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December 17, 2019

VIA FEDERAL EXPRESS

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PA PUBLIC UTILITY COMMISSION
SECRETARY'S BUREAU

**ACT 129 ENERGY EFFICIENCY PLAN
FILING TO BE REVIEWED UNDER
THE COMMISSION'S EXPEDITED PROCESS**

Rosemary Chiavetta, Secretary
Pennsylvania Public Utility Commission
Commonwealth Keystone Building
P.O. Box 3265
400 North Street
Harrisburg, PA 17105-3265

**Re: Petition of PECO Energy Company for Approval of Its Act 129 Phase III Energy
Efficiency and Conservation Plan
Docket No. M-2015-2515691**

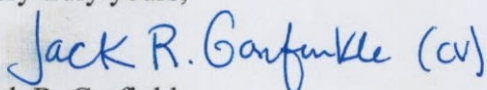
Dear Secretary Chiavetta:

Enclosed for filing in the above-referenced docket is the **Petition of PECO Energy Company for Approval of Minor Changes to Its Phase III EE&C Plan Pursuant to the Commission's Expedited Review Process**. As indicated by the title of the Petition, the Company is seeking review under the expedited process established by the Commission's June 10, 2011 Final Order at Docket No. M-2008-2069887.

A copy of the Petition has been served upon the presiding Administrative Law Judges and parties to this proceeding in the manner indicated on the attached Certificate of Service.

Please do not hesitate to contact me should you have any questions regarding this filing.

Very truly yours,



Jack R. Garfinkle
Associate General Counsel

Enclosures

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PA PUBLIC UTILITY COMMISSION
SECRETARY'S BUREAU

BEFORE THE
PENNSYLVANIA PUBLIC UTILITY COMMISSION

PETITION OF PECO ENERGY :
COMPANY FOR APPROVAL OF ITS :
ACT 129 PHASE III ENERGY : DOCKET NO. M-2015-2515691
EFFICIENCY AND CONSERVATION :
PLAN :

PETITION OF PECO ENERGY COMPANY FOR APPROVAL OF
MINOR CHANGES TO ITS PHASE III EE&C PLAN PURSUANT TO THE
COMMISSION'S EXPEDITED REVIEW PROCESS

I. INTRODUCTION

PECO Energy Company ("PECO" or the "Company") hereby petitions the Pennsylvania Public Utility Commission (the "Commission") for approval of minor changes to the Company's Phase III Energy Efficiency and Conservation Plan ("Phase III Plan" or "Plan"). PECO is filing this Petition pursuant to the Commission's expedited review process, which was first established in the *Minor Plan Change Order*¹ and later refined in the Implementation Orders for Phase II² and Phase III³ of the Act 129 Energy Efficiency & Conservation Program.

PECO has analyzed the performance of its Residential Demand Response Program ("Residential DR Program"), including Program expenditures, through October 31, 2019 and projected the funding necessary to continue the Program through the end of the Company's Phase III Plan. Based on this analysis, which assumes continued enrollment of nearly 20,000

¹ *Energy Efficiency and Conservation Program*, Docket No. M-2008-2069887 (Order entered June 10, 2011).

² *Energy Efficiency and Conservation Program*, Docket No. M-2012-2289411 (Order entered August 3, 2014) ("*Phase II Implementation Order*").

³ *Energy Efficiency and Conservation Program*, Docket No. M-2014-2424864 (Order entered June 19, 2015) ("*Phase III Implementation Order*").

more residential participating units⁴ than originally projected, PECO has determined that the Residential DR Program requires an additional \$6.4 million in funding. The Company proposes to transfer the necessary funds from the Phase III Plan's \$10 million research and development ("R&D") budget allocated to the residential customer class, without any increase in the overall cost to residential customers. PECO respectfully submits that this transfer of funds within the residential customer class is consistent with the Commission's definition of "minor changes." PECO also submits that the transfer of funds is in the public interest and should, therefore, be approved.

II. THE MINOR PLAN CHANGE ORDER

1. The *Minor Plan Change Order* delegates the Commission's authority to review and approve minor energy efficiency and conservation ("EE&C") plan changes to Commission staff.⁵

2. In the *Phase III Implementation Order*, the Commission defined minor changes as follows:

1. The elimination of a measure that is underperforming; is no longer viable for reasons of cost-effectiveness, savings or market penetration; or has met its approved budgeted funding, participation level or amount of savings;
2. The transfer of funds from one measure or program to another measure or program within the same customer class;
3. Adding a measure or changing the conditions of a measure, such as is eligibility requirements, technical description, rebate

⁴ A residential participating unit is a central air conditioning unit that a residential customer enrolls in the Company's DR program (called the Smart AC Saver Program). A customer may have more than one residential participating unit.

⁵ *Minor Plan Change Order*, p. 18.

structure or amount, projected savings, estimated incremental costs, projected number of participants or other conditions so long as the change does not increase the overall costs to that customer class;

4. A change in vendors for existing programs that will continue into Phase II; and

5. The elimination of programs which are not viable due to market conditions.⁶

3. An electric distribution company (“EDC”) must file sufficient documentation to support a proposed minor EE&C Plan change, including the affected pages of the plan, a redlined version of the affected pages and an explanation of how the proposed minor changes affect the previously approved plan. In addition, an EDC must post a complete redlined version of its plan on its website that reflects the proposed plan changes for public inspection upon filing.⁷

4. Commission staff is directed to issue a Secretarial Letter approving, denying, or transferring to the Office of Administrative Law Judge, some or all of the proposed minor changes within 35 days after the changes are filed with the Secretary.⁸

III. BACKGROUND

5. PECO is a corporation organized and existing under the laws of the Commonwealth of Pennsylvania with its principal office in Philadelphia, Pennsylvania. PECO provides electric delivery service to approximately 1.6 million customers and natural gas delivery service to more than 511,000 customers in Pennsylvania.

⁶ *Phase III Implementation Order*, p. 116 (citing the *Phase II Implementation Order*, p. 91).

⁷ *Minor Plan Change Order*, p. 19.

⁸ *Id.*

6. On October 15, 2008, then Governor Edward G. Rendell signed into law Act 129, which, among other things, added Section 2806.1 to the Pennsylvania Public Utility Code. The applicable provisions of Act 129 required Pennsylvania EDCs to file EE&C plans by July 1, 2009 containing the plan elements specified in Section 2806.1(b) (“Phase I EE&C Program”).⁹ 66 Pa.C.S. § 2806.1(b). An EDC’s plan had to pass a “total resource cost” or “TRC” test to determine whether the avoided cost of supplying electricity is greater than the cost of a plan’s energy efficiency and conservation measures. 66 Pa.C.S. § 2806.1(b)(1)(i)(I); *2016 Total Resource Cost (TRC) Test*, Docket No. M-2015-2468992 (Order entered June 22, 2015). Additionally, Sections 2806.1(c) and (d) required that EDCs’ Phase I EE&C plans be designed: (1) to reduce retail energy consumption by a minimum of 1% by May 31, 2011 and a minimum of 3% by May 31, 2013; and (2) to reduce peak demand, measured by reference to the 100 highest hours of demand, by a minimum of 4.5% no later than May 31, 2013. 66 Pa.C.S. § 2806.1(c) and (d).

7. In compliance with Section 2806.1 and the Commission’s Order entered January 15, 2009 at Docket No. M-2008-2069887, implementing that section, PECO prepared and submitted its EE&C plan for the Phase I EE&C Program on July 1, 2009. The Commission subsequently approved PECO’s Phase I Plan, with modifications, on October 28, 2009.¹⁰ The Phase I Plan included, among other things, a direct load control (“DLC”) program called the Smart AC Saver Program (“AC Saver Program”). Participants in the AC Saver Program receive

⁹ 66 Pa.C.S. § 2806.1(l) exempts EDCs with fewer than 100,000 customers from this requirement.

¹⁰ *Petition of PECO Energy Company for Approval of its Act 129 Energy Efficiency and Conservation Plan and Expedited Approval of its Compact Fluorescent Lamp Program*, Docket No. M-2009-2093215 (Order entered October 28, 2009).

a bill credit in exchange for allowing PECO to remotely cycle or shut down a customer's central air conditioning unit on short notice during DR events in the months of June through September.

8. Act 129 further required the Commission, by November 30, 2013, to evaluate the costs and benefits of the Phase I EE&C Program. If the benefits of the Program were found to exceed its costs, the Commission was directed to adopt "additional required incremental reductions in consumption" and "additional incremental requirements for reduction in peak demand." 66 Pa.C.S. §§ 2806.1(c)(3) and (d)(2).

9. On August 3, 2012, the Commission entered its *Phase II Implementation Order*, adopting EDC-specific targets for reducing energy consumption for the next EE&C Program term (June 1, 2013-May 31, 2016).¹¹ The Commission did not establish any Phase II peak demand reduction ("DR") requirement in its August 3, 2012 Order because, at that time, it did not have enough information to determine the cost-effectiveness of the Phase I DR programs. The Commission did, however, allow EDCs to voluntarily offer cost-effective DR programs during Phase II.¹²

10. Consistent with the *Phase II Implementation Order*, PECO submitted a Phase II Plan that was approved by the Commission on February 28, 2013. Thereafter, a voluntary DR program was added to the Phase II Plan on May 9, 2013.¹³ The voluntary DR program was a continuation of the AC Saver Program from the Company's Phase I Plan.

¹¹ *Phase II Implementation Order*, pp. 23-24.

¹² *Id.* at 33, 42.

¹³ See *Petition of PECO Energy Company for Approval of its Act 129 Phase II Energy Efficiency and Conservation Plan*, Docket No. M-2012-2333992.

11. In its *Phase III Implementation Order*, the Commission established both consumption reduction and DR targets for the five-year plan period June 1, 2016 through May 31, 2021. For PECO, the consumption reduction target is 1,962,659 MWh (5.0% of the 2009/2010 forecast baseline) over the five-year term of the Phase III Plan.¹⁴ PECO's DR target for the four-year period June 1, 2017 through May 31, 2021 is an average annual potential savings of 161 MW.¹⁵

12. Consistent with the *Phase III Implementation Order*, PECO submitted a Phase III Plan that was approved by the Commission on May 19, 2016.¹⁶

IV. PROPOSED MINOR CHANGES TO PECO'S PHASE III PLAN

A. The Need For Additional Funding Of The Residential DR Program

13. PECO's Phase III Plan contains three DR programs: Residential, Small C&I, and Large C&I. The Residential DR Program¹⁷ includes a continuation of the AC Saver Program offered by the Company in Phase I and Phase II.¹⁸

¹⁴ *Phase III Implementation Order*, p. 57.

¹⁵ EDCs are not required to obtain peak demand reductions in the first program year (PY 2016) of Phase III. *Phase III Implementation Order*, p. 35.

¹⁶ See *Petition of PECO Energy Company for Approval of its Act 129 Phase III Energy Efficiency and Conservation Plan*, Docket No. M-2015-2515691 (Order entered May 19, 2016).

¹⁷ The Phase III Plan identifies three solutions within the Residential DR Program: Residential Direct Load Control (the AC Saver Program), Smart Thermostat DR and Behavioral DR. Although the Company has only implemented the AC Saver Program thus far in Phase III, PECO is retaining all three solutions in the Plan to preserve DR programming flexibility for the remainder of Phase III.

¹⁸ PECO also offers an AC Saver Program as part of the Company's Small C&I DR Program. This Petition addresses the residential AC Saver Program only.

14. The Company's total budget for the Residential DR Program is \$13.7 million and PECO is authorized to offer each residential participating unit in the AC Saver Program up to \$120 per year (or \$30 per month).¹⁹

15. PECO selected a Phase III incentive level of \$40 per year (or \$10 per month) for the AC Saver Program, which was a reduction from the Phase II incentive level of \$80 per year (or \$20 per month).

16. The Company anticipated that the lower Phase III incentive would reduce the level of customer participation in the AC Saver Program. Although the Program has experienced some annual customer attrition since the beginning of the Phase III Plan, the 2019 enrollment of approximately 62,000 residential participating units remains well above the estimate of approximately 44,000 residential participating units used when developing the Phase III Plan.

17. The average performance of the AC Saver Program during Phase III DR events through Program Year 11 (2019) was approximately 30 MW,²⁰ which equates to about 19% of the Company's overall 161 MW DR target. Although performance has been below the estimates in the Phase III Plan,²¹ the Program's contribution to meeting the overall DR target has been sufficient when combined with the performance of the Small C&I and Large C&I DR Programs and remains necessary for PECO to meet its overall DR target.

18. While PECO was able to pay the \$40 per year incentive for each residential participating unit and remain within its overall budget for the first three years of the program, the

¹⁹ Phase III Plan, p. 81 (overall budget) and p. 204 (incentive range).

²⁰ This average is based on verified and reported performance data for Program Year 9 (2017) and 10 (2018) as well as preliminary estimated performance data for Program Year 11 (2019).

²¹ See Phase III Plan, p. 86.

continuing customer participation above projected levels resulted in PECO exceeding its total approved budget for the Residential DR Program in 2019 (including both incentive and non-incentive direct program costs) by \$1.7 million.²²

19. PECO projects that it will require an additional \$4.7 million to continue the AC Saver Program until the end of Phase III using the current incentive amount, the Company's forecast of approximately 62,000 residential participating units in 2020²³, and estimated ongoing non-incentive direct program costs.

20. Overall, the Residential DR Program budget requires an additional \$6.4 million to address the \$1.7 million 2019 budget shortfall and projected costs of \$4.7 million for the remainder of the Phase III Plan.

21. The \$6.4 million addition reflects approximately \$5.6 million in customer incentives (\$3.1 million of which was paid to customers in prior program years), \$400,000 in non-incentive direct program costs (PECO and conservation service provider labor), and an unexpected cost contingency of \$400,000. With this addition, the new total Residential DR Program budget for the Phase III Program would be \$20.1 million.

²² PECO notes it has not offset this amount with \$461,376 in net proceeds from bidding AC Saver Program resources into the PJM market in accordance with PECO's Phase III Plan. Those proceeds have been returned directly to residential customers through PECO's Energy Efficiency and Conservation Program Costs ("EEPC") surcharge. The net amount does include some unanticipated AC Saver Program expenses, including additional investment in a new data platform to address data quality issues during PECO's 2017 DR performance period.

²³ To develop the forecast, the Company conservatively assumed there would be no customer attrition from 2019 to 2020.

B. The Transfer Of Funds From The Residential R&D Budget To The Residential DR Program Budget

22. PECO is proposing to transfer \$6.4 million from the residential R&D budget to the Residential DR program. The residential R&D budget is \$10 million²⁴ and the Company has spent approximately \$500,000 of that budget to date.

23. Because the funding transfer is based upon a greater than anticipated level of customer participation and is entirely within the residential customer class, it is consistent with two of the Commission's criteria in the *Minor Plan Change Order*: "The transfer of funds from one measure or program to another measure or program within the same customer class." and "[A]dding or changing the conditions of a measure, such as . . . projected number of participants or other conditions so long as the change does not increase the overall costs to that customer class."²⁵

24. The proposed Phase III Plan changes to accomplish this transfer are displayed in the following two exhibits which are appended to this Petition:

Exhibit 1 – Portions of the Phase III Plan that have been revised to accomplish the proposed minor change.

Exhibit 2 – Redlined portions of Phase III Plan displaying the revisions to accomplish the proposed minor change.²⁶

25. As shown in the exhibits, the Residential DR Program will remain cost effective after the proposed funding transfer, but its TRC value will decline from 1.7 to 1.2.²⁷ The

²⁴ Phase III Plan, p. 127.

²⁵ *Phase III Implementation Order*, p. 116.

²⁶ Exhibit 1 and 2 include a revised Exhibit RAS-2 because that exhibit is part of Appendix F of the Phase III Plan.

²⁷ *See, e.g.*, Exhibit 2, p. 15, Table 2.

Company's entire Phase III portfolio of programs also remains cost-effective, with no change to its TRC value of 1.3.²⁸

26. PECO does not anticipate detrimental impacts to its residential portfolio of programs as a result of moving funds out of the residential R&D budget. As explained in the Phase III Plan, R&D funds are for market research in response to emerging technologies and market transformations.²⁹ The Company may decide to integrate an emerging technology or other market transformation into an existing program to remedy program challenges or enhance program performance.

27. The Company's residential energy efficiency portfolio has already demonstrated strong performance as currently designed and shown in PECO's Phase III Final Annual EE&C Report for Program Year 10 (June 1, 2018 through May 31, 2019).

28. In light of the performance of the residential energy efficiency portfolio, the Company has a lesser need for R&D funding than it might under different circumstances. And, as explained in Section IV.A. *supra*, additional funding for the Residential DR Program is critical to facilitate compliance with PECO's 161 MW DR target.

V. NOTICE

29. PECO is serving copies of this filing on the Office of Consumer Advocate ("OCA"), the Office of Small Business Advocate ("OSBA"), the Commission's Bureau of Investigation and Enforcement, and all parties to the Company's Phase III EE&C Plan proceeding. The Company has also engaged in informal discussions with key stakeholders about

²⁸ Exhibit 2, p. 132, Table C-5.

²⁹ Phase III Plan, p. 106 & 123.

the filing, including OCA, OSBA, the Coalition for Affordable Utility Services and Energy Efficiency in Pennsylvania, the Philadelphia Area Industrial Energy Users Group and the Keystone Energy Efficiency Alliance.

30. In addition, consistent with the *Minor Change Filing Order*, the Company will post a complete redlined version of its revised EE&C Plan on the Company's website (<https://www.peco.com/MyAccount/MyBillUsage/Pages/Filings.aspx>).

VI. CONCLUSION

Based upon the foregoing, including the attached exhibits, PECO respectfully requests that Commission staff grant this Petition and enter a Secretarial Letter approving the Company's proposed minor EE&C Plan changes.

Respectfully submitted,

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Counsel for PECO Energy Company

December 17, 2019

PECO Exhibit No. 1

PECO PROGRAM YEARS 2016-2020
ACT 129 - PHASE III ENERGY EFFICIENCY AND
CONSERVATION PLAN

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PA PUBLIC UTILITY COMMISSION
SECRETARY'S BUREAU

Submitted to:
Pennsylvania Public Utility Commission

Submitted by:



November 30, 2015
Revised February 12, 2016
Revised December 17, 2019

- » Annual reports filed with the Commission in Phase II
- » Energy Efficiency and Demand Response portfolio benchmarking research on program delivery achieved in other states, as well as a review of best practice design and delivery approaches
- » PECO evaluator reports: a) Baseline Study; b) Potential Study; c) Control Points Study
- » Statewide Evaluator reports: a) Baseline Studies^{3,4,5}; b) Potential Studies^{6,7}; c) Light Metering Study⁸; d) Incremental Cost Databases^{9,10}
- » Updated savings and other inputs per the 2016 Final TRM Order¹²
- » Other updated information (e.g., avoided costs, discount rates, load shapes, cost escalation rates, line loss factors, internal labor rates, etc.)
- » Discussions with other PA utilities and members of our stakeholder group to review strategies and areas of possible coordination
- » Customization of a comprehensive benefit-cost screening tool, with specific adjustments to the required calculation¹¹
- » Iterative program design planning meetings to ensure a combination of programs for all customer classes, including comprehensive measures, with attention to cost-effectiveness thresholds

1.3 Summary Tables of Portfolio Savings Goals, Budget and Cost-Effectiveness

PECO will invest up to a total of \$427.4 million in energy efficiency and demand response programs over a five-year program period for PY 2016 through PY 2020. The Company plans to achieve approximately 107% of the energy savings target established in the PUC Implementation Order. Additionally, consistent with Phase III requirements, PECO has developed this Plan to meet or exceed the required G/E/NP savings requirement of at least 3.5% of the overall energy savings target and meet or exceed the requirement of 5.5% of the overall energy savings target coming from the low-income sector. In addition, PECO plans to achieve approximately 106% of the PY 2017 - PY 2020 peak load reduction target of 161 MW from dedicated demand response programs.

Figure 2 presents the Phase III portfolio structure. Section 3.2 of this report provides a full description of each program.

³ Pennsylvania Statewide Act 129 2014 Non-Residential End-Use & Saturation Study, Nexant, April 2014.

⁴ Pennsylvania Statewide Act 129 Residential Baseline Study. GDS Associates. April 2014.

⁵ Demand Response Potential Study, 2015. Prepared by the PA Statewide Evaluation Team; GDS Associates, Nexant, Research Into Action, Apex Analytics. February 25, 2015.

⁶ Energy Efficiency Potential for Pennsylvania. Prepared by the PA Statewide Evaluation Team; GDS Associates, Nexant, Research Into Action, Apex Analytics. February 2015.

⁷ Distributed Generation Potential Study for Pennsylvania. Prepared by the PA Statewide Evaluation Team; GDS Associates, Nexant, Research Into Action, Apex Analytics. March, 2015.

⁸ Pennsylvania Statewide Act 129 2014 Commercial & Residential Light Metering Study. Prepared by the PA Statewide Evaluation Team; GDS Associates, Nexant, Research Into Action, Apex Analytics. January 13, 2014.

⁹ SWE Team Residential Incremental Measure Cost Database, V2.1. Prepared by the PA Statewide Evaluation Team; GDS Associates, Nexant, Research Into Action, Apex Analytics. May 15, 2015.

¹⁰ SWE Team Incremental Measure Cost Database, V1.1. Prepared by the PA Statewide Evaluation Team; GDS Associates, Nexant, Research Into Action, Apex Analytics. February 15, 2013.

¹¹ Pennsylvania PUC 2016 Total Resource Cost Test M-2015-2468992, June 11, 2015

Figure 2: PECO Phase III PY 2016-2020 Energy Efficiency and Demand Response Portfolio Structure

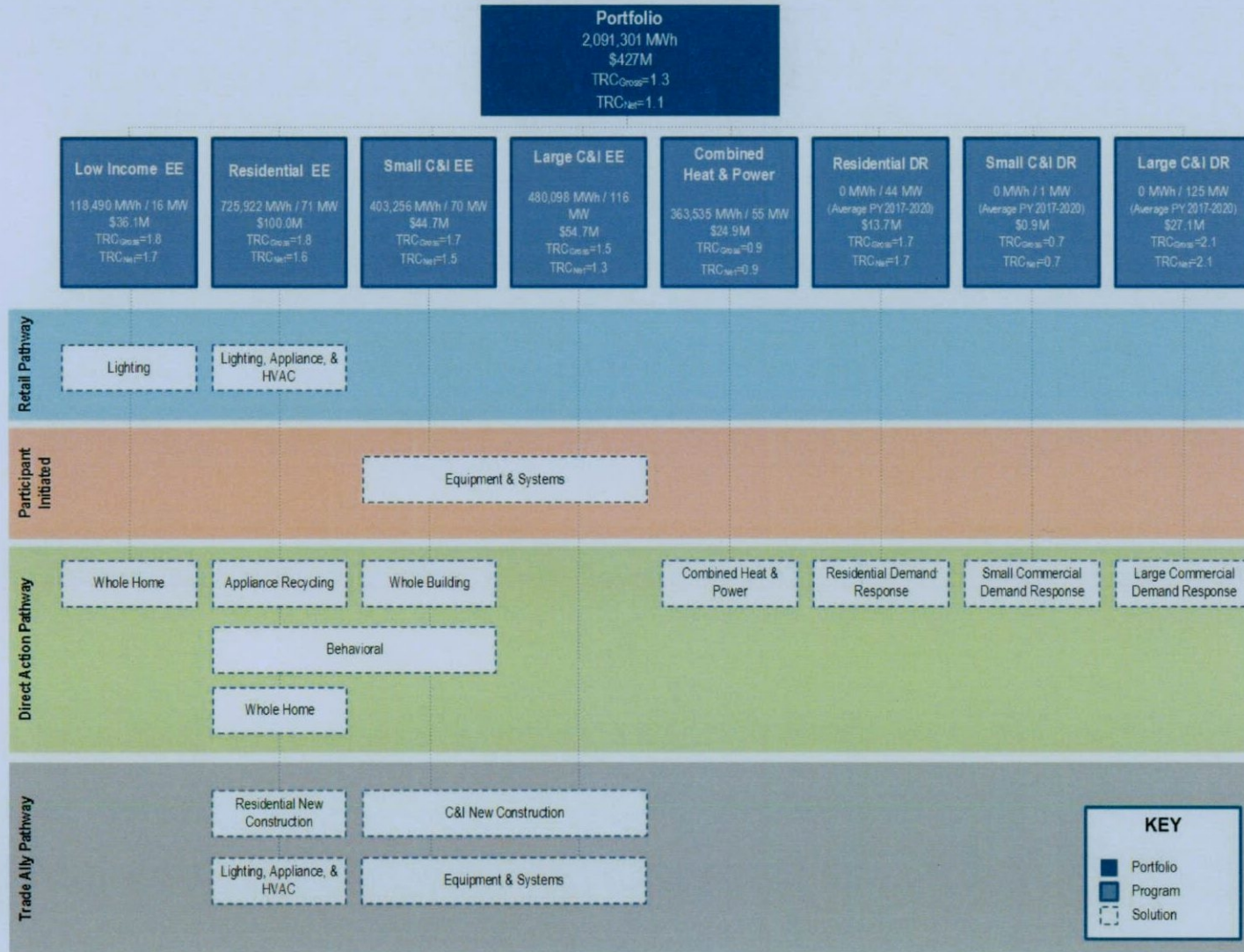


Table 2 through Table 4 Summarize PECO's savings targets, projected budgets, participation levels, benefit-cost ratios and acquisition costs for each program in each program year, as well as for Phase III as a whole.

Table 2. PECO EE and DR Program Summary – Phase III Energy Savings and Acquisition Costs

Programs	Annual Energy Savings (MWh)						Percent of Energy Savings	TRC Analysis		Acquisition Costs		
	PY 2016	PY 2017	PY 2018	PY 2019	PY 2020	5-Year Total		B/C Ratio (Gross)	B/C Ratio (Net)	Incentive Costs (\$/kWh)	Non-Incentive Costs (\$/kWh)	Total Costs (\$/kWh)
Residential EE (Exclusive of Low-Income)	129,359	141,053	147,191	151,861	156,457	725,922	35%	1.8	1.6	\$0.05	\$0.09	\$0.14
Low-Income EE	22,373	22,953	22,600	23,818	26,746	118,490	6%	1.8	1.7	\$0.01	\$0.29	\$0.30
Small C&I EE	73,954	79,879	84,818	85,491	79,113	403,256	19%	1.7	1.5	\$0.03	\$0.08	\$0.11
Large C&I EE	95,050	95,606	95,678	96,256	97,507	480,098	23%	1.5	1.3	\$0.05	\$0.06	\$0.11
CHP	78,710	81,806	85,057	88,471	29,490	363,535	17%	0.9	0.9	\$0.05	\$0.02	\$0.07
Residential DR	0	0	0	0	0	0	0%	1.2	1.2	\$0.00	\$0.00	\$0.00
Small C&I DR	0	0	0	0	0	0	0%	0.7	0.7	\$0.00	\$0.00	\$0.00
Large C&I DR	0	0	0	0	0	0	0%	2.1	2.1	\$0.00	\$0.00	\$0.00
Grand Total – All Phase III Programs	399,445	421,298	435,346	445,899	389,314	2,091,301	100%	1.3	1.1	\$0.06	\$0.14	\$0.20

* Total savings from the G/E/NP customers (which are eligible for the Small C&I EE, Large C&I EE, and CHP Programs) are forecasted to be 273,530 MWh, equivalent to 13% of total portfolio savings over the Phase III period and 14% of the Phase III energy savings compliance target.

* Energy savings are at the meter.

* For the Residential EE Program, although Net and Gross benefits and costs are different (net benefits = \$161.0 Million, net costs = \$101.0 Million; gross benefits = \$243.5 Million, gross costs = \$134.0 Million), the ratio of benefits to costs is very similar. This is due to the fact that the majority of the costs of this program are variable and scale with savings (both net and gross) and under the 2001 California Standard Practice Manual, incentives to freeriders do not count as costs in the TRC test.

