



Is There Effective Competition in the Electricity Industry?

The Right Answer to the Wrong Question

As Ohio's electricity challenges have moved up the General Assembly's priority list, we find that some stakeholders are claiming that effective competition exists and Ohio should stay the course. The purpose of this paper is to respond to the claim that effective competition exists.

Wholesale or Retail

With virtually no alternative retail suppliers offering supply options except for an occasional affiliate of vertically integrated electric utilities, we know of no stakeholder that is claiming that effective retail competition has arrived in Ohio. Thus, we assume that all stakeholders agree that there is no effective retail competition in Ohio.

It is important to note that the objectives in Ohio's restructuring legislation are tied to retail competition rather than wholesale competition. The Standard Service Offer mandated by Section 4928.14, Revised Code, is a retail service. If there is no effective retail competition, then reliance on so-called market forces to set retail electricity prices is essentially the same as relying on deregulated monopolies to set retail electric prices. Because the lack of retail competition is readily acknowledged by all stakeholders, we focus below on the claim that there is effective wholesale competition. Of course, it is not possible to have effective retail competition without effective wholesale competition unless there is a ready and comparable retail substitute for electricity.

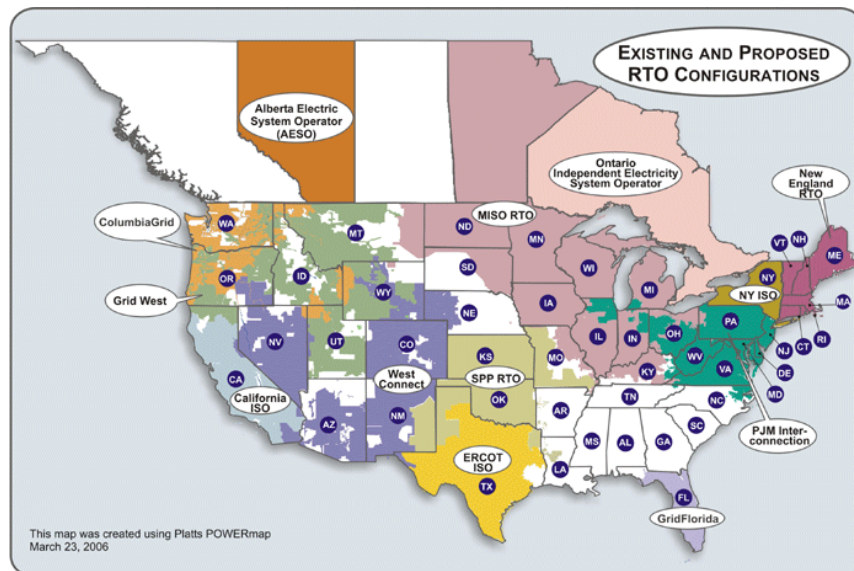
Wholesale Fault Lines

The wholesale electric industry is regulated by the Federal Energy Regulatory Commission ("FERC"). Through trial and error (and a lot of error), FERC has attempted to enable effective competition in the wholesale sector of the industry. FERC's effort began with a finding that the legacy structure of the electric industry was anticompetitive. To change the legacy condition and enable the forces of effective competition, a lot of things needed to happen. In Ohio, they were all supposed to happen during the Market Development Period (between 1-1-01 and 12-31-05).

Unbundling and corporate separation along functional (generation, transmission and distribution) lines were FERC strategies to address the anticompetitive structure of the electric industry. FERC's vision included the creation of new independent institutions that would intervene to break the anticompetitive grip of the incumbents. Along the way, FERC often encountered and rejected the advice of the Federal Trade Commission and the Department of Justice, two arms of government with extensive experience in industries that operate in competitive markets.

FERC's reach is limited in that it does not regulate the entire electric industry. In addition, FERC has chosen to make voluntary any utility's membership in the institutions (called regional transmission organizations or "RTOs") that FERC mainly relies on to remedy the anticompetitive structure of the electric industry. These two attributes of FERC's decisions have given market participants (including vertically integrated electric utilities) abundant opportunities to affect the size, scope and shape of the commercial market. Since the size, scope and shape of the physical electricity exchange is dictated by the law of physics, the consequences of the elections by FERC and utilities have been profound relative to any discussion about the quantity and quality of competition in the wholesale sector. In more simple terms, these elections have allowed barriers or "seams" to be erected in the logical physical market and these seams or barriers provide great opportunities for incumbents to preserve their anticompetitive advantage and to name their price. These seams in the electricity industry can be analogized to a geologically significant fault line. In both cases, being close to the seam or fault line brings added risk of problems at the local level.

