BEFORE THE STATE OF NEW JERSEY
BOARD OF PUBLIC UTILITIES

IN THE MATTER OF THE VERIFIED PETITION OF JERSEY CENTRAL POWER & LIGHT COMPANY CONCERNING A PROPOSAL FOR FOUR SMALL SCALE/PILOT DEMAND RESPONSE PROGRAMS FOR THE PERIOD BEGINNING JUNE 1, 2009	)))))))	**BPU DKT. NO. EO08050326 EO08080542**

ADDITIONAL TESTIMONY OF J. RICHARD HORNBY

ON BEHALF OF THE

NEW JERSEY DEPARTMENT OF THE PUBLIC ADVOCATE
DIVISION OF RATE COUNSEL

RONALD K. CHEN
PUBLIC ADVOCATE OF NEW JERSEY

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I. INTRODUCTION

Q. PLEASE STATE YOUR NAME, EMPLOYER, AND PRESENT POSITION.

A. My name is James Richard Hornby. I am a Senior Consultant at Synapse Energy Economics, Inc., 22 Pearl Street, Cambridge, MA 02139.

Q. ON WHOSE BEHALF ARE YOU TESTIFYING IN THIS CASE?

A. I am testifying on behalf of the New Jersey Department of the Public Advocate, Division of Rate Counsel ('Rate Counsel').

Q. PLEASE DESCRIBE SYNAPSE ENERGY ECONOMICS.

A. Synapse Energy Economics ("Synapse") is a research and consulting firm specializing in energy and environmental issues, including: electric generation, transmission and distribution system reliability, market power, electricity market prices, stranded costs, efficiency, renewable energy, environmental quality, and nuclear power.

Q. PLEASE SUMMARIZE YOUR WORK EXPERIENCE AND EDUCATIONAL BACKGROUND.

A. I am a consultant specializing in planning, market structure, ratemaking, and gas supply/fuel procurement in the electric and gas industries. Over the past twenty years, I have presented expert testimony and provided litigation support on these issues in approximately 100 proceedings in over thirty jurisdictions in the United States and Canada. Over this period, my clients have included staff of public utility commissions, state energy offices, consumer advocate offices and marketers.

Prior to joining Synapse in 2006, I was a Principal with CRA International and, prior to that, Tabors Caramanis & Associates. From 1986 to 1998, I worked with the Tellus Institute (formerly Energy Systems Research Group), initially as

Manager of the Natural Gas Program and subsequently as Director of their Energy Group. Prior to 1986, I was Assistant Deputy Minister of Energy for the Province of Nova Scotia.

I have a Master of Science in Energy Technology and Policy from the Massachusetts Institute of Technology (MIT) and a Bachelor of Industrial Engineering from the Technical University of Nova Scotia, now merged with Dalhousie University. I have attached my resume to this testimony as Exhibit___(JRH-1).

Q. PLEASE SUMMARIZE YOUR EXPERIENCE WITH ENERGY EFFICIENCY MEASURES AND POLICIES, INCLUDING POLICIES ON RATEMAKING.

A. My experience with energy efficiency measures and policies began over thirty years ago as a project engineer responsible for identifying and pursuing opportunities to reduce energy use in a factory in Nova Scotia. Subsequently, in my graduate program at MIT I took several courses on energy technologies and policies, and prepared a thesis analyzing federal policies to promote investments in energy efficiency. After MIT, I spent several years with the government in Nova Scotia, during which time I administered a provincial program to promote energy conservation in the industrial sector and later included energy conservation in all sectors as part of energy plans developed for the province. More recently, over the past twenty years as a regulatory consultant I have helped review and prepare numerous integrated resource plans in the gas and electric industries.

Since 2007 I have completed several projects addressing the alignment of utility financial incentives and rates with the pursuit of energy efficiency. Those projects include testimony in proceedings in North Carolina, South Carolina and Indiana as well as the preparation of a report sponsored by the National Action Plan for Energy Efficiency.

Q. HAVE YOU PREVIOUSLY TESTIFIED BEFORE THE NEW JERSEY BOARD OF PUBLIC UTILITIES?

A. Yes. Over the past 20 years I have testified on rate unbundling and purchased gas adjustment clause matters before the Board of Public Utilities (Board or BPU) in various gas and electric cases. More recently, on July 23, 2009, I submitted testimony on behalf of the Division of Rate Counsel ("Rate Counsel") concerning what has been referred to as Phase I, i.e., the Jersey Central Power & Light Company ("JCP&L" or "the Company") Expanded Integrated Distributed Energy Resource ("IDER") Program. However, the parties reached a stipulated agreement on the IDER Program and no hearing was held.

Q. WHAT IS THE PURPOSE OF YOUR TESTIMONY?

A. My testimony evaluates each of three demand response (DR) programs for which JCP&L has requested approval. The proposed Tariff-Based Curtailment Program, described in the Direct Testimony of Mr. Siebens, is projected to achieve a reduction of 60 MW. The Permanent Peak Load Shift (PPLS) and Electricity Storage (ES) Programs, described in the Direct Testimony of Ms. Gardow, are projected to achieve reductions of 5MW and 3 MW respectively. My testimony focuses on the benefits of each proposed program relative to its costs.

Q. PLEASE SUMMARIZE YOUR POSITION REGARDING THE THREE PROPOSED DR PROGRAMS.

A. In July 2008 the Board set a target for the State's electric distribution companies (EDCs) to reduce electricity use in New Jersey during hours of system-wide peak demand by an aggregate quantity of 300 MW in the first year of their programs and by 600 MW by the third year. The JCP&L proposed DR programs under consideration in this proceeding represent three of its proposals in response to that Order.

The July 2008 Order required EDCs to include a projection of the cost-effectiveness of each DR program in their proposals. I have evaluated the projected benefits and costs of each JCP&L proposed programs under both the Total Resource Cost (TRC) test and the Ratepayer Impact (RIM) test.

