

**REBUTTAL TESTIMONY OF
JOSEPH BOWRING
ON BEHALF OF
VIRGINIA ELECTRIC AND POWER COMPANY
BEFORE THE
STATE CORPORATION COMMISSION OF VIRGINIA
CASE NO. PUE-2000-00551**

**REBUTTAL TESTIMONY OF JOSEPH BOWRING,
PJM MARKET MONITOR**

Q.1 ARE YOU THE SAME JOSEPH BOWRING WHO SUBMITTED DIRECT TESTIMONY IN THIS PROCEEDING?

A.1 Yes.

Q.2 WHAT IS THE PURPOSE OF YOUR REBUTTAL TESTIMONY?

A.2 The purpose of my testimony is to respond to some of the observations of Staff Witness Howard Spinner in his testimony in this proceeding. I will not attempt to respond to each and every point, some of which I agree with and some of which I do not agree with. Rather, I will respond to some of his key observations concerning the operation of the PJM Interconnection L.L.C. (PJM) markets and the role of market monitoring of those markets.

Q.3 PLEASE SUMMARIZE YOUR REBUTTAL TESTIMONY.

A.3 I agree with Mr. Spinner that wholesale power markets require careful market monitoring in order to ensure that the efficiency benefits are realized. Integral to PJM's market design is the existence of independent market monitoring and cost-based local market power mitigation to prevent the exercise of market power in those places where competitive market outcomes cannot be assured. I describe that market monitoring mitigation in my initial testimony and reference it in this rebuttal testimony.

I believe the central question raised by Mr. Spinner's testimony is whether a transparent centrally organized wholesale market operated by an independent entity is superior to the bilateral wholesale market that Dominion Virginia Power (Dominion) operates in today. Since the PJM market operates at the wholesale level, comparisons to retail cost of service regulation do not address the central issue.

Mr. Spinner's claims about the effectiveness of strategic bidding in PJM and his analysis of PJM's market prices are not accurate and are not supported by the data. The alleged strategic bidding example to which he refers is not, in fact, an example of strategic bidding and did not impact PJM prices. In addition, PJM prices have decreased, rather than increased, on a fuel-cost adjusted basis during the time period he analyzes.

Procedures and protocols are now in place for the Market Monitoring Unit to share confidential market sensitive data with state commissions. We look forward to working with Mr. Spinner and the Virginia State Corporation Commission (SCC or Commission) so we can share information and analysis concerning the operation of the market in Virginia.

Q.4 PLEASE PROVIDE AN OVERVIEW OF YOUR RESPONSE TO MR. SPINNER'S TESTIMONY.

A.4 Mr. Spinner and I agree on a number of points. Among other things, I agree with his comment on page 3 of his testimony that, in the debate about restructuring of the electric industry, "what is often overlooked is that economic theory---when applied in its entirety---has much to offer regarding the efficiency and equity of competitive outcomes produced by markets for electric service such as PJM's locational marginal pricing (LMP) model. However, I do not agree with the related conclusions drawn by Mr. Spinner. I also agree that the exercise of market power, if unchecked, can lead to adverse results. In fact, that is the reason why a strong and independent market monitoring unit and market power mitigation were established at the inception of PJM.

I am not suggesting that the PJM model is perfect or that careful monitoring of these markets is unnecessary. Security constrained central dispatch with LMP, price

transparency, the full set of PJM market rules and independent market monitoring are all components of an efficient wholesale market.

Q.5 IN LIGHT OF MR. SPINNER'S APPROACH, IN YOUR VIEW, WHAT IS THE FUNDAMENTAL ISSUE FOR THE COMMISSION'S CONSIDERATION CONCERNING THE WORKINGS OF THE PJM MARKET?

A.5 The fundamental issue is whether an organized transparent wholesale LMP-based market is superior to today's wholesale bilateral market. Regardless of the details of retail regulation, electric utilities participate in wholesale power markets. The goal should be to choose the most efficient way to organize wholesale power markets. Thus the starting point for that analysis needs to be a comparison of the wholesale environment that exists today outside of organized markets and wholesale power markets as organized by PJM.

