

**STATE OF MARYLAND**  
**BEFORE THE PUBLIC SERVICE COMMISSION**

**In the Matter of the Optimal Structure of the )**  
**Electric Industry of Maryland )**

**Case No. 9063**

**DIRECT TESTIMONY OF**  
**JONATHAN WALLACH**  
**ON BEHALF OF**  
**THE OFFICE OF PEOPLE'S COUNSEL**

Resource Insight, Inc.

**OCTOBER 3, 2006**

1 **I. Introduction**

2 **Q: Please state your name, occupation, and business address.**

3 A: I am Jonathan F. Wallach. I am Vice President of Resource Insight, Inc., 5  
4 Water Street, Arlington, Massachusetts.

5 **Q: Please summarize your professional education and experience.**

6 A: I have worked as a consultant to the electric-power industry for more than  
7 two decades. From 1981 to 1986, I was a research associate at Energy  
8 Systems Research Group. In 1987 and 1988, I was an independent  
9 consultant. From 1989 to 1990, I was a senior analyst at Komanoff Energy  
10 Associates. I have been in my current position at Resource Insight since  
11 September of 1990.

12 Over the last twenty-five years, I have advised clients on a wide range  
13 of economic, planning, and policy issues including: electric-utility  
14 restructuring; wholesale-power market design and operations; transmission  
15 pricing and policy; market valuation of generating assets and purchase  
16 contracts; power-procurement strategies; integrated resource planning; cost  
17 allocation and rate design; and energy-efficiency program design and  
18 planning.

19 My resume is attached as Exhibit JFW-1.

20 **Q: Please summarize your experience with regard to the issue of electric  
21 restructuring in Maryland.**

22 A: In 1997, I co-authored a major study of electric-utility restructuring in  
23 Maryland for the Office of People's Counsel ("OPC"). Since then, I have  
24 advised and testified on behalf of OPC in most of the major proceedings

1 relating to Maryland's restructuring process. I assisted OPC during  
2 settlement negotiations, and testified in support of such settlements, in Case  
3 Nos. 8794, 8795, and 8797 (regarding electric restructuring), 8890 (regarding  
4 the proposed merger of Potomac Electric Power Company and Delmarva  
5 Power & Light to form PEPCo Holdings, Inc. ["PHI"]), and 8908 (regarding  
6 procurement of Standard Offer Service ["SOS"].) I also testified in Case Nos.  
7 8852 (regarding Potomac Electric Power Company's proposed fees for  
8 electricity-supplier services), 8994 and 8995 (regarding determination of the  
9 residential SOS Administrative Charge), and 8985 (regarding Southern  
10 Maryland Electric Coop's SOS procurement plan). Most recently, I testified  
11 in Case No. 9052 regarding proposals to transition Baltimore Gas &  
12 Electric's ("BGE") residential customers to market-based SOS rates, and  
13 Case No. 9056 regarding default service for Type II customers. Finally, on  
14 OPC's behalf, I have monitored the SOS procurement process in every year  
15 since its inception.

16 **Q: On whose behalf are you testifying?**

17 A: I am testifying on behalf of the Office of the People's Counsel.

18 **Q: What is the purpose of your testimony?**

19 A: In accordance with the Commission's Notice of Procedural Schedule of  
20 August 3, 2006, this testimony: (1) discusses the current approach for  
21 procuring full-requirements contracts for serving residential SOS load, that  
22 approach having been developed in the context of the statutory requirements  
23 in place at that time; (2) describes the effects of that approach on residential  
24 SOS prices and market performance; and (3) discusses alternative  
25 procurement strategies.

1 People's Counsel is also sponsoring testimony from Ms. Barbara  
2 Alexander. Ms. Alexander's testimony describes the new policies set forth in  
3 recently enacted Senate Bill 1 concerning SOS procurement for residential  
4 and small commercial customers, and makes recommendations on how to  
5 implement those policies.

## 6 **II. Current Procurement Approach**

7 **Q: Please describe the current approach used to procure contracts to serve**  
8 **residential SOS load.**

9 A: In accordance with the Phase I and II settlement agreements in Case No.  
10 8908 (as codified in regulation), utilities have procured a mix of one-, two-,  
11 and three-year contracts for full-requirements service through a competitive  
12 bidding process. Under this approach, bidders may offer prices that vary by  
13 season and by contract year.

14 The 8908 settlement agreements require that utilities attempt to  
15 maintain a set percentage mix of one-, two-, and three-year contracts for at  
16 least three years. Specifically, the Phase I settlement agreement provides that  
17 50% of residential SOS load will be met with one-year contracts, 25% with  
18 two-year contracts, and 25% with three-year contracts.

19 These overall percentage targets, in turn, determine the mix of contract  
20 durations procured in each year of bidding. For example, in its first year of  
21 bidding under the current approach, PEPCo procured a mix of approximately  
22 50% one-year contracts, 25% two-year contracts, and 25% three-year  
23 contracts. In the second year, PEPCo simply procured one-year contracts to  
24 replace the expiring one-year contracts that had been procured in the first  
25 year. In the third year, completed this past February, PEPCo procured one-

1 and two-year contracts as replacements for the one-year contracts procured  
2 last year and the two-year contracts procured in the first year of bidding. As a  
3 result, PEPCo maintained in all three years the 50% / 25% / 25% mix  
4 stipulated in the Phase I settlement agreement.

5 Because of the four-year term of the 8908 settlement agreements, under  
6 the current approach, this 50% / 25% / 25% mix will not be maintained in the  
7 fourth year of procurement. Instead, utilities will procure one-year contracts  
8 for 75% of the load, resulting in a 75% / 25% / 0% mix. In the fifth year,  
9 100% of the residential SOS load will be exposed to new-contract re-pricing.

10 **Q: What was the benefit to residential customers of this procurement**  
11 **approach?**

12 A: At the time that it was adopted, this approach appeared to offer a partial  
13 hedge against the risk of future price volatility by locking in the price to  
14 supply a portion of the SOS requirement in the second and third year. In  
15 essence, the intent was to dampen price changes by limiting the amount of  
16 new contracts at prevailing market prices that would need to be procured in  
17 each year of bidding.

18 **Q: Have consumers actually benefited with multi-year contracts as opposed**  
19 **to one-year contracts?**

20 A: Judging from PEPCo's experience over the last three years, retail generation  
21 prices appear to have increased more slowly under the current approach than  
22 they might have if PEPCo had purchased solely one-year contracts over that  
23 same period.