As can be seen from the illustration below, Ohio is split between the Midwest Independent System Operator ("MISO") and PJM Interconnect LLC ("PJM"). On each side of the RTO fault line, we have institutions engaged in disconnected tasks and implementing different reliability and commercial conventions or protocols as though the law of physics was of little or no significance. Instead of an RTO that meets the characteristics laid down by the General Assembly in Ohio's restructuring legislation [Section 4928.12(B), Revised Code], Ohio is home to an RTO fault line that is an accident waiting to happen.



The status of "competition" in the wholesale sector cannot be examined without appreciating the sometimes competing mission of RTOs. While RTOs are charged by FERC with being a wholesale market maker, the RTOs also have responsibility for maintaining reliability in real time. If there is a conflict (actual or potential) between the RTO's market making and reliability roles, the RTO's performance indicates that

reliability considerations trump market considerations. Many of the problems we have encountered in the effort to enable effective competition in the wholesale sector stem from this conflict of missions and the priority assigned to the reliability mission.

At FERC's direction, each RTO is responsible for maintaining real time reliability of the electric grid. Real time reliability is monitored by sampling the frequency of the grid.¹ The RTO directs the performance of generators or electricity producers, distributors and ultimate users to preserve the ability of the grid to reliably meet demand in real time. If the frequency drops below a safe level, the RTO will direct generators to bring up their production to meet the need if possible. Otherwise, the RTO will direct reductions in usage through curtailment or interruptions to keep the grid frequency within an acceptable zone. The RTO may direct generating plants in Ohio to run and meet the needs of customers in Michigan or Indiana. The RTOs—not Ohio—dictate when and how generating plants located in Ohio will run and how the output of these units will be used to maintain reliability in the RTO's region.

RTOs run predictive computer models that attempt to anticipate a need to intervene so that the RTOs can proactively ramp up performance to head off a reliability problem. Because electricity reliability demands real time performance, it is very difficult to maintain reliability by playing catch up. A blackout, such as the one that occurred on August 14, 2003, results when there is inadequate or untimely intervention to head off a physical imbalance that sends the frequency into an unsafe zone. A blackout occurs when the equipment sensors detect a condition that may cause damage to the equipment if it stays connected to an unstable grid. The sensors may attempt to stabilize the grid through some predefined automatic response but if this fails the sensors will work to disconnect the equipment from the grid. A cascading disconnection will, as we know from the 2003 experience, produce a blackout over a large region.

The reliability role of an RTO is pursued through a command and control approach because the law of physics demands such. It is not possible given current technology and systems to leave reliability up to the voluntary interaction of producers and users. Reliability is not left to market forces. And, as indicated above, reliability considerations control all other objectives of an RTO.

¹ The system of three-phase alternating current ("AC") electrical generation and distribution was invented by several persons in the 19th Century including Nikola Tesla. He considered 60 Hertz ("Hz") the best **frequency** for AC power distribution. Frequency stabilization of large interconnected power systems allows line-operated clocks to keep accurate time. RTOs and other network operators will regulate the daily average frequency so that clocks stay within a few seconds of correct time. In practice, the nominal frequency is raised or lowered by a specific percentage to maintain synchronization. Many different power frequencies were used in the 19th century, but early in the 20th century most power was produced at 60 Hz (North America) or 50 Hz (Europe and most of Asia). The first units at the Niagara Falls generating station produced 25 Hz power and some early systems used 25 Hz. Today, a normal wall outlet in the United States is 110 volts transmitting current at 60 Hz per second. The 110 volt level was chosen in the United States to make high-resistance carbon filament lamps practical and economically competitive with gas lighting. While higher voltages would reduce the current required for a given quantity of lamps, the original lamp filaments would become increasingly fragile and short-lived. Thomas A. Edison selected voltages around 100 as a compromise between distribution costs and lamp costs.

Organized Markets (Regulation in Disguise)

The efforts to enable competition in the wholesale sector rests on a command and control foundation for meeting reliability objectives. In the early days, RTOs sought to enable a market for the balancing quantities that were supplied to maintain a reliability-driven equilibrium between supply and demand. As the RTO sensed a mismatch between actual supply and demand, it would issue instructions to bring the actual supply and demand into equilibrium. With the power to instruct this performance came the obligation to compensate participants that followed the RTO's directions. To provide the compensation to the participants that followed the RTO's instructions, the RTO must collect revenue from other participants and then cut checks. Out of the RTO's reliability role, a "balancing market" arose and in its original form the compensation and pricing of this balancing market were tied to a cost-based pricing convention. Because of the reliability roots of the commerce that occurred at the direction of the RTO, the balancing market came to be known as an "organized market".

