

PENNFUTURE PARTIES STATEMENT NO. 1

*Phila 9/23/05  
JK*

BEFORE THE  
PENNSYLVANIA PUBLIC UTILITY COMMISSION

JOINT APPLICATION OF PECO  
ENERGY COMPANY AND  
PUBLIC  
SERVICE ELECTRIC AND GAS  
COMPANY FOR APPROVAL OF  
THE MERGER OF PUBLIC  
SERVICE ENTERPRISE GROUP  
WITH AND INTO EXELON  
CORPORATION

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DIRECT TESTIMONY OF  
THOMAS J. TUFFEY

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SEP 26 2005

PA PUBLIC UTILITY COMMISSION  
SECRETARY'S BUREAU

**Subject: Renewable Energy, Energy Efficiency**

**Dated: June 28, 2005**

1 **I. Introduction and Summary**

2 **Q: STATE YOUR NAME, POSITION, AND BUSINESS ADDRESS.**

3 A: Thomas J. Tuffey. I am the Director of the Center for Energy, Environment and  
4 Enterprise at Citizens for Pennsylvania's Future (PennFuture) located at 1518 Walnut  
5 Street, Philadelphia, Pa. As such, I devote 100% of my efforts to clean energy advocacy  
6 and market development in Pennsylvania, particularly focusing on renewable energy.

7 **Q: ON WHOSE BEHALF ARE YOU TESTIFYING IN THIS PROCEEDING?**

8 A: On behalf of The PennFuture Parties.

9 **Q: WHAT IS THE PURPOSE OF YOUR TESTIMONY?**

10 A: I will describe the status of renewable energy in Pennsylvania and its benefits to  
11 society and ratepayers in the PECO territory. I will further describe those existing  
12 programs that are delivering results and need additional funds. Lastly, I will recommend  
13 funding and policy actions to the Commission.

14 **Q: PLEASE DESCRIBE SOME OF YOUR RECENT ACTIVITIES RELATED**  
15 **TO RENEWABLE ENERGY POLICY.**

16 A: I serve on the Governor's Energy Advisory Board and was an advisor to Secretary  
17 Kathleen McGinty of the Pennsylvania Department of Environmental Protection (DEP)  
18 in the reauthorization of the Pennsylvania Energy Development Authority (PEDA). At  
19 the request of DEP, I assisted staff in the design of the current DEP Energy Harvest Grant  
20 Program to encourage renewable energy development in Pennsylvania. I served on the  
21 Executive Committee of the Clean Energy States Alliance (CESA) the professional  
22 association representing the Clean Energy Funds throughout the country, with some \$4  
23 billion in funds. I designed and hosted the annual Pennsylvania Sustainable Energy

1 Partners Retreats, including all the various funding sources and market makers  
2 throughout the state. Representing PennFuture, I am an active participant in the PUC  
3 Working Group drafting rules for implementation of Act 213, the Advanced Energy  
4 Portfolio Standards Act. With John Hanger, PennFuture's President, I designed and co-  
5 hosted the recent Clean Energy Conference held in Harrisburg with 285 participants.  
6 Additionally, I currently manage the Mid-Atlantic Renewable Energy Coalition  
7 (MAREC), the association of private and public entities most active in Pennsylvania  
8 wind resources development.

9 **Q: PLEASE DESCRIBE YOUR EDUCATIONAL BACKGROUND AND WORK**  
10 **EXPERIENCE.**

11 **A:** I attended Rutgers University, where I was a Cook Scholar, and graduated in 1968  
12 with a Bachelor of Science degree in Preparation for Research. In 1972, I received a  
13 Masters Degree in Environmental Science from Rutgers University. In 1973, I received  
14 my doctorate, also from Rutgers University, and also in Environmental Sciences. In  
15 1988, I attended and completed the Wharton Advanced Management Program at the  
16 University of Pennsylvania. From 1973 to 1976, I was an Assistant Professor, Water  
17 Resources Research Institute and the Bureau of Engineering Research with faculty  
18 appointment in Chemical Engineering at Rutgers University.

19  
20 From 1976 to 1992, I was employed by Roy F. Weston Inc. I held many positions in this  
21 3,000-person environmental engineering and consulting firm including Executive Vice  
22 President and President of Weston International. In 1992, I founded and was President  
23 and Chief Executive Officer of EMAX Solution Partners, a firm specializing in

1 information management systems for chemicals management and the Environmental,  
2 Health and Safety aspects of drug discovery. During this period beginning in 1992 and  
3 continuing to 1996, I was also affiliated with Safeguard Scientifics, then the leading  
4 venture capital organization in Southeastern Pennsylvania, and participated as an equity  
5 investor in several environmental companies.

6

7 From 1996 to 2000, I was President to EMIS Tech Publishing, Inc. EMIS Tech focused  
8 on information systems and technologies for Environmental, Health and Safety managers.  
9 EMIS Tech published the EMIS Tech Newsletter and produced EMIS (Environmental,  
10 Health and Safety Management Information Systems) Conferences. During this period, I  
11 also maintained a private management consulting practice, T.J. Tuffey and Associates,  
12 providing management consulting expertise to large organizations, like Oracle, where I  
13 was a retained consultant.

14

15 From 2000 through October of 2004, I was Executive Director of the Sustainable Energy  
16 Fund for Central Eastern Pennsylvania, the clean energy fund for the PPL territory. In  
17 November of 2004, I joined PennFuture in my current position.

18

19 While at the Sustainable Energy Fund (SEF), I managed many investments and grant  
20 awards in renewable energy and energy efficiency and became very involved in such  
21 activities throughout Pennsylvania.

22 **Q: HAVE YOU TESTIFIED PREVIOUSLY BEFORE THIS COMMISSION?**

1 A: Yes, I testified last year in the PPL rate case, Docket No. R-00049255, on behalf of  
2 SEF, supporting inclusion of that organization in the PPL rate base.

3 **Q: PLEASE SUMMARIZE YOUR FINDINGS AND CONCLUSIONS IN THIS**  
4 **CURRENT TESTIMONY.**

5 A: I find that the development of renewable energy is critically important to the  
6 assurance of safe, reliable, clean and affordable service in the PECO Energy territory and  
7 the rest of the Commonwealth. Renewable energy delivers significant benefits to society  
8 and ratepayers. The renewable energy market is in early stage but with a good start and  
9 great promise. The existing programs that provide financial incentives to this market  
10 have been successful but are in need of additional funding. PECO Energy has not  
11 demonstrated adequate participation and has not advanced plans to do so, hence, the  
12 Commission should order them to do so.

13 **Q: WHAT ARE YOUR RECOMMENDATIONS FOR THE COMMISSION IN**  
14 **THIS PROCEEDING?**

15 A: I recommend that the Commission order a total of \$60.5 million for renewable energy  
16 funding to existing programs to provide further incentive for the development of  
17 renewable energy in the PECO territory and the Commonwealth. Additionally, I  
18 recommend additional funds for energy efficiency programs as a necessary corollary to  
19 my recommendation for renewable energy, including \$20 million as part of this merger  
20 proceeding plus separate funding recommended in testimony by Mr. John Plunkett.

21 **II. Renewable Energy in Pennsylvania and PECO Territory**

22 **Q: WHAT IS RENEWABLE ENERGY?**

1 A: For purposes of this testimony, I refer to renewable energy as those energy sources  
2 included in Tier I resources of Act 213, the Advanced Energy Portfolio Standards Act.  
3 These include wind, solar photovoltaic, incremental hydro power, biomass and biogas,  
4 including that derived from methane gas produced from the digestion of animal manure.

5 **Q: HOW DOES RENEWABLE ENERGY BENEFIT SOCIETY?**

6 A: When compared to conventional sources of generation in Pennsylvania, clean,  
7 renewable energy is very beneficial. It does not deplete the supply of existing fuels, it is  
8 domestic and secure supply that reduces the dependence on foreign sources, it reduces air  
9 pollution and global warming, it reduces the health related impacts of airborne  
10 particulates and contaminants, it improves distribution system reliability and reduces  
11 system congestion, and it provides for new jobs and economic development.

12

13 For example, a 50 MW wind farm located in Pennsylvania will:

- 14 • Produce 137,500,000 kWhrs of clean energy annually, which is enough to supply  
15 some 18,975 average Pennsylvania homes,
- 16 • Avoid 522 tons of acid rain-producing sulfur dioxide annually,
- 17 • Avoid 75,488 tons of the global warming gas carbon dioxide annually, and
- 18 • Provide close to 1000 job years of employment over a 20 year life. (source:  
19 Economic Impact of Renewable Energy in Pennsylvania; available at  
20 [www.cfalleghenies.org/images/EnergyStudy1.pdf](http://www.cfalleghenies.org/images/EnergyStudy1.pdf))

21 Because our example is wind energy, the price of power is without fuel cost and will be  
22 stable through the life of the project.

23 **Q: HOW DOES THE PECO RATEPAYER BENEFIT?**

1 A: The PECO ratepayer benefits along with the rest of society. Clean energy is a clear  
2 example of mutual benefit to the economy and the environment. For example, the  
3 emergence of the Pennsylvania wind energy market has resulted in some 40 new jobs at  
4 the Gamesa North American headquarters in Philadelphia and 25 jobs at Community  
5 Energy Inc., headquartered in Wayne, Pa. At the same time, improved air quality  
6 improves the health of citizens in the five county area and reduces health costs caused by  
7 poor air quality, borne both directly and indirectly by the ratepayer.

8 Exelon has itself proudly announced to both ratepayers and shareholders the advantages  
9 of a diverse generation portfolio, including such renewable energy sources as wind  
10 energy.

11 Additionally, the supply of renewable sources from distributed generation projects reduce  
12 the loading and stress on the distribution system, extending its life and ending or delaying  
13 the need for expensive distribution system upgrades and improving reliability.

14 The distribution benefits of distributed generation, or DG, projects are widely recognized.

15 For example, an A.D. Little whitepaper entitled "Reliability and Distributed Generation  
16 (available at [www.encorp.com/dwnld/pdf/whitepaper/wp\\_ADL\\_4.pdf](http://www.encorp.com/dwnld/pdf/whitepaper/wp_ADL_4.pdf) ; p. 16) notes:

17 DG can provide policymakers, regulators, wires companies, and customers with multiple  
18 options to increase reliability. The potential benefits of DG in addressing reliability  
19 concerns were specifically recognized in the DOE POST study as a way to "respond  
20 more rapidly to an increased demand for electricity in areas where demand is already  
21 high." DG can be installed within the distribution system or at a customer's site, as a  
22 separate solution or in combination with market-driven incentives such as interruptible  
23 programs, to improve reliability by:

- 24 • Adding generation capacity at the customer site for continuous power and backup  
25 supply
- 26 • Adding system generation capacity
- 27 • Freeing up additional system generation, transmission and distribution capacity
- 28 • Relieve transmission and distribution bottlenecks
- 29 • Supporting power system maintenance or restoration operations with generation  
30 of temporary backup.

1

2 A.D. Little, p. 16 (citation omitted). The Legislature recognized the critical importance  
3 of renewable sources of distributed generation with special provision in Act 213 for  
4 preferred net metering treatment of micro grids to provide electric power to critical  
5 facilities during emergencies.

6 **Q: WHAT FORMS OF RENEWABLE ENERGY ARE MOST IMPORTANT**  
7 **NOW?**

8 **A:** I endorse all of renewable energy sources in Tier I of Act 213.

9 Clearly, the source most currently important is wind energy. Pennsylvania is emerging as  
10 the leading wind power state in the East. Considering our dominant position in nuclear  
11 power and coal fired generation, it is exciting to see an emerging technology with strong  
12 potential for not only environmental and health benefits but also for job creation and  
13 economic development.

14 Pennsylvania currently has more wind generation than any other Eastern state, but it is  
15 just a small beachhead when compared to conventional power; 129 MW of capacity  
16 when compared to 50,000 + MW for conventional generation.

17

18 A new technology market as a wind industry hub is forming in Pennsylvania. We have  
19 successfully recruited one of the world leaders, Gamesa Wind SPA, to locate its North  
20 America Headquarters in Philadelphia and a blade manufacturing plant with hundreds of  
21 jobs in Johnstown, Pennsylvania. GE has announced an expansion of their turbine plant  
22 in Erie. Also, Wayne, Pennsylvania is the home of Community Energy, the leading wind  
23 energy marketer in the East.

1 I estimate the potential Pennsylvania market for wind power at 5,000 MW; 3600 MW  
2 from the Act 213 portfolio requirements and 1400 MW more from the voluntary market  
3 purchases that have jumpstarted the market to date. This represents about \$7 billion in  
4 new capital investment, with resultant environmental, human health, system security, and  
5 economic benefits.

6

7 We need more incentive funding to support this market development and to better  
8 compete with neighboring states for projects. We also need funds to provide incentives  
9 for community scale wind projects. They are an important factor in the exemplary  
10 European wind market but have not yet emerged in Pennsylvania. Developers will prefer  
11 to spread transaction costs over larger projects. We need both favorable net metering  
12 rules and specific incentive funding for community scale wind projects.

13 **Q: WHERE DOES SOLAR ENERGY FIT?**

14 A: Next is solar photovoltaic energy. Act 213 has a specific solar set-aside projected to  
15 be 600 MW, the only specified technology carved out in the Advanced Energy Portfolio  
16 Standards Act. This is one of the highest goals in the country. The solar requirement  
17 steps up gradually over the life of the 15 year compliance period. This recognizes the  
18 comparatively high current cost of solar technology and anticipates cost efficiencies  
19 through the period. Industry leadership agrees: the President of BP Solar has forecasted  
20 20% annual reductions in cost.

21

22 The initial portfolio requirement is for only 4 MW. It is very important to provide  
23 further incentives for early stage demonstration projects so that consumers may develop

1 an understanding of the technology, its applications and the reliability of solar energy.

2 As discussed later, it is important to remove the current market barriers, including those  
3 regarding net metering billing rules, and the restriction of the SDF solar incentive  
4 program to systems of 5 kw or less, as imposed by Commission order.

5 **Q: WHAT ABOUT BIOMASS AND METHANE FORMS OF ENERGY**  
6 **GENERATION?**

7 **A:** Capture of methane gas from landfills is currently an important source of renewable  
8 energy and is becoming more attractive with increases in natural gas prices. These  
9 facilities are almost at economic parity with conventional power. As micro turbine  
10 technology advances, the use of methane gas from sewage treatment plants will be  
11 technically and economically more feasible. I have been involved in such a project at the  
12 Allentown municipal sewage treatment plant and predict growth in this industry over the  
13 next few years.

14 Currently, it is very important to continue to provide financial incentives and remove  
15 market barriers, in the form of net metering rules, for agricultural manure biodigestion  
16 and subsequent production of Tier I electricity. Both the DEP and the Department of  
17 Agriculture have provided incentive grants to a few farms, but the current net metering  
18 rules are a market barrier. I am hopeful that they will be removed in the Act 213  
19 rulemaking process. The importance of this policy adoption lies not only in the power  
20 produced but in the additional benefits of water pollution and nuisance odor control, both  
21 essential to environmental improvement and economic well being in the Chesapeake Bay  
22 and agricultural communities. We do need demonstration projects to show farmers the  
23 value of this energy production.

1 **Q: HOW DOES ENERGY EFFICIENCY RELATE TO RENEWABLE ENERGY?**

2 **A:** Energy efficiency is best considered in tandem with renewable energy. The cleanest  
3 electron is one not used. In addition to my recommendations regarding renewable  
4 energy, PennFuture also addresses energy efficiency separately in this proceeding  
5 through the testimony of our expert Mr. John Plunkett.

6 **Q: HAS PENNFUTURE PLAYED A SPECIAL ROLE IN THE ACT 213  
7 RULEMAKING PROCESS AS REGARDS ENERGY EFFICIENCY?**

8 **A:** Yes. Of the 19 parties submitting recommendations, Commission staff adopted  
9 PennFuture's recommended plan as the basis for the recently promulgated draft rule for  
10 *Tier II Energy Efficiency and Demand Side Management*. Mr. Plunkett worked with  
11 PennFuture on this issue.

12 **III. Renewable Energy Programs**

13 **Q: WHAT IS ACT 213, THE ADVANCED ENERGY PORTFOLIO STANDARDS  
14 ACT?**

15 **A:** Act 213, the Pennsylvania Advanced Energy Portfolio Standards Act, was signed into  
16 law by Gov. Rendell in November of 2004. It mandates a schedule of advanced energy  
17 purchases by electric distribution companies (EDCs) over its 15-year horizon, including  
18 an 8% requirement for Tier I categories of renewable energy and a 10% requirement for  
19 Tier II advanced energy resources including energy efficiency and demand side  
20 management. Act 213 does not provide funding incentives for projects but encourages  
21 free market development of Advanced Energy Credits, each equal to 1 MWhr of Tier I or  
22 Tier II energy sources, to monetize those credits by EDC purchase.

