PECO ENERGY COMPANY
STATEMENT NO. 2

BEFORE THE
PENNSYLVANIA PUBLIC UTILITY COMMISSION

ENERGY EFFICIENCY AND CONSERVATION PROGRAM

DOCKET NO. M-2009-2093215

DIRECT TESTIMONY SUPPORTING PECO'S PETITION FOR APPROVAL OF ITS PHASE II EE&C PLAN

WITNESS: TOBEN E. GALVIN

SUBJECT: DEVELOPMENT OF PECO ENERGY COMPANY'S ACT 129 ENERGY EFFICIENCY AND CONSERVATION PLAN AND SUMMARY OF PRINCIPAL FINDINGS

DATED: NOVEMBER 1, 2012

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DIRECT TESTIMONY
OF
TOBEN E. GALVIN

I. INTRODUCTION AND PURPOSE OF TESTIMONY

1. Q. Please state your name and business address.

A. My name is Toben E. Galvin. My business address is 255 S. Champlain Street, Suite 10, Burlington, VT 05401.

2. Q. By whom are you employed and in what capacity?

A. I am employed by Navigant Consulting Inc. ("Navigant") as an Associate Director in the Energy Practice.

3. Q. Please state your educational background.

A. I received a BA degree in Anthropology from Grinnell College in 1995 and a MS degree in Resource Economics from the University of Florida in 2000.

4. Q. Please describe your current and prior work experience.

A. My resume is set forth in Exhibit TEG-1. In summary, for the past ten years I have been employed as a consultant to the utility industry on matters related to demand-side management ("DSM") program planning, design and evaluation. I currently work for Navigant's energy efficiency/DSM practice. My work covers topics such as energy efficiency portfolio design planning, implementation support, potential studies, benchmarking studies, and portfolio evaluation management. Recently, I have specialized in assisting electric and natural gas utilities with portfolio design

planning and cost-effectiveness analysis to meet energy efficiency resource standards in Michigan, Arizona, Ohio, and Nova Scotia. I started my career in the energy efficiency industry at the Vermont Energy Investment Corporation where I worked on DSM program planning, measure characterization and Technical Reference Manual development for Efficiency Vermont and other utilities in the northeast. I have also worked as Deputy Director of Energy Programs for the Maine Public Utilities Commission, in which capacity I helped to manage Efficiency Maine's $13 million annual portfolio of energy efficiency programs.

5. Q. Have you previously testified in any regulatory proceedings?

A. Yes. I have presented live testimony in several DSM regulatory proceedings. In February 2007, as Deputy Director of Energy Programs at the Maine Public Utilities Commission, I presented summary findings and recommendations to the Maine Public Utilities Commission with respect to "Draft Staff Report Docket No. 2006-446: Inquiry into New Conservation Programs and Developing a Plan for Using Increases in the Conservation Fund". In November 2008, on behalf of the Southern Maryland Electric Cooperative, I presented live testimony to the Maryland Public Service Commission with respect to providing a summary overview of Southern Maryland Electric Cooperative Demand Side Management Plan for 2009-2015 as part of the EmPower Maryland Case No. 9157. In January 2010, on behalf of the Maine Public Utilities Commission, I presented live testimony to the Maine Public Utilities Commission on a research project titled "Summary Report of Recently Completed Potential Studies and Extrapolation of Achievable Potential for Maine (2010-2019)",

followed by additional live testimony in June 2010 on the "Review of the Efficiency Maine Trust Triennial Plan 2011-2013".

6. Q. What is the purpose of your testimony in this case?

A. Navigant was retained by PECO Energy Company ("PECO") to assist it in the development of its Act 129 Phase II Energy Efficiency and Conservation Plan (the "Phase II Plan" or "Plan") for the period from June 1, 2013 to May 31, 2016. The purpose of my testimony is: (1) to describe the process by which PECO and Navigant identified, evaluated and selected energy efficiency programs for inclusion in the Phase II Plan; and (2) to summarize our principal findings in terms of projected energy savings, program expenditures and Total Resource Cost ("TRC") net benefits.