Organized markets feature commerce that occurs at the direction of a central planner and prices that attach based on the methods or conventions established by the central planner. In this case, the central planner is the RTO. Each RTO's reliability maintenance scheme and the related pricing conventions are subject to the regulatory jurisdiction of FERC and must be filed with and approved by FERC. These balancing and "organized markets" are not unique to electricity; they exist in other network industries such as telephone and natural gas.

As FERC pushed forward with its trial and error approach to enabling wholesale competition in the electricity industry, it attempted to react to fundamental problems by demanding that the RTOs establish yet another type of product or service market that required a further breakdown of electricity into unbundled components. In addition to balancing energy, FERC pushed the RTOs to come up with capacity, regulation, reactive power, reserves and other markets and to attach prices to the unbundled commerce occurring through the organized markets. In other words, FERC pushed the RTOs to expand the significance, size and shape of the organized markets.

Today, the commercial activity and transactions that some stakeholders point to as evidence of competition are actually the result of the organized markets that leave reliability-driven physical performance and pricing/compensation tied to the decisions of the central-planner-RTO and its boss, FERC. Organized markets are to effective competition what identity theft is to a credit card holder. The organized market may look like effective competition but the reality is otherwise. While it may be convenient for some stakeholders to characterize this commercial activity as the type of competition that will work in the public interest, the prices that fall out of these organized markets are established by a process administered by the RTOs and FERC—not through the voluntary interaction between buyers and sellers. Instead of the competition in the wholesale sector, regulation is operating in disguise.

The role of the RTO's administratively-determined prices has had a profound impact on electricity prices because the RTOs and FERC have decided that prices in

the wholesale sector must favor producers. In economic terms, FERC and the RTOs have set out to create “producer surplus” and they are succeeding in ways that ratchet up the revenue that must be collected by the RTOs to “compensate” the producers. The illustration below makes this point mathematically. Of course, the source of the revenue that must be collected by the RTO to pay generators is ultimately retail customers.

Example:

- **Assume that 600 MWH (600,000 kWh) are needed to meet demand and wholesale bids are received from several electric generators:**
 - 200 MWH @ \$20 per MWH
 - 200 MWH @ \$30 per MWH
 - 100 MWH @ \$40 per MWH
 - 50 MWH @ \$50 per MWH
 - 50 MWH @ \$100 per MWH

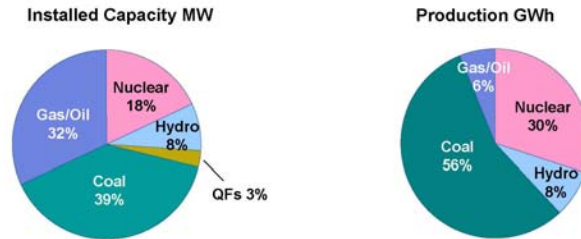
**Average for 600 MWH =
\$35.84 per MWH (3.584 ¢ per kWh)**
- **What is the “organized market” price for the 600 MWH?**

\$100 per MWH! (10 ¢ per kWh)
- **Why? Under the current organized market pricing convention, the price of the spot energy would be set at the last bid price accepted by the RTO to obtain the entire 600 MWH. The RTOs use a “uniform clearing price” approach to establish the price paid for the 600 MWH and the revenue that needs to be collected by the RTO to compensate the generators.**
- **The entire 600 MWH of generation supply would be priced at \$100/MWH and each generator that was accepted by the RTO to run to supply energy would be paid \$100/MWH irrespective of its actual production costs or lower bid price.**

The uniform clearing price method used by the RTOs provides a very attractive opportunity for generators with relatively low cost generating assets (like the coal and nuclear generating assets owned by Ohio utilities) to significantly increase revenue and profits. And, the illusion of a competitive market created by the RTOs provides these generators with a convenient opportunity to attribute the “rate shock” results of state auctions to good old competition in markets supervised by “independent” watchdogs. And, all of this is indirectly predicted in the financial presentations that the incumbent utilities make to the investment and Wall Street communities.

Below is information taken from a PPL Corporation² (“PPL”) presentation³ that identifies a discussion of its generating mix and its average cost of producing electricity.