Table 3. PECO EE and DR Program Summary – Phase III Demand Savings

Programs	Peak Demand Savings (MW)					5-Year Total EE Programs	4-Year Average DR Programs
	PY 2016	PY 2017	PY 2018	PY 2019	PY 2020		
Residential EE (Exclusive of Low-Income)	19	20	21	22	23	71	N/A
Low-Income EE	3	3	3	3	4	16	N/A
Small C&I EE	14	14	14	14	14	70	N/A
Large C&I EE	23	23	23	23	23	116	N/A
CHP	12	12	13	13	4	55	N/A
Residential DR	39	43	44	45	46	N/A	44
Small C&I DR	1	1	1	1	1	N/A	1
Large C&I DR	0	126	126	125	124	N/A	125
Grand Total – All Phase III Programs	110	244	245	247	240	327	171

¹ Demand savings from EE specific programs do not count towards the demand reduction compliance target. They are being shown here for reference only to show demand savings achieved through the EE programs. Demand savings from installation of EE measures are cumulative over the phase.

² Demand savings counting towards demand reduction compliance target achieved through dedicated demand reduction programs. Demand savings from demand response measures are not cumulative from year to year. The compliance target is based on the average demand reduction of compliance during the period of PY 2017 – PY 2020.

Table 4. PECO EE and DR Program Summary – Phase III Budget and Total Participants

Programs	Budget (Million \$)							Percent of Spending	Total Participants (Cumulative)
	PY 2016	PY 2017	PY 2018	PY 2019	PY 2020	5-Year Total	Average Annual		
Residential (Exclusive of Low-Income)	\$19.7	\$19.8	\$19.8	\$20.2	\$20.6	\$100.0	\$20.0	23%	1,815,820
Low-Income	\$7.0	\$7.0	\$7.0	\$7.3	\$7.8	\$36.1	\$7.2	8%	139,927
Small C&I	\$9.0	\$9.0	\$9.0	\$9.0	\$8.6	\$44.7	\$8.9	10%	30,515
Large C&I	\$10.6	\$10.8	\$10.9	\$11.1	\$11.3	\$54.7	\$10.9	13%	2,370
CHP	\$5.3	\$5.6	\$5.8	\$6.1	\$2.2	\$25.0	\$5.0	6%	75
Residential DR	\$5.1	\$3.9	\$3.8	\$3.5	\$3.8	\$20.1	\$4.0	5%	312,052
Small C&I DR	\$0.2	\$0.2	\$0.2	\$0.2	\$0.2	\$0.9	\$0.2	0%	7,766
Large C&I DR	\$0.2	\$6.8	\$6.8	\$6.7	\$6.7	\$27.1	\$5.4	6%	830
Support Services	\$22.5	\$19.9	\$20.0	\$20.0	\$22.6	\$104.9	\$21.0	25%	N/A
Research and Development	\$5.9	\$2.6	\$2.2	\$1.4	\$1.7	\$13.8	\$2.8	3%	N/A
Grand Total – All Phase III Programs	\$85.5	\$85.5	\$85.5	\$85.5	\$85.5	\$427.4	\$85.5	100%	2,309,355

Table 5 and Table 6 present portfolio lifetime costs and benefits at the various sector levels. Overall, the portfolio is cost-effective.

Table 5. Portfolio Summary of Lifetime Costs and Benefits of Energy Efficiency Measures

Portfolio	Discount Rate	Total Discounted Lifetime Costs (\$000)	Total Discounted Lifetime Benefits (\$000)	Total Discounted Net ¹ Lifetime Benefits (\$000)	Cost-Benefit Ratio (TRC)
Residential (exclusive of Low-Income) ²	7.6%	\$133,961	\$243,496	\$109,535	1.8
Low-Income	7.6%	\$38,250	\$69,128	\$30,879	1.8
Small C&I	7.6%	\$87,650	\$147,957	\$60,307	1.7
Large C&I	7.6%	\$203,138	\$263,343	\$60,205	1.3
Governmental/Educational/Non-Profit	7.6%	\$82,132	\$94,858	\$12,727	1.2
Common Costs	7.6%	\$103,643			
Total	N/A	\$648,774	\$818,783	\$170,009	1.3

¹ "Net" refers to the arithmetic difference between the previous two columns. It does not refer to net verified savings.

² The PUC Implementation Order disallowed the inclusion of low-income participation in standard, non-low-income-specific residential programs in the calculation of savings towards the 5.5% low-income carve-out.

³ Low-Income and G/E/NP are not customer rate classes or sectors, but rather customer segments that fit under the Residential, Small C&I and Large C&I customer classes. The Low-Income customers can be on meters listed under all three customer classes. G/E/NP customers may be on meters within either the Small C&I or Large C&I customer classes.

⁴ The TRC ratios are rounded to the nearest tenth.

* Note that these TRC values do not include portfolio administration costs.

Table 6. Portfolio Summary of Lifetime Costs and Benefits of Demand Response Measures

Portfolio	Discount Rate	Total Discounted Lifetime Costs (\$000)	Total Discounted Lifetime Benefits (\$000)	Total Discounted Net ¹ Lifetime Benefits (\$000)	Cost-Benefit Ratio (TRC)
Residential (exclusive of Low-Income) ²	7.6%	\$14,675	\$17,318	\$2,642	1.2
Low-Income	7.6%	N/A	N/A	N/A	N/A
Large C&I⁴	7.6%	\$15,667	\$36,843	\$21,176	2.4
Small C&I⁴	7.6%	\$655	\$431	-\$223	0.7
Governmental/Educational/Non-Profit⁴	7.6%	\$3,036	\$2,126	-\$909	0.7
Total	N/A	\$34,033	\$56,718	\$22,685	1.7

¹ "Net" refers to the arithmetic difference between the previous two columns. It does not refer to net verified savings.

² The June 19, 2015 Implementation Order disallowed the inclusion of low-income participation in standard, non-low-income-specific residential programs in the calculation of savings towards the 5.5% low-income carve-out.

³ Low-Income and G/E/NP are not customer rate classes or sectors, but rather customer segments that fit under the Residential, Small C&I and Large C&I customer classes. The Low-Income customers can be on meters listed under all three customer classes. G/E/NP customers may be on meters within either the Small C&I or Large C&I customer classes.

⁴ Large C&I, Small C&I, and G/E/NP updated to fix reporting error in original filing, discovered during Res DR cost adjustment (December 2019). Model inputs for Large C&I, Small C&I and G/E/NP were unchanged.

* Note that these TRC values do not include portfolio administration costs.

Table 7 shows cumulative gross annual energy and demand savings.

Table 7. Summary of Portfolio Energy and Demand Savings

MWh and kW Saved for Consumption Reductions	PY 2016		PY 2017		PY 2018		PY 2019		PY 2020		Total	
	MWh	kW	MWh	kW	MWh	kW	MWh	kW	MWh	kW	MWh	kW
Baseline ¹	38,809,100	N/A	38,809,100	N/A	38,809,100	N/A	38,809,100	N/A	38,809,100	N/A	38,809,100	N/A
Residential Sector (exclusive of Low-Income) - Projected Portfolio Savings ²	129,359	57,385	141,053	63,675	147,191	65,153	151,861	66,589	156,457	68,207	725,922	116,737
Low-Income Sector - Projected Portfolio Savings ²	22,373	3,067	22,953	3,135	22,600	3,085	23,818	3,235	26,746	3,603	118,490	16,125
Small C&I Sector - Projected Portfolio Savings ²	68,357	14,034	73,260	14,133	77,175	14,083	77,829	14,134	71,361	14,097	367,982	65,417
Large C&I Program - Net Weather Adjusted Savings ²	123,347	25,951	125,454	152,609	127,162	152,305	129,454	152,077	99,961	147,051	605,377	252,907
Governmental/Educational/Non-Profit Sector - Projected Portfolio Savings ²	56,010	9,904	58,578	10,136	61,217	10,378	62,936	10,633	34,789	6,573	273,530	47,624
EE&C Plan Total - Projected Savings	399,445	110,340	421,298	243,688	435,346	245,003	445,899	246,668	389,314	239,531	2,091,301	498,810
EE&C Plan Total - Percentage of Target to be Met	15%	N/A	15%	N/A	15%	N/A	15%	N/A	15%	N/A	100%	N/A
Estimated Phase II Carryover Savings	0	0	0	0	0	0	0	0	0	0	0	0
Total Projected Savings Phase III + Estimated Phase II Carryover Savings	399,445	110,340	421,298	243,688	435,346	245,003	445,899	246,668	389,314	239,531	2,091,301	498,810
EE&C Plan Total - Percentage of Target Met ³	20%	N/A	21%	N/A	22%	N/A	23%	N/A	20%	N/A	107%	N/A
Percent Reduction From Baseline	1.0%	N/A	1.1%	N/A	1.1%	N/A	1.1%	N/A	1.0%	N/A	5.4%	N/A
Commission-Identified Goal ⁴											1,962,659	N/A
Percent Savings Due to Portfolio Above or Below Commission-Identified Goal											107%	N/A

¹ As defined in the June 19, 2015 Implementation Order.

² Adjusted for weather and extraordinary load, as applicable.

³ Low-Income and G/E/NP are not customer rate classes or sectors, but rather customer segments that fit under the Residential, Small C&I and Large C&I customer classes. The Low-Income customers can be on meters listed under all three customer classes. G/E/NP customers may be on meters within either the Small C&I or Large C&I customer classes.

⁴ The June 19, 2015 Implementation Order directed at least 15% of an EDC's target amount in each program year.

⁵ Demand savings totals include the five-year sum of all EE program demand savings and the PY 2020 DR Program demand savings as a representative of the total demand savings achieved over the phase.

Table 8 presents summary portfolio costs over the PY 2016-2020 period.

Table 8. Summary of Portfolio Costs

Portfolio	PY 2016		PY 2017		PY 2018		PY 2019		PY 2020	
	\$M	%	\$M	%	\$M	%	\$M	%	\$M	%
Residential Portfolio Annual Budget	\$24.8	29%	\$23.7	28%	\$23.6	28%	\$23.7	28%	\$24.3	28%
Low-Income Portfolio Annual Budget	\$7.0	8%	\$7.0	8%	\$7.0	8%	\$7.3	9%	\$7.8	9%
Small C&I Portfolio Annual Budget	\$8.4	10%	\$8.4	10%	\$8.5	10%	\$8.4	10%	\$8.1	9%
Large C&I Portfolio Annual Budget	\$12.2	14%	\$19.1	22%	\$19.3	23%	\$19.6	23%	\$17.6	21%
Governmental/Educational/Non-Profit Portfolio Annual Budget	\$4.7	6%	\$4.8	6%	\$5.0	6%	\$5.1	6%	\$3.3	4%
Total Portfolio-specific Budget	\$57.1	67%	\$63.0	74%	\$63.3	74%	\$64.1	75%	\$61.2	72%
Portfolio Common Costs	\$28.4	33%	\$22.4	26%	\$22.1	26%	\$21.3	25%	\$24.3	28%
Total Portfolio Annual Budget	\$85.5	100%	\$85.5	100%	\$85.5	100%	\$85.5	100%	\$85.5	100%

¹Low-Income and G/E/NP are not customer rate classes or sectors, but rather customer segments that fit under the Residential, Small C&I and Large C&I customer classes. The Low-Income customers can be on meters listed under all three customer classes. G/E/NP customers may be on meters within either the Small C&I or Large C&I customer classes.

2.2 Plan Data: Costs, Cost-Effectiveness and Savings by Program, Sector and Portfolio

Various sections of this report contain the following data tables as required by the Commission's Plan III template:

- » Section 1.3: Table 5. Portfolio Summary of Lifetime Costs and Benefits of Energy Efficiency Measures
- » Section 1.3: Table 6. Portfolio Summary of Lifetime Costs and Benefits of Demand Response Measures
- » Section 1.3: Table 7. Summary of Portfolio Energy and Demand Savings
- » Section 1.3: Table 8. Summary of Portfolio Costs
- » Section 2.1: Table 9. Program Summaries

2.3 Budget and Parity Analysis

Table 10. Budget and Parity Analysis Summary (PY 2016-2020)

Customer Class	Budget (\$M)	% of Total EDC Budget	% of Total Budget Excluding Other Expenditures	% of Total Customer Revenue ¹	Difference
Residential	\$120.2	28%	39%	0.56%	11%
Low-Income	\$36.1	8%	12%	0.17%	3%
Residential Subtotal	\$156.3	37%	51%	0.73%	14%
Small C&I	\$41.8	10%	14%	0.20%	4%
Large C&I	\$87.8	21%	29%	0.41%	8%
C&I Subtotal	\$129.6	30%	42%	0.61%	12%
Governmental/Educational/Non-Profit	\$22.9	5%	8%	0.11%	2%
Governmental/Educational/Non-Profit Subtotal	\$22.9	5%	7%	0.11%	2%
Residential, C&I, Governmental/Educational/Non-Profit Subtotal	\$308.8	72%	100%	1.44%	28%
Other Expenditures	\$118.6	28%	N/A	0.56%	N/A
Other Expenditures Subtotal	\$118.6	28%	N/A	0.56%	N/A
EDC TOTAL	\$427.4	100%	N/A	2.00%	N/A

¹ Percent of Total Customer Revenue calculated using 2006 total revenues as of 12/31/06.

² Low-Income and G/E/NP are not customer rate classes or sectors, but rather customer segments that fit under the Residential, Small C&I and Large C&I customer classes. The Low-Income customers can be on meters listed under all three customer classes. G/E/NP customers may be on meters within either the Small C&I or Large C&I customer classes. Low-Income and G/E/NP have been separated for the purposes of this table.

sealing and maintenance, low-flow showerheads and faucet aerators, water heater and pipe wrap, power strips and lighting. PECO's low-income customers will have access to a comprehensive set of measures available for direct-installation or giveaways at no cost to them. PECO's small C&I customers will have access to direct installation of select prescriptive measures, such as lighting and refrigeration, with minimal cost. PECO's largest C&I customers will have access to customized account management services and incentives, to support identification, prioritization, and installation of large, comprehensive projects. Multifamily is a unique customer segment that will be deliberately targeted in the implementation cycle. PECO is offering a comprehensive list of measures that satisfies the multifamily segment and touches all customer classes. For example, a multifamily facility is defined as all building types with more than one unit when the building is bigger than a duplex (or 1-family attached unit). It can be either a small C&I or a large C&I building, master-metered as a whole, or only in the common areas, while individual housing units are individually metered. Furthermore, there are master-metered buildings that house low-income qualified families. Both master-metered and individually metered multifamily properties will be eligible for all measures contained in the entire portfolio. Costs and savings related to multifamily measures delivered to residential, individually metered customers are assigned to the residential class. Costs and savings related to multifamily measures delivered to residents in master-metered buildings are assigned to the applicable C&I class.

Starting in Program Year 2018, PECO will begin to phase out incentives for CFLs in its Residential Energy Efficiency Programs. By Program Year 2019, PECO will no longer offer incentives for the purchase of CFLs. Beginning in Program Year 2019, all lighting incentives for the Residential Energy Efficiency Programs will be for non-CFLs.

All Energy Efficiency kits in the Residential Energy Efficiency Program with lighting measures will include at least one LED lamp. Additional LED lamps may be included so long as their inclusion does not jeopardize the Company's ability to meet its EE target within its budget.

3.2 Individual Program Descriptions

3.2.1 Residential Programs

3.2.1.1 Residential Energy Efficiency Program, (Exclusive of Low-Income)

Program Title and Years	PECO Residential Energy Efficiency Program PY 2016 – PY 2020																			
Objectives and Savings	<p>The purpose of the PECO Residential Energy Efficiency (Residential EE) Program is to offer comprehensive and cross-cutting opportunities to assist residential customers save energy. The program encompasses a variety of participant solutions and measures to achieve this goal.</p> <table border="1" data-bbox="444 1549 1438 1665"> <thead> <tr> <th colspan="5" data-bbox="444 1549 1438 1581">Five Year Program Savings and Spending Forecast</th> </tr> <tr> <th data-bbox="444 1581 662 1633">Total Annual MWh</th> <th data-bbox="662 1581 857 1633">Total Annual kW</th> <th data-bbox="857 1581 1075 1633">Total Budget (\$M)</th> <th data-bbox="1075 1581 1269 1633">% of Portfolio Savings</th> <th data-bbox="1269 1581 1438 1633">% of Portfolio Spending</th> </tr> </thead> <tbody> <tr> <td data-bbox="444 1633 662 1665">725,922</td> <td data-bbox="662 1633 857 1665">104,869</td> <td data-bbox="857 1633 1075 1665">\$100.0</td> <td data-bbox="1075 1633 1269 1665">35%</td> <td data-bbox="1269 1633 1438 1665">23%</td> </tr> </tbody> </table>					Five Year Program Savings and Spending Forecast					Total Annual MWh	Total Annual kW	Total Budget (\$M)	% of Portfolio Savings	% of Portfolio Spending	725,922	104,869	\$100.0	35%	23%
Five Year Program Savings and Spending Forecast																				
Total Annual MWh	Total Annual kW	Total Budget (\$M)	% of Portfolio Savings	% of Portfolio Spending																
725,922	104,869	\$100.0	35%	23%																
Target Market	The eligible population and target markets for the PECO Residential EE Program are all PECO residential electric customers.																			
Program Description	The PECO Residential EE Program is designed to offer our residential customers opportunities to save energy across all their electric end-uses and to market those																			

opportunities in ways that minimize lost savings opportunities. The program encompasses a comprehensive series of Solutions designed to influence customer behavior and purchasing decisions. The Solutions in the Residential EE Program include approaches that cut across major channels for communicating with customers or trade allies, and reflect the various ways a customer may take advantage of the energy efficiency opportunities available.

The program includes Lighting, Appliances & HVAC Solutions to offer customers energy savings opportunities through a retail pathway to assist customers in purchasing the most efficient technology when they are shopping for new products. The program also includes an Appliance Recycling Solution to help customers recycle energy wasting appliances. For those customers that want to understand how to improve the energy performance of their entire home, PECO will offer the comprehensive Whole Home Solution; and when developers or customers are building a new single family or multifamily home they can take advantage of the New Construction Solution.

Multifamily buildings will be a particular focus of the Residential EE Program. Families in multifamily buildings, which are defined as building types with more than one unit when the building is bigger than a duplex or 1-family attached unit, will have access to participation opportunities for both low-cost, in-unit, direct-install measures (e.g., LEDs, CFLs, power strips, showerheads and faucet aerators) as well as opportunities to participate in higher-cost incentivized measures such as appliance replacements. Multifamily building owners will have efficiency opportunities addressing whole building components such as HVAC updates or maintenance and building shell upgrades. Both master-metered and individually metered multifamily properties will be eligible for all measures contained in the entire portfolio. Costs and savings related to multifamily measures delivered to residential, individually metered customers are assigned to the residential class.

Measures installed in common areas of multifamily buildings, the costs and savings will be assigned according to the type of meter associated with the particular common area. For multifamily buildings in which verified low-income residents comprise less than 66 percent of units, the subsidies for common areas in individually metered buildings and all subsidies for master-metered buildings, except for those subsidies provided to residences that are verified as low-income, will be consistent with those available to other customers in the rate class in which electric service is taken.

A major element of the Residential EE Program is education and awareness for those customers that want an easy entry to, and benefit from, energy efficient products. Further, PECO's Residential EE Program will use the Behavioral Solution offering to leverage the power of social norming to drive persistent energy savings through smart energy practices.

For planning purposes, we used the following estimated forecasted savings across the Solutions:

Solution Offering	Forecasted Phase III Sum of First Year Savings (MWh)
Lighting, Appliances & HVAC	283,640
Appliance Recycling	76,882
Whole Home	37,667
Residential New Construction	4,386
Behavioral	304,999

In addition there is one unique segment that will receive targeted focus: Multifamily. The Multifamily segment as defined above is estimated to contribute 18,346 MWh.

Targeted Market Segments	Forecasted Phase III Sum of First Year Savings (MWh)
Multifamily	18,346

The Solution level savings projected here are estimated forecasts of activity for plan development purposes. PECO plans to spend no more \$100.0M and achieve approximately 725,922 MWh from the Residential EE Program. This program is cost-effective with a gross TRC of 1.8 and net TRC of 1.6.

Implementation Strategy

PECO will administer the Residential EE Program through CSPs that have a proven record of providing the services to be offered in this program effectively.

For the Lighting, Appliances & HVAC Solution, PECO will employ a retail pathway and will offer a combination of cash rebates, and upstream- or midstream-discounts to influence the adoption of energy efficiency measures. Rebates will reduce the initial cost barrier for customers purchasing and installing qualifying efficient products including high efficiency lighting, appliances, electronics, HVAC and water heating equipment that are typically sold through major retail outlets or through HVAC trade ally contractors.

PECO will offer the New Construction Solution and certain equipment replacement solutions through a trade ally and contractor pathway where PECO will collaborate with the community of architects, builders, and contractors to design and promote ENERGY STAR homes or other new construction standards that meet high energy efficiency performance standards. In many cases residential customers face decisions to replace certain equipment through contractors such as HVAC or water heating equipment. This pathway will also ensure that our residential customers have the opportunity to take advantage of our solutions when they are facing these types of projects in their homes.

The remaining solutions included in the Residential EE Program will be delivered through a direct action pathway where PECO will offer customer energy audits and assessments, and directly install energy efficiency improvements in customer homes and apartments at no cost, or significantly reduced cost, to the customer. Appliance recycling opportunities will be provided and homeowners and renters will be engaged directly to make products and informational material readily available through product giveaways, energy kits, an online web store, or opt-in direct mail technology as an option in-lieu of rebates.

The Behavioral Solution involves providing both digital and paper versions of home energy reports that compares the customers' electric consumption to similar households and makes personalized recommendations for the participates to use energy more efficiently. Other behavioral awareness tactics that may be utilized include real-time energy displays, social media updates, and community energy competitions.

Overview of Roles and Activities

PECO will lead the marketing efforts for the Residential EE Program, and will hire and manage experienced CSPs for implementation of the solutions within the program. PECO

- will have a keen management focus on ensuring interested customers are channeled to the participation pathway that best fits their energy needs and ensure their participation experience is convenient, effective and minimizes lost opportunities. The CSPs working for PECO will have representative roles and responsibilities, including, but not limited to:
- » Development of upstream and midstream supplier networks and coordination with product retailers.
 - » Program outreach and lead generation including development and distribution of program materials, neighborhood canvassing, managing inbound and outbound calls.
 - » Manage in-home audits, including telephone customer screening, monitoring of auditors and contractors, direct-installation of measures, and customer reports.
 - » Distribution of efficient measure giveaways or energy kits.
 - » Appliance pick-up and recycling, including scheduling and executing appliance pickups from customer homes, verification of unit qualification for complimentary removal and incentive payment, pickup and proper disposal of units.
 - » Rebate processing: receive, review, and verify applications; and pay rebates.
 - » Program performance tracking and implementing continuous improvement.
 - » Reporting program activities to meet program goals, as well as program and regulatory reporting requirements.

Program Issues,
Risks, and Risk
Management
Strategies

PECO has designed the Residential EE Program to manage the risks inherent to residential energy efficiency program implementation. The comprehensive portfolio design will allow PECO to closely monitor program results, and adjust implementation tactics (including marketing approaches, participation guidelines, incentives, and program resource allocation) to meet the portfolio level targets.

Key program issues, risks, and risk management strategies include:

Risk	Description	Management Strategy
Participation	Customer participation does not meet forecast expectations due to lack of program awareness or external forces (homeowner time or financial resources to manage project implementation, financial barriers, economic downturns, product availability, etc.)	<p>PECO will collaborate with implementation CSPs to provide direct marketing outreach and raise homeowner awareness.</p> <p>PECO will offer technical assistance and incentives aligned with attractive participant payback criteria to make projects viable for participants.</p> <p>PECO will collaborate with suppliers, retailers, and contractors to ensure recommended products are available to consumers.</p>
Equipment Costs	Unanticipated equipment purchase and installation cost increases, reducing project economic benefits.	PECO will monitor costs and adjust program incentives and technical services as needed to manage the program budget and savings. PECO will also monitor costs at the Residential EE Program level for their effects on the overall portfolio budget and savings, and adjust other program incentives or costs as needed.
Regulation	Increases in code-required baselines can reduce the energy savings available, effectively increasing resource acquisition costs.	PECO will monitor the effects of regulatory changes on the forecast savings, and adjust the mix of measures and incentives within the Residential EE Program if necessary to meet the target. The changes to the Residential EE Program will be monitored for their effect on the overall portfolio performance as well.
Trade Ally Participants	Success is dependent on trade ally engagement and program participation.	<p>PECO will implement courses that provide skills to perform audits, identify, recommend and install efficient measures.</p> <p>PECO will develop a trade ally value proposition to attract and engage an adequate network of contractors to perform services.</p> <p>PECO will recognize and recommend contractors who meet or exceed the program requirements through website listing.</p>

Marketing
Strategy

PECO will provide customers with an enhanced experience, where each inbound customer contact is treated as personal and unique, and where each outbound response to the customer is determined by the customer's inbound engagement history along with his/her communication and customer/utility engagement preference.

PECO's marketing strategy will provide a customer-centric experience and approach with a deliberate management focus on making participation in comprehensive energy solutions easy, convenient and a smart choice for customers. PECO will continue to develop and execute a broad awareness campaign in support of the overall plan. PECO will also develop and execute program and Solution level strategies to generate interest and participation in the program by focusing on the customer relationship and stream of offerings we can provide to help homeowners and renters use energy more efficiently.

PECO will engage with customers both directly and through indirect channels. A list of key consumer targets includes:

- All PECO residential electric account customers
- Current and past PECO efficiency program participants
- Non-participating customers
- New construction design and builder trade allies
- Installation trade allies including HVAC, lighting, etc.
- Suppliers and retailers

PECO will develop communication protocols that will seek to reach prospective customers at the right time, through the right channel, with the right message. This will require customer data analysis and segmentation; testing, tracking and multiple channel deployment strategies. PECO will make regular adjustments to communication protocols and deployment strategies to achieve the program goals, balancing program participation and changes in market conditions. PECO will use a variety of deployment strategies to meet the specific needs of each program Solution offering, which may include:

- Direct Marketing
 - Direct mail
 - Email marketing
 - Direct response digital
 - Outbound calling
- General Awareness
 - Special sponsorships
 - Banner Ads
 - TV, Radio

Marketing Strategy Examples by Pathway

PECO will coordinate marketing strategies through a collection of 'Pathways.' The pathways include a selection of Solutions designed to address the specific needs of targeted sub-markets within the residential portfolio. The following table illustrates envisioned marketing approaches, subject to change and modification over the course of the program phase period:

Pathway	Solution	Marketing Approaches
Retail	» Lighting, Appliances, & HVAC	» In-store promotions and advertising, » Mass and direct marketing strategies, » Contractor outreach, » Cross-promotion through participation in other pathways
PECO Direct-Action	» Appliance Recycling » Whole Home » Behavioral	» Direct marketing, » Web-based marketing, » Cross-promotion through participation in other pathways and community events, » Home Energy Reports
Trade Ally/Contractor	» Residential New Construction » Lighting, Appliances, & HVAC	» Direct contractor outreach, » Contractor word-of-mouth, » Mass marketing strategies » Cross-promotion through participation in other pathways

Eligible Measures and Incentives

The PECO Residential EE Program eligible measures and incentive level ranges are detailed in Appendix E.

Ramp Up Strategy / Program Start Date and Key Milestones

The PECO Residential EE Program will operate during program years 2016 through 2020.

Proposed PECO Residential EE Program Implementation Schedule

Key Milestone	Timing
CSP Selection Process	November-December 2015
Promotional Materials and Participant Applications Development	January-May 2016
Program Launch	June 1, 2016

Evaluation, Measurement, and Verification Requirements

The evaluation and data collection methodologies proposed for the PECO Residential EE Program are consistent with current EM&V practices for the Phase II residential sector programs. The EM&V requirements for this program conform to all applicable state protocols.