The proposed Tariff-Based Curtailment Program is cost-effective according to those tests. Based upon those results I recommend that it be approved subject to two constraints.

- First, in addition to limiting the program to new capacity reductions eligible for credits under the Interruptible Load for Reliability ('ILR') program operated by the PJM Interconnection ('PJM'), JCP&L should also limit this program to customers who have not participated in the Demand Response Working Group ("DRWG') Modified Program in 2009[1]. This constraint will prevent a participant from receiving an incentive from a Curtailment Service

[1] In its July 2008 Order the Board invited proposals from all energy industry entities for market-based programs that could achieve an additional aggregate reduction of up to 600 MW. The Board approved the DRWG Modified Program in its December 10, 2008 Order in Docket EO08050326.

provider ('CSP') under the DRWG Modified Program and again from JCP&L under its Curtailment Program.

- Second, ratepayer funding for the Tariff-Based Curtailment Program should not exceed the amount approved for the DRWG Modified Program, which was a first year amount of $22.50 per MW-day per participant. This constraint will place JCP&L on a more equal footing with CSPs who are offering the DRWG Modified Program.

Finally, I recommend that the Board require JCP&L to submit an analysis of the changes that would be required to continue the Curtailment Program beyond May 2012.

Neither the PPLS Program nor the ES Programs is cost-effective according to the TRC test. JCP&L has not provided projections of other benefits that help justify approval of either program. The technologies in each proposed program have been proven in other jurisdictions so there is no need for ratepayers to fund either program on a pilot basis. Based upon this analysis I recommend that neither program be approved at this time. JCP&L could re-submit these proposed programs for consideration at a later date if justified by new estimates of their projected costs and benefits.

II. CRITERIA FOR EVALUATING PROPOSED DR PROGRAMS

Q. PLEASE BEGIN BY EXPLAINING THE CONTEXT OF JCP&L'S REQUEST FOR APPROVAL OF THREE PROPOSED DR PROGRAMS.

A. The JCP&L request for approval of three DR programs is part of its August 1, 2008 response to an Order issued July 1, 2008. In that Order the Board set a target for the State's electric distribution companies (EDCs) to reduce electricity use in New Jersey during hours of system-wide peak demand. The near-term target set for EDCs was an aggregate reduction of 300 MW with an ultimate target being an aggregate reduction of 600 MW within three years. That Order also invited proposals from all energy industry entities for market-based programs that could achieve an additional aggregate reduction of up to 600 MW within three years.

The JCP&L portion of the aggregate reduction target of 300 MW is 93 MW. In its August 1, 2008 response JCP&L indicated that it planned to meet 10 MW of that target through two programs that had been approved earlier in 2008, 8 MW from a pilot central air conditioning direct load control program ("IDER program) and 2 MW from rate design changes for its Basic Generation Service ("BGS"). The Company proposed to achieve an additional 15 MW reduction by expanding its IDER program. A stipulation regarding the IDER expansion was submitted to the Board earlier in August 2009. JCP&L proposed to meet the remaining portions of its near-term target through the three programs under consideration in this proceeding. These are 60 MW from the Tariff-Based Curtailment Program, 5 MW from the PPLS and 3 MW from the ES Program.

Q. HAS JCP&L UPDATED ITS PROJECTIONS OF THE COSTS AND BENEFITS OF ITS THREE PROPOSED PROGRAMS?

A. Yes. JCP&L provided updated estimates of the projected costs and benefits of its three proposed programs in responses to Rate Counsel data requests RC-JCPL-80 and 93.

Q. PLEASE DESCRIBE THE CRITERIA YOU USED TO EVALUATE THE THREE PROPOSED DR PROGRAMS.

A. The July 2008 Order required EDCs to include a projection of the cost-effectiveness of each DR program in their proposals. This cost-effectiveness criterion is consistent with sound policy and ratemaking principles. The Board has set demand reduction targets but there are many alternative approaches available to achieve demand reduction. For example, electricity use can be reduced during hours of peak system-wide demand, and in many other hours throughout the year, through improvements efficiency. In addition, DR programs can target different classes of customers and can be achieved through various technologies. Therefore, in order to ensure reliable service at reasonable rates, and the attainment of energy and environmental policy objectives at least cost, it is important to evaluate the benefits and costs of each proposed approach, as well as to compare alternative approaches according to their relative benefits and costs.

I evaluated the projected benefits and costs of each JCP&L proposed programs under the Total Resource Cost (TRC) test. That test compares the value of the projected benefits of the program over the life of the measures, calculated as a net present value ('NPV') at a discount rate of 6.86%[2], to the corresponding NPV of the

[2] JCP&L estimate of after-tax weighted average cost of capital.

costs of the program. The TRC test calculates these benefits and costs from a system-wide perspective and therefore does not include incentives given to program participants as program costs, since they are viewed as transfers from non-participating customers to participating customers. A program is cost-effective under the TRC test if the ratio of benefits to costs is greater than 1. To provide additional information I have also evaluated the benefits and costs under the RIM test, which compares the benefits of the program to the costs of the program from a ratepayer perspective. Under the RIM test incentives paid to participants and revenues lost by the utility are both included as costs.

In addition to evaluating the projected benefits and costs of each proposed program I also considered other benefits that might help justify the programs, such as projected environmental benefits and the field testing of new technologies. It is particularly important to examine and verify projections of environmental benefits associated with reducing electricity use during hours of peak demand. Demand reductions do reduce ozone levels due to reduced generating unit emissions in those 100 or so hours, but they are unlikely to result in material reductions in annual carbon dioxide emissions. Moreover, if the reduction in peak hours is achieved by participants shifting some of their use to off-peak hours, rather than permanently reducing the quantity of electricity they use for the day, there may be an increase in carbon dioxide emissions on that day. The increase is due to shifting use from peak hours when natural gas fired units may be the marginal generating units to off peak hours when coal units may be the marginal units.

