicles. RTO operations can receive information from and provide dispatch instructions to a large number of remote devices that could eliminate the need for 20-25 percent of existing generation resources.[35] Such a development would improve the load factor of the bulk power system, reduce load volatility (and thereby reduce price volatility), lower carbon emissions, and improve overall economic efficiency. These are the potential

[35] Part of this 20-25% reduction would come from overall efficiency improvements and some would come from improved load factors. *See*, ISO New England Scenario Analysis documents at http://www.iso-ne.com/committees/comm_wkgrps/othr/sas/mtrls/elec_report/index.html.

benefits that are offered by advance metering and smart grid enhancements to the transmission and distribution systems in coordination with RTO policies that recognize the value of demand side resources.

12. Are the RTOs policies and practices relating to the treatment of Price Responsive Demand (PRD) consistent with facilitating the development of PRD through dynamic and time-differentiated retail pricing? (PRD is consumer demand that predictably responds to changes in wholesale prices as a result of dynamic or time-differentiated retail rates.)

One key issue is the integration of wholesale market designs and incentives with similar efforts in the development of retail rates and policies. All RTOs are in the early stages of developing market structures for the accommodation of demand resources and the comparable treatment of them. At the same time, state commissions are being flooded with proposals for changes to retail rate structures to accommodate advanced metering options and "smart grid" developments. As explained in our response to question 11 above, the potential exists for significant improvements to the efficiency of the overall bulk power system. The critical issue is how to coordinate state efforts to improve the price signals at the retail level with market based wholesale mechanisms that can accommodate widely dispersed and small scale demand side resources. Barriers to customers participating in demand response need to be removed. Further, for all classes of customers, rate designs need to be put in place that provide customers with an array of options for participating in demand response. For residential customers, these rate designs need to be consumer friendly and designed to provide customers with savings.

A suite of rate options should be evaluated for which energy and capacity benefits as well as cost impacts to various sectors and customer classes are considered. The RTOs should support, and the utilities should offer, user-friendly rate designs that offer

residential, commercial, and industrial customers a suite of options. Moreover, regulators must put in place mechanisms to monitor the costs of such plans, ensuring that utility expenditures are reasonable relative to the overall savings. Finally, while efforts must be made to encourage consumer participation in the implementation of any dynamic pricing strategy, program participation must be voluntary.

13. Are the RTOs' queue and interconnection policies providing value to Ohio's consumers?

Both PJM and MISO have FERC-approved interconnection rules and processes for establishing interconnection queues for new resources. There are large numbers of projects in their respective interconnection queues representing significant quantities of new resources.

Until August 2008, MISO had a rigid interconnection queue process whereby first in became first out. This produced a long list of projects, some of which were only proposed for the purpose of securing a queue position. Some projects were listed more than once due to the low cost of getting into a queue and the lack of any milestone requirements to preserve queue position. MISO proposed changes to its interconnection queue process to provide more flexibility: first ready (rather than first in) became first out; milestones were created and had to be achieved in order to maintain queue position; and a fast-track process was established for interconnection request that required little study or evaluation.

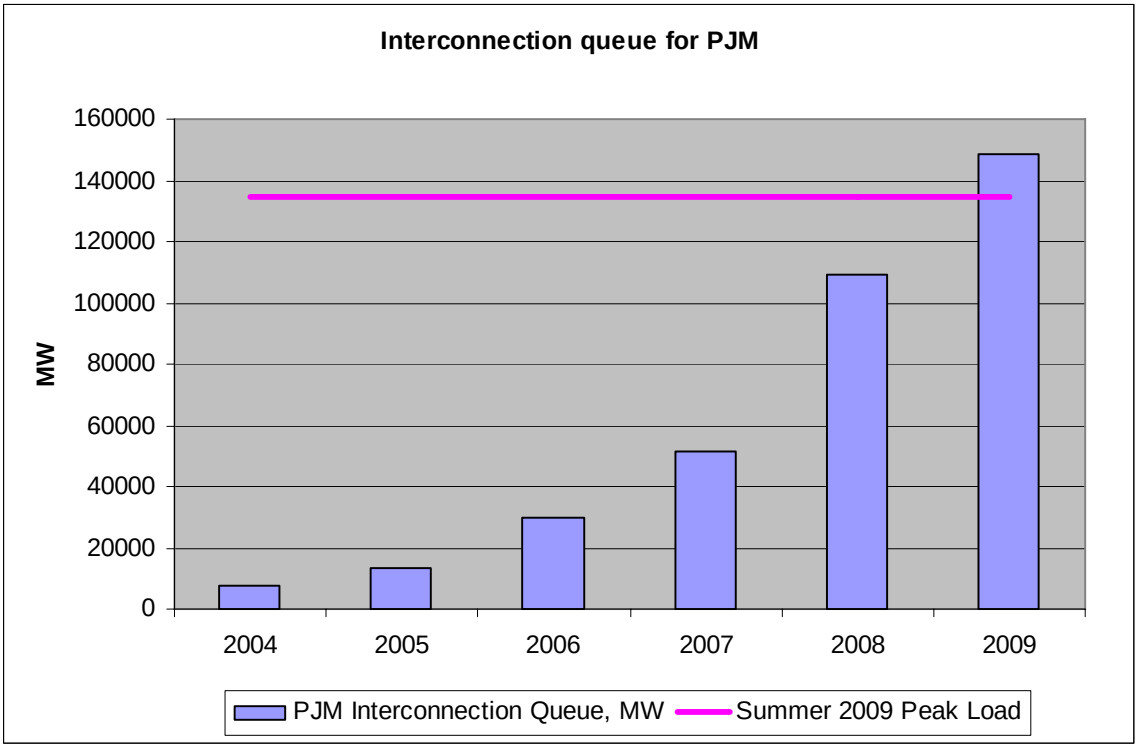
The FERC approved MISO's revised interconnection policies in an order issued in August 2008.[36] PJM has maintained a relatively fast-moving interconnection queue process for several years. However, the annual volume of requests continues to outpace