Metrics for Monitoring Program Success

- » Customer satisfaction with the program, and participation trends
- » Energy savings associated with installed efficient equipment or removed equipment
- » Program implementation costs incurred
- » Increase in customer awareness and receptivity to efficiency measures

Data Collection Approaches

Data for evaluating the program will come from the following sources:

- » Tracking system data
- » Engineering or TRM estimates of measure savings
- » Follow-up surveys of residential customers, retailers, trade allies, and service providers who participate in the program
- » Program implementer and PECO staff surveys or interviews
- » Evaluation of billing data
- » Local weather data

Impact Evaluation Methodology

Program impacts will be determined using a variety of data sources and tested techniques as applicable for individual pathways. These strategies include:

- » Field and phone verification, review of program records and incentive applications
- » Project reviews referencing per-unit deemed or default energy savings
- » Billing analysis
- » Installation follow-up phone interviews with program participants to identify:
 - Rebated measures installed and persistence (e.g., are the measures still installed?)
 - Other changes to the home that affect energy usage, such as changes in occupancy or changes in home or building size
- » Non-participant surveys

Process Evaluation Methodology

Evaluating program process success and efficiency across program delivery, administration, implementation, and customer response, includes the following strategies:

- » Assessment of marketing and promotional efforts
- » Monitoring contractor data-tracking system and implementation procedures to ensure that the program is being implemented as designed.
- » Interviews with utility staff, contractors, equipment vendors, and customers
- » Survey of program participants and non-participants, including self-report surveys
- » Assess customer understanding, satisfaction, and attitudes about the program

Administrative
Requirements

PECO will administer the Residential EE Program through a group of qualified CSPs. PECO’s role will be to ensure that major milestones are met and that the program is delivered according to the program design.

The program is expected to operate with the following PECO/Contract staffing mix:

PECO Residential EE Program – Proposed Staffing

Staff	FTE
PECO Residential EE Program Management	4.1

Requested external staffing levels will be provided upon the completion of the CSP selection process.

Program Title and Years **PECO Residential Energy Efficiency Program PY 2016 – PY 2020**

Estimated Participation Participation and measure adoption estimates were developed based on the CSPs' implementation experiences to date with each pathway in this program, the number of existing homes in PECO's service territory, and an assessment of the attainable market potential in the area. Estimated participation is detailed in Appendix E.

PECO Residential EE Program – Proposed Budget (\$000)

PECO Residential EE Program	Dollars						Program Budget as a % of Sector
	PY 2016	PY 2017	PY 2018	PY 2019	PY 2020	Total	
Residential	\$19,735	\$19,754	\$19,790	\$20,206	\$20,563	\$100,048	83%

PECO Residential EE Program – Participation Costs

PECO Residential EE Program	Dollars					
	PY 2016	PY 2017	PY 2018	PY 2019	PY 2020	Total
Residential	\$91,667	\$91,599	\$91,539	\$91,489	\$91,448	\$457,742

Projected Energy Savings and Demand Reduction The estimated energy savings and demand reductions are based on annual per-unit kWh and kW values indicated in the 2016 PA TRM. For measures not found in the current PA TRM, per unit savings were estimated using a variety of external sources including: other statewide TRMs, applicable evaluation reports, and/or engineering analysis. These values were applied to the estimated number of measures rebated in each program year.

PECO Residential EE Program Gross Annual Energy Savings Estimates (MWh)

PECO Residential EE Program	PY 2016	PY 2017	PY 2018	PY 2019	PY 2020
Residential	129,359	129,359	147,191	151,861	156,457

PECO Residential EE Program Peak Demand Savings Estimates (kW)

PECO Residential EE Program	PY 2016	PY 2017	PY 2018	PY 2019	PY 2020
Residential	18,647	20,342	21,288	21,983	22,609

Energy savings are "at meter"; demand savings are "at generator."

PECO Residential EE Program Cost-Effectiveness

PECO Residential EE Program	Dollars			TRC (GROSS)	TRC (NET)	NTG Ratio
	Discounted Lifetime Benefits	Discounted Lifetime Costs	Net Benefits			
Residential	\$243,496	\$133,961	\$109,535	1.8*	1.6*	0.8

*Program level TRCs do not include portfolio level administration costs.

3.2.3 Demand Response Programs

3.2.3.1 Residential Demand Response Program

Program Title and Years	PECO Residential Demand Response Program PY 2016 – PY 2020														
Objectives and Savings	<p>The objective of PECO’s Residential DR Program is to realize demand reductions from eligible residential customers during the system peak hours.</p> <p style="text-align: center;">5 Year Program Savings and Spending Forecast</p> <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="width: 20%;">Total Annual MWh</th> <th style="width: 20%;">Total Annual kW</th> <th style="width: 20%;">Total Budget (\$M)</th> <th style="width: 20%;">% of Portfolio Savings</th> <th style="width: 20%;">% of Portfolio Spending</th> </tr> </thead> <tbody> <tr> <td style="text-align: center;">0</td> <td style="text-align: center;">45,598</td> <td style="text-align: center;">\$20.1</td> <td style="text-align: center;">0%</td> <td style="text-align: center;">5%</td> </tr> </tbody> </table>					Total Annual MWh	Total Annual kW	Total Budget (\$M)	% of Portfolio Savings	% of Portfolio Spending	0	45,598	\$20.1	0%	5%
Total Annual MWh	Total Annual kW	Total Budget (\$M)	% of Portfolio Savings	% of Portfolio Spending											
0	45,598	\$20.1	0%	5%											
Target Market	<p>The eligible population and target markets for the PECO Residential DR Program are all PECO residential electric customers.</p>														
Program Description	<p>The PECO Residential DR Program encompasses opportunities designed to engage customers in demand reduction.</p> <table border="1" style="margin-left: auto; margin-right: auto; border-collapse: collapse;"> <thead> <tr> <th style="width: 60%;">Solution</th> <th style="width: 40%;">Four Year Average MW Savings (PY2016 – PY 2020)</th> </tr> </thead> <tbody> <tr> <td style="text-align: center;">Residential Direct Load Control (DLC)</td> <td style="text-align: center;">37.5</td> </tr> <tr> <td style="text-align: center;">Smart Thermostat for DR Savings</td> <td style="text-align: center;">5.4</td> </tr> <tr> <td style="text-align: center;">Behavioral DR Savings</td> <td style="text-align: center;">1.4</td> </tr> </tbody> </table> <p>The savings projected here are estimated forecasts of activity. PECO may make adjustments to individual Solution budgets and savings forecasts in response to program performance, market conditions, and market changes to cost-effectively achieve the overall portfolio compliance targets. PECO intends to evaluate the feasibility and risks associated with bidding resources from this program into the PJM market. All net proceeds from any such bidding will be returned to customers.</p>					Solution	Four Year Average MW Savings (PY2016 – PY 2020)	Residential Direct Load Control (DLC)	37.5	Smart Thermostat for DR Savings	5.4	Behavioral DR Savings	1.4		
Solution	Four Year Average MW Savings (PY2016 – PY 2020)														
Residential Direct Load Control (DLC)	37.5														
Smart Thermostat for DR Savings	5.4														
Behavioral DR Savings	1.4														
Implementation Strategy	<p>PECO will administer the Residential DR Program with assistance from CSPs that have a proven record of providing the services to be offered in this program effectively.</p> <p>Residential customers will be recruited and offered the opportunity to participate in three distinct Solutions: Direct Load Control (DLC) Solutions, Smart Thermostat DR Solutions, and Behavioral DR Solutions. In accordance with PUC directives, PECO will call DR events for the first six days that the peak hour of PJM’s day-ahead forecast for the PJM RTO is greater than 96% of the PJM RTO summer peak demand forecast for the months of June through September each year of the program¹⁵.</p>														

¹⁵ Pennsylvania PUC. Implementation Order, June 19, 2015, p. 37.

Solution	Description
Residential Direct Load Control (DLC)	PECO remotely cycles or shuts down a customer's central air conditioning (CAC) unit on short notice, during times of peak demand. In return, participants receive financial incentives for allowing PECO to control their equipment. DR events will be called during time periods that coincide with the highest peak demand. A one-way remote switch is connected to the condensing unit of an air conditioner. When activated by a control signal, the switch will not allow the equipment to operate for some predetermined portion of each hour. For the DLC Solution, the compressor is shut down during an event while the fan continues to operate. This allows cool air to be circulated throughout the home while the compressor is disabled. The operation of the switch is controlled through a digital paging network. CAC units will be controlled up to a maximum of 6 times during the annual peak period from June through September.
Smart Thermostat DR	The Smart Thermostat DR Solution will utilize Wi-Fi-enabled smart thermostats in customers' homes to reduce air conditioner use by increasing the set temperature on the device during times of peak demand. The smart thermostat is remotely controlled via internet connection. Participating smart thermostats will be controlled during the annual peak period from June through September. In return, participants receive financial incentives for allowing PECO to control their equipment.
Behavioral DR	The Behavioral Solution requires no hardware to be installed, and is open to all residential customers with Advanced Metering Infrastructure (AMI) data. This DR channel will alert participants the day before a DR event. It will provide participants with actions to reduce their energy use during the DR event. In return, participants will receive financial incentives for reducing their demand.

Customer Incentives

Customers participating in one of these three residential DR solutions will receive a monthly credit on their PECO bill. The credit will be issued to coincide with June, July, August, and September bill usage. Anticipated incentive payments will range from \$0 to \$40 per controlled unit per season, although this may be adjusted within the full incentive range as listed in Appendix E in the measure level details.

Overview of Roles and Activities

PECO will collaborate with implementation CSPs for delivery of all aspects of the program. Activities will include:

- » Program outreach and lead generation including development and distribution of program materials, neighborhood canvassing, managing inbound and outbound calls.
- » Manage in-home installations, including telephone customer screening, monitoring of auditors and contractors, direct installation of measures, device configuration/activation.
- » Verification of load reduction: load research studies to measure and verify the load reduction from switches, smart thermostats, and behavioral actions via review of AMI data or other references will be conducted.
- » Incentive processing: receive, review, and verify applications; and pay incentives.
- » Program performance tracking and implementing continuous improvement.
- » Reporting program activities to meet program goals, as well as program and regulatory reporting requirements.

Program Issues, Risks, and Risk Management Strategies

PECO has designed a portfolio of measures and programs to manage the risks inherent to residential energy efficiency and demand response program implementation. The comprehensive portfolio design will allow PECO to closely monitor program results, and adjust implementation tactics (including marketing approaches, participation guidelines, incentives, and program resource allocation) to meet the portfolio level targets.

Key program issues, risks, and risk management strategies include:

Risk	Description	Management Strategy
Participation	Customer participation does not meet forecast expectations due to lack of program awareness or external forces (homeowner time or financial resources to manage project implementation, economic downturns, product availability etc.)	To raise program awareness, PECO in collaboration with implementation CSPs will provide direct marketing outreach homeowners.
Customer Retention	Customers fail to take action in response to a Behavioral DR alert request.	PECO will monitor customer retention and engagement and adjust program design and incentives to motivate customers to stay in the program and/or take action.
Equipment Costs	Unanticipated equipment purchase and installation cost increases, reducing project economic benefits.	PECO will monitor costs and adjust program incentives and technical services as needed to manage the comprehensive portfolio budget and savings.
Trade Ally Participants	Success is dependent on trade ally engagement and program participation.	PECO will develop a trade ally value proposition to attract and engage an adequate network of contractors to perform services.

Marketing Strategy

PECO’s marketing strategy will provide a customer-centric experience and approach with a deliberate management focus on making participation easy, convenient and a smart choice for customers to take advantage of the residential DR program PECO will continue to develop and execute a broad awareness campaign in support of the overall plan. PECO will also develop and execute program and Solution level strategies to generate interest and participation in the programs by focusing on the customer relationship and stream of offerings we can provide to help homeowners and renters use energy more efficiently.

PECO will engage with customers both directly and through indirect channels. A list of key marketing targets includes:

- All PECO residential electric account holder customers
- Current and past PECO efficiency program participants
- Non-participating customers
- New construction design and builder trade allies
- HVAC installation trade allies
- Suppliers and retailers

PECO will develop communication protocols that will seek to reach prospective customers at the right time, through the right channel, with the right message. This will require customer data analysis and segmentation; testing, tracking and multiple channel deployment strategies.

PECO will make regular adjustments to communication protocols and deployment strategies to achieve the program goals, balancing program participation and changes in market conditions. PECO will use a variety of deployment strategies to meet the specific needs of individual solutions, which may include:

- Direct Marketing
 - Smart ideas website
 - Direct mail
 - Email marketing
 - Direct response digital
 - Outbound calling
- General Awareness
 - Special sponsorships
 - Banner Ads
 - TV, Radio

Eligible
Measures and
Incentives

The PECO Residential DR Program eligible measures and incentive level ranges are detailed in Appendix E.

Ramp Up
Strategy /
Program Start
Date and Key
Milestones

The PECO Residential DR Program will operate during program years 2016 through 2020. Because the Residential DLC Solutions is an active Phase II program, PECO does not anticipate a significant reduction in participation will take place in Phase III. In Program Year 2017 Smart Thermostats DR Solutions and Behavioral DR Solutions will be new introductions in Phase III, and PECO anticipates that participation will grow throughout the Phase.

Proposed PECO Residential DR Program Implementation Schedule

Key Milestone	Timing
CSP Selection Process	November-December 2015
Development of Promotional Materials and Participant Enrollment Procedures	January-May 2016
Program Launch	June 1, 2016

Evaluation,
Measurement,
and
Verification
Requirements

The evaluation and data collection methodologies proposed for the PECO Residential DR Program are consistent with current EM&V practices for the existing residential DR programs. The EM&V requirements for this program conform to all applicable state protocols.

Metrics for Monitoring Program Success

- » Customer satisfaction with the program, and participation trends
- » Verification of load reduction as set forth by PJM
- » Verification of paging success rate of thermostats and DLC switches
- » Program implementation costs incurred
- » Increase in customer awareness and receptivity to demand response

Data Collection Approaches

Data for evaluating the program may come from the following sources:

- » Tracking system data
- » Follow-up surveys of residential customers who participate in the program
- » Program implementer and PECO staff surveys or interviews
- » Evaluation of AMI data
- » Local weather data

Impact Evaluation Methodology

Program impacts will be determined using a variety of data sources and tested techniques as applicable for individual Solutions. These strategies may include:

- » Field and phone verification, and review of program records
- » M&V including equipment performance verification and load impact estimates.
- » AMI data analysis
- » Installation follow-up phone interviews with program participants to identify:
 - Rebated measures installed and persistence (e.g., are the measures still installed?)
 - Other changes to the home that affect energy usage such as changes in occupancy or changes in home or building size
- » Non-participant surveys

Process Evaluation Methodology

Evaluating program process success and efficiency across program delivery, administration, implementation, and customer response, includes the following strategies:

- » Assessment of marketing and promotional efforts
- » Monitoring contractor data-tracking system and implementation procedures to ensure that the program is being implemented as designed.
- » Interviews with utility staff, contractors, equipment vendors, and customers
- » Survey of program participants and non-participants, including self-report surveys
 - Assess customer understanding, satisfaction, and attitudes about the program

Program Title and Years **PECO Residential Demand Response Program PY 2016 – PY 2020**

Administrative Requirements PECO will administer the Residential DR Program through qualified CSPs. PECO’s role will be to ensure that major milestones are met and that the program is delivered according to the program design.

The program is expected to operate with the following PECO/Contract staffing mix:

PECO Residential DR Program – Proposed Staffing

Staff	FTE
PECO Residential DR Program Management	1.2

Requested external staffing levels will be provided upon the completion of the CSP selection process.

Estimated Participation Participation and measure adoption estimates were developed based on the CSPs’ implementation experiences to date in this program, the number of existing homes in PECO’s service territory, and an assessment of the attainable market potential in the area. Estimated participation is detailed in Appendix E.

PECO Residential DR Program – Proposed Budget (\$000)

PECO Residential DR Program	PY 2016	PY 2017	PY 2018	PY 2019	PY 2020	Total	Program Budget as a % of Sector
Residential DR	\$5,074	\$3,930	\$3,815	\$3,517	\$3,782	\$20,117	17%

PECO Residential DR Program – Participation Costs

PECO Residential DR Program	PY 2016	PY 2017	PY 2018	PY 2019	PY 2020	Total
Residential DR	\$0	\$0	\$0	\$0	\$0	\$0

Projected Energy Savings and Demand Reduction The estimated demand reductions are based on past evaluated annual per-unit kWh and kW values and effective useful life values indicated in the TRM. These values were applied to the estimated number of participants in each program year.

PECO Residential DR Program Gross Annual Energy Savings Estimates (MWh)

PECO Residential DR Program	PY 2016	PY 2017	PY 2018	PY 2019	PY 2020
Residential DR	0	0	0	0	0

PECO Residential DR Program Peak Demand Savings Estimates (kW)

PECO Residential DR Program	PY 2016	PY 2017	PY 2018	PY 2019	PY 2020
Residential DR	38,738	43,333	43,865	44,606	45,598

Energy savings are “at meter”; demand savings are “at generator”.

PECO Residential DR Program Cost-Effectiveness

PECO Residential DR Program	Dollars			TRC (GROSS)	TRC (NET)	NTG Ratio
	Discounted Lifetime Benefits	Discounted Lifetime Costs	Net Benefits			
Residential DR	\$17,318	\$14,675	\$2,642	1.2*	1.2*	1.0

*Program level TRCs do not include portfolio level administrative costs.

4.2.2 Approach for overseeing the performance of CSPs and other providers

Oversight of CSPs will be a key factor in the managing of programs. PECO will incorporate performance metrics into its contracts with the CSPs. Individual Program Managers will monitor performance closely through the tracking system that will measure key indicators such as participation, costs, savings, adherence to Plan, participant experience and other indicators. The Program Manager will work closely with the CSP to understand how the program is performing and if changes may be needed to make the program more successful.

Customer and trade ally satisfaction will be assessed through each program’s EM&V and will provide each Program Manager with feedback on this dimension of each CSPs’ performance.

4.2.3 Basis for Administrative Budget

The administrative expenses fall into the following categories as detailed in Table 11. Administrative Costs PY 2016-2020 and the costs will be factored into the overall portfolio benefit-cost analysis. These costs include estimated PECO staff and procurement costs as well as costs associated with third parties (e.g., EM&V and Data Tracking Database contractors).

Table 11. Administrative Costs 2016-2020 (\$M)

Administrative Costs (\$M)	PY 2016	PY 2017	PY 2018	PY 2019	PY 2020	Total (2016-2020)	Percent of Total Administrative Costs
Gen. Education, Awareness & Marketing	\$12.9	\$10.3	\$10.3	\$10.3	\$13.0	\$56.89	48%
Utility Administration	\$3.7	\$3.7	\$3.7	\$3.7	\$3.7	\$18.26	15%
EM&V	\$4.5	\$4.5	\$4.5	\$4.5	\$4.5	\$22.50	19%
Technical Support	\$1.4	\$1.4	\$1.5	\$1.5	\$1.4	\$7.20	6%
Research and Development	\$5.9	\$2.6	\$2.2	\$1.4	\$1.7	\$13.77	12%
Total Cost	\$28.4	\$22.4	\$22.1	\$21.3	\$24.3	\$118.63	100%

- » General Education, Awareness, and Marketing - represents broad marketing and education efforts to promote the overall portfolio of energy efficiency and demand response programs as well as specific and targeted marketing strategies for specific programs and solutions. This will include expenditures on radio, newspaper, social media, sponsorships, etc. to promote the portfolio of programs.
- » Utility Administration - represents PECO employees and contractors required to develop, oversee, execute, and evaluate all programs in the portfolio. Also included in this cost category are expenses associated with: a) customer service call center to support Phase III implementation; b) estimated costs for PECO staff energy efficiency and demand response training, energy efficiency and demand response industry conferences sponsorships and participation; c) represents costs for updating and expanding the data tracking system for overall tracking and reporting of energy efficiency and demand response savings.
- » EM&V- represents costs associated with third party independent EM&V for the full portfolio process and impact evaluation activities.
- » Technical Support- represents costs for on-going program design and EM&V research activities, benchmarking studies, updating avoided costs or load shape research.

- » Research and Development – represents 3% of the annual plan budget. These costs are made up of market research work in response to market transformations, which PECO believes will occur during this 5 year Phase. Additionally, PECO expects that new technologies will emerge and warrant pilots. This pilot work will be capped at 2% in accordance with the statute put forth by the Commission which states that no more than 2% of funds shall be allocated for experimental equipment or devices.

4.3 Conservation Service Providers (CSPs)

4.3.1 Selected CSPs

PECO will be issuing RFPs for selection of CSPs for Phase III. The selected CSPs, their qualifications, and basis for selection will be shared with the PUC. Each CSP contract is deemed confidential and proprietary and as such, each will be filed with the PUC separately.

4.3.2 Describe the work and measures being performed by CSPs

PECO Plans to implement the energy efficiency and demand response programs in a highly turn-key manner, thus relying on the experience and capabilities of the selected CSP. Each of the selected CSPs will be responsible for implementation services as detailed in the individual program descriptions detailed in Section 3.2.

4.3.3 Describe any pending RFPs to be issued for additional CSPs

PECO is planning to issue at a minimum the following RFPs for the programs indicated in Table 12.

Table 12. RFPs for Phase III Implementation Services

RFP	Sector	Solutions/Services
#1	Residential	Retail Pathway – Lighting, Appliance and HVAC
#2	Residential	Direct-Action - Low-Income Whole Home
#3	Residential	Direct-Action - Appliance Recycling
#4	Residential	Direct-Action – Behavior
#5	Residential	Direct-Action – Whole Home
#6	Residential	Trade Ally – Residential New Construction
#7	Residential	Demand Response
#8	Small C&I	Direct-Action – Whole Building
#9	Small C&I	Demand Response
#10	Large C&I	Demand Response - Aggregator
#11	Small/Large C&I	Direct-Action – Whole Building
#12	Small/Large C&I	Trade Ally- C&I New Construction
#13	Small/Large C&I	Trade Ally- Equipment and Systems
#14	Small/Large C&I	Direct-Action – Combined Heat and Power
#15	All	Marketing
#16	All	Call Center
#17	All	Tracking System * (To be bid in 2016, and implemented in 2017)
#18	All	EM&V

*RFP contracts for Phase III Implementation Services are being developed and will be awarded as outlined in the table above.

Appendix C. Program by Program Savings and Costs for Each Program Year

Tables C-1 to C-4: Program Cost Data

Table C-1. Portfolio-Specific Assignment of EE&C Costs¹

EE&C Program	Cost Elements (\$M)		Totals
	Incentive Costs	Non-Incentive Costs	
Low-Income Portfolio			
Low-Income EE	\$1.2	\$34.9	\$36.1
Totals	\$1.2	\$34.9	\$36.1
Residential Portfolio (excluding Low-Income)			
Residential EE (Exclusive of Low-Income)	\$38.0	\$62.0	\$100.0
Residential DR	\$13.5	\$6.6	\$20.1
Totals	\$51.5	\$68.6	\$120.2
Commercial Portfolio (Small)			
Small C&I EE (Exclusive of G/E/NP)	\$10.7	\$29.4	\$40.1
Small C&I DR	\$0.2	\$0.7	\$0.9
CHP (Exclusive of G/E/NP)	\$0.6	\$0.2	\$0.8
Totals	\$11.5	\$30.3	\$41.8
Commercial Portfolio (Large)			
Large C&I EE (Exclusive of G/E/NP)	\$22.5	\$24.8	\$47.3
Large C&I DR	\$19.7	\$7.4	\$27.1
CHP (Exclusive of G/E/NP)	\$9.8	\$3.6	\$13.4
Totals	\$52.0	\$35.8	\$87.8
Government/Educational/Non-Profit			
Small C&I EE G/E/NP	\$1.2	\$3.4	\$4.6
Large C&I EE G/E/NP	\$3.7	\$3.8	\$7.5
CHP G/E/NP	\$7.6	\$3.2	\$10.8
Totals	\$12.4	\$10.5	\$22.9
TOTAL			
TOTAL	\$128.6	\$180.2	\$308.8

¹ This table labeled 6A in Implementation Order.

² Low-Income and G/E/NP are not customer rate classes or sectors, but rather customer segments that fit under the Residential, Small C&I and Large C&I customer classes. The Low-Income customers can be on meters listed under all three customer classes. G/E/NP customers may be on meters within either the Small C&I or Large C&I customer classes.

Table C-2. Allocation of Common Costs to Applicable Customer Sector²

Common Cost Element	Total Cost (\$M)	Basis for Cost Allocation ¹	Class Cost Allocation (\$M)			
			Residential (Including Low-Income)	Small C&I	Large C&I	G/E/NP ³
Gen. Education, Awareness & Marketing	\$56.9		\$28.2	\$7.9	\$16.5	\$4.3
Utility Administration	\$18.3		\$9.1	\$2.5	\$5.3	\$1.4
EM&V	\$22.5		\$11.2	\$3.1	\$6.5	\$1.7
Technical Support	\$7.2		\$3.6	\$1.0	\$2.1	\$0.5
Research and Development	\$13.8		\$3.6	\$2.8	\$5.9	\$1.5
Totals	\$118.6		\$55.6	\$17.3	\$36.3	\$9.5

¹ The basis for cost allocation for common costs is a proportional allocation according to the percent of spending for programs in these sectors.

² This table labeled 6B in Implementation Order.

³ Low-Income and G/E/NP are not customer rate classes or sectors, but rather customer segments that fit under the Residential, Small C&I and Large C&I customer classes. The Low-Income customers can be on meters listed under all three customer classes. G/E/NP customers may be on meters within either the Small C&I or Large C&I customer classes.

Table C-3. Summary of Portfolio EE&C Costs (\$M)¹

Portfolio	Total Sector Portfolio-Specific Costs	Total Common Costs	Total of All Costs
Residential (Including Low-Income)	\$156.3	\$55.6	\$211.9
Small C&I	\$41.8	\$17.3	\$59.1
Large C&I	\$87.8	\$36.3	\$124.1
G/E/NP ²	\$22.9	\$9.5	\$32.3
Totals	\$308.8	\$118.6	\$427.4

¹ This table labeled 6C in Implementation Order.