III. PROPOSED TARIFF-BASED CURTAILMENT PROGRAM

Q. PLEASE SUMMARIZE THE PROPOSED TARIFF-BASED CURTAILMENT PROGRAM.

A. The proposed tariff-based curtailment program is designed to achieve reductions in demand by increasing the participation of C&I customers in the Interruptible Load for Reliability ('ILR') program operated by the PJM Interconnection ('PJM') [3]. In its August 1, 2008 filing JCP&L projected a 60 MW reduction through its Curtailment Program.

The reductions would be obtained from C&I customers who have not participated in the PJM ILR program to date as well as increases in the reductions of C&I customers who have been participating in those programs. Participating C&I customers would be responsible for identifying, and paying for, the specific measures used to reduce demand in their premises.

Under the Program the Company would provide participants the following incentives:

- 90% of the revenues received from the PJM ILR program for registered reductions;
- A one-time incentive payment of $22.50 per MW-day for registered reductions;
- A curtailment audit grant;
- An interval meter; and
- Access to the load data collected by the interval meter

The last three incentives would not be provided to customers that enroll through independent CSPs.

JCP&L proposes to terminate the program effective May 2012 coincident with the termination of the PJM ILR program.

[3] PJM operates the wholesale markets for capacity and energy.

Q. HAS JCP&L PROVIDED QUANTITATIVE PROJECTIONS OF BENEFITS FROM THE PROPOSED TARIFF-BASED CURTAILMENT PROGRAM?

A. Yes. JCP&L has provided a projection of the compensation it expects to receive for demand reductions registered in the PJM ILR program. Under the ILR program, PJM compensates EDCs and CSPs who commit to provide a specified quantity of demand reduction during a given year, if called upon according to reliability criteria[4]. The compensation equals the quantity of demand reduction committed for the year multiplied by the value of capacity in that year. For example, in 2011 JCP&L expects to receive compensation of $2,996,000 in return for registering 60 MW in the PJM ILR program. (This amount is 60 MW times a capacity value of $49.93 per kw-year per Schedule CWS-2, line 7).

JCP&L expects to receive additional compensation for reducing demand during PJM Economic Load Response events. Under that program, PJM compensates EDCs and CSPs when it calls for reductions in response to high wholesale energy market prices. For example, in 2011 JCP&L projects compensation of $ 118,000 in return for reducing demand by 60 MW in response to PJM calls for economic reductions during events on 6 days each lasting 6 hours. (This amount is 60 MW times 80 percent[5] times 36 hours times an energy value of $68 per MWh per Schedule CWS-2, line 15).

[4] The ILR Program terminates at the end of 2011. From 2012 onward participants seeking compensation from PJM for demand reduction must participate in auctions under the Reliability Pricing Model (RPM). The Base Residual Auction (BRA) for a future power year is held approximately three years in advance of that power year.

[5] JCP&L assumes that 20 percent of the reduction will be from C&I customers ineligible for the PJM Economic Load Response Program.

Q. DOES JCP&L PROJECT ANNUAL COMPENSATION FROM THE TWO PJM PROGRAMS WILL OFFSET THE PROJECTED COST OF THE PROPOSED CURTAILMENT PROGRAM?

A. JCP&L projects the cumulative compensation from these two PJM programs will offset 94% of the cumulative annual revenue requirements of the proposed Curtailment Program, as indicated in Exhibit___(JRH-2). The resulting benefit to cost ratio under the TRC test is 7.4. The RIM test benefit to cost ratio is 0.93.

Q. IS THE PROPOSED TARIFF-BASED CURTAILMENT PROGRAM COMPETING WITH SIMILAR CURTAILMENT PROGRAMS OFFERED BY OTHER CSPs.

A. Yes. JCP&L's proposed Tariff-based Curtailment Program is competing with similar programs that CSPs have been offering under the DRWG Modified Program. Under that program CSPs receive a one-time annual payment equivalent to $22.50 per MW-day for each MW of DR they enroll. That incentive is funded by revenues collected from ratepayers under the Regional Greenhouse Gas Initiative ('RGGI') Recovery Charge. In fact, JCP&L has stated that it may not be able to achieve the 60 MW it had projected in its August 2008 filing because an additional 82 MW of incremental demand response located within the JCP&L zone has been registered with PJM since that filing (Response RC-JCPL-80). That data response implies that only a limited number of C&I customers served by JCP&L are interested in participating in this type of curtailment program, and that CSPs have already enrolled many of those interested C&I customers under the DRWG Modified Program.

Q. WOULD THE BENEFITS OF THE CURTAILMENT PROGRAM BE GREATER IF IT CONTINUED BEYOND MAY 2012?

A. Yes. JCP&L currently proposes to terminate the Curtailment Program coincident with PJM's termination of its ILR program. However, the benefits of this Program would be much greater if JCP&L could continue it after May 2012 by convincing the C&I customers it enrolls in 2010 and 2011 to continue to participate. In order to continue the Curtailment Program after May 2102 JCP&L would have to bid the demand reductions into the PJM RPM, which conducts auctions starting three years in advance of the power year in which those reductions are projected to occur.

Q. WHAT ACTION DO YOU RECOMMEND THE BOARD TAKE REGARDING JCP&L'S PROPOSED CURTAILMENT PROGRAM.

A. I recommend that the Board approve the Curtailment Program with modifications. First, in addition to limiting the program to new capacity reductions eligible for credits under the PJM ILR Program, JCP&L should also limit this program to customers who have not participated in the DRWG Modified Program in 2009. This constraint will prevent a participant from receiving an incentive from a CSP under the DRWG Modified Program and again from JCP&L under its Curtailment Program. Second, ratepayer funding for the Tariff-Based Curtailment Program should not exceed the amount approved for the DRWG Modified Program, which was a first year amount of $22.50 per MW-day per participant. This constraint will place JCP&L on a more equal footing with CSPs who are offering the DRWG Modified Program. Finally, I recommend that the Board require JCP&L to submit an analysis of the changes that would be required to continue the Curtailment Program beyond May 2012.