1 **Q: DOESN'T ACT 213 PROVIDE ALL THAT IS NEEDED FOR RENEWABLE**  
2 **ENERGY IN PENNSYLVANIA?**

3 **A:** Not at all. Act 213 provides no funding and depends on free market enterprise. A  
4 great deal of private and public capital will be required, certainly more than \$10 billion.  
5 The Tier I renewable technologies are all more expensive than conventional power  
6 generation. In order to achieve a diverse mix of renewable energy sources, some  
7 incentive funding will be necessary to level the playing field and allow many  
8 technologies to achieve a foothold, and for future market forces to determine the most  
9 advantageous mix.  
10 Additionally, there are several reasons why we need more action on renewable energy  
11 sooner. For instance, the penalty phase for noncompliance does not engage until 2011.  
12 Also, a force majeure provision allows for relief of requirements if an adequate supply of  
13 a given technology is unavailable.

14

15 Certainly between now and the end of the decade, until the penalty phase engages,  
16 incentives will be required to continue an organized market development. Without such  
17 development, developers will wait for the end of the decade and build on speculation,  
18 with resulting price chaos.

19

20 Pennsylvania projects will also need to compete with those in neighboring states for the  
21 attention of project developers. Those states, with strong renewable energy incentive  
22 programs, will attempt to win projects over those in the Commonwealth.

23

1 We will need to be adept at allocating incentives over time. Some forms of clean energy  
2 will require incentive assistance for many years, fuel cells, the foundation of the future  
3 "hydrogen economy", are an example. Others technologies, wind is a good example, will  
4 become more economically competitive with conventional power as fuel and other costs  
5 continue to escalate. Regardless, it is clear that incentive financing will be necessary to  
6 develop a diverse renewable energy infrastructure and establish the foundation for a new,  
7 healthier energy technology mix.

8 **Q: WHAT IS THE SUSTAINABLE DEVELOPMENT FUND?**

9 **A:** The Sustainable Development Fund (SDF) is the clean energy fund for the PECO  
10 territory as ordered by the Commission in its restructuring proceeding. It is managed as  
11 an imbedded fund within The Reinvestment Fund, a well-established social investing  
12 fund headquartered in Philadelphia. The Reinvestment Fund has a staff of some 75 and  
13 has a 20 year record of social investing.

14

15 The SDF has been functioning for 5 years, overseen by a Board approved by the  
16 Commission. It has an exceptional record of success in promoting clean energy projects  
17 in the PECO territory and Pennsylvania. In 2004, SDF approved \$3.7 million in loans,  
18 equity investments, grants and incentives and leveraged an additional \$35.3 million in  
19 private and public project financing. Its programs cover wind power production  
20 incentives and project finance, solar photovoltaic grants, consumer education for  
21 renewable energy including media advertising buys, a new rewards program to encourage  
22 third parties to sell renewable energy, attractive finance for energy efficiency projects, a  
23 loan program to provide incentive for "Green" energy efficient buildings, grants to

1 conduct clean energy feasibility studies or prepare business plans, and equity financing  
2 for the Pennsylvania Advanced Industrial Technology Fund, a venture incubator with a  
3 clean energy portfolio.

4 **Q: HOW IS IT FUNDED?**

5 **A:** SDF has received \$13.3 from PECO as ordered in the restructuring agreement and an  
6 additional \$18.5 million from PECO as a result of the PECO Energy/Unicom merger  
7 agreement. The latter provided \$12 million for wind energy development in  
8 Pennsylvania, \$4 million for the SDF photovoltaic program, and \$2.5 million for public  
9 education about renewable energy.

10

11 SDF is one of four such funds in Pennsylvania. They must compete with much larger  
12 funds in neighboring states to attract projects to Pennsylvania. For example, the clean  
13 energy funds in New Jersey and New York are each funded from a system benefit charge.  
14 Each has approximately \$130 million available annually with a predictable future  
15 revenue stream, a tremendous competitive advantage. The Pennsylvania funds have  
16 approximately \$8 million a year in funds from a defined funding pool without future  
17 commitment.

18 **Q: HAS THE MONEY BEEN WELL DEPLOYED BY SDF?**

19 **A:** Yes, it has. The referenced \$12 million of wind development incentive from the  
20 merger settlement has resulted in 155 MW of wind power in development in  
21 Pennsylvania. The public education funding set the stage for the PECO Wind direct  
22 marketing program to customers that NREL rates as one of the top 10 in the country, with  
23 13,000 current residential buyers and a potential of 40,000 to 50,000 customers. The

1 SDF photovoltaic program, although constrained by a 5 kW unit limit, has resulted in  
2 some 89 residential systems totaling 332 kw of capacity. In fact, the Governor recently  
3 authorized a photovoltaic system for the Governor's Residence. The wind and public  
4 education funding is now fully committed to projects and the solar program is one-half  
5 committed.

6 The most recent SDF Annual Report (available through <http://www.trfund.com/sdf/> ) has  
7 a more complete discussion of results, but it has been impressive. As stated, I served on  
8 the Executive Committee of the Clean Energy States Alliance, from which I can judge  
9 the relative performance of clean energy funds across the country. SDF is clearly a  
10 leading fund and well recognized as such by its peers.

11

12 Funding from this proceeding will be essential to SDF continuing to support its programs  
13 and deliver the societal benefits discussed.

14 **Q: DID THE PECO ENERGY/UNICOM MERGER AGREEMENT RESULT IN**  
15 **ANY OTHER INCENTIVES FOR RENEWABLE ENERGY DEVELOPMENT IN**  
16 **PENNSYLVANIA?**

17 **A:** The agreement also provided for \$3.5 million in start-up funding for Community  
18 Energy, Inc. (CEI). CEI markets renewable energy, particularly wind energy, and has  
19 most recently begun to develop wind farms. It has been tremendously important to wind  
20 energy development in Pennsylvania, and start-up funding from the merger has  
21 contributed to its success. CEI is the east coast leader in marketing wind energy.

22 Marketing is the critical path to securing a Power Purchase Agreement which is, in turn,  
23 the critical path to project development. Simply stated, without CEI we would not be as

1 far along in wind energy development in Pennsylvania. CEI has more than 25 employees  
2 and have been profitable for the last 2 years. CEI made the first purchase of Gamesa  
3 wind turbines in Pennsylvania and was instrumental in attracting this global wind turbine  
4 manufacturer to locate both its North American headquarters and its blade manufacturing  
5 plant to Pennsylvania.

6 **Q: WHAT IS THE PENNSYLVANIA ENERGY DEVELOPMENT AUTHORITY**  
7 **(PEDA)?**

8 A: PEDA is an energy project finance organization managed by DEP, chaired by the  
9 Secretary of DEP, and governed by a Board appointed by the Governor and approved by  
10 the Senate. It was originally authorized under the Thornburgh Administration, was most  
11 active in the Casey Administration, and was reauthorized under the Rendell  
12 Administration.

13 PEDA is complemented by the Energy Harvest grant program of DEP. Energy Harvest,  
14 which also focuses on clean energy development, has been funded at \$5 million for the  
15 last two years.

16 **Q: HOW IS PEDA FUNDED?**

17 A: PEDA has the authority to provide some grants but its primary mission is to develop  
18 tax-free revenue bonds for advanced energy projects. As such, energy projects that it  
19 approves must receive their primary funding from other institutions and/or retail investors  
20 buying revenue-backed bonds through brokerage houses. While authorized for up to  
21 \$300 million in bonding capacity, PEDA needs seed money to jumpstart the market.  
22 PEDA recently received an initial funding of \$10 million and just made its first project  
23 commitments. PEDA has a critical role to play in project finance, and since Act 213

1 portfolio standards will require at least \$10 billion in project finance, more funding is  
2 needed now.

3 **Q: WHAT ARE PECO PROGRAMS FOR RENEWABLE ENERGY?**

4 **A:** According to its responses to our interrogatories, PECO Energy described:

- 5 • The installation of 210 solar hot water heating units in low income housing in  
6 1999 to 2001 and a similar program for solar photovoltaic energy on low income  
7 housing.
- 8 • Its development of 11,000 residential customers purchasing PECO Wind wind  
9 blocks, which I understand is currently 13,000 customers,
- 10 • Its providing \$28.5 Million to the Sustainable Development Fund.
- 11 • That a PECO Energy representative is a member of the Board of Directors of the  
12 SDF, and that
- 13 • PECO Energy provided \$6,475,000 annually in the Low Income Usage Reduction  
14 Program (LIURP).

15 I note that the Commission assigned the Board seat to PECO Energy in the restructuring  
16 order. In fact, all the other mentioned programs have been by Commission order. PECO  
17 Energy has also stated that they intend to comply with the requirements of Act 213,  
18 including the mandated purchase of Tier I renewable energy.

19

20 PECO Energy did voluntarily commit to 10% of the demand in their main building in  
21 Philadelphia as supplied by wind energy, for which I commend them. In further response  
22 to our Interrogatory, PECO described the activities of Exelon Generation in acquiring  
23 some 153 MW of wind energy. Indeed, these Power Purchase Agreements were critical

1 to the early stage development of wind energy in Pennsylvania. Although the company  
2 was motivated by financial reasons, it was still critically important and they are  
3 commended for this foresight.

4 **Q: ARE THE PROGRAMS OF PECO ENERGY AS DISCLOSED ADEQUATE?**

5 **A:** Based on the information available to me, they are not. Other than the main building  
6 purchase, PECO Energy is doing the minimum required. If companies like PECO had  
7 voluntarily chosen to add more renewable supply to its portfolio, and deliver the resultant  
8 benefits, the Legislature would not have had to enact the requirements of Act 213. In the  
9 absence of such voluntary action, Act 213 was a necessity.

10 **Q: HAS PECO ANNOUNCED ANY MAJOR RENEWABLE ENERGY**  
11 **PROGRAMS?**

12 **A:** Other than to comply with the requirements of Act 213 and previous Commission  
13 orders, I am not aware of any further programs. There is no indication that the company  
14 will adopt any renewable energy program without being required to do so.

15 **Q: ARE THERE PECO POLICIES OR RULES THAT ACT AS MARKET**  
16 **BARRIERS FOR RENEWABLE ENERGY?**

17 **A:** The Company's net metering and interconnection rules constitute market barriers to  
18 the adoption of renewable energy sources of distributed generation. They are commented  
19 on in detail by the testimony of our witness, Mr. David Hill.

20 **IV. Recommendations**

21 **Q: WHAT DO YOU RECOMMEND TO THE COMMISSION?**

22 **A:** I recommend that the Commission order a total of \$60.5 million in incentive funding  
23 for the development of renewable energy in the PECO territory and the Commonwealth.

1 **Q: DO YOU ALSO SUPPORT ENERGY EFFICIENCY INCENTIVES?**

2 A: Mr. Plunkett, our expert in this area, has filed testimony regarding energy efficiency.  
3 In addition to the funding recommended in his testimony, the Commission should  
4 directly order \$20 million in funding under this merger case for energy efficiency.

5 **Q: WOULD YOU BE MORE SPECIFIC ON YOUR RECOMMENDATIONS**  
6 **FOR RENEWABLE ENERGY.**

7 A: Yes, I will. The \$60.5 million recommended should be deployed to cover specific  
8 needs for wind power, solar photovoltaic, and knowledge-based market transformation;  
9 and of this amount \$25 million should be used as funds to finance projects with funding  
10 payback.

11 **Q: WHAT DO YOU RECOMMEND AS TO WIND POWER?**

12 A: I recommend \$26.5 million for the combination of (1) production rebates for utility  
13 scale projects, (2) providing further consumer rewards incentives for third party sales to  
14 develop new market demand, and (3) a new program to encourage the development of  
15 community scale wind projects in Pennsylvania.

16 **Q: PLEASE DESCRIBE YOUR RECOMMENDATION FOR PRODUCTION**  
17 **REBATES FOR UTILITY SCALE PROJECTS,**

18 A: I recommend \$20 million to be provided as production rebates to owners of  
19 generation facilities for utility scale wind farm development and that said funding be  
20 administered by SDF. Their existing program has been highly successful. At the time of  
21 the Unicom merger, PennFuture expected that the allotted \$12 million would provide  
22 incentive for 30 MW of wind power. The program has been some 500% more effective,  
23 having developed 155 MW of projects. New funding is greatly needed to continue the

1 development of wind power in Pennsylvania, particularly during the period between now  
2 and 2011 when the Act 213 compliance penalty provides a regulatory market driver. I  
3 project that \$20 million of funding will result in some 300 MW of new wind power over  
4 the next 5 years. This amount of wind generation is enough to supply about 70,000  
5 residences with non polluting energy at stable, affordable prices. It will provide for  
6 continuity in organized market growth during the five year voluntary market period,  
7 versus chaos in price and performance.

8

9 **Q: PLEASE DESCRIBE YOUR RECOMMENDATION FOR A CONSUMER**  
10 **REWARDS INCENTIVE.**

11 **A:** I recommend \$2 Million in new funding to the existing SDF “Consumer Rewards  
12 Program”. This program provides incentives to the outside clean energy suppliers who  
13 make new renewable energy sales to PECO Energy distribution service customers. The  
14 outside suppliers receive a reward of \$40 per new customer regardless of customer class.  
15 Such programs have been very successful in other states, particularly New York. They  
16 greatly leverage the market by building highly visible demand that leads to new wind  
17 farm construction.

18

19 Of the \$2 million designated for consumer rewards, \$1 million would be focused on  
20 PECO Wind and New Wind Energy windblock purchases. The potential in the PECO  
21 territory is to grow from the existing 13,000 purchasers to 40,000 to 50,000 over the next  
22 three years. These two products should also be offered to PSE&G customers via bill  
23 inserts with company endorsement, as in the PECO territory. An additional \$1 million

1 would be available for any Green-e certified product (see [www.green-e.org](http://www.green-e.org) ) for  
2 electricity generated from wind, solar, biomass or low impact hydro projects located in  
3 Pennsylvania and qualifying as Tier I resources under Act 213.

4 **Q: PLEASE DESCRIBE YOUR RECOMMENDATION FOR A NEW PROGRAM**  
5 **TO ENCOURAGE THE DEVELOPMENT OF COMMUNITY SCALE WIND**  
6 **PROJECTS IN PENNSYLVANIA.**

7 **A:** I recommend \$4.5 million for community scale wind power. Act 213 specifically  
8 encourages the development of community scale renewable energy projects, including  
9 wind power projects up to 2 MW. The same regions of the Commonwealth that have  
10 utility scale wind projects are also suitable for the desired community-scale projects. No  
11 projects are yet available for demonstration, a key step in working through any issues  
12 associated with their development and winning market acceptance. St. Francis  
13 University and the Penelec Sustainable Energy Fund have just introduced a wind  
14 monitoring program aimed at community scale development. This recommendation is to  
15 provide \$1.5 million to DEP as grants to be awarded to communities wishing to do  
16 project feasibility studies. An additional \$3 million would be administered by DEP under  
17 either Energy Harvest or PEDA as project development grants, available either to public  
18 or private entities providing wind power to communities.

19

20 The initial community scale projects need additional incentives to overcome the higher  
21 transaction costs associated with such comparatively smaller, but important to society,  
22 projects. These will operate economically when costs are offset by the special net

1 metering provisions of Act 213, and the sale of advanced energy credits, but only after  
2 several projects have been successfully demonstrated.

3 **Q: WHAT DO YOU RECOMMEND FOR SOLAR PHOTOVOLTAIC**  
4 **FUNDING?**

5 **A:** I recommend that \$5 million be provided as production rebates to owners of  
6 generating units and administered by SDF under their existing program. The rebate  
7 would be up to \$5 per watt installed on systems up to 100 kw. The current program has  
8 been hindered by a restriction in the Commission order that limits rebates to installations  
9 no greater than 5 kw, essentially limiting applications to residential units.

10

11 Act 213 requires up to 600 MW of solar energy capacity development over the next 15  
12 years, one of the highest portfolio requirements in the country. The initial ramp up  
13 period is a modest 4 MW but includes the critical technology introduction stage. \$5  
14 million in incentive, available for commercial as well as residential units, provides a  
15 meaningful jumpstart to the market to allow infrastructure development, demonstration  
16 projects, and establishment of real market trading of solar advanced energy credits.

17 **Q: WHAT DO YOU MEAN BY KNOWLEDGE-BASED MARKET**  
18 **TRANSFORMATION AND WHAT DO YOU RECOMMEND?**

19 **A:** By knowledge-based market transformation I mean providing information that will  
20 encourage the acceptance of renewable energy and the subsequent growth in demand. It  
21 encompasses not only media advertising to assure consumers that renewable energy is  
22 available and reliable, but also provides the market makers, developers, financiers, and  
23 institutional buyers with exposure to new business models and financial products suitable

1 to our Pennsylvania market that have been proven elsewhere. There is a great need to  
2 learn and borrow the best from others.