24 The impact of mixed-duration contracts is illustrated in the following  
25 table, which compares two simulations of average annual retail generation  
26 prices for PEPCo's residential customers. These simulations assume all

1 contracts procured by PEPCo in the last three years were priced at PJM on-  
 2 peak forward prices prevailing at the time of contract award.<sup>1</sup> I simulated  
 3 proxy generation prices for two different procurement approaches: (1)  
 4 assuming the same bundle of mixed-duration contracts as actually procured  
 5 over the last three years; and (2) assuming procurement of one-year contracts  
 6 in each year. As shown in the table, the simulation results indicate that price  
 7 increases would have been sharper than experienced if SOS load were served  
 8 with one-year contracts.

Delivery Period	Mixed-Duration Contract Proxy (¢/kWh)	Cumulative Increase	One-Year Contract Proxy (¢/kWh)	Cumulative Increase
7/04-5/05	4.77		4.77	
6/05-5/06	5.23	9.6%	5.76	20.6%
6/06-5/07	7.65	60.3%	8.63	80.8%

11 **Q: Have there been any adverse impacts from the current procurement**  
 12 **approach?**

13 A: Yes. The current approach has exposed consumers to unreasonable price  
 14 increases. For example, PEPCo's retail generation prices increased seven  
 15 percent from 2004 to 2005 and then jumped by almost sixty percent from  
 16 2005 to 2006. Two factors contributed to these sharp increases. First, per the  
 17 terms of the Phase I settlement agreement, the amount of load exposed to  
 18 market re-pricing has grown to the point where PEPCo was replacing

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<sup>1</sup> Although contract prices for full-requirements service will reflect costs other than for on-peak forwards, changes in on-peak forward prices are primary drivers of movements in such contract prices.

1 contracts equivalent to 75% of residential SOS load by the third year of  
2 bidding. Second, as discussed below, developments in PJM's markets are  
3 driving changes in price levels and volatility for short-term full-requirements  
4 contracts (including those procured under the current approach.)

5 **Q: What are the likely wholesale-market drivers of these price increases?**

6 A: There have been a number of developments in PJM's spot markets that have  
7 contributed to SOS price trends, either by directly increasing commodity  
8 costs or by increasing risk premiums associated with full-requirements  
9 contracting. These developments include:

- 10 • A growing reliance on natural gas as the marginal fuel, along with  
11 unprecedented increases in gas prices and price volatility over the last  
12 few years.
- 13 • Rising congestion costs, due to rising marginal fuel prices and the  
14 failure of merchant generation or transmission investors to invest in  
15 projects to relieve congestion in response to spot price signals.
- 16 • A radical restructuring of PJM's installed-capacity market that, once  
17 implemented, is expected to significantly increase capacity costs.
- 18 • The implementation of scarcity-pricing rules, including exemptions on  
19 market mitigation, increasing the risk of higher prices and greater price  
20 volatility during high-load hours.

21 These market developments have increased both spot-market price  
22 levels and price risk over the last few years. These spot-price trends have  
23 driven trends in the forward markets, which, in turn, have increased the costs  
24 and exacerbated the risks associated with providing full-requirements  
25 service.

1 **Q: Why are gas prices driving price levels and volatility in electric markets?**

2 A: Natural gas is the predominant “marginal fuel” in the PJM spot market. In  
3 other words, prices in PJM’s energy market are set by gas-fired generators in  
4 a substantial number of on-peak hours, even though gas-fired generation  
5 represents a minor share of total energy production.<sup>2</sup> According to PJM’s  
6 Market Monitoring Unit, in 2005, units fueled by natural gas were the  
7 marginal unit 26% of the time, yet represented only 6% of total PJM  
8 generation in that year.<sup>3</sup> As a result, forward electric prices, which reflect  
9 expectations regarding future spot prices, tend to also follow natural-gas  
10 prices.

11 This effect is illustrated in Exhibits JFW-2 and JFW-3, which compare  
12 daily closing prices for PJM on-peak forwards against daily closing prices for  
13 Henry Hub natural gas forwards. For both the electric and gas forwards,  
14 Exhibit JFW-2 shows for each trading day in 2005 the closing price for the  
15 twelve-month strip for calendar-year 2006.<sup>4</sup> Exhibit JFW-2 shows the  
16 extremely tight correlation between gas and electric forward prices. Using the  
17 closing-price data shown in Exhibit JFW-2, Exhibit JFW-3 provides the  
18 percentage change in daily closing prices relative to the previous day’s  
19 closing price. Exhibit JFW-3 further illustrates the close correlation between

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<sup>2</sup> As noted above, gas prices are not the sole driver of PJM spot-price levels and volatility. In fact, in 2005, PJM Western Hub daily spot prices were significantly more volatile than Henry Hub daily spot prices.

<sup>3</sup> PJM Interconnection, LLC, *2005 State of the Market Report*, March 8, 2006, Table 2-18, p. 86 and Figure 3-5, p. 136.

<sup>4</sup> For each trading day, Exhibit JFW-2 provides the average of that day’s twelve closing prices for the twelve monthly forward contracts for 2006.



1 gas- and electric-forward price changes, as well as the noticeable increase in  
2 daily price volatility in both markets following Hurricanes Katrina and Rita.

3 The correlation between gas prices and prices for short-term full-  
4 requirements contracts is illustrated in the following table, which compares  
5 PEPCo's actual average annual retail generation prices against a simulation  
6 of such prices assuming all contracts were priced at Henry Hub forward  
7 prices prevailing at the time of contract award. As with the simulation  
8 analysis discussed above, I simulated generation prices in this case assuming  
9 the same bundle of mixed-duration contracts as actually procured over the  
10 last three years. As indicated in the table, increases in retail generation rates –  
11 and the underlying short-term contracts – have closely tracked increases in  
12 forward gas prices over the last three years.

13

Delivery Period	PEPCo Residential Generation Rate (¢/kWh)	Cumulative Increase	Mixed-Duration Contract Proxy (\$/MMBtu)	Cumulative Increase
7/04-5/05	5.68		5.39	
6/05-5/06	6.08	7.0%	5.89	9.4%
6/06-5/07	9.67	70.2%	8.79	63.1%

14  
15 **Q: Does the current procurement approach offer adequate protection**  
16 **against the types of changes in market conditions discussed above?**

17 A: No. Under the current approach, procurement in any year is spread across  
18 three rounds of bidding or “tranches”, with each tranche scheduled about a  
19 month apart in time. Spreading procurement over a three-month period  
20 reduces the risk that offer prices will be affected by transitory adverse  
21 movements in market prices. However, this multi-tranche approach offers no

1 protection against longer-term changes in market conditions like those  
2 experienced in PJM.

3 **Q: Have these developments in PJM's spot markets heightened the risks**  
4 **associated with providing full-requirements service?**

5 A: Yes. Suppliers of full-requirements service assume all price- and volume-  
6 related risk associated with serving residential SOS load. These  
7 developments – e.g., increased gas prices and volatility, increased congestion  
8 costs – amplify the consequences of unanticipated movements in spot prices  
9 or changes in load.