IV. PROPOSED PPLS AND ES PROGRAMS

Q. PLEASE SUMMARIZE THE PROPOSED PPLS PROGRAM.

A. The proposed PPLS Program is designed to achieve permanent reductions in demand by shifting electricity use of building air conditioning system of participating C&I customers from hours of peak demand to off-peak hours. In its August 1, 2008 filing JCP&L projected a 5 MW reduction by enrolling 250 C&I customers. The Company would use ratepayer funding to pay for the installation of Ice Bear Hybrid Air Conditioner units on building air conditioners. The incentive to participating C&I customers would be the MW reduction in the level of demand for which they are billed, and hence the potential for somewhat lower bills.

Q. HAS JCP&L PROVIDED QUANTITATIVE PROJECTIONS OF BENEFITS FROM THE PROPOSED PPLS PROGRAM?

A. Yes. Since the PPLS Program results in a permanent reduction in peak load of the participating customers, it should eventually lead to a lower wholesale capacity obligation for the load serving entity ("LSE") serving those participants. There is a time lag between the year in which the demand reduction occurs and the year in which PJM will reflect that reduction by lowering the capacity obligation because PJM sets that capacity obligation three years in advance.

JCP&L has estimated the value of that reduction to be equivalent to the value of wholesale capacity under the PJM ILR program or the RPM, plus the value of avoided energy under the PJM Economic Load Response Program.

Q. DOES THE PROJECTED VALUE OF THE PPLS PROGRAM OFFSET ITS PROJECTED COST?

A. No. JCP&L's own projections indicate that the benefits are much less than the costs, and thus the PPLS Program is not cost-effective based upon those projected benefits. JCP&L projects that, over 10 years, the cumulative value of the Program's shift in demand from peak hours to off-peak hours will only be approximately 25% of the cumulative cost of the Program. The Company's projection of cumulative benefits and cumulative costs is presented in Exhibit___(JRH-3).

My analysis calculates the projected benefits and costs of the PPLS program over 15 years, the projected life of the equipment. Over that period the ratio of benefits to costs under the TRC test is 0.33. The RIM test ratio is also 0.33 since no incentives are given to participating customers. The results of my calculations are also presented in presented in Exhibit___(JRH-3).

My calculations use the Company's projections of benefits and costs through 2019. For the years 2020 to 2024 my projections of benefits and costs are consistent with the Company's projections for its IDER Expansion Program. In particular, for the power years from 2013 to 2019 JCP&L projects the value of wholesale capacity to be the value set in the PJM RPM auction for the 2012 power year, i.e. $139.73 per MW-day. From 2020 to 2024 I escalate this value at 3.5% per year. This estimated value is the same as JCP&L used in its analysis of the IDER Expansion program.

On an NPV basis over 15 years this projected value of wholesale capacity is approximately 80 percent of the value of $65 per kw-year from the 2007 Summit Blue report that Atlantic City Electric Company used to analyze its Residential Controllable Smart Thermostat Program. (That Program was approved by the Board in an Order dated July 31, 2009 in Dockets EO08050326 et al.) If the TRC test of the PPLS Program had been calculated using that higher projection of PJM wholesale capacity prices the benefit to cost ratio would increase, but not proportionally because the value of avoided capacity represents only about half of the benefits. Moreover, in that alternative analysis one could include two offsetting reductions. First, one could reduce the value attributed to the PJM Economic Load Response Program to reflect reductions by C&I participants ineligible for payments under that Program. Second, one could reduce the value of avoided capacity to reflect the delay between the year the demand reduction first occurs and the power year in which PJM would fully translate that reduction into a reduction in capacity obligation.

Q. PLEASE SUMMARIZE THE PROPOSED ES PROGRAM.

A. The proposed ES Program is designed to achieve reductions in demand through the use of trailer-mounted electricity storage units at three substations on the JCP&L distribution system. In its August 1, 2008 filing JCP&L projected a 3 MW reduction from this program.

Q. HAS JCP&L PROVIDED QUANTITATIVE PROJECTIONS OF BENEFITS FROM THE PROPOSED ES PROGRAM?

A. Yes. JCP&L has provided a projection of the compensation it would receive for demand reductions registered in the PJM ILR Program and for reducing demand during PJM Economic Load Response events.

Q. DOES THE PROJECTED VALUE OF THE ES PROGRAM OFFSET ITS PROJECTED COST?

A. No. JCP&L's own projections indicate that the benefits are much less than the costs, and thus the ES Program is not cost-effective based upon those projected benefits.

JCP&L projects the cumulative compensation for reductions under the ES Program through 2019 will be 16% of the cost of that program. Those projections are summarized in Exhibit___(JRH-4).

My analysis calculates the projected benefits and costs of the ES Program over 30 years, the projected life of the equipment. Over that period the ratio of benefits to costs under the TRC test is 0.28. The RIM test ratio is also 0.28 since there are no incentives given to participating customers. The results of my calculations are also presented in presented in Exhibit___(JRH-4). As with the PPLS Program, these calculations are based on the Company's projections of benefits and costs through 2019, projections from 2020 to 2029 consistent with the Company's projections for its IDER Expansion Program, and no escalation of wholesale capacity from 2030 onward.

Q. HAS JCP&L PROVIDED QUANTITATIVE ESTIMATES OF BENEFITS OTHER THAN PJM REVENUES FOR EITHER THE PPLS PROGRAM OR THE ES PROGRAM?