3  
4 Specifically, I recommend \$2.5 million be provided for consumer education including  
5 media buys, web site activity, events, exhibits, curriculum, etc. This would be  
6 administered under the existing SDF program. Additionally, I recommend \$1.5 million  
7 for research and develop of new enterprise models, sometimes transferring technology  
8 and business models from other states, to expand into new areas like community-scale  
9 projects, or develop new products or tools needed to overcome a market obstacle as Act  
10 213 is implemented. This funding would be administered by DEP under Energy Harvest  
11 or by PEDDA.

12 **Q: PLEASE EXPLAIN YOUR RECOMMENDATION FOR PROJECT**  
13 **FINANCE.**

14 **A:** The funding that I have recommended thus far is for essentially grants, although the  
15 recommendations often encourage production rebates to assure that the funding goes to  
16 performing projects. This recommendation is to provide funding to finance projects with  
17 debt and receive payback. Both PEDDA and SDF have programs to do so. They should  
18 take on additional, but not unreasonable risk, beyond that which a conventional finance  
19 institution is comfortable with. The recommendation is “but for” funding that moves a  
20 project forward, leverages other private funds into a project, and also provides for an  
21 evergreen funding source.

22 Act 213 does not provide funding for the mandated portfolio standards and, as noted,  
23 development of our renewable energy industry may be delayed as the Act's

1 noncompliance penalties do not take effect until 2011 and force majeure provisions  
2 excuse noncompliance if some technologies are not reasonably available in the market.  
3 Advanced energy credits and an effective tracking/trading system are just being  
4 developed; the monetization rates are as yet unknown.

5

6 Favorably positioned debt funding can stimulate early stage market development. This  
7 \$25 million in market incentives can be administered by the DEP under PEDA and/or by  
8 the SDF.

9 **Q: IN ADDITION TO THE FUNDING YOU HAVE DESCRIBED, WHAT**  
10 **POLICY CHANGES DO YOU RECOMMEND?**

11 **A:** I recommend that the Commission order PECO Energy (1) to adopt net metering  
12 rules similar to those in NJ, (2) to expand the capacity limit on the SDF solar PV program  
13 to 100 kw to remove the current market barrier to commercial scale development, and (3)  
14 to offer PECO Wind wind block purchases in the PSE&G territory.

15 **Q: PLEASE ELABORATE ON YOUR NET METERING RECOMMENDATION.**

16 **A:** I recommend that the company adopt the net metering rules similar to those in NJ, the  
17 benefits of which the PSE&G customers enjoy. This is especially important to enable the  
18 development of community scale projects under the Act 213 provisions for such and the  
19 subject of the funding incentives which I recommended. I refer to the testimony of Mr.  
20 David Hill on behalf of PennFuture for the specifics of this recommendation.

21 **Q: WHAT IS YOUR RECOMMENDATION REGARDING THE INCENTIVE**  
22 **FUNDING LIMIT FOR SOLAR PHOTOVOLTAIC ENERGY?**

1 A: I recommend that this limit be increased from 5 kw to 100 kw. The existing SDF  
2 program is limited by Commission order to 5 kw, which is essentially a residential  
3 system. This limit acts as a market barrier. SDF has asked for relief. Act 213 mandates  
4 up to 600 MW of capacity development over the 15 year compliance period. To achieve  
5 this level will require larger-scale systems. We must be able to build some demonstration  
6 systems at such scale to successfully bridge the technology introduction phase of market  
7 development.

8 **Q: PLEASE EXPLAIN YOUR RECOMMENDATION THAT PECO ENERGY**  
9 **OFFER ITS WIND ENERGY PRODUCT IN THE PSE&G TERRITORY.**

10 A: It is essential that demand continues to grow for renewable energy. The most  
11 effective sales programs are those that are offered by the EDC. Consumer concern about  
12 the reliability of renewable energy is the number one demand side hurdle. The consumer  
13 trusts the product offerings of the EDC to be reliable. The PECO Wind sales program,  
14 which allows purchases via a billing insert, has been judged by the National Renewable  
15 Energy Lab of the US Department of Energy as one of the most effective in the country.  
16 It has signed up 13,000 customers in its initial phase and projects 40,000 to 50,000  
17 customers. The same program offered to the PSE&G customer should have comparable  
18 results. That additional demand will be supplied by Pennsylvania wind farms.

19 **Q: WHAT IS YOUR RECOMMENDATION REGARDING ENERGY**  
20 **EFFICIENCY?**

21 A: I recommend that the Commission require \$20 million in funding for energy  
22 efficiency as a condition of this merger, in addition to the funding recommended by Mr.  
23 Plunkett.

1 **Q: WHAT IS THE CONNECTION BETWEEN THIS FUNDING FOR ENERGY**  
2 **EFFICIENCY AND YOUR TESTIMONY ON RENEWABLE ENERGY?**

3 A: Energy efficiency should always be considered in tandem with renewable energy  
4 programs. The concept is that the cleanest and most renewable watt is that never used.  
5 Incentive funding is related to programs to mitigate market barriers. The PECO territory  
6 and Pennsylvania have scant energy efficiency programs, certainly when compared to  
7 those enjoyed by the ratepayer in the PSE&G territory and NJ. I have been an active  
8 participant in the Demand Side Management/Energy Efficiency Working Group  
9 sponsored by the Commission for the rulemaking process for Act 213. Funding energy  
10 efficiency programs as a condition of this merger will provide benefits to ratepayers.

11 **Q: IS THAT THE END OF YOUR TESTIMONY?**

12 A: Thank you, it is.

PENNFUTURE PARTIES STATEMENT NO. 2

*9/23/05  
Phila JK*

BEFORE THE  
PENNSYLVANIA PUBLIC UTILITY COMMISSION

JOINT APPLICATION OF PECO  
ENERGY COMPANY AND  
PUBLIC  
SERVICE ELECTRIC AND GAS  
COMPANY FOR APPROVAL OF  
THE MERGER OF PUBLIC  
SERVICE ENTERPRISE GROUP  
WITH AND INTO EXELON  
CORPORATION

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DOCUMENT  
FOLDER

DIRECT TESTIMONY OF  
JOHN J. PLUNKETT

Subject: Energy Efficiency

RECEIVED

SEP 26 2005

PA PUBLIC UTILITY COMMISSION  
SECRETARY'S BUREAU

Dated: June 28, 2005

1           **I.     INTRODUCTION AND SUMMARY.**

2

3   **Q:     PLEASE STATE YOUR NAME AND BUSINESS ADDRESS.**

4   **A:**    I am John Plunkett. I am a partner in Optimal Energy, Inc. ("OEI"). Our  
5           address is 14 School Street, Bristol, Vermont, 05443.

6   **Q:     ON WHOSE BEHALF ARE YOU TESTIFYING IN THIS PROCEEDING?**

7   **A:**    The PennFuture Parties are sponsoring my testimony.

8   **Q:     WHAT IS THE PURPOSE OF YOUR TESTIMONY?**

9   **A:**    My purpose is twofold. First, I estimate the economic and electricity savings  
10           the Pennsylvania Public Utility Commission ("the Commission") can expect if  
11           the merged companies invested in energy efficiency in the Philadelphia  
12           Electric ("PECO") territory proportionately what PSE&G is spending on its  
13           portion of the New Jersey Clean Energy Portfolio. Second, I recommend that  
14           the Commission require as a condition of the merger that Exelon invest \$203  
15           million over the next three years in PECO's territory, which would be  
16           commensurate with PSE&G's ongoing electric efficiency investment in New  
17           Jersey.

18 **Q:     SUMMARIZE YOUR QUALIFICATIONS.**

19 **A:**    I am an economist with 27 years of experience in the clean energy consulting  
20           business. I have testified as an expert witness on energy efficiency as an  
21           electricity and gas supply alternative in numerous regulatory proceedings in  
22           the U.S. and Canada, including Indiana, Florida, Ontario and Quebec. I have  
23           led several major studies of economically achievable efficiency potential  
24           which estimate the amount of cost-effective efficiency resources available,

1 including in New York, Vermont, and Maine. I have also led collaborative  
2 teams in the estimation of electric, economic, and environmental impacts of  
3 energy-efficiency portfolios, including New Jersey, Maryland, and most  
4 recently the Chinese provinces of Shanghai and Jiangsu.

5  
6 For the past five years I have served on the senior management team of  
7 Efficiency Vermont, the nation's first statewide electric efficiency utility, which  
8 has been responsible for managing Vermont's \$70 million efficiency portfolio  
9 through 2005 since its inception in 2000. I also led the economic analysis of  
10 the \$150 million, five-year Clean Energy Initiative on behalf of the Long Island  
11 Power Authority; since that time Optimal has provided ongoing program  
12 planning and management support. I have served as an economic advisor to  
13 Northeast Energy Efficiency Partnerships since 1998, for whom I have led  
14 analyses of a variety of regional utility energy-efficiency initiatives. I have also  
15 been an economic advisor to the non-utility parties engaged in energy-  
16 efficiency collaboratives with Massachusetts electric and gas utilities.

17  
18 I earned my bachelors' degree in economics with distinction from Swarthmore  
19 College, graduating Phi Beta Kappa. Exhibit PF-JP-1 provides my full  
20 resume.

21 **Q: HAVE YOU TESTIFIED PREVIOUSLY BEFORE THIS COMMISSION?**

22 **A:** Yes, twice. On behalf of the Office of Consumer Advocate ("OCA"), I testified  
23 in 1985 on the potential for energy efficiency to provide an economical

1 alternative to completing and operating the second unit of Limerick nuclear  
2 power station. I again testified for OCA on prudence cost adjustments  
3 proposed concerning Limerick 1 in 1986.

4 **Q: HAVE YOU DONE OTHER WORK RELATED TO ENERGY EFFICIENCY IN**  
5 **PENNSYLVANIA?**

6 **A:** Yes, I have. In 1990, I co-authored three volumes of the five-volume report on  
7 demand management planning commissioned by the Pennsylvania Energy  
8 Office. Most recently, I led the consulting team working on behalf of  
9 PennFuture that developed proposed methodology for counting efficiency  
10 credits in the Commission's rulemaking concerning the Alternative Energy  
11 Performance Standard ("AEPS").

12 **Q: SUMMARIZE YOUR FINDINGS AND CONCLUSIONS.**

13 **A:** PSE&G is projecting to spend \$137 million over the next three years (2006-  
14 2008) on electricity (\$92 million) and gas (\$45 million) demand-side  
15 management in New Jersey through New Jersey's Clean Energy Programs.  
16 This is PSE&G's share of the billion dollar, eight-year portfolio investing in  
17 comprehensive energy efficiency (and solar) programs serving all New Jersey  
18 electricity and gas customers. Were Exelon to spend an amount proportional  
19 to its electricity sales in the PECO territory, it could reasonably expect to  
20 reduce peak generating capacity requirements by 301 megawatts (MW)<sup>1</sup> and  
21 779 gigawatt-hours (GWh) in electricity generation. It is reasonable for the

---

<sup>1</sup> This includes a 20% reserve margin above the estimated 251 MW summer peak savings through energy efficiency.

1 Commission to expect electricity savings from efficiency investment to cost  
2 and to be worth more or less the same to PECO and PSE&G customers.  
3 Consequently, expanding PSE&G's programs to households and businesses  
4 in PECO's territory over the next 3 years (2006-2008) would reduce their  
5 electricity bills by \$225 million in present worth value. To realize these  
6 electricity and economic savings, Exelon would need to spend annually an  
7 average of \$68 million over the next 3 years on comprehensive efficiency  
8 investments. I estimate that this spending would represent roughly 0.06 cents  
9 per kWh of total electricity sales, or 0.6 percent of total annual revenue  
10 requirements in the PECO territory – if amortized over a 15-year typical  
11 measure life. Accounting for electric supply costs avoided by the resulting  
12 electricity savings, extending the benefits of energy efficiency investments to  
13 PECO customers results in an average net reduction in electricity rates of 0.8  
14 percent.

15 **Q: WHY DO YOU RECOMMEND THAT THE COMMISSION REQUIRE**  
16 **EXELON TO SPEND AN AMOUNT COMPARABLE TO THAT OF PSE&G**  
17 **ON AN ENERGY EFFICIENCY INVESTMENT PORTFOLIO AS A**  
18 **CONDITION OF THE COMMISSION APPROVAL OF THE PROPOSED**  
19 **MERGER?**

20 **A:** I can think of no valid reason to deny Pennsylvania customers the same  
21 economic advantages that New Jersey customers enjoy from PSE&G's long-  
22 term commitment to clean energy resources. To do so would deprive PECO's  
23 customers the full benefits of the merger of the two companies.

1

## 2       **II.    CLEAN ENERGY INVESTMENT PROGRAMS**

3

4   **Q:**    WHAT IS NEW JERSEY'S CLEAN ENERGY PORTFOLIO?

5   **A:**    The New Jersey Clean Energy Portfolio includes electric and natural gas  
6           energy-efficiency programs that are managed by New Jersey's seven  
7           investor-owned electric and natural gas utilities since 2001. The Portfolio also  
8           encompasses renewable energy programs initially managed by the utilities  
9           now run by the New Jersey Office of Clean Energy. New Jersey statewide  
10          programs in 2004 included:

### 11       Residential Sector

- 12       • Residential HVAC – Electric
- 13       • Residential New Construction
- 14       • Energy Star Products
- 15       • Appliance Cycling
- 16       • Residential Low Income

### 17       Commercial/Industrial Sector

- 18       • Commercial/Industrial New Construction

19       Exhibit PF-JP-2 lists the 2004 statewide program spending and savings  
20       results by sector for the programs managed by the utilities.

21   **Q:**    **ON WHAT ECONOMIC BASIS DOES PSE&G JUSTIFY INVESTING IN**  
22       **THIS PORTFOLIO?**

1 **A:** PSE&G's support for energy efficiency investments is based on an  
2 understanding of the market barriers facing their customers preventing them  
3 from investing in cost-effective efficiency. PSE&G's efficiency portfolio creates  
4 cost-effective efficiency resources that can be procured with strategies  
5 targeted to overcome these market barriers.

6 **Q: WOULD THE SAME ECONOMIC RATIONALE APPLY IN**  
7 **PENNSYLVANIA?**

8 **A:** Absolutely. The same market barriers stand in the way of lowering the  
9 Commonwealth's total electricity costs. Overcoming these barriers with  
10 successful market strategies produces major electric savings to and  
11 economic benefits to consumers in the form of lower electricity bills. Helping  
12 Pennsylvania households and businesses save money by saving energy  
13 helps the Commonwealth's economy.

14 **Q: DO YOU BELIEVE THAT THESE PROGRAMS WOULD BE EFFECTIVE IN**  
15 **PECO'S TERRITORY?**

16 **A:** I am sure of it. Everywhere else that efficiency portfolio administrators have  
17 deployed best practices in market strategies, they have succeeded and  
18 produced large and highly cost-effective electricity savings. This is true  
19 elsewhere in North America where comprehensive efficiency portfolios have  
20 been deployed, particularly in the neighboring states of New Jersey, New  
21 York, and Maryland. In 2004, New Jersey's Clean Energy Program saved 252  
22 MW and 328,513 MWh.

23

1           **III.    CLEAN ENERGY PROJECT BUDGET**

2    **Q:    HOW MUCH IS PSE&G SPENDING ON ITS SHARE OF THE NEW JERSEY**  
3           **CLEAN ENERGY PORTFOLIO?**

4    **A:**    For the period 2006 through 2008, in New Jersey, PSE&G funding for energy  
5           efficiency and renewable energy is a total of \$352.8 million, with \$96.2,  
6           \$119.6 and \$137.1 million, respectively in 2006, 2007 and 2008.

7    **Q:    HOW MUCH WOULD IT TAKE TO FUND A PORTFOLIO OF ELECTRIC**  
8           **EFFICIENCY PROGRAMS OF COMPARABLE SCALE IN PECO'S**  
9           **TERRITORY?**

10   **A:**    It would require a total of \$203 million over the next three years, with \$55, \$69  
11           and \$79 million, respectively in 2006, 2007 and 2008.

12   **Q:    HOW DID YOU ARRIVE AT THIS ESTIMATE?**

13   **A:**    The PECO spending is proportional to the PSE&G projected spending on  
14           electric energy efficiency through New Jersey's Clean Energy Program,  
15           based on MWh sales. The residential and non-residential portions of  
16           spending were separately scaled using the sales from each respective sector.  
17           For example, since the PECO residential sales were 89% of PSE&G  
18           residential sales, PECO's estimated residential DSM spending is 89% of  
19           PSE&G's projected residential spending.