Q.6 DOES DOMINION CURRENTLY OPERATE IN A WHOLESALE MARKET?

A.6 Yes. Dominion, along with just about every other major electric utility, buys and sells electricity in wholesale power markets. Utilities purchase electricity at wholesale when it is cheaper to do so than to generate from their own resources. They also may purchase from other companies at wholesale when they experience a plant outage. Electric utilities routinely sell excess generation in the wholesale market when it is economic to do so.

The wholesale market that Dominion and other non-RTO utilities operate in today is characterized by bilateral transactions and a lack of price transparency. In other words, transactions are between individual buyers and sellers. There is no one place where buyers and sellers can obtain real time information on system conditions or the hourly price of electricity on a day ahead or real time basis. Price discovery depends on brokers or proprietary trading platforms. In addition, bilateral transactions are typically limited to

pre-specified blocks of hours. Bilateral markets are an essential part of the PJM wholesale markets as participation in PJM spot markets is voluntary. However, it is the transparency and efficiency of the PJM energy market that permits the bilateral markets to function more effectively in the PJM context than they do on a stand alone basis.

Furthermore, uncertainty exists as to whether a given transaction will go through or be curtailed. A utility can arrange a wholesale transaction, beneficial to its customers, that is curtailed, through the calling of Transmission Loading Relief (TLR), despite the fact that a lower cost or more efficient alternative to alleviate the affected constraints may exist on a neighboring system or in another state.

LMP is superior to TLRs as a congestion management tool since it is expressly designed to produce a more efficient overall dispatch of generation resources to resolve congestion. LMP will increase prices on the constrained side of a facility, thereby signaling to the market the need for additional supply and reduced consumption. TLR procedures, on the other hand, are used to curtail broad categories of transactions based upon whether a transaction's effect on a constrained facility exceeds a defined impact. A TLR affecting a broad category of transactions can at times be replaced with the redispatch of one or two units at substantially lower cost.

Q.7 WHAT IS YOUR RESPONSE TO THE FUNDAMENTAL QUESTION ABOUT WHOLESALE MARKET STRUCTURE AND ITS RELATIONSHIP TO MR. SPINNER'S OVERALL APPROACH?

A.7 My view is that an organized, centrally dispatched, security constrained, independently operated, transparent wholesale marketplace is superior to a bilateral wholesale marketplace. The existence of a liquid market for wholesale power with transparent nodal prices posted on a five-minute basis that reflect the cost of the most

efficient resources required to operate the system results from the organization of the PJM centrally dispatched, security constrained model. The ability to redispatch units over a large market footprint increases the efficiency of the market and reduces the chance that an inefficiently large number of economic transactions will be curtailed in order to relieve a constraint.

Mr. Spinner does not address whether an organized transparent wholesale market, such as PJM's, would be better for Dominion customers than the present bilateral wholesale market. Since PJM's market operates at the wholesale level and leaves retail ratemaking issues to the states, comparing cost of service retail ratemaking to PJM's market is not the relevant focus.

Q.8 DO YOU AGREE WITH MR. SPINNER'S ARGUMENTS THAT THERE ARE THEORETICAL PROBLEMS WITH PJM LMP?

A.8 Mr. Spinner states that there are three main areas of "theoretical problems" with the PJM LMP model. He labels these areas as "market power considerations", externalities and equity or fairness issues.¹ I will address the merits of each of these arguments as they pertain to actual operating experience in PJM.

Q.9 WHAT IS THE MARKET POWER ISSUE THAT MR. SPINNER RAISES?

A.9 On the issue of market power, Mr. Spinner's theoretical concern about LMP is that competition assumes that generators submit offers based on marginal costs but that there is no rule requiring such offers. As a result, generator offers may exceed marginal cost and, if accepted, result in the exercise of market power. Mr. Spinner offers some facts in support of his position.