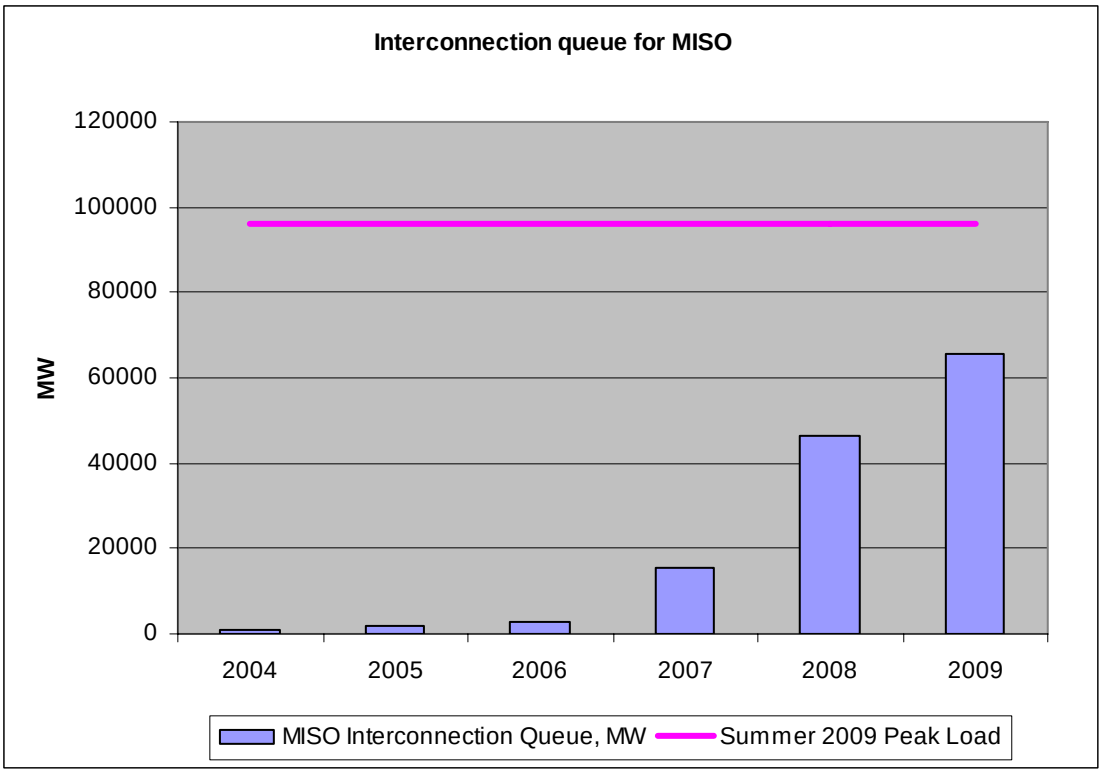
[36] Docket No. ER08-1169-000, August 25, 2008, 124 FERC ¶ 61,183.

the annual ability to conduct all the studies necessary to determine interconnection impacts. There is a danger that both MISO and PJM may continue to fall behind in conducting their interconnection reviews.

We believe that both RTOs are making progress to expedite interconnection requests and we view the change in the queuing of projects as a step in the right direction. Individual project sponsors may have different opinions. We look forward reviewing the comments of other parties in this proceeding and will address any issues raised in reply comments.

The charts below show the annual MW quantities of new projects for the past several years for both PJM and MISO.





These two charts, above, demonstrate that significant quantities of new resources have been proposed for both MISO and PJM. For MISO, the quantity in 2009 is approaching two-thirds of the estimated 2009 MISO summer peak demand. For PJM, the quantity in 2009 exceeds the estimated 2009 summer peak demand.

14. Is the resolution of seams issues being thoroughly addressed and resolved by the RTOs operating in Ohio?

MISO and PJM have been addressing and continue to address seams issues between their respective regions. In December 2003 PJM and MISO filed a "Joint Operating Agreement" with FERC in response to FERC's mandate that the RTOs create a "joint and common market" to address the seams between the region. Currently, the

MISO-PJM joint and common market website details the progress to date (and ongoing efforts not yet completed) on the joint and common market initiative.[37]

Considerable effort has been expended to address energy market pricing issues, congestion management protocols (including a "redispatch" agreement), interregional power flow, FTR policies, transmission planning, and many other operational issues. The PJM market monitor in the most recent State of the Market Report for PJM indicated:

> the relationship between prices at the PJM/MISO Interface and at the MISO/PJM Interface reflected economic fundamentals as did the relationship between interface price differentials and power flows between PJM and the Midwest ISO.[38]

While energy market pricing is not the only seam issue deserving of careful consideration, Synapse believes that it is a primary indicator of the extent of seam "smoothness" between the regions.