7. Q. How is your testimony organized?

A. I first describe the process employed in developing the Phase II Plan. Next, I discuss the results of preparing the key inputs to the portfolio benefit-cost screening model and the iterative discussions with PECO and conservation service providers ("CSPs") to refine the portfolio strategy. I then summarize the Phase II programs that PECO is proposing to implement and discuss common barriers to participation in energy efficiency programs. I conclude by offering my observations of the reasons I believe PECO's Plan represents a balanced, comprehensive and diverse portfolio of energy efficiency programs.

II. PROCESS FOR DEVELOPING THE PHASE II PLAN

8. Q. Please describe the process employed in developing the Phase II Plan.

A. Five primary elements were employed in developing PECO's Plan, all of which were based on practices and approaches that are well-established in the industry. First, Navigant had numerous planning and design meetings with PECO and existing and prospectively new CSPs to review contextual background, discuss past experience from Phase I delivery, and identify new strategies and enhancements for Phase II. Second, Navigant engaged in design data verification in which we prepared a comprehensive list of DSM programs and corresponding measure level savings and cost estimates. Third, Navigant engaged in design and market characterization assessment, which included assessing lessons learned from the Phase I evaluation reports, benchmarking analysis, and findings from the Statewide Evaluator market potential study to help inform our final program and measure selection priorities. Fourth, we populated our benefit-cost screening tool with the populated measure level data and forecasted incentive and non-incentive costs, and conducted an extensive iterative process of assessing numerous program design scenarios and cost-effectiveness results to provide an optimal mix of DSM programs. The fifth and final step was preparing the overall narrative plan and supporting tables and figures.

9. Q. Did you utilize the Technical Reference Manual ("TRM") adopted by the Pennsylvania Public Utility Commission ("Commission" or "PUC") in quantifying program savings?

A. Yes. We considered energy and demand savings values as calculated from the most recently revised 2012 TRM , and our best forecast of anticipated 2013 TRM savings values were used to the extent possible.[1] In some instances, Navigant applied some additional downward adjustment to estimated savings based on a best assumption forecast of how deemed savings are likely to change in the 2013-2015 time period due to: a) projected evaluation, measurement and verification adjustments that will influence changes to future TRM versions; and b) adjustment to per unit savings per changing baselines due to the Energy Independence and Security Act of 2007 ("EISA"). Some measures included in PECO's proposed portfolio are not currently characterized in the Pennsylvania TRM. In those instances, Navigant used weather adjusted savings estimates from other published industry sources, including California's Database of Energy Efficiency Resources ("DEER"), the Mid-Atlantic TRM, Efficiency Vermont's TRM, and Navigant engineering estimates.

10. Q. How were the other necessary supporting data developed?

A. The development of additional necessary supporting data consisted of multiple components. First, we collected all available relevant secondary data and then supplemented that effort with primary data collection where necessary. The types of

[1] The currently effective 2012 TRM was adopted by the PUC on December 15, 2011 at Docket No. M-00051865 and became effective on June 1, 2012. We also consulted the June 25, 2012 PUC memorandum regarding HVAC, Water Heating, New Construction, Energy Star Lighting, Appliance Recycling, and Energy Star Appliances.

secondary data that we assembled included reviews of other recently filed energy efficiency portfolio plans in Pennsylvania, New Jersey, Ohio, New York, Massachusetts, Michigan and Maryland to ensure we were cognizant of the evolution of portfolio designs, programs, and measures being promoted across the industry. The primary data comprised PECO-specific load forecasts, historical customer billing records, avoided cost information, discount rates, previous market research studies, previous PECO Phase I program evaluation studies, and a multi-utility benchmarking analysis which compared program costs and delivery approaches.

11. Q. Was it at this point in your analysis that you identified the various programmatic measures that might be considered for inclusion in PECO's Phase II Plan?