¹ See Prefiled Testimony of Howard M. Spinner regarding Application of Virginia Electric and Power Company to Join PJM as PJM South (Case no. PUE-2000-00551) at Page 13.

Q.10 DO THE FACTS SUPPORT MR. SPINNER'S CONCERN?

A.10 The facts do not support Mr. Spinner's concern. The PJM Market Monitoring Unit (MMU) has concluded that the PJM market results have been competitive, based on objective measures, for each year of operation. While it is correct that, in a competitive market, every generator can choose how to offer its units to the market, it is competition that results in generators offering units at their marginal costs because that is the profit maximizing strategy in a competitive market. Each year, the MMU produces a detailed State of the Market Report on the PJM Market, copies of which are provided to state commissions, the Federal Energy Regulatory Commission (FERC) and all market participants. As one indicator of market power, the MMU compares PJM's market clearing prices to the marginal costs of operating generators, in order to determine the relationship between observed prices and competitive prices. The MMU has concluded in every case that the market results are consistent with a competitive outcome.

The Mansur studies reported by Mr. Spinner support the view that mark ups in the PJM markets have been quite low and that the PJM markets are relatively competitive.² The second Mansur study refines and modifies the results of the initial study.

In addition, the MMU calculates net revenues to determine how revenues to generators resulting from actual prices in PJM's energy, capacity and ancillary services markets compare to generators' capital and operating costs. In recent years, generator net revenues have been significantly below the level required to cover generators' fixed and variable costs. (See Figure 1 which is Table 2-17 from the State of the Market Report 2003.) Over the five years of PJM operation, net revenues have not, on average, been

² See Id. at 47.

adequate to cover the costs of a new CT and that has been especially true in 2002 and 2003.

Q.11 WHAT ARE THE MITIGATION MEASURES IN PLACE TO ENSURE AGAINST THE EXERCISE OF MARKET POWER?

A.11 PJM relies upon competition to limit market power in the overall energy market. In the absence of local market power issues the only explicit rule governing what generators can offer in the PJM energy market is the \$1,000 per MWh overall offer cap. The results have generally been consistent with competition.

To prevent the exercise of local market power, the energy market offers submitted by generators which were under construction prior to July 9, 1996 are capped at the unit's marginal cost plus 10 percent when they are required to run to relieve a transmission constraint. PJM caps units at the higher of zonal prices or the unit's costs plus 10 percent in order to prevent the exercise of local market power. Thus, with respect to local market power, there is a strong mitigation tool in place. For units with construction start dates after July 9, 1996, PJM does not have ongoing authority to mitigate units to their cost based offers. However, PJM can petition the FERC, on a fact-specific basis, for the ability to mitigate those units that could exercise market power. There are no such mitigation rules in existence for bilateral wholesale markets in non-RTO areas nor an independent entity to administer them in real time.

Q.12 MR. SPINNER RAISES A SECOND "THEORETICAL" ISSUE THAT HE LABELS EXTERNALITIES. WHAT ARE YOUR COMMENTS ON HIS CONCERN?

A.12 Mr. Spinner posits two types of "externalities". He labels the first of his identified externalities as reliability and describes his second as the "environmental, aesthetic or

sociological impacts of electrical infrastructure development that are expected to occur in response to observed LMPs”.³ Mr. Spinner states that “the industry has historically --- and generally continues to --- provide the same level of reliability regardless of differing value provided to each customer. Since it is difficult to differentially price reliability to reflect differing customer value derived from that reliability, customers will tend to hide their true preference for reliability. In short, customers will want to enjoy reliability but not pay for it individually since it is hard to price reliability differently for different customers. Thus, this produces a distorted price signal.”⁴