10 Potential suppliers of full-requirements service are likely to respond to  
11 this enhanced risk by either increasing risk premiums on price offers or by  
12 declining to participate in the bidding process.

13 **Q: Is there any indication that this increase in supplier risk has affected**  
14 **bidding for residential full-requirements service?**

15 A: From the second year to the third year of bidding, there was a dramatic  
16 decline in the number of suppliers participating in the solicitation and in the  
17 number of price offers by participating suppliers. Although I am unable to  
18 determine the cause, this decline coincided with a jump in gas and electric  
19 forward price levels and volatility, and followed a period of time where  
20 congestion costs in PJM were much greater than had been anticipated.  
21 Regardless of cause, a decline in participation of this magnitude raises  
22 concerns regarding the competitiveness of price offers.

1 **III. Alternative Procurement Strategies**

2 **Q: Given the apparent correlation between gas prices and pricing of short-**  
3 **term full-requirements contracts, how can the current procurement**  
4 **approach be modified to reduce consumers' exposure to gas-price**  
5 **volatility?**

6 A: The tight linkage between natural-gas and SOS prices can be loosened by: (1)  
7 reducing the reliance on short-term full-requirements contracts to serve SOS  
8 load (such as those procured under the current approach); and (2)  
9 diversifying or staggering contract durations for those full-requirements  
10 contracts included in the SOS supply portfolio. Broadening the SOS supply  
11 portfolio to include longer-term supply and demand resources should move  
12 SOS prices away from the volatile gas-driven margin and toward more-stable  
13 cost-based levels. Such long-term options include direct investment, baseload  
14 or intermediate bilateral fixed-block contracts, unit-contingent contracts,  
15 slice-of-system purchases, demand-response and energy-efficiency resources,  
16 peaking capacity and energy contracts, tolling agreements, financial  
17 derivatives, options, and other financial products. Diversifying or staggering  
18 contract durations for full-requirement contracts should dampen price  
19 volatility by limiting the amount of new contracts at prevailing market prices  
20 that need to be procured at any one time.

21 **Q: Why might a longer-term contract or investment be priced at a discount**  
22 **to expected market prices?**

23 A: Longer-term contracts or investments provide a valuable long-term hedge  
24 that is not currently available to generation owners through organized  
25 forward markets. Longer-term contracts or direct investment in new  
26 resources provide long-term revenue stability and certainty to project

1 developers, potentially reducing financing costs and thus cost of service. In  
2 addition, long-term contracts or direct investment shift price risk, and  
3 perhaps other risks, from sellers to buyers, creating incentives for sellers to  
4 reduce the margin between market price and cost of service.

5 Direct investment is the clearest example of this relationship between  
6 risk allocation and price. For example, ownership or control of a baseload  
7 asset implies that the output of that asset will be priced at cost, rather than at  
8 a spot- or forward-market price established by a more expensive marginal  
9 resource. However, this benefit comes at the cost of increased risk. Investors  
10 assume risks associated with the finance and construction of a generating  
11 facility, as well as the fuel, maintenance, outage, and other risks associated  
12 with plant operation. Ultimately, investors assume the risk that the  
13 investment will not be economically beneficial over the life of the asset.<sup>5</sup>

14 **Q: Will reliance on long-term contracts lead to abrupt price changes when**  
15 **those contracts expire?**

16 A: No. Even though a long-term contract may be priced below market, that does  
17 not mean that consumers will be exposed to an abrupt transition to market  
18 price when that contract expires. Long-term contracts should be considered  
19 as part of a diverse portfolio of contracts and investments that dampens price  
20 volatility by minimizing reliance on any one resource type or contract term.  
21 Thus, a diverse portfolio avoids abrupt price changes by ensuring that only a  
22 small portion of the portfolio rolls over at one time. This diversification  
23 should reduce the likelihood of a repeat of the BGE “perfect storm”, where  
24 the start-up of market-based SOS procurement, requiring procurement for

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<sup>5</sup> Even if the investment is more expensive on average than spot purchases over the life of the asset, it still provides a hedge against spot-price volatility.

1 100% of residential load, coincided with an unprecedented run-up of market  
2 prices.

3 **Q: Are you suggesting that an SOS portfolio should consist solely of long-**  
4 **term contracts?**

5 A: No. A portfolio procurement strategy should avoid putting all the eggs in one  
6 basket, whether that “basket” is short-term full-requirements contracts, as  
7 under the current approach, or long-term contracts. Instead, the objective  
8 should be to layer a mix of short- and long-term assets and contracts that  
9 minimize costs and avoid excessive price swings.

10 I provide an illustration of this type of layered approach in Exhibit  
11 JFW-4, which reproduces a chart from a newly released report from the  
12 Office of Ohio Consumers’ Counsel.<sup>6</sup> As indicated in Exhibit JFW-4, this  
13 illustrative portfolio relies on a balanced mix of short-term full-requirements  
14 contracts, short- and long-term baseload and intermediate contracts, and  
15 renewable resources.<sup>7</sup>

16 **Q: Why not simply procure a mix of short-term (three years or less) and**  
17 **long-term full requirements contracts to serve residential SOS load?**

18 A: Given the substantial price risk, it is unlikely that suppliers would be willing  
19 to offer at a reasonable price, if at all, full-requirements contracts for a longer  
20 term than currently procured. Suppliers would need to assess a substantial

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<sup>6</sup> A copy of this report is included with this testimony as Attachment 1.

<sup>7</sup> The resources shown in Exhibit JFW-4 by no means comprise the universe of resource options. As noted above, other options include direct investment, unit-contingent contracts, slice-of-system purchases, demand-response and energy-efficiency resources, peaking capacity and energy contracts, tolling agreements, financial derivatives, options, and other financial products.

1 risk premium to compensate for assuming essentially unhedgable spot-price  
2 (for expected spot purchases), volumetric (for unanticipated spot purchases),  
3 and congestion risk over the term of the contract.<sup>8</sup>

4 **Q: Are there other benefits from long-term contracting other than price**  
5 **stabilization?**

6 A: Yes. Long-term purchase contracts provide the level of revenue certainty  
7 that developers need to finance capital-intensive resources in the post-Enron  
8 wholesale markets. As such, long-term contracting can serve as a powerful  
9 policy tool for promoting investment in preferred generation or demand-side  
10 resources, and for facilitating investments in resources needed to ensure  
11 reliable electricity supply.