A. No. JCP&L states that the demand reductions from these programs offer benefits such as cost savings from mitigation of prices for wholesale capacity and energy, environmental benefits from reduced operation of less efficient generating units and reduced requirements for new generation; improvements in system reliability and the deferral of capital investments in the T&D system. However, JCP&L has not quantified any of those purported benefits as indicated in the various data responses presented in Exhibit___(JRH-5).

Q. IS EITHER THE PPLS PROGRAM OR THE ES PROGRAM JUSTIFIED ON A PILOT BASIS?

A. No. According to Ms. Gardow the PPLS Program technology is commercially available (Direct testimony page 15 line 21) and the ES Program technology has been field tested (Direct testimony page 23 line 10). JCP&L data responses indicate that these technologies are proven (Response to RC-JCPL- 25 and 29). Since the technologies in each proposed program have been proven in other jurisdictions there is no need for JCP&L ratepayers to fund them on a pilot basis.

Q. WHAT ACTION DO YOU RECOMMEND THE BOARD TAKE REGARDING JCP&L'S PROPOSED ES PROGRAM.

A. I recommend that the Board find that JCP&L has failed to demonstrate that either the PPLS Program or the ES Program is cost-effective and therefore not approve either program at this time. I also recommend that JCP&L be given the option to re-submit these proposed programs for consideration at a later date with new estimates of their projected costs and benefits.

Q. **DOES THIS CONCLUDE YOUR DIRECT TESTIMONY?**

A. Yes.

EXHIBITS

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PROFESSIONAL EXPERIENCE

Synapse Energy Economics, Inc., Cambridge, MA. *Senior Consultant,* 2006 to present. Analysis and expert testimony regarding planning, market structure, ratemaking and contracting issues in the electricity and natural gas industries.

Charles River Associates (formerly Tabors Caramanis & Associates), Cambridge, MA.
Principal, 2004-2006.
Senior Consultant, 1998-2004.
Provided expert testimony and litigation support in several energy contract price arbitration proceedings, as well as in electric and gas utility ratemaking proceedings in Ontario, New York, Nova Scotia and New Jersey. Managed a major productivity improvement and planning project for two electric distribution companies within the Abu Dhabi Water and Electricity Authority. Analyzed a range of market structure and contracting issues in wholesale electricity markets.

Tellus Institute, Boston, MA.
Vice President and Director of Energy Group, 1997–1998.
Presented expert testimony on rates for unbundled retail services in restructured retail markets and analyzed the options for purchasing electricity and gas in those markets.
Manager of Natural Gas Program, 1986–1997.
Prepared testimony and reports on a range of gas industry issues including market structure, unbundled services, ratemaking, strategic planning, market analyses, and supply planning.

Nova Scotia Department of Mines and Energy, Halifax, Canada; 1981–1986
Member, Canada-Nova Scotia Offshore Oil and Gas Board, 1983–1986
Member of a federal-provincial board responsible for regulating petroleum industry exploration and development activity offshore Nova Scotia.

Assistant Deputy Minister of Energy 1983–1986
Responsible for analysis and implementation of provincial energy policies and programs, as well as for Energy Division budget and staff. Directed preparation of comprehensive energy plan emphasizing energy efficiency and use of provincial energy resources. Senior technical advisor on provincial team responsible for negotiating and implementing a federal/provincial fiscal, regulatory, and legislative regime to govern offshore oil and gas. Directed analyses of proposals to develop and market natural gas, coal, and tidal power resources. Also served as Director of Energy Resources (1982-1983) and Assistant to the Deputy Minister (1981-1982.

Nova Scotia Research Foundation, Dartmouth, Canada, Consultant, 1978–1981
Edited Nova Scotia's first comprehensive energy plan. Administered government-funded industrial energy conservation program—audits, feasibility studies, and investment grants.

Canadian Keyes Fibre, Hantsport, Canada, Project Engineer, 1975–1977

Imperial Group Limited, Bristol, England, Management Consultant, 1973–1975

EDUCATION

M.S., Technology and Policy (Energy), Massachusetts Institute of Technology, 1979.
Thesis: "An Assessment of Government Policies to Promote Investments in Energy Conserving Technologies"

B.Eng. Industrial Engineering (with Distinction), Dalhousie University, Canada, 1973

EXPERT TESTIMONY AND LITIGATION SUPPORT (1987 to present)

Provided expert testimony and/or litigation support on planning, market structure, ratemaking and gas supply/fuel procurement in the electric and gas industries in approximately 100 proceedings in over thirty jurisdictions in the United States and Canada. List of proceedings available upon request.

Exhibit___(JRH-2)

Curtailment Program ($ in 000)

Total Resource Cost Test

Line		2008	2009	2010	2011	2012	2013	Cumulative Total 2009 - 2013	NPV at 6.86%	Benefits vs Costs
1	Estimated Program Costs		$ 168	$ 2,870	$ 2,886	$ 1,093	$ -	$ 7,017		
2	Less incentives to participants		$ 28	$ 2,525	$ 2,696	$ 903	$ -	$ 6,152		
3=1 - 2	Program Costs net of rebates	$ -	$ 140	$ 345	$ 190	$ 190	$ -	$ 865	$735	
4	Revenues from PJM	-	-	2,344	3,113	1,121	-	$ 6,578	$5,464	**7.4**

Ratepayer Test

Line		2008	2009	2010	2011	2012	2013	Cumulative Total 2009 - 2013	NPV at 6.86%	Benefits vs Costs
5	Estimated Program Costs	$0	$168	$2,870	$2,886	$1,093		$ 7,017	$5,874	
6	Revenues from PJM	$0	$0	$2,344	$3,113	$1,121		$ 6,578	$5,464	**0.93**
7	Revenues versus Costs							**94%**	93%	

Sources	Estimated Program Costs	Attachment RC-JCPL-80, Schedule CWS - 1, line 8
	Incentives to participants	Attachment RC-JCPL-80, Schedule CWS - 1, line 4
	Revenues from PJM	Attachment RC-JCPL-80, Schedule CWS - 2, line16