Mr. Spinner’s reliability externality argument does not address overall system reliability or PJM’s approach to ensuring overall reliability. Rather, he raises the issue of whether rate structures should allow customers to pay for different levels of reliability. Since differentiated reliability services ultimately means the ability to interrupt individual customers based on their choices, this depends ultimately on both pricing and the technology to interrupt individual customers. At the wholesale level, PJM provides LMP pricing that reflects the economic impact of usage of the system by individual customers. In addition, PJM facilitates the expression of individual customer preferences for electric service through demand side response programs which compensate eligible customers at the real time LMP value for voluntarily curtailing their consumption. The LMP system provides the tools for allowing customers to realize the economic value to the system of their voluntarily curtailing their load in order to ensure reliability. Bilateral wholesale markets do not provide this real time information or a clear means to compensate customers for their voluntary demand side reductions. Regardless of pricing, the

³ See Id. at 32.

technology does not currently exist to interrupt individual customers based on their preferred reliability of service.

Q.13 PLEASE COMMENT ON THE ROLE OF LMP AS IT RELATES TO MR. SPINNER'S SECOND EXTERNALITY--ENVIRONMENTAL, AESTHETIC AND SOCIOLOGICAL IMPACTS OF ELECTRIC INFRASTRUCTURE DEVELOPMENT.

A.13 As noted above, LMP is a market-based tool that sends price signals based on economically efficient outcomes. Neither LMP nor entry into PJM is intended to be a substitute for enforcement of environmental laws, state siting reviews or consideration of other sociological impacts in the development of new generation or transmission. As a result, Mr. Spinner's criticism of LMP is misplaced. If anything, LMP incents appropriate infrastructure development subject to environmental and siting reviews.

LMP reflects the economic cost of energy in a given location based on the transmission infrastructure and the cost of local generation. This information can be used to help determine the proper type and location of congestion solutions and to determine the least cost solution. These price signals do not exist in bilateral wholesale markets.

In addition, PJM's centralized transmission planning function ensures that needed upgrades are coordinated across the RTO footprint to most efficiently plan infrastructure expansion.

Q.14 PLEASE COMMENT ON MR. SPINNER'S EQUITY ISSUES DESCRIBED AT PP. 36-38 OF HIS TESTIMONY.

⁴ See *Id.* at 32.

A.14 The issue raised by Mr. Spinner is whether any potential rate impacts on retail customers should be considered in a transition to LMP-based markets. The question is a retail rate question which is outside the purview of PJM.

Q.15 MR. SPINNER ALSO MENTIONS CERTAIN EVENTS ON THE DELMARVA PENINSULA IN THE (2000 THROUGH JUNE 2003) TIME FRAME. CAN YOU COMMENT?

A.15 Last fall, a FERC administrative law judge found contentions that congestion has been caused or increased by locational marginal pricing were not supported by the record.⁵ Although the Commission had concerns with how FERC conducted that proceeding, the actual conclusions by the FERC Administrative Law Judge were consistent with my own.

Specifically, I concluded that, as a general matter, local market power is not exercised on the Delmarva Peninsula as a result of the effectiveness of PJM's rules governing local market power. PJM's local market power mitigation rules were applied extensively during the period covered by that proceeding to prevent the exercise of local market power. I also noted that the PJM local market power rules do not apply to units for which construction commenced after July 9, 1996. With regard to post-1996 units I concluded that the impact of post-1996 units was limited. The most significant impact occurred in 2001 and in that year, the result of the use of post-1996 units was either to reduce the price compared to the alternatives or to resolve a scarcity situation.

Q.16 HOW IS PJM ADDRESSING CONGESTION ON THE DELMARVA PENINSULA?

⁵ Transmission Congestion on the Delmarva Peninsula, 105 F.E.R.C. P63,004 at P 141 (2003).