Table C-4. Summary of Programs Cost by Year

Costs By Program Per Year (\$000)													
Program	PY	Direct Program Costs					Administrative Costs						Grand Total
		EDC Labor	CSP Labor	CSP Materials and Supplies	Customer Incentives	Total	Gen. Education, Awareness & Marketing	Utility Administration	EM&V	Technical Support	Research and Development	Total	
Residential	2016	\$732	\$8,992	\$2,204	\$7,807	\$19,735	\$4,269	\$1,208	\$1,489	\$463	\$1,224	\$8,654	\$28,389
	2017	\$747	\$9,226	\$2,117	\$7,665	\$19,754	\$3,414	\$1,208	\$1,489	\$463	\$530	\$7,104	\$26,858
	2018	\$761	\$9,420	\$2,081	\$7,528	\$19,790	\$3,411	\$1,208	\$1,489	\$496	\$450	\$7,055	\$26,844
	2019	\$777	\$9,835	\$2,083	\$7,512	\$20,206	\$3,420	\$1,208	\$1,489	\$496	\$281	\$6,894	\$27,100
	2020	\$792	\$10,225	\$2,048	\$7,498	\$20,563	\$4,311	\$1,208	\$1,489	\$463	\$351	\$7,823	\$28,386
Total		\$3,809	\$47,697	\$10,533	\$38,009	\$100,048	\$18,825	\$6,042	\$7,445	\$2,382	\$2,835	\$37,530	\$137,577
Low-Income	2016	\$183	\$3,264	\$3,203	\$317	\$6,966	\$1,541	\$436	\$538	\$167	\$211	\$2,894	\$9,860
	2017	\$186	\$3,424	\$3,112	\$272	\$6,994	\$1,232	\$436	\$538	\$167	\$92	\$2,465	\$9,459
	2018	\$190	\$3,492	\$3,083	\$238	\$7,003	\$1,231	\$436	\$538	\$179	\$78	\$2,462	\$9,465
	2019	\$194	\$3,768	\$3,137	\$207	\$7,307	\$1,234	\$436	\$538	\$179	\$48	\$2,436	\$9,743
	2020	\$198	\$4,308	\$3,153	\$188	\$7,847	\$1,556	\$436	\$538	\$167	\$61	\$2,758	\$10,605
Total		\$951	\$18,256	\$15,688	\$1,223	\$36,117	\$6,796	\$2,181	\$2,688	\$860	\$490	\$13,015	\$49,132
Small C&I	2016	\$323	\$4,597	\$1,650	\$2,413	\$8,984	\$1,906	\$540	\$665	\$207	\$1,287	\$4,605	\$13,589
	2017	\$330	\$4,649	\$1,654	\$2,406	\$9,039	\$1,524	\$540	\$665	\$207	\$557	\$3,493	\$12,532
	2018	\$336	\$4,640	\$1,657	\$2,397	\$9,031	\$1,523	\$540	\$665	\$222	\$473	\$3,422	\$12,453
	2019	\$343	\$4,664	\$1,667	\$2,319	\$8,994	\$1,527	\$540	\$665	\$222	\$295	\$3,248	\$12,242
	2020	\$350	\$4,296	\$1,680	\$2,301	\$8,628	\$1,925	\$540	\$665	\$207	\$369	\$3,705	\$12,333
Total		\$1,683	\$22,846	\$8,309	\$11,837	\$44,675	\$8,406	\$2,698	\$3,324	\$1,064	\$2,981	\$18,473	\$63,148
Large C&I	2016	\$394	\$4,827	\$208	\$5,209	\$10,639	\$2,335	\$661	\$815	\$253	\$1,576	\$5,641	\$16,279
	2017	\$402	\$4,950	\$207	\$5,227	\$10,787	\$1,867	\$661	\$815	\$253	\$682	\$4,279	\$15,066
	2018	\$410	\$5,060	\$209	\$5,244	\$10,923	\$1,866	\$661	\$815	\$272	\$579	\$4,192	\$15,115
	2019	\$418	\$5,213	\$216	\$5,233	\$11,080	\$1,871	\$661	\$815	\$272	\$361	\$3,979	\$15,059
	2020	\$427	\$5,404	\$223	\$5,246	\$11,300	\$2,358	\$661	\$815	\$253	\$452	\$4,539	\$15,840
Total		\$2,051	\$25,454	\$1,064	\$26,160	\$54,728	\$10,298	\$3,305	\$4,073	\$1,303	\$3,651	\$22,630	\$77,359
CHP	2016	\$166	\$1,299	\$0	\$3,863	\$5,328	\$1,067	\$302	\$372	\$116	\$720	\$2,576	\$7,904
	2017	\$170	\$1,377	\$0	\$4,025	\$5,572	\$853	\$302	\$372	\$116	\$312	\$1,954	\$7,526
	2018	\$173	\$1,460	\$0	\$4,196	\$5,829	\$852	\$302	\$372	\$124	\$265	\$1,915	\$7,744
	2019	\$177	\$1,549	\$0	\$4,375	\$6,101	\$854	\$302	\$372	\$124	\$165	\$1,817	\$7,918
	2020	\$180	\$527	\$0	\$1,458	\$2,165	\$1,077	\$302	\$372	\$116	\$206	\$2,073	\$4,238
Total		\$866	\$6,211	\$0	\$17,918	\$24,995	\$4,703	\$1,510	\$1,860	\$595	\$1,668	\$10,335	\$35,330
Residential DR	2016	\$268	\$970	\$0	\$3,836	\$5,074	\$585	\$166	\$204	\$64	\$119	\$1,137	\$6,211
	2017	\$213	\$1,083	\$0	\$2,634	\$3,930	\$468	\$166	\$204	\$64	\$51	\$953	\$4,883
	2018	\$210	\$1,110	\$0	\$2,495	\$3,815	\$468	\$166	\$204	\$68	\$44	\$949	\$4,764
	2019	\$199	\$1,130	\$0	\$2,188	\$3,517	\$469	\$166	\$204	\$68	\$27	\$934	\$4,451
	2020	\$208	\$1,210	\$0	\$2,363	\$3,782	\$591	\$166	\$204	\$64	\$34	\$1,058	\$4,840
Program Total		\$1,098	\$5,502	\$0	\$13,517	\$20,117	\$2,581	\$828	\$1,021	\$327	\$275	\$5,032	\$25,149
Small C&I DR	2016	\$116	\$25	\$0	\$45	\$186	\$40	\$11	\$14	\$4	\$27	\$97	\$283

Costs By Program Per Year (\$000)

Program	PY	Direct Program Costs					Administrative Costs						Grand Total
		EDC Labor	CSP Labor	CSP Materials and Supplies	Customer Incentives	Total	Gen. Education, Awareness & Marketing	Utility Administration	EM&V	Technical Support	Research and Development	Total	
	2017	\$118	\$25	\$0	\$44	\$187	\$32	\$11	\$14	\$4	\$12	\$74	\$261
	2018	\$120	\$25	\$0	\$43	\$188	\$32	\$11	\$14	\$5	\$10	\$72	\$261
	2019	\$123	\$25	\$0	\$43	\$190	\$32	\$11	\$14	\$5	\$6	\$69	\$259
	2020	\$125	\$24	\$0	\$42	\$192	\$41	\$11	\$14	\$4	\$8	\$78	\$270
Total		\$601	\$124	\$0	\$217	\$943	\$177	\$57	\$70	\$22	\$63	\$390	\$1,333
	2016	\$165	\$0	\$0	\$0	\$165	\$1,158	\$328	\$404	\$126	\$782	\$2,797	\$2,962
	2017	\$168	\$1,651	\$0	\$4,952	\$6,771	\$926	\$328	\$404	\$126	\$338	\$2,122	\$8,893
Large C&I DR	2018	\$172	\$1,645	\$0	\$4,936	\$6,752	\$925	\$328	\$404	\$135	\$287	\$2,079	\$8,831
	2019	\$175	\$1,640	\$0	\$4,919	\$6,733	\$928	\$328	\$404	\$135	\$179	\$1,973	\$8,706
	2020	\$179	\$1,634	\$0	\$4,902	\$6,715	\$1,169	\$328	\$404	\$126	\$224	\$2,251	\$8,965
Total		\$859	\$6,570	\$0	\$19,709	\$27,137	\$5,106	\$1,639	\$2,019	\$646	\$1,810	\$11,221	\$38,358
Total		\$11,916	\$132,660	\$35,593	\$128,590	\$308,760	\$56,893	\$18,261	\$22,500	\$7,200	\$13,772	\$118,626	\$427,386

Tables C-5 to C-10: TRC Benefits Tables

Table C-5. Gross TRC Benefits Table

Gross TRC Benefits By Program Per Year (\$000)												
Program	Program Year	TRC	Program Costs (\$000)	Program Benefits (\$000)	Capacity		Energy		Load Reductions in kW		MWh Saved	
					Annual		Annual		Annual	Lifetime	Annual	Lifetime
					Generation	Trans/Dist	Peak	Off Peak				
Residential (Exclusive of Low-Income)	2016	1.6	\$30,020	\$47,792	\$5,381	\$3,808	\$12,247	\$14,679	18,647	141,500	129,359	956,255
	2017	1.7	\$30,257	\$50,743	\$5,637	\$3,921	\$12,879	\$15,350	20,342	147,415	141,053	994,486
	2018	1.8	\$30,674	\$55,591	\$5,847	\$4,067	\$13,531	\$16,192	21,288	155,510	147,191	1,050,046
	2019	2.0	\$31,519	\$62,043	\$6,192	\$4,307	\$14,632	\$17,590	21,983	167,368	151,861	1,135,429
	2020	2.1	\$32,206	\$67,997	\$6,610	\$4,598	\$16,035	\$19,339	22,609	179,517	156,457	1,222,857
Total		1.8	\$154,676	\$284,166	\$29,667	\$20,701	\$69,325	\$83,150	71,139	757,579	725,922	5,359,074
Low-Income	2016	1.6	\$8,562	\$13,438	\$1,154	\$817	\$2,856	\$3,419	3,067	29,411	22,373	219,123
	2017	1.7	\$8,601	\$14,288	\$1,195	\$831	\$2,981	\$3,551	3,135	30,365	22,953	226,855
	2018	1.8	\$8,612	\$15,526	\$1,214	\$845	\$3,107	\$3,678	3,085	31,492	22,600	235,931
	2019	2.0	\$8,932	\$17,633	\$1,309	\$910	\$3,453	\$4,078	3,235	34,530	23,818	260,024
	2020	2.1	\$9,498	\$19,901	\$1,449	\$1,008	\$3,948	\$4,649	3,603	38,192	26,746	289,007
Total		1.8	\$44,205	\$80,786	\$6,322	\$4,411	\$16,345	\$19,376	16,125	163,991	118,490	1,230,940
Small C&I	2016	1.6	\$21,535	\$35,280	\$5,837	\$4,131	\$11,116	\$9,223	13,822	160,474	73,954	721,352
	2017	1.7	\$21,553	\$35,978	\$5,934	\$4,127	\$11,359	\$9,393	13,928	162,245	79,879	730,564
	2018	1.7	\$21,452	\$36,763	\$5,979	\$4,159	\$11,619	\$9,585	13,883	164,235	84,818	740,678
	2019	1.8	\$21,447	\$37,994	\$6,058	\$4,214	\$12,068	\$9,917	13,941	167,117	85,491	757,427
	2020	1.8	\$21,082	\$39,002	\$6,135	\$4,267	\$12,568	\$10,283	14,144	169,469	79,113	771,388
Total		1.7	\$107,069	\$185,017	\$29,943	\$20,898	\$58,730	\$48,401	69,718	823,539	403,256	3,721,408
Large C&I	2016	1.4	\$37,373	\$53,831	\$10,727	\$7,591	\$17,153	\$16,419	22,896	307,218	95,050	1,269,872
	2017	1.4	\$37,869	\$54,668	\$10,866	\$7,558	\$17,491	\$16,698	23,029	309,353	95,606	1,280,022
	2018	1.5	\$38,340	\$55,650	\$10,922	\$7,597	\$17,876	\$17,043	23,091	311,699	95,678	1,291,787

Gross TRC Benefits By Program Per Year (\$000)												
Program	Program Year	TRC	Program Costs (\$000)	Program Benefits (\$000)	Capacity		Energy		Load Reductions in kW		MWh Saved	
					Annual		Annual		Annual	Lifetime	Annual	Lifetime
					Generation	Trans/Dist	Peak	Off Peak				
	2019	1.5	\$38,896	\$57,042	\$11,001	\$7,652	\$18,448	\$17,526	23,218	314,666	96,256	1,308,445
	2020	1.5	\$39,498	\$58,656	\$11,076	\$7,704	\$19,159	\$18,108	23,413	317,269	97,507	1,325,461
Total		1.5	\$191,975	\$279,846	\$54,592	\$38,103	\$90,127	\$85,793	115,645	1,560,205	480,098	6,475,588
CHP	2016	0.9	\$27,425	\$25,337	\$6,060	\$4,289	\$13,588	\$16,658	11,881	178,211	78,710	1,180,649
	2017	0.9	\$28,732	\$26,345	\$6,337	\$4,408	\$14,273	\$17,497	12,348	185,218	81,806	1,227,095
	2018	0.9	\$30,116	\$27,448	\$6,579	\$4,576	\$15,022	\$18,445	12,838	192,575	85,057	1,275,862
	2019	0.9	\$31,579	\$28,757	\$6,832	\$4,752	\$15,903	\$19,514	13,353	200,300	88,471	1,327,068
	2020	0.9	\$10,755	\$9,694	\$2,274	\$1,582	\$5,426	\$6,638	4,451	66,767	29,490	442,356
Total		0.9	\$128,607	\$117,581	\$28,081	\$19,606	\$64,212	\$78,751	54,871	823,071	363,535	5,453,030
Residential DR	2016	0.9	\$4,115	\$3,590	\$2,102	\$1,488	\$0	\$0	38,738	38,738	0	0
	2017	1.2	\$3,271	\$4,029	\$2,376	\$1,653	\$0	\$0	43,333	43,333	0	0
	2018	1.3	\$3,191	\$4,072	\$2,401	\$1,670	\$0	\$0	43,865	43,865	0	0
	2019	1.4	\$2,970	\$4,135	\$2,438	\$1,696	\$0	\$0	44,606	44,606	0	0
	2020	1.3	\$3,191	\$4,220	\$2,489	\$1,731	\$0	\$0	45,598	45,598	0	0
Program Total		1.2	\$16,738	\$20,045	\$11,807	\$8,238	\$0	\$0	45,598	45,598	0	0
Small C&I DR	2016	0.7	\$174	\$120	\$70	\$50	\$0	\$0	1,290	1,290	0	0
	2017	0.7	\$176	\$118	\$70	\$49	\$0	\$0	1,274	1,274	0	0
	2018	0.7	\$178	\$117	\$69	\$48	\$0	\$0	1,258	1,258	0	0
	2019	0.6	\$179	\$115	\$68	\$47	\$0	\$0	1,242	1,242	0	0
	2020	0.6	\$181	\$113	\$67	\$47	\$0	\$0	1,226	1,226	0	0
Program Total		0.7	\$888	\$583	\$344	\$240	\$0	\$0	1,226	1,226	0	0
Large C&I DR	2016	0.0	\$165	\$0	\$0	\$0	\$0	\$0	0	0	0	0
	2017	2.1	\$5,533	\$11,742	\$6,925	\$4,817	\$0	\$0	126,300	126,300	0	0
	2018	2.1	\$5,519	\$11,668	\$6,882	\$4,787	\$0	\$0	125,695	125,695	0	0

Gross TRC Benefits By Program Per Year (\$000)												
Program	Program Year	TRC	Program Costs (\$000)	Program Benefits (\$000)	Capacity		Energy		Load Reductions in kW		MWh Saved	
					Annual		Annual		Annual	Lifetime	Annual	Lifetime
					Generation	Trans/Dist	Peak	Off Peak				
	2019	2.1	\$5,504	\$11,595	\$6,838	\$4,756	\$0	\$0	125,091	125,091	0	0
	2020	2.1	\$5,489	\$11,521	\$6,795	\$4,726	\$0	\$0	124,487	124,487	0	0
<i>Program Total</i>		2.1	\$22,210	\$46,526	\$27,440	\$19,086	\$0	\$0	124,487	124,487	0	0
Total		1.3	\$666,368	\$1,014,549	\$188,196	\$131,284	\$298,739	\$315,471	498,810	4,299,696	2,091,301	22,240,039

¹This table labeled 7 in Implementation Order.

Table C-6. Net TRC Benefits Table

Net Benefits By Program Per Year (\$000)													
Program	Program Year	NTG Ratio	TRC	Program Costs (\$000)	Program Benefits (\$000)	Capacity		Energy		Load Reductions in kW		MWh Saved	
						Annual		Annual		Annual	Lifetime	Annual	Lifetime
						Generation	Trans/Dist	Peak	Off Peak				
Residential (Exclusive of Low-Income)	2016	0.8	1.4	\$22,632	\$30,881	\$3,355	\$2,374	\$7,758	\$9,236	13,718	87,744	95,999	599,299
	2017	0.8	1.5	\$22,807	\$33,232	\$3,565	\$2,480	\$8,285	\$9,790	15,380	92,492	107,644	631,424
	2018	0.8	1.6	\$23,113	\$36,899	\$3,752	\$2,610	\$8,827	\$10,483	16,432	98,922	114,843	677,073
	2019	0.8	1.7	\$23,783	\$41,531	\$4,017	\$2,794	\$9,630	\$11,522	17,082	107,677	119,391	741,366
	2020	0.8	1.9	\$24,315	\$45,570	\$4,304	\$2,994	\$10,583	\$12,721	17,417	116,041	121,948	802,624
Total		0.8	1.6	\$116,650	\$188,113	\$18,993	\$13,252	\$45,084	\$53,752	46,298	502,877	559,824	3,451,786
Low-Income	2016	0.9	1.5	\$8,426	\$12,470	\$1,080	\$765	\$2,667	\$3,195	2,871	27,526	20,866	204,781
	2017	0.9	1.6	\$8,484	\$13,158	\$1,109	\$771	\$2,760	\$3,289	2,906	28,191	21,187	210,243
	2018	0.9	1.7	\$8,514	\$14,203	\$1,114	\$775	\$2,845	\$3,369	2,817	28,977	20,527	216,649
	2019	0.9	1.8	\$8,847	\$16,076	\$1,192	\$829	\$3,142	\$3,710	2,921	31,614	21,380	237,593
	2020	0.9	1.9	\$9,418	\$18,060	\$1,313	\$914	\$3,573	\$4,209	3,233	34,801	23,872	262,855
Total		0.9	1.7	\$43,689	\$73,967	\$5,808	\$4,053	\$14,986	\$17,772	14,748	151,110	107,832	1,132,120
Small C&I	2016	0.6	1.4	\$14,583	\$20,519	\$3,280	\$2,321	\$6,438	\$5,285	7,759	90,218	45,803	414,755
	2017	0.6	1.4	\$14,613	\$20,951	\$3,336	\$2,321	\$6,587	\$5,396	7,821	91,267	51,621	421,020
	2018	0.6	1.5	\$14,549	\$21,439	\$3,360	\$2,337	\$6,739	\$5,523	7,786	92,367	56,900	427,932
	2019	0.6	1.5	\$14,554	\$22,210	\$3,405	\$2,368	\$7,007	\$5,742	7,812	94,014	57,621	439,351
	2020	0.6	1.6	\$14,192	\$22,683	\$3,454	\$2,403	\$7,277	\$5,960	7,938	95,531	50,767	447,846
Total		0.6	1.5	\$72,491	\$107,803	\$16,836	\$11,750	\$34,048	\$27,907	39,116	463,397	262,712	2,150,904
Large C&I	2016	0.5	1.3	\$21,435	\$27,368	\$5,405	\$3,825	\$8,691	\$8,357	11,544	154,755	48,332	644,704
	2017	0.5	1.3	\$21,749	\$27,843	\$5,477	\$3,810	\$8,875	\$8,516	11,614	155,903	48,684	651,043
	2018	0.5	1.3	\$22,044	\$28,415	\$5,507	\$3,831	\$9,087	\$8,716	11,643	157,151	48,786	658,734
	2019	0.5	1.3	\$22,406	\$29,244	\$5,551	\$3,861	\$9,408	\$9,003	11,712	158,796	49,226	669,976

Net Benefits By Program Per Year (\$000)													
Program	Program Year	NTG Ratio	TRC	Program Costs (\$000)	Program Benefits (\$000)	Capacity		Energy		Load Reductions in kW		MWh Saved	
						Annual		Annual		Annual	Lifetime	Annual	Lifetime
						Generation	Trans/Dist	Peak	Off Peak				
	2020	0.5	1.3	\$22,811	\$30,201	\$5,596	\$3,893	\$9,806	\$9,350	11,825	160,321	50,066	681,704
Total		0.5	1.3	\$110,445	\$143,071	\$27,537	\$19,220	\$45,868	\$43,943	58,337	786,925	245,094	3,306,162
CHP	2016	0.8	0.9	\$22,233	\$20,269	\$4,848	\$3,431	\$10,870	\$13,326	9,505	142,569	62,968	944,519
	2017	0.8	0.9	\$23,295	\$21,076	\$5,069	\$3,526	\$11,418	\$13,998	9,878	148,174	65,445	981,676
	2018	0.8	0.9	\$24,419	\$21,958	\$5,263	\$3,661	\$12,018	\$14,756	10,271	154,060	68,046	1,020,690
	2019	0.8	0.9	\$25,609	\$23,006	\$5,466	\$3,802	\$12,723	\$15,611	10,683	160,240	70,777	1,061,654
	2020	0.8	0.9	\$8,745	\$7,755	\$1,819	\$1,265	\$4,341	\$5,310	3,561	53,413	23,592	353,885
Total		0.8	0.9	\$104,301	\$94,065	\$22,465	\$15,685	\$51,370	\$63,001	43,897	658,457	290,828	4,362,424
Residential DR	2016	1.0	0.9	\$4,115	\$3,590	\$2,102	\$1,488	\$0	\$0	38,738	38,738	0	0
	2017	1.0	1.2	\$3,271	\$4,029	\$2,376	\$1,653	\$0	\$0	43,333	43,333	0	0
	2018	1.0	1.3	\$3,191	\$4,072	\$2,401	\$1,670	\$0	\$0	43,865	43,865	0	0
	2019	1.0	1.4	\$2,970	\$4,135	\$2,438	\$1,696	\$0	\$0	44,606	44,606	0	0
	2020	1.0	1.3	\$3,191	\$4,220	\$2,489	\$1,731	\$0	\$0	45,598	45,598	0	0
Program Total		1.0	1.2	\$16,738	\$20,045	\$11,807	\$8,238	\$0	\$0	45,598	45,598	0	0
Small C&I DR	2016	1.0	0.7	\$174	\$120	\$70	\$50	\$0	\$0	1,290	1,290	0	0
	2017	1.0	0.7	\$176	\$118	\$70	\$49	\$0	\$0	1,274	1,274	0	0
	2018	1.0	0.7	\$178	\$117	\$69	\$48	\$0	\$0	1,258	1,258	0	0
	2019	1.0	0.6	\$179	\$115	\$68	\$47	\$0	\$0	1,242	1,242	0	0
	2020	1.0	0.6	\$181	\$113	\$67	\$47	\$0	\$0	1,226	1,226	0	0
Program Total		1.0	0.7	\$888	\$583	\$344	\$240	\$0	\$0	1,226	1,226	0	0
Large C&I DR	2016	1.0	0.0	\$165	\$0	\$0	\$0	\$0	\$0	0	0	0	0
	2017	1.0	2.1	\$5,533	\$11,742	\$6,925	\$4,817	\$0	\$0	126,300	126,300	0	0
	2018	1.0	2.1	\$5,519	\$11,668	\$6,882	\$4,787	\$0	\$0	125,695	125,695	0	0
	2019	1.0	2.1	\$5,504	\$11,595	\$6,838	\$4,756	\$0	\$0	125,091	125,091	0	0

Net Benefits By Program Per Year (\$000)													
Program	Program Year	NTG Ratio	TRC	Program Costs (\$000)	Program Benefits (\$000)	Capacity		Energy		Load Reductions in kW		MWh Saved	
						Annual		Annual		Annual	Lifetime	Annual	Lifetime
						Generation	Trans/Dist	Peak	Off Peak				
	2020	1.0	2.1	\$5,489	\$11,521	\$6,795	\$4,726	\$0	\$0	124,487	124,487	0	0
<i>Program Total</i>		1.0	2.1	\$22,210	\$46,526	\$27,440	\$19,086	\$0	\$0	124,487	124,487	0	0
Total			1.1	\$487,412	\$674,172	\$131,229	\$91,524	\$191,356	\$206,375	373,708	2,734,077	1,466,291	14,403,397

Table C-7. Residential Low Income TRC Benefits Table

Gross TRC Benefits Per Year (\$000)												
Program	Program Year	TRC	Program Costs (\$000)	Program Benefits (\$000)	Capacity		Energy		Load Reductions in kW		MWh Saved	
					Annual		Annual		Annual	Lifetime	Annual	Lifetime
					Generation	Trans/Dist	Peak	Off Peak				
Low-Income	2016	1.6	\$8,562	\$13,438	\$1,154	\$817	\$2,856	\$3,419	3,067	29,411	22,373	219,123
	2017	1.7	\$8,601	\$14,288	\$1,195	\$831	\$2,981	\$3,551	3,135	30,365	22,953	226,855
	2018	1.8	\$8,612	\$15,526	\$1,214	\$845	\$3,107	\$3,678	3,085	31,492	22,600	235,931
	2019	2.0	\$8,932	\$17,633	\$1,309	\$910	\$3,453	\$4,078	3,235	34,530	23,818	260,024
	2020	2.1	\$9,498	\$19,901	\$1,449	\$1,008	\$3,948	\$4,649	3,603	38,192	26,746	289,007
Total			\$44,205	\$80,786	\$6,322	\$4,411	\$16,345	\$19,376	16,125	163,991	118,490	1,230,940

Table C-8. Residential (Exclusive of Low-Income) TRC Benefits Table

Gross TRC Benefits By Program Per Year (\$000)												
Program	Program Year	TRC	Program Costs (\$000)	Program Benefits (\$000)	Capacity		Energy		Load Reductions in kW		MWh Saved	
					Annual		Annual		Annual	Lifetime	Annual	Lifetime
					Generation	Trans/Dist	Peak	Off Peak				
<i>Residential (Exclusive of Low-Income)</i>	2016	1.6	\$30,020	\$47,792	\$5,381	\$3,808	\$12,247	\$14,679	18,647	141,500	129,359	956,255
	2017	1.7	\$30,257	\$50,743	\$5,637	\$3,921	\$12,879	\$15,350	20,342	147,415	141,053	994,486
	2018	1.8	\$30,674	\$55,591	\$5,847	\$4,067	\$13,531	\$16,192	21,288	155,510	147,191	1,050,046
	2019	2.0	\$31,519	\$62,043	\$6,192	\$4,307	\$14,632	\$17,590	21,983	167,368	151,861	1,135,429
	2020	2.1	\$32,206	\$67,997	\$6,610	\$4,598	\$16,035	\$19,339	22,609	179,517	156,457	1,222,857
<i>Residential DR</i>	2016	0.9	\$4,115	\$3,590	\$2,102	\$1,488	\$0	\$0	38,738	38,738	0	0
	2017	1.2	\$3,271	\$4,029	\$2,376	\$1,653	\$0	\$0	43,333	43,333	0	0
	2018	1.3	\$3,191	\$4,072	\$2,401	\$1,670	\$0	\$0	43,865	43,865	0	0
	2019	1.4	\$2,970	\$4,135	\$2,438	\$1,696	\$0	\$0	44,606	44,606	0	0
	2020	1.3	\$3,191	\$4,220	\$2,489	\$1,731	\$0	\$0	45,598	45,598	0	0
Total			\$171,414	\$304,210	\$41,474	\$28,939	\$69,325	\$83,150	116,737	803,177	725,922	5,359,074

Table C-9. Small C&I TRC Benefits Table

Gross TRC Benefits By Program Per Year (\$000)												
Program	Program Year	TRC	Program Costs (\$000)	Program Benefits (\$000)	Capacity		Energy		Load Reductions in kW		MWh Saved	
					Annual		Annual		Annual	Lifetime	Annual	Lifetime
					Generation	Trans/Dist	Peak	Off Peak				
Small C&I EE	2016	1.6	\$21,535	\$35,280	\$5,837	\$4,131	\$11,116	\$9,223	13,822	160,474	73,954	721,352
	2017	1.7	\$21,553	\$35,978	\$5,934	\$4,127	\$11,359	\$9,393	13,928	162,245	79,879	730,564
	2018	1.7	\$21,452	\$36,763	\$5,979	\$4,159	\$11,619	\$9,585	13,883	164,235	84,818	740,678
	2019	1.8	\$21,447	\$37,994	\$6,058	\$4,214	\$12,068	\$9,917	13,941	167,117	85,491	757,427
	2020	1.8	\$21,082	\$39,002	\$6,135	\$4,267	\$12,568	\$10,283	14,144	169,469	79,113	771,388
CHP	2016	0.7	\$1,787	\$1,334	\$452	\$108	\$763	\$888	642	9,637	4,278	64,176
	2017	0.7	\$1,878	\$1,387	\$471	\$111	\$803	\$934	669	10,029	4,452	66,786
	2018	0.7	\$1,974	\$1,445	\$489	\$116	\$846	\$985	696	10,439	4,635	69,526
	2019	0.7	\$2,077	\$1,514	\$508	\$120	\$897	\$1,043	725	10,871	4,827	72,403
	2020	0.7	\$706	\$510	\$169	\$40	\$306	\$355	242	3,624	1,609	24,134
Small C&I DR	2016	0.7	\$174	\$120	\$70	\$50	\$0	\$0	1,290	1,290	0	0
	2017	0.7	\$176	\$118	\$70	\$49	\$0	\$0	1,274	1,274	0	0
	2018	0.7	\$178	\$117	\$69	\$48	\$0	\$0	1,258	1,258	0	0
	2019	0.6	\$179	\$115	\$68	\$47	\$0	\$0	1,242	1,242	0	0
	2020	0.6	\$181	\$113	\$67	\$47	\$0	\$0	1,226	1,226	0	0
Total			\$116,378	\$191,790	\$32,376	\$21,633	\$62,345	\$52,606	73,917	869,365	423,057	4,018,433