REDACTED

Exhibit___(JRH-3)

PPLS Program ($ in 000)

Total Resource Cost Test		**10 Year Analysis**			**15 Year Analysis**		
		Cumulative Total	**NPV at 6.86%**	**Benefits vs Costs**	**Cumulative Total**	**NPV at 6.86%**	**Benefits vs Costs**
Line		2009 - 2019			2009 - 2024		
1	Estimated Program Costs						
2	Less incentives to participants						
3=1 - 2	Program Costs net of rebates						
4	Revenues from PJM			0.25			**0.33**

Ratepayer Test							
		Cumulative Total	**NPV at 6.86%**	**Benefits vs Costs**	**Cumulative Total**	**NPV at 6.86%**	**Benefits vs Costs**
Line		2009 - 2013			2009 - 2024		
5	Estimated Program Costs						
6	Revenues from PJM						**0.33**
7 = 5 / 6	Revenues versus Costs	**26%**	25%		39%	33%	

Notes	Estimated Program Costs	Through 2019 Attachment RC-JCPL-93, Schedule ELG - 3, line 26. From 2020 onward annual expenses of XXXX
	Revenues from PJM	Through 2019 Attachment RC-JCPL-93, Schedule ELG - 3, line 15. From 2020 to 2029 annual escalation at 3.5%

REDACTED

Exhibit___(JRH-4)

ES Program ($ in 000)

Total Resource Cost Test		**10 Year Analysis**			**30 Year Analysis**		
		Cumulative Total	**NPV at 6.86%**	**Benefits vs Costs**	**Cumulative Total**	**NPV at 6.86%**	**Benefits vs Costs**
Line		2009 - 2019			2009 - 2039		
1	Estimated Program Costs						
2	Less incentives to participants						
3=1 - 2	Program Costs net of rebates						
4	Revenues from PJM			0.15			0.28

Ratepayer Test							
		Cumulative Total	**NPV at 6.86%**	**Benefits vs Costs**	**Cumulative Total**	**NPV at 6.86%**	**Benefits vs Costs**
Line		2009 - 2013			2009 - 2039		
5	Estimated Program Costs						
6	Revenues from PJM						**0.28**
7 = 5 / 6	Revenues versus Costs	**16%**	15%		45%	28%	

Notes	Estimated Program Costs	Through 2019 Attachment RC-JCPL-93, Schedule ELG - 3, line 26. From 2020 onward annual expenses of $XXXXX
	Revenues from PJM	Through 2019 Attachment RC-JCPL-93, Schedule ELG - 3, line 15. From 2020 to 2029 annual escalation at 3.5% From 2030 onward no escalation

Data Request: RC-JCPL-16

In the Matter of Demand Response Programs for the Period Beginning June 1, 2009 – Electric Distribution Company Programs Docket Nos. EO08080542 and EO08050326

RESPONSES TO DATA REQUESTS

RC-JCPL-16 For each program, please identify which of the following types of benefits the Company expects to achieve, together with a quantification of the benefits:

a) Reduced installed capacity requirements, as determined by PJM;
b) Interruptible Load for Reliability (ILR) credits from PJM;
c) Demand Resource (DR) credits from PJM;
d) Reduction in market price for capacity, i.e., lower RPM price;
e) Reduced quantity of energy purchases in peak hours;
f) Reduction in market price for energy, e.g., reduction in locational marginal price in peak hours; and,
g) Any other types of credits or revenue sources.

Response: **Curtailment Pilot – Witness: Christopher W. Siebens**

a) None.
b) **See** Schedule CWS-2 to Exhibit JCDR-1.
c) None.
d) JCP&L has no basis for assessing the proposed Curtailment Pilot's impact on market prices.
e) **See** Schedule CWS-2 to Exhibit JCDR-1 and the assumptions used therein.
f) JCP&L has no basis for assessing the proposed Curtailment Pilot's impact on market prices.
g) **See** Schedule CWS-2 to Exhibit JCDR-1.

IDER, Permanent Peak Load Shift Program and Electricity Storage Program - Witness: Eva l. Gardow

a) Capacity requirements will be as determined by PJM.
b) **See** Schedule ELG-2 to Exhibit JCDR-2 and the assumptions used therein. As noted in the testimony of Eva L. Gardow, Exhibit JCDR-2, pages 8, 13, 16, 21, and 24, there is considerable uncertainty as to whether, and to what extent, the Company will be successful in registering the proposed programs in appropriate PJM demand response/load reduction programs, and even if accepted, the magnitude of any resulting benefits.
c) **See** the response to part b) above.
d) JCP&L has no basis for assessing the proposed programs' impact on market prices.
e) **See** Schedule ELG-2 to Exhibit JCDR-2 and the assumptions used therein.
f) JCP&L has no basis for assessing the impact of the proposed programs on market prices.
g) **See** the response to part b) above.

In the Matter of Demand Response Programs for the Period Beginning June 1, 2009 – Electric Distribution Company Programs Docket Nos. EO08080542 and EO08050326

RESPONSES TO DATA REQUESTS

RC-JCPL-18 Regarding cost-effectiveness:

a) Please identify the cost-effectiveness test(s) the Company used to evaluate each program;

b) For each program, please provide projections of cost effectiveness including all workbooks used to estimate costs and benefits including all inputs and calculations (in operable electronic format).

Response: **Curtailment Pilot – Witness: Christopher W. Siebens**

a) & b) See the Testimony of Christopher W. Siebens, Exhibit JCDR-1, pages 10-13, and Schedules CWS-1 through 3 thereto. A workbook, labeled RC-JCPL-18 Attachment 1, will be provided in operable electronic format via e-mail to Rate Counsel, BPU Staff and the DAG.

Please note, that JCP&L will be updating the referenced Schedules to reflect the one-time crediting process described in the response to S-JCPL-DR-8, which will require only minor changes to Schedules CWS-1 and CWS-3, and will provide those updated Schedules as soon as they are available.