A.16 It should be noted that congestion increased significantly on the Delmarva Peninsula when transmission lines were taken out of service in order for Connectiv to implement required upgrades. Congestion increased while those upgrades were under construction just as traffic on a highway often gets worse while road improvements are made. Notably, since the upgrades were made, there has been a significant reduction in congestion on the Peninsula. During 2003, congestion-event hours on the Peninsula were 512, or less than 20 percent the 2,812 hour level in 2001, the peak year. (See Figure 2.)

In partial response to stakeholder concerns regarding congestion on the Delmarva Peninsula, PJM developed, tested and implemented a new Post Contingency Congestion Management protocol that will result in less frequent out-of-merit dispatch than under the current system. The PJM plan relies on support from synchronous condensers to avoid the need for re-dispatch. On August 19, 2004 in Docket No. ER04-987-000, the Federal Energy Regulatory Commission accepted the plan proposed by PJM that will reduce transmission costs on PJM's multi-state system, more equitably distribute costs to those customers that benefit from the reductions, while ensuring reliability of electric service. FERC noted that the expansion of this program has the potential to: (1) reduce re-dispatch costs in chronically congested areas in the PJM region; (2) more accurately reflect the local benefits of avoided re-dispatch and enhanced reliability; (3) reduce the potential for the exercise of local market power; (4) reduce emissions; and (5) allow for more efficient use of assets. FERC Chairman Pat Wood, III stated, "This proposal is the sort of cost-saving innovation that is possible with organized markets and independent transmission operators. While cost savings will be realized across PJM's system, it's a

particularly important part of the solution to chronic congestion in the Delmarva Peninsula.”⁶ The program takes effect Sept. 1, 2004

Q.17 MOVING TO THE “IN PRACTICE” PARTS OF MR. SPINNER’S TESTIMONY BEGINNING ON P. 38 of 64, DO YOU AGREE WITH WITNESS SPINNER’S CLAIMS CONCERNING STRATEGIC BIDDING?

A.17 At the outset, Mr. Spinner asserts that generators bid above their marginal cost and thus engage in “strategic bidding” which he characterizes as the exercise of market power. Mr. Spinner’s analysis does not support his claims.

As a general matter, the definition of market power is the ability to increase market prices above the competitive level. Thus, the exercise of market power means that a market participant successfully increased the market price above the competitive level. Mr. Spinner has provided no evidence to support a claim of market power either for the market as a whole or for any particular time period or load area. The fact that some generators at times offer energy at greater than marginal cost may be an effort to exercise market power but also may reflect additional marginal costs that are not reflected in accounting data for fuel costs and variable operating and maintenance expense. Such marginal costs include risk and opportunity costs. Even if market participants do increase their offer prices above marginal cost, this does not constitute an exercise of market power unless the result is to increase the market price above the competitive level.

The data cited above from the MMU’s State of the Market Reports indicates that there has been no systematic exercise of market power in the PJM energy markets since competitive markets were introduced on April 1, 1999.

⁶ FERC Press Release dated August 19, 2004, Reference Docket No. ER04-987-000, News Media Contact Barbara A. Connors

The specific case of strategic bidding proffered by Mr. Spinner does not demonstrate either strategic bidding or the exercise of market power. Mr. Spinner bases his claims about the exercise of market power in PJM on an analysis of published generator offer data from two days in January 2003. That analysis calculates the difference between the maximum bids submitted for identified generating units on those two days. Mr. Spinner concludes, "If generators were not engaging in strategic bidding, I would expect, except for valid differences caused by fuel prices, the bids on these two days to be much closer in magnitude for each individual generator".⁷ Though Mr. Spinner recognizes that fuel cost differences would account for some element of variance, Mr. Spinner provides no analysis of changes in fuel costs or of the expected impact of observed increases in fuel costs on cost-based offers and thus offers no basis for his conclusions regarding strategic bidding.

