

**PECO ENERGY COMPANY
STATEMENT NO. 3**

BEFORE THE
PENNSYLVANIA PUBLIC UTILITY COMMISSION

ENERGY EFFICIENCY AND CONSERVATION PROGRAM

DOCKET NO. M-2015-

DIRECT TESTIMONY
SUPPORTING PECO'S PETITION FOR APPROVAL
OF ITS PHASE III 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 30, 2015

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

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

10 A. Yes, in 2012 I provided written testimony in support of PECO Energy Company's
11 ("PECO") Phase II EE&C plan. I have also presented live testimony in several DSM
12 regulatory proceedings. In February 2007, as Deputy Director of Energy Programs at
13 the Maine Public Utilities Commission, I presented summary findings and
14 recommendations to the Maine Public Utilities Commission with respect to "Draft
15 Staff Report Docket No. 2006- 446: Inquiry into New Conservation Programs and
16 Developing a Plan for Using Increases in the Conservation Fund". In November
17 2008, on behalf of the Southern Maryland Electric Cooperative, I presented live
18 testimony to the Maryland Public Service Commission with respect to providing a
19 summary overview of Southern Maryland Electric Cooperative Demand Side
20 Management Plan for 2009-2015 as part of the EmPower Maryland Case No. 9157.
21 In January 2010, on behalf of the Maine Public Utilities Commission, I presented live
22 testimony to the Maine Public Utilities Commission on a research project titled
23 "Summary Report of Recently Completed Potential Studies and Extrapolation of

1 Achievable Potential for Maine (2010-2019)”, followed by additional live testimony
2 in June 2010 on the “Review of the Efficiency Maine Trust Triennial Plan 2011-
3 2013”.

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

5 A. Navigant was retained by PECO to assist it in the development of its Act 129 Phase
6 III Energy Efficiency and Conservation Plan (the “Phase III Plan” or “Plan”) for the
7 period from June 1, 2016 to May 31, 2021. The purpose of my testimony is: (1) to
8 describe the process by which PECO and Navigant identified, evaluated, and selected
9 energy efficiency and demand response technologies and services; bundled them into
10 comprehensive customer-focused solution offerings; and included them in the Phase
11 III Plan; and (2) to summarize our principal findings in terms of projected energy and
12 demand savings, program expenditures and Total Resource Cost (“TRC”) net
13 benefits.

14 **7. Q. How is your testimony organized?**

15 A. I first describe the process employed in developing the Phase III Plan. Next, I discuss
16 the results of preparing the key inputs to the portfolio benefit-cost screening model
17 and the iterative discussions with PECO to design a comprehensive plan that is
18 customer-focused and provides a wide array of opportunities for customers to take
19 advantage of energy efficiency and demand response programs. I then identify the
20 Phase III programs that PECO is proposing to implement and discuss common
21 barriers to participation in energy efficiency and demand response programs. I
22 conclude by offering my observations of the reasons I believe PECO’s Plan

1 represents a balanced, comprehensive and diverse portfolio of energy efficiency and
2 demand response programs.

3 **II. PROCESS FOR DEVELOPING THE PHASE III PLAN**

4 **8. Q. Please describe the process employed in developing the Phase III Plan.**

5 A. Five primary elements were employed in developing PECO's Plan, all of which were
6 based on practices and approaches that are well-established in the industry. First we
7 conducted a thorough review of the Phase III Implementation Order and established a
8 set of design principles which informed our initial scope of work and set specific plan
9 guidelines and constraints around savings and budgets. Then, Navigant had
10 numerous planning and design meetings with PECO to discuss past experience from
11 Phase I & II delivery, and identify new strategies and enhancements for Phase III.
12 Navigant engaged in design data verification in which we prepared a comprehensive
13 list of DSM programs and corresponding measure level savings and cost estimates.
14 Navigant engaged in design and market characterization assessment, which included
15 assessing lessons learned from the Phase II evaluation reports, benchmarking
16 analysis, the Statewide Evaluator baseline studies, PECO's supplemental baseline
17 study, and findings from the Statewide Evaluator market potential study (energy
18 efficiency and demand response). Finally, we considered findings from PECO's
19 internal potential study to help inform our final program and measure selection
20 priorities. We next populated our benefit-cost screening tool with the measure level
21 data, forecasted incentive and non-incentive costs, and conducted an extensive
22 iterative process of assessing numerous program design scenarios and cost-