20   **Q:    IS THIS REASONABLE?**

21   **A:**    Yes, this is a reasonable and unbiased method for establishing efficiency  
22           portfolio funding requirements for PECO given PSE&G's clean energy

1 spending. It accurately reflects the different split between PECO's and  
2 PSE&G's residential and nonresidential customers by extrapolating the  
3 PSE&G spending per kWh sold between residential and nonresidential  
4 customers. It also is based on the knowledge that PSE&G and PECO are  
5 both members of the same PJM power pool.

#### 7 **IV. CLEAN ENERGY PORTFOLIO ELECTRIC AND** 8 **ECONOMIC SAVINGS**

9  
10 **Q: HOW MUCH ELECTRICITY WOULD PECO CUSTOMERS SAVE IF**  
11 **EXELON INVESTED THE SAME AMOUNT RELATIVE TO ITS**  
12 **ELECTRICITY SALES ON ENERGY EFFICIENCY IN ITS PENNSYLVANIA**  
13 **TERRITORY AS IT DOES IN NEW JERSEY?**

14 **A:** PECO could expect to acquire 251 Summer Peak MW and 779 GWh  
15 cumulative annual savings in three years, with 57 MW, 86 MW, 107 MW and  
16 182 GWh, 272 GWh and 325 GWh savings, respectively in 2006, 2007 and  
17 2008.

18 **Q: EXPLAIN THE BASIS FOR YOUR ESTIMATE OF ELECTRICITY SAVINGS**  
19 **IN PECO'S TERRITORY FROM COMPREHENSIVE EFFICIENCY**  
20 **INVESTMENT.**

21 **A:** The PECO savings were estimated by multiplying the estimated PECO  
22 spending times the New Jersey MWh savings per dollar spent. I assumed the  
23 same incremental MWh savings per dollar spent from the 2001 New Jersey  
24 Clean Energy Collaborative assessment for the years 2006, 2007 and 2008.

1 The residential and non-residential savings per dollar figures were calculated  
2 separately and multiplied times the respective residential and non-residential  
3 budgets.

4 **Q: WHY IS IT REASONABLE TO ASSUME THAT PECO CUSTOMERS**  
5 **WOULD REALIZE THE SAME ELECTRICITY SAVINGS YIELD FROM**  
6 **EFFICIENCY PROGRAM THAT PSE&G PROJECTS FROM ITS**  
7 **INVESTMENT?**

8 A: I can think of no valid reason to expect that program delivery or efficiency  
9 technology costs would necessarily vary decisively between adjoining  
10 territories and interconnected markets, including the PJM power pool, in  
11 western New Jersey and eastern Pennsylvania.

12 **Q: HOW MUCH WOULD THESE ELECTRICITY SAVINGS BE WORTH TO**  
13 **PECO'S CUSTOMERS?**

14 A: These programs could provide a net present value of \$307 million in societal  
15 net benefits – \$674 million in societal benefits and \$368 million in societal  
16 costs – with an overall societal benefit/cost ratio of 1.83.

17 **Q: ON WHAT DO YOU BASE YOUR ESTIMATE OF ECONOMIC NET**  
18 **BENEFITS?**

19 A: I first estimated the PECO territory societal costs by using the sectoral  
20 societal costs per electric utility costs from the 2001 New Jersey Clean  
21 Energy Collaborative assessment and applying those to the PECO residential  
22 and non-residential estimated budgets. I then calculated the societal benefits

1 by multiplying the PECO sectoral societal costs by the societal benefit/cost  
2 ratios from the same 2001 New Jersey Clean Energy assessment.

## 4 **V. RECOMMENDATIONS**

5 **Q: BASED ON YOUR FINDINGS FROM YOUR ANALYSIS, WHAT DO YOU**  
6 **RECOMMEND TO THE COMMISSION?**

7 **A:** As a condition of its approval of the Exelon/PSE&G merger, I recommend that  
8 the Commission require the merged company to commit to \$68 million in  
9 annual funding for a comprehensive efficiency portfolio serving PECO's  
10 customers over the next three years. The Commission should order Exelon to  
11 enter a collaborative settlement process whereby it and other interested  
12 parties would develop an action plan for design, planning and administering,  
13 and overseeing the efficiency investment portfolio. The Commission should  
14 direct the parties to submit a joint proposal for settlement of these issues  
15 within six months of the date of its order approving the merger. The  
16 Commission should then approve, reject, or modify the proposed settlement  
17 as it sees fit. Within three months of the Commission's order approving or  
18 modifying the joint settlement proposal, I recommend that the Commission  
19 order the signatories to make a compliance filing establishing the contents of  
20 the portfolio, electricity and economic savings goals, a funding mechanism,  
21 and an administrative and oversight structure. I also recommend that the  
22 Commission require that the action plan be incorporated into PECO's

1 planning for generation, transmission and distribution as part of its integrated  
2 resource planning process.

3 **Q: WHY SHOULD THE COMMISSION ADOPT THESE RECOMMENDATIONS**  
4 **IN THIS PROCEEDING?**

5 **A:** These recommendations will ensure that PECO ratepayers receive concrete  
6 benefits from the merger. The process I recommend for achieving this  
7 objective is similar to that leading up to and resulting from the recent decision  
8 by the NY PSC approving a settlement between Con Ed, PSC Staff, NRDC  
9 and others. That decision calls for Con Edison to spend \$250 million over the  
10 next three years on DSM beyond the statewide efforts administered in its  
11 service territory by NYSERDA.

12 **Q: ARE YOU TESTIFYING THAT THE COMMISSION SHOULD ADOPT**  
13 **PSE&G'S CURRENT PROGRAMS "AS IS"?**

14 **A:** No, not necessarily. It may be appropriate to modify these programs or target  
15 different markets. The crucial point is that the efficiency portfolio serving  
16 PECO's customers should be designed and implemented to yield maximum  
17 electric and economic savings in the long run. The Commission ultimately  
18 must decide how the portfolio will be administered. Responsibility for  
19 administration of New Jersey's clean energy portfolio is about to be  
20 transferred to independent contractors, to be selected through a competitive  
21 bidding process.

1 **Q: ARE YOU TESTIFYING THAT THE COMMISSION SHOULD DIRECT**  
2 **EXELON TO ADOPT YOUR ESTIMATED SAVINGS FOR RESOURCE**  
3 **PLANNING PURPOSES?**

4 **A:** No. The goals established pursuant to the action plan I recommend should be  
5 integrated into PECO's planning for generation, transmission and distribution.

6 **Q: WOULDN'T THE BUDGETS NECESSARY TO SUPPORT EFFICIENCY**  
7 **INVESTMENT IN PECO'S TERRITORY RAISE RATES?**

8 **A:** Not when considered over the lifetime of the portfolio's investments. This is  
9 because the portfolio can be expected to yield 2.2 times more benefits in  
10 terms of electricity supply cost savings than the present worth of program  
11 spending funded through rates. How much rates rise or fall due to the  
12 portfolio in any one year depends on the cost recovery period for the  
13 efficiency portfolio expenditures relative to the lifetime of the efficiency  
14 portfolio yield. Program costs may raise rates during the three years of  
15 program implementation if they are fully recovered in the years they are  
16 incurred. Extended recovery to more closely reflect the life of the portfolio's  
17 savings would probably lower rates over the entire period.

18 **Q: Does this complete your pre-filed direct testimony?**

19 **A:** Yes it does.

PENNFUTURE PARTIES STATEMENT NO. 2

9/23/05  
Phila  
jk

BEFORE THE  
PENNSYLVANIA PUBLIC UTILITY COMMISSION

JOINT APPLICATION OF PECO  
ENERGY COMPANY AND PUBLIC  
SERVICE ELECTRIC AND GAS  
COMPANY FOR APPROVAL OF  
THE MERGER OF PUBLIC  
SERVICE ENTERPRISE GROUP  
WITH AND INTO EXELON  
CORPORATION

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DOCKET NO. A-110550F0160

EXHIBIT PF-JP-1

Dated: June 28, 2005

## RESUME

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John Plunkett has 25 years of experience in energy utility planning, concentrating on energy-efficiency as a resource and business strategy by energy service providers. Plunkett has played key advisory and negotiating roles for clients on virtually all aspects of utility demand-side management, including residential, industrial and commercial program design, implementation, oversight, performance incentives, and monitoring and evaluation planning, and their respective roles in business, regulatory, ratemaking, resource planning and policy decisions. He has also led and/or prepared numerous analyses and reports on the economic potential for efficiency and renewable resources.

## PROFESSIONAL EXPERIENCE

1996 – present

*Partner, **Optimal Energy, Inc.**, Bristol, VT.*

Strategic planning, implementation management and regulatory support on energy-efficiency investment by regulated and unregulated businesses. Currently leading consulting team engaged by the Natural Resources Defense Council to work with two Chinese provinces in the development and economic assessment of energy-efficiency investment portfolios. Co-author and expert witness on achievable potential for energy-efficiency resources in Quebec, and follow-up critique of Hydro Quebec's efficiency investment plan. Lead author and expert witness on report recommending revamped performance incentive for Connecticut efficiency program administrators, on behalf of Office of Consumer Counsel. Led statewide efficiency and renewable potential study for New York and efficiency potential study for Vermont, 2002-2003. Lead author and expert witness on assessment of economically achievable transmission capacity from efficiency resources, on behalf of Vermont transmission utility. Senior policy advisor to and on senior management team for Efficiency Vermont, the nation's first statewide energy-efficiency utility, 2000-present. Advisor on economic analysis of clean energy initiative for the Long Island Power Authority, on regional efficiency initiative cost-effectiveness for Northeast Energy Efficiency Partnerships, and on program cost-effectiveness in Massachusetts and New Jersey collaboratives. Business planning and product development consulting for retail energy service providers in Vermont, metropolitan Washington, DC, and Pennsylvania, 1997-2000.

1990 – 1996

*Senior Vice President, Resource Insight, Inc., Middlebury, VT.*

Provided analysis of DSM resource planning/acquisition and integrated resource planning in numerous states. Investigated regulatory and planning reforms needed to integrate demand-side resources with least-cost planning requirements by public utility commissions. Prepared, delivered and/or supported testimony on wide variety of IRP, DSM, economic, cost recovery and other issues before regulatory agencies throughout North America. Consulted and provided technical assistance regarding utility filings. Responsible for presentations and seminars on DSM planning and evaluation.

1984 – 1990

*Senior Economist, Komanoff Energy Associates, New York, NY.*

Directed consulting services on integrated utility resource planning. Testified on utility resource alternatives, including energy-efficiency investments and independent power. Examined costs and benefits of resource options in over twenty-five proceedings. Supported major investigation into utility DSM investment and integrated resource planning. Designed and co-wrote microcomputer software for evaluating the financial prospects of customer-owned power generation. *Wrote and spoke widely on integrated planning issues. Contributed to least-cost planning handbooks prepared by the National Association of Regulatory Utility Commissioners and by the National Association of State Utility Consumer Advocates.*

1978 – 1984

*Staff Economist, Institute for Local Self-Reliance, Washington, D.C.*

Project development and management for a non-profit consulting firm specializing in energy and urban economic development. Project manager and economist for an investigation into the economic impact on small generators from electric utilities' grid-interconnection requirements. Coordinated research by three electrical engineers, and analyzed the impact of interconnection costs on wind, hydroelectric and cogeneration projects in seven utility service areas in New York. Provided technical coordination in cases before the District of Columbia Public Service Commission involving gas and electric utility demand management investment, non-utility generation pricing, both for the D.C. Office of People's Counsel.

## **EDUCATION**

B.A., Economics *with Distinction*, Phi Beta Kappa, Swarthmore College, Swarthmore, PA, 1983. Adams Prize in Quantitative Economics.

## **HIGHLIGHTS OF PROJECT EXPERIENCE**

### EFFICIENCY PORTFOLIO DESIGN AND PLANNING

- Co-author of and expert witness supporting "Getting Results: Review of Hydro Quebec's Proposed 2005-2010 Energy Efficiency Plan," before the Quebec Energy Board, on behalf of a coalition of business, municipal, and environmental groups (January-March 2005)

- Testimony (with Ashok Gupta) before the New York Public Service Commission supporting joint settlement proposal for 300 MW of additional efficiency investment in Con Edison territory, on behalf of the Natural Resources Defense Council, Pace Energy Project, and the Association for Energy Affordability (December 2004 – January 2005).
- Consulting team leader on development and assessment of demand-side management investment portfolios for China, for the Natural Resources Defense Council. (July 2003 – present) Responsible for framing and conducting benefit/cost analysis of efficiency program portfolios for Jiangsu province and Shanghai municipality, including assessment of 300-MW Efficiency Power Plants for prospectus by Asian Development Bank.
- Report and testimony on performance incentives for administrators of conservation and load management programs in Connecticut, on behalf of Connecticut Office of Consumer Counsel. (February 2003 – August 2004). DPUC adopted recommended performance incentive mechanism for 2006 program year.
- Project leader, including report and testimony, for consulting team projecting potential for demand-side resources to defer the need for major transmission upgrades, on behalf of Vermont Electric Power Company. (November 2001 – December 2004)
- Report and testimony on Opportunities for Accelerated Electrical Energy Efficiency in Quebec 2005 – 2012, on behalf of Regroupement National des Conseils Regionaux de L'environnement du Quebec, Regroupement des Organismes Environnementaux en Energie and Regroupement pour la Responsabilite Sociale des Entreprises. (March – June 2004)
- Senior Policy Advisor and member of senior management team, Efficiency Vermont the world's first Energy Efficiency Utility, operating under a \$14 million annual contract with the Vermont Public Service Board to deliver statewide energy-efficiency programs for the customers of Vermont's twenty-one electric utilities. (senior management team, 2000-present; policy advisor, 2002-present; led program development and planning, 2000-2002).
- Project leader for consulting team assessing technical, achievable and economic potential for energy-efficiency and renewable resources in New York State and five sub regions over 5, 10 and 20 years, on behalf of New York State Research and Development Authority. (January 2002 – August 2003)
- Project leader for consulting team updating statewide projection of economically achievable efficiency potential for state of Vermont, on behalf of the Vermont Department of Public Service. (October 2001 – 2003)
- "A Conservation Contingency Plan for Indian Point: Using California's Success Beating Blackouts to Replace Nuclear Generation Serving Greater New York," prepared for the Natural Resources Defense Council, October 2003.