12 As is now widely recognized by market participants, Enron's collapse,  
13 and the ensuing loss of market liquidity, precipitated a retrenchment of the  
14 capital markets and a refocusing on industry fundamentals and long-term  
15 revenue certainty. In a recent article in *Public Utilities Fortnightly*, Larry  
16 Kellerman of Goldman Sachs described this paradigm shift in the capital  
17 markets as follows:

18 One might argue that those kinds of long-term "merchant" capital  
19 investments were, in the recent past at least, made by firms on the basis  
20 of a combination of short-dated market signals and long-term consultant  
21 projections of forward markets. The short-lived period of investment  
22 euphoria from 1997 to 2001 recklessly burned through scores of billions  
23 of dollars of wasted capital, bankrupting many firms and seriously  
24 hobbling previously strong enterprises. More important for the future, it  
25 taught a durable lesson to the capital markets to be much more guarded

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<sup>8</sup> Suppliers may eventually be able to hedge long-term congestion risk using Long-Term Auction Revenue Rights.

1 and risk-conscious in any new capital being purportedly committed to  
2 take advantage of current or impending capacity shortfalls.<sup>9</sup>

3 Mr. Kellerman highlights the implications of this “durable lesson” for  
4 project investors:

5 For new construction, it takes three years to site, permit, and build a gas-  
6 fired plant today – much more for solid fuel and many renewable  
7 projects.... These kinds of investments are not going to be made without  
8 some degree of long-dated revenue visibility. That long-dated revenue  
9 visibility is best provided through long-dated, contractually based  
10 capacity payment streams.<sup>10</sup>

11 At a FERC technical conference in 2004, Jonathan Baliff of Credit  
12 Suisse First Boston offered a similar perspective from the vantage point of an  
13 investment banker for a generation project:

14 The debt investors will not take market risk right now.... So we need to  
15 have a contract. That was almost a necessary but not a sufficient  
16 condition to get this financed and you need to have a credit-worthy off  
17 take.

18 We want to see somebody like a Con Ed, who is an A rated entity come  
19 in and give us a nice 10 year contract. I’m not going to get into the  
20 details of what that contract is but, for the most part, it needs to create a  
21 stable cash flow stream.<sup>11</sup>

22 Long-term contracts can provide the type of revenue stability and  
23 certainty that developers need to attract debt financing for new construction  
24 (or major upgrades to existing plant.) The long-term revenue certainty  
25 afforded with these contracts may also reduce a project’s overall cost of  
26 capital. As explained by Frank Napolitano of Lehman Brothers at the 2004  
27 FERC technical conference:

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<sup>9</sup> Larry Kellerman, “Mending Our Broken Capacity Markets”, *Public Utilities Fortnightly*, June 2006, p. 61.

<sup>10</sup> *Id.*, p. 60.

<sup>11</sup> *Transcript*, FERC Docket No. PL04-2-000, February 4, 2004, pp. 152-153.

1           The contract would mitigate risks that are the unknowns, therefore, the  
2           equity capital that will flow against a debt to round out the capital  
3           structure will inherently have less risk, and therefore, should  
4           theoretically charge less of a return. That's a way of bringing low-cost  
5           resources. Maybe that's not the preferred way, but it certainly is a way  
6           of bringing low-cost resources and assets into the marketplace.<sup>12</sup>

7   **Q: Will PJM's proposal to restructure its capacity market provide the long-**  
8   **term revenue certainty needed to promote capacity investments?**

9   A: No. PJM's proposed Reliability Pricing Model ("RPM") will transform the  
10   capacity market from a spot to a forward market, locking in capacity  
11   revenues (and providing price signals) four years in advance of delivery.  
12   However, the annual RPM auctions will lock in prices for only one year at a  
13   time, thus providing only one-year's worth of revenue certainty. While  
14   RPM's forward commitment of a year of capacity revenues provides more  
15   certainty than today's daily capacity markets, it does not provide the long-  
16   term price certainty and stability that market participants indicate is  
17   necessary to finance capacity investments. Long-term contracts between  
18   utilities and project developers can fill this gap, enabling financing and  
19   construction of assets whenever and wherever needed.

20   **Q: Does this conclude your testimony?**

21   A: Yes.

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<sup>12</sup> *Id.*, p. 22.



## Exhibit JFW-1

Qualifications of  
**JONATHAN F. WALLACH**

Resource Insight, Inc.  
5 Water Street  
Arlington, Massachusetts 02476

### SUMMARY OF PROFESSIONAL EXPERIENCE

- 1990–Present* **Vice President, Resource Insight, Inc.** Provides research, technical assistance, and expert testimony on electric- and gas-utility planning, economics, regulation, and restructuring. Designs and assesses resource-planning strategies for regulated and competitive markets, including estimation of market prices and utility-plant stranded investment; negotiates restructuring strategies and implementation plans; assists in procurement of retail power supply.
- 1989–90* **Senior Analyst, Komanoff Energy Associates.** Conducted comprehensive cost-benefit assessments of electric-utility power-supply and demand-side conservation resources, economic and financial analyses of independent power facilities, and analyses of utility-system excess capacity and reliability. Provided expert testimony on statistical analysis of U.S. nuclear plant operating costs and performance. Co-wrote *The Power Analyst*, software developed under contract to the New York Energy Research and Development Authority for screening the economic and financial performance of non-utility power projects.
- 1987–88* **Independent Consultant.** Provided consulting services for Komanoff Energy Associates (New York, New York), Schlissel Engineering Associates (Belmont, Massachusetts), and Energy Systems Research Group (Boston, Massachusetts).
- 1981–86* **Research Associate, Energy Systems Research Group.** Performed analyses of electric utility power supply planning scenarios. Involved in analysis and design of electric and water utility conservation programs. Developed statistical analysis of U.S. nuclear plant operating costs and performance.

### EDUCATION

BA, Political Science with honors and Phi Beta Kappa, University of California, Berkeley, 1980.

Massachusetts Institute of Technology, Cambridge, Massachusetts. Physics and Political Science, 1976–1979.

### PUBLICATIONS

“The Future of Utility Resource planning: Delivering Energy Efficiency through Distributed Utilities” (with Paul Chernick), *International Association for Energy Economics Seventeenth Annual North American Conference* (460–469). Cleveland, Ohio: USAEE. 1996.

“The Price is Right: Restructuring Gain from Market Valuation of Utility Generating Assets” (with Paul Chernick), *International Association for Energy Economics Seventeenth Annual North American Conference* (345–352). Cleveland, Ohio: USAEE. 1996.

“The Future of Utility Resource Planning: Delivering Energy Efficiency through Distribution Utilities” (with Paul Chernick), *1996 Summer Study on Energy Efficiency in Buildings* 7(7.47–7.55). Washington: American Council for an Energy-Efficient Economy, 1996.

“The Transfer Loss is All Transfer, No Loss” (with Paul Chernick), *Electricity Journal* 6:6 (July, 1993).

“Benefit-Cost Ratios Ignore Interclass Equity” (with Paul Chernick et al.), *DSM Quarterly*, Spring 1992.

