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**BEFORE
THE PUBLIC UTILITY COMMISSION OF OHIO**

In the Matter of the Application of)
Vectren Energy Delivery of Ohio, Inc. for)
Approval, Pursuant to Revised Code)
Section 4929.11 of Tariffs to Recover)
Conservation Expenses and Decoupling)
Revenues Pursuant to Automatic)
Adjustment Mechanisms and for Such)
Accounting Authority as May be Required)
to Defer Such Expenses and Revenues for)
Future Recovery through Such)
Adjustment Mechanisms.

Case No. 05-1444-GA-UNC

**DIRECT TESTIMONY OF
PAUL L. CHERNICK
Resource Insight, Inc.**

**ON BEHALF OF
THE OFFICE OF THE OHIO CONSUMERS' COUNSEL**
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Dated: February 21, 2007

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EXHIBITS

Exhibit PLC-1: *Professional Qualifications of Paul Chernick*

1 **I. IDENTIFICATION AND QUALIFICATIONS**

2
3 **Q1: Mr. Chernick, please state your name, occupation and business address.**

4 A1: I am Paul L. Chernick. I am the president of Resource Insight, Inc., 5 Water
5 Street, Arlington, Massachusetts.

6
7 **Q2: Summarize your professional education and experience.**

8 A2: I received an SB degree from the Massachusetts Institute of Technology in June 1974
9 from the Civil Engineering Department, and an SM degree from the Massachusetts
10 Institute of Technology in February 1978 in technology and policy. I have been
11 elected to membership in the civil engineering honorary society Chi Epsilon, and the
12 engineering honor society Tau Beta Pi, and to associate membership in the research
13 honorary society Sigma Xi.

14 I was a utility analyst for the Massachusetts Attorney General for more than three
15 years, and was involved in numerous aspects of utility rate design, costing, load
16 forecasting, and the evaluation of power supply options. Since 1981, I have been
17 a consultant in utility regulation and planning, first as a research associate at
18 Analysis and Inference, after 1986 as president of PLC, Inc., and in my current
19 position at Resource Insight. In these capacities, I have advised a variety of
20 clients on utility matters.

21 My work has considered, among other things, the cost-effectiveness of
22 prospective new generation plants and transmission lines, retrospective review of
23 generation-planning decisions, ratemaking for plant under construction,
24 ratemaking for excess and/or uneconomical plant entering service, conservation

1 program design, cost recovery for utility efficiency programs, the valuation of
2 environmental externalities from energy production and use, allocation of costs of
3 service between rate classes and jurisdictions, design of retail and wholesale rates,
4 and performance-based ratemaking and cost recovery in restructured gas and
5 electric industries. My professional qualifications are further summarized in
6 Exhibit PLC-1.

7
8 **Q3: Have you testified previously in utility proceedings?**

9 A3: Yes. I have testified more than two hundred times on utility issues before various
10 regulatory, legislative, and judicial bodies in the United States and Canada.

11
12 **Q4: Have you previously testified before the Public Utilities Commission of Ohio?**

13 A4: Yes. In Cases No. 91-635-EL-FOR, 92-312-EL-FOR, 92-1172-EL-ECP, I
14 testified on behalf of the City of Cincinnati on the treatment of demand-side
15 management (DSM) in the Cincinnati Gas and Electric Long Term Forecast
16 Report for 1992. In Case No. 95-203-EL-FOR, I testified on behalf of the
17 Campaign for an Energy Efficient Ohio on cost-effectiveness tests for electric
18 DSM. In Case 03-2144-EL-ATA, I testified on behalf of Green Mountain Energy
19 on the pricing of standard-offer service.

1 **Q5: Have you been involved in other utility-related activities in Ohio?**

2 A5: Yes. In June 2006, I completed a report (with others) for the Office of the Ohio
3 Consumers' Counsel, "Integrated Portfolio Management in a Restructured Supply
4 Market." I also made the following presentations to seminars and training
5 programs sponsored by the Ohio Office of Energy Efficiency:

- 6 • "The Economic and Environmental Benefits of Gas IRP: FERC
7 636 and Beyond" for "Gas Utility Integrated Resource Planning,"
8 April 1994;
- 9 • "DSM Cost Recovery and Rate Impacts" and "Cost-Effectiveness
10 Analysis for Effective DSM Collaborative Processes," August
11 1993.

12
13
14
15 **Q6: What is your experience with gas DSM?**

16 A6: I was involved in the following:

17 **Projects and Cases:**

- 18 • Projects related to the Boston Gas Company in the late 1980s and
19 early 1990s, including testimony advocating that Boston Gas
20 initiate a DSM program, on behalf of the Boston Housing
21 Authority (June 1988); testimony on behalf of Boston Gas on its
22 avoided costs and cost-effectiveness in March and December 1989;
23 and assistance in development of Boston Gas avoided costs in
24 subsequent proceedings.
- 25 • Testimony before the Ontario Energy Board on behalf of the Green
26 Energy Coalition in cases related to recovery of DSM costs, lost
27 revenue, and incentives for Consumers Gas and Union Gas in
28 1995–2000.
- 29 • Development of gas avoided costs for utilities in Massachusetts,
30 New Hampshire, and Rhode Island, in 1999 and 2001.
- 31 • Development of gas avoided costs for Upstate and Downstate New
32 York, for New York State Energy Research and Development
33 Authority in 2006.

- 1 • Estimation of potential lost revenues and discussion of alternative
2 recovery mechanisms for Con Edison's gas DSM programs on
3 behalf of NYSERDA (2006).
- 4 • Washington Gas Light's avoided costs for DSM on behalf of the
5 Maryland Office of People's Counsel (Maryland PSC 8720); May
6 1996).
- 7
- 8 • Review of the Elizabethtown Gas Company's 1992 DSM Plan on
9 behalf of the New Jersey Department of Public Advocate.
- 10

11 **Presentations:**

- 12
- 13 • Demand-Side Management and the Global Environment
14 Conference; "Least Cost Planning and Gas Utilities," Conservation
15 Law Foundation Utility Energy Efficiency Advocacy Workshop;
16 Boston, February 28, 1991.
- 17
- 18 • District of Columbia Natural Gas Seminar on "Conservation in the
19 Future of Natural Gas Local Distribution Companies," May 23,
20 1989.
- 21
- 22 • Massachusetts Natural Gas Council, on "Conservation and Load
23 Management for Natural Gas Utilities," April 3, 1989.
- 24

25 **Publications:**

- 26
- 27 • "Is Least-Cost Planning for Gas Utilities the Same as Least-Cost
28 Planning for Electric Utilities?" in Proceedings of the NARUC
29 Second Annual Conference on Least-Cost Planning, September 10-
30 13, 1989.
- 31
- 32 • "Conservation and Cost-Benefit Issues Involved in Least-Cost
33 Planning for Gas Utilities," in Least Cost Planning and Gas
34 Utilities: Balancing Theories with Realities, Seminar proceedings
35 from the District of Columbia Natural Gas Seminar, May 23, 1989.
- 36

1 **II. INTRODUCTION**

2
3 **Q7: On whose behalf are you testifying?**

4 A7: My testimony is sponsored by the Office of the Ohio Consumers' Counsel
5 ("OCC").

6
7 **Q8: What is the purpose of your direct testimony?**

8 A8: The OCC has asked me to address issues raised by the January 12, 2007
9 Stipulation filed in this case.

10
11 **Q9: Have you reviewed the January 12 Stipulation filed in this proceeding?**

12 A9: Yes, I have reviewed the January 12 Stipulation. That stipulation discards the
13 energy-efficiency portfolio proposed by Vectren, OPAE, and OCC, through the
14 April 7, 2006 Stipulation. The April Stipulation would have instituted much more
15 comprehensive energy-efficiency portfolio of programs for commercial and
16 residential customers. The January Stipulation replaces these programs with a \$2
17 million single energy efficiency program directed solely to low-income
18 customers.

19 I have also reviewed the Commission's Opinion and Order of September 13, 2006
20 and the Commission's November 8, 2006 Entry on Rehearing, as well as other
21 case materials, including testimony filed in the first phase of this proceeding.

1 **Q10: How is the January 12 Stipulation related to the September 13 Opinion and**
2 **Order in this docket?**

3 A10: By its own terms, the January 12 Stipulation attempts to convert the conclusions
4 of the Commission's September 13 Opinion and Order into a stipulation. The
5 Stipulation states that it:

- 6 • is "intended to preserve the result of the Commission's original
7 order in this proceeding."
8
- 9 • will "retain the result of the Commission's September Order and
10 November Entry on Rehearing. Any unintended ambiguity, actual
11 or perceived, in this document should be interpreted to have a
12 meaning consistent with terms and conditions approved in the
13 September Order."
14

15 Clearly, the January 12 Stipulation is inextricably linked to the conclusions
16 of the Commission in its September 13 Opinion and Order and its
17 November Entry on Rehearing.
18

19 **Q11: What is your understanding of the change in the approach to energy**
20 **efficiency in the January 12 Stipulation, compared to that of the April**
21 **Stipulation?**

22 A11: Since the January 12 Stipulation is based upon the decision reached by the
23 Commission in the Opinion and Order, the change in focus is apparently due to
24 the Commission's view that the energy-efficiency portfolio in the April
25 Stipulation has not been shown to be economically beneficial. In particular, in the
26 Commission's Order of September 13, 2006, this issue was addressed:

1 In the last rate proceeding, signed April 13, 2005, ... we rejected
2 OCC's proposal for a much higher level of funding stating that
3 OCC's efforts to develop DSM programs were laudable, but under
4 close scrutiny OCC's proposal would cause nonparticipants in the
5 conservation program to pay higher rates to subsidize the program
6 and that, to consider the adoption of the program, we would need
7 to find net-economic benefits.... Order at 12

8 [I]t would be unfair to impose the program on VEDO ratepayers
9 where there is no credible basis that, in isolation, the DSM
10 program would result in the economic benefits referenced by OCC.
11 Order at 13
12

13 These statements in the order appear to reflect the views of the Commission Staff,
14 and in particular Staff Witness Steve Puican. The Staff was not a signatory party
15 to the April Stipulation, and filed direct and surrebuttal testimony against the
16 adoption of the April Stipulation (Direct and Surrebuttal Testimony of Steve
17 Puican). I will therefore comment on the assertions in that testimony, since that
18 seems to be the ultimate basis for the January 12, 2007 Stipulation.
19

20 **Q12: Please summarize your conclusions.**

21 A12: The natural gas energy efficiency programs contained in the April Stipulation
22 were cost effective and should have been approved in their entirety. The cost
23 effectiveness tests that are applied to evaluate electric DSM programs are
24 appropriate for evaluating gas DSM programs. Finally, gas DSM programs
25 provide system benefits for all customers.
26

1 **III. ENERGY-EFFICIENCY PROGRAM COST-BENEFIT ANALYSIS**

2
3 **Q13: How would you determine the net economic benefits of energy-efficiency**
4 **programs?**

5 A13: Like any other activity, energy efficiency efforts should be evaluated by
6 comparing their benefits to their costs. Various utilities and regulators use
7 variations on this basic total-cost concept. If the total cost of a program is less
8 than the total benefits, or the total cost with the program is less than the total cost
9 without the program, the program is cost-effective.

10 In some jurisdictions, the test is called the Total Resource Cost Test, in others the
11 Societal Test. Some jurisdictions include only the expected direct dollar costs
12 borne by the utility and its customers.¹ Since the costs to the utility generally
13 flow through to the customers in their bills, these direct-cost tests essentially
14 measure the effect of the energy-efficiency program on total bills.

15 Other jurisdictions include the effects of the program on other factors important to
16 the utility's customers, to the remainder of the jurisdiction, and sometimes a
17 broader public, such as the costs of other utility services (e.g., the marginal cost of
18 other fuels and water), environmental externalities, reliability, improved service,
19 and risk. These broader-cost tests add to the direct consumer costs quantifiable
20 indirect costs and various measures of the quality of the service.