IDER, Permanent Peak Load Shift Program and Electricity Storage Program - Witness: Eva l. Gardow

a) & b) As stated in the Testimony of Eva L. Gardow, Exhibit JCDR-2, pages 8, 16, 23, and 24, JCP&L recognizes the many benefits of the programs beyond their direct peak load reduction but is not able to quantify the value of those benefits at this time. Although limited in meaningfulness, an analysis comparing preliminary estimates of PJM revenues to costs is shown on Schedule ELG-3. A **confidential** workbook, labeled RC-JCPL-18 Attachment 2, will be provided in operable electronic format via e-mail to Rate Counsel, BPU Staff and the DAG.

Data Request: RC-JCPL-25

In the Matter of Demand Response Programs for the Period Beginning June 1, 2009 – Electric Distribution Company Programs Docket Nos. EO08080542 and EO08050326

RESPONSES TO DATA REQUESTS

RC-JCPL-25 Please indicate whether any other utility programs were used as a model by the Company in developing its proposed programs. If so, please provide any supporting information including documents, studies, orders that provide details and/or cost/benefit analysis for each of the models.

Response: **Curtailment Pilot – Witness: Christopher W. Siebens**

The proposed Curtailment Pilot is designed around the current PJM Demand Response markets, and is therefore unique.

IDER, Permanent Peak Load Shift Program and Electricity Storage Program - Witness: Eva l. Gardow

The proposed programs are designed around the specific features of these proven technology applications integrated with the distribution system and are therefore unique.

Data Request: RC-JCPL-26
Witnesses: Christopher W. Siebens
& Eva L. Gardow

In the Matter of Demand Response Programs for the Period Beginning June 1, 2009 – Electric Distribution Company Programs
Docket Nos. EO08080542 and EO08050326

RESPONSES TO DATA REQUESTS

RC-JCPL-26 Regarding reduction in greenhouse gas emissions, please respond to the following:

a) Please provide the projected reduction in annual greenhouse gas emissions that the Company expects to achieve from each of its proposed programs, including all supporting analyses and assumptions;

b) If the Company has not estimated the reduction in greenhouse gas emissions for each program, please explain why such a calculation was not made.

Response:

a) **See** the Testimony of Christopher Siebens, Exhibit JCDR-1, pages 14 and 15 for the Curtailment Tariff Pilot.

See the Testimony of Eva L. Gardow, Exhibit JCDR-2, pages 10, 18, and 24-25 for the IDER, Permanent Peak Load Shift and Electricity Storage programs respectively.

b) As stated in the testimonies, these programs "should provide benefits in the form of reduced emissions from operation of less efficient generating units and reduced requirements for new generation. By deferring the need for additional generation, it allows the industry time to develop, build and bring on-line cleaner, more efficient generation, which can reasonably be expected to result in a reduction of CO2 emissions over time. However, it is not possible to quantify these anticipated avoided emissions at this time."

Data Request: RC-JCPL-29
Witness: Eva L. Gardow

In the Matter of Demand Response Programs for the Period Beginning June 1, 2009 – Electric Distribution Company Programs Docket Nos. EO08080542 and EO08050326

RESPONSES TO DATA REQUESTS

RC-JCPL-29 Reference Gardow testimony, pp. 19-25. Please indicate whether the TransFlow 2000 electricity storage units have been deployed successfully in the PJM control area or elsewhere. If so, please include details about their deployment as well as any available historical operating data for the units.

Response: The TransFlow 2000 Electricity Storage unit has not been deployed in the PJM control area. The Power Block 150, a smaller version with the same storage modules and electronics, has been successfully tested with EPRI at a JCP&L substation.

Data Request: RC-JCPL-80

In the Matter of Demand Response Programs for the Period Beginning June 1, 2009 – Electric Distribution Company Programs Docket Nos. EO08080542 and EO08050326

RESPONSES TO DATA REQUESTS

RC-JCPL-80 The response to RC-JCPL-18 states that Schedules CWS-1 through CW-3 will be updated. Have those updates been provided? If not, when does the Company envision that these updates will be provided?

Response: Attachment RC-JCPL-80 includes revised schedules revising the period of performance to start in 2009/2010 and end in 2011/2012 as discussed below.

Due to the passage of time and the Board's Order in Docket No.EO08050326, dated December 10, 2008, to implement the Demand Response Working Group proposal ("DRWG Order"), an additional 81.688 MW of incremental demand response have registered in the JCP&L zone.

The Board Order in Docket Nos.EO08050326 and EO08060421("DR Order") , dated July 1, 2008, directed EDCs to present plans delivering a total of 300 MW, of which JCP&L's share was 93 MW.

The Company's proposal for a Tariff-based curtailment program was based on the MWs directed in the DR Order. Under these circumstances, described above, the Company believes that a significant portion of the MWs included in this petition will not be available for this proposed program. However, assuming that the Company can obtain the 60 MWs included in this program, the Company has modified the schedules, provided hereto as Attachment RC-JCPL-80, accordingly.

The program end date remains at May 31, 2012 due to PJM's transition to exclusive use of Demand Response in the RPM auction process (eliminating the ILR capacity registration processes) beginning in the 2012/13 year. The Company was unable to commit (and bid) the proposed MW into the 2009 RPM auction for 2012/2013, thus we do not have access to the $139.73/MW-day that resulted from the Auction. While we may be able to extend the program through participation in Incremental Auctions following program approval and enrollment of customers, we cannot now predict the value we may receive from those auctions.

In the Matter of Demand Response Programs for the Period Beginning June 1, 2009 – Electric Distribution Company Programs Docket Nos. EO08080542 and EO08050326

RESPONSES TO DATA REQUESTS

RC-JCPL-82 Regarding the response to RC-JCPL-17, is there still uncertainty regarding whether, and to what extent, the Company will be successful in registering the proposed programs in appropriate PJM demand response/load reduction programs, or has some of this uncertainty been resolved? If this uncertainty has been resolved, then please explain the resolution.