A. Yes. Based on the information we had assembled and on our professional experience, we conducted a thorough assessment of the various energy efficiency programs and measures that could be included in the portfolio. We began this effort by reviewing all of the current Phase I measures, and then identified an additional list of measures based on our experience in the industry, as supplemented by the input and feedback that we received during numerous meetings with PECO staff, CSPs, and input from stakeholder groups. We then ran those measures through a series of qualitative screens to eliminate measures that either were not applicable to PECO customers or could not feasibly be implemented. Finally, we assessed the benefits of each individual measure relative to that measure's cost with our benefit-cost screening tool and used this information to assist with measure selection and participation forecasting.

12. Q. How were specific Phase II Plan programs selected?

A. Once we finished our review of possible measures, we transitioned to determining the best combinations of programs to maximize portfolio success. As a starting point, we assessed PECO's existing Phase I programs and considered what aspects of the current portfolio were working well and should be continued, and/or which program components were in need of modification. We then layered into this review new programs that were intended to broaden and diversify the range of efficiency opportunities available to all customers. This process involved numerous meetings and discussions with PECO staff and CSPs, and was further informed by a review of energy efficiency programs from other parts of the country.

13. Q. How involved was PECO in the process of developing the programs?

A. PECO was involved at every step in the process. Navigant had frequent and extensive meetings with PECO staff to strategize on best practice program design, eligibility, measure selection, incentive level ranges, estimated non-incentive costs and participation forecasts. The overall process was to start with a wide approach to program and measure selection, and then narrow the selection to identify the preferred mix of programs to suit the uniqueness of PECO's customer base. Program development was focused on addressing Act 129 and PUC requirements, including: (1) PECO's Phase II consumption reduction target of 2.9% of its expected sales for the June 1, 2009 through May 31, 2010 period; (2) the requirement that at least 4.5%

of portfolio savings come from low income customers[2]; (3) the requirement that 10% of portfolio savings come from Government, Institutional and Non-Profit ("GINP") customers; and (4) the expansion of comprehensive energy efficiency program opportunities for residential and small commercial customers.

14. Q. Please describe the PECO stakeholder process.

A. Throughout the Phase II portfolio planning process, PECO participated in various stakeholder forums. The meetings were intended to inform the stakeholders of the process that PECO was utilizing in developing its Phase II Plan and, more importantly, to solicit their input regarding potential programs.

15. Q. Please describe further the analysis of specific programs.

A. Initially, it was necessary to develop the various parameters that would enable us to conduct a detailed cost-effectiveness analysis. These parameters included identifying the specific energy efficiency measures for each program, the number of customers that might participate in the program each year, the total incremental cost of each measure, the amount of rebate or incentive that would be offered to offset that cost, and the costs to administer the program.

16. Q. How did you determine customer participation rates?

A. Our forecast of customer participation rates was informed by a multi-step process. First,we considered the participation rates observed by PECO during the Phase I

[2] Low income customers are those with a household income at or below 150% of the Federal Poverty Income Guidelines. *See* 66 Pa.C.S.§ 2806.1(b)(1)(i)(G).

period. Then we extrapolated the probability of on-going levels of sustained or increased participation for existing programs based on our planned incentive levels, market outreach strategy, and estimated remaining market potential. For new programs, we calibrated our estimated participation for PECO by normalizing estimated units rebated per customer through a review of similar programs in Ohio and Michigan, as Navigant had good access to detailed data for programs in these states and they are at a similar DSM market maturity level. We then considered customer acceptance rates for PECO for each individual measure based largely on our observation of the experience of other comparable programs. Adjustments to these forecasted participation rates were then made based on discussions with PECO staff and its experience working with customers in the greater Philadelphia area. We also utilized input from key vendors and current and potential future CSPs. For example, PECO convened meetings with CSPs active in all of the proposed program areas to gather their input on preliminary designs, strategies, and participation forecasts.

17. Q. How certain are you that these participation rates can be achieved?

A. I am confident that these participation forecasts can be achieved based on PECO's experience from Phase I and the comparative review we completed of utility performance of similar programs being delivered in other states. Nonetheless, market forecasting of any type remains an inexact process.

18. Q. You mentioned that once the parameters were developed, you then conducted a cost-effectiveness analysis. How was that done?