An MMU review of the two days cited by Mr. Spinner shows that gas costs increased by a factor of more than three times between the two days, from \$5.31 per MMBtu to \$16.52 per MMBtu. For a range of heat rates from 10,500 Btu/KWh to 17,000 Btu/KWh, this increase in fuel costs translated into a cost-based bid increase of from \$117.73 to \$190.61 per MWh. Many of the units identified by Mr. Spinner as showing the largest increases in offers between the two days were gas-fired units with increases explained by the increase in gas costs; units that did not run on the second day; or were units that were not marginal if they did run and therefore did not set the market price.

However, this does not mean that generators do not engage in strategic bidding. Some certainly do. This also does not mean that strategic bidding does not result in

⁷ See *Id.* at 40.

increasing prices. At times, strategic bidding can and does increase prices. However, as explained further below, this is not a systematic issue nor does it change the basic conclusion that the results in PJM energy markets have been competitive.

Q.18 MR. SPINNER UNDERTAKES CERTAIN REGRESSION ANALYSES ON PJM PRICES DURING THE 2002 TO 2004 TIME FRAME. DO YOU AGREE WITH MR. SPINNER'S ASSERTION THAT HIS RESULTS SUPPORT THE CLAIM THAT STRATEGIC BIDDING HAS BEEN SUCCESSFUL AND THAT MARKET POWER HAS BEEN EXERCISED IN PJM MARKETS?

A.18 No. Mr. Spinner's regression analysis of prices in PJM clearly does not support his claim that market power was exercised during the period. In fact, Mr. Spinner asserts only that he "suspects that on certain days and under certain conditions, market clearing prices in PJM are higher than one would expect".⁸ The regression analysis, as performed does not provide any evidence relevant to addressing the question of market power. In fact, real prices are the result of a number of interacting factors including the level of demand by hour and the nature of the supply curve. Increasing prices alone are not evidence of market power any more than decreasing prices are evidence of competition.

The MMU has analyzed annual price changes in a number of ways. The table below shows annual prices on a simple average basis and on a fuel-cost adjusted basis. (Figure 3.) Adjusting prices for changes in fuel costs is a complex task requiring knowledge of marginal units and associated fuel types and costs. The approach taken by the MMU uses the actual marginal units and associated fuel types and thus reflects actual fuel cost adjusted LMPs rather than an estimate. Fuel costs have risen since 1998. For example, gas prices have increased from an average of \$2.62 per MMBtu in 1999 to

\$6.45 per MMBtu in 2003, an increase of 146 percent. (Figure 4.) The results of the MMU analysis show that while simple load-weighted average LMPs have risen since 1998, fuel cost adjusted LMPs have declined about 4.7 percent since 1998. This is consistent with the expected operation of a competitive market in which input price changes are reflected in offer prices.

Q.19 DO YOU AGREE WITH THE ANALOGY THAT WITNESS SPINNER ATTEMPTS TO DRAW BETWEEN THE CALIFORNIA AND PJM ENERGY MARKETS WITH RESPECT TO THE RISK OF GENERATION ADEQUACY?

A.19 No. The rules in PJM are very different from what was in place in California. Since the PJM market design is so different, most of the identified behaviors that occurred in California would be very difficult or even impossible to replicate in PJM. A good market design is a prerequisite to consistently competitive results. Some of the PJM market rules that distinguish PJM from California include: participation in PJM spot markets is voluntary; congestion is addressed via nodal pricing rather than transmission reservations; PJM operates an economically dispatched, security constrained balancing market.

Q.20 MR. SPINNER CALLS THE PJM MARKET MODEL UNTESTED AND INCOMPLETE. DO YOU AGREE?

A.20 No. The PJM Model has certainly been tested since April 1, 1999. I have analyzed the results of that market each year since its inception and have concluded that overall, it has led to competitive results. It is true that the PJM market design continues to evolve. The fact that changes are being made to the market to improve the design by adding new

⁸ See Id. at 45.

markets in ancillary services and by reforming the capacity markets is a positive feature of the PJM markets and of the PJM governance structure.