¹ In some states, energy-efficiency services are delivered by entities other than the utility, in which case the program administrator's costs are also included.

1 **Q14: Should all costs to customers be treated equivalently in evaluating energy-**
2 **efficiency programs?**

3 A14: Yes. A dollar spent by the utility on an energy-efficiency program, a dollar of
4 fuel or storage capacity charges or purchased power or O&M or capital recovery
5 for T&D, and a dollar spent by a customer for energy efficiency all ultimately
6 come from the pockets of the customers. The simplest objective of resource
7 planning is to minimize those costs.

8
9 **Q15: Does it matter whether the costs avoided are related to capital investments,**
10 **expenses, or purchases?**

11 A15: No. The nature of the costs is not critical to the cost-effectiveness of DSM; I have
12 never seen such distinctions made in any reference work or in any other
13 jurisdiction.

14
15 **Q16: Are some types of avoided costs important and other unimportant?**

16 A16: No. The belief that only the costs of avoiding "expensive generating facilities"
17 should be treated as benefits of energy-efficiency programs is erroneous when one
18 looks at the rationale for electric DSM historically.

19
20 **Q17: What was the rationale for electric DSM in the 1980s?**

21 A17: The high costs of power supply in the 1980s certainly caught the attention of
22 utilities, regulators and customers. In some states, those high costs were driven,
23 at least in part, by the costs of new nuclear units, but by the time the plants were
24 completed and in rates, they were no longer avoidable. Avoiding the completed,

1 or nearly completed, power plants was not the purpose of energy-efficiency
2 programs.

3 In the states that were most active in energy-efficiency in the 1980s—California,
4 New York, and the New England states—high fuel prices were also an important
5 part of the high costs of power. In many cases, utilities and regions had more than
6 enough capacity, including committed resources, and no new power plant
7 investment was expected to be avoidable for many years. Much of the benefit of
8 energy efficiency was reducing fuel use at what were then considered to be high
9 prices.²

10
11 **Q18: Did the same support exist for gas DSM?**

12 **A18:** Yes. By the late 1980s, regulators in at least California, Massachusetts, Vermont
13 and the District of Columbia had ordered natural-gas utilities to pursue energy-
14 efficiency investment.

15 Following the same historic logic, the Commission should support gas DSM
16 programs that help in reducing utility dependency on purchasing gas to meet their
17 customer service obligations and that pass a Total Resource Cost Test.

18

² Other benefits typically included reducing purchases capacity and energy from existing plants, the opportunity to sell into the market capacity and energy from existing plants, and reducing investment in T&D.

1 **Q19: How do the fuel prices in the 1980s compare to current fuel prices?**

2 A19: In the late 1980s, average annual natural gas wellhead prices were less than
3 \$2/MMBtu, and crude oil was \$15–\$20/barrel. Today, futures prices for gas at
4 Henry Hub exceed \$7/MMBtu through 2012, while crude oil is running about
5 \$50/barrel. In terms of fuel prices and fuel security, energy efficiency is much
6 more important today than it was in the 1980s.

7
8 **Q20: Have those jurisdictions that promoted energy efficiency in the 1980s and**
9 **have now restructured abandoned DSM programs as utilities ceased to be**
10 **responsible for building generating facilities, expensive or otherwise?**

11 A20: No. As they restructured the utility industry, such states as Massachusetts,
12 Connecticut, New York and New Jersey created new mechanisms for funding
13 energy efficiency through charges on customer bills. Even though the electric
14 utilities in those states now relate to generation services much as gas utilities
15 relate to gas commodity—purchasing commodity for some customers and flowing
16 the costs through, while delivering commodity from third parties to other
17 customers—they have increased their commitment to DSM, rather than decreased
18 it.

19

1 **Q21: Are you aware of any jurisdictions that undertook electric DSM primarily to**
2 **reduce emissions?**

3 A21: No. Some jurisdictions with operating DSM programs introduced the valuation of
4 environmental externalities in the late 1980s and reflected those costs in their
5 total-cost tests. I do not know of any situations in which externalities resulted in
6 significant expansion of DSM programs.

7
8 **Q22: Global warming has been identified as one of the motivations for regulators**
9 **when DSM was first introduced as a concept in the early 1980s. Is global**
10 **warming as much a concern today as it was in the early 1980s?**

11 A22: Global warming has become a much larger issue since the early 1980s. DSM has
12 long been recognized as providing environmental benefits by reducing emissions,
13 including those contributing to global warming.

14
15 **Q23: Is it true that cost-effective energy-efficiency programs may result in higher**
16 **rates?**

17 A23: Yes. Whether rates rise overall depends on many factors, some of which I discuss
18 in Section V (page 16).

19
20 **Q24: If rates rise, does that mean that the energy-efficiency program is not cost-**
21 **effective?**

22 A24: Not at all. Cost-effectiveness deals with the total dollars that customers are
23 paying for their energy services, not with the rate per kilowatt-hour or per
24 dekatherm. Consumers write checks for bills, not for rates.

1 **Q25: If rates rise, would customers who do not participate in the program pay**
2 **higher bills?**

3 A25: Not necessarily. Energy-efficiency programs often transform markets, so that
4 more efficient equipment and designs become standard practice, so even non-
5 participants in the program can wind up with lower bills.

6 Energy-efficiency programs also confer health, environmental-quality, and
7 quality-of-life benefits that are no less real for being external to the economic
8 transaction that is captured in rates and bills.

9 In addition, the non-participants in one program may be participants in other
10 programs, and non-participants in the first year may be participants in later years.

11 Over time, portfolios of energy-efficiency programs should be designed to offer
12 direct benefits to as many customers as feasible.

13

14 **Q26: Based on the information available to you, do the programs proposed in the**
15 **April Stipulation pass the Total Resource Cost Test?**

16 A26: Yes. OCC estimated at the time of the negotiations for the April 2006 stipulation
17 in this case, the following nominally levelized societal costs per therm saved for
18 Vectren's proposed non-low-income programs:

- 19 • \$0.35/therm saved for furnace-rebate program
20 • \$0.58/therm saved for residential-new-construction program

21 Vectren's consultants estimated the real-levelized avoided costs for its Indiana gas
22 companies at about \$0.885/therm for heating load and \$0.81/therm for non-

1 heating load over periods of 15 to 30 years.³ In the nominally levelized terms of
2 the cost estimate, the avoided costs would be about \$1.20/therm for heating load
3 and \$1.10/therm for non-heating load, over the twenty-year life of the measures.
4 The programs of the April Stipulation are highly cost-effective with those avoided
5 costs.

6
7 **Q27: Have you reviewed Vectren's estimate of avoided costs?**

8 A27: Yes. The derivation of the avoided costs is contained in Appendix D to the
9 Vectren DSM Action Plan. The estimate is based on Vectren's Indiana gas costs
10 for 2005/06, differentiated between customers with space heating and those
11 without. That initial price is reduced over the next few years in proportion to the
12 falling Henry Hub forwards, and then in proportion to the Energy Information
13 Administration's forecast of gas delivered to residential customers in the East
14 North Central region.⁴

15
16 **Q28: Is that a reasonable approach?**

17 A28: The general approach is reasonable, but Vectren's computation appears to
18 understate the benefits for customers. Most importantly, the starting point is
19 Vectren's average cost of gas, including pipeline and storage capacity charges.
20 The average cost of gas included some market-price gas and some fixed-price gas

³ "Vectren DSM Action Plan: Final Report," prepared for Vectren Energy Delivery of Indiana by Forefront Economics and H. Gil Peach & Associates, December 9, 2005, provided as Document Request #4.

⁴ These avoided cost values are consistent with Vectren's response to OCC Document Request #2b (Ohio Avoided Costs1).doc.

1 at much lower prices. The cost of gas avoided by a reduction in load would be the
2 higher market price.

3
4 **IV. NATURAL-GAS-UTILITY AVOIDED COSTS**

5
6 **Q29: What costs are avoided by gas DSM?**

7 A29: Gas DSM can avoid both supply costs and utility costs.

8
9 **Q30: What supply costs are avoided by gas DSM?**

10 A30: Gas supply planning is complicated, especially when the utility and several other
11 suppliers are serving customers in the same service territory. The utility, or any
12 other supplier, may:

- 13 • purchase gas at the wellhead or at production-area hubs, under
14 long-, intermediate-, and short-term contracts (which may cover
15 deliveries every day of the year or as little as 60 days), and from
16 the spot market;
- 17 • purchase pipeline delivery capacity from each gas purchase point
18 to the citygates, under long-, intermediate- and short-term
19 contracts;
- 20 • swap gas at one location for gas at another location;
- 21 • purchase gas at delivery points closer to the citygates, from
22 generators, brokers and other users, either long- or short-term;
- 23 • purchase underground storage capacity (paying annual capacity
24 charges, inventory charges, injection and withdrawal fees);
- 25 • purchase pipeline capacity from each gas purchase point to the
26 storage facilities (usually off-peak or year-round), and from the
27 storage facilities to the citygates (usually only in the peak months);
- 28 • build local gas storage, as LNG (liquefying gas off-peak and
29 expanding it on-peak) or compressed gas;

- build local propane facilities to inject supplemental supplies under design-peak conditions.⁵

Depending on its exact mix of gas supplies, a reduction in load due to energy efficiency will allow the utility to avoid various categories of these costs. If the utility does not fully use its commodity and capacity entitlements, it can sell the excess to other users at market rates.

Not only will the utility (and direct marketers) purchase less gas, the reduction in demand will generally reduce the unit market price of gas, further reducing the cost to customers, as I discuss in Section V, below.

Q31: What local utility costs are avoided by gas DSM?

A31: In addition to the avoided local storage and supplemental supply costs, energy efficiency can reduce some operating costs, such as energy used for compression, and local transmission and distribution investments.

V. ENERGY-EFFICIENCY SYSTEM BENEFITS

Q32: Do customers who do not participate in DSM programs receive any benefit from the reduction in usage?

A32: Yes. In fact, natural-gas DSM benefits non-participating customers in at least three ways, as follows:

⁵ Gas utilities must have supplemental supplies—propane, local storage, and/or additional pipeline capacity—to allow delivery of sufficient gas in extreme weather conditions.

- 1 • Vectren has a range of gas resources. Reductions in gas usage may
2 allow Vectren to cut back its use of the most expensive resources,
3 reducing average gas prices to customers.
4
- 5 • Reduced usage is likely to allow Vectren to avoid some local
6 transmission-and-distribution costs.
7
- 8 • Reduced demand for natural gas by firm customers may free up
9 pipeline capacity and local distribution capacity, allowing Vectren
10 to deliver more gas to interruptible and dual-fuel customers,
11 earning revenues that reduce delivery costs to firm customers.
12
- 13 • Reduced demand for natural gas will tend to reduce wholesale
14 market prices in production areas and in delivery areas, benefiting
15 Vectren customers and gas customers throughout Ohio and
16 beyond. Since the market price of electricity is driven largely by
17 the cost of gas burned in power plants, electric customers in Ohio
18 and elsewhere will also benefit.
19
20

21 **Q33: What is the price effect of gas conservation?**

22 A33: First, the simplest analysis of demand and supply curve from an elementary
23 economics textbook makes the point that shifting the demand curve for a product
24 to the left reduces the quantity and price at which the demand and supply curves
25 cross. As demonstrated by the spikes in gas prices in cold weather, the supply
26 curve for natural gas is quite steep, so a change in the market-clearing quantity
27 would be expected to result in a large change in the market price. If the change in
28 demand is very small, the change in price may not be striking, but it should occur.
29 Second, a large number of electric and gas utilities nationwide, and in Canada, do
30 have large-scale DSM programs. Ohio is already getting the benefits of reduced
31 gas prices from DSM in California, Ontario, the Northeast, and elsewhere;
32 implementing the programs from the April Stipulation would move Vectren
33 toward contributing to reducing gas prices further.