A. Per Act 129, we followed the Commission's guidance on how to calculate the TRC test as the basis for judging the economic viability of the Phase II Plan. To this end, we worked with PECO to determine representative avoided costs for energy and capacity, as well as other important drivers including system loss factors, discount rates, and cost escalation rates. In addition to the TRC test, we developed levelized costs of saved energy and capacity, which were calculated by dividing the lifetime costs of a program by the lifetime savings associated with that program. We also calculated and reported first year cost/kWh, which is another common metric in the industry to compare the costs of efficiency programs. We incorporated the following specific modifications to the TRC test to comply with Commission guidance:

a) Measure lifetime was capped at 15 years;
b) Non-electric savings (e.g., natural gas savings) were excluded from measure benefits;
c) Energy savings were calculated at the meter, without line losses, while demand savings were calculated at the generator, with line losses;
d) Estimated net-to-gross ratios ("NTG") from previous PECO Phase I evaluation findings were applied as appropriate to measures. In instances of new measures with no previous PECO evaluation experience, we applied an estimated NTG from other recent evaluation reports of similar

programs elsewhere that are at approximately the same stage of market maturity[3].

e) Costs associated with the free provision of efficient equipment and installation labor costs (e.g. low income, multifamily direct install, existing home audit and free direct install), are all treated as non-incentive costs.

It is important to note that these specific Commission requirements for the TRC test result in lower benefit-cost ratios than if these Commission-stipulated modifications to the TRC test were not required.

19. Q. How many programs did PECO select for inclusion in its Phase II Plan?

A. PECO selected thirteen programs, seven geared toward residential energy efficiency savings and six geared toward commercial and industrial ("C&I") savings. Seven of the programs represent new Phase II programs that are proposed to help advance the adoption of energy efficiency in new target sectors. These programs are described below.

Energy Efficiency Programs

1. Smart Appliance Recycling (recycling of second refrigerators/freezers)
2. Smart Home Rebates (efficient lighting, HVAC, and other retail products)
3. Smart House Call (existing homes retrofit with an assessment/audit)*
4. Smart Builder Rebates (residential new construction)*
5. Residential Low-Income Energy Efficiency (low income retrofit)

[3] Consistent with the Commission's guidance, NTG factors are applied only for purposes of benefit-cost screening. Claimed savings for compliance with Act 129 Phase II standards do not include NTG factors and are based only on gross savings estimates.

6. Smart Energy Saver (grade school education, awareness, and take-home kits)*

7. Smart Usage Profile (direct mail home energy reports)*

8. Smart Equipment Incentives (C&I prescriptive rebates)

9. Smart Business Solutions (small commercial direct install)*

10. Smart Multi-Family Solutions (Two program components (a) multifamily residential individual metered and b) commercial master metered multi-family direct install and commercial prescriptive measures)*

11. Smart Construction Incentives (C&I new construction)

12. Smart Equipment Incentives GINP (government, institutional, non-profit)

13. Smart On-Site (C&I combined heat and power)*

* Indicates a new program effective for Phase II.

20. Q. Does PECO's filing contain more detailed descriptions of the proposed energy efficiency programs?

A. Yes. Consistent with the filing template issued by the PUC[4], detailed descriptions of the programs are set forth in Section 3 of the Phase II Plan and provide the following information:

- Program Title and Years of Operation
- Objectives
- Target Market
- Program Description
- Implementation Strategy

[4] September 26, 2012 Letter at Docket No. M-2012-2289411.