1 effectiveness results to provide an optimal mix of the most comprehensive DSM
2 programs possible given the savings targets and budget constraints. The final step
3 was preparing the overall narrative plan and supporting tables and figures.

4 **9. Q. Did you utilize the Technical Reference Manual (“TRM”) adopted by the**
5 **Pennsylvania Public Utility Commission (“Commission” or “PUC”) in**
6 **quantifying program savings?**

7 A. Yes. We considered energy and demand savings values as calculated from the most
8 recently revised 2016 TRM. Some measures included in PECO’s proposed portfolio
9 are not currently characterized in the Pennsylvania TRM. In those instances,
10 Navigant used weather-adjusted savings estimates from other published industry
11 sources, including California’s Database of Energy Efficiency Resources (“DEER”),
12 Illinois’ TRM, the Mid-Atlantic TRM, Efficiency Vermont’s TRM, Ohio’s TRM,
13 Arkansas’ TRM, and Navigant engineering estimates.

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

15 A. The development of additional necessary supporting data consisted of multiple
16 components. First, we collected all available relevant secondary data and then
17 supplemented that effort with primary data collection where necessary. The types of
18 secondary data that we assembled included reviews of other recently filed energy
19 efficiency and demand response portfolio plans to ensure we were cognizant of the
20 evolution of portfolio designs, programs, and measures being promoted across the
21 industry. The primary data comprised PECO-specific load forecasts, historical
22 customer billing records, avoided cost information, discount rates, previous market

1 research studies, previous PECO Phase II program evaluation studies, and a multi-
2 utility benchmarking analysis which compared program costs and delivery
3 approaches. We also used the Statewide Evaluator’s incremental cost databases and
4 metering studies.

5 **11. Q. Was it at this point in your analysis that you identified the various**
6 **programmatic measures that might be considered for inclusion in PECO’s Phase**
7 **III Plan?**

8 A. Yes. Based on the information we had assembled and on our professional experience,
9 we conducted a thorough assessment of the various energy efficiency and demand
10 response programs and measures that could be included in the portfolio. We began
11 this effort by reviewing all of the current Phase II measures and the full list of
12 measures included in the 2016 TRM and the supporting Statewide Evaluator energy
13 efficiency and demand response potential studies. We then identified an additional
14 list of measures based on our experience in the industry, review of TRMs from other
15 jurisdictions and review of measures included in similar large utility energy
16 efficiency portfolios. The resulting list of measures was supplemented by the input
17 and feedback that we received during numerous meetings with PECO staff,
18 conservation service providers (“CSPs”), and input from stakeholder groups. We
19 then ran those measures through a series of qualitative screens to eliminate measures
20 that either were not applicable to PECO and/or would be too expensive to implement.
21 We assessed the benefits of each individual measure relative to that measure’s cost
22 with our benefit-cost screening tool and used this information to assist with measure
23 selection and participation forecasting. The resulting measure list was further

1 adjusted to ensure the final set of included measures provide a comprehensive set of
2 opportunities, crossing all end-uses, so that PECO can offer all of their customers a
3 chance to participate.