1 Third, Ohio's gas usage is large enough that a serious conservation effort could
2 have an observable effect on Ohio gas prices. A recent study by the New York
3 Energy Research and Development Administration estimated that a gas DSM
4 program capturing just 5% of economic efficiency potential (reducing end-user
5 gas consumption by just 1.5%) by 2016 could reduce total retail gas prices by
6 about 0.3%.⁶ While that does not look like a large price reduction, the present-
7 value savings to New York gas consumers would be over \$500 million. Since
8 Ohio's gas usage is comparable to New York State's usage, a similar effort in
9 Ohio is likely to have a similarly significant benefit for all gas consumers,
10 including non-participants.

11 12 **VI. ENERGY EFFICIENCY IN RESOURCE PLANNING**

13 14 **Q34: What is the role of energy efficiency in gas-resource planning?**

15 **A34:** Energy efficiency is one of the few resources available to gas utilities to reduce
16 and stabilize customer bills over the long term. Unlike electric utilities, gas
17 utilities cannot generally build or contract for new supply resources in their
18 service territories to supply below-market energy to their customers. Gas utilities
19 have a limited range of supply options, other than purchases at market prices.

⁶ "Natural Gas Efficiency Resource Development Potential in New York" (with Phillip Mosenthal, R. Neal Elliott, Dan York, Chris Neme, and Kevin Petak. Albany, N.Y.; New York State Energy Research and Development Authority. October 31, 2006. For comparison, a study of a much larger efficiency effort (with reductions of about 6% in both gas and electric load) across eight Midwest states (with several times the gas usage of Ohio or New York) estimated a 13% reduction in wholesale gas prices. ("Examining the Potential for Energy Efficiency To Help Address the Natural Gas Crisis in the Midwest," Kushler, M., et al., January 2005, American Council for an Energy-Efficient Economy Report U051.) These estimates are consistent, when adjusted for the different scope and scale.

1 In addition, energy efficiency is essentially the only way in which firm gas
2 customers can respond to, and moderate, rising market prices. Given the
3 difficulties and costs for many customers in implementing energy-efficiency
4 measures on their own, utility DSM programs are vital in transforming the gas
5 market to a normal competitive market, in which both supply and demand
6 respond to price changes.

7
8 **Q35: Has the PUCO acknowledged the importance of energy efficiency in gas**
9 **planning and policy?**

10 A35: Yes. The PUCO, in its Order (at 13), stated:

11 The Commission does recognize that conservation and efficiency
12 should be an integral part of natural gas policy and that it may be
13 appropriate to reconsider the level of support.

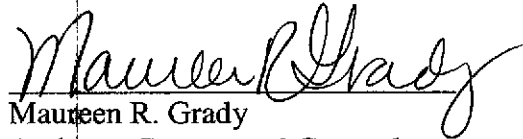
14
15 However, the PUCO has not acted consistently to support conservation and
16 energy efficiency as part of a natural gas policy. When it discarded the energy
17 conservation portfolio sponsored in the April Stipulation, in favor of a single \$2
18 million low income program, it quashed the opportunity to put into action its
19 purported policy.

20
21 **Q36: Does this conclude your testimony?**

22 A36: Yes.

CERTIFICATE OF SERVICE

I hereby certify that a copy of the Direct Testimony of Paul L. Chernick on behalf of the Office of the Ohio Consumers' Counsel was provided, as specifically agreed to by the persons listed below, electronically this 21st day of February 2007.


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SUMMARY OF PROFESSIONAL EXPERIENCE

- 1986–Present* **President, Resource Insight, Inc.** Consults and testifies in utility and insurance economics. Reviews utility supply-planning processes and outcomes: assesses prudence of prior power planning investment decisions, identifies excess generating capacity, analyzes effects of power-pool-pricing rules on equity and utility incentives. Reviews electric-utility rate design. Estimates magnitude and cost of future load growth. Designs and evaluates conservation programs for electric, natural-gas, and water utilities, including hook-up charges and conservation cost recovery mechanisms. Determines avoided costs due to cogenerators. Evaluates cogeneration rate risk. Negotiates cogeneration contracts. Reviews management and pricing of district heating systems. Determines fair profit margins for automobile and workers' compensation insurance lines, incorporating reward for risk, return on investments, and tax effects. Determines profitability of transportation services. Advises regulatory commissions in least-cost planning, rate design, and cost allocation.
- 1981–86* **Research Associate, Analysis and Inference, Inc.** (Consultant, 1980–81). Researched, advised, and testified in various aspects of utility and insurance regulation. Designed self-insurance pool for nuclear decommissioning; estimated probability and cost of insurable events, and rate levels; assessed alternative rate designs. Projected nuclear power plant construction, operation, and decommissioning costs. Assessed reasonableness of earlier estimates of nuclear power plant construction schedules and costs. Reviewed prudence of utility construction decisions. Consulted on utility rate-design issues, including small-power-producer rates; retail natural-gas rates; public-agency electric rates, and comprehensive electric-rate design for a regional power agency. Developed electricity cost allocations between customer classes. Reviewed district-heating-system efficiency. Proposed power-plant performance standards. Analyzed auto-insurance profit requirements. Designed utility-financed, decentralized conservation program. Analyzed cost-effectiveness of transmission lines.
- 1977–81* **Utility Rate Analyst, Massachusetts Attorney General.** Analyzed utility filings and prepared alternative proposals. Participated in rate negotiations, discovery, cross-examination, and briefing. Provided extensive expert testimony before various regulatory agencies. Topics included demand forecasting, rate design, marginal costs, time-of-use rates, reliability issues, power-pool operations, nuclear-power cost projections, power-plant cost-benefit analysis, energy conservation, and alternative-energy development.

EDUCATION

SM, Technology and Policy Program, Massachusetts Institute of Technology, February 1978.

SB, Civil Engineering Department, Massachusetts Institute of Technology, June 1974.

HONORS

Chi Epsilon (Civil Engineering)

Tau Beta Pi (Engineering)

Sigma Xi (Research)

Institute Award, Institute of Public Utilities, 1981.

PUBLICATIONS

"Environmental Regulation in the Changing Electric-Utility Industry" (with Rachel Brailove), *International Association for Energy Economics Seventeenth Annual North American Conference* (96-105). Cleveland, Ohio: USAEE. 1996.

"The Price is Right: Restructuring Gain from Market Valuation of Utility Generating Assets" (with Jonathan Wallach), *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 Distributed Utilities" (with Jonathan Wallach), *International Association for Energy Economics Seventeenth Annual North American Conference* (460-469). Cleveland, Ohio: USAEE. 1996.

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

"The Allocation of DSM Costs to Rate Classes," *Proceedings of the Fifth National Conference on Integrated Resource Planning*. Washington: National Association of Regulatory Utility Commissioners. May 1994.

"Environmental Externalities: Highways and Byways" (with Bruce Biewald and William Steinhurst), *Proceedings of the Fifth National Conference on Integrated Resource Planning*. Washington: National Association of Regulatory Utility Commissioners. May 1994.

"The Transfer Loss is All Transfer, No Loss" (with Jonathan Wallach), *The Electricity Journal* 6:6 (July 1993).

"Benefit-Cost Ratios Ignore Interclass Equity" (with others), *DSM Quarterly*, Spring 1992.

"ESCOs or Utility Programs: Which Are More Likely to Succeed?" (with Sabrina Birner), *The Electricity Journal* 5:2, March 1992.

"Determining the Marginal Value of Greenhouse Gas Emissions" (with Jill Schoenberg), *Energy Developments in the 1990s: Challenges Facing Global/Pacific Markets, Vol. II*, July 1991.

"Monetizing Environmental Externalities for Inclusion in Demand-Side Management Programs" (with E. Caverhill), *Proceedings from the Demand-Side Management and the Global Environment Conference*, April 1991.

"Accounting for Externalities" (with Emily Caverhill). *Public Utilities Fortnightly* 127(5), March 1 1991.

"Methods of Valuing Environmental Externalities" (with Emily Caverhill), *The Electricity Journal* 4(2), March 1991.

"The Valuation of Environmental Externalities in Energy Conservation Planning" (with Emily Caverhill), *Energy Efficiency and the Environment: Forging the Link*. American Council for an Energy-Efficient Economy; Washington: 1991.

"The Valuation of Environmental Externalities in Utility Regulation" (with Emily Caverhill), *External Environmental Costs of Electric Power: Analysis and Internalization*. Springer-Verlag; Berlin: 1991.

"Analysis of Residential Fuel Switching as an Electric Conservation Option" (with Eric Espenhorst and Ian Goodman), *Gas Energy Review*, December 1990.

"Externalities and Your Electric Bill," *The Electricity Journal*, October 1990, p. 64.

"Monetizing Externalities in Utility Regulations: The Role of Control Costs" (with Emily Caverhill), in *Proceedings from the NARUC National Conference on Environmental Externalities*, October 1990.

"Monetizing Environmental Externalities in Utility Planning" (with Emily Caverhill), in *Proceedings from the NARUC Biennial Regulatory Information Conference*, September 1990.

"Analysis of Residential Fuel Switching as an Electric Conservation Option" (with Eric Espenhorst and Ian Goodman), in *Proceedings from the NARUC Biennial Regulatory Information Conference*, September 1990.

"A Utility Planner's Checklist for Least-Cost Efficiency Investment" (with John Plunkett) in *Proceedings from the NARUC Biennial Regulatory Information Conference*, September 1990.

Environmental Costs of Electricity (with Richard Ottinger et al.). Oceana; Dobbs Ferry, New York: September 1990.

"Demand-Side Bidding: A Viable Least-Cost Resource Strategy" (with John Plunkett and Jonathan Wallach), in *Proceedings from the NARUC Biennial Regulatory Information Conference*, September 1990.

"Incorporating Environmental Externalities in Evaluation of District Heating Options" (with Emily Caverhill), *Proceedings from the International District Heating and Cooling Association 81st Annual Conference*, June 1990.

"A Utility Planner's Checklist for Least-Cost Efficiency Investment," (with John Plunkett), *Proceedings from the Canadian Electrical Association Demand-Side Management Conference*, June 1990.

"Incorporating Environmental Externalities in Utility Planning" (with Emily Caverhill), *Canadian Electrical Association Demand Side Management Conference*, May 1990.

"Is Least-Cost Planning for Gas Utilities the Same as Least-Cost Planning for Electric Utilities?" in *Proceedings of the NARUC Second Annual Conference on Least-Cost Planning*, September 10-13 1989.

"Conservation and Cost-Benefit Issues Involved in Least-Cost Planning for Gas Utilities," in *Least Cost Planning and Gas Utilities: Balancing Theories with Realities*, Seminar proceedings from the District of Columbia Natural Gas Seminar, May 23 1989.

"The Role of Revenue Losses in Evaluating Demand-Side Resources: An Economic Re-Appraisal" (with John Plunkett), *Summer Study on Energy Efficiency in Buildings, 1988*, American Council for an Energy Efficient Economy, 1988.

"Quantifying the Economic Benefits of Risk Reduction: Solar Energy Supply Versus Fossil Fuels," in *Proceedings of the 1988 Annual Meeting of the American Solar Energy Society*, American Solar Energy Society, Inc., 1988, pp. 553-557.

"Capital Minimization: Salvation or Suicide?," in I. C. Bupp, ed., *The New Electric Power Business*, Cambridge Energy Research Associates, 1987, pp. 63-72.

"The Relevance of Regulatory Review of Utility Planning Prudence in Major Power Supply Decisions," in *Current Issues Challenging the Regulatory Process*, Center for Public Utilities, Albuquerque, New Mexico, April 1987, pp. 36-42.

"Power Plant Phase-In Methodologies: Alternatives to Rate Shock," in *Proceedings of the Fifth NARUC Biennial Regulatory Information Conference*, National Regulatory Research Institute, Columbus, Ohio, September 1986, pp. 547-562.