Response: The Company will register the IDER Expansion and the Electricity Storage Program in the appropriate PJM Demand Response programs as these technologies can be called upon to operate as needed, and the IDER Pilot was registered in PJM programs. The Permanent Peak Load Shift Program provides a permanent peak load decrease whose cost benefits are embedded in lower capacity obligations and BGS prices. At this time, PJM does not have any programs that specifically compensate permanent peak load shift technologies.

Data Request: RC-JCPL-83

In the Matter of Demand Response Programs for the Period Beginning June 1, 2009 – Electric Distribution Company Programs Docket Nos. EO08080542 and EO08050326

RESPONSES TO DATA REQUESTS

RC-JCPL-83 Given the response to RC-JCPL-17, how much uncertainty is there in the PJM revenues shown in Schedule ELG-3?

Response: There is uncertainty in the potential PJM Revenues for the Permanent Peak Load Shift program as the benefits are accrued to the program through the lowering of capacity obligations and/or through BGS pricing.

Data Request: RC-JCPL-91

In the Matter of Demand Response Programs for the Period Beginning June 1, 2009 – Electric Distribution Company Programs Docket Nos. EO08080542 and EO08050326

RESPONSES TO DATA REQUESTS

RC-JCPL-91 Please provide all analyses and/or forecasts prepared or obtained by JCP&L of the capacity value per MW-day in the EMAAC zone of PJM for power years 2013/2014 and beyond. Please provide all supporting assumptions and calculations.

Response: 2012/2013 is the latest year available. To our knowledge, there is no forecast available beyond that year.

In the Matter of Demand Response Programs for the Period Beginning June 1, 2009 – Electric Distribution Company Programs Docket Nos. EO08080542 and EO08050326

RESPONSES TO DATA REQUESTS

RC-JCPL-92 Please provide all analyses and/or forecasts prepared or obtained by JCP&L of the energy credits for PJM Economic Load Response events in the EMAAC zone of PJM for power years 2010/2011 and beyond. Please provide all supporting assumptions and calculations.

Response: The Company has not obtained any analyses and/or forecast information other than that which has been previously provided.

See JCP&L's response to RC-JCPL-80.

In the Matter of Demand Response Programs for the Period Beginning June 1, 2009 – Electric Distribution Company Programs Docket Nos. EO08080542 and EO08050326

RESPONSES TO DATA REQUESTS

RC-JCPL-93 Please provide an updated response to RC-JCPL-6 for the Curtailment Pilot, the Permanent Peak Load Shift program and the Electricity Storage program respectively. Please assume that each program is approved in October 2009. Please reflect the fact that the PJM Interruptible Load for Reliability ("ILR") Program terminates at the end of 2011. Please reflect the fact that PJM conducts the Base Residual Auction (BRA) for the Reliability Pricing Model (RPM) of each power year approximately three years in advance of that power year (for example the BRA for the 2012/2013 power year was held in May 2009) and parties must bid their demand reduction for a power year into the BRA in order to obtain the maximum value from the RPM for that power year.

Response: **Curtailment Pilot – Witness: Christopher W. Siebens**

See updated information is shown in data responses RC-JCPL-80 and RC-JCPL-90.

Permanent Peak Load Shift Program and Electricity Storage Program - Witness: Eva l. Gardow

For the Permanent Peak Load Shift Program, **see** the updated information is shown in Attachment RC-JCPL-93. Note that in data response RC-JCPL-82, it was stated that the PPLS Program "provides a permanent peak load decrease whose cost benefits are embedded in lower capacity obligations and BGS prices" and that "PJM does not have any programs that specifically compensate permanent peak load shift technologies". In addition, as stated in data response RC-JCPL-84, Ice Bear units used for this program have an estimated life of 15 years.

The PJM ILR/RPM capacity programs are designed to compensate demand response participants with payments that are designed to represent the avoided cost of new generation. The PPLS technology avoids the need for new generation and the updated analysis uses these same PJM ILR/RPM revenues as a proxy for these cost benefits. Additional benefits to be gained by using it as designed are described in data response RC-JCPL-96.

For the Electricity Storage Program, **see** the updated information is shown in Attachment RC-JCPL-93.

Data Request: RC-JCPL-96

In the Matter of Demand Response Programs for the Period Beginning June 1, 2009 – Electric Distribution Company Programs Docket Nos. EO08080542 and EO08050326

RESPONSES TO DATA REQUESTS

RC-JCPL-96 Further to response to RC-JCPL-18. Please identify the threshold level of cost-effectiveness that the Company believes each of its three proposed programs must meet in order to be approved, and the basis for that position.

Response: The programs that the Company is proposing offer benefits beyond their cash value. The principal benefits of the programs are found in their effectiveness in contributing to the efforts to meet the State's demand response and related goals, which will produce many benefits in the areas of system reliability impacts; energy market pricing effects (for example, by reducing peak locational marginal prices ("LMPs") and by improving JCP&L's load shape, which should be reflected in BGS auction bids); environmental benefits from reduced operation of less efficient generating units and reduced requirements for new generation and the deferral of capital investments in the transmission or distribution system. However, JCP&L is not able to quantify the value of any of the foregoing benefits at this time. Therefore, JCP&L defers to the Board's approval process for an appropriate standard for cost-effectiveness for each of these programs.

JCP&L also notes that, after considerable discussion, in the so-called "RGGI Order" in Docket No. EO08030164, dated May 12, 2008, the Board determined that a cost/benefit analysis was not required for small scale or pilot programs "given the more limited nature of such programs to allow for a more accelerated review and approval process." See RGGI Order at page 4 and Item i.e of Appendix A thereto. All three proposed programs qualify as small scale or pilot programs.