“Consider Plant Heat Rate Fluctuations,” *Independent Energy*, July/August 1991.

“Demand-Side Bidding: A Viable Least-Cost Resource Strategy” (with Paul Chernick and John Plunkett), *Proceedings from the NARUC Biennial Regulatory Information Conference*, September 1990.

“New Tools on the Block: Evaluating Non-Utility Supply Opportunities With *The Power Analyst*,” (with John Plunkett), *Proceedings of the Fourth National Conference on Microcomputer Applications in Energy*, April 1990.

## **REPORTS**

“First Year of SOS Procurement.” 2004. Prepared for the Maryland Office of People’s Counsel.

“Energy Plan for the City of New York” (with Paul Chernick, Susan Geller, Brian Tracey, Adam Auster, and Peter Lanzalotta). 2003. New York: New York City Economic Development Corporation.

“Peak-Shaving–Demand-Response Analysis: Load Shifting by Residential Customers” (with Brian Tracey). 2003. Barnstable, Mass.: Cape Light Compact.

“Electricity Market Design: Incentives for Efficient Bidding; Opportunities for Gaming.” 2002. Silver Spring, Maryland: National Association of State Consumer Advocates.

“Best Practices in Market Monitoring: A Survey of Current ISO Activities and Recommendations for Effective Market Monitoring and Mitigation in Wholesale Electricity Markets” (with Paul Peterson, Bruce Biewald, Lucy Johnston, and Etienne Gonin). 2001. Prepared for the Maryland Office of People’s Counsel, Pennsylvania Office of Consumer Advocate, Delaware Division of the Public Advocate, New Jersey Division of the Ratepayer Advocate, Office of the People’s Counsel of the District of Columbia.

“Comments Regarding Retail Electricity Competition.” 2001. Filed by the Maryland Office of People’s Counsel in U.S. FTC Docket No. V010003.

“Final Comments of the City of New York on Con Edison’s Generation Divestiture Plans and Petition.” 1998. Filed by the City of New York in PSC Case No. 96-E-0897.

“Response Comments of the City of New York on Vertical Market Power.” 1998. Filed by the City of New York in PSC Case Nos. 96-E-0900, 96-E-0098, 96-E-0099, 96-E-0891, 96-E-0897, 96-E-0909, and 96-E-0898.

“Preliminary Comments of the City of New York on Con Edison’s Generation Divestiture Plan and Petition.” 1998. Filed by the City of New York in PSC Case No. 96-E-0897.

“Maryland Office of People’s Counsel’s Comments in Response to the Applicants’ June 5, 1998 Letter.” 1998. Filed by the Maryland Office of People’s Counsel in PSC Docket No. EC97-46-000.

“Economic Feasibility Analysis and Preliminary Business Plan for a Pennsylvania Consumer’s Energy Cooperative” (with John Plunkett et al.). 1997. 3 vols. Philadelphia, Penn.: Energy Coordinating Agency of Philadelphia.

“Good Money After Bad” (with Charles Komanoff and Rachel Brailove). 1997. White Plains, N.Y.: Pace University School of Law Center for Environmental Studies.

“Maryland Office of People’s Counsel’s Comments on Staff Restructuring Report: Case No. 8738.” 1997. Filed by the Maryland Office of People’s Counsel in PSC Case No. 8738.

“Protest and Request for Hearing of Maryland Office of People’s Counsel.” 1997. Filed by the Maryland Office of People’s Counsel in PSC Docket Nos. EC97-46-000, ER97-4050-000, and ER97-4051-000.

“Restructuring the Electric Utilities of Maryland: Protecting and Advancing Consumer Interests” (with Paul Chernick, Susan Geller, John Plunkett, Roger Colton, Peter Bradford, Bruce Biewald, and David Wise). 1997. Baltimore, Maryland: Maryland Office of People’s Counsel.

“Comments of the New Hampshire Office of Consumer Advocate on Restructuring New Hampshire’s Electric-Utility Industry” (with Bruce Biewald and Paul Chernick). 1996. Concord, N.H.: NH OCA.

“Estimation of Market Value, Stranded Investment, and Restructuring Gains for Major Massachusetts Utilities” (with Paul Chernick, Susan Geller, Rachel Brailove, and Adam Auster). 1996. On behalf of the Massachusetts Attorney General (Boston).

“Report on Entergy’s 1995 Integrated Resource Plan.” 1996. On behalf of the Alliance for Affordable Energy (New Orleans).

“Preliminary Review of Entergy’s 1995 Integrated Resource Plan.” 1995. On behalf of the Alliance for Affordable Energy (New Orleans).

“Comments on NOPSI and LP&L’s Motion to Modify Certain DSM Programs.” 1995. On behalf of the Alliance for Affordable Energy (New Orleans).

“Demand-Side Management Technical Market Potential Progress Report.” 1993. On behalf of the Legal Environmental Assistance Foundation (Tallahassee)

“Technical Information.” 1993. Appendix to “Energy Efficiency Down to Details: A Response to the Director General of Electricity Supply’s Request for Comments on Energy Efficiency Performance Standards” (UK). On behalf of the Foundation for International Environmental Law and Development and the Conservation Law Foundation (Boston).

“Integrating Demand Management into Utility Resource Planning: An Overview.” 1993. Vol. 1 of “From Here to Efficiency: Securing Demand-Management Resources” (with Paul Chernick and John Plunkett). Harrisburg, Pa.: Pennsylvania Energy Office

“Making Efficient Markets.” 1993. Vol. 2 of “From Here to Efficiency: Securing Demand-Management Resources” (with Paul Chernick and John Plunkett). Harrisburg, Pa.: Pennsylvania Energy Office.

“Analysis Findings, Conclusions, and Recommendations.” 1992. Vol. 1 of “Correcting the Imbalance of Power: Report on Integrated Resource Planning for Ontario Hydro” (with Paul Chernick and John Plunkett).

“Demand-Management Programs: Targets and Strategies.” 1992. Vol. 1 of “Building Ontario Hydro’s Conservation Power Plant” (with John Plunkett, James Peters, and Blair Hamilton).

“Review of the Elizabethtown Gas Company’s 1992 DSM Plan and the Demand-Side Management Rules” (with Paul Chernick, John Plunkett, James Peters, Susan Geller, Blair Hamilton, and Andrew Shapiro). 1992. Report to the New Jersey Department of Public Advocate.

“Comments of Public Interest Intervenors on the 1993–1994 Annual and Long-Range Demand-Side Management and Integrated Resource Plans of New York Electric Utilities” (with Ken Keating et al.) 1992.

“Review of Jersey Central Power & Light’s 1992 DSM Plan and the Demand-Side Management Rules” (with Paul Chernick et al.). 1992. Report to the New Jersey Department of Public Advocate.