"Assessing Conservation Program Cost-Effectiveness: Participants, Non-participants, and the Utility System" (with A. Bachman), *Proceedings of the Fifth NARUC Biennial Regulatory Information Conference*, National Regulatory Research Institute, Columbus, Ohio, September 1986, pp. 2093-2110.

"Forensic Economics and Statistics: An Introduction to the Current State of the Art" (with Eden, P., Fairley, W., Aller, C., Vencill, C., and Meyer, M.), *The Practical Lawyer*, June 1 1985, pp. 25-36.

"Power Plant Performance Standards: Some Introductory Principles," *Public Utilities Fortnightly*, April 18 1985, pp. 29-33.

"Opening the Utility Market to Conservation: A Competitive Approach," *Energy Industries in Transition, 1985-2000*, Proceedings of the Sixth Annual North American Meeting of the International Association of Energy Economists, San Francisco, California, November 1984, pp. 1133-1145.

"Insurance Market Assessment of Technological Risks" (with Meyer, M., and Fairley, W) *Risk Analysis in the Private Sector*, pp. 401-416, Plenum Press, New York 1985.

"Revenue Stability Target Ratemaking," *Public Utilities Fortnightly*, February 17 1983, pp. 35-39.

"Capacity/Energy Classifications and Allocations for Generation and Transmission Plant" (with M. Meyer), *Award Papers in Public Utility Economics and Regulation*, Institute for Public Utilities, Michigan State University 1982.

Design, Costs and Acceptability of an Electric Utility Self-Insurance Pool for Assuring the Adequacy of Funds for Nuclear Power Plant Decommissioning Expense, (with Fairley, W., Meyer, M., and Scharff, L.) (NUREG/CR-2370), U.S. Nuclear Regulatory Commission, December 1981.

Optimal Pricing for Peak Loads and Joint Production: Theory and Applications to Diverse Conditions (Report 77-1), Technology and Policy Program, Massachusetts Institute of Technology, September 1977.

REPORTS

"Integrated Portfolio Management in a Restructured Supply Market" (with Jonathan Wallach, William Steinhurst, Tim Woolf, Anna Sommers, and Kenji Takahashi). 2006. Columbus, Ohio: Office of the Ohio Consumers' Counsel.

"Natural Gas Efficiency Resource Development Potential in New York" (with Phillip Mosenthal, R. Neal Elliott, Dan York, Chris Neme, and Kevin Petak. Albany, N.Y.; New York State Energy Research and Development Authority.

"Evaluation and Cost Effectiveness" (principal author), Ch. 14 of "California Evaluation Framework" Prepared for California utilities as required by the California Public Utilities Commission. 2004.

"Energy Plan for the City of New York" (with Jonathan Wallach, Susan Geller, Brian Tracey, Adam Auster, and Peter Lanzaletta). 2003. New York: New York City Economic Development Corporation.

"Review and Critique of the Western Division Load-Pocket Study of Orange and Rockland Utilities, Inc." (with John Plunkett, Philip Mosenthal, Robert Wichert, and Robert Rose). 1999. White Plains, N.Y.: Pace University School of Law Center for Environmental Studies.

"Avoided Energy Supply Costs for Demand-Side Management in Massachusetts" (with Rachel Brailove, Susan Geller, Bruce Biewald, and David White). 1999. Northborough,

Mass.: Avoided-Energy-Supply-Component Study Group, c/o New England Power Supply Company.

"Performance-based Regulation in a Restructured Utility Industry" (with Bruce Biewald, Tim Woolf, Peter Bradford, Susan Geller, and Jerrold Oppenheim). 1997. Washington: NARUC.

"Distributed Integrated-Resource-Planning Guidelines." 1997. Appendix 4 of "The Power to Save: A Plan to Transform Vermont's Energy-Efficiency Markets," submitted to the Vermont PSB in Docket No. 5854. Montpelier: Vermont DPS.

"Restructuring the Electric Utilities of Maryland: Protecting and Advancing Consumer Interests" (with Jonathan Wallach, 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 Jonathan Wallach). 1996. Concord, N.H.: NH OCA.

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

From Here to Efficiency: Securing Demand-Management Resources (with Emily Caverhill, James Peters, John Plunkett, and Jonathan Wallach). 1993. 5 vols. Harrisburg, Penn: Pennsylvania Energy Office.

"Analysis Findings, Conclusions, and Recommendations," vol. 1 of "Correcting the Imbalance of Power: Report on Integrated Resource Planning for Ontario Hydro" (with Plunkett, John, and Jonathan Wallach), December 1992.

"Estimation of the Costs Avoided by Potential Demand-Management Activities of Ontario Hydro," December 1992.

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

Environmental Externalities Valuation and Ontario Hydro's Resource Planning (with E. Caverhill and R. Brailove), 3 vols.; prepared for the Coalition of Environmental Groups for a Sustainable Energy Future, October 1992.

"Review of Jersey Central Power & Light's 1992 DSM Plan and the Demand-Side Management Rules" (with Jonathan Wallach et al.); Report to the New Jersey Department of Public Advocate, June 1992.

"The AGREIA Project Critique of Externality Valuation: A Brief Rebuttal," March 1992.

"The Potential Economic Benefits of Regulatory NO_x Valuation for Clean Air Act Ozone Compliance in Massachusetts," March 1992.

"Initial Review of Ontario Hydro's Demand-Supply Plan Update" (with David Argue et al.), February 1992.

"Report on the Adequacy of Ontario Hydro's Estimates of Externality Costs Associated with Electricity Exports" (with Emily Caverhill), January 1991.

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

"Power by Efficiency: An Assessment of Improving Electrical Efficiency to Meet Jamaica's Power Needs," (with Conservation Law Foundation, et al.), June 1990.

"Analysis of Fuel Substitution as an Electric Conservation Option," (with Ian Goodman and Eric Espenhorst), Boston Gas Company, December 22 1989.

"The Development of Consistent Estimates of Avoided Costs for Boston Gas Company, Boston Edison Company, and Massachusetts Electric Company" (with Eric Espenhorst), Boston Gas Company, December 22 1989.

"The Valuation of Externalities from Energy Production, Delivery, and Use: Fall 1989 Update" (with Emily Caverhill), Boston Gas Company, December 22 1989.

"Conservation Potential in the State of Minnesota," (with Ian Goodman) Minnesota Department of Public Service, June 16 1988.

"Review of NEPOOL Performance Incentive Program," Massachusetts Energy Facilities Siting Council, April 12 1988.

"Application of the DPU's Used-and-Useful Standard to Pilgrim 1" (With C. Wills and M. Meyer), Massachusetts Executive Office of Energy Resources, October 1987.

"Constructing a Supply Curve for Conservation: An Initial Examination of Issues and Methods," Massachusetts Energy Facilities Siting Council, June 1985.

"Final Report: Rate Design Analysis," Pacific Northwest Electric Power and Conservation Planning Council, December 18 1981.

PRESENTATIONS

"Adding Transmission into New York City: Needs, Benefits, and Obstacles." Presentation to FERC and the New York ISO on behalf of the City of New York. October 2004.

"Plugging Into a Municipal Light Plant," With Peter Enrich and Ken Barna. Panel presentation as part of the 2004 Annual Meeting of the Massachusetts Municipal Association. January 2004.

"Distributed Utility Planning." With Steve Litkovitz. Presentation to the Vermont Distributed-Utility-Planning Collaborative, November 1999.

"The Economic and Environmental Benefits of Gas IRP: FERC 636 and Beyond." Presentation as part of the Ohio Office of Energy Efficiency's seminar, "Gas Utility Integrated Resource Planning," April 1994.

"Cost Recovery and Utility Incentives." Day-long presentation as part of the Demand-Side-Management Training Institute's workshop, "DSM for Public Interest Groups," October 1993.

"Cost Allocation for Utility Ratemaking." With Susan Geller. Day-long workshop for the staff of the Connecticut Department of Public Utility Control, October 1993.

"Comparing and Integrating DSM with Supply." Day-long presentation as part of the Demand-Side-Management Training Institute's workshop, "DSM for Public Interest Groups," October 1993.

"DSM Cost Recovery and Rate Impacts." Presentation as part of "Effective DSM Collaborative Processes," a week-long training session for Ohio DSM advocates sponsored by the Ohio Office of Energy Efficiency, August 1993.

"Cost-Effectiveness Analysis." Presentation as part of "Effective DSM Collaborative Processes," a week-long training session for Ohio DSM advocates sponsored by the Ohio Office of Energy Efficiency, August 1993.

"Environmental Externalities: Current Approaches and Potential Implications for District Heating and Cooling" (with R. Brailove), International District Heating and Cooling Association 84th Annual Conference; June 1993.

"Using the Costs of Required Controls to Incorporate the Costs of Environmental Externalities in Non-Environmental Decision-Making." Presentation at the American Planning Association 1992 National Planning Conference; presentation cosponsored by the Edison Electric Institute. May 1992.

"Cost Recovery and Decoupling" and "The Clean Air Act and Externalities in Utility Resource Planning" panels (session leader), DSM Advocacy Workshop; April 15 1992.

"Overview of Integrated Resources Planning Procedures in South Carolina and Critique of South Carolina Demand Side Management Programs," Energy Planning Workshops; Columbia, S.C.; October 21 1991;

"Least Cost Planning and Gas Utilities." Conservation Law Foundation Utility Energy Efficiency Advocacy Workshop; Boston, February 28 1991.

"Least-Cost Planning in a Multi-Fuel Context," NARUC Forum on Gas Integrated Resource Planning; Washington, D.C., February 24 1991.

"Accounting for Externalities: Why, Which and How?" Understanding Massachusetts' New Integrated Resource Management Rules; Needham, Massachusetts, November 9 1990.

"Increasing Market Share Through Energy Efficiency." New England Gas Association Gas Utility Managers' Conference; Woodstock, Vermont, September 10 1990.

“Quantifying and Valuing Environmental Externalities.” Presentation at the Lawrence Berkeley Laboratory Training Program for Regulatory Staff, sponsored by the U.S. Department of Energy’s Least-Cost Utility Planning Program; Berkeley, California, February 2 1990;

“Conservation in the Future of Natural Gas Local Distribution Companies,” District of Columbia Natural Gas Seminar; Washington, D.C., May 23 1989.

“Conservation and Load Management for Natural Gas Utilities,” Massachusetts Natural Gas Council; Newton, Massachusetts, April 3 1989.

New England Conference of Public Utilities Commissioners, Environmental Externalities Workshop; Portsmouth, New Hampshire, January 22–23 1989.

“Assessment and Valuation of External Environmental Damages,” New England Utility Rate Forum; Plymouth, Massachusetts, October 11 1985; “Lessons from Massachusetts on Long Term Rates for QFs”.

“Reviewing Utility Supply Plans,” Massachusetts Energy Facilities Siting Council; Boston, Massachusetts, May 30 1985.

“Power Plant Performance,” National Association of State Utility Consumer Advocates; Williamstown, Massachusetts, August 13 1984.

“Utility Rate Shock,” National Conference of State Legislatures; Boston, Massachusetts, August 6 1984.

“Review and Modification of Regulatory and Rate Making Policy,” National Governors’ Association Working Group on Nuclear Power Cost Overruns; Washington, D.C., June 20 1984.

“Review and Modification of Regulatory and Rate Making Policy,” Annual Meeting of the American Association for the Advancement of Science, Session on Monitoring for Risk Management; Detroit, Michigan, May 27 1983.

ADVISORY ASSIGNMENTS TO REGULATORY COMMISSIONS

District of Columbia Public Service Commission, Docket No. 834, Phase II; Least-cost planning procedures and goals; August 1987 to March 1988.

Connecticut Department of Public Utility Control, Docket No. 87-07-01, Phase 2; Rate design and cost allocations; March 1988 to June 1989.