15. Does the RTOs' treatment of financial-only market participants (or virtual traders) provide value to Ohio's consumers?

Generally, yes. However, current financial market disruptions should lead to even greater scrutiny on the part of FERC and market monitors to ensure that only financially qualified entities participate in the energy markets administered by the RTOs. The inclusion of "financial only" market participants has added liquidity to RTO markets. It may also expose some of the vulnerabilities of wholesale electric markets to those who would use such participation to extract profit without providing any attendant value to consumers. Policies to ensure that risks of financial default are properly allocated among all the market participants is an issue that has received more attention since the problems

[37] *See*, http://www.miso-pjm.com/.

[38] State of the Market Report for PJM, Vol. I: Introduction at 22.

last fall in the banking and securities trading industries. Both MISO and PJM have experienced defaults and resulting suspensions of trading entities in their jurisdictions.

16. Are the RTOs' administrative expenses and corresponding assessments to member companies reasonable and resulting in value to Ohio's consumers?

During the period of 2001-2005, MISO's administrative costs accounted for almost 99% of its total RTO costs, while PJM's administrative costs ranged from 50% to 70% of its total RTO costs. On average, across all RTOs from 2001-2005, the split between administrative and operational costs was 75% to 25%.[39] The percentage split of RTOs' costs change as market structures evolve and new functions are added. As soon as MISO started operating its energy market in 2005, the proportion of administrative and operational costs changed such that operational expenses became a larger part of total MISO costs.

According to the FERC's Staff Report (2004)[40], there are significant costs associated with developing and running an RTO, which are fully recovered through charges levied on market participants and consumers. However, the actual revenue requirement to compensate the transmission organizations necessary for wholesale market transactions is far less significant and has a relatively small impact on retail customers (less than 1% of a typical retail consumer's bill). In return, consumers gain all the benefits of independence and reliability associated with the existence of RTOs.

---

[39] *Analysis of Operational and Administrative Cost of RTOs for the American Public Power Association (APPA)*, February 5, 2007. Prepared by GDS Associates, http://www.appanet.org/files/PDFs/AnalysisCostofRTOs020507GDS.pdf

[40] Staff Report on Cost Ranges for the Development and Operation of a Day One Regional Transmission Organization. Docket No. PL04-16-000. Prepared by the Staff of the Federal Energy Regulatory Commission (2004).

Moreover, total costs of RTOs constitute a small fraction of the market they operate and these costs are not solely attributable to the formation of RTOs. Some portion of these costs would be incurred by traditional transmission providers in the absence of RTOs.

APPENDIX B: RTO ALTERNATIVE

QUESTIONS 1-3

1. Are there viable, cost-effective alternatives to the existing RTO memberships of Ohio utilities or to Ohio utility participation in RTO managed functions (e.g. renewable tracking, reserve sharing groups, etc.)?

We do not believe that, in general, there are viable, cost-effective alternatives to RTO membership of Ohio utilities or to Ohio utility participation in RTO-managed functions. We do believe that there are numerous ways in which RTOs could be made more responsive to customer interests, and Ohio can and should take a leading role in promoting these changes. Foremost among these would be to improve the representation of electric customer interests on the governing boards of the RTOs. Customers are the ultimate constituency for the RTOs, and they are the ones ultimately paying all of the bills, yet they are woefully underrepresented in governance. We believe that each RTO should incorporate consumer protections into their mission statements. We further recommend that each RTO has not less than two board members representing the interests of retail consumers

There are a number of other ways in which RTOs could be more responsive to electric customer needs, including representation of customers in the board of directors, greater transparency in decision-making; taking a proactive role in fostering energy efficiency and demand response; development and support of flexible, customer-oriented electric rates; and more aggressive market monitoring and market power mitigation. Further, each RTO should revise its mission statement to clarify that just and reasonable electric rates for the consumers who benefit from and pay for electric services are a crucial component of all market design decisions, in addition to assuring reliability and

fostering a competitive market for its own sake. However, we believe that many of these changes would flow naturally from a governing board that is more representative of customer interests, so we believe this is the number one priority for creating RTOs that provide value to Ohio customers.

In terms of whether the PUCO should direct its utilities to pursue either all joining PJM or all joining MISO, we believe that a cost-benefit analysis should be conducted to determine whether there may be some administrative advantages to participating in a single RTO instead of two RTOs. Such a study will weigh these benefits against the considerable administrative cost of having some utilities leave one RTO and join another, and the myriad operational adjustments that would have to be made both at the RTOs and in the state to accommodate this switch.

2. Would it be reasonable, cost effective, and viable for the Ohio Commission to pursue the construct of an Ohio-only RTO?

We do not believe that it would be reasonable or cost-effective for Ohio to construct a single-state RTO. This approach would lead to a significant loss of operational efficiency, create much more complicated "seams" issues than those that exist today, and unnecessarily complicate the development of regional transmission additions to meet the electricity and resource needs of the future. At the same time, we do not believe that any benefits would be likely to accrue from such an initiative. If an Ohio RTO were to provide the same or comparable services as MISO or PJM, administrative fees would likely be as high or higher on a per-kWh basis because economies of scale would be lost, and the opportunity to exercise market power as a result of fewer generators would be greater. It is also unlikely that in any FERC-approved RTO Ohio would be better able to retain the value of its relatively low-cost in-state generation or

have better access to cheaper power from outside an Ohio-only RTO. In sum, we believe that there are much more fruitful paths to pursue to enhance RTO responsiveness and customer value than by trying to develop a single-state RTO in Ohio.