“Review of Rockland Electric Company’s 1992 DSM Plan and the Demand-Side Management Rules” (with Paul Chernick et al.). 1992.

“Initial Review of Ontario Hydro’s Demand-Supply Plan Update” (with David Argue et al.). 1992.

“Comments on the Utility Responses to Commission’s November 27, 1990 Order and Proposed Revisions to the 1991–1992 Annual and Long Range Demand Side Management Plans” (with John Plunkett et al.). 1991.

“Comments on the 1991–1992 Annual and Long Range Demand-Side-Management Plans of the Major Electric Utilities” (with John Plunkett et al.). Filed in NY PSC Case No. 28223 in re New York utilities’ DSM plans. 1990.

“Profitability Assessment of Packaged Cogeneration Systems in the New York City Area.” 1989. Principal investigator.

“Statistical Analysis of U.S. Nuclear Plant Capacity Factors, Operation and Maintenance Costs, and Capital Additions.” 1989.

“The Economics of Completing and Operating the Vogtle Generating Facility.” 1985. ESRG Study No. 85-51A.

“Generating Plant Operating Performance Standards Report No. 2: Review of Nuclear Plant Capacity Factor Performance and Projections for the Palo Verde Nuclear Generating Facility.” 1985. ESRG Study No. 85-22/2.

“Cost-Benefit Analysis of the Cancellation of Commonwealth Edison Company’s Braidwood Nuclear Generating Station.” 1984. ESRG Study No. 83-87.

“The Economics of Seabrook 1 from the Perspective of the Three Maine Co-owners.” 1984. ESRG Study No. 84-38.

“An Evaluation of the Testimony and Exhibit (RCB-2) of Dr. Robert C. Bushnell Concerning the Capital Cost of Fermi 2.” 1984. ESRG Study No. 84-30.

“Electric Rate Consequences of Cancellation of the Midland Nuclear Power Plant.” 1984. ESRG Study No. 83-81.

“Power Planning in Kentucky: Assessing Issues and Choices—Project Summary Report to the Public Service Commission.” 1984. ESRG Study No. 83-51.

“Electric Rate Consequences of Retiring the Robinson 2 Nuclear Plant.” 1984. ESRG Study No. 83-10.

“Power Planning in Kentucky: Assessing Issues and Choices—Conservation as a Planning Option.” 1983. ESRG Study No. 83-51/TR III.

“Electricity and Gas Savings from Expanded Public Service Electric and Gas Company Conservation Programs.” 1983. ESRG Study No. 82-43/2.

“Long Island Without the Shoreham Power Plant: Electricity Cost and System Planning Consequences; Summary of Findings.” 1983. ESRG Study No. 83-14S.

“Long Island Without the Shoreham Power Plant: Electricity Cost and System Planning Consequences; Technical Report B—Shoreham Operations and Costs.” 1983. ESRG Study No. 83-14B.

“Customer Programs to Moderate Demand Growth on the Arizona Public Service Company System: Identifying Additional Cost-Effective Program Options.” 1982. ESRG Study No. 82-14C.

“The Economics of Alternative Space and Water Heating Systems in New Construction in the Jersey Central Power and Light Service Area, A Report to the Public Advocate.” 1982. ESRG Study No. 82-31.

“Review of the Kentucky-American Water Company Capacity Expansion Program, A Report to the Kentucky Public Service Commission.” 1982. ESRG Study No. 82-45.

“Long Range Forecast of Sierra Pacific Power Company Electric Energy Requirements and Peak Demands, A Report to the Public Service Commission of Nevada.” 1982. ESRG Study No. 81-42B.

“Utility Promotion of Residential Customer Conservation, A Report to Massachusetts Public Interest Research Group.” 1981. ESRG Study No. 81-47

## **PRESENTATIONS**

“Electricity Market Design: Incentives for Efficient Bidding, Opportunities for Gaming.” NASUCA Northeast Market Seminar, Albany, N.Y., February 2001.

“Direct Access Implementation: The California Experience.” Presentation to the Maryland Restructuring Technical Implementation Group on behalf of the Maryland Office of People’s Counsel. June 1998.

“Reflecting Market Expectations in Estimates of Stranded Costs,” speaker, and workshop moderator of “Effectively Valuing Assets and Calculating Stranded Costs.” Conference sponsored by International Business Communications, Washington, D.C., June 1997.

## **EXPERT TESTIMONY**

1989 **Mass. DPU** on behalf of the Massachusetts Executive Office of Energy Resources. Docket No. 89-100. Joint testimony with Paul Chernick relating to statistical analysis of U.S. nuclear-plant capacity factors, operation and maintenance costs, and capital additions; and to projections of capacity factor, O&M, and capital additions for the Pilgrim nuclear plant.

1994 **NY PSC** on behalf of the Pace Energy Project, Natural Resources Defense Council, and Citizen’s Advisory Panel. Case No. 93-E-1123. Joint testimony with John Plunkett critiques proposed modifications to Long Island Lighting Company’s DSM programs from the perspective of least-cost-planning principles.

1994 **Vt. PSB** on behalf of the Vermont Department of Public Service. Docket No. 5270-CV-1 and 5270-CV-3. Testimony and rebuttal testimony discusses rate and bill effects from DSM spending and sponsors load shapes for measure- and program-screening analyses.

1996 **New Orleans City Council** on behalf of the Alliance for Affordable Energy. Docket Nos. UD-92-2A, UD-92-2B, and UD-95-1. Rates, charges, and integrated resource planning for Louisiana Power & Lights and New Orleans Public Service, Inc.