Table C-10. Large C&I TRC Benefits Table

Program	Program Year	TRC	Program Costs (\$000)	Program Benefits (\$000)	Capacity		Energy		Load Reductions in kW		MWh Saved	
					Annual		Annual		Annual	Lifetime	Annual	Lifetime
					Generation	Trans/Dist	Peak	Off Peak				
Large C&I EE	2016	1.4	\$37,373	\$53,831	\$10,727	\$7,591	\$17,153	\$16,419	22,896	307,218	95,050	1,269,872
	2017	1.4	\$37,869	\$54,668	\$10,866	\$7,558	\$17,491	\$16,698	23,029	309,353	95,606	1,280,022
	2018	1.5	\$38,340	\$55,650	\$10,922	\$7,597	\$17,876	\$17,043	23,091	311,699	95,678	1,291,787
	2019	1.5	\$38,896	\$57,042	\$11,001	\$7,652	\$18,448	\$17,526	23,218	314,666	96,256	1,308,445
	2020	1.5	\$39,498	\$58,656	\$11,076	\$7,704	\$19,159	\$18,108	23,413	317,269	97,507	1,325,461
CHP	2016	0.9	\$25,639	\$24,003	\$5,732	\$4,057	\$12,825	\$15,770	11,238	168,574	74,432	1,116,473
	2017	0.9	\$26,855	\$24,958	\$5,994	\$4,169	\$13,470	\$16,563	11,679	175,189	77,354	1,160,309
	2018	0.9	\$28,141	\$26,003	\$6,222	\$4,328	\$14,176	\$17,460	12,142	182,136	80,422	1,206,336
	2019	0.9	\$29,503	\$27,243	\$6,461	\$4,494	\$15,006	\$18,470	12,629	189,429	83,644	1,254,665
	2020	0.9	\$10,049	\$9,184	\$2,151	\$1,496	\$5,120	\$6,283	4,210	63,143	27,881	418,222
Large C&I DR	2016	0.0	\$165	\$0	\$0	\$0	\$0	\$0	0	0	0	0
	2017	2.1	\$5,533	\$11,742	\$6,925	\$4,817	\$0	\$0	126,300	126,300	0	0
	2018	2.1	\$5,519	\$11,668	\$6,882	\$4,787	\$0	\$0	125,695	125,695	0	0
	2019	2.1	\$5,504	\$11,595	\$6,838	\$4,756	\$0	\$0	125,091	125,091	0	0
	2020	2.1	\$5,489	\$11,521	\$6,795	\$4,726	\$0	\$0	124,487	124,487	0	0
Total			\$334,371	\$437,762	\$108,592	\$75,733	\$150,724	\$160,339	292,030	2,463,163	823,832	11,631,593

Table E-6. Residential DR Program Measure Level Details

Residential DR Program											
Measure List			Gross First Year Savings per Unit		Incentive Range		Annual Participation (Units)				
Measure Name	Units	Pathway	Energy Savings (kWh/unit)	Peak Demand Savings (kW/unit)	Low	High	PY 2016	PY 2017	PY 2018	PY 2019	PY 2020
Behavioral DR	Participant	Retail or Trade Ally/Contractor	0.0	0.080	\$0.00	\$120.00	0	12,000	14,400	17,280	20,736
Residential DLC	Switch	Retail or Trade Ally/Contractor	0.0	0.825	\$0.00	\$120.00	45,294	44,720	44,152	43,592	62,500
Smart/Learning Thermostat	Thermostat	Retail or Trade Ally/Contractor	0.0	0.750	\$0.00	\$120.00	0	5,000	6,000	7,200	8,640

Table E-7. Small C&I DR Program Measure Level Details

Small C&I DR Program											
Measure List			Gross First Year Savings per Unit		Incentive Range		Annual Participation (Units)				
Measure Name	Units	Pathway	Energy Savings (kWh/unit)	Peak Demand Savings (kW/unit)	Low	High	PY 2016	PY 2017	PY 2018	PY 2019	PY 2020
Commercial DLC	Thermostat	Retail or Trade Ally/Contractor	0.0	0.750	\$0.00	\$120.00	1,593	1,573	1,553	1,533	1,514

Table E-8. Large C&I DR Measure Level Details

Large C&I DR Program											
Measure List			Gross First Year Savings per Unit		Incentive Range		Annual Participation (Units)				
Measure Name	Units	Pathway	Energy Savings (kWh/unit)	Peak Demand Savings (kW/unit)	Low	High	PY 2016	PY 2017	PY 2018	PY 2019	PY 2020
DR Aggregator Program, not PJM-enrolled	Customer	Retail or Trade Ally/Contractor	0.0	559.585	\$8,393.78	\$50,362.69	0	86	86	86	86
DR Aggregator Program, PJM-enrolled	Customer	Retail or Trade Ally/Contractor	0.0	481.963	\$4,196.89	\$25,181.34	0	123	122	121	120

Appendix F. Exhibits RAS

Exhibits RAS-1, RAS-2, RAS-3 and RAS-4 are attached to the Direct Testimony of Richard A. Schlesinger.

**PHASE III ENERGY EFFICIENCY AND CONSERVATION PLAN
PROGRAM COST BY RATE CLASS (PY2016 -PY2020)**

Exhibit RAS-1

Program	Residential	Small C&I	Large C&I	Municipal	Total
Residential					
1. Residential (Exclusive of Low-Income)					
	\$100,070,556	\$0	\$0	\$0	\$100,070,556
2. Residential Low-Income	\$29,399,456	\$0	\$0	\$0	\$29,399,456
3. Residential DR	\$20,116,919	\$0	\$0	\$0	\$20,116,919
Subtotal Residential Programs	\$149,586,931	\$0	\$0	\$0	\$149,586,931
Small Commercial					
4. Small Commercial	\$0	\$39,580,311	\$0	\$0	\$39,580,311
5. Small Commercial G/E/NP	\$0	\$4,674,354	\$0	\$0	\$4,674,354
6. Small Commercial Low-Income	\$0	\$3,554,143	\$0	\$0	\$3,554,143
7. Small C&I CHP (Exclusive of G/E/NP)	\$0	\$779,201	\$0	\$0	\$779,201
8. Small C&I CHP G/E/NP	\$0	\$654,224	\$0	\$0	\$654,224
9. Small Commercial DR	\$0	\$942,773	\$0	\$0	\$942,773
Subtotal C&I Small Programs	\$0	\$50,185,005	\$0	\$0	\$50,185,005
Large Commercial					
10. Large Commercial	\$0	\$0	\$47,576,988	\$0	\$47,576,988
11. Large Commercial G/E/NP	\$0	\$0	\$7,457,153	\$0	\$7,457,153
12. Large Commercial Low-Income	\$0	\$0	\$3,192,104	\$0	\$3,192,104
13. CHP (Exclusive of G/E/NP)	\$0	\$0	\$13,411,937	\$0	\$13,411,937
14. CHP G/E/NP	\$0	\$0	\$10,129,741	\$0	\$10,129,741
15. Large Commercial DR	\$0	\$0	\$27,136,803	\$0	\$27,136,803
Subtotal C&I Large Programs	\$0	\$0	\$108,904,726	\$0	\$108,904,726
Municipal					
16. LED Retrofit (Small Commercial)	\$0	\$0	\$0	\$209,602	\$209,602
17. LED Retrofit (Large Commercial)	\$0	\$0	\$0	\$90,596	\$90,596
Subtotal Municipal Programs	\$0	\$0	\$0	\$300,198	\$300,198
Subtotal Com., Ind. & Muni. Programs	\$0	\$50,185,005	\$108,904,726	\$300,198	\$159,389,929
Support Services	\$49,619,414	\$17,390,907	\$37,739,399	\$104,030	\$104,853,750
Research and Development	\$3,043,309	\$3,309,747	\$7,182,366	\$19,798	\$13,555,220
Grand Total	\$202,249,654	\$70,885,659	\$153,826,491	\$424,026	\$427,385,830

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PECO Exhibit No. 1

PECO PROGRAM YEARS 2016-2020
ACT 129 - PHASE III ENERGY EFFICIENCY AND
CONSERVATION PLAN

Submitted to:
Pennsylvania Public Utility Commission

Submitted by:



November 30, 2015
Revised February 12, 2016
Revised December 17, 2019

- » Annual reports filed with the Commission in Phase II
- » Energy Efficiency and Demand Response portfolio benchmarking research on program delivery achieved in other states, as well as a review of best practice design and delivery approaches
- » PECO evaluator reports: a) Baseline Study; b) Potential Study; c) Control Points Study
- » Statewide Evaluator reports: a) Baseline Studies^{3,4,5}; b) Potential Studies^{6,7}; c) Light Metering Study⁸; d) Incremental Cost Databases^{9,10}
- » Updated savings and other inputs per the 2016 Final TRM Order¹²
- » Other updated information (e.g., avoided costs, discount rates, load shapes, cost escalation rates, line loss factors, internal labor rates, etc.)
- » Discussions with other PA utilities and members of our stakeholder group to review strategies and areas of possible coordination
- » Customization of a comprehensive benefit-cost screening tool, with specific adjustments to the required calculation¹¹
- » Iterative program design planning meetings to ensure a combination of programs for all customer classes, including comprehensive measures, with attention to cost-effectiveness thresholds

1.3 Summary Tables of Portfolio Savings Goals, Budget and Cost-Effectiveness

PECO will invest up to a total of \$427.4 million in energy efficiency and demand response programs over a five-year program period for PY 2016 through PY 2020. The Company plans to achieve approximately 107% of the energy savings target established in the PUC Implementation Order. Additionally, consistent with Phase III requirements, PECO has developed this Plan to meet or exceed the required G/E/NP savings requirement of at least 3.5% of the overall energy savings target and meet or exceed the requirement of 5.5% of the overall energy savings target coming from the low-income sector. In addition, PECO plans to achieve approximately 106% of the PY 2017 - PY 2020 peak load reduction target of 161 MW from dedicated demand response programs.

Figure 2 presents the Phase III portfolio structure. Section 3.2 of this report provides a full description of each program.

³ Pennsylvania Statewide Act 129 2014 Non-Residential End-Use & Saturation Study, Nexant, April 2014.

⁴ Pennsylvania Statewide Act 129 Residential Baseline Study. GDS Associates. April 2014.

⁵ Demand Response Potential Study, 2015. Prepared by the PA Statewide Evaluation Team; GDS Associates, Nexant, Research Into Action, Apex Analytics. February 25, 2015.

⁶ Energy Efficiency Potential for Pennsylvania. Prepared by the PA Statewide Evaluation Team; GDS Associates, Nexant, Research Into Action, Apex Analytics. February 2015.

⁷ Distributed Generation Potential Study for Pennsylvania. Prepared by the PA Statewide Evaluation Team; GDS Associates, Nexant, Research Into Action, Apex Analytics. March, 2015.

⁸ Pennsylvania Statewide Act 129 2014 Commercial & Residential Light Metering Study. Prepared by the PA Statewide Evaluation Team; GDS Associates, Nexant, Research Into Action, Apex Analytics. January 13, 2014.

⁹ SWE Team Residential Incremental Measure Cost Database, V2.1. Prepared by the PA Statewide Evaluation Team; GDS Associates, Nexant, Research Into Action, Apex Analytics. May 15, 2015.

¹⁰ SWE Team Incremental Measure Cost Database, V1.1. Prepared by the PA Statewide Evaluation Team; GDS Associates, Nexant, Research Into Action, Apex Analytics. February 15, 2013.

¹¹ Pennsylvania PUC 2016 Total Resource Cost Test M-2015-2468992, June 11, 2015

Figure 2: PECO Phase III PY 2016-2020 Energy Efficiency and Demand Response Portfolio Structure

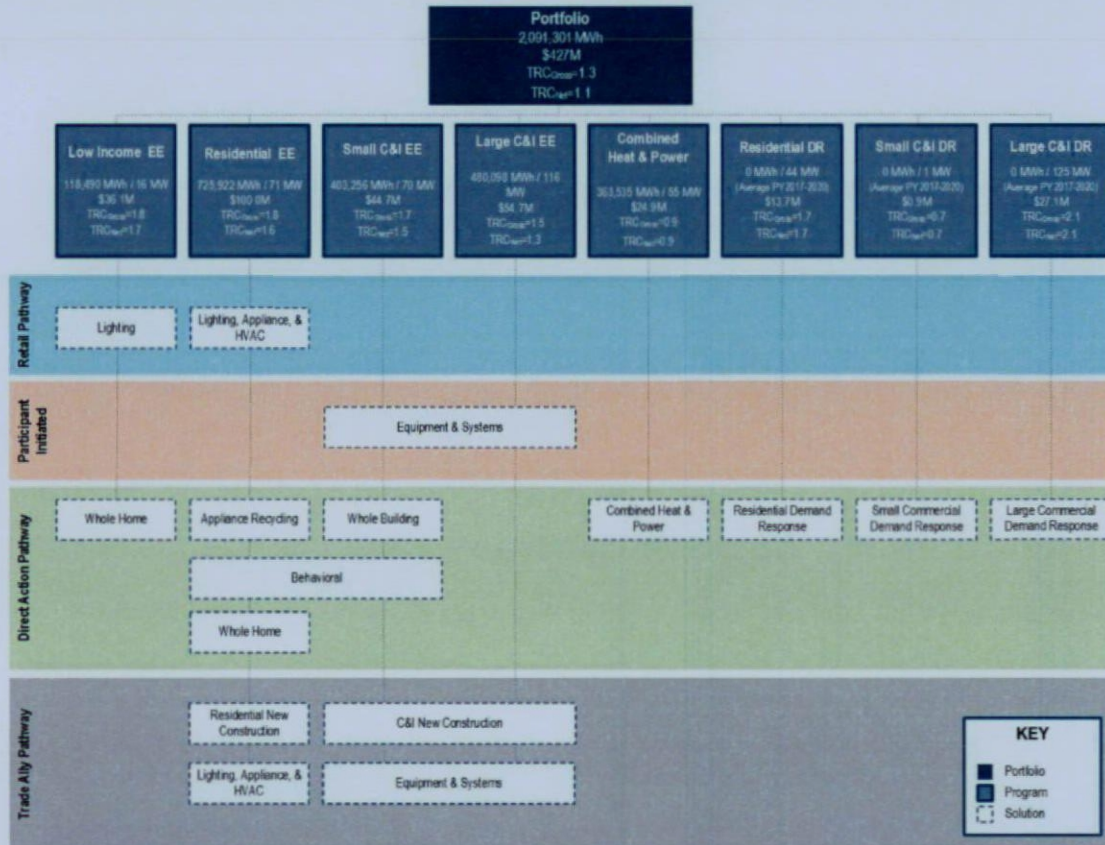


Table 2 through Table 4. Summarize PECO's savings targets, projected budgets, participation levels, benefit-cost ratios and acquisition costs for each program in each program year, as well as for Phase III as a whole.

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Table 2. PECO EE and DR Program Summary – Phase III Energy Savings and Acquisition Costs

Programs	Annual Energy Savings (MWh)						Percent of Energy Savings	TRC Analysis		Acquisition Costs		
	PY 2016	PY 2017	PY 2018	PY 2019	PY 2020	5-Year Total		B/C Ratio (Gross)	B/C Ratio (Net)	Incentive Costs (\$/kWh)	Non-Incentive Costs (\$/kWh)	Total Costs (\$/kWh)
Residential EE (Exclusive of Low-Income)	129,359	141,053	147,191	151,861	156,457	725,922	35%	1.8	1.6	\$0.05	\$0.09	\$0.14
Low-income EE	22,373	22,953	22,600	23,818	26,746	118,490	6%	1.8	1.7	\$0.01	\$0.29	\$0.30
Small C&I EE	73,954	79,879	84,818	85,491	79,113	403,256	19%	1.7	1.5	\$0.03	\$0.08	\$0.11
Large C&I EE	95,050	95,606	95,678	96,256	97,507	480,098	23%	1.5	1.3	\$0.05	\$0.06	\$0.11
CHP	78,710	81,806	85,057	88,471	29,490	363,535	17%	0.9	0.9	\$0.05	\$0.02	\$0.07
Residential DR	0	0	0	0	0	0	0%	1.2	1.2	\$0.00	\$0.00	\$0.00
Small C&I DR	0	0	0	0	0	0	0%	0.7	0.7	\$0.00	\$0.00	\$0.00
Large C&I DR	0	0	0	0	0	0	0%	2.1	2.1	\$0.00	\$0.00	\$0.00
Grand Total – All Phase III Programs	399,445	421,298	435,346	445,899	389,314	2,091,301	100%	1.3	1.1	\$0.06	\$0.14	\$0.20

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* Total savings from the G/E/NP customers (which are eligible for the Small C&I EE, Large C&I EE, and CHP Programs) are forecasted to be 273,530 MWh, equivalent to 13% of total portfolio savings over the Phase III period and 14% of the Phase III energy savings compliance target.

* Energy savings are at the meter.

* For the Residential EE Program, although Net and Gross benefits and costs are different (net benefits = \$161.0 Million, net costs = \$101.0 Million; gross benefits = \$243.5 Million, gross costs = \$134.0 Million), the ratio of benefits to costs is very similar. This is due to the fact that the majority of the costs of this program are variable and scale with savings (both net and gross) and under the 2001 California Standard Practice Manual, incentives to freeriders do not count as costs in the TRC test.

Table 3. PECO EE and DR Program Summary – Phase III Demand Savings

Programs	Peak Demand Savings (MW)					5-Year Total EE Programs	4-Year Average DR Programs
	PY 2016	PY 2017	PY 2018	PY 2019	PY 2020		
Residential EE (Exclusive of Low-Income)	19	20	21	22	23	71	N/A
Low-Income EE	3	3	3	3	4	16	N/A
Small C&I EE	14	14	14	14	14	70	N/A
Large C&I EE	23	23	23	23	23	116	N/A
CHP	12	12	13	13	4	55	N/A
Residential DR	39	43	44	45	46	N/A	44
Small C&I DR	1	1	1	1	1	N/A	1
Large C&I DR	0	126	126	125	124	N/A	125
Grand Total – All Phase III Programs	110	244	245	247	240	327	171

¹ Demand savings from EE specific programs do not count towards the demand reduction compliance target. They are being shown here for reference only to show demand savings achieved through the EE programs. Demand savings from installation of EE measures are cumulative over the phase.

² Demand savings counting towards demand reduction compliance target achieved through dedicated demand reduction programs. Demand savings from demand response measures are not cumulative from year to year. The compliance target is based on the average demand reduction of compliance during the period of PY 2017 – PY 2020.

Table 4. PECO EE and DR Program Summary – Phase III Budget and Total Participants

Programs	Budget (Million \$)						5-Year Total	Average Annual	Percent of Spending	Total Participants (Cumulative)
	PY 2016	PY 2017	PY 2018	PY 2019	PY 2020					
Residential (Exclusive of Low-Income)	\$19.7	\$19.8	\$19.8	\$20.2	\$20.6	\$100.0	\$20.0	23%	1,815,820	
Low-Income	\$7.0	\$7.0	\$7.0	\$7.3	\$7.8	\$36.1	\$7.2	8%	139,927	
Small C&I	\$9.0	\$9.0	\$9.0	\$9.0	\$8.6	\$44.7	\$8.9	10%	30,515	
Large C&I	\$10.6	\$10.8	\$10.9	\$11.1	\$11.3	\$54.7	\$10.9	13%	2,370	
CHP	\$5.3	\$5.6	\$5.8	\$6.1	\$2.2	\$25.0	\$5.0	6%	75	
Residential DR	\$5.1	\$3.9	\$3.8	\$3.5	\$3.8	\$20.1	\$4.0	5%	312,052	
Small C&I DR	\$0.2	\$0.2	\$0.2	\$0.2	\$0.2	\$0.9	\$0.2	0%	7,766	
Large C&I DR	\$0.2	\$6.8	\$6.8	\$6.7	\$6.7	\$27.1	\$5.4	6%	830	
Support Services	\$22.5	\$19.9	\$20.0	\$20.0	\$22.6	\$104.9	\$21.0	25%	N/A	
Research and Development	\$5.9	\$2.6	\$2.2	\$1.4	\$1.7	\$13.8	\$2.8	3%	N/A	
Grand Total – All Phase III Programs	\$85.5	\$85.5	\$85.5	\$85.5	\$85.5	\$427.4	\$85.5	100%	2,309,355	

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Table 5 and Table 6 present portfolio lifetime costs and benefits at the various sector levels. Overall, the portfolio is cost-effective.

Table 5. Portfolio Summary of Lifetime Costs and Benefits of Energy Efficiency Measures

Portfolio	Discount Rate	Total Discounted Lifetime Costs (\$000)	Total Discounted Lifetime Benefits (\$000)	Total Discounted Net ¹ Lifetime Benefits (\$000)	Cost-Benefit Ratio (TRC)
Residential (exclusive of Low-Income) ²	7.6%	\$133,961	\$243,496	\$109,535	1.8
Low-Income	7.6%	\$38,250	\$69,128	\$30,879	1.8
Small C&I	7.6%	\$87,850	\$147,957	\$60,307	1.7
Large C&I	7.6%	\$203,138	\$263,343	\$60,205	1.3
Governmental/Educational/Non-Profit	7.6%	\$82,132	\$94,858	\$12,727	1.2
Common Costs	7.6%	\$103,643			
Total	N/A	\$648,774	\$818,783	\$170,009	1.3

¹ "Net" refers to the arithmetic difference between the previous two columns. It does not refer to net verified savings.

² The PUC Implementation Order disallowed the inclusion of low-income participation in standard, non-low-income-specific residential programs in the calculation of savings towards the 5.5% low-income carve-out.

³ Low-Income and G/E/NP are not customer rate classes or sectors, but rather customer segments that fit under the Residential, Small C&I and Large C&I customer classes. The Low-Income customers can be on meters listed under all three customer classes. G/E/NP customers may be on meters within either the Small C&I or Large C&I customer classes.

⁴ The TRC ratios are rounded to the nearest tenth.

* Note that these TRC values do not include portfolio administration costs.

Table 6. Portfolio Summary of Lifetime Costs and Benefits of Demand Response Measures

Portfolio	Discount Rate	Total Discounted Lifetime Costs (\$000)	Total Discounted Lifetime Benefits (\$000)	Total Discounted Net ¹ Lifetime Benefits (\$000)	Cost-Benefit Ratio (TRC)
Residential (exclusive of Low-Income) ²	7.6%	\$14,675	\$17,318	\$2,642	1.2
Low-Income	7.6%	N/A	N/A	N/A	N/A
Large C&I ³	7.6%	\$15,667	\$36,843	\$21,176	2.4
Small C&I ³	7.6%	\$655	\$431	-\$223	0.7
Governmental/Educational/Non-Profit ³	7.6%	\$3,036	\$2,126	-\$909	0.7
Total	N/A	\$34,033	\$56,718	\$22,685	1.7

¹ "Net" refers to the arithmetic difference between the previous two columns. It does not refer to net verified savings.

² The June 19, 2015 Implementation Order disallowed the inclusion of low-income participation in standard, non-low-income-specific residential programs in the calculation of savings towards the 5.5% low-income carve-out.

³ Low-Income and G/E/NP are not customer rate classes or sectors, but rather customer segments that fit under the Residential, Small C&I and Large C&I customer classes. The Low-Income customers can be on meters listed under all three customer classes. G/E/NP customers may be on meters within either the Small C&I or Large C&I customer classes.

⁴ Large C&I, Small C&I, and G/E/NP updated to fix reporting error in original filing, discovered during Res DR cost adjustment (December 2019). Model inputs for Large C&I, Small C&I and G/E/NP were unchanged.

* Note that these TRC values do not include portfolio administration costs.

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Table 7 shows cumulative gross annual energy and demand savings.

Table 7. Summary of Portfolio Energy and Demand Savings

MWh and kW Saved for Consumption Reductions	PY 2016		PY 2017		PY 2018		PY 2019		PY 2020		Total	
	MWh	kW	MWh	kW	MWh	kW	MWh	kW	MWh	kW	MWh	kW
Baseline ¹	38,809,100	N/A	38,809,100	N/A	38,809,100	N/A	38,809,100	N/A	38,809,100	N/A	38,809,100	N/A
Residential Sector (exclusive of Low-Income) - Projected Portfolio Savings ²	129,359	57,385	141,053	63,675	147,191	65,153	151,861	66,589	156,457	68,207	725,922	116,737
Low-Income Sector - Projected Portfolio Savings ²	22,373	3,067	22,953	3,135	22,600	3,085	23,818	3,235	26,746	3,603	118,490	16,125
Small C&I Sector - Projected Portfolio Savings ²	68,357	14,034	73,260	14,133	77,175	14,083	77,829	14,134	71,361	14,097	367,982	65,417
Large C&I Program - Net Weather Adjusted Savings ²	123,347	25,951	125,454	152,609	127,162	152,305	129,454	152,077	99,961	147,051	605,377	252,907
Governmental/Educational/Non-Profit Sector - Projected Portfolio Savings ²	56,010	9,904	58,578	10,136	61,217	10,378	62,936	10,633	34,789	6,573	273,530	47,624
EE&C Plan Total - Projected Savings	399,445	110,340	421,298	243,688	435,346	245,003	445,899	246,668	389,314	239,531	2,091,301	498,810
EE&C Plan Total - Percentage of Target to be Met	15%	N/A	15%	N/A	15%	N/A	15%	N/A	15%	N/A	100%	N/A
Estimated Phase II Carryover Savings	0	0	0	0	0	0	0	0	0	0	0	0
Total Projected Savings Phase III + Estimated Phase II Carryover Savings	399,445	110,340	421,298	243,688	435,346	245,003	445,899	246,668	389,314	239,531	2,091,301	498,810
EE&C Plan Total - Percentage of Target Met ³	20%	N/A	21%	N/A	22%	N/A	23%	N/A	20%	N/A	107%	N/A
Percent Reduction From Baseline	1.0%	N/A	1.1%	N/A	1.1%	N/A	1.1%	N/A	1.0%	N/A	5.4%	N/A
Commission-Identified Goal ⁴											1,962,659	N/A
Percent Savings Due to Portfolio Above or Below Commission-Identified Goal											107%	N/A

¹ As defined in the June 19, 2015 Implementation Order.

² Adjusted for weather and extraordinary load, as applicable.

³ Low-Income and G/E/NP are not customer rate classes or sectors, but rather customer segments that fit under the Residential, Small C&I and Large C&I customer classes. The Low-Income customers can be on meters listed under all three customer classes. G/E/NP customers may be on meters within either the Small C&I or Large C&I customer classes.

⁴ The June 19, 2015 implementation Order directed at least 15% of an EDC's target amount in each program year.

⁵ Demand savings totals include the five-year sum of all EE program demand savings and the PY 2020 DR Program demand savings as a representative of the total demand savings achieved over the phase.

Table 8 presents summary portfolio costs over the PY 2016-2020 period.