- "The Achievable Potential for Electric Efficiency Savings in Maine." Projected and compared 10-year C&I costs, savings and benefits (based on technical potential analysis prepared by Exeter Associates). Expert testimony on behalf of the Office of Public Advocate, before the Maine PUC. (October 2002)
- Project leader for consulting team *supporting utilities* in targeting demand-side resources to optimize distribution investment planning in statewide distributed utility planning collaborative, on behalf of the Vermont Department of Public Service. (September 2001 – December 2002)
- Advisor on economic analysis for program planning and implementation of multi-year statewide energy-efficiency programs in the New Jersey Clean Energy Collaborative involving all the state's electric and gas utilities and the Natural Resources Defense Council. (April 2000 – June 2003, on behalf of NRDC). Co-directed collaborative work on program development, planning, and implementation for Conectiv. (November 1996 – 2000)
- Advisor to consulting team leader on planning and management support for Long Island Power Authority's Clean Energy Initiative (January 2003 – present). Consulting team leader on energy-efficiency program planning and implementation management support to LIPA; coordinated development of core energy-efficiency and renewable programs in clean energy portfolio. (July 1998 – January 2001)
- Policy and economic advisor for Massachusetts energy efficiency collaboratives, focusing on regulatory, cost-effectiveness, shareholder incentives and other policy issues and strategies, on behalf of Massachusetts Collaborative Non-Utility Parties. (January 1999 – present)
- Economic advisor to Northeast Energy Efficiency Partnerships, a not-for-profit regional consortium of utilities pursuing market transformation in efficiency markets. Economic analysis and report on cost-effectiveness of NEEP initiatives involving high-efficiency motors, clothes washers, and residential lighting. (1998 – in progress)
- "Examining the Potential for Energy Efficiency in Michigan: Help for the Economy and the Environment," for American Council for an Energy-Efficient Economy (ACEEE). Analysis and report projecting costs and benefits of aggressive energy-efficiency investment. (January 2003)
- Led consulting team in the preparation of detailed recommendations for implementing strategic plan for acquiring clean power resources for the Jacksonville Electric Authority. (May – September 2001)
- Consultant to Citizens Utilities Corporation's, supporting planning and management of investments pursuing maximum achievable levels of optimally cost-effective energy-efficiency in its Vermont Electric Division. (1997 – 2001)

- Consultant to PEPCo Energy Services on building energy-efficiency in retail service offerings. (2000 – 2001)
- Consultant to California Board for Energy-Efficiency, the agency responsible for administering wires-charge funded statewide energy-efficiency programs. Technical service consultant on nonresidential program design. (1997 – 1999)
- Lead consultant on energy product development for consumer energy cooperative, on behalf of Vermont Energy Futures, a non-profit organization spearheading development of a consumer-owned energy cooperative that will bundle electricity with energy-efficiency, renewables, and fossil fuels for residential, low-income, and small non-residential customers. One of key team members who prepared grant application to federal Health and Human Services Department for \$800,000 grant supporting development of the co-op. (1997 – 2000)
- Led feasibility analysis and prepared preliminary business plan for bundling electricity, fuel, efficiency services, and green power initially targeting low-income and environmentally-conscious consumers, on behalf of the Energy Coordinating Agency and Conservation Consultants, Inc. (July – December 1997). Consultant on energy and business strategy and planning for Energy Cooperative Association of Pennsylvania, a buyers' cooperative offering electricity, fuel oil, energy-efficiency, and renewable energy to residential and non-profit consumers in eastern and western Pennsylvania. (1998 – July 1999)
- Lead consultant on energy efficiency program designs and planning for Maryland Office of People's Counsel and Maryland Energy Administration. Led research, analysis, and program descriptions and budgets for use in restructuring workshops and legislative development on efficiency and renewable programs supported by system benefits charge. (1998)
- Consultant on various energy-efficiency program, planning, and policy issues for Maryland utilities including Potomac Electric, Baltimore Gas and Electric, Potomac Edison, Delmarva Power and Light, Southern Maryland Electric Cooperative, Washington Gas, on behalf of Maryland Office of People's Counsel. This has included work as coordinator and lead negotiator on DSM collaboratives for Washington Gas, Potomac Electric, Baltimore Gas and Electric, Delmarva Power and Light and Potomac Electric. Projects have included resource planning and allocation, program design, policy, cost recovery, mechanism design, and monitoring and evaluation planning. (1989 – 1997)
- Lead consultant for the Vermont Department of Public Service regarding energy-efficiency investment during and after the transition to electricity restructuring. Lead author of *The Power to Save: A Plan to Transform Vermont's Efficiency Markets*, the DPS filing which calls for development of centrally delivered statewide core programs by an efficiency utility. Prepared written testimony, on behalf of the Vermont Department of Public Service in Docket 5980. (1997 – 1999)

- Support to the Burlington (VT) Electric Department in developing energy efficiency programs and policies as part of their resource and business planning. (November 1996 – May 1997)
- Prepared written report to the Ontario Energy Board assessing the 1997 DSM Plan filed by Union and Centra Gas LTD in light of prior OEB decisions, as well as specific program plans for residential and non-residential customers. The report also addressed potential changes in gas DSM regulation, cost recovery, and incentives. [*Assessment of the Centra/Union Gas Fiscal 1997 DSM Plan*, Plunkett, Hamilton, and Mosenthal, August 30, 1996.] Also testified before the OEB concerning the report's findings and recommendations. Union/Centra Rate Case, EBRO 493/494. Also prepared a report and testified on Union Gas's DSM program design in EBRO 496/94/95. (July 1996 – November 1996)
- Support to the Iowa Office of Consumer Advocate with the review and analysis of MidAmerican's, Interstate Power's and Iowa Electric Services' existing energy efficiency plans. Developed proposals for changes to and modifications of the utilities commercial and industrial energy efficiency programs. (1995 – 1996)
- Prepared testimony and supported the Iowa Office of Consumer Advocate in settlement negotiations re IES Utilities C/I DSM programs. Docket No. EEP-95-1. (February 1996)
- Supported Florida Power Corporation with development of alternative DSM programs for commercial and industrial customers. (1995 – 1997)
- Supported the development of testimony and discussions regarding DSM program alternatives for Carolina Power & Light, on behalf of the Southern Environmental Law Center. Docket No. 92-209-E. (1995 – 1996)
- Reviewed and commented on Consumer Gas' C/I DSM programs on behalf of the Green Energy Coalition. (1995)
- Support to the Vermont Department of Public Service in negotiation settlement with Green Mountain Power regarding DSM program design and planning, focusing on target retrofits in load centers under T&D capacity constraints, and increased participation and comprehensiveness of lost-opportunity programs. (1995)
- Consulting services and expert testimony concerning Ontario Hydro's DSM plans and acquisition of lost-opportunity resources on behalf of the Green Energy Coalition. Before Ontario Energy Board H.R. 22. re: Ontario Hydro 1995 Rates and Spending. (1994) and re: Ontario Hydro's Bulk Power Rates for 1993. Ontario Energy Board HR-21. (1992)
- Coordinated testimony assessing the planning process, screening analyses, and cost-recovery proposals of the Detroit Edison Company for its demand-side management programs. Estimated potential levels of savings; identified improvements to the utility's proposed cost-recovery, lost-revenue, and incentive mechanisms; and recommended

regulatory signals consistent with least-cost planning. Provided economic and regulatory advice, consulting services, and oversaw preparation of testimony. Michigan PSC Case No. U-10102. (1992)

- Economic and regulatory advice, consulting services, and oversaw preparation of testimony. Provided technical services encompassing demand-side management program monitoring and evaluation, cost recovery, and review of second efficiency plans. Before the Iowa Utilities Board, Iowa Power and Light Docket No. EEP-91-3 and Interstate Power Company Docket No. EEP-91-5. (1992)
- Consulting on policy and resource-allocation issues on behalf of the Vermont Department of Public Service as part of DSM-program-design collaboratives with Vermont Gas. (1990 – 1991), Citizens Utilities (1990 – 1991), Central Vermont Public Service Corporation (1990) and Green Mountain Power. (1990)

## ENERGY AND REGULATORY POLICY

- Team leader providing technical assistance supporting rulemaking to implement energy-efficiency provision of renewable portfolio standard for Pennsylvania, on behalf of Citizens for Pennsylvania's Future (PennFuture). (February 2005 – present)
- Analysis and testimony before the Connecticut Siting Council on integrating potential demand reductions from targeted demand-side resources into need assessment for transmission upgrades, on behalf of the Connecticut Office of Consumer Counsel. Docket No. 217. (February 2002 – present)
- Advice and negotiation on policy and scope of utility activities regarding targeted DSM to optimize distribution investment planning, involving Consolidated Edison, PECO Energy, and Orange and Rockland Utilities, on behalf of the Natural Resources Defense Council (Con Ed and PECO) and Pace Energy Project (O&R). (1999 – 2000)
- Consultant to Vermont Senate Natural Resources and Finance Committees on efficiency and renewable policies in restructuring legislation passed by the Senate but not adopted by the House. Provided technical assistance to support drafting and passage of utility restructuring legislation (S.62). (1997)
- Provided direct testimony and cross-examination relating to the future of DSM under the proposed BG&E/PEPCo utility merger. Case No. 8725 In the matter of Application of BGE, PEPCo & Constellation Energy Corporation for Merger. (1996)
- Reviewed Tennessee Valley Authority programs and environmental planning for the Tennessee Valley Energy Reform Coalition. (November 1994 – July 1995)
- Prepared and defended direct testimony on gas and electric Demand-Side Management/Integrated Resource Planning guidelines before the North Carolina Public Utilities Commission. Evaluated DSM activities in light of market barriers, total-resource-cost-effectiveness, and rate impacts. Docket No. E-100, SUB 64A in the matter of Request by Duke Power Company for Approval of a Food Service Program, Docket E-100, SUB 71 In the matter of Investigation of the Effect of Electric IRP and DSM Programs on the Competition Between Electric Utilities and Natural Gas Utilities. (1994)
- Prepared and defended expert testimony and led analyses of demand-side management and fuel switching opportunities in Central Vermont Public Service territory, on behalf of the Vermont Department of Public Service. Project involved detailed analysis of measure costs, savings, and cost-effectiveness. Vermont Public Service Board, Docket 5270-CVPS-1&3. (1994)
- Prepared and defended expert testimony for the Vermont Department of Public Service on prudence of demand-side management in CVPS rate case. Vermont Public Service Board, Docket 5724. (May – August 1994)

- Directed and supported the preparation of joint testimony for Enersave, an efficiency service provider. Before the New York Public Service Commission, Case No. 94-E-0334. (September 1994)
- Joint testimony with Jonathan Wallach for the New York Public Utility intervenors reviewing 1994 LILCo DSM Plan. Before the New York Public Service Commission. P.S.C. Case No. 93-5-1123. (May 1994)
- Contributed to the critique of PECO Demand-Side Management Plan for the Nonprofits Energy Savings Investment Program. (February 1994)
- Provided direct testimony in a proceeding to investigate restrictions on DSM that could give one utility (gas or electric) an unfair competitive advantage over another (electric or gas, respectively). Before the Louisiana Public Service Commission Docket No. U-20178 Re: Louisiana Power & Light Company Least Cost Resource Plan. (1994)
- Provided expert testimony in support of PEPCo's DSM implementation. Before the Public Service Commission of the District of Columbia. Case No. 929. (1993)
- Comprehensive assessment of Ontario Hydro's 25-year resource plan. Directed work by over a dozen consultants. The study encompassed load forecasting; assessing DM potential and costs; resolving DM-implementation, resource-integration, and institutional issues; assessing all resource costs, including externalities; assessing costs of all supply-resources, including non-utility generators; and estimating avoided costs. (1990 – 1992)
- Support to the Pennsylvania Energy Office in its evaluation of Pennsylvania electric utility demand-management plans by preparing testimony and co-authoring a comprehensive, five-volume study of all aspects of demand management. This document surveys issues related to integration of demand-management resources into utility planning, and reconciling least-cost planning objectives with rate-impact constraints; discusses strategies for utility intervention to remove market barriers to energy conservation; evaluates cost-recovery mechanisms for demand-management expenditures by utilities; explores issues related to the screening demand-management measures and programs; and examines direct costs, risk, and externalities avoidable through demand management. (1991 – 1993)
- Provided analysis of 1991 - 1992 New York electric utility DSM plans, and support for the analysis of 1993 - 1994 DSM Plans on behalf of Pace University Center for Environmental and Legal Studies, and Vladeck, Waldman, Elias & Engelhard, P.C., Counsel for the Class of LILCo Ratepayers in County of Suffolk *et al.* v. LILCo *et al.* Proceeding to Inquire into the Benefits to Ratepayers and Utilities from Implementation of Conservation Programs that will reduce Electric Use, New York Public Service Commission Case No. 28223. (1990, 1992, 1994)
- Reviewed Demand Side Management regulations and DSM compliance filings of four New

Jersey utilities on behalf of the New Jersey Division of Rate Counsel. Demand Side Management Resource Plan of Jersey Central Power & Light Company. Docket No. EE-92020103. (1992)

- Advisor to the Vermont Public Service Board. Supported formulating issues, conducting hearings, deciding policy, and drafting opinions and orders on DSM planning programs, and ratemaking. Advised the Board's hearing officer on numerous decisions concerning policy and process, including cost-benefit analysis, design and coverage of utility energy-efficiency programs and integrated planning requirements. Investigation into Least-Cost Investments, Energy Efficiency, Conservation, and Management of Demand for Energy, Docket No. 5270. (1988 – 1990)
- Provided technical and policy advice for the South Carolina Department of Consumer Affairs in PSC investigation into Electric Utility Least-Cost Planning, Docket No. 87-223-E. (September 1987 – November 1992)

#### RESOURCE PLANNING AND ASSESSMENT

- Support to the Vermont Department of Public Service in assessing the performance and expenditures of Green Mountain Power's commercial and industrial DSM programs. Also provided support to the DPS in the evaluation of GMP's actions surrounding the Vermont Joint Owners contract with Hydro Quebec including prudence. (1997)
- Prepared testimony and supported settlement negotiations concerning the DSM Plan of Jersey Central Power and Light on behalf of the Mid Atlantic Energy Project and New Jersey Public Interest Research Group. Analyzed DSM policy and commercial and industrial programs. Docket No. EE9580349 In the matter of Consideration and Determination of Jersey Central Power and Light Company's Demand Side Management Resource Plan filed pursuant to N.J.A.C. 14:12. (1995)
- Prepared written testimony for the Maryland Office of People's Counsel analyzing potential for demand-side resources offset need for power for proposed coal-fired plant. Delmarva Power & Light Company Dorchester Power Plant Certificate of Public Convenience and Necessity. Maryland PSC Case No. 8489. (January 1993)
- Provided technical assistance and advice on behalf of the South Carolina Department of Consumer Affairs on all aspects of Integrated Resource Planning and DSM planning including cost-effectiveness tests for South Carolina PSC investigation into Electric Utility Least-Cost Planning, Docket No. 87-223-E. (1987 – 1992)
- Identified energy-efficiency resources missing from FPL's resource plan that could provide economical substitutes for proposed power supply option. Expert testimony also addressed environmental costs avoided by DSM. Florida PSC Docket No. 920520-EG, In Re: Joint Petition of Florida Power and Light and Cypress Energy Partners, Limited Partnership for Determination of Need. (1992)

- Provided technical consulting services for the Indiana Office of Utility Consumer Counselor, including expert testimony. In the matter of the Petition of Indianapolis Power & Light Company for a Certificate of Public Convenience and Necessity for the Construction by it of Facilities for the Generation of Electricity and Submission and Request for Approval of Plan to meet future needs for Electricity. Cause No. 39236. (August 1991 – May 1992)
- Provided technical consulting services for the Indiana Office of Utility Consumer Counselor, including expert testimony. In the matter of the Petition of PSI Energy, Inc. Filed Pursuant to the Public Service Commission Act, as Amended, and I.C. 8-1-8.52 for the Issuance of Certificates of Public Convenience and Necessity to Construct Generating Facilities for the Furnishing of Electric Utility Service to the Public and for the Approval of Expenditures for such Facilities. Cause No. 39175. (June 1991 – February 1992)
- Testimony and surrebuttal for the Delaware PSC Staff. Before the Delaware Public Service Commission Staff, In the Matter of the Application of Delmarva Power & Light Company for Approval of 48 MW Power Purchase Agreement with Star Enterprise, PSC Docket No. 90-16. (January 1991)
- Prepared comments on IRP principles and objectives for the Southern Environmental Law Center. Commonwealth of Virginia State Corporation Commission Order Establishing Commission Investigation to Consider Rules and Policy Regarding Conservation and Load Management Programs, Case No. PUE900070. (1991)
- Prepared and defended expert testimony for the Indiana Office of Utility Consumer Counselor on potential for DSM to defer need for new generating capacity. Petition of Southern Indiana Gas and Electric Co. for Approval of Construction and Cost of Additional Electric Generation and for Issuance of a Certificate of Need Therefore, Indiana Utility Regulatory Commission, Cause No. 38738. (September 1989)
- Prepared and defended expert testimony for the Illinois Citizens Utility Board on adequacy of Commonwealth Edison's DSM efforts. Rulemaking Implementing Section 8-402 of the Public Utilities Act, Least-Cost Planning, Illinois ICC Docket No. 89-0034. (July 1989)
- Supported the Vermont Public Service Board with analysis, findings, and conclusions regarding the need for power based on potential DSM resources. Application of Twenty-Four Electric Utilities for a Certificate of Public Good Authorizing Execution and Performance of a Firm Power and Energy Contract with Hydro-Quebec and a Hydro-Quebec Participation Agreement, Docket No. 5330. (1989 – 1990)
- Cost-benefit analysis for the City of Chicago examining alternatives to the renewal of Commonwealth Edison's franchise. (1989)
- Advisor for the South Carolina Department of Consumer Affairs. Assessed costs and benefits of long-term power contract. In the Matter of Duke Power Company, Federal Energy

Commission, Docket No. ER89-106-000. (January 1989 – March 1990)

- Analyzed and provided expert testimony on the economic potential for cost-effective DSM to substitute for capacity and energy from a combined cycle generating plant. Testimony. Application of Potomac Electric Power Company for Certificate of Public Convenience and Necessity for Station H, Maryland PSC Docket No. 8063 Phase II. (1988)
- Examined, compared, and recommended appropriate cost-effectiveness tests for the DSM portion of the Massachusetts Department of Public Utilities investigation into the Pricing and Ratemaking Treatment to Be Afforded New Electric Generating Facilities Which Are Not Qualifying Facilities. Docket No. 86-36. (1988)
- Testimony for the District of Columbia on electric and gas utility least-cost planning. Application of the Potomac Electric Power Company for Changes to Electric Rate Schedules, D.C. PSC Formal Case 834 Phase II. (April and June 1987)
- Stood cross-examination for the Connecticut Division of Consumer Counsel to defend KEA's financial assessment of CL&P's ability to withstand Millstone 3 disallowance. Investigation into Excess Generating Capacity of Connecticut Light & Power Company, Connecticut DPUC Docket No. 85-09-12. (April 1986)
- Cross examination for the Connecticut Division of Consumer Counsel to defend financial and statistical model supporting KEA's findings of CL&P construction imprudence. Retrospective Audit of the Prudence of the Construction of Millstone 3, Connecticut DPUC Docket 83-07-03. (March 1986)
- Cross examination for the Pennsylvania Office of Consumer Advocate, defended quantification of imprudence findings by O'Brien/Kreitzberg & Associates regarding PECO's construction management of the Limerick 1 project. Pennsylvania PUC v. Philadelphia Electric Company Docket R-850152. (February 1986)
- Prepared and defended direct and surrebuttal testimony for the Pennsylvania Office of Consumer Advocate critiquing utility conservation and cogeneration assumptions and presented alternative 20-year electricity sales projection. Pennsylvania PUC Limerick 2 Investigation Docket I-840381. (April 1985)

#### LOW-INCOME ENERGY PROGRAMS

- Technical advisor to the Public Utility Law Project of New York. Recommended economic principles for planning utility DSM investment for low-income customers in New York. Proceeding on Motion of the Commission to Determine Whether the Major Gas and Combination Gas and Electric Utilities Subject to the Commission's Jurisdiction Should Establish and Implement a Low-Income Energy Efficiency Program, Case 89-M-124. (1990).