- Program Issues, Risks, and Risk Management Strategies
- Ramp-up Strategy
- Marketing Strategy
- Eligible Measures and Incentive Strategy
- Program Start Date and Key Milestones
- Evaluation, Measurement, and Verification Requirements
- Administrative Requirements
- Estimated Participation
- Estimated Percent of Sector Budget
- Projected Energy and Peak Demand Savings
- Cost-Effectiveness

21. Q. Please summarize the total energy savings projected for the Plan.

Overall, PECO anticipates saving a total of 1,184,442 MWh in Phase II, which represents approximately 105% of PECO's required 2.9% minimum savings target. Table 1 presents the gross annual energy savings by program for each year of the Phase II Plan, including a forecast of anticipated Phase I banked savings. For the residential sector, the greatest amount of savings will be generated by the Smart Home Rebates program, which includes promotion of efficient lighting, HVAC, and other ENERGY STAR products. For the C&I sector, PECO's Smart Equipment Incentives program will account for the majority of savings. Overall, approximately 41% of the MWh savings come from the residential sector, and 59% from the C&I sector.

Table 1: PECO's Projected Annual Gross Energy Savings by Program

Program	Energy Savings (MWh)			
	PY 2013	PY 2014	PY 2015	3-Year Total
Energy Efficiency Programs				
Residential				
1. PECO Smart Appliance Recycling	13,628	13,628	13,628	40,885
2. PECO Smart Home Rebates	102,940	93,314	84,606	280,860
3. PECO Smart House Call	5,307	4,765	4,539	14,611
4. PECO Smart Builder Rebates	112	135	162	409
5. PECO Low Income Energy Efficiency (LEEP)	16,432	16,446	16,487	49,364
6.PECO Smart Energy Saver	958	958	958	2,873
7. PECO Smart Usage Profile	8,000	16,800	26,000	50,800
8. PECO Smart Multi-Family Solutions Program (Res)	3,274	2,793	2,793	8,861
Subtotal Residential EE Programs	***150,651***	***148,838***	***149,173***	***448,663***
Phase 1 Banked Savings (Residential)	16,684	16,684	16,684	***50,053***
Subtotal Residential EE Programs + Phase 1 Banked Savings (Residential)	***167,336***	***165,523***	***165,857***	***498,715***
Commercial and Industrial				
9. PECO Smart Equipment Incentives (C&I)	90,274	90,576	90,019	270,870
10. PECO Smart Business Solutions	14,477	14,622	14,768	43,867
11. PECO Smart Multi-Family Solutions Program (C&I)	4,405	3,993	3,997	12,395
12. PECO Smart Construction Incentives	26,029	26,290	26,552	78,871
13. PECO Smart Equipment Incentives (GINP)	34,239	34,582	34,927	103,748
14. PECO Smart On-Site	45,001	45,001	45,001	135,002
Subtotal Commercial & Industrial EE Programs	***214,425***	***215,063***	***215,266***	***644,754***
Phase 1 Banked Savings (Commercial)	13,651	13,651	13,651	***40,952***
Phase 2 Residential and Commercial & Industrial EE Programs + Phase 1 Banked Savings (Commercial)	***228,076***	***228,714***	***228,916***	***685,706***
Grand Total – All Phase II EE Programs	***365,077***	***363,901***	***364,439***	***1,093,417***
Grand Total – All Phase II EE Programs + Phase I Banked Savings	***395,412***	***394,236***	***394,774***	***1,184,422***

22. Q. What are the total peak demand savings projected for the Plan?

A. Overall, PECO anticipates a Phase II total peak demand reduction of 208.8 MW. Table 2 summarizes the projected summer peak demand savings for each of the energy efficiency programs.