EXPERT TESTIMONY

1. MEFSC 78-12/MDPU 19494, Phase I; Boston Edison 1978 forecast; Massachusetts Attorney General; June 12 1978.

Appliance penetration projections, price elasticity, econometric commercial forecast, peak demand forecast. Joint testimony with Susan C. Geller.

2. **MEFSC 78-17**; Northeast Utilities 1978 forecast; Massachusetts Attorney General; September 29 1978.

Specification of economic/demographic and industrial models, appliance efficiency, commercial model structure and estimation.

3. **MEFSC 78-33**; Eastern Utilities Associates 1978 forecast; Massachusetts Attorney General; November 27 1978.

Household size, appliance efficiency, appliance penetration, price elasticity, commercial forecast, industrial trending, peak demand forecast.

4. **MDPU 19494**; Phase II; Boston Edison Company Construction Program; Massachusetts Attorney General; April 1 1979.

Review of numerous aspects of the 1978 demand forecasts of nine New England electric utilities, constituting 92% of projected regional demand growth, and of the NEPOOL demand forecast. Joint testimony with S.C. Geller.

5. **MDPU 19494**; Phase II; Boston Edison Company Construction Program; Massachusetts Attorney General; April 1 1979.

Reliability, capacity planning, capability responsibility allocation, customer generation, co-generation rates, reserve margins, operating reserve allocation. Joint testimony with S. Finger.

6. **ASLB, NRC 50-471**; Pilgrim Unit 2, Boston Edison Company; Commonwealth of Massachusetts; June 29 1979.

Review of the Oak Ridge National Laboratory and NEPOOL demand forecast models; cost-effectiveness of oil displacement; nuclear economics. Joint testimony with S.C. Geller.

7. **MDPU 19845**; Boston Edison Time-of-Use Rate Case; Massachusetts Attorney General; December 4 1979.

Critique of utility marginal cost study and proposed rates; principles of marginal cost principles, cost derivation, and rate design; options for reconciling costs and revenues. Joint testimony with S.C. Geller. Testimony eventually withdrawn due to delay in case.

8. **MDPU 20055**; Petition of Eastern Utilities Associates, New Bedford G & E., and Fitchburg G & E. to purchase additional shares of Seabrook Nuclear Plant; Massachusetts Attorney General; January 23 1980.

Review of demand forecasts of three utilities purchasing Seabrook shares; Seabrook power costs, including construction cost, completion date, capacity factor, O&M expenses, interim replacements, reserves and uncertainties; alternative energy sources, including conservation, cogeneration, rate reform, solar, wood and coal conversion.

9. **MDPU 20248**; Petition of MMWEC to Purchase Additional Share of Seabrook Nuclear Plant; Massachusetts Attorney General; June 2 1980.

Nuclear power costs; update and extension of MDPU 20055 testimony.

10. **MDPU 200**; Massachusetts Electric Company Rate Case; Massachusetts Attorney General; June 16 1980.

Rate design; declining blocks, promotional rates, alternative energy, demand charges, demand ratchets; conservation: master metering, storage heating, efficiency standards, restricting resistance heating.

11. **MEFSC 79-33**; Eastern Utilities Associates 1979 Forecast; Massachusetts Attorney General; July 16 1980.

Customer projections, consistency issues, appliance efficiency, new appliance types, commercial specifications, industrial data manipulation and trending, sales and resale.

12. **MDPU 243**; Eastern Edison Company Rate Case; Massachusetts Attorney General; August 19 1980.

Rate design: declining blocks, promotional rates, alternative energy, master metering.

13. **Texas PUC 3298**; Gulf States Utilities Rate Case; East Texas Legal Services; August 25 1980.

Inter-class revenue allocations, including production plant in-service, O&M, CWIP, nuclear fuel in progress, amortization of canceled plant residential rate design; interruptible rates; off-peak rates. Joint testimony with M. B. Meyer.

14. **MEFSC 79-1**; Massachusetts Municipal Wholesale Electric Company Forecast; Massachusetts Attorney General; November 5 1980.

Cost comparison methodology; nuclear cost estimates; cost of conservation, cogeneration, and solar.

15. **MDPU 472**; Recovery of Residential Conservation Service Expenses; Massachusetts Attorney General; December 12 1980.

Conservation as an energy source; advantages of per-kWh allocation over per-customer-month allocation.

16. **MDPU 535**; Regulations to Carry Out Section 210 of PURPA; Massachusetts Attorney General; January 26 1981 and February 13 1981.

Filing requirements, certification, qualifying facility (QF) status, extent of coverage, review of contracts; energy rates; capacity rates; extra benefits of QFs in specific areas; wheeling; standardization of fees and charges.

17. **MEFSC 80-17**; Northeast Utilities 1980 Forecast; Massachusetts Attorney General; March 12 1981 (not presented).

Specification process, employment, electric heating promotion and penetration, commercial sales model, industrial model specification, documentation of price forecasts and wholesale forecast.

18. **MDPU 558**; Western Massachusetts Electric Company Rate Case; Massachusetts Attorney General; May 1981.

Rate design including declining blocks, marginal cost conservation impacts, and promotional rates. Conservation, including terms and conditions limiting renewable, cogeneration, small power production; scope of current conservation program; efficient insulation levels; additional conservation opportunities.

19. **MDPU 1048**; Boston Edison Plant Performance Standards; Massachusetts Attorney General; May 7 1982.

Critique of company approach, data, and statistical analysis; description of comparative and absolute approaches to standard-setting; proposals for standards and reporting requirements.

20. **DCPSC FC785**; Potomac Electric Power Rate Case; DC People's Counsel; July 29 1982.

Inter-class revenue allocations, including generation, transmission, and distribution plant classification; fuel and O&M classification; distribution and service allocators. Marginal cost estimation, including losses.

21. **NHPUC DE1-312**; Public Service of New Hampshire-Supply and Demand; Conservation Law Foundation, et al.; October 8 1982.

Conservation program design, ratemaking, and effectiveness. Cost of power from Seabrook nuclear plant, including construction cost and duration, capacity factor, O&M, replacements, insurance, and decommissioning.

22. **Massachusetts Division of Insurance**; Hearing to Fix and Establish 1983 Automobile Insurance Rates; Massachusetts Attorney General; October 1982.

Profit margin calculations, including methodology, interest rates, surplus flow, tax flows, tax rates, and risk premium.

23. **Illinois Commerce Commission 82-0026**; Commonwealth Edison Rate Case; Illinois Attorney General; October 15 1982.

Review of Cost-Benefit Analysis for nuclear plant. Nuclear cost parameters (construction cost, O&M, capital additions, useful life, capacity factor), risks, discount rates, evaluation techniques.

24. **New Mexico PSC 1794**; Public Service of New Mexico Application for Certification; New Mexico Attorney General; May 10 1983.

Review of Cost-Benefit Analysis for transmission line. Review of electricity price forecast, nuclear capacity factors, load forecast. Critique of company ratemaking proposals; development of alternative ratemaking proposal.

25. **Connecticut Public Utility Control Authority 830301**; United Illuminating Rate Case; Connecticut Consumers Counsel; June 17 1983.

Cost of Seabrook nuclear power plants, including construction cost and duration, capacity factor, O&M, capital additions, insurance and decommissioning.

26. **MDPU 1509**; Boston Edison Plant Performance Standards; Massachusetts Attorney General; July 15 1983.

Critique of company approach and statistical analysis; regression model of nuclear capacity factor; proposals for standards and for standard-setting methodologies.

27. **Massachusetts Division of Insurance**; Hearing to Fix and Establish 1984 Automobile Insurance Rates; Massachusetts Attorney General; October 1983.

Profit margin calculations, including methodology, interest rates.

28. **Connecticut Public Utility Control Authority 83-07-15**; Connecticut Light and Power Rate Case; Alloy Foundry; October 3 1983.

Industrial rate design. Marginal and embedded costs; classification of generation, transmission, and distribution expenses; demand versus energy charges.

29. **MEFSC 83-24**; New England Electric System Forecast of Electric Resources and Requirements; Massachusetts Attorney General; November 14 1983, Rebuttal, February 2 1984.

Need for transmission line. Status of supply plan, especially Seabrook 2. Review of interconnection requirements. Analysis of cost-effectiveness for power transfer, line losses, generation assumptions.

30. **Michigan PSC U-7775**; Detroit Edison Fuel Cost Recovery Plan; Public Interest Research Group in Michigan; February 21 1984.

Review of proposed performance target for new nuclear power plant. Formulation of alternative proposals.

31. **MDPU 84-25**; Western Massachusetts Electric Company Rate Case; Massachusetts Attorney General; April 6 1984.

Need for Millstone 3. Cost of completing and operating unit, cost-effectiveness compared to alternatives, and its effect on rates. Equity and incentive problems created by CWIP. Design of Millstone 3 phase-in proposals to protect ratepayers: limitation of base-rate treatment to fuel savings benefit of unit.

32. **MDPU 84-49 and 84-50; Fitchburg Gas & Electric Financing Case; Massachusetts Attorney General; April 13 1984.**

Cost of completing and operating Seabrook nuclear units. Probability of completing Seabrook 2. Recommendations regarding FG&E and MDPU actions with respect to Seabrook.

33. **Michigan PSC U-7785; Consumers Power Fuel Cost Recovery Plan; Public Interest Research Group in Michigan; April 16 1984.**

Review of proposed performance targets for two existing and two new nuclear power plants. Formulation of alternative policy.

34. **FERC ER81-749-000 and ER82-325-000; Montaup Electric Rate Cases; Massachusetts Attorney General; April 27 1984.**

Prudence of Montaup and Boston Edison in decisions regarding Pilgrim 2 construction: Montaup's decision to participate, the Utilities' failure to review their earlier analyses and assumptions, Montaup's failure to question Edison's decisions, and the utilities' delay in canceling the unit.

35. **Maine PUC 84-113; Seabrook 1 Investigation; Maine Public Advocate; September 13 1984.**

Cost of completing and operating Seabrook Unit 1. Probability of completing Seabrook 1. Comparison of Seabrook to alternatives. Rate effects. Recommendations regarding utility and PUC actions with respect to Seabrook.

36. **MDPU 84-145; Fitchburg Gas and Electric Rate Case; Massachusetts Attorney General; November 6 1984.**

Prudence of Fitchburg and Public Service of New Hampshire in decision regarding Seabrook 2 construction: FGE's decision to participate, the utilities' failure to review their earlier analyses and assumptions, FGE's failure to question PSNH's decisions, and utilities' delay in halting construction and canceling the unit. Review of literature, cost and schedule estimate histories, cost-benefit analyses, and financial feasibility.

37. **Pennsylvania PUC R-842651; Pennsylvania Power and Light Rate Case; Pennsylvania Consumer Advocate; November 1984.**

Need for Susquehanna 2. Cost of operating unit, power output, cost-effectiveness compared to alternatives, and its effect on rates. Design of phase-in and excess capacity proposals to protect ratepayers: limitation of base-rate treatment to fuel savings benefit of unit.

38. **NHPUC 84-200; Seabrook Unit 1 Investigation; New Hampshire Public Advocate; November 15 1984.**

Cost of completing and operating Seabrook Unit 1. Probability of completing Seabrook 1. Comparison of Seabrook to alternatives. Rate and financial effects.

39. **Massachusetts Division of Insurance; Hearing to Fix and Establish 1985 Automobile Insurance Rates; Massachusetts Attorney General; November 1984.**

Profit margin calculations, including methodology and implementation.

40. **MDPU 84-152; Seabrook Unit 1 Investigation; Massachusetts Attorney General; December 12 1984.**

Cost of completing and operating Seabrook. Probability of completing Seabrook 1. Seabrook capacity factors.