## RENEWABLE ENERGY

- Co-author (with J. Wallach) of *The Power Analyst*, integrated spreadsheet-based software for projecting the economic and financial performance of renewable and cogeneration projects, for the New York State Energy Research and Development Authority. Project manager, economic analysis. (1989)
- Technical and economic analysis of small-generator grid interconnection of seven New York electric utilities for the New York Energy Research and Development Authority. Project manager, economic analysis. (1983)
- Written testimony on behalf of the Alaska Public Interest Research Group implementing PURPA 210. Before the Alaska PUC. (1981)
- Written and oral testimony in oversight hearings on state implementation of PURPA 210. U.S House of Representatives Subcommittee on Energy Conservation and Power. (1981)
- Written and oral testimony in rulemaking for PURPA on behalf of the Institute For Local Self-Reliance, before the Federal Energy Regulatory Commission. (1979)

## PUBLICATIONS/PRESENTATIONS

"Energy Efficiency and Renewable Energy Resource Potential In New York State: Summary of Potential Analysis Prepared For the New York State Energy Research and Development Authority", invited presentation to the National Academy of Sciences Committee On Alternatives to Indian Point, Washington, DC, January 2005.

"Estimating and Valuing Energy-Efficiency Resource Contributions: Toward a Common Regional Protocol," presented at the Northeast Energy Efficiency Partnerships conference on regional efficiency policy, November 2004.

"The Economically Achievable Energy Efficiency Potential In New England," presented at the Northeast Energy Efficiency Partnerships conference on regional efficiency policy, November 2004.

"Rewarding Successful Efficiency Investment In Three Neighboring States: The Sequel, the Re-Make and the Next Generation (In Vermont, Massachusetts and Connecticut)," (with P. Horowitz and S. Slote), 2004 *Summer Study on Energy Efficiency in Buildings*, American Council for an Energy Efficient Economy, Pacific Grove, California, August 2004.

"Measuring Success at the Nation's First Efficiency Utility" (With B. Hamilton), 2002 *Summer Study on Energy Efficiency in Buildings*, American Council for an Energy Efficient Economy, Pacific Grove, California, August 2002.

"New Jersey's Clean Energy Collaborative: Model or Mess?" (with D. Bryk and S. Coakley), 2002 *Summer Study on Energy Efficiency in Buildings*, American Council for an Energy Efficient Economy, Pacific Grove, California, August 2002.

"Yes, Virginia, You Can Get There From Here: New Jersey's New Policy Framework For Guiding Ratepayer-Funded Efficiency Programs" (with S. Coakley and D. Bryk), 2000 *Summer Study on Energy Efficiency in Buildings*, American Council for an Energy Efficient Economy, Pacific Grove, California, August 2000.

"Integrated Market-Based Efficiency and Supply for Small Energy Consumers: The Consumer Energy Cooperative" (with B. Sachs and E. Belliveau) 2000 *Summer Study on Energy Efficiency in Buildings*, American Council for an Energy Efficient Economy, Pacific Grove, California, August 2000.

"Comprehensive Energy Services At Competitive Prices: Integrating Least-Cost Energy Services To Small Consumers Through A Retail Buyer's Cooperative" (with B. Sachs), 1998 *Summer Study on Energy Efficiency in Buildings*, American Council for an Energy Efficient Economy, Pacific Grove, California, August 1998.

"Capturing Comprehensive Benefits from Commercial Customers: A Comparative Analysis of HVAC Retirement Alternatives" (with P. Mosenthal and M. Kumm), 1996 *Summer Study on Energy Efficiency in Buildings*, American Council for an Energy Efficient Economy, Pacific Grove, California, August 1996. 5.169.

"Joint Delivery of Core DSM Programs: The Next Generation, Made in Vermont" (with S. Parker), 1996 *Summer Study on Energy Efficiency in Buildings*, American Council for an Energy Efficient Economy, Pacific Grove, California, August 1996. 7.127.

"Retrofit Economics 201: Correcting Common Errors in Demand-Side Management Cost-Benefit Analysis" (with R. Brailove and J. Wallach) *IGT's Eighth International Symposium on Energy Modeling*, Atlanta, Georgia, April 1995.

"DSM's Best Kept Secret: The Process, Outcome and Future of the PEPCo-Maryland Collaborative" (with R. D. Obeiter and E. R. Mayberry), *Proceedings of the ACEEE Summer Study on Energy Efficiency in Buildings*, Monterey, California, August 1994. 10.199.

Louisville Gas and Electric Company. Invited to make presentation on commercial program design. March 10, 1994.

'DSM for Public Interest Groups, "Seminar coordinator and presenter. DSM Training Institute, Boston, Massachusetts, October 1993.

DSM Training Institute - *Training for Ohio DSM Advocates: Effective DSM Collaborative Processes*. Seminar co-presenter. Cleveland, Ohio, August 1993.

"Demand-Management Programs: Targets and Strategies," Vol. 1 of "Building Ontario Hydro's Conservation Power Plant" (with J. Wallach, J. Peters, and B. Hamilton), Coalition of Environmental Groups, Toronto, ONT, November 1992.

"DSM Program Monitoring and Evaluation: Prospects and Pitfalls for Consumer Advocates," *Proceedings from the Mid-Year NASUCA Meeting*, Saint Louis, Missouri, June 8, 1993.

"Twelve Steps To Comprehensive Demand-Management Program Development: A Collaborative Perspective", *Proceedings from the IRP Workshop: The Basic Landscape, NARUC-DOE Fourth IRP Conference*, Burlington Vermont, September 1992. 45.

"Demand-Side Cost Recovery: Toward Solutions that Treat the Causes of Utility Under-Investment in Demand-Side Resources" (with P. Chernick), *Proceedings from the Third NARUC Conference on Integrated Utility Planning*, Santa Fe, New Mexico, April 1991.

"Demand-Side Bidding: A Viable Least-Cost Resource Strategy?" (with P. Chernick and J. Wallach), *Proceedings from the Seventh NARUC Biennial Regulatory Information Conference*, Columbus, Ohio, September 1990.

"Where Do We Go From Here? Eight Steps for Regulators to Jump-Start Least-Cost Planning" (with M. Dworkin), *Proceedings from the Seventh NARUC Biennial Regulatory Information Conference*, Columbus, Ohio, September 1990.

"A Utility Planner's Checklist for Least-Cost Efficiency Investment" (with P. Chernick) *Proceedings from the Seventh NARUC Biennial Regulatory Information Conference*, September, 1990. Also published in *Proceedings from the Canadian Electric Association's Demand-Side Management Conference*, St. John, Nova Scotia, September 1990.

"Carrots and Sticks: Do Utilities Need Incentives to Do the Right Thing on Demand-Side Investment?", *Proceedings from the National Association of State Utility Consumer Advocates* Santa Fe, New Mexico, June 1990.

"New Tools On the Block: Evaluating Non-Utility Supply "Opportunities with the Power Analyst" (with J. Wallach), *Proceedings from the Fourth National Conference on Microcomputer Applications in Energy*, Phoenix, AZ, April 1990.

"Breaking New Ground in Collaboration and Program Design," *The Rocky Mountain Institute Competitek Forum* (Moderator), Aspen, Colorado, September 1989.

"Lost Revenues and Other Issues in Demand-Side Resource Evaluation: An Economic Reappraisal" (with P. Chernick), *1988 Summer Study on Energy Efficiency in Buildings*, American Council for an Energy Efficient Economy, Pacific Grove, California, September 1988.

"Pursuing Least-Cost Strategies for Ratepayers While Promoting Competitive Success for Utilities", *Proceedings from the Least-Cost Planning Conference, National Association of*

*Regulatory Utility Commissioners*, Aspen, Colorado, April 1988.

"Balancing Different Economic Perspectives in Demand-Side Resource Evaluation", Workshop on Demand-Side Bidding, Co-sponsored by New York State PSC, ERDA, and Energy Office, Albany, New York, March 1988.

"There They Go Again: A Critique of the AER/UDI Report on Future Electricity Adequacy through the Year 2000" (with C. Komanoff, H. Geller and C. Mitchell), Presentation NASUCA (also debated AER/UDI co-author before NARUC annual meeting), New Orleans, Louisiana, November 1987.

"Saying No to the No-Losers Test: Correctly Assessing Demand-Side Resources to Achieve Least-Cost Utility Strategies", *Proceedings from the Mid-year NASUCA meeting*, Washington, D.C., June 1987.

"The Economic Impact of Three Mile Island" (with C. Komanoff), *Proceedings from the American Association for the Advancement of Science symposium*, May 1986.

"Facing the Grid" (with D. Morris), *New Shelter*, May - June 1981.

PENNFUTURE PARTIES STATEMENT NO. 2

9/23/05  
Phila

BEFORE THE  
PENNSYLVANIA PUBLIC UTILITY COMMISSION

JK

JOINT APPLICATION OF PECO  
ENERGY COMPANY AND PUBLIC  
SERVICE ELECTRIC AND GAS  
COMPANY FOR APPROVAL OF  
THE MERGER OF PUBLIC  
SERVICE ENTERPRISE GROUP  
WITH AND INTO EXELON  
CORPORATION

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DOCKET NO. A-110550F0160

EXHIBIT PF-JP-2

Dated: June 28, 2005

<b>New Jersey Clean Energy Portfolio - Statewide Actual Results - 2004</b>			
<b>data from NJ Clean Energy Programs Report - Submitted to NJ BPU May 6, 2005</b>	<b>Spending</b>	<b>Installed Savings</b>	
	<b>Thousand \$</b>	<b>(kW)</b>	<b>(MWh)</b>
<b>Residential Programs</b>			
Residential HVAC – Electric and Gas	\$ 15,564	13,065	15,499
Residential New Construction	\$ 21,736	14,869	4,551
<b>ENERGY STAR® Products</b>			
Maintenance	\$ 1,654	-	-
Room Air Conditioning	\$ 397	1,441	1,377
Lighting and Other	\$ 6,048	5,089	95,947
Home Energy Audit	\$ 350	-	-
Appliance Cycling	\$ 496	173,164	-
<b>Residential Low Income</b>			
Comfort Program	\$ 13,974	770	6,786
Senior Weatherization Pilot	\$ 292	50	209
Refrigerator Turn-In	\$ 16	-	-
STAC Evaluation	\$ 1	-	-
Home Performance with ENERGY STAR®	\$ 6	-	-
<b>Sub-total Residential</b>	<b>\$ 60,534</b>	<b>208,448</b>	<b>124,369</b>
<b>Commercial/Industrial</b>			
<b>Commercial/Industrial Construction</b>			
Commercial & Industrial Construction	\$ 3,902	6,380	31,538
Commercial & Industrial Retrofit	\$ 22,686	33,751	163,631
New School Construction & Retrofit	\$ 3,073	3,199	8,975
Pay for Performance	\$ 32	-	-
Special Studies/Pilot Studies	\$ 8	-	-
Cool Cities	\$ 2,429	-	-
Combined Heat and Power Incentives	\$ 32	-	-
<b>EDA Programs</b>			
Public Entity Financing	\$ 56	-	-
<b>Sub-total Commercial/Industrial</b>	<b>\$ 32,219</b>	<b>43,330</b>	<b>204,144</b>
<b>TOTAL ENERGY EFFICIENCY PROGRAMS</b>	<b>\$ 92,753</b>	<b>251,778</b>	<b>328,513</b>

PENNFUTURE PARTIES STATEMENT NO. 3

*Phila DK  
9/23/05*

BEFORE THE  
PENNSYLVANIA PUBLIC UTILITY COMMISSION

JOINT APPLICATION OF PECO :  
ENERGY COMPANY AND : DOCKET NO. A-110550F0160  
PUBLIC :  
SERVICE ELECTRIC AND GAS :  
COMPANY FOR APPROVAL OF :  
THE MERGER OF PUBLIC :  
SERVICE ENTERPRISE GROUP :  
WITH AND INTO EXELON :  
CORPORATION :

DIRECT TESTIMONY OF  
DAVID HILL

Subjects: Net Metering and Interconnection

Dated: June 28, 2005

RECEIVED

SEP 26 2005

PA PUBLIC UTILITY COMMISSION  
SECRETARY'S BUREAU

1 **I. INTRODUCTION & SUMMARY**

2 **Q: PLEASE STATE YOUR NAME, POSITION, AND BUSINESS ADDRESS.**

3 **A:** My name is David Hill. I am a Senior Project Manager for the Vermont  
4 Energy Investment Corporation. My business address is 255 South  
5 Champlain Street, Burlington, VT 05401.

6 **Q: ON WHOSE BEHALF ARE YOU TESTIFYING IN THIS PROCEEDING?**

7 **A:** I am testifying on behalf of the PennFuture Parties.

8 **Q: WHAT IS THE PURPOSE OF YOUR TESTIMONY?**

9 **A:** The primary purpose of my testimony is to describe the importance of net  
10 metering and interconnection rules to the development of distributed  
11 renewable generation in Pennsylvania, and the associated benefits for  
12 consumers. Secondly, I will discuss issues with current net metering  
13 procedures, requirements and charges in the affected Pennsylvania and New  
14 Jersey service territories. Finally, I will make specific recommendations on  
15 net metering and interconnection for the Commission to consider adopting as  
16 potential conditions for approval of the proposed merger.

17 **Q: PLEASE SUMMARIZE YOUR QUALIFICATIONS.**

18 **A:** I am currently a Senior Project Manager with the Vermont Energy Investment  
19 Corporation (VEIC). I have more than a dozen years of experience with the  
20 planning, evaluation and implementation of energy efficiency and renewable  
21 energy programs. I have testified in regulatory hearings before the Ontario  
22 Energy Board on proposed plans for smart metering, energy efficiency and  
23 load control; presented renewable energy potential study results to

1 stakeholder working group meetings during the development of New York  
2 State's renewable energy portfolio standard; testified on renewable market  
3 development and incentive program design and administration before  
4 committees of the Vermont legislature on several occasions. I also assisted  
5 New Jersey's electric utilities to review, and make consistent, their net  
6 metering and interconnection standards during the initial launch of New  
7 Jersey's Clean Energy Programs. I am currently the program administrator  
8 for Vermont's Solar and Small Wind Incentive Program. I have been a  
9 member of VEIC's Planning and Evaluation Group since 1998. In this role,  
10 my work has encompassed detailed program design and market strategy  
11 planning, potential analysis, cost-effectiveness screening, and program  
12 implementation support. For several assignments, I have played a leading  
13 role in the coordination and negotiations helping multiple parties work  
14 collaboratively on efficiency and renewable initiatives. Before joining VEIC, I  
15 worked for five years with the Tellus Institute and the Boston Center of the  
16 Stockholm Environment Institute. I have a joint undergraduate degree from  
17 Middlebury College in Geography and Political Science, a Masters Degree in  
18 Appropriate Technology and International Development from the University of  
19 Pennsylvania, and a PhD in Energy Management and Policy Planning, also  
20 from the University of Pennsylvania. My resume is provided as Exhibit PF-  
21 DH-1.

22 **Q: HAVE YOU TESTIFIED PREVIOUSLY BEFORE THIS COMMISSION?**

1 **A:** No. As stated above I have testified before the Ontario Energy Board in RP-  
2 2004-0203 / EB-2004-0533, and provided testimony before legislative  
3 committees on three occasions during the last year in Vermont.

4 **Q: HAVE YOU DONE OTHER WORK RELATED TO RENEWABLE ENERGY**  
5 **IN PENNSYLVANIA?**

6 **A:** I am currently advising PennFuture on net metering and interconnection rules  
7 in the Act 213 rulemaking process and participating in working group  
8 meetings on their behalf. Besides this I have not conducted other work  
9 related to renewable energy in Pennsylvania.