Q.21 MR. SPINNER ALSO REFERS TO INCOMPLETE RULES CONCERNING THE PROVISION OF CONFIDENTIAL DATA TO STATE COMMISSIONS. WHAT IS THE STATUS OF THAT PROCESS?

A.21 The State Commissions, PJM Members and PJM negotiated a protocol that was approved by FERC on June 28, 2004 and is now in effect.⁹ Under this protocol, Commission staff may, after the execution of appropriate confidentiality documents, obtain confidential market sensitive data from the MMU both orally and in writing. The rules contain deadlines for PJM to provide such data as well as various due process and dispute resolution procedures. The protocol is in effect and we look forward to working with the SCC Staff under this protocol.

Q.22 THE CENTRAL ISSUE IS A COMPARISON OF ALTERNATIVE WAYS TO ORGANIZE WHOLESALE POWER MARKETS. HOW DOES MR. SPINNER'S TESTIMONY BEAR ON THAT QUESTION?

A.22 The fundamental issue is whether an organized transparent wholesale LMP-based market is superior to today's wholesale bilateral market. Regardless of the details of retail regulation, electric utilities participate in wholesale power markets. The goal should be to choose the most efficient way to organize wholesale power markets. Thus the starting point for that analysis needs to be a comparison of the wholesale environment that exists today outside of organized markets and wholesale power markets as organized by PJM.

My view is that an organized, centrally dispatched, security constrained, independently operated, transparent wholesale marketplace is superior to a standalone

bilateral wholesale marketplace. The existence of a liquid market for wholesale power with transparent nodal prices posted on a five-minute basis that reflect the cost of the most efficient resources required to operate the system results from the organization of the PJM centrally dispatched, security constrained model. The ability to redispatch units over a large market footprint increases the efficiency of the market and reduces the chance that an inefficiently large number of economic transactions will be curtailed in order to relieve a constraint. The existence of a PJM wholesale market makes the parallel bilateral markets more efficient. Bilateral markets are an essential part of the wholesale markets in PJM.

Mr. Spinner does not directly address the fundamental issue. Mr. Spinner does not address the fact that each of the concerns he raises, from consideration of environmental externalities to the exercise of market power, exists in the bilateral markets outside of RTO market areas. Although PJM markets are not immune from these issues, the PJM market design and the presence of independent market monitoring provides customers with more protections than exist today with respect to wholesale bilateral markets. PJM wholesale markets are not a substitute for the important work of this Commission and the application of environmental and ratemaking laws. However, PJM wholesale power markets can enhance the wholesale competitive environment for the Commonwealth of Virginia.

Q.23 DOES THAT CONCLUDE YOUR REBUTTAL TESTIMONY?

A.23 Yes.

⁹ PJM Interconnection, L.L.C. 107 FERC ¶ 61,322 (June 28, 2004).

Figure 1

2003	\$15,380	\$53,743	\$5,936	\$3,880	\$25,196	\$63,559	964	2,791
2001	\$44,481	\$74,831	\$36,700	\$3,823	\$85,004	\$115,354	1,373	3,507
1999	\$73,480	\$97,603	\$20,469	\$3,444	\$97,393	\$121,516	1,415	4,199