PPL Supply Business Overview



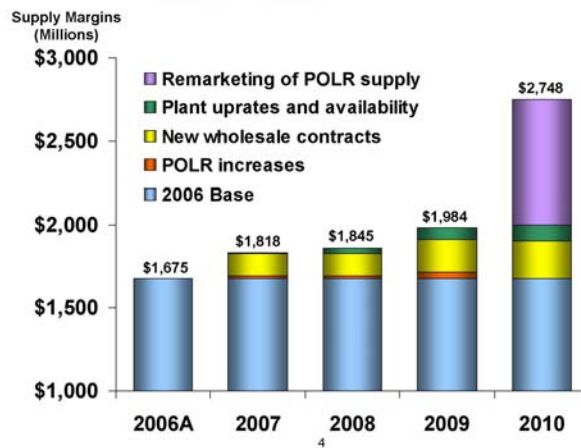
- In 2007, 94% of our owned generation output is expected to be produced at a fuel cost of approximately \$16/MWh or less.

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Below is PPL’s estimate of the revenue and margin growth that it expects to achieve when the Pennsylvania price caps expire and it can enhance its revenue through the use of the RTO’s uniform clearing price method.

Key Drivers of Margin Growth



² PPL Corporation (NYSE: PPL) is a Fortune 500 company with headquarters in Allentown, PA.

³ These illustrations are taken from presentations available via the Internet at <http://www.pplweb.com/NR/rdonlyres/B10386D1-9641-4009-AC1B-F5E9EE5AB056/0/PPLCorporationLehmanBrothers9407.pdf> and <http://www.pplweb.com/NR/rdonlyres/EB1F8D39-C278-4A4E-9E17-44C5895C90F3/9708/PPLCorporationPresentationDeutscheBank0507.pdf>

⁴ \$16 per MWh is 1.6¢ per kWh.

The tremendous revenue uplift potential available from this RTO form of price regulation has provided a powerful incentive for utilities to characterize the organized markets as effectively competitive markets and to urge state policy makers to use auctions to convey the “proper price signals” to retail customers.⁵ In 2003 and 2004, Monongahela Power attempted to use an auction or so-called competitive bidding process to bring the uniform clearing price’s rate shock to some 29,000 customers in Southeast Ohio. Fortunately, Ohio prudently pushed back. Some states like Illinois and Maryland went ahead with auctions that allowed incumbent utilities to open the retail customers’ door to the profit escalating effects of the RTO’s uniform clearing price brand of regulation and the results were predictably disastrous for retail customers in those states. Prior to the auction in Illinois, large energy-intensive customers were paying between 3¢ and 4¢ per kWh for electricity. The auction results took Illinois electric prices for these customers to 8¢ or 9¢ per kWh. For the largest manufacturers, a change in the price of a kWh by just one-tenth of a cent will change the annual electric bill by more than \$1,000,000.

During testimony before the Senate Public Utilities Committee on October 2, 2007, American Electric Power’s (“AEP”) witness, Craig Baker, confirmed the revenue and profit enhancing opportunity that awaits AEP in the “organized market”. During his questions, Senator Niehaus observed that FirstEnergy’s average retail price was between 8¢ and 10¢ per kWh, Duke’s average price was between 6¢ and 7¢ and that AEP’s average price was between 4¢ and 5¢ per kWh. Senator Niehaus then asked Mr. Baker why AEP was not attempting to sell electricity to retail customers in FirstEnergy’s service area given the higher revenue and profit opportunities presented by FirstEnergy’s higher prices. Mr. Baker responded to the question with a question. Mr. Baker asked why AEP would sell electricity to customers in FirstEnergy’s service area when the organized market would pay AEP 13¢ per kWh.⁶

We are sometimes asked why FERC and the RTOs would adopt the uniform clearing price method of establishing organized market prices. The answer involves some speculation but generally it resides in a theoretical view that anticipates that this pricing method (sometimes called “scarcity pricing”) will induce suppliers to add more generating capacity in places where prices are high. Instead, however, the pricing method tends to encourage scarcity because scarcity is the condition that favors higher prices, revenue and profits.

The utilities that claim that effective competition exists in the wholesale market do so because they see this claim as a necessary foundation for their revenue and profit

⁵ The actual wealth transfer resulting from the uniform clearing price form of regulation is discussed in *THE ELECTRIC HONEYPOT: THE PROFITABILITY OF DEREGULATED ELECTRIC GENERATION COMPANIES* by Edward Bodmer which is available via the Internet at <http://appanet.org/files/PDFs/BodmerElectricHoneyPotExexSummary.pdf> . A copy of this paper is also attached for the convenience of the reader.