10 **Q: PLEASE SUMMARIZE YOUR FINDINGS AND CONCLUSIONS**

11 **A:** My findings and conclusions include the following. First, poorly designed net  
12 metering and interconnection rules and procedures serve as effective market  
13 barriers and negatively impact the development of distributed renewable  
14 energy resources. Second, the development of distributed renewable energy  
15 resources in Pennsylvania provides customer benefits, for both the customers  
16 installing the renewable energy systems and more broadly for all electric  
17 system customers. Third, the current net metering and interconnection rules  
18 in Pennsylvania, and to a lesser degree New Jersey, function as barriers in  
19 certain situations. Finally, in comparing the two territories, New Jersey has  
20 preferable net metering laws and relatively streamlined procedures, and I  
21 would recommend the Commission treat the NJ rules as a benchmark.  
22 Consistency between New Jersey and Southeastern Pennsylvania is  
23 important because of the proximity of the markets. Streamlined and

1 consistent rules and procedures will help to lower the transaction costs of  
2 developing renewable distributed generation, and promote sustained market  
3 development.

4 **Q: WHAT ARE YOUR RECOMMENDATIONS FOR THE COMMISSION IN**  
5 **THIS PROCEEDING?**

6 **A:** As a condition of the merger approval the Commission should require the  
7 companies to adopt a consistent, streamlined set of procedures and  
8 requirements for net metering and interconnection. This will directly benefit  
9 customers in Pennsylvania by lowering the transactions costs and improving  
10 the economics of renewable distributed generation systems. The rules and  
11 procedures should be based upon the standards currently in place in New  
12 Jersey. Further, I would encourage the Commission to consider requiring  
13 clarifications or modifications in two areas where the NJ standards may be  
14 improved upon. These are to adopt an abbreviated application and  
15 interconnection agreement for Level I interconnections (proposals for this are  
16 under regulatory review in NJ but are not yet in place), and to permit balance  
17 billing or budget payment customers to be eligible for net metering.

18

19 **II. THE IMPORTANCE OF NET METERING AND INTERCONNECTION RULES**  
20 **TO THE DEVELOPMENT OF DISTRIBUTED RENEWABLE GENERATION IN**  
21 **PENNSYLVANIA**

1 Q: WHAT RENEWABLE ENERGY RESOURCES ARE ELIGIBLE FOR NET  
2 METERING AND CAN BE EXPECTED TO PROVIDE DISTRIBUTED  
3 GENERATION IN PENNSYLVANIA?

4 A: As defined by Act 213, the renewable resources eligible for net metering are  
5 solar photovoltaic energy, wind power, low impact hydropower, geothermal  
6 energy, biologically derived methane gas, and biomass energy. Fuel cells  
7 and coal mine methane, while not necessarily renewable, are also identified  
8 by Act 213 as Tier I resources.

9 Q: HOW WILL THE DEVELOPMENT OF THESE RESOURCES BENEFIT  
10 CUSTOMERS AND SOCIETY?

11 A: The societal and customer benefits of renewable distributed generation  
12 include: cleaner air; a more robust, economic and resilient generation and  
13 distribution system; reduced dependence on imported energy; reduced  
14 volatility in electric and natural gas prices; and economic development. The  
15 nature and scope of these benefits are also being addressed in the testimony  
16 submitted by Mr. Tuffey on behalf of PennFuture and are therefore not  
17 repeated here. We also recommend to the Commission the comments  
18 submitted by the Small Generator Coalition to the net metering and  
19 interconnection working group which include a January 2005 white paper  
20 "Quantifying the Benefits of Solar Power for California" produced by Ed  
21 Smeloff for the Vote Solar Initiative (available at  
22 [www.votesolar.org/tools\\_QuantifyingSolar%27sBenefits.pdf](http://www.votesolar.org/tools_QuantifyingSolar%27sBenefits.pdf)). This study  
23 provides a detailed analysis of the most readily quantifiable system benefits

1 for solar installations in California. While the particular parameters of the  
2 analysis would vary when applied to the Pennsylvania and New Jersey  
3 markets, the nature and general magnitude of the findings, valuing on peak  
4 solar energy between \$0.23 and \$0.35 per kWh are nevertheless instructive.

5 **Q: WHAT IS DISTRIBUTED RENEWABLE GENERATION?**

6 **A:** There are several important attributes that help to define and distinguish the  
7 distributed renewable generation systems impacted by the two companies net  
8 metering and interconnection rules. First of all, these systems generate  
9 electricity on the customer's side of the utility company meter. They operate  
10 in parallel with the electric grid, and function primarily to off set the customer's  
11 own electric load. At times when a customer's generation exceeds their  
12 consumption, they supply net excess generation to the electric grid. This is in  
13 contrast to larger – grid supply – renewable energy systems that are designed  
14 and developed to sell power into the wholesale market.

15 **Q: WHAT IS NET METERING?**

16 **A:** Net metering encompasses the physical metering and tariff arrangements  
17 under which an electric distribution company permits customers who install  
18 the types of distributed renewable generation systems described above to  
19 receive full retail credit for their net excess electric production. A simple  
20 example is a residential photovoltaic system. During the daytime, if no one is  
21 home and the household's electric consumption is low, the system may  
22 produce more electricity than is being consumed on site. With net metering  
23 the customer receives full retail credit for this excess production, most

1 commonly by having their meter "spin backwards". Later in the evening,  
2 when the customer's consumption exceeds the solar electric production, the  
3 credit produced during the sunny part of the day is consumed. Net metering  
4 also typically allows a customer to carry forward net excess production on a  
5 monthly basis towards future billing cycles. Typically, at the end of an annual  
6 cycle, the electric distribution company compensates the customer for any  
7 remaining net excess generation based according to a whole sale rate.

8 **Q: WHY IS NET METERING IMPORTANT?**

9 **A:** Net metering promotes projects that provide the customer and system  
10 benefits of distributed renewable generation systems, including reduced  
11 transmission and distribution system line losses, high value on-peak power  
12 (particularly in the case of solar), reduced air emissions, reduced demand for  
13 conventional fossil fuels and economic development. Simply stated, net  
14 metering policies promote these benefits by significantly improving the  
15 customer economics for these projects, which in many cases, would not be  
16 able to proceed if the customer generator were simply compensated  
17 according to wholesale rates. The difference to the Pennsylvania customer  
18 generator between net metering with full retail rate compensation and an  
19 alternative compensation based on wholesale power purchase can be a  
20 factor of 2 or more. Furthermore, net metering allows customers to better  
21 match the instantaneous production of solar or wind systems, which varies  
22 significantly on a daily and monthly basis, to their annual consumption

1 pattern. The fact that net metering is now available in thirty nine states and  
2 the District of Columbia<sup>1</sup> reflects its importance as a policy tool.

3 **Q: WHAT ABOUT INTERCONNECTION AGREEMENTS?**

4 **A:** Interconnection applications and agreements specify the technical and  
5 contractual requirements a customer generator (whether net metering or not)  
6 must meet before they can interconnect with the grid. Interconnection  
7 procedures and requirements that are streamlined and consistent across  
8 utility territories and states are important to promote market development and  
9 obtain the benefits of renewable distributed generation that have been  
10 discussed above. Technical standards, such as the IEEE 1547 and UL 1741  
11 are available to insure that the safety and technical issues of interconnection  
12 are handled according to best practice as established through extensive  
13 multi-party development, review and comment procedures. Interconnection  
14 agreements, requirements and procedures that pose undue technical or  
15 business burdens on potential customer generators act as significant market  
16 barriers and can delay, reduce or eliminate the development of potential  
17 projects.

18 **Q: CAN YOU PROVIDE EXAMPLES FROM PENNSYLVANIA WHERE**  
19 **UNFAVORABLE NET METERING OR INTERCONNECTION RULES ARE**  
20 **ACTING AS MARKET BARRIERS?**

21 **A:** Yes, I can offer three broad examples. These are illustrative, and not meant  
22 to represent a full exposition on the subject. I am sure that market participants

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<sup>1</sup> Interstate Renewable Energy Council, Database of State Incentives for Renewable Energy. [www.dsire-usa.org](http://www.dsire-usa.org).

1 could provide additional insights on this topic. First is the simple case of  
2 comparing the current capacity limit for net metering between New Jersey  
3 and the Southeastern Pennsylvania markets. In New Jersey installations up  
4 to 2 MW are eligible for net metering. In PECO's territory, across the river,  
5 potential system developers are only permitted to net meter systems up to 40  
6 kW in capacity. This difference, by itself, acts as a strong market barrier and  
7 disincentive to the development of systems of >40 to 2,000 kW of rated  
8 capacity in Pennsylvania.

9 Second, the Pennsylvania Farm Bureau has raised concerns that the net  
10 metering tariffs and structure currently in place in PPL territory are preventing  
11 the development of agricultural methane digester projects. This is because  
12 the current rules do not permit net metering for the scale of agricultural  
13 digester projects (~200 kW rated capacity) that are most economical and  
14 technically feasible to develop. The current rules and tariffs also act as a  
15 barrier by imposing potential customers to standby, stranded cost, manual  
16 billing and/or exit charges. The tariff structure does not provide full retail  
17 credit for the portion of the customer generator's production that is below total  
18 annual consumption, but rather offers to compensate the generators for all  
19 production based on a whole sale avoided cost. Under these conditions  
20 projects are not moving forward, despite grants from the Department of  
21 Environmental Protection to promote the development and installation of  
22 methane digesters.

1 The third example compares the net metering application costs and required  
2 metering set up for small photovoltaic systems of less than 10kW based on a  
3 comparison of the current rules in the Exelon and PECO territories in New  
4 Jersey and Pennsylvania. The potential New Jersey customer is not charged  
5 an interconnection application fee, the PECO customer is charged a \$100  
6 fee. The New Jersey customer is able to use an existing single bi-directional  
7 meter, or if existing meter does not meet required specifications, a new  
8 revenue meter is installed at the company's expense. In contrast, the  
9 potential customer in PECO's territory is required to install two meters, in  
10 outdoor sockets, at the customer's expense. Finally, the customer in New  
11 Jersey with compliant equipment that meets IEEE 929 standards is not  
12 required to have an outdoor utility accessible disconnect switch, while the  
13 customer in Pennsylvania is. The differential cost to the potential customer  
14 generator and/or the installation contractor between these two sets of  
15 requirements is significant, and for most installations in this size class would  
16 eliminate savings generated by several years of system operations.

17  
18 In all three cases, the adoption of standards similar to those currently in place  
19 in New Jersey would encourage greater market development of distributed  
20 renewable generation in Pennsylvania, a goal which is consistent with current  
21 regulatory and policy objectives, and is supported by the consumer benefits  
22 outlined above.

23

1     **III. DISCUSSION OF PECO AND PSEG'S CURRENT NET METERING AND**  
 2     **INTERCONNECTION RULES**

3     **Q: WHAT IS THE CURRENT STATUS OF NET METERING IN PECO AND**  
 4     **PSE&G'S SERVICE TERRITORIES?**

5     **A:** Net metering is still in the early stages of market development for both.  
 6     Interrogatory response indicates there were 60 net metering customers as of  
 7     3/05 in PECO's territory. PSE&G responded that they currently bill 130 net  
 8     metering customers.

9     **Q: ARE THERE AREAS WHERE THE CURRENT REQUIREMENTS, COSTS,**  
 10    **AND PROCESSES ARE MORE FAVORABLE TO A POTENTIAL NET**  
 11    **METERING CUSTOMER IN EITHER NJ (PSE&G) OR PA (PECO)?**

12    **A:** The following table compares current requirements for the two service  
 13    territories across several key factors.

	<b>PECO</b>	<b>PSE&amp;G</b>
<b>Maximum eligible system size</b>	40 kW	2 MW
<b>Application fees</b>	\$300 for non photovoltaic installations  \$100 for PV installations meeting IEEE and UL Standards	\$500 for systems larger than 100 kW  \$100 for systems <100 kW  No fee for PV systems less than 10kW
<b>Metering requirements</b>	The customer is required to furnish, install, and maintain second meter. Under "RS Option C" a customer a single advanced meter may be used when available	The company may not require more than one meter per customer generator. An additional meter may be installed at the company's expense with customer consent, or at the customer's request
<b>Interconnection Review</b>	Any cost in excess of \$1,000 for rearranging PECO distribution facility shall be borne by customer	N.J.A.C. 14:4-9 defines three levels of interconnection review, fees of up to \$50 + \$1/kW for level II, and up to \$100 + \$2/kW for level III
<b>Treatment of monthly excess net customer generation</b>	Customer compensated at average PJM clearing price	Full retail credit, rolled forward to next monthly billing period. Credit accumulates to end of annualized period with net excess compensated at avoided wholesale cost.

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This comparison demonstrates that a potential customer generator in New Jersey faces eligibility requirements, costs and tariff structures that are more favorable than the same customer would face in Pennsylvania. The higher eligible system size means more projects are eligible for net metering in New Jersey. The application costs for the eligible customer generator in Pennsylvania (<40kW) are higher which makes the customer economics worse. The required metering equipment in Pennsylvania is more expensive and complicated to install. The costs of an interconnection study and potential costs associated with modifications to the distribution system are less certain in Pennsylvania, with no cap, and expose the potential customer generator to a higher level of risk, again discouraging project development. Finally, the compensation for net generation on a monthly basis in PECO territory is based on wholesale avoided cost, while a New Jersey customer receives full retail credit towards the next monthly billing cycle. Overall, under the current rules in PECO territory the required costs are higher, the eligibility requirements are more restrictive the costs are less certain, and the options less clear. The latter two create greater risk and transaction costs which further dissuade net metering development. Since both New Jersey and Pennsylvania have adopted legislation and regulatory policies to promote greater development of net metering. I see no reason why the implementation of the rules to attain the policy goals should be less favorable in the PECO territory than they are in New Jersey.

1 **Q: WON'T STATEWIDE INTERCONNECTION AND NET METERING RULES**  
2 **FOR PENNSYLVANIA PROVIDE ALL THAT IS NEEDED?**

3 **A:** The development of statewide rules in Pennsylvania provide an important  
4 basis for market development, but these may not gain all the advantages from  
5 the combined experience and rules that can be applied under the PECO and  
6 PSE&G merger. Since there is no guarantee that the recommendations in  
7 this testimony will be captured by new statewide rules in Pennsylvania, the  
8 Commission should require PECO to adopt rules that are consistent with the  
9 New Jersey standards. This will have an important positive impact on  
10 regional market development in the Southeast Pennsylvania and adjacent  
11 New Jersey territory. It is likely that Southeastern Pennsylvania will continue  
12 to be the leading and most promising geographic market for solar  
13 development in Pennsylvania. The reasons for this include a relatively  
14 favorable solar resource, demographics, and market infrastructure  
15 development is underway in New Jersey. Therefore consistency between the  
16 interconnection and net metering rules between the Southeast Pennsylvania  
17 and New Jersey markets is critical irregardless of the outcome of the  
18 statewide rulemaking process.

19 **IV. Findings and Conclusions**

20 **Q: WHAT ARE YOUR FINDINGS AND CONCLUSIONS WITH REGARD TO**  
21 **HOW NET METERING AND INTERCONNECTION RULES AND**  
22 **PROCEDURES SHOULD BE TREATED IN RELATION TO THE**  
23 **PROPOSED MERGER?**

1 **A:** Poor net metering and interconnection rules and procedures are currently a  
2 market barrier to the development of distributed renewable generation in the  
3 PECO territory. If the merger is approved, there will be market and  
4 administrative benefits to consistency in rules, requirements, and procedures  
5 between the two service territories. The New Jersey rules and procedures –  
6 with some modifications -- should serve as a basis for use in both service  
7 territories.

8 **V. Recommendations**

9 **Q: WHAT DO YOU RECOMMEND TO THE COMMISSION?**

10 **A:** As a condition of the merger approval require the companies to adopt a  
11 consistent, streamlined set of procedures and requirements for net metering  
12 and interconnection. This will promote greater market development for  
13 renewable distributed generation and provide consumer benefits in both  
14 service territories. With a few specific exceptions (described below) these  
15 should be based upon the standards currently in place in New Jersey.

16 **Q: DO YOU ALSO SUPPORT OTHER INVESTMENTS IN THE**  
17 **DEVELOPMENT OF ENERGY EFFICIENCY AND RENEWABLE**  
18 **SERVICES AND PROGRAMS?**

19 **A:** Yes, I do, as recommended in the testimonies of Messrs. Plunkett and Tuffey,  
20 experts who are testifying on behalf of PennFuture in these respective areas.  
21 Their recommendations include requiring the investment of \$60.5 million for  
22 renewable energy development and an additional investments for efficiency  
23 initiatives as conditions of the merger approval.