41. **Maine PUC 84-120; Central Maine Power Rate Case; Maine PUC Staff; December 11 1984.**

Prudence of Central Maine Power and Boston Edison in decisions regarding Pilgrim 2 construction: CMP's decision to participate, the utilities' failure to review their earlier analyses and assumptions, CMP's failure to question Edison's decisions, and the utilities' delay in canceling the unit. Prudence of CMP in the planning and investment in Sears Island nuclear and coal plants. Review of literature, cost and schedule estimate histories, cost-benefit analyses, and financial feasibility.

42. **Maine PUC 84-113; Seabrook 2 Investigation; Maine PUC Staff; December 14 1984.**

Prudence of Maine utilities and Public Service of New Hampshire in decisions regarding Seabrook 2 construction: decisions to participate and to increase ownership share, the utilities' failure to review their earlier analyses and assumptions, failure to question PSNH's decisions, and the utilities' delay in halting construction and canceling the unit. Review of literature, cost and schedule estimate histories, cost-benefit analyses, and financial feasibility.

43. **MDPU 1627; Massachusetts Municipal Wholesale Electric Company Financing Case; Massachusetts Executive Office of Energy Resources; January 14 1985.**

Cost of completing and operating Seabrook nuclear unit 1. Cost of conservation and other alternatives to completing Seabrook. Comparison of Seabrook to alternatives.

44. **Vermont PSB 4936; Millstone 3; Costs and In-Service Date; Vermont Department of Public Service; January 21 1985.**

Construction schedule and cost of completing Millstone Unit 3.

45. **MDPU 84-276; Rules Governing Rates for Utility Purchases of Power from Qualifying Facilities; Massachusetts Attorney General; March 25 1985, and October 18 1985.**

Institutional and technological advantages of Qualifying Facilities. Potential for QF development. Goals of QF rate design. Parity with other power sources. Security requirements. Projecting avoided costs. Capacity credits. Pricing options. Line loss corrections.

46. **MDPU 85-121; Investigation of the Reading Municipal Light Department; Wilmington (MA) Chamber of Commerce; November 12 1985.**

Calculation on return on investment for municipal utility. Treatment of depreciation and debt for ratemaking. Geographical discrimination in street-lighting rates. Relative size of voluntary payments to Reading and other towns. Surplus and disinvestment. Revenue allocation.

47. **Massachusetts Division of Insurance; Hearing to Fix and Establish 1986 Automobile Insurance Rates; Massachusetts Attorney General and State Rating Bureau; November 1985.**

Profit margin calculations, including methodology, implementation, modeling of investment balances, income, and return to shareholders.

48. **New Mexico PSC 1833, Phase II; El Paso Electric Rate Case; New Mexico Attorney General; December 23 1985.**

Nuclear decommissioning fund design. Internal and external funds; risk and return; fund accumulation, recommendations. Interim performance standard for Palo Verde nuclear plant.

49. **Pennsylvania PUC R-850152; Philadelphia Electric Rate Case; Utility Users Committee and University of Pennsylvania; January 14 1986.**

Limerick 1 rate effects. Capacity benefits, fuel savings, operating costs, capacity factors, and net benefits to ratepayers. Design of phase-in proposals.

50. **MDPU 85-270; Western Massachusetts Electric Rate Case; Massachusetts Attorney General; March 19 1986.**

Prudence of Northeast Utilities in generation planning related to Millstone 3 construction: decisions to start and continue construction, failure to reduce ownership share, failure to pursue alternatives. Review of industry literature, cost and schedule histories, and retrospective cost-benefit analyses.

51. **Pennsylvania PUC R-850290; Philadelphia Electric Auxiliary Service Rates; Albert Einstein Medical Center, University of Pennsylvania and AMTRAK; March 24 1986.**

Review of utility proposals for supplementary and backup rates for small power producers and cogenerators. Load diversity, cost of peaking capacity, value of generation, price signals, and incentives. Formulation of alternative supplementary rate.

52. **New Mexico PSC** 2004; Public Service of New Mexico, Palo Verde Issues; New Mexico Attorney General; May 7 1986.

Recommendations for Power Plant Performance Standards for Palo Verde nuclear units 1, 2, and 3.

53. **Illinois Commerce Commission** 86-0325; Iowa-Illinois Gas and Electric Co. Rate Investigation; Illinois Office of Public Counsel; August 13 1986.

Determination of excess capacity based on reliability and economic concerns. Identification of specific units associated with excess capacity. Required reserve margins.

54. **New Mexico PSC** 2009; El Paso Electric Rate Moderation Program; New Mexico Attorney General; August 18 1986. (Not presented).

Prudence of EPE in generation planning related to Palo Verde nuclear construction, including failure to reduce ownership share and failure to pursue alternatives. Review of industry literature, cost and schedule histories, and retrospective cost-benefit analyses.

Recommendation for rate-base treatment; proposal of power plant performance standards.

55. **City of Boston, Public Improvements Commission**; Transfer of Boston Edison District Heating Steam System to Boston Thermal Corporation; Boston Housing Authority; December 18 1986.

History and economics of steam system; possible motives of Boston Edison in seeking sale; problems facing Boston Thermal; information and assurances required prior to Commission approval of transfer.

56. **Massachusetts Division of Insurance**; Hearing to Fix and Establish 1987 Automobile Insurance Rates; Massachusetts Attorney General and State Rating Bureau; December 1986 and January 1987.

Profit margin calculations, including methodology, implementation, derivation of cash flows, installment income, income tax status, and return to shareholders.

57. **MDPU** 87-19; Petition for Adjudication of Development Facilitation Program; Hull (MA) Municipal Light Plant; January 21 1987.

Estimation of potential load growth; cost of generation, transmission, and distribution additions. Determination of hook-up charges. Development of residential load estimation procedure reflecting appliance ownership, dwelling size.

58. **New Mexico PSC** 2004; Public Service of New Mexico Nuclear Decommissioning Fund; New Mexico Attorney General; February 19 1987.

Decommissioning cost and likely operating life of nuclear plants. Review of utility funding proposal. Development of alternative proposal. Ratemaking treatment.

59. **MDPU 86-280; Western Massachusetts Electric Rate Case; Massachusetts Energy Office; March 9 1987.**

Marginal cost rate design issues. Superiority of long-run marginal cost over short-run marginal cost as basis for rate design. Relationship of consumer reaction, utility planning process, and regulatory structure to rate design approach. Implementation of short-run and long-run rate designs. Demand versus energy charges, economic development rates, spot pricing.

60. **Massachusetts Division of Insurance 87-9; 1987 Workers' Compensation Rate Filing; State Rating Bureau; May 1987.**

Profit margin calculations, including methodology, implementation, surplus requirements, investment income, and effects of 1986 Tax Reform Act.

61. **Texas PUC 6184; Economic Viability of South Texas Nuclear Plant #2; Committee for Consumer Rate Relief; August 17 1987.**

STNP operating parameter projections; capacity factor, O&M, capital additions, decommissioning, useful life. STNP 2 cost and schedule projections. Potential for conservation.

62. **Minnesota PUC ER-015/GR-87-223; Minnesota Power Rate Case; Minnesota Department of Public Service; August 17 1987.**

Excess capacity on MP system; historical, current, and projected. Review of MP planning prudence prior to and during excess; efforts to sell capacity. Cost of excess capacity. Recommendations for ratemaking treatment.

63. **Massachusetts Division of Insurance 87-27; 1988 Automobile Insurance Rates; Massachusetts Attorney General and State Rating Bureau; September 2 1987. Rebuttal October 8 1987.**

Underwriting profit margins. Effect of 1986 Tax Reform Act. Biases in calculation of average margins.

64. **MDPU 88-19; Power Sales Contract from Riverside Steam and Electric to Western Massachusetts Electric; Riverside Steam and Electric; November 4 1987.**

Comparison of risk from QF contract and utility avoided cost sources. Risk of oil dependence. Discounting cash flows to reflect risk.

65. **Massachusetts Division of Insurance 87-53; 1987 Workers' Compensation Rate Refiling; State Rating Bureau; December 14 1987.**

Profit margin calculations, including updating of data, compliance with Commissioner's order, treatment of surplus and risk, interest rate calculation, and investment tax rate calculation.

66. **Massachusetts Division of Insurance**; 1987 and 1988 Automobile Insurance Remand Rates; Massachusetts Attorney General and State Rating Bureau; February 5 1988.

Underwriting profit margins. Provisions for income taxes on finance charges. Relationships between allowed and achieved margins, between statewide and nationwide data, and between profit allowances and cost projections.

67. **MDPU 86-36**; Investigation into the Pricing and Ratemaking Treatment to be Afforded New Electric Generating Facilities which are not Qualifying Facilities; Conservation Law Foundation; May 2 1988.

Cost recovery for utility conservation programs. Compensating for lost revenues. Utility incentive structures.

68. **MDPU 88-123**; Petition of Riverside Steam & Electric Company; Riverside Steam and Electric Company; May 18 1988, and November 8 1988.

Estimation of avoided costs of Western Massachusetts Electric Company. Nuclear capacity factor projections and effects on avoided costs. Avoided cost of energy interchange and power plant life extensions. Differences between median and expected oil prices. Salvage value of cogeneration facility. Off-system energy purchase projections. Reconciliation of avoided cost projection.

69. **MDPU 88-67**; Boston Gas Company; Boston Housing Authority; June 17 1988.

Estimation of annual avoidable costs, 1988 to 2005, and levelized avoided costs. Determination of cost recovery and carrying costs for conservation investments. Standards for assessing conservation cost-effectiveness. Evaluation of cost-effectiveness of utility funding of proposed natural gas conservation measures.

70. **Rhode Island PUC Docket 1900**; Providence Water Supply Board Tariff Filing; Conservation Law Foundation, Audubon Society of Rhode Island, and League of Women Voters of Rhode Island; June 24 1988.

Estimation of avoidable water supply costs. Determination of costs of water conservation. Conservation cost-benefit analysis.

71. **Massachusetts Division of Insurance 88-22**; 1989 Automobile Insurance Rates; Massachusetts Attorney General and State Rating Bureau; Profit Issues, August 12 1988, supplemented August 19 1988; Losses and Expenses, September 16 1988.

Underwriting profit margins. Effects of 1986 Tax Reform Act. Taxation of common stocks. Lag in tax payments. Modeling risk and return over time. Treatment of finance charges. Comparison of projected and achieved investment returns.

72. **Vermont PSB 5270**, Module 6; Investigation into Least-Cost Investments, Energy Efficiency, Conservation, and the Management of Demand for Energy; Conservation Law Foundation, Vermont Natural Resources Council, and Vermont Public Interest Research Group; September 26 1988.

Cost recovery for utility conservation programs. Compensation of utilities for revenue losses and timing differences. Incentive for utility participation.

- 73. Vermont House of Representatives, Natural Resources Committee;** House Act 130; "Economic Analysis of Vermont Yankee Retirement"; Vermont Public Interest Research Group; February 21 1989.

Projection of capacity factors, operating and maintenance expense, capital additions, overhead, replacement power costs, and net costs of Vermont Yankee.

- 74. MDPU 88-67, Phase II;** Boston Gas Company Conservation Program and Rate Design; Boston Gas Company; March 6 1989.

Estimation of avoided gas cost; treatment of non-price factors; estimation of externalities; identification of cost-effective conservation.

- 75. Vermont PSB 5270;** Status Conference on Conservation and Load Management Policy Settlement; Central Vermont Public Service, Conservation Law Foundation, Vermont Natural Resources Council, Vermont Public Interest Research Group, and Vermont Department of Public Service; May 1 1989.

Cost-benefit test for utility conservation programs. Role of externalities. Cost recovery concepts and mechanisms. Resource allocations, cost allocations, and equity considerations. Guidelines for conservation preapproval mechanisms. Incentive mechanisms and recovery of lost revenues.

- 76. Boston Housing Authority Court 05099;** Gallivan Boulevard Task Force vs. Boston Housing Authority, et al.; Boston Housing Authority; June 16 1989.