3. What recommendations could be made to FERC or required of Ohio's RTO member companies that would result in increased value to Ohio's consumers?

We believe that the most important recommendation to FERC for increasing value to Ohio's consumers is to require inclusion of the retail consumers' perspective and an understanding of their issues on the boards of the RTOs. This perspective would provide more balance in culture of the RTO. The absence of this knowledge and experience is clearly evident in the RTOs' efforts in setting market rules - for example - in PJM's overly burdensome capacity requirements. There are areas in RTO policies and operations where value could be enhanced without compromising reliability. The retail consumer perspective would assist these changes because they are recognized as beneficial and desired by retail customers.

We are concerned that today's RTOs place little emphasis on retail electric consumer value. RTOs typically operate in an historical transmission owner culture where the objective was to "keep the lights on" above all else. This culture was incubated in a pre-market environment where consumers were charged on an average-cost basis and transmission and generation were built and controlled by a single vertically integrated entity. The question of whether a "market structure" produced a reasonable allocation of resources, adequate value, and tools for consumers to manage their consumption was not addressed.

Another reason there is little emphasis on retail electric consumer value is the governance structure of the RTOs. While the RTOs themselves are supposed to be disinterested market administrators, their rules are developed through membership committees made up of generators, utilities, public power entities, state commission staff, state consumer advocates, and industrial users. Of these, the generators have access to and are willing to spend abundant resources in the RTO stakeholder process through attendance at committee meetings and engaging consultants with expertise in these areas. These efforts by producer invariably outnumber representatives of electric customer interests many times over, both in shear human resources in the debate over market rules.

RTOs often vote on a "sectoral" basis in an attempt to rectify the lopsided representation advantage of the profit-motivated generation sector. The sector voting seems to only work in theory for several reasons, including that generation and transmission owners have the resources consumer representatives do not to participate in these processes. The load sectors remain at a considerable disadvantage however, both in terms of resources as noted above, and in terms of an asymmetry of interests. Electric customers are interested in both price and reliability, which means that they want to ensure rates are reasonably high enough to support needed generation and transmission enhancements without unreasonably burdening customers. Generators have no corresponding inherent interest in ensuring that rates are low enough to support electric customer welfare.

In terms of member companies, we believe that there are two crucial requirements that should be made for retaining and increasing Ohio consumer value. First, RTO member companies should not be allowed to divest any additional generating assets from

the regulated utilities to unregulated ownership, including to the unregulated generating affiliates of the utilities, without specific review by the PUCO of the terms of sale and power purchase agreements, including opportunities for intervention and public comment. Doing so immediately changes assets under average-cost pricing into marginal-cost pricing, and recent history shows that this has raised prices for consumers and may raise them more in the future. Second, they should be required to pursue all cost-effective energy efficiency prior to any new infrastructure investments. This cost-effectiveness test should consider the lifetime benefits of energy efficiency measures including avoided environmental externalities. In addition, the avoided cost of fossil resources used in this test should include a realistic estimate of the cost of carbon emissions under future federal regulations. If electricity needs can be more economically met with energy efficiency measures than with development of new resources, energy efficiency should be the resource of choice.

Moreover, RTOs could facilitate DSM and distributed generation by including those resources in their markets as follows:

- The RTO could structure its operating-reserve markets to allow the participation of such customer-side resources as load management, demand response, and distributed generation.

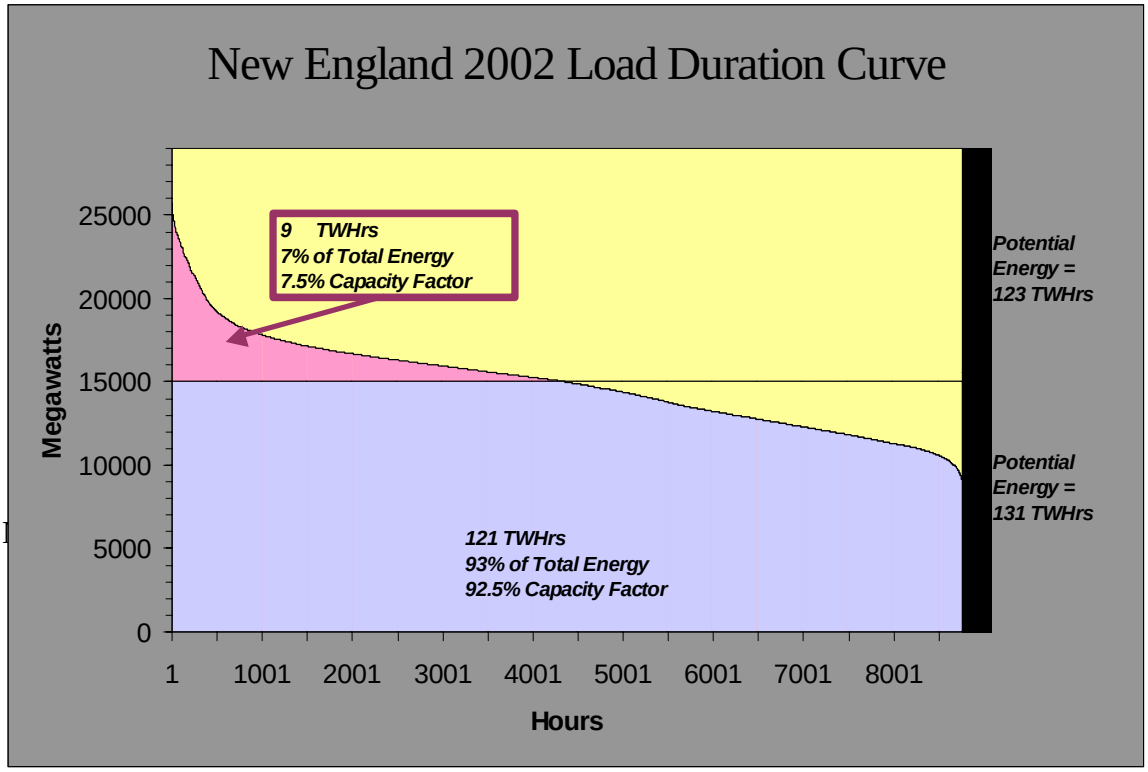
- The RTO could include all customer-side resources, including energy efficiency, in capacity markets, as FERC has approved for ISO-New England's new forward capacity markets.