1 Q: WOULD YOU BE MORE SPECIFIC ON YOUR RECOMMENDATIONS FOR  
2 NET METERING?

3 A: The fundamental components of the recommended approach to net metering  
4 are:

- 5 ♦ Net metering is available to all customers generating on their side of the  
6 meter using a Tier I resource on a non-discriminatory, first come first  
7 served basis;
- 8 ♦ Net metering provides full retail credit up to a customer's total annual  
9 consumption;
- 10 ♦ Systems up to 2 MW peak nameplate capacity are eligible for net  
11 metering;
- 12 ♦ Excess generation in a monthly billing period is credited to the customer's  
13 account and carried forward to be used as needed through the end of an  
14 annualized billing period;
- 15 ♦ The EDC compensates a net metering customer for net excess generation  
16 at the end of annual period based on the EDC's average wholesale  
17 locational marginal price;
- 18 ♦ Net metering customers are not subject to additional charges, such as  
19 additional insurance requirements, exit fees, or other standby charges;
- 20 ♦ The customer generator owns the AEPS, and/or other green energy  
21 attribute credits, and may aggregate, negotiate, sell or retire credits at  
22 their discretion;

1           ♦ Net Metering purchases are treated by the electric distribution companies  
2           as a deferred regulatory asset eligible for cost recovery.

3           These recommendations are consistent with the PennFuture comments to the  
4           net metering interconnection working group convened by the Commission.

5   **Q: WOULD YOU BE MORE SPECIFIC ON YOUR RECOMMENDATIONS FOR**  
6   **INTERCONNECTION?**

7   **A:** The recommendations of PennFuture with respect to Interconnection  
8           requirements were presented to the net metering and interconnection sub-  
9           working group in the proceedings on the Implementation of the Alternative  
10          Energy Portfolio Standards Act of 2004, Docket No. M-00051865. These  
11          recommendations, which we encourage the Commission to adopt as  
12          preconditions to the proposed merger include the following. The IEEE 1547  
13          Standard for Interconnecting Distributed Resources with Electric Power  
14          Systems should serve as the basis for interconnection requirements. The  
15          principal adopted should be that any deviations from IEEE 1547 be vetted  
16          and the specific need for the deviation identified and documented by the party  
17          proposing the deviation. The Commission should further expect language  
18          consistent with NJAC 14:4-9.11, which explicitly prohibits an EDC from  
19          requiring facilities meeting criteria their level 1 and level 2 screening criteria  
20          from having to install additional controls or external disconnect switches.  
21          Finally, the Commission should require the companies to adopt  
22          interconnection forms and agreements that are consistent with the Interstate  
23          Renewable Energy Council's (IREC) Model Distributed Generation

1 Interconnection Procedures for simplified, expedited and standard  
2 interconnections.

3 **Q: IF THE COMMISSION ADOPTED YOUR RECOMMENDATIONS WOULD**  
4 **THERE BE ANY CHANGES REQUIRED TO THE CURRENT RULES AND**  
5 **PROCEDURES IN PLACE IN NEW JERSEY (PSE&G TERRITORY)?**

6 **A:** Yes, one change would be to allow balanced billing customers to net meter in  
7 New Jersey. Balanced billing, or budget billing, are able to pay a constant  
8 monthly fee based on an average of past consumption history, with  
9 mechanisms for true-up if the customer over or underpays based on metered  
10 consumption. This service allows customers to better anticipate and budget  
11 for electric payments throughout the year. Currently in New Jersey balanced  
12 billing customers are not eligible for net metering. I recommend that these  
13 customers be allowed to net meter. The balanced billing calculation can  
14 incorporate the anticipated output of their customer generator system, and  
15 these customers can be billed in the same fashion as other balanced billing  
16 customers who are not net metering. Another recommendation is to insure  
17 that the interconnection and net metering forms for customers installing  
18 systems under 10kW in New Jersey are significantly shortened, and revised  
19 to reflect that no application fee is charged for systems this size. My  
20 understanding is that these revisions have been proposed, and are pending  
21 approval by the New Jersey Board of Public Utilities.

22 **Q: IS THAT THE END OF YOUR TESTIMONY?**

23 **A:** Thank you, it is.

PENNFUTURE PARTIES STATEMENT NO. 3

9/23/05  
Phila  
jk

BEFORE THE  
PENNSYLVANIA PUBLIC UTILITY COMMISSION

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CORPORATION :

EXHIBIT PF-DH-1

Dated: June 28, 2005

**DAVID G. HILL, Ph. D.**  
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Dr. Hill is an energy expert specializing in residential energy efficiency and renewable energy. He has played a significant role in the design and development of over a half dozen programs in New Jersey, Vermont and Long Island. He has contributed significantly to several programs that improve energy affordability through a comprehensive set of energy efficiency, consumer education, and arrearage reduction strategies. Before joining VEIC, Dr. Hill served as a Research Associate with Tellus Institute and the Boston Center of the Stockholm Environment Institute (SEI-B) where he specialized in integrated environmental/energy policy planning, program design, market assessment, and the evaluation of residential, commercial, and industrial energy efficiency activities.

## PROFESSIONAL EXPERIENCE

1998-present

*Senior Project Planner, Vermont Energy Investment Corporation, Burlington, VT.*

Responsible for the management of consulting projects involving the design, delivery, and evaluation of energy efficiency and renewable energy measures, programs, and policies. His skills include facilitation and management of multi-party collaborative working groups, the estimation of environmental impacts, facility with the techniques and tools used to conduct economic and technical screening of energy investment options, managing the development and implementation of marketing and evaluation plans, and the ability to design, supervise, and conduct efficient and reliable quantitative analyses. Recent major project activities include:

- ◆ Green Energy Coalition: Expert witness before the Ontario Energy Board, filing comments on Hydro One Networks Inc. and Hydro One Brampton Networks Inc. Conservation and Demand Management Plans. This testimony focused on encouraging the companies to adopt a greater emphasis on cost effective energy efficiency, as opposed to smart metering and load control, in their proposed spending of \$42.7 million over three years.
- ◆ Northeast Energy Efficiency Partnerships (NEEP): Dr. Hill led a team conducting a quantitative analysis of the achievable potential for current and enhanced energy efficiency initiatives in the Northeast region in the 2009 to 2014 time frame. This work was a strategic regional level analysis that was used as the basis for recommendations to NEEP's Strategic Initiative Review Committee on future directions and priorities.
- ◆ New York State Energy Research Development Authority (NYSERDA): Dr. Hill was the renewable team project manager for a comprehensive technical and achievable potential assessment of renewable and energy efficiency technologies for New York. The renewable energy analyses include the estimation of the full economic costs and benefits for eight renewable energy resources and over twenty specific technologies under four planning scenarios. As the renewable energy team co-leader Dr. Hill was responsible for guiding the work, and providing quality assurance and quality control for the work of eight independent renewable resource experts. The technical potential analysis results have been included in the 2002 New York State Energy Plan.
- ◆ Massachusetts Technology Collaborative (MTC): Dr. Hill is leading a team, comprised of staff from VEIC, Optimal Energy Inc., and the Natural Resources Defense Council, on a project to assist the MTC and Renewable Energy Trust develop a framework for case studies of the renewable and green building projects. The project team is providing expert assistance and recommendations on case study content, marketing channels, format and materials designed to meet the priority needs of specific target audiences. When complete, the framework will facilitate information management, improve content quality and consistency, and generate case studies that maximize the impact of featured projects on future decision making.

- ◆ Natural Resource Defense Council – New Jersey Utilities Collaborative: Dr. Hill was a leading designer, and was the collaborative advisor, for the statewide renewable energy, and residential retrofits programs adopted by the New Jersey Board of Public Utilities. He also contributed to the design of the low-income program and served as the collaborative advisor for that program during its first 18 months of operation. Specific duties included multi-year program planning, budgeting, establishment of performance metrics, the development and execution of marketing strategies, the supervision and conduct of technical and economic screening analyses, and the development and management of multi-year evaluation plans.
- ◆ Long Island Power Authority Clean Energy Plan: Dr. Hill manages the VEIC team working with LIPA to provide program design and implementation assistance for residential efficiency and solar programs in the Clean Energy Initiative, including the Solar Pioneer Program, Residential Energy Affordability Program, and the Residential Lighting and Appliance Program. He drafted and advised on the executive summary for the Biennial Report to LIPA's Board on the Clean Energy Initiatives, and is playing a leading role in the development and economic screening of proposed program extensions.
- ◆ Vermont's Million Solar Roofs Partnership: Dr. Hill directs the Renewable Energy Resource Center, which provides marketing and analytic support for consumers and the renewable energy industry in Vermont. The RERC was selected by the State of Vermont Department of Public Service to design and administer Vermont's Solar and Small Wind Incentive Program which has successfully distributed over \$960,000 of incentives for 200 small wind, solar electric and solar thermal systems. Dr. Hill also managed a Solar Hot Water Market Development grant conducted for the Department of Energy, and has assisted two Vermont utilities with the design and implementation of pilot programs offering direct financial incentives for solar hot water and photovoltaic systems.
- ◆ Alliance for Climate Action: Dr. Hill was the lead author for Burlington's Climate Protection Action Plan and is an ongoing consultant for the newly formed Alliance for Climate Action. His current activities include serving as a Board member for the Alliance, and leading the development of the Ten Percent Challenge Campaign's calculator tools, and monitoring and reporting system. The Ten Percent Challenge is increasingly being recognized at the regional and national level as a leading example of local climate initiatives.

1993-1998

**Research Associate, Tellus Institute and the Boston Center of the Stockholm Environment Institute, Boston, MA.** Responsible for program design and marketing assessment and monitoring and evaluation of residential, commercial, and industrial energy efficiency activities. Dr. Hill was the principal investigator conducting a process evaluation for the Ohio Department of Development, Office of Energy Efficiency. This investigation included the estimation of environmental impacts generated through the program's gas and electric savings.

Other project work included developing analytic tools for use by private and public sector clients seeking to evaluate energy service procurement opportunities. Highlights include coordinating an evaluation of a proposed energy services contract for a large commercial complex (annual electricity bills of over \$5 million) including consideration of electricity price trends in deregulated markets, account aggregation, and extensive energy efficiency investments. Dr. Hill also designed the energy module component for the Energy & Environment Financial Analysis and Cost Evaluation System (E2/FINANCE), a total cost assessment tool for estimating profitability indicators for industrial eco-efficiency investments. David also co-managed a project that created an internet and written directory of public and private financing resources available for business improvement projects with environmental benefits (for the EPA - Region I).

Selected international projects conducted for clients including the Inter-American Development Bank, the United Nations Industrial Development Organization, and the United Nations Development Programme include:

- ◆ Provided training and ongoing technical support for representatives from six countries on the use of the Long-range Energy Alternatives Planning/Environmental Database (LEAP/EDB) system for conducting greenhouse gas mitigation analyses.

- ◆ Contributed to a review of the Inter-American Development Bank's lending and support for renewable energy and energy efficiency projects.

## EDUCATION

University of Pennsylvania, *Energy Management and Policy Planning*,  
Ph.D.; 1993

University of Pennsylvania, *Appropriate Technology and International Development*,  
Masters of Arts; 1989

Middlebury College, *Bachelor of Arts in Geography and Political Science*; 1981

## ADDITIONAL INFORMATION

Fulbright Scholar conducted dissertation research on energy decision making in rural Nepal (1991-1993).  
US Peace Corps volunteer, Sierra Leone (1984-1986).

## SELECTED PUBLICATIONS, PRESENTATIONS AND REPORTS

- 2005 Testimony to the Ontario Energy Board on Hydro One Networks and Brampton Conservation and Demand Management Plans. February 17-18, 2005.
- 2005 Testimony to the Vermont State Legislature House Committee on Energy and Natural Resources on Vermont's Solar and Small Wind Incentive Program. February 9, 2005.
- 2004 "Cost Effective Contributions to New York's Greenhouse Gas Reduction Targets from Energy Efficiency and Renewable Energy Resources", Proceedings of ACEEE 2004 Summer Study Conference on Energy Efficiency in Buildings, Volume 8, (with John Plunkett, Lawrence J. Pakenias, R. Neal Elliot, Christine Donovan, Phil Mosenthal, and Chris Neme).
- 2003 "Solar Energy Value and Opportunities in Vermont", Invited Session Panel Moderator and Speaker, 2nd Annual Power for a New Economy Conference, Burlington, Vermont, October 8, 2003. Renewable Energy Vermont.
- 2003 "Renewable Energy Case Studies: Redefining the Models, Refining the Messages, and Getting the Word Out", Invited Session Panel Moderator, Solar 2003 National Solar Energy Conference, Austin, Texas June 22, 2003. American Solar Energy Society.
- 2002 "Transforming Markets for Customer Sited Clean Renewable Energy: Connecting Field Experience with Lessons from the Efficiency World", Invited Session Panel Moderator, Solar 2002 National Solar Energy Conference, Reno, Nevada June 18, 2002. American Solar Energy Society.
- 2002 "The Ten Percent Challenge: A Participatory Community Scale Climate Campaign", Proceedings of ACEEE 2002 Summer Study Conference on Energy Efficiency in Buildings, Volume 9, (with Tom Buckley, Jennifer Green, and Debra Sachs)
- 2000 "Implementing and Monitoring Community-Based Climate Action Plans", Proceedings of ACEEE 2000 Summer Study Conference on Energy Efficiency in Buildings, Volume 9, pp. 149-160 (with Tom Buckley, Mark Eldridge, Debra Sachs, and Abby Young)
- 2000 "The Climate Action Plan: A Plan to Save Energy and Reduce Greenhouse Gas Emissions" Lead Author for the Burlington Climate Protection Task Force.
- 1998 "Eco-Efficiency Financing Resource Directory". Electronic web-site, and printed directory prepared for the Environmental Protection Agency, Region I, New England.

- 1998 "Home Weatherization Assistance Program Environmental Impact Analysis". Prepared for the Ohio Department of Development, Office of Energy Efficiency.
- 1997 "Achieving Public Policy Objectives Under Retail Competition: The Role of Customer Aggregation". Prepared for the Colorado Governor's Office of Energy Conservation.
- 1997 "IDENTIFY: Improving Industrial Energy Efficiency and Mitigating Global Climate Change", software and paper prepared for the United Nations Industrial Development Organization, presented at the ACEEE Summer Study on Industrial Energy Efficiency.
- 1997 "E2/FINANCE: A Software System for Evaluating Industrial Eco-Efficiency Opportunities", sponsored by the U.S. Department of Energy. Software and paper presented at the ACEEE Summer Study on Industrial Energy Efficiency.
- 1997 "E2/FINANCE Software: Case Studies", Prepared for the Workshop on Innovative Financing for Energy Efficiency and Pollution Prevention Technologies, sponsored by the U.S. Department of Energy, Office of Energy Efficiency and Renewable Energy.
- 1997 "Review of the Swaziland Energy Information System and Report on LEAP Training Activities", Prepared for the Ministry of Natural Resources and Energy, Government Kingdom of Swaziland.
- 1996 "Evaluation of the IDB's Policies and Practices in Support of Renewable Energy and Energy Efficiency: A Report to the Inter-American Development Bank." Brower and Company and Tellus Institute.
- 1996 "Action plan for the Massachusetts' Industrial Services Program (ISP), prepared for the Sustainable Industries Initiative of the Corporation for Business Work and Learning.
- 1995 "Process Evaluation of Three Gas Utility Commercial Industrial Demand Side Programs," Prepared for the Colonial Gas Company, and presented at the ACEEE's 1995 Summer Study on Energy Efficiency in Industry.
- 1995 "Framework for National Energy Planning: Mission Report", The Republic of Maldives. United Nations Department for Development Support and Management Services.
- 1994-95 The SEI/UNEP Fuel Chain Project: Methods, Issues, and Case Studies in Developing Countries. Venezuela Case Study.
- 1994 *Future Energy Requirements for Africa's Agriculture (Sudan Case Study)*. Report to the African Development Bank by the UN Food and Agriculture Organization.
- 1994 *Report to the Idaho Public Utility Commission on Suggested Cost Allowances for the Idaho Power Company's DSM Programs*. Prepared for the Idaho Public Utilities Commission, Tellus Report No. 94-177.
- 1994 *Review of Pennsylvania Electric Company's 1995 Demand Side Management Filing*. Prepared for: Pennsylvania Office of Consumer Advocate. Tellus Study No. 94-071.
- 1994 *Review of Union Electric Company's Electric Utility Resource Planning Compliance Filings*. Prepared for: The Missouri Office of Public Counsel. Tellus Study No. 93-300.
- 1994 *Incorporating Environmental Externalities in Energy Decisions: A Guide for Energy Planners*. A Report to the Swedish International Development Agency. SEI-B Report No. 91-157.