- 1996 **New Orleans City Council** Docket Nos. UD-92-2A, UD-92-2B, and UD-95-1. Rates, charges, and integrated resource planning for Louisiana Power & Lights and New Orleans Public Service, Inc.; Alliance for Affordable Energy. April, 1996.
- Prudence of utilities' IRP decisions; costs of utilities' failure to follow City Council directives; possible cost disallowances and penalties; survey of penalties for similar failures in other jurisdictions.
- 1998 **Massachusetts Department of Telecommunications and Energy** Docket No. 97-111, Commonwealth Energy proposed restructuring; Cape Cod Light Compact. Joint testimony with Paul Chernick, January, 1998.
- Critique of proposed restructuring plan filed to satisfy requirements of the electric-utility restructuring act of 1997. Failure of the plan to foster competition and promote the public interest.
- Massachusetts Department of Telecommunications and Energy** Docket No. 97-120, Western Massachusetts Electric Company proposed restructuring; Massachusetts Attorney General. Joint testimony with Paul Chernick, October, 1998. Joint surrebuttal with Paul Chernick, January, 1999.
- Market value of the three Millstone nuclear units under varying assumptions of plant performance and market prices. Independent forecast of wholesale market prices. Value of Pilgrim and TMI-1 asset sales.
- 1999 **Maryland PSC** Case No. 8795, Delmarva Power & Light comprehensive restructuring agreement, Maryland Office of People's Counsel. July 1999.
- Support of proposed comprehensive restructuring settlement agreement
- Maryland PSC** Case Nos. 8794 and 8808, Baltimore Gas & Electric Company comprehensive restructuring agreement, Maryland Office of People's Counsel. Initial Testimony July 1999; Reply Testimony August 1999; Surrebuttal Testimony August 1999.
- Support of proposed comprehensive restructuring settlement agreement
- Maryland PSC** Case No. 8797, comprehensive restructuring agreement for Potomac Edison Company, Maryland Office of People's Counsel. October 1999.
- Support of proposed comprehensive restructuring settlement agreement
- Connecticut DPUC** Docket No. 99-03-35, United Illuminating standard offer, Connecticut Office of Consumer Counsel. November 1999.
- Reasonableness of proposed revisions to standard-offer-supply energy costs. Implications of revisions for other elements of proposed settlement.
- 2000 **U.S. FERC** Docket No. RT01-02-000, Order No. 2000 compliance filing, Joint Consumer Advocates intervenors. Affidavit, November 2000.

Evaluation of innovative rate proposal by PJM transmission owners.

2001 **Maryland PSC** Case No. 8852, Charges for electricity-supplier services for Potomac Electric Power Company, Maryland Office of People's Counsel. March 2001.

Reasonableness of proposed fees for electricity-supplier services.

**Maryland PSC** Case No. 8890, Merger of Potomac Electric Power Company and Delmarva Power and Light Company, Maryland Office of People's Counsel. September 2001; surrebuttal, October 2001. In support of settlement: Supplemental, December 2001; rejoinder, January 2002.

Costs and benefits to ratepayers. Assessment of public interest.

**Maryland PSC** Case No. 8796, Potomac Electric Power Company stranded costs and rates, Maryland Office of People's Counsel. December 2001; surrebuttal, February 2002.

Allocation of benefits from sale of generation assets and power-purchase contracts.

2002 **Maryland PSC** Case No. 8908, Maryland electric utilities' standard offer and supply procurement, Maryland Office of People's Counsel. Direct, November 2002; Rebuttal December 2002.

Benefits of proposed settlement to ratepayers. Standard-offer service. Procurement of supply.

2003 **Maryland PSC** Case No. 8980, adequacy of capacity in restructured electricity markets; Maryland Office of People's Counsel. Direct, December 2003; Reply December 2003.

Purpose of capacity-adequacy requirements. PJM capacity rules and practices. Implications of various restructuring proposals for system reliability.

2004 **Maryland PSC** Case No. 8995, Potomac Electric Power Company recovery of generation-related uncollectibles; Maryland Office of People's Counsel. Direct, March 2004; Supplemental March 2004, Surrebuttal April 2004.

Calculation and allocation of costs. Effect on administrative charge pursuant to settlement.

**Maryland PSC** Case No. 8994, Delmarva Power & Light recovery of generation-related uncollectibles; Maryland Office of People's Counsel. Direct, March 2004; Supplemental April 2004.

Calculation and allocation of costs. Effect on administrative charge pursuant to settlement.



**Maryland PSC** Case No. 8985, Southern Maryland Electric Coop standard-offer service; Maryland Office of People's Counsel. Direct, July 2004.

Reasonableness and risks of resource-procurement plan.

2005 **FERC** Docket No. ER05-428-000, revisions to ICAP demand curves; City of New York. Statement, March 2005.

Net-revenue offset to cost of new capacity. Winter-summer adjustment factor. Market power and in-City ICAP price trends.

**FERC** Docket No. PL05-7-000, capacity markets in PJM; Maryland Office of People's Counsel. Statement, June 2005.

Inefficiencies and risks associated with use of administratively determined demand curve. Incompatibility of four-year procurement plan with Maryland standard-offer service.

**FERC** Dockets Nos. ER05-1410-000 & EL05-148-000, proposed market-clearing mechanism for capacity markets in PJM; Coalition of Consumers for Reliability, October 2005.

Inefficiencies and risks associated with use of administratively determined demand curve. Effect of proposed reliability-pricing model on capacity costs.

2006 **MD PUC** Case No. 9052, Baltimore Gas & Electric rates and market-transition plan; Maryland Office of People's Counsel, February 2006.

Transition to market-based residential rates. Price volatility, bill complexity, and cost-deferral mechanisms.

**MD PUC** Case No. 9056, default service for commercial and industrial customers; Maryland Office of People's Counsel, April 2006.

Assessment of proposals to modify default service for commercial and industrial customers.

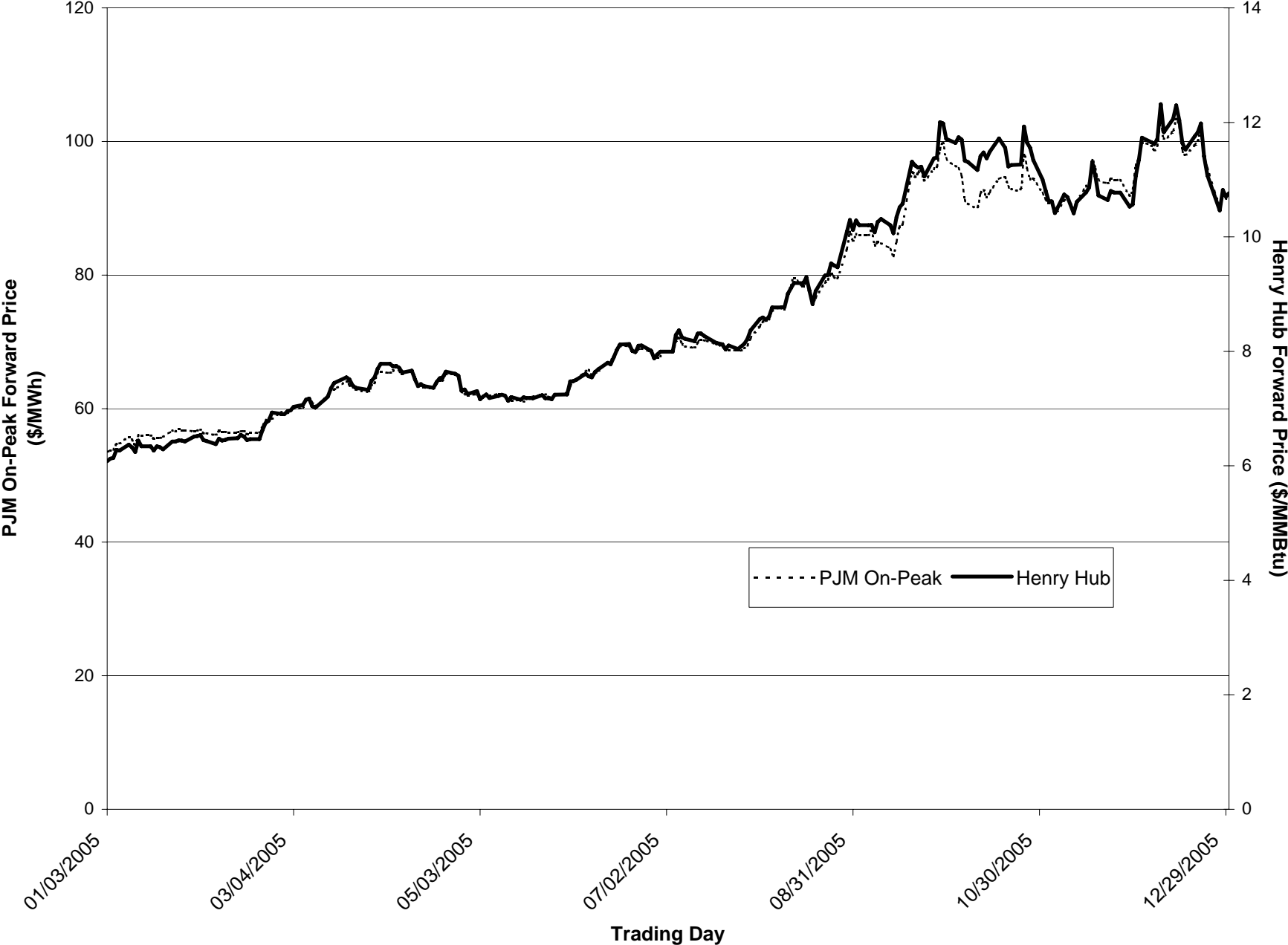
**MD PUC** Case No. 9054, merger of Constellation Energy Group and FPL Group; Maryland Office of People's Counsel, June 2006.