Both of these features would improve the cost-effectiveness of the customer-side resources in Ohio and the RTO region.[41]

[41] *Integrated Portfolio Management in a Restructured Supply Market. A Report to the Office of the Ohio Consumers' Counsel*. Synapse Energy Economics, Inc., and Resource Insight, Inc., June 30, 2006 at 44.

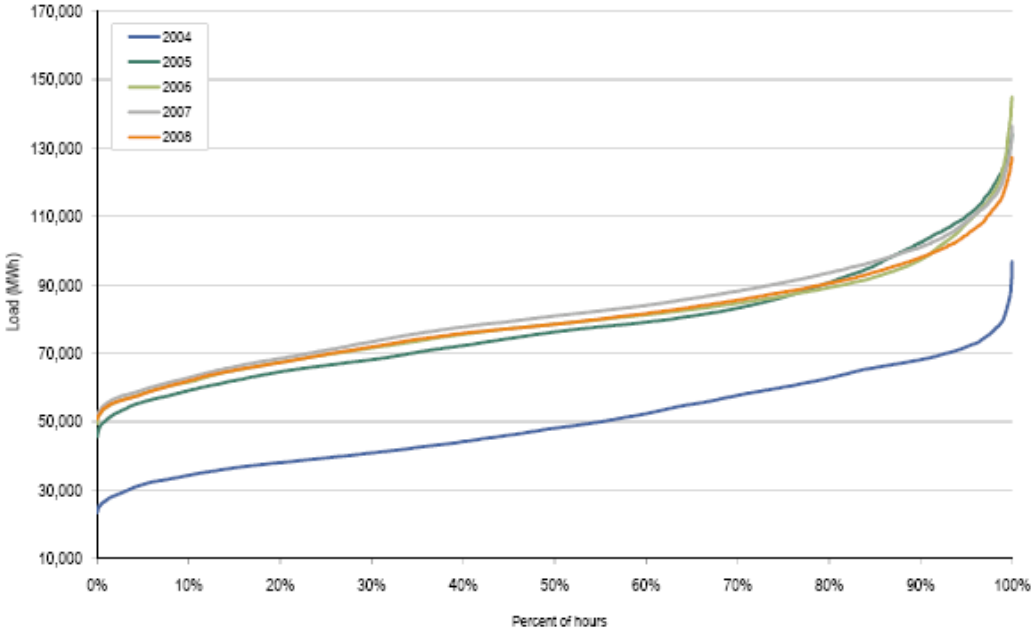
APPENDIX C: LOAD DURATION CURVES

2002 New England load duration curve from Con Edison Energy, January 26, 2004



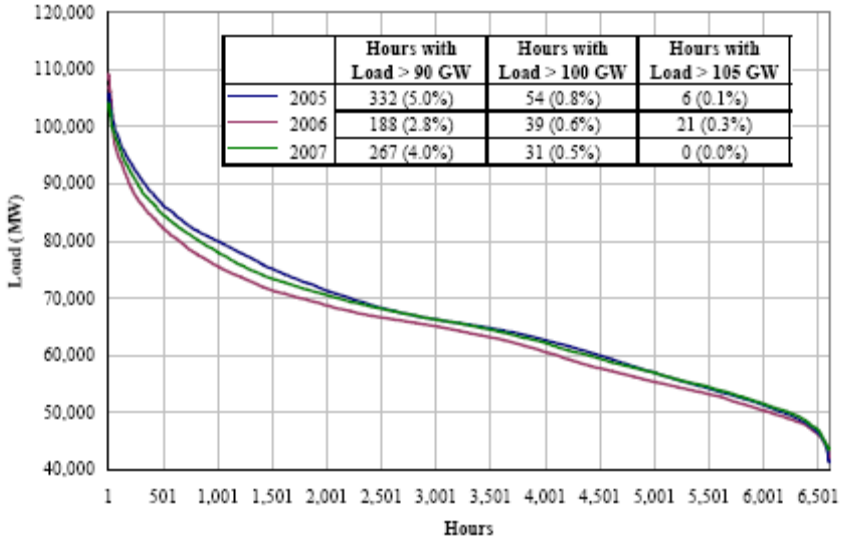
PJM load duration curves 2004-2008 from 2008 State of the Markets Report, Volume 2, Section 2 at p.42.