4 **12. Q. How were specific Phase III Plan programs selected?**

5 A. Once we finished our review of possible measures, we transitioned to determining the
6 best combinations of programs to maximize portfolio success, focused on identifying
7 the correct mix of measures and programs to provide the most comprehensive
8 offering of participation channels, given the overall savings target and budget limit.
9 As a starting point, we assessed PECO's existing Phase II programs and considered
10 what aspects of the current portfolio were working well and should be continued,
11 and/or which program components were in need of modification. We then layered
12 into this review new programs that were intended to broaden and diversify the range
13 of efficiency opportunities available to all customers. This process involved
14 numerous meetings and discussions with PECO staff and was further informed by a
15 review of energy efficiency and demand response programs from other parts of the
16 country. Our overall findings resulted in offering broader and more comprehensive
17 programs, providing customers the flexibility to participate in any number of
18 "solutions" within the program or the customer sector. Changing the structure of the
19 programs is purposeful and indicative of PECO's strategy to move customers from
20 individual measure based participation to an emphasis on trying to achieve broader
21 and deeper participation at their business or home in order to minimize lost
22 opportunities.

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

2 A. PECO was involved at every step in the process. Navigant had frequent and
3 extensive meetings with PECO staff to strategize on best practice program design,
4 eligibility, measure selection, incentive level ranges, estimated non-incentive costs
5 and participation forecasts. Together, we started with a wide approach to program
6 and measure selection, and then narrowed the selection process to identify the
7 preferred mix of programs to suit the uniqueness of PECO’s customer base. Program
8 development was focused on addressing Act 129 and PUC requirements, including:
9 (1) PECO’s Phase III consumption reduction target of 1,962,659 MWh from June 1,
10 2016 through May 31, 2021; (2) the requirement that at least 5.5% of PECO’s overall
11 savings target (107,946 MWh) come from a dedicated program focused on low
12 income customers¹; (3) the requirement that 3.5% of PECO’s overall savings target
13 (68,693 MWh) come from Government, Educational and Non-Profit (“G/E/NP”)
14 customers; (4) the expansion of comprehensive energy efficiency program
15 opportunities for residential and small commercial customers; and (5) the requirement
16 to achieve an average annual potential savings of 161 MW for program years 2017
17 through 2020.

18 **14. Q. Please describe the PECO stakeholder process.**

19 A. Throughout the Phase III portfolio planning process, PECO participated in various
20 stakeholder meetings. The meetings were intended to inform the stakeholders of the
21 process that PECO was utilizing in developing its Phase III Plan, to share the Plan

¹ 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).

1 design being considered, and, more importantly, to solicit their opinions and input on
2 the overall framework and potential energy efficiency and demand response
3 programs. As a result of this process, the Phase III plan, by design, focuses on
4 delivering comprehensive program offerings to customers via four main marketing
5 and delivery channels: (1) retail (e.g., lighting rebates at a hardware store); (2)
6 participant-initiated (e.g., customers who pursue energy savings directly and apply for
7 rebates through PECO); (3) direct action (e.g., a CSP picking up an appliance for
8 recycling); and (4) trade ally (e.g., a contractor implementing measures during major
9 renovations).

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

11 A. Initial steps included developing the various parameters that would enable us to
12 conduct a detailed cost-effectiveness analysis. These parameters included identifying
13 the specific energy efficiency and demand response measures for each program, the
14 number of customers that might participate in the program each year, the total
15 incremental cost of each measure, the amount of rebate or incentive that would be
16 offered to offset that cost, and the costs to administer the program. In addition to
17 these factors, we reviewed the ways that customers may participate in each program
18 through various channels, which we call “pathways” to ensure all customers have an
19 opportunity to participate.

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

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

1 period for energy efficiency and demand response programs. Then we extrapolated
2 the probability of on-going levels of sustained or increased participation for existing
3 programs based on our planned incentive levels, market outreach strategy, and
4 estimated remaining market potential. For new or revised measures and programs,
5 we calibrated our estimated participation for PECO by normalizing estimated units
6 rebated per customer through a review of similar programs elsewhere, review of
7 PECO market baseline data, and estimated remaining market potential, as well as
8 performance for similar measures in PECO's Phase II programs. We then considered
9 customer acceptance rates for PECO for each individual measure based largely on our
10 observation of the experience of other comparable programs and informed by recently
11 completed potential studies. Adjustments to these forecasted participation rates were
12 then made based on discussions with PECO staff and its experience working with
13 customers in the greater Philadelphia area.