Table 8. Summary of Portfolio Costs

Portfolio	PY 2016		PY 2017		PY 2018		PY 2019		PY 2020	
	\$M	%	\$M	%	\$M	%	\$M	%	\$M	%
Residential Portfolio Annual Budget	\$24.8	29%	\$23.7	28%	\$23.6	28%	\$23.7	28%	\$24.3	28%
Low-income Portfolio Annual Budget	\$7.0	8%	\$7.0	8%	\$7.0	8%	\$7.3	9%	\$7.8	9%
Small C&I Portfolio Annual Budget	\$8.4	10%	\$8.4	10%	\$8.5	10%	\$8.4	10%	\$8.1	9%
Large C&I Portfolio Annual Budget	\$12.2	14%	\$19.1	22%	\$19.3	23%	\$19.6	23%	\$17.6	21%
Governmental/Educational/Non-Profit Portfolio Annual Budget	\$4.7	6%	\$4.8	6%	\$5.0	6%	\$5.1	6%	\$3.3	4%
Total Portfolio-specific Budget	\$57.1	67%	\$63.0	74%	\$63.3	74%	\$64.1	75%	\$61.2	72%
Portfolio Common Costs	\$28.4	33%	\$22.4	26%	\$22.1	26%	\$21.3	25%	\$24.3	28%
Total Portfolio Annual Budget	\$85.5	100%	\$85.5	100%	\$85.5	100%	\$85.5	100%	\$85.5	100%

¹ Low-income and G/E/NP are not customer rate classes or sectors, but rather customer segments that fit under the Residential, Small C&I and Large C&I customer classes. The Low-income customers can be on meters listed under all three customer classes. G/E/NP customers may be on meters within either the Small C&I or Large C&I customer classes.

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2.2 Plan Data: Costs, Cost-Effectiveness and Savings by Program, Sector and Portfolio

Various sections of this report contain the following data tables as required by the Commission's Plan III template:

- » Section 1.3: [Table 5. Portfolio Summary of Lifetime Costs and Benefits of Energy Efficiency Measures](#)
- » Section 1.3: [Table 6. Portfolio Summary of Lifetime Costs and Benefits of Demand Response Measures](#)
- » Section 1.3: [Table 7. Summary of Portfolio Energy and Demand Savings](#)
- » Section 1.3: [Table 8. Summary of Portfolio Costs](#)
- » Section 2.1: [Table 9. Program Summaries](#)

2.3 Budget and Parity Analysis

Table 10. Budget and Parity Analysis Summary (PY 2016-2020)

Customer Class	Budget (\$M)	% of Total EDC Budget	% of Total Budget Excluding Other Expenditures	% of Total Customer Revenue ¹	Difference
Residential	\$120.2	28%	39%	0.56%	11%
Low-Income	\$36.1	8%	12%	0.17%	3%
Residential Subtotal	\$156.3	37%	51%	0.73%	14%
Small C&I	\$41.8	10%	14%	0.20%	4%
Large C&I	\$87.8	21%	29%	0.41%	8%
C&I Subtotal	\$129.6	30%	42%	0.61%	12%
Governmental/Educational/Non-Profit	\$22.9	5%	8%	0.11%	2%
Governmental/Educational/Non-Profit Subtotal	\$22.9	5%	7%	0.11%	2%
Residential, C&I, Governmental/Educational/Non-Profit Subtotal	\$308.8	72%	100%	1.44%	28%
Other Expenditures	\$118.6	28%	N/A	0.56%	N/A
Other Expenditures Subtotal	\$118.6	28%	N/A	0.56%	N/A
EDC TOTAL	\$427.4	100%	N/A	2.00%	N/A

¹ Percent of Total Customer Revenue calculated using 2006 total revenues as of 12/31/06.

² Low-Income and G/E/NP are not customer rate classes or sectors, but rather customer segments that fit under the Residential, Small C&I and Large C&I customer classes. The Low-Income customers can be on meters listed under all three customer classes. G/E/NP customers may be on meters within either the Small C&I or Large C&I customer classes. Low-Income and G/E/NP have been separated for the purposes of this table.

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sealing and maintenance, low-flow showerheads and faucet aerators, water heater and pipe wrap, power strips and lighting. PECO's low-income customers will have access to a comprehensive set of measures available for direct-installation or giveaways at no cost to them. PECO's small C&I customers will have access to direct installation of select prescriptive measures, such as lighting and refrigeration, with minimal cost. PECO's largest C&I customers will have access to customized account management services and incentives, to support identification, prioritization, and installation of large, comprehensive projects. Multifamily is a unique customer segment that will be deliberately targeted in the implementation cycle. PECO is offering a comprehensive list of measures that satisfies the multifamily segment and touches all customer classes. For example, a multifamily facility is defined as all building types with more than one unit when the building is bigger than a duplex (or 1-family attached unit). It can be either a small C&I or a large C&I building, master-metered as a whole, or only in the common areas, while individual housing units are individually metered. Furthermore, there are master-metered buildings that house low-income qualified families. Both master-metered and individually metered multifamily properties will be eligible for all measures contained in the entire portfolio. Costs and savings related to multifamily measures delivered to residential, individually metered customers are assigned to the residential class. Costs and savings related to multifamily measures delivered to residents in master-metered buildings are assigned to the applicable C&I class.

Starting in Program Year 2018, PECO will begin to phase out incentives for CFLs in its Residential Energy Efficiency Programs. By Program Year 2019, PECO will no longer offer incentives for the purchase of CFLs. Beginning in Program Year 2019, all lighting incentives for the Residential Energy Efficiency Programs will be for non-CFLs.

All Energy Efficiency kits in the Residential Energy Efficiency Program with lighting measures will include at least one LED lamp. Additional LED lamps may be included so long as their inclusion does not jeopardize the Company's ability to meet its EE target within its budget.

3.2 Individual Program Descriptions

3.2.1 Residential Programs

3.2.1.1 Residential Energy Efficiency Program, (Exclusive of Low-Income)

Program Title and Years	PECO Residential Energy Efficiency Program PY 2016 – PY 2020															
Objectives and Savings	<p>The purpose of the PECO Residential Energy Efficiency (Residential EE) Program is to offer comprehensive and cross-cutting opportunities to assist residential customers save energy. The program encompasses a variety of participant solutions and measures to achieve this goal.</p> <table border="1"> <thead> <tr> <th colspan="5">Five Year Program Savings and Spending Forecast</th> </tr> <tr> <th>Total Annual MWh</th> <th>Total Annual kW</th> <th>Total Budget (\$M)</th> <th>% of Portfolio Savings</th> <th>% of Portfolio Spending</th> </tr> </thead> <tbody> <tr> <td>725,922</td> <td>104,869</td> <td>\$100.0</td> <td>35%</td> <td>23%</td> </tr> </tbody> </table>	Five Year Program Savings and Spending Forecast					Total Annual MWh	Total Annual kW	Total Budget (\$M)	% of Portfolio Savings	% of Portfolio Spending	725,922	104,869	\$100.0	35%	23%
Five Year Program Savings and Spending Forecast																
Total Annual MWh	Total Annual kW	Total Budget (\$M)	% of Portfolio Savings	% of Portfolio Spending												
725,922	104,869	\$100.0	35%	23%												
Target Market	The eligible population and target markets for the PECO Residential EE Program are all PECO residential electric customers.															
Program Description	The PECO Residential EE Program is designed to offer our residential customers opportunities to save energy across all their electric end-uses and to market those															

opportunities in ways that minimize lost savings opportunities. The program encompasses a comprehensive series of Solutions designed to influence customer behavior and purchasing decisions. The Solutions in the Residential EE Program include approaches that cut across major channels for communicating with customers or trade allies, and reflect the various ways a customer may take advantage of the energy efficiency opportunities available.

The program includes Lighting, Appliances & HVAC Solutions to offer customers energy savings opportunities through a retail pathway to assist customers in purchasing the most efficient technology when they are shopping for new products. The program also includes an Appliance Recycling Solution to help customers recycle energy wasting appliances. For those customers that want to understand how to improve the energy performance of their entire home, PECO will offer the comprehensive Whole Home Solution; and when developers or customers are building a new single family or multifamily home they can take advantage of the New Construction Solution.

Multifamily buildings will be a particular focus of the Residential EE Program. Families in multifamily buildings, which are defined as building types with more than one unit when the building is bigger than a duplex or 1-family attached unit, will have access to participation opportunities for both low-cost, in-unit, direct-install measures (e.g., LEDs, CFLs, power strips, showerheads and faucet aerators) as well as opportunities to participate in higher-cost incentivized measures such as appliance replacements. Multifamily building owners will have efficiency opportunities addressing whole building components such as HVAC updates or maintenance and building shell upgrades. Both master-metered and individually metered multifamily properties will be eligible for all measures contained in the entire portfolio. Costs and savings related to multifamily measures delivered to residential, individually metered customers are assigned to the residential class.

Measures installed in common areas of multifamily buildings, the costs and savings will be assigned according to the type of meter associated with the particular common area. For multifamily buildings in which verified low-income residents comprise less than 66 percent of units, the subsidies for common areas in individually metered buildings and all subsidies for master-metered buildings, except for those subsidies provided to residences that are verified as low-income, will be consistent with those available to other customers in the rate class in which electric service is taken.

A major element of the Residential EE Program is education and awareness for those customers that want an easy entry to, and benefit from, energy efficient products. Further, PECO's Residential EE Program will use the Behavioral Solution offering to leverage the power of social norming to drive persistent energy savings through smart energy practices.

For planning purposes, we used the following estimated forecasted savings across the Solutions:

Solution Offering	Forecasted Phase III Sum of First Year Savings (MWh)
Lighting, Appliances & HVAC	283,640
Appliance Recycling	76,882
Whole Home	37,667
Residential New Construction	4,386
Behavioral	304,999

Program Title and Years **PECO Residential Energy Efficiency Program PY 2016 – PY 2020**

In addition there is one unique segment that will receive targeted focus: Multifamily. The Multifamily segment as defined above is estimated to contribute 18,346 MWh.

Targeted Market Segments	Forecasted Phase III Sum of First Year Savings (MWh)
Multifamily	18,346

The Solution level savings projected here are estimated forecasts of activity for plan development purposes. PECO plans to spend no more \$100.0M and achieve approximately 725,922 MWh from the Residential EE Program. This program is cost-effective with a gross TRC of 1.8 and net TRC of 1.6.

Implementation Strategy

PECO will administer the Residential EE Program through CSPs that have a proven record of providing the services to be offered in this program effectively.

For the Lighting, Appliances & HVAC Solution, PECO will employ a retail pathway and will offer a combination of cash rebates, and upstream- or midstream-discounts to influence the adoption of energy efficiency measures. Rebates will reduce the initial cost barrier for customers purchasing and installing qualifying efficient products including high efficiency lighting, appliances, electronics, HVAC and water heating equipment that are typically sold through major retail outlets or through HVAC trade ally contractors.

PECO will offer the New Construction Solution and certain equipment replacement solutions through a trade ally and contractor pathway where PECO will collaborate with the community of architects, builders, and contractors to design and promote ENERGY STAR homes or other new construction standards that meet high energy efficiency performance standards. In many cases residential customers face decisions to replace certain equipment through contractors such as HVAC or water heating equipment. This pathway will also ensure that our residential customers have the opportunity to take advantage of our solutions when they are facing these types of projects in their homes.

The remaining solutions included in the Residential EE Program will be delivered through a direct action pathway where PECO will offer customer energy audits and assessments, and directly install energy efficiency improvements in customer homes and apartments at no cost, or significantly reduced cost, to the customer. Appliance recycling opportunities will be provided and homeowners and renters will be engaged directly to make products and informational material readily available through product giveaways, energy kits, an online web store, or opt-in direct mail technology as an option in-lieu of rebates.

The Behavioral Solution involves providing both digital and paper versions of home energy reports that compares the customers' electric consumption to similar households and makes personalized recommendations for the participates to use energy more efficiently. Other behavioral awareness tactics that may be utilized include real-time energy displays, social media updates, and community energy competitions.

Overview of Roles and Activities

PECO will lead the marketing efforts for the Residential EE Program, and will hire and manage experienced CSPs for implementation of the solutions within the program. PECO

Program Title
and Years

PECO Residential Energy Efficiency Program PY 2016 – PY 2020

will have a keen management focus on ensuring interested customers are channeled to the participation pathway that best fits their energy needs and ensure their participation experience is convenient, effective and minimizes lost opportunities. The CSPs working for PECO will have representative roles and responsibilities, including, but not limited to:

- » Development of upstream and midstream supplier networks and coordination with product retailers.
- » Program outreach and lead generation including development and distribution of program materials, neighborhood canvassing, managing inbound and outbound calls.
- » Manage in-home audits, including telephone customer screening, monitoring of auditors and contractors, direct-installation of measures, and customer reports.
- » Distribution of efficient measure giveaways or energy kits.
- » Appliance pick-up and recycling, including scheduling and executing appliance pickups from customer homes, verification of unit qualification for complimentary removal and incentive payment, pickup and proper disposal of units.
- » Rebate processing: receive, review, and verify applications; and pay rebates.
- » Program performance tracking and implementing continuous improvement.
- » Reporting program activities to meet program goals, as well as program and regulatory reporting requirements.

Program Title and Years **PECO Residential Energy Efficiency Program PY 2016 – PY 2020**

Program Issues, Risks, and Risk Management Strategies PECO has designed the Residential EE Program to manage the risks inherent to residential energy efficiency program implementation. The comprehensive portfolio design will allow PECO to closely monitor program results, and adjust implementation tactics (including marketing approaches, participation guidelines, incentives, and program resource allocation) to meet the portfolio level targets.

Key program issues, risks, and risk management strategies include:

Risk	Description	Management Strategy
Participation	Customer participation does not meet forecast expectations due to lack of program awareness or external forces (homeowner time or financial resources to manage project implementation, financial barriers, economic downturns, product availability, etc.)	PECO will collaborate with implementation CSPs to provide direct marketing outreach and raise homeowner awareness. PECO will offer technical assistance and incentives aligned with attractive participant payback criteria to make projects viable for participants. PECO will collaborate with suppliers, retailers, and contractors to ensure recommended products are available to consumers.
Equipment Costs	Unanticipated equipment purchase and installation cost increases, reducing project economic benefits.	PECO will monitor costs and adjust program incentives and technical services as needed to manage the program budget and savings. PECO will also monitor costs at the Residential EE Program level for their effects on the overall portfolio budget and savings, and adjust other program incentives or costs as needed.
Regulation	Increases in code-required baselines can reduce the energy savings available, effectively increasing resource acquisition costs.	PECO will monitor the effects of regulatory changes on the forecast savings, and adjust the mix of measures and incentives within the Residential EE Program if necessary to meet the target. The changes to the Residential EE Program will be monitored for their effect on the overall portfolio performance as well.
Trade Ally Participants	Success is dependent on trade ally engagement and program participation.	PECO will implement courses that provide skills to perform audits, identify, recommend and install efficient measures. PECO will develop a trade ally value proposition to attract and engage an adequate network of contractors to perform services. PECO will recognize and recommend contractors who meet or exceed the program requirements through website listing.

Program Title
and Years

PECO Residential Energy Efficiency Program PY 2016 – PY 2020

Marketing
Strategy

PECO will provide customers with an enhanced experience, where each inbound customer contact is treated as personal and unique, and where each outbound response to the customer is determined by the customer's inbound engagement history along with his/her communication and customer/utility engagement preference.

PECO's marketing strategy will provide a customer-centric experience and approach with a deliberate management focus on making participation in comprehensive energy solutions easy, convenient and a smart choice for customers. PECO will continue to develop and execute a broad awareness campaign in support of the overall plan. PECO will also develop and execute program and Solution level strategies to generate interest and participation in the program by focusing on the customer relationship and stream of offerings we can provide to help homeowners and renters use energy more efficiently.

PECO will engage with customers both directly and through indirect channels. A list of key consumer targets includes:

- All PECO residential electric account customers
- Current and past PECO efficiency program participants
- Non-participating customers
- New construction design and builder trade allies
- Installation trade allies including HVAC, lighting, etc.
- Suppliers and retailers

PECO will develop communication protocols that will seek to reach prospective customers at the right time, through the right channel, with the right message. This will require customer data analysis and segmentation; testing, tracking and multiple channel deployment strategies. PECO will make regular adjustments to communication protocols and deployment strategies to achieve the program goals, balancing program participation and changes in market conditions. PECO will use a variety of deployment strategies to meet the specific needs of each program Solution offering, which may include:

- Direct Marketing
 - Direct mail
 - Email marketing
 - Direct response digital
 - Outbound calling
- General Awareness
 - Special sponsorships
 - Banner Ads
 - TV, Radio

Program Title and Years **PECO Residential Energy Efficiency Program PY 2016 – PY 2020**

Marketing Strategy Examples by Pathway

PECO will coordinate marketing strategies through a collection of 'Pathways.' The pathways include a selection of Solutions designed to address the specific needs of targeted sub-markets within the residential portfolio. The following table illustrates envisioned marketing approaches, subject to change and modification over the course of the program phase period:

Pathway	Solution	Marketing Approaches
Retail	» Lighting, Appliances, & HVAC	» In-store promotions and advertising, » Mass and direct marketing strategies, » Contractor outreach, » Cross-promotion through participation in other pathways
PECO Direct-Action	» Appliance Recycling » Whole Home » Behavioral	» Direct marketing, » Web-based marketing, » Cross-promotion through participation in other pathways and community events, » Home Energy Reports
Trade Ally/ Contractor	» Residential New Construction » Lighting, Appliances, & HVAC	» Direct contractor outreach, » Contractor word-of-mouth, » Mass marketing strategies » Cross-promotion through participation in other pathways

Eligible Measures and Incentives The PECO Residential EE Program eligible measures and incentive level ranges are detailed in Appendix E.

Ramp Up Strategy / Program Start Date and Key Milestones The PECO Residential EE Program will operate during program years 2016 through 2020.

Proposed PECO Residential EE Program Implementation Schedule

Key Milestone	Timing
CSP Selection Process	November-December 2015
Promotional Materials and Participant Applications Development	January-May 2016
Program Launch	June 1, 2016

Evaluation, Measurement, and Verification Requirements The evaluation and data collection methodologies proposed for the PECO Residential EE Program are consistent with current EM&V practices for the Phase II residential sector programs. The EM&V requirements for this program conform to all applicable state protocols.

Metrics for Monitoring Program Success

- » Customer satisfaction with the program, and participation trends
- » Energy savings associated with installed efficient equipment or removed equipment
- » Program implementation costs incurred
- » Increase in customer awareness and receptivity to efficiency measures

Data Collection Approaches

Data for evaluating the program will come from the following sources:

Program Title and Years	PECO Residential Energy Efficiency Program PY 2016 – PY 2020				
	<ul style="list-style-type: none"> » Tracking system data » Engineering or TRM estimates of measure savings » Follow-up surveys of residential customers, retailers, trade allies, and service providers who participate in the program » Program implementer and PECO staff surveys or interviews » Evaluation of billing data » Local weather data <p><u>Impact Evaluation Methodology</u></p> <p>Program impacts will be determined using a variety of data sources and tested techniques as applicable for individual pathways. These strategies include:</p> <ul style="list-style-type: none"> » Field and phone verification, review of program records and incentive applications » Project reviews referencing per-unit deemed or default energy savings » Billing analysis » Installation follow-up phone interviews with program participants to identify: <ul style="list-style-type: none"> o Rebated measures installed and persistence (e.g., are the measures still installed?) o Other changes to the home that affect energy usage, such as changes in occupancy or changes in home or building size » Non-participant surveys <p><u>Process Evaluation Methodology</u></p> <p>Evaluating program process success and efficiency across program delivery, administration, implementation, and customer response, includes the following strategies:</p> <ul style="list-style-type: none"> » Assessment of marketing and promotional efforts » Monitoring contractor data-tracking system and implementation procedures to ensure that the program is being implemented as designed. » Interviews with utility staff, contractors, equipment vendors, and customers » Survey of program participants and non-participants, including self-report surveys » Assess customer understanding, satisfaction, and attitudes about the program 				
Administrative Requirements	<p>PECO will administer the Residential EE Program through a group of qualified CSPs. PECO's role will be to ensure that major milestones are met and that the program is delivered according to the program design.</p> <p>The program is expected to operate with the following PECO/Contract staffing mix:</p> <p style="text-align: center;">PECO Residential EE Program – Proposed Staffing</p> <table border="1" style="margin-left: auto; margin-right: auto;"> <thead> <tr> <th data-bbox="397 1514 885 1541">Staff</th> <th data-bbox="885 1514 987 1541">FTE</th> </tr> </thead> <tbody> <tr> <td data-bbox="397 1541 885 1568">PECO Residential EE Program Management</td> <td data-bbox="885 1541 987 1568">4.1</td> </tr> </tbody> </table> <p>Requested external staffing levels will be provided upon the completion of the CSP selection process.</p>	Staff	FTE	PECO Residential EE Program Management	4.1
Staff	FTE				
PECO Residential EE Program Management	4.1				

Program Title and Years	PECO Residential Energy Efficiency Program PY 2016 – PY 2020							
Estimated Participation	Participation and measure adoption estimates were developed based on the CSPs' implementation experiences to date with each pathway in this program, the number of existing homes in PECO's service territory, and an assessment of the attainable market potential in the area. Estimated participation is detailed in Appendix E.							
Estimated Program Budget and Percent of Sector	PECO Residential EE Program—Proposed Budget (\$000)							
	PECO Residential EE Program	PY 2016	PY 2017	PY 2018	PY 2019	PY 2020	Total	Program Budget as a % of Sector
	Residential	\$19,735	\$19,754	\$19,790	\$20,206	\$20,563	\$100,048	83%
Anticipated Costs to Participating Customers	PECO Residential EE Program—Participation Costs							
	PECO Residential EE Program	PY 2016	PY 2017	PY 2018	PY 2019	PY 2020	Total	
	Residential	\$91,667	\$91,599	\$91,539	\$91,489	\$91,448	\$457,742	
Projected Energy Savings and Demand Reduction	The estimated energy savings and demand reductions are based on annual per-unit kWh and kW values indicated in the 2016 PA TRM. For measures not found in the current PA TRM, per unit savings were estimated using a variety of external sources including: other statewide TRMs, applicable evaluation reports, and/or engineering analysis. These values were applied to the estimated number of measures rebated in each program year.							
	PECO Residential EE Program Gross Annual Energy Savings Estimates (MWh)							
	PECO Residential EE Program	PY 2016	PY 2017	PY 2018	PY 2019	PY 2020		
	Residential	129,359	129,359	147,191	151,861	156,457		
	PECO Residential EE Program Peak Demand Savings Estimates (kW)							
	PECO Residential EE Program	PY 2016	PY 2017	PY 2018	PY 2019	PY 2020		
	Residential	18,647	20,342	21,288	21,983	22,609		
	Energy savings are "at meter"; demand savings are "at generator."							
Cost-Effectiveness	PECO Residential EE Program Cost-Effectiveness							
	PECO Residential EE Program	Dollars			TRC (GROSS)	TRC (NET)	NTG Ratio	
		Discounted Lifetime Benefits	Discounted Lifetime Costs	Net Benefits				
	Residential	\$243,496	\$133,961	\$109,535	1.8*	1.6*	0.8	
	*Program level TRCs do not include portfolio level administration costs.							

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3.2.3 Demand Response Programs

3.2.3.1 Residential Demand Response Program

Program Title and Years	PECO Residential Demand Response Program PY 2016 – PY 2020												
Objectives and Savings	The objective of PECO's Residential DR Program is to realize demand reductions from eligible residential customers during the system peak hours.												
	5 Year Program Savings and Spending Forecast												
	Total Annual MWh	Total Annual kW	Total Budget (\$M)	% of Portfolio Savings	% of Portfolio Spending								
Target Market	The eligible population and target markets for the PECO Residential DR Program are all PECO residential electric customers.												
Program Description	The PECO Residential DR Program encompasses opportunities designed to engage customers in demand reduction.												
	<table border="1" style="margin-left: auto; margin-right: auto;"> <thead> <tr> <th data-bbox="508 884 719 940">Solution</th> <th data-bbox="719 884 857 940">Four Year Average MW Savings (PY2016 – PY 2020)</th> </tr> </thead> <tbody> <tr> <td data-bbox="508 940 719 993">Residential Direct Load Control (DLC)</td> <td data-bbox="719 940 857 993" style="text-align: center;">37.5</td> </tr> <tr> <td data-bbox="508 993 719 1077">Smart Thermostat for DR Savings</td> <td data-bbox="719 993 857 1077" style="text-align: center;">5.4</td> </tr> <tr> <td data-bbox="508 1077 719 1140">Behavioral DR Savings</td> <td data-bbox="719 1077 857 1140" style="text-align: center;">1.4</td> </tr> </tbody> </table>					Solution	Four Year Average MW Savings (PY2016 – PY 2020)	Residential Direct Load Control (DLC)	37.5	Smart Thermostat for DR Savings	5.4	Behavioral DR Savings	1.4
	Solution	Four Year Average MW Savings (PY2016 – PY 2020)											
Residential Direct Load Control (DLC)	37.5												
Smart Thermostat for DR Savings	5.4												
Behavioral DR Savings	1.4												
The savings projected here are estimated forecasts of activity. PECO may make adjustments to individual Solution budgets and savings forecasts in response to program performance, market conditions, and market changes to cost-effectively achieve the overall portfolio compliance targets. PECO intends to evaluate the feasibility and risks associated with bidding resources from this program into the PJM market. All net proceeds from any such bidding will be returned to customers.													
Implementation Strategy	<p>PECO will administer the Residential DR Program with assistance from CSPs that have a proven record of providing the services to be offered in this program effectively.</p> <p>Residential customers will be recruited and offered the opportunity to participate in three distinct Solutions: Direct Load Control (DLC) Solutions, Smart Thermostat DR Solutions, and Behavioral DR Solutions. In accordance with PUC directives, PECO will call DR events for the first six days that the peak hour of PJM's day-ahead forecast for the PJM RTO is greater than 96% of the PJM RTO summer peak demand forecast for the months of June through September each year of the program¹⁵.</p>												

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¹⁵ Pennsylvania PUC. Implementation Order, June 19, 2015, p. 37.

Solution	Description
Residential Direct Load Control (DLC)	PECO remotely cycles or shuts down a customer's central air conditioning (CAC) unit on short notice, during times of peak demand. In return, participants receive financial incentives for allowing PECO to control their equipment. DR events will be called during time periods that coincide with the highest peak demand. A one-way remote switch is connected to the condensing unit of an air conditioner. When activated by a control signal, the switch will not allow the equipment to operate for some predetermined portion of each hour. For the DLC Solution, the compressor is shut down during an event while the fan continues to operate. This allows cool air to be circulated throughout the home while the compressor is disabled. The operation of the switch is controlled through a digital paging network. CAC units will be controlled up to a maximum of 6 times during the annual peak period from June through September.
Smart Thermostat DR	The Smart Thermostat DR Solution will utilize Wi-Fi-enabled smart thermostats in customers' homes to reduce air conditioner use by increasing the set temperature on the device during times of peak demand. The smart thermostat is remotely controlled via internet connection. Participating smart thermostats will be controlled during the annual peak period from June through September. In return, participants receive financial incentives for allowing PECO to control their equipment.
Behavioral DR	The Behavioral Solution requires no hardware to be installed, and is open to all residential customers with Advanced Metering Infrastructure (AMI) data. This DR channel will alert participants the day before a DR event. It will provide participants with actions to reduce their energy use during the DR event. In return, participants will receive financial incentives for reducing their demand.

Customer Incentives

Customers participating in one of these three residential DR solutions will receive a monthly credit on their PECO bill. The credit will be issued to coincide with June, July, August, and September bill usage. Anticipated incentive payments will range from \$0 to \$40 per controlled unit per season, although this may be adjusted within the full incentive range as listed in Appendix E in the measure level details.