Figure 2-4 PJM real-time load duration curves: Calendar years 2004 to 2008



MISO load duration curves 2005-2007 from 2007 State of the Markets Report for the Midwest ISO at page 13.

Figure 10: Load Duration Curves
2005 - 2007



	Hours with Load > 90 GW	Hours with Load > 100 GW	Hours with Load > 105 GW
2005	332 (5.0%)	54 (0.8%)	6 (0.1%)
2006	188 (2.8%)	39 (0.6%)	21 (0.3%)
2007	267 (4.0%)	31 (0.5%)	0 (0.0%)

New England load duration curves 2003-2007 from 2007 Annual Markets Report at page 28.

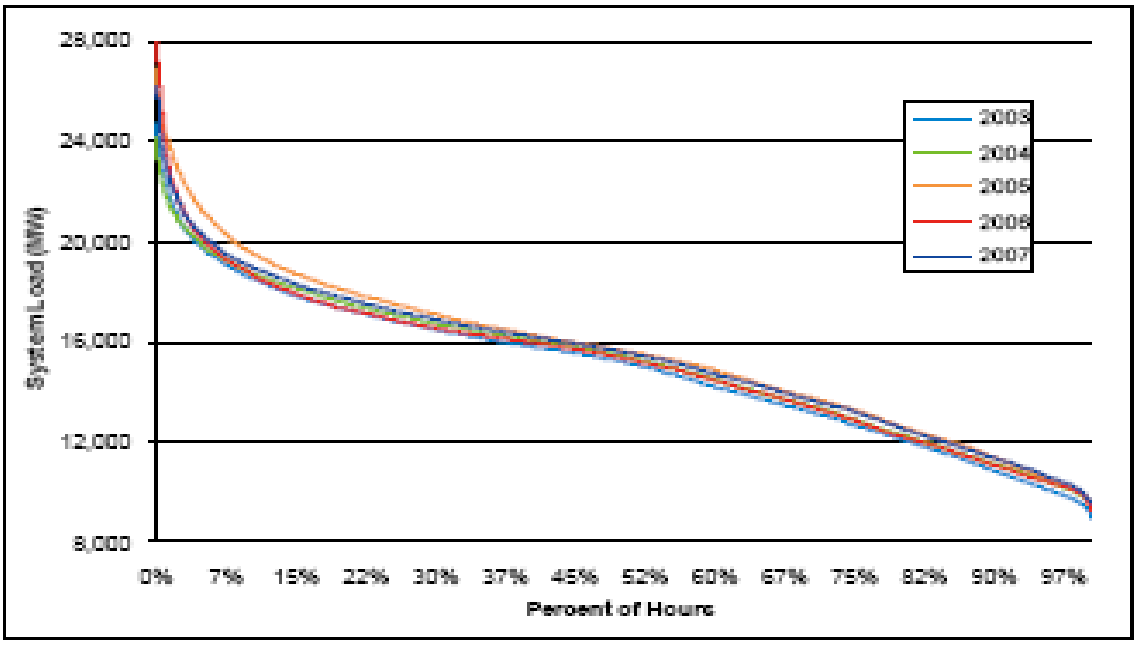


Figure 2-3: New England hourly load-duration curves, 2003 to 2007.

New England summer peak capacity factor 1980-2007 from 2007 Annual Markets Report at page 29.

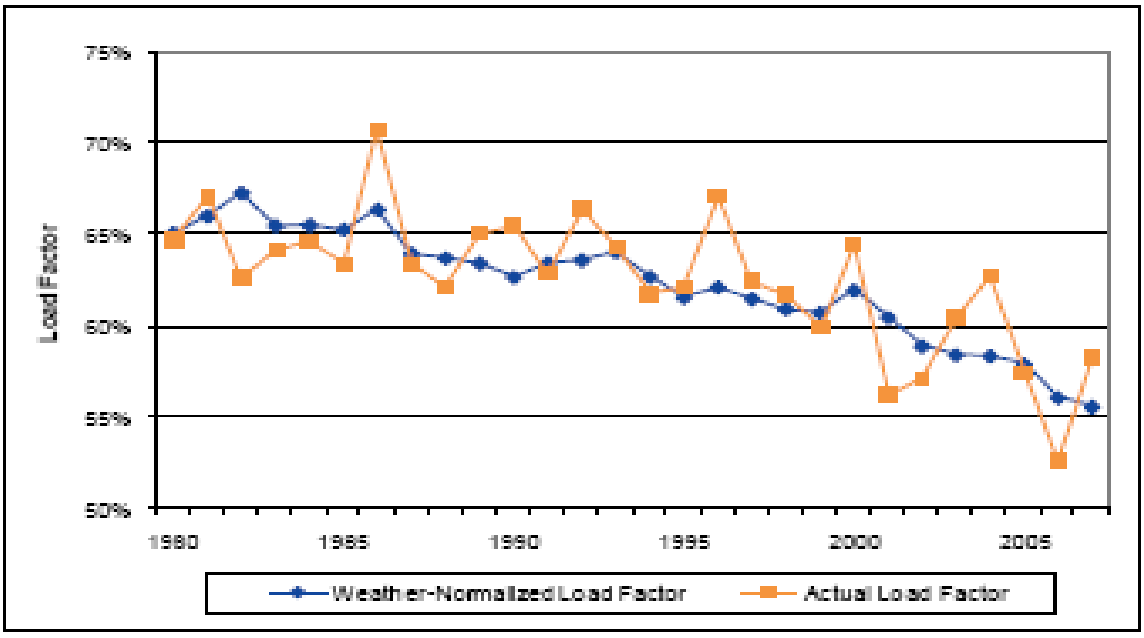


Figure 2-5: New England summer-peak load factors, 1980 to 2007.