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

15 A. I am confident that these participation forecasts can be achieved based on PECO's
16 experience from Phase II, complemented by insights gained from the Statewide
17 Evaluator and PECO's own potential studies and the comparative review we
18 completed of utility performance of similar programs being delivered in other states.
19 Nonetheless, market forecasting of any type remains an inexact process.

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

3 A. We followed the Commission’s guidance in the 2016 TRC Order on how to calculate
4 the TRC test as the basis for judging the economic viability of the Phase III Plan. To
5 this end, we worked with PECO to determine representative avoided costs for energy
6 and capacity, avoided costs for fossil fuel and water reductions, as well as other
7 important drivers including system loss factors, discount rates, and cost escalation
8 rates. Where appropriate we also estimated costs for avoided operations and
9 maintenance, and for future equipment replacement in the cases of early replacement
10 measures. The TRC test was calculated and reviewed using both gross savings
11 estimates and net savings estimates. We incorporated the following specific
12 modifications to the TRC test to comply with Commission guidance:

- 13 a) Measure lifetime was capped at 15 years;
- 14 b) Energy savings were calculated at the meter, without line losses, while
15 demand savings were calculated at the generator, with line losses;
- 16 c) Estimated net-to-gross ratios (“NTG”) from previous PECO Phase II
17 evaluation findings were applied as appropriate to measures. For new
18 measures with no previous PECO evaluation experience or for existing
19 measures with anticipated program modifications, we applied an estimated
20 NTG either from other recent evaluation reports of similar programs
21 elsewhere that are at approximately the same stage of market maturity or
22 from professional judgment based on expected changes to the marketplace
23 and program; and

1 d) Costs associated with the free provision of efficient equipment and
2 installation labor costs (e.g., low income, multifamily and single family
3 direct install, small business direct install) are all treated as non-incentive
4 costs.

5 It is important to note that these specific Commission requirements for the TRC test
6 (specifically capping measure life at 15 years and the treatment of direct install costs)
7 result in lower benefit-cost ratios than if these Commission-stipulated modifications
8 to the TRC test were not required.

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

10 A. PECO selected eight programs, one geared toward residential energy efficiency
11 savings, one geared toward energy efficiency savings for low-income customers,
12 three geared toward commercial and industrial (“C&I”) energy efficiency savings,
13 and three geared toward demand response savings of the different customer rate
14 classes (residential, small C&I and large C&I). While these eight programs contain
15 many of the same implementation components as PECO’s Phase II portfolio, they
16 represent a reorganization of the portfolio to minimize lost opportunities for
17 customers of all rate classes and demographics to save energy and participate. This
18 program structure enhances PECO’s ability to better serve its customers while
19 providing a comprehensive portfolio with the widest and most diverse opportunities
20 for participation by customers. The eight programs are listed below.

- 21 1. Residential Energy Efficiency Program
- 22 2. Low-Income Energy Efficiency Program
- 23 3. Small Commercial and Industrial Energy Efficiency Program

- 1 4. Large Commercial and Industrial Energy Efficiency Program
- 2 5. Combined Heat and Power for both Small Commercial and Industrial and
- 3 Large Commercial and Industrial Customers
- 4 6. Residential Demand Response Program
- 5 7. Small Commercial and Industrial Demand Response Program
- 6 8. Large Commercial and Industrial Demand Response Program

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

9 A. Yes. Consistent with the filing template issued by the PUC², detailed descriptions of
10 the programs are set forth in Section 3 of the Phase III Plan and provide the following
11 information:

- 12 • Program Title and Years of Operation
- 13 • Objectives and Savings
- 14 • Target Market
- 15 • Program Description
- 16 • Implementation Strategy
- 17 • Program Issues, Risks, and Risk Management Strategies
- 18 • Marketing Strategy
- 19 • Eligible Measures and Incentives
- 20 • Ramp Up Strategy / Program Start Date and Key Milestones
- 21 • Evaluation, Measurement, and Verification Requirements

² *Implementation of Act 129 of 2008 – Phase III Energy Efficiency and Conservation Plan Template*, Docket No. M-2014-2424864 (Issued September 22, 2015).