Overview of Roles and Activities

PECO will collaborate with implementation CSPs for delivery of all aspects of the program. Activities will include:

- » Program outreach and lead generation including development and distribution of program materials, neighborhood canvassing, managing inbound and outbound calls.
- » Manage in-home installations, including telephone customer screening, monitoring of auditors and contractors, direct installation of measures, device configuration/activation.
- » Verification of load reduction: load research studies to measure and verify the load reduction from switches, smart thermostats, and behavioral actions via review of AMI data or other references will be conducted.
- » Incentive processing: receive, review, and verify applications; and pay incentives.
- » Program performance tracking and implementing continuous improvement.
- » Reporting program activities to meet program goals, as well as program and regulatory reporting requirements.

Program Title and Years **PECO Residential Demand Response Program PY 2016 – PY 2020**

Program Issues, Risks, and Risk Management Strategies

PECO has designed a portfolio of measures and programs to manage the risks inherent to residential energy efficiency and demand response program implementation. The comprehensive portfolio design will allow PECO to closely monitor program results, and adjust implementation tactics (including marketing approaches, participation guidelines, incentives, and program resource allocation) to meet the portfolio level targets.

Key program issues, risks, and risk management strategies include:

Risk	Description	Management Strategy
Participation	Customer participation does not meet forecast expectations due to lack of program awareness or external forces (homeowner time or financial resources to manage project implementation, economic downturns, product availability etc.)	To raise program awareness, PECO in collaboration with implementation CSPs will provide direct marketing outreach homeowners.
Customer Retention	Customers fail to take action in response to a Behavioral DR alert request.	PECO will monitor customer retention and engagement and adjust program design and incentives to motivate customers to stay in the program and/or take action.
Equipment Costs	Unanticipated equipment purchase and installation cost increases, reducing project economic benefits.	PECO will monitor costs and adjust program incentives and technical services as needed to manage the comprehensive portfolio budget and savings.
Trade Ally Participants	Success is dependent on trade ally engagement and program participation.	PECO will develop a trade ally value proposition to attract and engage an adequate network of contractors to perform services.

Marketing Strategy

PECO's marketing strategy will provide a customer-centric experience and approach with a deliberate management focus on making participation easy, convenient and a smart choice for customers to take advantage of the residential DR program PECO will continue to develop and execute a broad awareness campaign in support of the overall plan. PECO will also develop and execute program and Solution level strategies to generate interest and participation in the programs by focusing on the customer relationship and stream of offerings we can provide to help homeowners and renters use energy more efficiently.

PECO will engage with customers both directly and through indirect channels. A list of key marketing targets includes:

- All PECO residential electric account holder customers
- Current and past PECO efficiency program participants
- Non-participating customers
- New construction design and builder trade allies
- HVAC installation trade allies
- Suppliers and retailers

PECO will develop communication protocols that will seek to reach prospective customers at the right time, through the right channel, with the right message. This will require customer data analysis and segmentation; testing, tracking and multiple channel deployment strategies. PECO

Program Title and Years	PECO Residential Demand Response Program PY 2016 – PY 2020								
	<p>will make regular adjustments to communication protocols and deployment strategies to achieve the program goals, balancing program participation and changes in market conditions. PECO will use a variety of deployment strategies to meet the specific needs of individual solutions, which may include:</p> <ul style="list-style-type: none"> • Direct Marketing <ul style="list-style-type: none"> ○ Smart ideas website ○ Direct mail ○ Email marketing ○ Direct response digital ○ Outbound calling • General Awareness <ul style="list-style-type: none"> ○ Special sponsorships ○ Banner Ads ○ TV, Radio 								
Eligible Measures and Incentives	The PECO Residential DR Program eligible measures and incentive level ranges are detailed in Appendix E.								
Ramp Up Strategy / Program Start Date and Key Milestones	<p>The PECO Residential DR Program will operate during program years 2016 through 2020. Because the Residential DLC Solutions is an active Phase II program, PECO does not anticipate a significant reduction in participation will take place in Phase III. In Program Year 2017 Smart Thermostats DR Solutions and Behavioral DR Solutions will be new introductions in Phase III, and PECO anticipates that participation will grow throughout the Phase.</p> <p style="text-align: center;">Proposed PECO Residential DR Program Implementation Schedule</p> <table border="1" data-bbox="329 1150 1044 1285"> <thead> <tr> <th data-bbox="329 1150 760 1182">Key Milestone</th> <th data-bbox="760 1150 1044 1182">Timing</th> </tr> </thead> <tbody> <tr> <td data-bbox="329 1182 760 1213">CSP Selection Process</td> <td data-bbox="760 1182 1044 1213">November-December 2015</td> </tr> <tr> <td data-bbox="329 1213 760 1255">Development of Promotional Materials and Participant Enrollment Procedures</td> <td data-bbox="760 1213 1044 1255">January-May 2016</td> </tr> <tr> <td data-bbox="329 1255 760 1285">Program Launch</td> <td data-bbox="760 1255 1044 1285">June 1, 2016</td> </tr> </tbody> </table>	Key Milestone	Timing	CSP Selection Process	November-December 2015	Development of Promotional Materials and Participant Enrollment Procedures	January-May 2016	Program Launch	June 1, 2016
Key Milestone	Timing								
CSP Selection Process	November-December 2015								
Development of Promotional Materials and Participant Enrollment Procedures	January-May 2016								
Program Launch	June 1, 2016								

Program Title and Years	PECO Residential Demand Response Program PY 2016 – PY 2020
Evaluation, Measurement, and Verification Requirements	<p>The evaluation and data collection methodologies proposed for the PECO Residential DR Program are consistent with current EM&V practices for the existing residential DR programs. The EM&V requirements for this program conform to all applicable state protocols.</p> <p><u>Metrics for Monitoring Program Success</u></p> <ul style="list-style-type: none"> » Customer satisfaction with the program, and participation trends » Verification of load reduction as set forth by PJM » Verification of paging success rate of thermostats and DLC switches » Program implementation costs incurred » Increase in customer awareness and receptivity to demand response <p><u>Data Collection Approaches</u></p> <p>Data for evaluating the program may come from the following sources:</p> <ul style="list-style-type: none"> » Tracking system data » Follow-up surveys of residential customers who participate in the program » Program implementer and PECO staff surveys or interviews » Evaluation of AMI data » Local weather data <p><u>Impact Evaluation Methodology</u></p> <p>Program impacts will be determined using a variety of data sources and tested techniques as applicable for individual Solutions. These strategies may include:</p> <ul style="list-style-type: none"> » Field and phone verification, and review of program records » M&V including equipment performance verification and load impact estimates. » AMI data analysis » Installation follow-up phone interviews with program participants to identify: <ul style="list-style-type: none"> o Rebated measures installed and persistence (e.g., are the measures still installed?) o Other changes to the home that affect energy usage such as changes in occupancy or changes in home or building size » Non-participant surveys <p><u>Process Evaluation Methodology</u></p> <p>Evaluating program process success and efficiency across program delivery, administration, implementation, and customer response, includes the following strategies:</p> <ul style="list-style-type: none"> » Assessment of marketing and promotional efforts » Monitoring contractor data-tracking system and implementation procedures to ensure that the program is being implemented as designed. » Interviews with utility staff, contractors, equipment vendors, and customers » Survey of program participants and non-participants, including self-report surveys <ul style="list-style-type: none"> o Assess customer understanding, satisfaction, and attitudes about the program

Program Title and Years **PECO Residential Demand Response Program PY 2016 – PY 2020**

Administrative Requirements PECO will administer the Residential DR Program through qualified CSPs. PECO's role will be to ensure that major milestones are met and that the program is delivered according to the program design.

The program is expected to operate with the following PECO/Contract staffing mix:

PECO Residential DR Program – Proposed Staffing

Staff	FTE
PECO Residential DR Program Management	1.2

Requested external staffing levels will be provided upon the completion of the CSP selection process.

Estimated Participation Participation and measure adoption estimates were developed based on the CSPs' implementation experiences to date in this program, the number of existing homes in PECO's service territory, and an assessment of the attainable market potential in the area. Estimated participation is detailed in Appendix E.

PECO Residential DR Program – Proposed Budget (\$000)

PECO Residential DR Program	PY 2016	PY 2017	PY 2018	PY 2019	PY 2020	Total	Program Budget as a % of Sector
Residential DR	\$5,074	\$3,930	\$3,815	\$3,517	\$3,782	\$20,117	17%

PECO Residential DR Program – Participation Costs

PECO Residential DR Program	PY 2016	PY 2017	PY 2018	PY 2019	PY 2020	Total
Residential DR	\$0	\$0	\$0	\$0	\$0	\$0

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Projected Energy Savings and Demand Reduction The estimated demand reductions are based on past evaluated annual per-unit kWh and kW values and effective useful life values indicated in the TRM. These values were applied to the estimated number of participants in each program year.

PECO Residential DR Program Gross Annual Energy Savings Estimates (MWh)

PECO Residential DR Program	PY 2016	PY 2017	PY 2018	PY 2019	PY 2020
Residential DR	0	0	0	0	0

PECO Residential DR Program Peak Demand Savings Estimates (kW)

PECO Residential DR Program	PY 2016	PY 2017	PY 2018	PY 2019	PY 2020
Residential DR	38,738	43,333	43,865	44,606	45,598

Energy savings are "at meter"; demand savings are "at generator".

Program Title and Years **PECO Residential Demand Response Program PY 2016 – PY 2020**

Cost-Effectiveness **PECO Residential DR Program Cost-Effectiveness**

PECO Residential DR Program	Dollars			TRC (GROSS)	TRC (NET)	NTG Ratio
	Discounted Lifetime Benefits	Discounted Lifetime Costs	Net Benefits			
Residential DR	\$17,318	\$14,675	\$2,642	1.2*	1.2*	1.0

*Program level TRCs do not include portfolio level administrative costs.

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4.2.2 Approach for overseeing the performance of CSPs and other providers

Oversight of CSPs will be a key factor in the managing of programs. PECO will incorporate performance metrics into its contracts with the CSPs. Individual Program Managers will monitor performance closely through the tracking system that will measure key indicators such as participation, costs, savings, adherence to Plan, participant experience and other indicators. The Program Manager will work closely with the CSP to understand how the program is performing and if changes may be needed to make the program more successful.

Customer and trade ally satisfaction will be assessed through each program’s EM&V and will provide each Program Manager with feedback on this dimension of each CSPs’ performance.

4.2.3 Basis for Administrative Budget

The administrative expenses fall into the following categories as detailed in Table 11. Administrative Costs PY 2016-2020 and the costs will be factored into the overall portfolio benefit-cost analysis. These costs include estimated PECO staff and procurement costs as well as costs associated with third parties (e.g., EM&V and Data Tracking Database contractors).

Table 11. Administrative Costs 2016-2020 (\$M)

Administrative Costs (\$M)	PY 2016	PY 2017	PY 2018	PY 2019	PY 2020	Total (2016-2020)	Percent of Total Administrative Costs
Gen. Education, Awareness & Marketing	\$12.9	\$10.3	\$10.3	\$10.3	\$13.0	\$56.89	48%
Utility Administration	\$3.7	\$3.7	\$3.7	\$3.7	\$3.7	\$18.26	15%
EM&V	\$4.5	\$4.5	\$4.5	\$4.5	\$4.5	\$22.50	19%
Technical Support	\$1.4	\$1.4	\$1.5	\$1.5	\$1.4	\$7.20	6%
Research and Development	\$5.9	\$2.6	\$2.2	\$1.4	\$1.7	\$13.77	12%
Total Cost	\$28.4	\$22.4	\$22.1	\$21.3	\$24.3	\$118.63	100%

- » General Education, Awareness, and Marketing - represents broad marketing and education efforts to promote the overall portfolio of energy efficiency and demand response programs as well as specific and targeted marketing strategies for specific programs and solutions. This will include expenditures on radio, newspaper, social media, sponsorships, etc. to promote the portfolio of programs.
- » Utility Administration - represents PECO employees and contractors required to develop, oversee, execute, and evaluate all programs in the portfolio. Also included in this cost category are expenses associated with: a) customer service call center to support Phase III implementation; b) estimated costs for PECO staff energy efficiency and demand response training, energy efficiency and demand response industry conferences sponsorships and participation; c) represents costs for updating and expanding the data tracking system for overall tracking and reporting of energy efficiency and demand response savings.
- » EM&V- represents costs associated with third party independent EM&V for the full portfolio process and impact evaluation activities.
- » Technical Support- represents costs for on-going program design and EM&V research activities, benchmarking studies, updating avoided costs or load shape research.

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- » Research and Development – represents 3% of the annual plan budget. These costs are made up of market research work in response to market transformations, which PECO believes will occur during this 5 year Phase. Additionally, PECO expects that new technologies will emerge and warrant pilots. This pilot work will be capped at 2% in accordance with the statute put forth by the Commission which states that no more than 2% of funds shall be allocated for experimental equipment or devices.

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4.3 Conservation Service Providers (CSPs)

4.3.1 Selected CSPs

PECO will be issuing RFPs for selection of CSPs for Phase III. The selected CSPs, their qualifications, and basis for selection will be shared with the PUC. Each CSP contract is deemed confidential and proprietary and as such, each will be filed with the PUC separately.

4.3.2 Describe the work and measures being performed by CSPs

PECO Plans to implement the energy efficiency and demand response programs in a highly turn-key manner, thus relying on the experience and capabilities of the selected CSP. Each of the selected CSPs will be responsible for implementation services as detailed in the individual program descriptions detailed in Section 3.2.

4.3.3 Describe any pending RFPs to be issued for additional CSPs

PECO is planning to issue at a minimum the following RFPs for the programs indicated in Table 12.

Table 12. RFPs for Phase III Implementation Services

RFP	Sector	Solutions/Services
#1	Residential	Retail Pathway – Lighting, Appliance and HVAC
#2	Residential	Direct-Action - Low-income Whole Home
#3	Residential	Direct-Action - Appliance Recycling
#4	Residential	Direct-Action – Behavior
#5	Residential	Direct-Action – Whole Home
#6	Residential	Trade Ally – Residential New Construction
#7	Residential	Demand Response
#8	Small C&I	Direct-Action – Whole Building
#9	Small C&I	Demand Response
#10	Large C&I	Demand Response - Aggregator
#11	Small/Large C&I	Direct-Action – Whole Building
#12	Small/Large C&I	Trade Ally- C&I New Construction
#13	Small/Large C&I	Trade Ally- Equipment and Systems
#14	Small/Large C&I	Direct-Action – Combined Heat and Power
#15	All	Marketing
#16	All	Call Center
#17	All	Tracking System * (To be bid in 2016, and implemented in 2017)
#18	All	EM&V

*RFP contracts for Phase III Implementation Services are being developed and will be awarded as outlined in the table above.

Appendix C. Program by Program Savings and Costs for Each Program Year

Tables C-1 to C-4: Program Cost Data

Table C-1. Portfolio-Specific Assignment of EE&C Costs¹

EE&C Program	Cost Elements (\$M)		Totals
	Incentive Costs	Non-Incentive Costs	
Low-Income Portfolio			
Low-Income EE	\$1.2	\$34.9	\$36.1
Totals	\$1.2	\$34.9	\$36.1
Residential Portfolio (excluding Low-Income)			
Residential EE (Exclusive of Low-Income)	\$38.0	\$62.0	\$100.0
Residential DR	\$13.5	\$6.6	\$20.1
Totals	\$51.5	\$68.6	\$120.2
Commercial Portfolio (Small)			
Small C&I EE (Exclusive of G/E/NP)	\$10.7	\$29.4	\$40.1
Small C&I DR	\$0.2	\$0.7	\$0.9
CHP (Exclusive of G/E/NP)	\$0.6	\$0.2	\$0.8
Totals	\$11.5	\$30.3	\$41.8
Commercial Portfolio (Large)			
Large C&I EE (Exclusive of G/E/NP)	\$22.5	\$24.8	\$47.3
Large C&I DR	\$19.7	\$7.4	\$27.1
CHP (Exclusive of G/E/NP)	\$9.8	\$3.6	\$13.4
Totals	\$52.0	\$35.8	\$87.8
Government/Educational/Non-Profit			
Small C&I EE G/E/NP	\$1.2	\$3.4	\$4.6
Large C&I EE G/E/NP	\$3.7	\$3.8	\$7.5
CHP G/E/NP	\$7.6	\$3.2	\$10.8
Totals	\$12.4	\$10.5	\$22.9
TOTAL			
TOTAL	\$128.6	\$180.2	\$308.8

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¹This table labeled 6A in Implementation Order.

²Low-Income and G/E/NP are not customer rate classes or sectors, but rather customer segments that fit under the Residential, Small C&I and Large C&I customer classes. The Low-Income customers can be on meters listed under all three customer classes. G/E/NP customers may be on meters within either the Small C&I or Large C&I customer classes.

Table C-2. Allocation of Common Costs to Applicable Customer Sector²

Common Cost Element	Total Cost (\$M)	Basis for Cost Allocation ¹	Class Cost Allocation (\$M)			
			Residential (Including Low-Income)	Small C&I	Large C&I	G/E/NP ³
Gen. Education, Awareness & Marketing	\$56.9		\$28.2	\$7.9	\$16.5	\$4.3
Utility Administration	\$18.3		\$9.1	\$2.5	\$5.3	\$1.4
EM&V	\$22.5		\$11.2	\$3.1	\$6.5	\$1.7
Technical Support	\$7.2		\$3.6	\$1.0	\$2.1	\$0.5
Research and Development	<u>\$13.6</u>		<u>\$3.6</u>	<u>\$2.8</u>	<u>\$5.9</u>	<u>\$1.5</u>
Totals	\$118.6		\$55.6	\$17.3	\$36.3	\$9.5

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¹ The basis for cost allocation for common costs is a proportional allocation according to the percent of spending for programs in these sectors.

² This table labeled 6B in Implementation Order.

³ Low-income and G/E/NP are not customer rate classes or sectors, but rather customer segments that fit under the Residential, Small C&I and Large C&I customer classes. The Low-Income customers can be on meters listed under all three customer classes. G/E/NP customers may be on meters within either the Small C&I or Large C&I customer classes.

Table C-3. Summary of Portfolio EE&C Costs (\$M)¹

Portfolio	Total Sector Portfolio-Specific Costs	Total Common Costs	Total of All Costs
Residential (Including Low-Income)	<u>\$156.3</u>	<u>\$55.6</u>	\$211.9
Small C&I	\$41.8	\$17.3	\$59.1
Large C&I	\$87.8	\$36.3	\$124.1
G/E/NP ²	\$22.9	\$9.5	\$32.3
Totals	\$308.8	\$118.6	\$427.4

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¹ This table labeled 6C in Implementation Order.

Table C-4. Summary of Programs Cost by Year

Costs By Program Per Year (\$000)													
Program	PY	Direct Program Costs				Administrative Costs						Grand Total	
		EDC Labor	CSP Labor	CSP Materials and Supplies	Customer Incentives	Total	Gen. Education, Awareness & Marketing	Utility Administration	EM&V	Technical Support	Research and Development		Total
Residential	2016	\$732	\$8,992	\$2,204	\$7,807	\$19,735	\$4,269	\$1,208	\$1,489	\$483	\$1,224	\$8,654	\$28,389
	2017	\$747	\$9,226	\$2,117	\$7,665	\$19,754	\$3,414	\$1,208	\$1,489	\$483	\$530	\$7,104	\$28,856
	2018	\$761	\$9,420	\$2,081	\$7,528	\$19,790	\$3,411	\$1,208	\$1,489	\$496	\$450	\$7,055	\$28,844
	2019	\$777	\$9,835	\$2,083	\$7,512	\$20,206	\$3,420	\$1,208	\$1,489	\$486	\$281	\$6,894	\$27,100
	2020	\$792	\$10,225	\$2,048	\$7,498	\$20,563	\$4,311	\$1,208	\$1,489	\$483	\$351	\$7,823	\$28,386
Total		\$3,809	\$47,897	\$10,533	\$38,009	\$100,048	\$18,825	\$6,042	\$7,445	\$2,382	\$2,835	\$37,530	\$137,573
Low-Income	2016	\$183	\$3,264	\$3,203	\$317	\$6,966	\$1,641	\$436	\$538	\$167	\$211	\$2,894	\$9,865
	2017	\$186	\$3,424	\$3,112	\$272	\$6,994	\$1,232	\$436	\$538	\$167	\$93	\$2,465	\$9,454
	2018	\$190	\$3,492	\$3,083	\$238	\$7,003	\$1,231	\$436	\$538	\$179	\$73	\$2,464	\$9,485
	2019	\$194	\$3,768	\$3,137	\$207	\$7,307	\$1,234	\$436	\$538	\$179	\$48	\$2,436	\$9,743
	2020	\$198	\$4,308	\$3,153	\$188	\$7,847	\$1,556	\$436	\$538	\$167	\$61	\$2,758	\$10,605
Total		\$951	\$18,256	\$15,688	\$1,223	\$36,117	\$6,796	\$2,181	\$2,688	\$880	\$490	\$13,015	\$49,133
Small C&I	2016	\$323	\$4,587	\$1,650	\$2,413	\$8,984	\$1,906	\$540	\$665	\$207	\$1,287	\$4,605	\$13,589
	2017	\$330	\$4,649	\$1,654	\$2,408	\$9,039	\$1,524	\$540	\$665	\$207	\$557	\$3,493	\$12,532
	2018	\$336	\$4,640	\$1,657	\$2,397	\$9,031	\$1,523	\$540	\$665	\$222	\$473	\$3,422	\$12,453
	2019	\$343	\$4,664	\$1,667	\$2,319	\$8,994	\$1,527	\$540	\$665	\$222	\$295	\$3,248	\$12,242
	2020	\$350	\$4,296	\$1,680	\$2,301	\$8,628	\$1,925	\$540	\$665	\$207	\$389	\$3,705	\$12,333
Total		\$1,683	\$22,846	\$8,309	\$11,837	\$44,675	\$8,406	\$2,698	\$3,324	\$1,064	\$2,981	\$18,473	\$63,148
Large C&I	2016	\$394	\$4,827	\$208	\$5,209	\$10,639	\$2,335	\$661	\$815	\$253	\$1,576	\$5,641	\$16,279
	2017	\$402	\$4,950	\$207	\$5,227	\$10,787	\$1,867	\$661	\$815	\$253	\$682	\$4,279	\$15,066
	2018	\$410	\$5,060	\$209	\$5,244	\$10,923	\$1,866	\$661	\$815	\$272	\$579	\$4,192	\$15,115
	2019	\$418	\$5,213	\$216	\$5,233	\$11,080	\$1,871	\$661	\$815	\$272	\$361	\$3,979	\$15,059
	2020	\$427	\$5,404	\$223	\$5,246	\$11,300	\$2,358	\$661	\$815	\$253	\$452	\$4,539	\$15,840
Total		\$2,051	\$25,454	\$1,064	\$26,160	\$54,728	\$10,298	\$3,305	\$4,073	\$1,303	\$3,651	\$22,630	\$77,359
CHP	2016	\$166	\$1,299	\$0	\$3,863	\$5,328	\$1,067	\$302	\$372	\$116	\$720	\$2,576	\$7,904
	2017	\$170	\$1,377	\$0	\$4,025	\$5,572	\$853	\$302	\$372	\$116	\$312	\$1,954	\$7,526
	2018	\$173	\$1,460	\$0	\$4,196	\$5,829	\$852	\$302	\$372	\$124	\$265	\$1,915	\$7,744
	2019	\$177	\$1,549	\$0	\$4,375	\$6,101	\$854	\$302	\$372	\$124	\$165	\$1,817	\$7,918
	2020	\$180	\$527	\$0	\$1,458	\$2,165	\$1,077	\$302	\$372	\$116	\$206	\$2,073	\$4,238
Total		\$866	\$6,211	\$0	\$17,918	\$24,995	\$4,703	\$1,510	\$1,860	\$595	\$1,688	\$10,335	\$35,330
Residential DR	2016	\$268	\$970	\$0	\$3,836	\$5,074	\$585	\$166	\$204	\$64	\$119	\$1,137	\$6,211
	2017	\$213	\$1,083	\$0	\$2,634	\$3,930	\$468	\$166	\$204	\$64	\$51	\$953	\$4,883
	2018	\$210	\$1,110	\$0	\$2,495	\$3,815	\$468	\$166	\$204	\$68	\$44	\$849	\$4,764
	2019	\$199	\$1,130	\$0	\$2,188	\$3,517	\$469	\$166	\$204	\$68	\$27	\$834	\$4,451
	2020	\$208	\$1,210	\$0	\$2,363	\$3,784	\$591	\$166	\$204	\$64	\$34	\$1,058	\$4,840
Program Total		\$1,026	\$5,502	\$0	\$13,511	\$20,113	\$2,581	\$828	\$1,021	\$327	\$2,75	\$5,032	\$25,149
Small C&I DR	2016	\$116	\$25	\$0	\$45	\$186	\$40	\$11	\$14	\$4	\$27	\$97	\$283

- Deleted: \$10,312
- Deleted: \$2,882
- Deleted: \$30,047
- Deleted: \$7,822
- Deleted: \$1,248
- Deleted: \$27,576
- Deleted: \$7,664
- Deleted: \$1,059
- Deleted: \$27,454
- Deleted: \$7,274
- Deleted: \$661
- Deleted: \$27,480
- Deleted: \$8,298
- Deleted: \$826
- Deleted: \$28,861
- Deleted: \$41,370
- Deleted: \$6,675
- Deleted: \$141,417
- Deleted: \$3,723
- Deleted: \$1,040
- Deleted: \$10,689
- Deleted: \$2,824
- Deleted: \$450
- Deleted: \$9,818
- Deleted: \$2,767
- Deleted: \$382
- Deleted: \$9,769
- Deleted: \$2,626
- Deleted: \$238
- Deleted: \$9,933
- Deleted: \$2,996
- Deleted: \$298
- Deleted: \$10,843
- Deleted: \$14,935
- Deleted: \$2,410
- Deleted: \$51,052
- Deleted: \$166
- Deleted: \$725
- Deleted: \$1,420
- Deleted: \$1,414
- Deleted: \$2,310
- Deleted: \$395
- Deleted: \$3,724
- Deleted: \$169
- Deleted: \$1,072
- Deleted: \$977
- Deleted: \$1,588
- Deleted: \$2,734

Costs By Program Per Year (\$000)													
Program	PY	Direct Program Costs					Administrative Costs						Grand Total
		EDC Labor	CSP Labor	CSP Materials and Supplies	Customer Incentives	Total	Gen. Education, Awareness & Marketing	Utility Administration	EM&V	Technical Support	Research and Development	Total	
	2017	\$118	\$25	\$0	\$44	\$187	\$32	\$11	\$14	\$4	\$12	\$74	\$261
	2018	\$120	\$25	\$0	\$43	\$188	\$32	\$11	\$14	\$5	\$10	\$72	\$261
	2019	\$123	\$25	\$0	\$43	\$190	\$32	\$11	\$14	\$5	\$6	\$69	\$259
	2020	\$125	\$24	\$0	\$42	\$192	\$41	\$11	\$14	\$4	\$8	\$78	\$270
Total		\$601	\$124	\$0	\$217	\$943	\$177	\$57	\$70	\$22	\$63	\$390	\$1,333
	2016	\$165	\$0	\$0	\$0	\$165	\$1,158	\$328	\$404	\$126	\$782	\$2,797	\$2,962
	2017	\$168	\$1,651	\$0	\$4,952	\$6,771	\$926	\$328	\$404	\$126	\$338	\$2,122	\$8,893
Large C&I DR	2018	\$172	\$1,645	\$0	\$4,936	\$6,752	\$925	\$328	\$404	\$135	\$287	\$2,079	\$8,831
	2019	\$175	\$1,640	\$0	\$4,919	\$6,733	\$928	\$328	\$404	\$135	\$179	\$1,973	\$8,706
	2020	\$179	\$1,634	\$0	\$4,902	\$6,715	\$1,169	\$328	\$404	\$126	\$224	\$2,251	\$8,965
Total		\$859	\$6,570	\$0	\$19,709	\$27,137	\$5,106	\$1,639	\$2,019	\$646	\$1,810	\$11,221	\$38,358
Total		\$11,916	\$132,680	\$35,593	\$128,590	\$308,790	\$56,893	\$18,261	\$22,500	\$7,200	\$13,772	\$118,826	\$427,386