Assessment of effects and risks of proposed merger on ratepayers.

**Illinois Commerce Commission** Docket No. 06-0411, Commonwealth Edison Company residential rate plan; Citizens Utility Board, Cook County State's Attorney's Office, and City of Chicago, Direct July 2006, Reply August 2006.

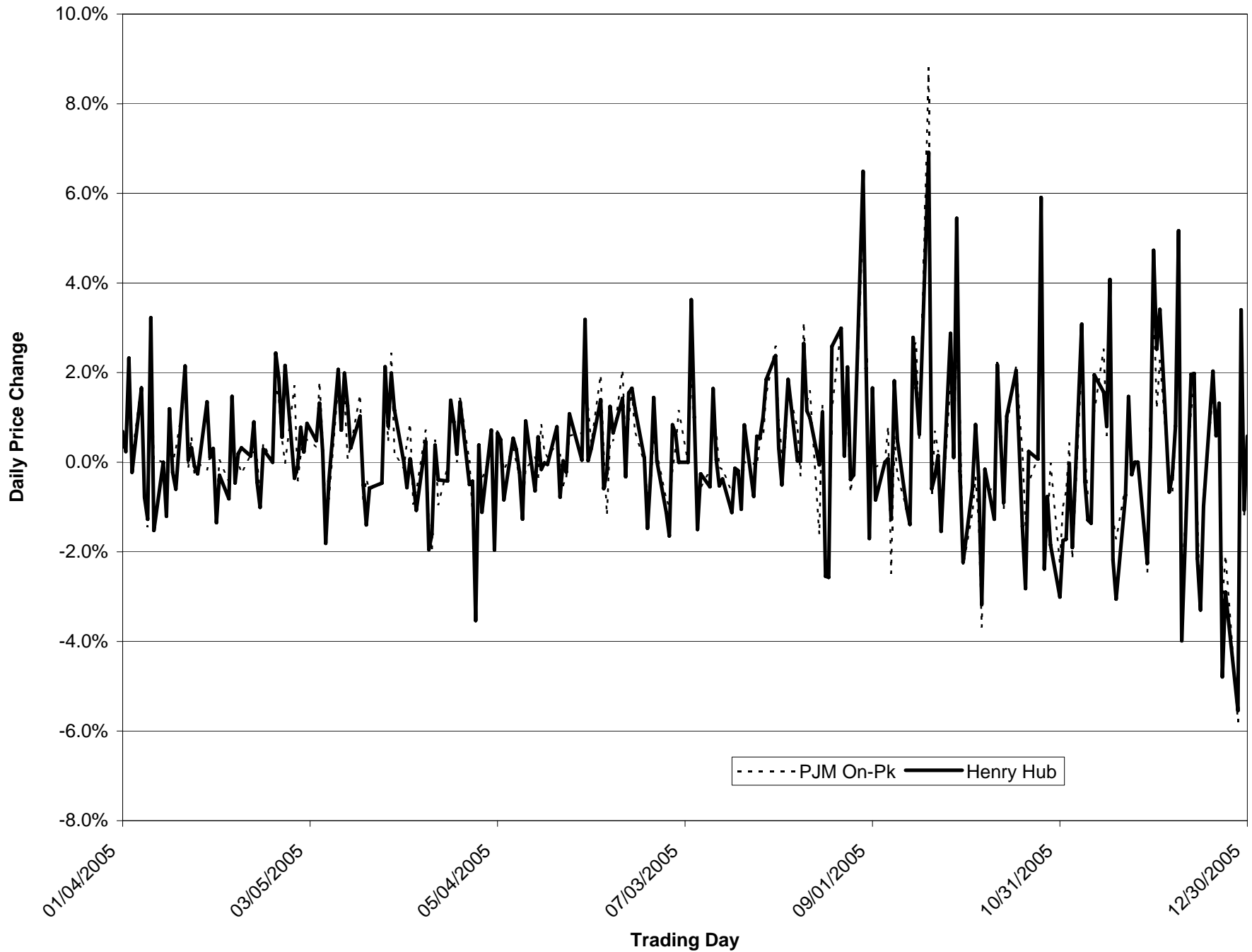
Transition to market-based rates. Securitization of power costs. Rate of return on deferred assets.

### Closing Prices for Calendar Year 2006 Forwards PJM On-Peak vs. Henry Hub Natural Gas



Daily Change in Closing Prices For Calendar Year 2006 Forwards  
PJM On-Peak vs. Henry Hub Natural Gas

Exhibit JFW-3



## Illustrative Portfolio Strategy



# **ATTACHMENT 1**

## **INTEGRATED PORTFOLIO MANAGEMENT IN A RESTRUCTURED SUPPLY MARKET**

A REPORT TO THE  
OFFICE OF THE OHIO CONSUMERS' COUNSEL