- 1 • Administrative Requirements
- 2 • Estimated Participation
- 3 • Estimated Program Budget and Percent of Sector
- 4 • Anticipated Costs to Participating Customers
- 5 • Projected Energy Savings and Demand Reduction
- 6 • Cost-Effectiveness

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

8 A. Overall, PECO anticipates saving a total of 2,100,875 MWh in Phase III, which
9 represents approximately 107% of PECO’s required 5.0% minimum savings target.
10 Table 1 presents the gross annual energy savings by program for each year of the
11 Phase III Plan. PECO does not anticipate carrying over any Phase II banked savings
12 into Phase III. Overall, approximately 41% of the MWh savings come from the
13 residential sector, and 59% from the C&I sector. Roughly 6% of overall forecasted
14 savings come from the low-income customer segment representing roughly 6.3% of
15 PECO’s Phase III target which exceeds the required 5.5% of savings coming from
16 low income customers. Approximately 13% of the portfolio forecasted savings come
17 from the G/E/NP customers representing roughly 14% of PECO’s Phase III target
18 which exceeds the required 3.5% of savings coming from G/E/NP customers.

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

Programs	Annual Energy Savings (MWh)					5-Year Total
	PY 2016	PY 2017	PY 2018	PY 2019	PY 2020	
Residential EE (Exclusive of Low-Income)	128,166	139,740	148,876	154,269	156,144	727,195
Low-Income EE	22,627	23,244	24,314	25,866	27,941	123,991
Small C&I EE	73,843	79,613	85,681	86,907	79,236	405,280
Large C&I EE	94,954	95,444	96,067	96,841	97,568	480,875
CHP	78,710	81,806	85,057	88,471	29,490	363,535
Residential DR	0	0	0	0	0	0
Small C&I DR	0	0	0	0	0	0
Large C&I DR	0	0	0	0	0	0
Grand Total – All Phase III Programs	398,299	419,848	439,995	452,355	390,378	2,100,875

22. Q. What are the total peak demand savings projected for the Plan from demand response programs specifically?

A. With respect to demand savings from dedicated demand response programs, PECO forecasts a Phase III four year average (PY 2017 – PY 2020) annual peak demand reduction of 171.0 MW, exceeding the required four year average peak demand reductions of 161 MW. Table 2 summarizes the projected summer peak demand savings for each of the dedicated demand response programs.

Table 2: PECO’s Demand Response Projected Annual Gross Peak Demand Savings

Program	Peak Demand Savings (MW)				
	PY 2016 ³	PY 2017	PY 2018	PY 2019	PY 2020
Demand Response Programs					
Residential DR	39	43	44	45	46
Small C&I DR	1	1	1	1	1
Large C&I DR	0	126	126	125	124
Grand Total – Demand Response Programs	40	170	171	171	171

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

A. PECO expects to spend \$427.4 million over the five 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 III. Of that total, PECO expects to spend 32% of the program delivery budget for residential energy efficiency programming, 11% on small C&I energy efficiency programming, 18% on large C&I energy efficiency programming, 10% on demand response programming, and 29% for cross-cutting common costs. 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 Costs category includes all PECO staff and material costs and third party contractor costs to be incurred by PECO for overall portfolio and program management, data tracking, education and awareness,

³ PECO is not required to obtain peak demand reductions in the first program year of Phase III (PY2016). *See* Implementation Order, *Energy Efficiency and Conservation Program*, Docket No. M-2014-2424864 (Order entered June 19, 2015), p. 35. As explained in the testimony of Mr. DeDominicis, the Company proposes to implement residential and small C&I direct load control (“DLC”) solutions during PY 2016 to prevent its existing Phase II DLC programs from “going dark” for a year and losing participants.