Effect of master-metering on consumption of natural gas and electricity. Legislative and regulatory mandates regarding conservation.

- 77. MDPU 89-100;** Boston Edison Rate Case; Massachusetts Energy Office; June 30 1989.

Prudence of BECo's decision of spend \$400 million from 1986-88 on returning the Pilgrim nuclear power plant to service. Projections of nuclear capacity factors, O&M, capital additions, and overhead. Review of decommissioning cost, tax effect of abandonment, replacement power cost, and plant useful life estimates. Requirements for prudence and used-and-useful analyses.

- 78. MDPU 88-123;** Petition of Riverside Steam and Electric Company; Riverside Steam and Electric; July 24 1989. Rebuttal, October 3 1989.

Reasonableness of Northeast Utilities' 1987 avoided cost estimates. Projections of nuclear capacity factors, economy purchases, and power plant operating life. Treatment of avoidable energy and capacity costs and of off-system sales. Expected versus reference fuel prices.

79. **MDPU 89-72**; Statewide Towing Association, Police-Ordered Towing Rates; Massachusetts Automobile Rating Bureau; September 13 1989.

Review of study supporting proposed increase in towing rates. Critique of study sample and methodology. Comparison to competitive rates. Supply of towing services. Effects of joint products and joint sales on profitability of police-ordered towing. Joint testimony with I. Goodman.

80. **Vermont PSB 5330**; Application of Vermont Utilities for Approval of a Firm Power and Energy Contract with Hydro-Quebec; Conservation Law Foundation, Vermont Natural Resources Council, Vermont Public Interest Research Group; December 19 1989. Surrebuttal February 6 1990.

Analysis of a proposed 450-MW, 20 year purchase of Hydro-Quebec power by twenty-four Vermont utilities. Comparison to efficiency investment in Vermont, including potential for efficiency savings. Analysis of Vermont electric energy supply. Identification of possible improvements to proposed contract.

Critique of conservation potential analysis. Planning risk of large supply additions. Valuation of environmental externalities.

81. **MDPU 89-239**; Inclusion of Externalities in Energy Supply Planning, Acquisition and Dispatch for Massachusetts Utilities; December 1989; April 1990; May 1990.

Critique of Division of Energy Resources report on externalities. Methodology for evaluating external costs. Proposed values for environmental and economic externalities of fuel supply and use.

82. **California PUC**; Incorporation of Environmental Externalities in Utility Planning and Pricing; Coalition of Energy Efficient and Renewable Technologies; February 21 1990.

Approaches for valuing externalities for inclusion in setting power purchase rates. Effect of uncertainty on assessing externality values.

83. **Illinois Commerce Commission Docket 90-0038**; Proceeding to Adopt a Least Cost Electric Energy Plan for Commonwealth Edison Company; City of Chicago; May 25 1990. Joint rebuttal testimony with David Birr, August 14 1990.

Problems in Commonwealth Edison's approach to demand-side management. Potential for cost-effective conservation. Valuing externalities in least-cost planning.

84. **Maryland PSC 8278**; Adequacy of Baltimore Gas & Electric's Integrated Resource Plan; Maryland Office of People's Counsel; September 18 1990.

Rationale for demand-side management, and BG&E's problems in approach to DSM planning. Potential for cost-effective conservation. Valuation of environmental externalities. Recommendations for short-term DSM program priorities.

- 85. Indiana Utility Regulatory Commission; Integrated Resource Planning Docket; Indiana Office of Utility Consumer Counselor; November 1 1990.**

Integrated resource planning process and methodology, including externalities and screening tools. Incentives, screening, and evaluation of demand-side management. Potential of resource bidding in Indiana.

- 86. MDPU 89-141, 90-73, 90-141, 90-194, and 90-270; Preliminary Review of Utility Treatment of Environmental Externalities in October QF Filings; Boston Gas Company; November 5 1990.**

Generic and specific problems in Massachusetts utilities' RFPs with regard to externality valuation requirements. Recommendations for corrections.

- 87. MEFSC 90-12/90-12A; Adequacy of Boston Edison Proposal to Build Combined-Cycle Plant; Conservation Law Foundation; December 14 1990.**

Problems in Boston Edison's treatment of demand-side management, supply option analysis, and resource planning. Recommendations of mitigation options.

- 88. Maine PUC 90-286; Adequacy of Conservation Program of Bangor Hydro Electric; Penobscot River Coalition; February 19 1991.**

Role of utility-sponsored DSM in least-cost planning. Bangor Hydro's potential for cost-effective conservation. Problems with Bangor Hydro's assumptions about customer investment in energy efficiency measures.

- 89. Virginia State Corporation Commission PUE900070; Order Establishing Commission Investigation; Southern Environmental Law Center; March 6 1991.**

Role of utilities in promoting energy efficiency. Least-cost planning objectives of and resource acquisition guidelines for DSM. Ratemaking considerations for DSM investments.

- 90. MDPU 90-261-A; Economics and Role of Fuel-Switching in the DSM Program of the Massachusetts Electric Company; Boston Gas Company; April 17 1991.**

Role of fuel-switching in utility DSM programs and specifically in Massachusetts Electric's. Establishing comparable avoided costs and comparison of electric and gas system costs. Updated externality values.

- 91. Private arbitration; Massachusetts Refusetech Contractual Request for Adjustment to Service Fee; Massachusetts Refusetech; May 13 1991.**

NEPCo rates for power purchases from the NESWC plant. Fuel price and avoided cost projections vs. realities.

- 92. Vermont PSB 5491; Cost-Effectiveness of Central Vermont's Commitment to Hydro Quebec Purchases; Conservation Law Foundation; July 19 1991.**

Changes in load forecasts and resale markets since approval of HQ purchases. Effect of HQ purchase on DSM.

93. **South Carolina PSC 91-216-E**; Cost Recovery of Duke Power's DSM Expenditures; South Carolina Department of Consumer Affairs; September 13 1991. Surrebuttal October 2 1991.

Problems with conservation plans of Duke Power, including load building, cream skimming, and inappropriate rate designs.

94. **Maryland PSC 8241, Phase II**; Review of Baltimore Gas & Electric's Avoided Costs; Maryland Office of People's Counsel; September 19 1991.

Development of direct avoided costs for DSM. Problems with BG&E's avoided costs and DSM screening. Incorporation of environmental externalities.

95. **Bucksport Planning Board**; AES/Harriman Cove Shoreland Zoning Application; Conservation Law Foundation and Natural Resources Council of Maine; October 1 1991.

New England's power surplus. Costs of bringing AES/Harriman Cove on line to back out existing generation. Alternatives to AES.

96. **MDPU 91-131**; Update of Externalities Values Adopted in Docket 89-239; Boston Gas Company; October 4 1991. Rebuttal, December 13 1991.

Updates on pollutant externality values. Addition of values for chlorofluorocarbons, air toxics, thermal pollution, and oil import premium. Review of state regulatory actions regarding externalities.

97. **Florida PSC 910759**; Petition of Florida Power Corporation for Determination of Need for Proposed Electrical Power Plant and Related Facilities; Floridians for Responsible Utility Growth; October 21 1991.

Florida Power's obligation to pursue integrated resource planning and failure to establish need for proposed facility. Methods to increase scope and scale of demand-side investment.

98. **Florida PSC 910833-EI**; Petition of Tampa Electric Company for a Determination of Need for Proposed Electrical Power Plant and Related Facilities; Floridians for Responsible Utility Growth; October 31 1991.

Tampa Electric's obligation to pursue integrated resource planning and failure to establish need for proposed facility. Methods to increase scope and scale of demand-side investment.

99. **Pennsylvania PUC I-900005, R-901880**; Investigation into Demand Side Management by Electric Utilities; Pennsylvania Energy Office; January 10 1992.

Appropriate cost recovery mechanism for Pennsylvania utilities. Purpose and scope of direct cost recovery, lost revenue recovery, and incentives.

100. **South Carolina PSC 91-606-E**; Petition of South Carolina Electric and Gas for a Certificate of Public Convenience and Necessity for a Coal-Fired Plant; South Carolina Department of Consumer Affairs; January 20 1992.
- Justification of plant certification under integrated resource planning. Failures in SCE&G's DSM planning and company potential for demand-side savings.
101. **MDPU 92-92**; Adequacy of Boston Edison's Street-Lighting Options; Town of Lexington; June 22 1992.
- Efficiency and quality of street-lighting options. Boston Edison's treatment of high-quality street lighting. Corrected rate proposal for the Daylux lamp. Ownership of public street lighting.
102. **South Carolina PSC 92-208-E**; Integrated Resource Plan of Duke Power Company; South Carolina Department of Consumer Affairs; August 4 1992.
- Problems with Duke Power's DSM screening process, estimation of avoided cost, DSM program design, and integration of demand-side and supply-side planning.
103. **North Carolina Utilities Commission E-100, Sub 64**; Integrated Resource Planning Docket; Southern Environmental Law Center; September 29 1992.
- General principles of integrated resource planning, DSM screening, and program design. Review of the IRPs of Duke Power Company, Carolina Power & Light Company, and North Carolina Power.
104. **Ontario Environmental Assessment Board Ontario Hydro Demand/Supply Plan Hearings**; *Environmental Externalities Valuation and Ontario Hydro's Resource Planning* (3 vols.); October 1992.
- Valuation of environmental externalities from fossil fuel combustion and the nuclear fuel cycle. Application to Ontario Hydro's supply and demand planning.
105. **Texas PUC 110000**; Application of Houston Lighting and Power Company for a Certificate of Convenience and Necessity for the DuPont Project; Destec Energy, Inc.; September 28 1992.
- Valuation of environmental externalities from fossil fuel combustion and the application to the evaluation of proposed cogeneration facility.
106. **Maine Board of Environmental Protection**; In the Matter of the Basin Mills Hydroelectric Project Application; Conservation Intervenors; November 16 1992.
- Economic and environmental effects of generation by proposed hydro-electric project.
107. **Maryland PSC 8473**; Review of the Power Sales Agreement of Baltimore Gas and Electric with AES Northside; Maryland Office of People's Counsel; November 16 1992.

Non-price scoring and unquantified benefits; DSM potential as alternative; environmental costs; cost and benefit estimates.

108. **North Carolina Utilities Commission E-100**, Sub 64; Analysis and Investigation of Least Cost Integrated Resource Planning in North Carolina; Southern Environmental Law Center; November 18 1992.

Demand-side management cost recovery and incentive mechanisms.

109. **South Carolina PSC 92-209-E**; In Re Carolina Power & Light Company; South Carolina Department of Consumer Affairs; November 24 1992.

DSM planning; objectives, process, cost-effectiveness test, comprehensiveness, lost opportunities. Deficiencies in CP&L's portfolio. Need for economic evaluation of load building.

110. **Florida Department of Environmental Regulation** hearings on the Power Plant Siting Act; Legal Environmental Assistance Foundation, December 1992.

Externality valuation and application in power-plant siting. DSM potential, cost-benefit test, and program designs.

111. **Maryland PSC 8487**; Baltimore Gas and Electric Company, Electric Rate Case; January 13 1993. Rebuttal Testimony: February 4 1993.

Class allocation of production plant and O&M; transmission, distribution, and general plant; administrative and general expenses. Marginal cost and rate design.

112. **Maryland PSC 8179**; for Approval of Amendment No. 2 to Potomac Edison Purchase Agreement with AES Warrior Run; Maryland Office of People's Counsel; January 29 1993.

Economic analysis of proposed coal-fired cogeneration facility.

113. **Michigan PSC U-10102**; Detroit Edison Rate Case; Michigan United Conservation Clubs; February 17 1993.

Least-cost planning; energy efficiency planning, potential, screening, avoided costs, cost recovery, and shareholder incentives.

114. **Ohio PUC 91-635-EL-FOR, 92-312-EL-FOR, 92-1172-EL-ECP**; Cincinnati Gas and Electric demand-management programs; City of Cincinnati. April 1993.