⁶ The attractiveness of the “organized market” is not limited to the prices produced by the uniform clearing price form of regulation. For example, when a supplier serves a retail customer, the supplier has to deal with collection risk or the risk that the customer may not pay the bill. There is effectively no collection risk associated with a sale to the RTO.

enhancement goals. They advance auctions as a means to establish retail prices because auctions are very good conductors for FERC's and the RTOs' uniform clearing prices. But effective competition has not arrived in the wholesale sector of the industry. RTOs and FERC are regulating the reliability, services and prices that fall out of the wholesale sector, they have no skin in the game and they care not one whit about Ohio's economy or the consequence of rate shock.

Claims that organized markets are competitive also ignore that as FERC has pushed RTOs to expand markets beyond balancing services, the expanded scope has increased the opportunity for regulation to masquerade as competition. For example and to meet its reliability duties, PJM requires electric utilities to meet capacity requirements through an auction process called the reliability pricing model or "RPM". This process uses an auction to establish clearing prices for electric generating capacity. However, if it is determined that there is insufficient competition, PJM may elect to limit the prices which generators may charge and collect for their capacity offer. Where the generators' bid prices are "mitigated" by PJM, the generators are paid for capacity in accordance with an administratively-determined capped offer.⁷ In all of the RPM auctions held to date, PJM has found that there is inadequate competition and imposed a cap on the clearing prices paid to generators.⁸ Despite the caps imposed by PJM because it has concluded that there is inadequate competition in the so-called capacity market, the clearing price method used by PJM to set capacity prices is also helping to create the producer surplus. The effects of the PJM form of pricing regulation have become so profound that even some investor-owned utilities are rebelling at the consequences. For example, Duquesne Light recently announced that it was exiting PJM due to the impact of prices that PJM is setting in PJM's organized capacity market.

MISO provides another recent example of the lack of effective competition in the wholesale sector of the electric industry. In September 2007, MISO requested FERC to approve generating reserves markets (regulation, spinning reserves and supplemental reserves). To support this request, MISO was required to submit a market power analysis of the proposed markets, which MISO has proposed to be sub-regional in nature (MISO is essentially subdividing its entire region into small compartments producing even more seams). While FERC has not yet acted on MISO's request, the market power analysis submitted by MISO documents the lack of effective competition:

At the sub-regional level, however, the analysis indicates a greater potential for market power. During Summer 2006, for example, the largest supplier in WUMS held nearly two-thirds of the Regulating Reserve

⁷ See, *Analysis of the 2007 – 2008 RPM Auction, PJM Market Monitoring Unit* (August 16, 2007) at 3. "If a capacity resource owner failed the market power test for the auction, avoidable costs were used to calculate offer caps for that owner's resources." A copy of this report is available at: <http://www.pjm.com/markets/market-monitor/downloads/mmu-reports/20070820-analysis-2007-2008-rpm-auction.pdf>.

⁸ The most recent results are summarized in the *Analysis of the 2007 – 2008 RPM Auction, PJM Market Monitoring Unit* on page 6. "As shown in Table 3, all participants in the total PJM market as well as both LDA RPM markets failed the [three pivotal supplier] test. The result was that offer caps were applied to all sell offers."

capability, and the largest supplier within Michigan had a market share of 72 percent. In the four clusters examined, the largest supplier had a market share ranging from 30 percent to almost 60 percent in Summer 2006. Winter 2006/2007 results are similar to the Summer 2006. These values are all above the 20 percent standard generally relied upon as a market share screen. The HHI values for the three constrained areas range from almost 3700 to almost 6200 during Summer 2006. In every hour the HHI values produced in these areas exceeded 2500 for Regulating Reserves. Likewise, the HHI values for the clusters indicate that these areas are highly concentrated. The Winter 2006/2007 results show similar patterns.

The pivotal supplier analysis confirms the potential for the exercise of market power in the Regulating Reserve market. For example, WUMS would have faced a pivotal supplier for regulation in 91.5 percent of hours, Michigan in 97.4 percent of hours, and the Minnesota NCA in 87.4 percent of hours. The four clusters would have faced a pivotal supplier for Regulating Reserves from 14.3 percent of hours (in Cluster #5) to 96.7 percent of hours (Cluster #9). **I conclude that the market for Regulating Reserves will be vulnerable to the exercise of local market power when local requirements are defined for specific areas and import of reserves or energy into the local area is constrained.**

Affidavit of David B. Patton, Ph.D at 16 (emphasis added).⁹ Dr. Patton reached similar conclusions about the potential to exercise market power in spinning and supplemental reserve markets. As a result, he has proposed that supplier offers be subjected to mitigation within local market areas.