1 various technical support and program design needs, research and development and
 2 third party evaluation, measurement, and verification.

3 **Table 3: PECO’s Projected Yearly Expenditure by Program**

Program	Budget (Million \$)						Average Annual
	PY 2016	PY 2017	PY 2018	PY 2019	PY 2020	5-Year Total	
Energy Efficiency/Demand Response Programs							
Residential							
Residential (Exclusive of Low-Income)	\$19.7	\$19.7	\$19.9	\$20.3	\$20.4	\$100.1	\$20.0
Low-Income	\$7.0	\$7.0	\$7.1	\$7.4	\$7.7	\$36.1	\$7.2
Residential DR	\$2.3	\$2.7	\$2.8	\$2.9	\$3.0	\$13.7	\$2.7
Subtotal Residential EE/DR Programs	\$29.0	\$29.4	\$29.9	\$30.5	\$31.1	\$149.9	\$30.0
Commercial & Industrial							
Small C&I	\$8.9	\$9.0	\$9.0	\$9.0	\$8.6	\$44.5	\$8.9
Large C&I	\$10.7	\$10.8	\$11.0	\$11.2	\$11.4	\$55.1	\$11.0
CHP	\$5.3	\$5.6	\$5.8	\$6.1	\$2.2	\$25.0	\$5.0
Small C&I DR	\$0.2	\$0.2	\$0.2	\$0.2	\$0.2	\$0.9	\$0.2
Large C&I DR	\$0.2	\$6.8	\$6.8	\$6.7	\$6.7	\$27.1	\$5.4
Subtotal Commercial & Industrial EE/DR Programs	\$25.3	\$32.4	\$32.8	\$33.2	\$29.0	\$152.6	\$30.5
Common Costs	\$31.2	\$23.7	\$22.8	\$21.8	\$25.4	\$124.8	\$25.0
Grand Total – All EE/DR Programs	\$85.5	\$85.5	\$85.5	\$85.5	\$85.5	\$427.4	\$85.5

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

2 A. For the Plan as a whole over Phase III, the gross TRC benefit to cost ratio is 1.4
3 yielding total net benefits based on gross savings of \$272.6 million. The net TRC
4 benefit cost ratio is 1.3 yielding total net benefits based on net savings of \$138.2
5 million. Table 4 summarizes the results of the TRC analysis by program. Of the
6 eight programs, only two, the CHP with a score of 0.9, and small C&I demand
7 response program with a TRC score of 0.7, fail to pass the TRC test. The key reasons
8 for the CHP having a TRC of less than 1.0 are: (1) the significant customer
9 investment in construction costs; and (2) the fact that the long-term benefits of CHP
10 investments are not fully captured by the TRC, which limits measure life to 15 years.
11 The small C&I DR program does not pass the TRC test primarily because of fixed
12 costs for delivery and the relatively low number of participants. Nevertheless, we
13 believe these programs should be included in the Plan because it allows PECO to
14 mitigate lost energy savings opportunities for both small and large C&I customers
15 and their inclusion contributes to a well-rounded portfolio of programs overall.

1 for Phase III and the continued investment in customer awareness and education will
2 help meet the Phase III savings requirements established by the PUC.

3 **III. COMMON BARRIERS IN ENERGY EFFICIENCY**
4 **AND DEMAND RESPONSE PROGRAMS**

5 **26. Q. What are some of the common barriers to participation in energy efficiency and**
6 **demand response programs?**

7 A. Experience points to a number of barriers that could impede achieving energy
8 efficiency and demand response targets. First, consumers are often poorly informed
9 about technology characteristics and energy efficiency opportunities. It is my
10 experience that “word-of-mouth” is the main avenue for customers to learn about
11 energy efficiency options and be convinced to take action. It can take many years to
12 inform and educate a large majority of households and businesses about energy
13 efficiency technology and the details of energy efficiency programs. Second, for
14 customers who don’t own the property they are using (e.g., business or housing unit),
15 a split incentive exists between the cost of the efficiency upgrade which would be the
16 responsibility of the property owner, and the tenant who pays the monthly electric
17 bill. Finally, convincing customers to adopt energy efficiency products requires
18 voluntary participation and, in most instances, a significant customer up-front
19 financial commitment, even after accounting for the utility incentives. With respect
20 to demand response, initial challenges include customer recruitment and enrollment,
21 followed by customer retention. Challenges may include customer complaints and
22 fatigue if the demand response events are called too frequently or for too long of a
23 period.