Figure 2

DPL South: Constrained Hours by Year

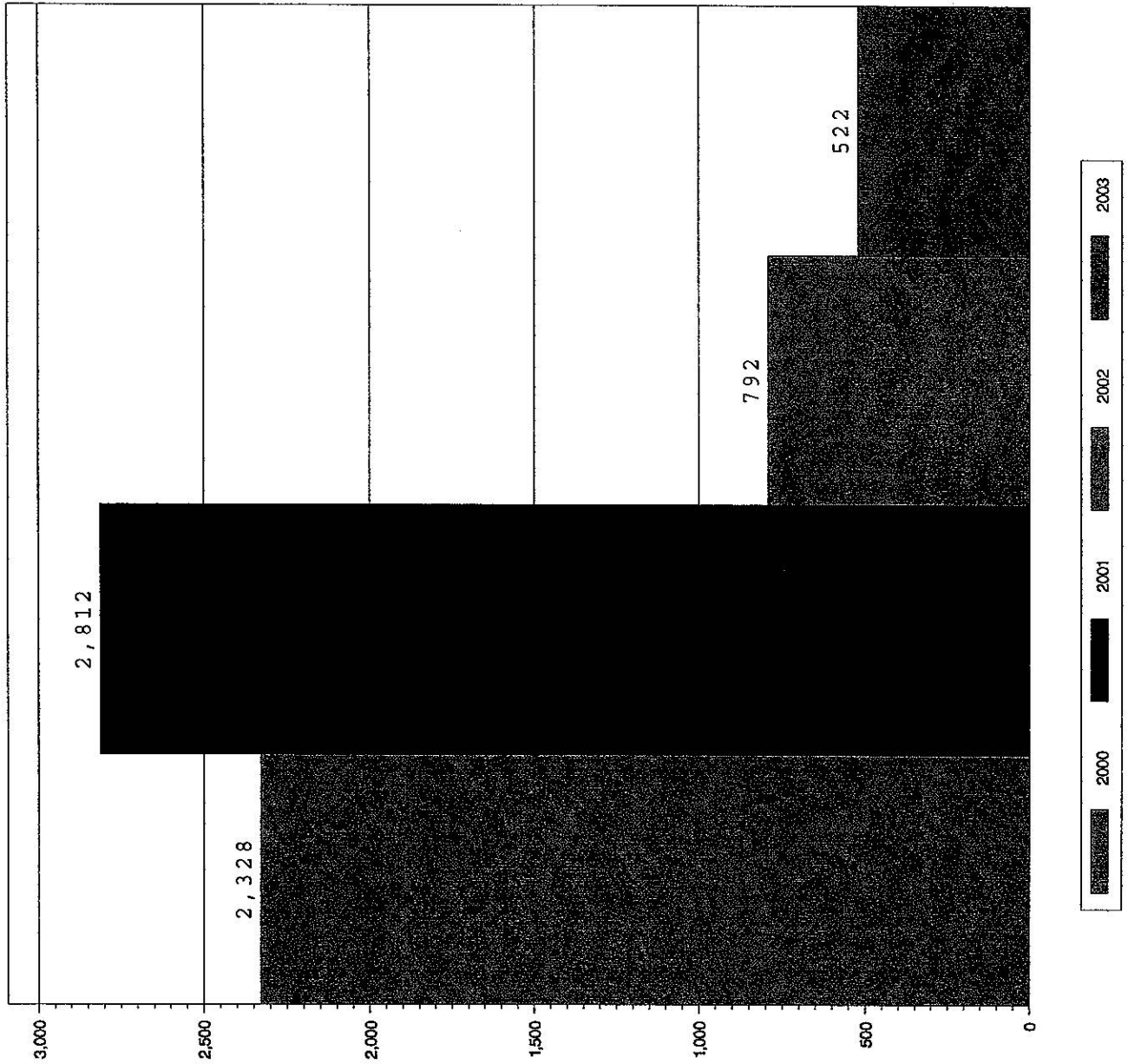


Figure 3

Multi-Year PJM Load-Weighted, Fuel-Cost-Adjusted LMP
Calculated on an April 1 to March 31 Period Basis

	2002/2003	2001/2002	2000/1999	1999/1998	1998/1999
Load Weighted LMP	\$51.93	\$37.16	\$33.25	\$35.40	\$24.38
Load Weighted and Fuel Adjusted LMP	\$23.24	\$21.63	\$18.44	\$30.18	\$24.38
Year over Base Year Comparison (1)	-4.69%	-11.30%	-24.39%	23.78%	

(1) The comparison is between the Load-Weighted, Fuel Adjusted LMP and the Load-Weighted LMP from the 1998 base period.

Figure 4

Burner Tip Average Fuel Price in PJM Natural Gas