Table 2: PECO's Projected Annual Gross Peak Demand Savings by Program

Program	Peak Demand Savings (MW)			
	PY 2013	PY 2014	PY 2015	3-Year Total
Energy Efficiency Programs				
Residential				
1. PECO Smart Appliance Recycling	1.7	1.7	1.7	5.0
2. PECO Smart Home Rebates	13.5	13.4	11.5	38.4
3. PECO Smart House Call	0.6	0.5	0.5	1.6
4. PECO Smart Builder Rebates	0.0	0.0	0.0	0.1
5. PECO Low Income Energy Efficiency (LEEP)	1.1	1.1	1.0	3.1
6.PECO Smart Energy Saver	0.0	0.0	0.0	0.1
7. PECO Smart Usage Profile	1.0	2.1	3.2	6.3
8. PECO Smart Multi-Family Solutions Program (Res)	0.2	0.2	0.2	0.5
Subtotal Residential EE Programs	***18.1***	***18.9***	***18.2***	***55.2***
Commercial and Industrial				
9. PECO Smart Equipment Incentives (C&I)	20.3	20.3	20.1	60.7
10. PECO Smart Business Solutions	3.1	3.1	3.2	9.4
11. PECO Smart Multi-Family Solutions Program (C&I)	0.4	0.3	0.3	1.0
12. PECO Smart Construction Incentives	6.2	6.3	6.3	18.8
13. PECO Smart Equipment Incentives (GINP)	11.5	11.7	11.8	35.0
14. PECO Smart On-Site	9.5	9.5	9.5	28.6
Subtotal Commercial & Industrial EE Programs	***51.0***	***51.2***	***51.3***	***153.5***
Grand Total -- All EE Programs	***69.1***	***70.2***	***69.5***	**208.8**

23. Q. What are the annual and cumulative program expenditures projected for the Plan?

A. PECO expects to spend $256.4 million over the three year Plan period in order to achieve the energy savings represented in Table 1 and the peak demand reductions represented in Table 2. This represents 100% of PECO's spending cap under Act 129 Phase II. Of that total, PECO expects to spend 51% of the program delivery budget on residential programs and 49% on C&I programs. Table 3 lists the anticipated annual and total expenditures by program. Projected costs by program represent all anticipated costs to be incurred by PECO and competitively selected CSPs for program implementation. The common cost category includes all PECO staff and material costs and third party contractor costs to be incurred by PECO for overall portfolio management, data tracking, education and awareness, various technical support and program design needs, and third party evaluation, measurement, and verification.

Table 3: PECO's Projected Yearly Expenditure by Program

Program	Budget (Million $)				
	PY 2013	PY 2014	PY 2015	3-Year Total	Average Annual
Energy Efficiency Programs					
Residential					
1. PECO Smart Appliance Recycling	$2.4	$2.4	$2.4	$7.2	$2.4
2. PECO Smart Home Rebates	$17.5	$18.3	$17.7	$53.5	$17.8
3. PECO Smart House Call	$5.2	$5.3	$5.5	$16.0	$5.3
4. PECO Smart Builder Rebates	$0.5	$0.6	$0.6	$1.7	$0.6
5. PECO Low Income Energy Efficiency (LEEP)	$7.8	$8.0	$8.1	$23.8	$7.9
6.PECO Smart Energy Saver	$0.5	$0.5	$0.5	$1.6	$0.5
7. PECO Smart Usage Profile	$0.6	$1.0	$1.4	$3.0	$1.0
8. PECO Smart Multi-Family Solutions Program (Res)	$1.6	$1.7	$1.7	$5.0	$1.7
Subtotal Residential EE Programs	***$36.3***	***$37.8***	***$37.9***	***$111.9***	***$37.3***
Commercial and Industrial					
9. PECO Smart Equipment Incentives (C&I)	$13.8	$14.0	$14.2	$42.1	$14.02
10. PECO Smart Business Solutions	$2.7	$2.8	$2.9	$8.4	$2.81
11. PECO Smart Multi-Family Solutions Program (C&I)	$1.6	$1.6	$1.7	$4.8	$1.62
12. PECO Smart Construction Incentives	$4.0	$4.1	$4.2	$12.3	$4.09
13. PECO Smart Equipment Incentives (GINP)	$8.0	$8.1	$8.3	$24.4	$8.12
14. PECO Smart On-Site	$4.9	$5.0	$5.0	$14.9	$4.96
Subtotal Commercial & Industrial EE Programs	***$35.1***	***$35.6***	***$36.1***	***$106.9***	***$35.6***
Common Costs	***$13.7***	***$11.8***	***$12.1***	***$37.6***	***$12.5***
Grand Total -- All EE Programs	***$85.0***	***$85.2***	***$86.2***	***$256.4***	***$85.5***