At the beginning of this paper, we indicated that the question about the existence of competition in the wholesale sector is the wrong question. The question is the wrong question because it has nothing to do with Ohio's electricity challenges or the objectives that caused Ohio to enact electric restructuring legislation in 1999.

In 1999, we assumed that with a lot of hard work it would be possible to enable effective competition to do a better job of meeting the public interest in reliable service and reasonable prices than regulation. We have worked hard. The huge amounts of stranded costs (called transition costs in Ohio) that were claimed by utilities and granted by the Public Utilities Commission of Ohio ("PUCO") provided hard evidence that regulation gave us excessive prices and was blocking innovation. The power supply shortages and price spikes that occurred in the summer of 1998 – prior to Ohio's enactment of restructuring legislation – indicated that regulation was threatening supply reliability. Competition was viewed as a better means of serving the public interest and being fair to utilities. Competition for the sake of competition was not the objective. Competition was a means to a better end.

⁹ This affidavit was submitted by MISO to FERC on September 14, 2007 in Docket No. ER07-1372. A copy of the complete filing (large file ~2600 pages) is posted at: http://www.midwestmarket.org/publish/Document/4c558e_11508d3ed38_-7fff0a48324a?rev=2.

For the reasons described above, effective competition has not arrived in the wholesale or retail sectors of the electric industry. If Ohio chooses the path taken by Illinois and Maryland – pretending that organized markets are effective markets – retail prices will be driven by the uniform clearing price form of price regulation established by the RTOs and FERC and retail rates will rise rapidly and unpredictably. If Ohio continues its prudent attention to the risks, it can select a path that provides the PUCO with better tools to ensure that a proper balance is struck between the interests of utilities' owners and Ohio's electric consumers.

The problems that are currently before the General Assembly are not new. On October 15, 2003, the Select Committee to Study Ohio's Energy Policy issued a report to the House of Representatives. The Committee was charged with the task of making sure that, as the world changes, Ohioans would have adequate supplies of safe, reliable and clean energy supplies of energy now and in the future. The report was assembled based on the input the Committee received during 11 hearings between April 2002 and January 2003. The report included a discussion about early indications that electric restructuring expectations were not in alignment with actual results. At page 3 of the report, the Committee stated (emphasis added):

As Ohio treaded into uncharted waters by being one of the first states to deregulate its electric utility industry, the General Assembly knew that regulation and oversight by the PUCO would be necessary to achieve a competitive market. The legislature gave the PUCO a tremendous amount of supervision and management authority in SB 3, and it continues to monitor the market as we move through the transition periods. For example, to give competition more time to develop, the PUCO approved an extension of the transition period for Dayton Power & Light. Consumer advocates, regulatory officials and industry representatives worked together to craft a new plan, agreed to by the parties, to continue the framework of a competitive market while allowing some protection to customers. **The members encourage the PUCO to continue to take the necessary steps, whether by rule or a request for legislation, to ensure that a healthy competitive market is in place before full competition begins.** Ohio has been a model to the rest of the county regarding its innovative and vanguard approach to the electric utility industry. By continuing to design good public policy to shape the industry, Ohio can remain a prosperous, growing state through the 21st Century.

We encourage the General Assembly to follow the policy path confirmed by the House Select Committee to Study Ohio's Energy Policy. We encourage the General Assembly to take the necessary steps to ensure that a healthy competitive market is in place before full competition begins.

Current law declares generation supply to be a competitive service and states that the supply made available by incumbent utilities is to be priced using a “market-based” standard. The term “market-based” is not defined by current law or the PUCO’s rules and regulations. The status of current law as implemented by the PUCO provides incumbent utilities with a convenient opportunity to promote the use of auctions to conduct the rate shock results of FERC’s uniform clearing price form of regulation to Ohio’s captive electric customers.

Current law was written with the expectation that effective competition would be in place by the end of 2005. For whatever reason, this expectation has not been fulfilled. It is imperative that the PUCO be given clear authority and direction to set generation supply prices that fairly balance the interests of utility shareholders and customers. Whether these balanced prices are set as part of a rate stabilization plan or energy security plan is not important. What matters is making sure that Ohio’s price setting agency has clear authority to avoid the side effects of the “producer surplus” steroids that FERC and the RTOs are dispensing to generators including those affiliated with Ohio’s investor-owned utilities.