1 **27. Q. How will PECO’s Phase III Plan work to overcome common barriers to**
2 **program participation and help ensure overall savings goals are achieved?**

3 A. To help ensure that overall portfolio savings and demand targets are met, PECO has
4 designed a set of programs that minimizes overall performance risk by providing a
5 comprehensive list of measures and pathways with enough flexibility so that each
6 customer can participate in a way that meets his or her individual needs and
7 circumstances. When PECO’s programs are able to meet their customers’ needs in a
8 positive manner, the customers are much more likely to tell their neighbors or
9 coworkers about their experience, thus overcoming the barrier of knowledge of
10 energy efficiency and demand response technology options and the programs
11 themselves. For example, in response to a small number of customers that indicated
12 an inability to participate if only the most efficient options were included in the
13 programs, some measures now include a plan for tiered incentives based on efficiency
14 levels to encourage customer participation in the most efficient options, but still offer
15 a means to participate for those customers that may only be able to afford a slightly
16 lower efficiency level. Building on the lessons learned from the implementation of
17 Phases I and II, individual program design features include: robust education and
18 awareness plans; incentives to off-set the higher first costs of more efficient
19 equipment; and reasonable incentive ranges to allow PECO to rapidly respond to the
20 marketplace if measure participation is significantly different than forecast. For
21 customers that cannot afford to participate at all (i.e., low-income sector), PECO has
22 included a robust set of direct install and giveaway measures and no-cost participation
23 solutions so that such customers can participate in the program in a meaningful way.

1 PECO has included residential single family and multifamily solutions which pair
2 low/no cost direct install measures with higher cost partially incented measures to
3 encourage participation in deeper saving, longer lasting measures, and which are
4 intended to minimize the split-incentive barrier discussed previously. For C&I
5 customers, incentive ranges were selected with the goal of buying down measure
6 costs to a financially acceptable simple payback period for the customer rather than
7 assigning incentives based on a set percent of incremental cost which in some cases
8 may not be enough to spur action and in others more than is required. PECO's
9 strategy for achieving the demand response savings is based on acquiring savings
10 across all customer types, with a variety of mechanisms, primarily from direct load
11 control and demand response aggregation with larger customers. Customer education
12 and incentives to compensate for the disruption will be emphasized. Customer
13 education is a primary component of every program and PECO is also focused on
14 raising trade ally awareness of the efficiency programs and providing training as
15 needed to encourage their participation. Finally, in the event that a program in one
16 sector is struggling to meet a savings goal, the broader diversified portfolio design
17 will help to compensate.

18 IV. CONCLUSION

19 **28. Q. Do you have any concluding thoughts about PECO's Phase III Plan?**

20 A. Yes. First, I believe that PECO is proposing a broad and diverse portfolio of proven
21 energy efficiency and demand response programs that will satisfy the Phase III
22 savings requirements established by the PUC and offer customers a wide variety of

1 options to actively participate in the implementation of Act 129. Second, I believe
2 that PECO's Phase III Plan will provide significant benefits to residents and
3 businesses of the Philadelphia metropolitan area. Third, PECO was inclusive in the
4 development of this Plan, holding stakeholder meetings and numerous other informal
5 meetings with interested parties, which demonstrated to me that PECO was sincerely
6 committed to incorporating the ideas and feedback of all interested parties.

7 **29. Q. Does this conclude your direct testimony?**

8 A. Yes.