DSM planning, program designs, potential savings, and avoided costs.

115. **Michigan PSC U-10335**; Consumers Power Rate Case; Michigan United Conservation Clubs; October 1993.

Least-cost planning; energy efficiency planning, potential, screening, avoided costs, cost recovery, and shareholder incentives.

116. **Illinois Commerce Commission** 92-0268, Electric-Energy Plan for Commonwealth Edison; City of Chicago. Direct testimony, February 1 1994; rebuttal, September 1994.

Cost-effectiveness screening of demand-side management programs and measures; estimates by Commonwealth Edison of costs avoided by DSM and of future cost, capacity, and performance of supply resources.

117. **FERC** 2422 et al., Application of James River-New Hampshire Electric, Public Service of New Hampshire, for Licensing of Hydro Power; Conservation Law Foundation; 1993.

Cost-effective energy conservation available to the Public Service of New Hampshire; power-supply options; affidavit.

118. **Vermont PSB** 5270-CV-1,-3, and 5686; Central Vermont Public Service Fuel-Switching and DSM Program Design, on behalf of the Vermont Department of Public Service. Direct, April 1994; rebuttal, June 1994.

Avoided costs and screening of controlled water-heating measures; risk, rate impacts, participant costs, externalities, space- and water-heating load, benefit-cost tests.

119. **Florida PSC** 930548-EG-930551-EG, Conservation goals for Florida electric utilities; Legal Environmental Assistance Foundation, Inc. April 1994.

Integrated resource planning, avoided costs, rate impacts, analysis of conservation goals of Florida electric utilities.

120. **Vermont PSB** 5724, Central Vermont Public Service Corporation rate request; Vermont Department of Public Service. Joint surrebuttal testimony with John Plunkett. August 1994.

Costs avoided by DSM programs; Costs and benefits of deferring DSM programs.

121. **MDPU** 94-49, Boston Edison integrated resource-management plan; Massachusetts Attorney General. August 1994.

Least-cost planning, modeling, and treatment of risk.

122. **Michigan PSC** U-10554, Consumers Power Company DSM Program and Incentive; Michigan Conservation Clubs. November 1994.

Critique of proposed reductions in DSM programs; discussion of appropriate measurements of cost-effectiveness, role of DSM in competitive power markets.

123. **Michigan PSC** U-10702, Detroit Edison Company Cost Recovery, on behalf of the Residential Ratepayers Consortium. December 1994.

Impact of proposed changes to DSM plan on energy costs and power-supply-cost-recovery charges. Critique of proposed DSM changes; discussion of appropriate measurements of cost-effectiveness, role of DSM in competitive power markets.

124. **New Jersey Board of Regulatory Commissioners EM92030359**, Environmental costs of proposed cogeneration; Freehold Cogeneration Associates. November 1994.
- Comparison of potential externalities from the Freehold cogeneration project with that from three coal technologies; support for the study "The Externalities of Four Power Plants."
125. **Michigan PSC U-10671**, Detroit Edison Company DSM Programs; Michigan United Conservation Clubs. January 1995.
- Critique of proposal to scale back DSM efforts in light of potential for competition. Loss of savings, increase of customer costs, and decrease of competitiveness. Discussion of appropriate measurements of cost-effectiveness, role of DSM in competitive power markets.
126. **Michigan PSC U-10710**, Power-supply-cost-recovery plan of Consumers Power Company; Residential Ratepayers Consortium. January 1995.
- Impact of proposed changes to DSM plan on energy costs and power-supply-cost-recovery charges. Critique of proposed DSM changes; discussion of appropriate measurements of cost-effectiveness, role of DSM in competitive power markets.
127. **FERC 2458 and 2572**, Bowater-Great Northern Paper hydropower licensing; Conservation Law Foundation. February 1995.
- Comments on draft environmental impact statement relating to new licenses for two hydropower projects in Maine. Applicant has not adequately considered how energy conservation can replace energy lost due to habitat-protection or -enhancement measures.
128. **North Carolina Utilities Commission E-100**, Sub 74, Duke Power and Carolina Power & Light avoided costs; Hydro-Electric-Power Producer's Group. February 1995.
- Critique and proposed revision of avoided costs offered to small hydro-power producers by Duke Power and Carolina Power and Light.
129. **New Orleans City Council UD-92-2A and -2B**, Least-cost IRP for New Orleans Public Service and Louisiana Power & Light; Alliance for Affordable Energy. Direct, February 1995; rebuttal, April 1995.
- Critique of proposal to scale back DSM efforts in light of potential competition.
130. **DCPSC Formal 917, II**, Prudence of DSM expenditures of Potomac Electric Power Company; Potomac Electric Power Company. Rebuttal testimony, February 1995.
- Prudence of utility DSM investment; prudence standards for DSM programs of the Potomac Electric Power Company.
131. **Ontario Energy Board EBRO 490**, DSM cost recovery and lost-revenue-adjustment mechanism for Consumers Gas Company; Green Energy Coalition. April 1995.

DSM cost recovery. Lost-revenue-adjustment mechanism for Consumers Gas Company.

- 132. New Orleans City Council CD-85-1**, New Orleans Public Service rate increase; Alliance for Affordable Energy. Rebuttal, May 1995.

Allocation of costs and benefits to rate classes.

- 133. MDPU Docket DPU-95-40**, Mass. Electric cost-allocation; Massachusetts Attorney General. June 1995.

Allocation of costs to rate classes. Critique of cost-of-service study. Implications for industry restructuring.

- 134. Maryland PSC 8697**, Baltimore Gas & Electric gas rate increase; Maryland Office of People's Counsel. July 1995

Rate design, cost-of-service study, and revenue allocation.

- 135. North Carolina Utilities Commission E-2**, Sub 669. December 1995.

Need for new capacity. Energy-conservation potential and model programs.

- 136. Arizona Commerce Commission U-1933-95-317**, Tucson Electric Power rate increase; Residential Utility Consumer Office. January 1996.

Review of proposed rate settlement. Used-and-usefulness of plant. Rate design. DSM potential.

- 137. Ohio PUC 95-203-EL-FOR**; Campaign for an Energy-Efficient Ohio. February 1996

Long-term forecast of Cincinnati Gas and Electric Company, especially its DSM portfolio. Opportunities for further cost-effective DSM savings. Tests of cost effectiveness. Role of DSM in light of industry restructuring; alternatives to traditional utility DSM.

- 138. Vermont PSB 5835**; Vermont Department of Public Service. February 1996.

Design of load-management rates of Central Vermont Public Service Company.

- 139. Maryland PSC 8720**, Washington Gas Light DSM; Maryland Office of People's Counsel. May 1996.

Avoided costs of Washington Gas Light Company; integrated least-cost planning.

- 140. MDPU DPU 96-100**; Massachusetts Utilities' Stranded Costs; Massachusetts
A. Attorney General. Oral testimony in support of "estimation of Market Value, Stranded Investment, and Restructuring Gains for Major Massachusetts Utilities," July 1996.

Stranded costs. Calculation of loss or gain. Valuation of utility assets.

- 141. MDPU DPU 96-70**; Massachusetts Attorney General. July 1996.

Market-based allocation of gas-supply costs of Essex County Gas Company.

142. **MDPU DPU 96-60**; Massachusetts Attorney General. Direct testimony, July 1996; surrebuttal, August 1996.
Market-based allocation of gas-supply costs of Fall River Gas Company.
143. **Maryland PSC 8725**; Maryland Office of People's Counsel. July 1996.
Proposed merger of Baltimore Gas & Electric Company, Potomac Electric Power Company, and Constellation Energy. Cost allocation of merger benefits and rate reductions.
144. **New Hampshire PUC DR 96-150**, Public Service Company of New Hampshire stranded costs; New Hampshire Office of Consumer Advocate. December 1996.
Market price of capacity and energy; value of generation plant; restructuring gain and stranded investment; legal status of PSNH acquisition premium; interim stranded-cost charges.
145. **Ontario Energy Board EBRO 495**, LRAM and shared-savings incentive for DSM performance of Consumers Gas; Green Energy Coalition. March 1997.
LRAM and shared-savings incentive mechanisms in rates for the Consumers Gas Company Ltd.
146. **New York PSC Case 96-E-0897**, Consolidated Edison restructuring plan; City of New York. April 1997.
Electric-utility competition and restructuring; critique of proposed settlement of Consolidated Edison Company; stranded costs; market power; rates; market access.
147. **Vermont PSB 5980**, proposed statewide energy plan; Vermont Department of Public Service. Direct, August 1997; rebuttal, December 1997.
Justification for and estimation of statewide avoided costs; guidelines for distributed IRP.
148. **MDPU 96-23**, Boston Edison restructuring settlement; Utility Workers Union of America. September 1997.
Performance incentives proposed for the Boston Edison company.
149. **Vermont PSB 5983**, Green Mountain Power rate increase; Vermont Department of Public Service. Direct, October 1997; rebuttal, December 1997.
In three separate pieces of prefiled testimony, addressed the Green Mountain Power Corporation's (1) distributed-utility-planning efforts, (2) avoided costs, and (3) prudence of decisions relating to a power purchase from Hydro-Quebec.
150. **MDPU 97-63**, Boston Edison proposed reorganization; Utility Workers Union of America. October 1997.

Increased costs and risks to ratepayers and shareholders from proposed reorganization; risks of diversification; diversion of capital from regulated to unregulated affiliates; reduction in Commission authority.

151. **MDTE 97-111**, Commonwealth Energy proposed restructuring; Cape Cod Light Compact. Joint testimony with Jonathan Wallach, 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.

152. **NH PUC Docket DR 97-241**, Connecticut Valley Electric fuel and purchased-power adjustments; City of Claremont, N.H. February 1998.

Prudence of continued power purchase from affiliate; market cost of power; prudence disallowances and cost-of-service ratemaking.

153. **Maryland PSC 8774**; APS-DQE merger; Maryland Office of People's Counsel. February 1998.

Power-supply arrangements between APS's operating subsidiaries; power-supply savings; market power.

154. **Vermont PSB 6018**, Central Vermont Public Service Co. rate increase; Vermont Department of Public Service. February 1998.

Prudence of decisions relating to a power purchase from Hydro-Quebec. Reasonableness of avoided-cost estimates. Quality of DU planning.

155. **Maine PUC 97-580**, Central Maine Power restructuring and rates; Maine Office of Public Advocate. May 1998; Surrebuttal, August 1998.

Determination of stranded costs; gains from sales of fossil, hydro, and biomass plant; treatment of deferred taxes; incentives for stranded-cost mitigation; rate design.

156. **MDTE 98-89**, purchase of Boston Edison municipal streetlighting, Towns of Lexington and Acton. Affidavit, August 1998.

Valuation of municipal streetlighting; depreciation; applicability of unbundled rate.

157. **Vermont PSB 6107**, Green Mountain Power rate increase, Vermont Department of Public Service. Direct, September 1998; Surrebuttal drafted but not filed, November 2000.

Prudence of decisions relating to a power purchase from Hydro-Quebec. Least-cost planning and prudence. Quality of DU planning.

158. **MDTE 97-120**, Western Massachusetts Electric Company proposed restructuring; Massachusetts Attorney General. Joint testimony with Jonathan Wallach, October 1998. Joint surrebuttal with Jonathan Wallach, 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.

- 159. Maryland PSC 8794 and 8804; BG&E restructuring and rates; Maryland Office of People's Counsel. Direct, December 1998; rebuttal, March 1999.**

Implementation of restructuring. Valuation of generation assets from comparable-sales and cash-flow analyses. Determination of stranded cost or gain.

- 160. Maryland PSC 8795; Delmarva Power & Light restructuring and rates; Maryland Office of People's Counsel. December 1998.**

Implementation of restructuring. Valuation of generation assets and purchases from comparable-sales and cash-flow analyses. Determination of stranded cost or gain.

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