APPENDIX D: CURRICULUM VITAE OF AUTHORS

Paul Peterson

Paul Peterson is a Senior Associate with Synapse and has been working on energy-related issues since 1978. His experience includes work on efficiency policy issues at the University of Vermont Extension Service, the Vermont Public Service Board, and ISO New England, the operator of the regional electric grid for New England.

In his eight years of work with Synapse, Mr. Peterson has focused on a wide range of wholesale market issues and regional transmission structures with a concentration on ISO New England and the PJM Interconnection. He was involved in the stakeholder process and the Settlement discussions that created forward capacity markets in both New England and PJM on behalf of regional consumer advocates and other clients. He has participated in regulatory proceedings at the state and Federal level on issue of wholesale market design and implementation.

Over an eight-year period with the Vermont Public Service Board, Mr. Peterson focused on electric utility integrated resource planning, electric rate cases, and numerous other contested cases; he served as both a Hearing Officer and a Board analyst in these proceedings. Mr. Peterson was directly involved in the negotiations to re-design the New England wholesale electric markets and create the Independent System Operator (ISO).

In the fall of 1998, Mr. Peterson joined ISO New England Inc. to manage its regulatory affairs. For three years he worked with state, regional, and Federal entities and regulators regarding ISO New England development and implementation issues. These included the start-up of new wholesale markets in 1999, changes and improvements to those markets, market monitoring reports, the development of load response programs, the implementation of electronic dispatch, and the long-term efforts to develop and implement a congestion management system (CMS) and a multi-settlement system (MSS). He was also involved in the early discussions and filings related to FERC's efforts to establish regional transmission organizations (RTOs).

Mr. Peterson holds a BA in Political Science from Williams College and a JD from Western New England College School of Law. He has also taken courses at the National Judicial College and has experience with mediation of Vermont Superior Court civil cases.

Ezra Hausman, PhD

Ezra Hausman, a Senior Associate with Synapse Energy Economics, has been involved in design and analysis of electricity markets for over ten years. Dr. Hausman’s areas of expertise include electricity market design and market restructuring; asset valuation;

quantification, pricing, regulation, and impacts of CO_2 emissions from the electric power sector; and pricing of energy, capacity, transmission, losses and other electricity-related services. Dr. Hausman serves as an analyst and expert witness in several areas, including:

- Electricity and generating capacity market design
- Economic analysis of environmental and other regulations, including CO_2 cap-and-trade regulation, in electricity markets
- Economic analysis, price forecasting, and asset valuation in electricity markets
- Quantification of the economic and environmental benefits of displaced emissions associated with energy efficiency and renewable energy initiatives
- Regulation and mitigation of greenhouse gas emissions from the supply and demand sides of the U.S. electricity sector.

Dr. Hausman holds a BA in psychology from Wesleyan University, an MS in environmental engineering from Tufts University, an SM in applied physics from Harvard University, and a PhD in atmospheric chemistry from Harvard University.

Bob Fagan

Mr. Fagan is a mechanical engineer and energy economics analyst who has been involved in analyzing the energy industry since 1987. His activities focus primarily on electric power industry issues, especially economic and technical analysis of transmission pricing structures, wholesale and retail electricity markets, renewable resource alternatives and assessment and implementation of demand-side alternatives.

Mr. Fagan is expert in the complexities of, and the interrelationships between, the technical and economic dimensions of the electric power industry in the United States and Canada, including the following areas: wholesale energy and capacity provision under market-based and regulated structures; transmission use pricing, encompassing congestion management, losses, LMP and alternatives; financial and physical transmission rights; and transmission asset pricing (embedded cost recovery tariffs). His experience includes knowledge of physical transmission network characteristics; related generation dispatch/system operation functions; technical and economic attributes of generation resources; RTO and ISO tariff and market rules structures and operation; and FERC regulatory policies and initiatives, including those pertaining to RTO and ISO development and evolution. Mr. Fagan is also expert in the assessment of technical and economic dimensions of wind power integration into utility power systems, and in utility demand side management and demand response impacts on the power system.

Mr. Fagan holds an MA from Boston University in Energy and Environmental Studies and a BS from Clarkson University in Mechanical Engineering. He has completed additional course work in wind integration, solar engineering, regulatory and legal aspects of electric power systems, building controls, cogeneration, lighting design and mechanical and aerospace engineering.

Vladlena Sabodash

Vladlena Sabodash is an intern at Synapse Energy Economics. She provides research and assists in writing testimony and reports on a wide range of issues from integrated resource planning to carbon price forecasts.

Ms. Sabodash is currently pursuing a Doctorate in Economics from Northeastern University. Her research focuses on the effects of electricity deregulation on wholesale and retail energy prices, the impacts of rate freezes, pricing strategies and bidding behavior of generators, capacity withholding issues, and price spikes. She holds a Bachelor of Science in Information Systems in Economics from South Ural State University, Russia.