24. Q. How does the Plan fare under the TRC test?

A. For the Plan as a whole over Phase II, the TRC benefit to cost ratio is 1.4, yielding net benefits of $165.8 million. Table 4 summarizes the results of the TRC analysis by program. Of the thirteen programs, only two (Smart Builder Rebates and Smart House Call) fail to pass the TRC test. There are two key reasons for their failure: (1) these programs provide long-term benefits that are not fully captured by the TRC, which limits measure life to 15 years; and (2) these programs provide significant non-electric benefits (e.g. natural gas savings) that are excluded from the TRC. For the Smart Builder Rebates program, another contributing factor is the limited market potential for residential new construction projects in PECO's territory that are installing an efficient source of electric heat (air or ground source heat pump heating systems only). For the Smart House Call Program, a key contributing factor is the significant marketing and awareness costs that PECO will incur in order to successfully launch and promote this new program. Nevertheless, we believe that these programs should be included in the Plan because they allow PECO to expand opportunities for residential customers and contribute to a well-rounded portfolio of programs overall.

Table 4: PECO's Estimated TRC Results by Program PY 2013-2015

Program	TRC Analysis			
	Discounted Benefits (Millions)	Discounted Costs (Millions)	Net Benefits (Millions)	B/C Ratio
Energy Efficiency Programs				
Residential				
1. PECO Smart Appliance Recycling	$22.54	$4.50	$18.04	5.0
2. PECO Smart Home Rebates	$111.38	$86.22	$25.15	1.3
3. PECO Smart House Call	$10.08	$15.00	-$4.92	0.67
4. PECO Smart Builder Rebates	$0.42	$2.06	-$1.64	0.2
5. PECO Low Income Energy Efficiency (LEEP)	$33.60	$22.21	$11.39	1.5
6.PECO Smart Energy Saver	$1.66	$1.50	$0.16	1.1
7. PECO Smart Usage Profile	$5.18	$2.72	$2.46	1.9
8. PECO Smart Multi-Family Solutions Program (Res)	$5.23	$4.68	$0.56	1.1
Subtotal Residential Programs	**$190.09**	**$138.89**	**$51.20**	
Commercial and Industrial				
9. PECO Smart Equipment Incentives (C&I)	$120.86	$59.55	$61.32	2.0
10. PECO Smart Business Solutions	$16.82	$11.11	$5.71	1.5
11. PECO Smart Multi-Family Solutions Program (C&I)	$5.11	$4.96	$0.15	1.0
12. PECO Smart Construction Incentives	$41.45	$26.39	$15.06	1.6
13. PECO Smart Equipment Incentives (GINP)	$48.68	$26.19	$22.49	1.9
14. PECO Smart On-Site	$70.05	$60.13	$9.92	1.2
Subtotal Commercial and Industrial Programs	**$302.97**	**$188.33**	**$114.65**	
Common Costs		**$35.2**		
Grand Total - All EE Programs	**$493.06**	**$362.42**	**$165.85**	**1.4**

25. Q. What is the levelized cost projected for the Plan?

A. Table 5 summarizes the levelized cost of saved energy and reduced peak demand by program. The levelized cost is a measure of total costs to deliver the program (over the expected lifetime of the measures) divided by the expected savings (over the useful lifetime of the measures), with appropriate adjustments for the time value of money. Overall the energy efficiency programs have a levelized cost of 3 cents/kWh.

Table 5: PECO's Estimated Levelized Cost by Program for PY 2013-2015

Program	Levelized Costs Levelized Cost of Saved Energy $/kWh
Energy Efficiency Programs	
Residential	
1. PECO Smart Appliance Recycling	$0.01
2. PECO Smart Home Rebates	$0.04
3. PECO Smart House Call	$0.13
4. PECO Smart Builder Rebates	$0.34
5. PECO Low Income Energy Efficiency (LEEP)	$0.06
6.PECO Smart Energy Saver	$0.08
7. PECO Smart Usage Profile	$0.05
8. PECO Smart Multi-Family Solutions Program –(Res)	$0.08
Average for Residential Programs	**$0.04**
Commercial and Industrial	
9. PECO Smart Equipment Incentives (C&I)	$0.02
10. PECO Smart Business Solutions	$0.03
11. PECO Smart Multi-Family Solutions Program (C&I)	$0.04
12. PECO Smart Construction Incentives	$0.02
13. PECO Smart Equipment Incentives (GINP)	$0.02
14. PECO Smart On-Site	$0.03
Average for Commercial Programs	**$0.02**
Total Portfolio	**$0.03**