ATTACHMENT 1
TABLE OF AUTHORITIES

Subject	Reference	Comments
Customer Value from RTOs	GAO. United States Government Accountability Office. Report to the Committee on Homeland Security and Governmental Affairs, U.S. Senate. Electricity Restructuring: FERC Could Take Additional Steps to Analyze Regional Transmission Organizations' Benefits and Performance. September 2008	Review of FERC Order 2000. Review of Stakeholder Input. A comparison of RTO expenses and investment as well as the importance of stakeholder input and the limitations of participation.
	Harvey, S.M., McConihe, B.M., Pope, S.J. "Analysis of the Impact of Coordinated Electricity Markets on Consumer Electricity Charges," LECG, LLC. Draft: November 20, 2006.	Are consumer rates higher than they would have been absent organized electric wholesale markets? The study indicates they are in fact less than they would have been absent organized wholesale electric markets.
	Hogan, W.W., Pope, S.J., "Comments on Wholesale Competition in Regions with Organized Electric Markets," Comments on Wholesale Competition in Regions with Organized Electric Markets, Dockets RM07-19-000 and AD07-7-000, Sept 17, 2007.	Presents a review of issues RTOs are facing and puts forth a framework for evaluating them in terms of regulatory structure.
	Sutherland, Dr. R.J. "Estimating the Benefits of Restructuring Electricity Markets: An Applicationto the PJM Region," Center for the Advancement of Energy Markets. Version 1.1, October 2003.	Evaluates the performance and benefits of PJM through a present value analysis, broken down by state and sector.
RTO Performance: Competition and Efficiency	Abbott, M. *Determining Levels of Productivity and Efficiency in the Electricity Industry*. The Electricity Journal. 2005. Vol 18:9, p62-72	Assessment of productivity and efficiency changes in the electric industry and methods of assessing these changes.
	Blumsack, S.A., Lave, L.B. *Lessons from the Failure of the U.S. Electricity Restructuring* . The Electricity Journal. 2006. Vol 19, pg 15-32.	Expose of bid behaviors with a focus on anti-competitive rationale.
	Nunez, K. Electric Utility Deregulation: Stranded Costs vs. Stranded Benefits. Journal of Accounting and Public Policy 2007. Vol 26, pg 193-211	Pg 197 provides a discussion of stranded cost related to long term power contracts and dissentives from deregulated markets for the promulgation of this.
	Hogan, W.W. "Electricity Market Structure and Infrastructure." Presented at Conference on Acting in Time on Energy Policy. Harvard University September 18-19, 2008.	Provides explanation and discussion of market constraints facing transmission, capacity and resource adequacy planning and performance through RTOs.
Financial Transmission Rights	Sun, J., Shang, W. "Evaluating the Performance of Financial Transmission Rights Auction Market: Evidence from the U.S. Midwest Energy Region." Department of Economics, Iowa State University. Ames, Iowa. November 3, 2006.	Provides methodology for assessing the performance and effectiveness of financial transmission rights auction markets in MISO.
Demand Response/Resources	Earle, R., Newell, S., Faruqui, A., Hajos, A., Hledik, R. "Fostering Economic Demand Response in the Midwest ISO." The Brattle Group, prepared for The Midwest Independent System Operator. December 30, 2008.	Provides a discussion of how demand response can be implemented or encouraged in RTOs.
	Felder, F.A., Newell, S.A. *Quantifying Demand Response Benefits in PJM* . The Brattle Group. Prepared for PJM Interconnection, LLC and the Mid-Atlantic Distributed Resources Initiative (MADRI). January 29, 2007.	Provides a simulation to quantify market impact of curtailing 3% of load in BGE, yielding a .9% drop in PJM peak load and applying these results in MADRI to arrive at a savings of $57-182 million. Provides a breakdown by utility and state.
	IRC/RTO Council. "Increasing Renewable Resources: How ISOs and RTOs are Helping Meet This Public Policy Objective." October 16, 2007	Benefit assessment by RTO.
Long-Term Contracts	Mansur, E.T., White, M.W. "Market Organization and Market Efficiency in Electricity Markets." DRAFT. Yale School of Management and The Wharton School, University of Pennsylvania. April 23, 2007.	Decentralized markets versus bilateral trading and impact on market efficiency.
Resource Adequacy	Chao, H-P., Wilson, R. "Resource Adequacy and Market Power Mitigation via Option Contracts," Electric Power Institute and Stanford University. DRAFT REVISED. March 18, 2004.	Review of wolesale markets and issues that arise in specifiying resource adequacy obligations. Addresses importance of long-term contracts and proposes use of option contract to help stabilize and encourage investment in new capacity and mitigation of suppliers market power in spot markets.
	Hogan, W.W. "Resource Adequacy Mandates and Scarcity Pricing: Belts and Suspenders," Harvard University, February 23, 2006, (availabe at www.whogan.com).	Address how markets fail at idetnifying appropriate investment needs at needed locations. Indentifies where markets fail at providing appropriate market signals to support resource adequacy initiatives.
Virtual Market	Hogan, W.W. "Revenue Sufficiency Guarantees, Cost Causation and Cost Allocation,' in response to Federal Energy Regulatory Order on Rehearing Docket ER04-691-074, *Virtual Market and Causation with Other Markets in MISO* October 26, 2006. October 9, 2008.	Provides some insight into the importance of virtual markets and their role.