26. Q. How do the levelized cost results compare to benchmark estimates?

A. According to the *National Action Plan for Energy Efficiency*,[5] the expected levelized cost for energy efficiency programs ranges between 3 and 5 cents per kWh. PECO's projected levelized cost of 3 cents falls within this range.

27. Q. Do you believe that the savings projections set forth in PECO's Phase II Plan are achievable?

A. Yes. PECO has developed a comprehensive and diversified portfolio of programs that provide opportunities for participation across all customer classes. The program administration experience PECO developed in Phase I provides a solid foundation to support Phase II program implementation. Customer awareness of PECO's energy efficiency initiatives in general is higher today than the start of Phase I, and the continued investment in customer awareness and education, particularly with respect to promotion of the new programs, will help meet the Phase II savings requirements established by the PUC.

III. COMMON BARRIERS IN ENERGY EFFICIENCY PROGRAMS

28. Q. What are some of the common barriers to participation in energy efficiency programs?

A. Experience points to a number of barriers that could impede achieving energy efficiency targets. First, consumers are often poorly informed about technology characteristics and energy efficiency opportunities. It is my experience that "word-

[5] U.S. Department of Energy and the Environmental Protection Agency. 2006. *National Action Plan for Energy Efficiency.* July 2006.

of-mouth" is the main avenue for customers to learn about energy efficiency options. It can take many years to inform and educate a large majority of households and businesses about energy efficiency technology and the details of energy efficiency programs. Second, for customers who don't own the property they are using (e.g., business or housing unit), a split incentive exists between the cost of the efficiency upgrade which would be the responsibility of the property owner, and the tenant who pays the monthly electric bill. Finally, convincing customers to adopt energy efficiency products requires voluntary participation and, in most instances, a significant customer up-front financial commitment, even after accounting for the utility incentives.

29. Q. How will PECO's Phase II Plan work to overcome common barriers to program participation and help ensure overall savings goals are achieved?

A. To help ensure that overall portfolio savings targets are met, PECO has designed a comprehensive and robust set of programs that minimizes overall performance risk through individual program design features and multiple program offerings. Building on the lessons learned from the Phase I implementation, individual program design features include: robust education and awareness plans; incentives to off-set the higher first costs of more efficient equipment; and multiple levels of participation. Customer education is a primary component of every program and PECO is also focused on raising trade ally awareness of the efficiency programs and providing training as needed to encourage their participation. In addition, many of the Phase II programs include targeted promotional campaigns and several include highly discounted or free direct installation of efficient technologies which are intended to

minimize the split-incentive barrier discussed previously. Finally, in the event that a program in one sector is struggling to meet a savings target, the broader diversified portfolio design will help to compensate.

IV. CONCLUSION

30. Q. Do you have any concluding thoughts about PECO's Phase II Plan?

A. Yes. First, I believe that PECO is proposing an outstanding portfolio of energy efficiency programs that will satisfy the Phase II savings requirements established by the PUC and offer customers a wide variety of options to actively participate in the implementation of Act 129. Second, PECO's energy efficiency staff invested a significant amount of time and effort to develop this Plan. They were presented all of the options that could be considered and ultimately landed on a Plan that is aggressive, yet practical and manageable within the three-year Phase II period. Third, I believe that PECO's Phase II Plan will provide significant benefits to residents and businesses of the Philadelphia metropolitan area. Fourth, PECO was very inclusive in the development of this Plan. Holding formal stakeholder meetings and numerous other informal meetings with interested parties demonstrated to me that PECO was sincerely committed to incorporating the ideas and feedback of all interested parties.

31. Q. Does this conclude your direct testimony?

A. Yes.