- Deleted: \$11,680
- Deleted: \$132,092
- Deleted: \$122,995
- Deleted: \$302,360
- Deleted: \$125,026
- Deleted: \$20,172

Tables C-5 to C-10: TRC Benefits Tables

Table C-5. Gross TRC Benefits Table

Gross TRC Benefits By Program Per Year (\$000)												
Program	Program Year	TRC	Program Costs (\$000)	Program Benefits (\$000)	Capacity		Energy		Load Reductions in kW		MWh Saved	
					Annual		Annual		Annual	Lifetime	Annual	Lifetime
					Generation	Trans/Dist	Peak	Off Peak				
Residential (Exclusive of Low-Income)	2016	1.6	\$30,020	\$47,792	\$5,381	\$3,808	\$12,247	\$14,679	18,647	141,500	129,359	956,255
	2017	1.7	\$30,257	\$50,743	\$5,637	\$3,921	\$12,879	\$15,350	20,342	147,415	141,053	994,486
	2018	1.8	\$30,674	\$55,591	\$5,847	\$4,067	\$13,531	\$16,192	21,288	155,510	147,191	1,050,046
	2019	2.0	\$31,519	\$62,043	\$6,192	\$4,307	\$14,632	\$17,590	21,983	167,368	151,861	1,135,429
	2020	2.1	\$32,206	\$67,997	\$6,610	\$4,598	\$16,035	\$19,339	22,609	179,517	156,457	1,222,857
Total		1.8	\$154,676	\$284,166	\$29,667	\$20,701	\$69,325	\$83,150	71,139	757,579	725,922	5,359,074
Low-Income	2016	1.6	\$8,562	\$13,438	\$1,154	\$817	\$2,856	\$3,419	3,067	29,411	22,373	219,123
	2017	1.7	\$8,601	\$14,288	\$1,195	\$831	\$2,981	\$3,551	3,135	30,365	22,953	226,855
	2018	1.8	\$8,612	\$15,526	\$1,214	\$845	\$3,107	\$3,678	3,085	31,492	22,600	235,931
	2019	2.0	\$8,932	\$17,633	\$1,309	\$910	\$3,453	\$4,078	3,235	34,530	23,818	260,024
	2020	2.1	\$9,498	\$19,901	\$1,449	\$1,008	\$3,948	\$4,649	3,603	38,192	26,746	289,007
Total		1.8	\$44,205	\$80,786	\$6,322	\$4,411	\$16,345	\$19,376	16,125	163,991	118,490	1,230,940
Small C&I	2016	1.6	\$21,535	\$35,280	\$5,837	\$4,131	\$11,116	\$9,223	13,822	160,474	73,954	721,352
	2017	1.7	\$21,553	\$35,978	\$5,934	\$4,127	\$11,359	\$9,393	13,928	162,245	79,879	730,564
	2018	1.7	\$21,452	\$36,763	\$5,979	\$4,159	\$11,619	\$9,585	13,883	164,235	84,818	740,678
	2019	1.8	\$21,447	\$37,994	\$6,058	\$4,214	\$12,068	\$9,917	13,941	167,117	85,491	757,427
	2020	1.8	\$21,082	\$39,002	\$6,135	\$4,267	\$12,568	\$10,283	14,144	169,469	79,113	771,388
Total		1.7	\$107,069	\$185,017	\$29,943	\$20,898	\$58,730	\$48,401	69,718	823,539	403,256	3,721,408
Large C&I	2016	1.4	\$37,373	\$53,831	\$10,727	\$7,591	\$17,153	\$16,419	22,896	307,218	95,050	1,269,872
	2017	1.4	\$37,869	\$54,668	\$10,866	\$7,558	\$17,491	\$16,698	23,029	309,353	95,606	1,280,022
	2018	1.5	\$38,340	\$55,650	\$10,922	\$7,597	\$17,876	\$17,043	23,091	311,699	95,678	1,291,787

Gross TRC Benefits By Program Per Year (\$000)												
Program	Program Year	TRC	Program Costs (\$000)	Program Benefits (\$000)	Capacity		Energy		Load Reductions in kW		MWh Saved	
					Annual		Annual		Annual	Lifetime	Annual	Lifetime
					Generation	Trans/Dist	Peak	Off Peak				
	2019	1.5	\$38,896	\$57,042	\$11,001	\$7,652	\$18,448	\$17,526	23,218	314,666	96,256	1,308,445
	2020	1.5	\$39,498	\$58,656	\$11,076	\$7,704	\$19,159	\$18,108	23,413	317,269	97,507	1,325,461
Total		1.5	\$191,975	\$279,846	\$54,592	\$38,103	\$90,127	\$85,793	115,645	1,560,205	480,098	6,475,588
CHP	2016	0.9	\$27,425	\$25,337	\$6,060	\$4,289	\$13,588	\$16,658	11,881	178,211	78,710	1,180,649
	2017	0.9	\$28,732	\$26,345	\$6,337	\$4,408	\$14,273	\$17,497	12,348	185,218	81,806	1,227,095
	2018	0.9	\$30,116	\$27,448	\$6,579	\$4,576	\$15,022	\$18,445	12,838	192,575	85,057	1,275,862
	2019	0.9	\$31,579	\$28,757	\$6,832	\$4,752	\$15,903	\$19,514	13,353	200,300	88,471	1,327,068
	2020	0.9	\$10,755	\$9,694	\$2,274	\$1,582	\$5,426	\$6,638	4,451	66,767	29,490	442,356
Total		0.9	\$128,607	\$117,581	\$28,081	\$19,606	\$64,212	\$78,751	54,871	823,071	363,535	5,453,030
Residential DR	2016	0.8	\$4,115	\$3,590	\$2,102	\$1,488	\$0	\$0	38,738	38,738	0	0
	2017	1.2	\$3,271	\$4,029	\$2,376	\$1,653	\$0	\$0	43,333	43,333	0	0
	2018	1.3	\$3,191	\$4,072	\$2,401	\$1,670	\$0	\$0	43,865	43,865	0	0
	2019	1.4	\$2,970	\$4,135	\$2,438	\$1,696	\$0	\$0	44,606	44,606	0	0
	2020	1.3	\$3,191	\$4,220	\$2,489	\$1,731	\$0	\$0	45,598	45,598	0	0
Program Total		1.2	\$16,738	\$20,045	\$11,807	\$8,238	\$0	\$0	45,598	45,598	0	0
Small C&I DR	2016	0.7	\$174	\$120	\$70	\$50	\$0	\$0	1,290	1,290	0	0
	2017	0.7	\$176	\$118	\$70	\$49	\$0	\$0	1,274	1,274	0	0
	2018	0.7	\$178	\$117	\$69	\$48	\$0	\$0	1,258	1,258	0	0
	2019	0.6	\$179	\$115	\$68	\$47	\$0	\$0	1,242	1,242	0	0
	2020	0.6	\$181	\$113	\$67	\$47	\$0	\$0	1,226	1,226	0	0
Program Total		0.7	\$888	\$583	\$344	\$240	\$0	\$0	1,226	1,226	0	0
Large C&I DR	2016	0.0	\$165	\$0	\$0	\$0	\$0	\$0	0	0	0	0
	2017	2.1	\$5,533	\$11,742	\$6,925	\$4,817	\$0	\$0	126,300	126,300	0	0
	2018	2.1	\$5,519	\$11,668	\$6,882	\$4,787	\$0	\$0	125,695	125,695	0	0

- Deleted: 1.8
- Deleted: \$1,955
- Deleted: 1.7
- Deleted: \$2,337
- Deleted: 1.7
- Deleted: \$2,398
- Deleted: 1.7
- Deleted: \$2,475
- Deleted: 1.6
- Deleted: \$2,572
- Deleted: 1.7
- Deleted: \$11,736

Gross TRC Benefits By Program Per Year (\$000)												
Program	Program Year	TRC	Program Costs (\$000)	Program Benefits (\$000)	Capacity		Energy		Load Reductions in kW		MWh Saved	
					Annual		Annual		Annual	Lifetime	Annual	Lifetime
					Generation	Trans/Dist	Peak	Off Peak				
	2019	2.1	\$5,504	\$11,595	\$6,838	\$4,756	\$0	\$0	125,091	125,091	0	0
	2020	2.1	\$5,489	\$11,521	\$6,795	\$4,726	\$0	\$0	124,487	124,487	0	0
<i>Program Total</i>		2.1	\$22,210	\$46,526	\$27,440	\$19,086	\$0	\$0	124,487	124,487	0	0
Total		1.3	\$666,368	\$1,014,549	\$188,196	\$131,284	\$298,739	\$315,471	498,810	4,299,696	2,091,301	22,240,039

Deleted: \$661,367

*This table labeled 7 in Implementation Order.

Table C-6. Net TRC Benefits Table

Net Benefits By Program Per Year (\$000)													
Program	Program Year	NTG Ratio	TRC	Program Costs (\$000)	Program Benefits (\$000)	Capacity		Energy		Load Reductions in kW		MWh Saved	
						Annual		Annual		Annual	Lifetime	Annual	Lifetime
						Generation	Trans/Dist	Peak	Off Peak				
Residential (Exclusive of Low-Income)	2016	0.8	1.4	\$22,632	\$30,881	\$3,355	\$2,374	\$7,758	\$9,236	13,718	87,744	95,999	599,299
	2017	0.8	1.5	\$22,807	\$33,232	\$3,565	\$2,480	\$8,285	\$9,790	15,380	92,492	107,644	631,424
	2018	0.8	1.6	\$23,113	\$36,899	\$3,752	\$2,610	\$8,827	\$10,483	16,432	98,922	114,843	677,073
	2019	0.8	1.7	\$23,783	\$41,531	\$4,017	\$2,794	\$9,630	\$11,522	17,082	107,677	119,391	741,366
	2020	0.8	1.9	\$24,315	\$45,570	\$4,304	\$2,994	\$10,583	\$12,721	17,417	116,041	121,948	802,624
Total		0.8	1.6	\$116,650	\$188,113	\$18,993	\$13,252	\$45,084	\$53,752	46,298	502,877	559,824	3,451,786
Low-Income	2016	0.9	1.5	\$8,426	\$12,470	\$1,080	\$765	\$2,667	\$3,195	2,871	27,526	20,866	204,781
	2017	0.9	1.6	\$8,484	\$13,158	\$1,109	\$771	\$2,760	\$3,289	2,906	28,191	21,187	210,243
	2018	0.9	1.7	\$8,514	\$14,203	\$1,114	\$775	\$2,845	\$3,369	2,817	28,977	20,527	216,649
	2019	0.9	1.8	\$8,847	\$16,076	\$1,192	\$829	\$3,142	\$3,710	2,921	31,614	21,380	237,593
	2020	0.9	1.9	\$9,418	\$18,060	\$1,313	\$914	\$3,573	\$4,209	3,233	34,801	23,872	262,855
Total		0.9	1.7	\$43,689	\$73,967	\$5,808	\$4,053	\$14,986	\$17,772	14,748	151,110	107,832	1,132,120
Small C&I	2016	0.6	1.4	\$14,583	\$20,519	\$3,280	\$2,321	\$6,438	\$5,285	7,759	90,218	45,803	414,755
	2017	0.6	1.4	\$14,613	\$20,951	\$3,336	\$2,321	\$6,587	\$5,396	7,821	91,267	51,621	421,020
	2018	0.6	1.5	\$14,549	\$21,439	\$3,360	\$2,337	\$6,739	\$5,523	7,786	92,367	56,900	427,932
	2019	0.6	1.5	\$14,554	\$22,210	\$3,405	\$2,368	\$7,007	\$5,742	7,812	94,014	57,621	439,351
	2020	0.6	1.6	\$14,192	\$22,683	\$3,454	\$2,403	\$7,277	\$5,960	7,938	95,531	50,767	447,846
Total		0.6	1.5	\$72,491	\$107,803	\$16,836	\$11,750	\$34,048	\$27,907	39,116	463,397	262,712	2,150,904
Large C&I	2016	0.5	1.3	\$21,435	\$27,368	\$5,405	\$3,825	\$8,691	\$8,357	11,544	154,755	48,332	644,704
	2017	0.5	1.3	\$21,749	\$27,843	\$5,477	\$3,810	\$8,875	\$8,516	11,614	155,903	48,684	651,043
	2018	0.5	1.3	\$22,044	\$28,415	\$5,507	\$3,831	\$9,087	\$8,716	11,643	157,151	48,786	658,734
	2019	0.5	1.3	\$22,406	\$29,244	\$5,551	\$3,861	\$9,408	\$9,003	11,712	158,796	49,226	669,976

Net Benefits By Program Per Year (\$000)													
Program	Program Year	NTG Ratio	TRC	Program Costs (\$000)	Program Benefits (\$000)	Capacity		Energy		Load Reductions in kW		MWh Saved	
						Annual		Annual		Annual	Lifetime	Annual	Lifetime
						Generation	Trans/Dist	Peak	Off Peak				
	2020	0.5	1.3	\$22,811	\$30,201	\$5,596	\$3,893	\$9,806	\$9,350	11,825	160,321	50,066	681,704
Total		0.5	1.3	\$110,445	\$143,071	\$27,537	\$19,220	\$45,868	\$43,943	58,337	786,925	245,094	3,306,162
CHP	2016	0.8	0.9	\$22,233	\$20,269	\$4,848	\$3,431	\$10,870	\$13,326	9,505	142,569	62,968	944,519
	2017	0.8	0.9	\$23,295	\$21,076	\$5,069	\$3,526	\$11,418	\$13,998	9,878	148,174	65,445	981,676
	2018	0.8	0.9	\$24,419	\$21,958	\$5,263	\$3,661	\$12,018	\$14,756	10,271	154,060	68,046	1,020,690
	2019	0.8	0.9	\$25,609	\$23,006	\$5,466	\$3,802	\$12,723	\$15,611	10,683	160,240	70,777	1,061,654
	2020	0.8	0.9	\$8,745	\$7,755	\$1,819	\$1,265	\$4,341	\$5,310	3,561	53,413	23,592	353,885
Total		0.8	0.9	\$104,301	\$94,065	\$22,465	\$15,685	\$51,370	\$63,001	43,897	658,457	290,828	4,362,424
Residential DR	2016	1.0	0.9	\$4,115	\$3,590	\$2,102	\$1,488	\$0	\$0	38,738	38,738	0	0
	2017	1.0	1.2	\$3,271	\$4,029	\$2,376	\$1,653	\$0	\$0	43,333	43,333	0	0
	2018	1.0	1.3	\$3,191	\$4,072	\$2,401	\$1,670	\$0	\$0	43,865	43,865	0	0
	2019	1.0	1.4	\$2,970	\$4,135	\$2,438	\$1,696	\$0	\$0	44,606	44,606	0	0
	2020	1.0	1.3	\$3,191	\$4,220	\$2,489	\$1,731	\$0	\$0	45,598	45,598	0	0
Program Total		1.0	1.2	\$16,738	\$20,045	\$11,807	\$8,238	\$0	\$0	45,598	45,598	0	0
Small C&I DR	2016	1.0	0.7	\$174	\$120	\$70	\$50	\$0	\$0	1,290	1,290	0	0
	2017	1.0	0.7	\$176	\$118	\$70	\$49	\$0	\$0	1,274	1,274	0	0
	2018	1.0	0.7	\$178	\$117	\$69	\$48	\$0	\$0	1,258	1,258	0	0
	2019	1.0	0.6	\$179	\$115	\$68	\$47	\$0	\$0	1,242	1,242	0	0
	2020	1.0	0.6	\$181	\$113	\$67	\$47	\$0	\$0	1,226	1,226	0	0
Program Total		1.0	0.7	\$888	\$583	\$344	\$240	\$0	\$0	1,226	1,226	0	0
Large C&I DR	2016	1.0	0.0	\$165	\$0	\$0	\$0	\$0	\$0	0	0	0	0
	2017	1.0	2.1	\$5,533	\$11,742	\$6,925	\$4,817	\$0	\$0	126,300	126,300	0	0
	2018	1.0	2.1	\$5,519	\$11,668	\$6,882	\$4,787	\$0	\$0	125,695	125,695	0	0
	2019	1.0	2.1	\$5,504	\$11,595	\$6,838	\$4,756	\$0	\$0	125,091	125,091	0	0

- Deleted: 1.8
- Deleted: \$1,955
- Deleted: 1.7
- Deleted: \$2,337
- Deleted: 1.7
- Deleted: \$2,398
- Deleted: 1.7
- Deleted: \$2,475
- Deleted: 1.6
- Deleted: \$2,572
- Deleted: 1.7
- Deleted: \$11,736

Net Benefits By Program Per Year (\$000)													
Program	Program Year	NTG Ratio	TRC	Program Costs (\$000)	Program Benefits (\$000)	Capacity		Energy		Load Reductions in kW		MWh Saved	
						Annual		Annual		Annual	Lifetime	Annual	Lifetime
						Generation	Trans/Dist	Peak	Off Peak				
	2020	1.0	2.1	\$5,489	\$11,521	\$6,795	\$4,726	\$0	\$0	124,487	124,487	0	0
<i>Program Total</i>		1.0	2.1	\$22,210	\$46,526	\$27,440	\$19,086	\$0	\$0	124,487	124,487	0	0
Total			1.1	\$487,412	\$674,172	\$131,229	\$91,524	\$191,356	\$206,375	373,708	2,734,077	1,466,291	14,403,397

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Table C-7. Residential Low Income TRC Benefits Table

Gross TRC Benefits Per Year (\$000)												
Program	Program Year	TRC	Program Costs (\$000)	Program Benefits (\$000)	Capacity		Energy		Load Reductions in kW		MWh Saved	
					Annual		Annual		Annual	Lifetime	Annual	Lifetime
					Generation	Trans/Dist	Peak	Off Peak				
Low-Income	2016	1.6	\$8,562	\$13,438	\$1,154	\$817	\$2,856	\$3,419	3,067	29,411	22,373	219,123
	2017	1.7	\$8,601	\$14,288	\$1,195	\$831	\$2,981	\$3,551	3,135	30,365	22,953	226,855
	2018	1.8	\$8,612	\$15,526	\$1,214	\$845	\$3,107	\$3,678	3,085	31,492	22,600	235,931
	2019	2.0	\$8,932	\$17,633	\$1,309	\$910	\$3,453	\$4,078	3,235	34,530	23,818	260,024
	2020	2.1	\$9,498	\$19,901	\$1,449	\$1,008	\$3,948	\$4,649	3,603	38,192	26,746	289,007
Total			\$44,205	\$80,786	\$6,322	\$4,411	\$16,345	\$19,376	16,125	163,991	118,490	1,230,940

Table C-8. Residential (Exclusive of Low-Income) TRC Benefits Table

Gross TRC Benefits By Program Per Year (\$000)												
Program	Program Year	TRC	Program Costs (\$000)	Program Benefits (\$000)	Capacity		Energy		Load Reductions in kW		MWh Saved	
					Annual		Annual		Annual	Lifetime	Annual	Lifetime
					Generation	Trans/Dist	Peak	Off Peak				
Residential (Exclusive of Low-Income)	2016	1.6	\$30,020	\$47,792	\$5,381	\$3,808	\$12,247	\$14,679	18,647	141,500	129,359	956,255
	2017	1.7	\$30,257	\$50,743	\$5,637	\$3,921	\$12,879	\$15,350	20,342	147,415	141,053	994,486
	2018	1.8	\$30,674	\$55,591	\$5,847	\$4,067	\$13,531	\$16,192	21,288	155,510	147,191	1,050,046
	2019	2.0	\$31,519	\$62,043	\$6,192	\$4,307	\$14,632	\$17,590	21,983	167,368	151,861	1,135,429
	2020	2.1	\$32,206	\$67,997	\$6,610	\$4,598	\$16,035	\$19,339	22,609	179,517	156,457	1,222,857
Residential DR	2016	0.9	\$4,115	\$3,590	\$2,102	\$1,488	\$0	\$0	38,738	38,738	0	0
	2017	1.2	\$3,271	\$4,029	\$2,376	\$1,653	\$0	\$0	43,333	43,333	0	0
	2018	1.3	\$3,191	\$4,072	\$2,401	\$1,670	\$0	\$0	43,865	43,865	0	0
	2019	1.4	\$2,970	\$4,135	\$2,438	\$1,696	\$0	\$0	44,606	44,606	0	0
	2020	1.3	\$3,191	\$4,220	\$2,489	\$1,731	\$0	\$0	45,598	45,598	0	0
Total			\$171,414	\$304,210	\$41,474	\$28,939	\$69,325	\$83,150	116,737	803,177	725,922	5,359,074

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Table C-9. Small C&I TRC Benefits Table

Gross TRC Benefits By Program Per Year (\$000)												
Program	Program Year	TRC	Program Costs (\$000)	Program Benefits (\$000)	Capacity		Energy		Load Reductions in kW		MWh Saved	
					Annual		Annual		Annual	Lifetime	Annual	Lifetime
					Generation	Trans/Dist	Peak	Off Peak				
Small C&I EE	2016	1.6	\$21,535	\$35,280	\$5,837	\$4,131	\$11,116	\$9,223	13,822	160,474	73,954	721,352
	2017	1.7	\$21,553	\$35,978	\$5,934	\$4,127	\$11,359	\$9,393	13,928	162,245	79,879	730,564
	2018	1.7	\$21,452	\$36,763	\$5,979	\$4,159	\$11,619	\$9,585	13,883	164,235	84,818	740,678
	2019	1.8	\$21,447	\$37,994	\$6,058	\$4,214	\$12,068	\$9,917	13,941	167,117	85,491	757,427
	2020	1.8	\$21,082	\$39,002	\$6,135	\$4,267	\$12,568	\$10,283	14,144	169,469	79,113	771,388
CHP	2016	0.7	\$1,787	\$1,334	\$452	\$108	\$763	\$888	642	9,637	4,278	64,176
	2017	0.7	\$1,878	\$1,387	\$471	\$111	\$803	\$934	669	10,029	4,452	66,786
	2018	0.7	\$1,974	\$1,445	\$489	\$116	\$846	\$985	696	10,439	4,635	69,526
	2019	0.7	\$2,077	\$1,514	\$508	\$120	\$897	\$1,043	725	10,871	4,827	72,403
	2020	0.7	\$706	\$510	\$169	\$40	\$306	\$355	242	3,624	1,609	24,134
Small C&I DR	2016	0.7	\$174	\$120	\$70	\$50	\$0	\$0	1,290	1,290	0	0
	2017	0.7	\$176	\$118	\$70	\$49	\$0	\$0	1,274	1,274	0	0
	2018	0.7	\$178	\$117	\$69	\$48	\$0	\$0	1,258	1,258	0	0
	2019	0.6	\$179	\$115	\$68	\$47	\$0	\$0	1,242	1,242	0	0
	2020	0.6	\$181	\$113	\$67	\$47	\$0	\$0	1,226	1,226	0	0
Total			\$116,378	\$191,790	\$32,376	\$21,633	\$62,345	\$52,606	73,917	869,365	423,057	4,018,433

Table C-10. Large C&I TRC Benefits Table

Program	Program Year	TRC	Program Costs (\$000)	Program Benefits (\$000)	Capacity		Energy		Load Reductions in kW		MWh Saved	
					Annual		Annual		Annual	Lifetime	Annual	Lifetime
					Generation	Trans/Dist	Peak	Off Peak				
Large C&I EE	2016	1.4	\$37,373	\$53,831	\$10,727	\$7,591	\$17,153	\$16,419	22,896	307,218	95,050	1,269,872
	2017	1.4	\$37,869	\$54,668	\$10,866	\$7,558	\$17,491	\$16,698	23,029	309,353	95,606	1,280,022
	2018	1.5	\$38,340	\$55,650	\$10,922	\$7,597	\$17,876	\$17,043	23,091	311,699	95,678	1,291,787
	2019	1.5	\$38,896	\$57,042	\$11,001	\$7,652	\$18,448	\$17,526	23,218	314,666	96,256	1,308,445
	2020	1.5	\$39,498	\$58,656	\$11,076	\$7,704	\$19,159	\$18,108	23,413	317,269	97,507	1,325,461
CHP	2016	0.9	\$25,639	\$24,003	\$5,732	\$4,057	\$12,825	\$15,770	11,238	168,574	74,432	1,116,473
	2017	0.9	\$26,855	\$24,958	\$5,994	\$4,169	\$13,470	\$16,563	11,679	175,189	77,354	1,160,309
	2018	0.9	\$28,141	\$26,003	\$6,222	\$4,328	\$14,176	\$17,460	12,142	182,136	80,422	1,206,336
	2019	0.9	\$29,503	\$27,243	\$6,461	\$4,494	\$15,006	\$18,470	12,629	189,429	83,644	1,254,665
	2020	0.9	\$10,049	\$9,184	\$2,151	\$1,496	\$5,120	\$6,283	4,210	63,143	27,881	418,222
Large C&I DR	2016	0.0	\$165	\$0	\$0	\$0	\$0	\$0	0	0	0	0
	2017	2.1	\$5,533	\$11,742	\$6,925	\$4,817	\$0	\$0	126,300	126,300	0	0
	2018	2.1	\$5,519	\$11,668	\$6,882	\$4,787	\$0	\$0	125,695	125,695	0	0
	2019	2.1	\$5,504	\$11,595	\$6,838	\$4,756	\$0	\$0	125,091	125,091	0	0
	2020	2.1	\$5,489	\$11,521	\$6,795	\$4,726	\$0	\$0	124,487	124,487	0	0
Total			\$334,371	\$437,762	\$108,592	\$75,733	\$150,724	\$160,339	292,030	2,463,163	823,832	11,631,593

Table E-6. Residential DR Program Measure Level Details

Residential DR Program											
Measure List			Gross First Year Savings per Unit		Incentive Range		Annual Participation (Units)				
Measure Name	Units	Pathway	Energy Savings (kWh/unit)	Peak Demand Savings (kW/unit)	Low	High	PY 2016	PY 2017	PY 2018	PY 2019	PY 2020
Behavioral DR	Participant	Retail or Trade Ally/Contractor	0.0	0.080	\$0.00	\$120.00	0	12,000	14,400	17,280	20,736
Residential DLC	Switch	Retail or Trade Ally/Contractor	0.0	0.825	\$0.00	\$120.00	45,294	44,720	44,152	43,582	<u>43,036</u> <u>2,500</u>
Smart/Learning Thermostat	Thermostat	Retail or Trade Ally/Contractor	0.0	0.750	\$0.00	\$120.00	0	5,000	6,000	7,200	8,640

Table E-7. Small C&I DR Program Measure Level Details

Small C&I DR Program											
Measure List			Gross First Year Savings per Unit		Incentive Range		Annual Participation (Units)				
Measure Name	Units	Pathway	Energy Savings (kWh/unit)	Peak Demand Savings (kW/unit)	Low	High	PY 2016	PY 2017	PY 2018	PY 2019	PY 2020
Commercial DLC	Thermostat	Retail or Trade Ally/Contractor	0.0	0.750	\$0.00	\$120.00	1,593	1,573	1,553	1,533	1,514

Table E-8. Large C&I DR Measure Level Details

Large C&I DR Program											
Measure List			Gross First Year Savings per Unit		Incentive Range		Annual Participation (Units)				
Measure Name	Units	Pathway	Energy Savings (kWh/unit)	Peak Demand Savings (kW/unit)	Low	High	PY 2016	PY 2017	PY 2018	PY 2019	PY 2020
DR Aggregator Program, not PJM-enrolled	Customer	Retail or Trade Ally/Contractor	0.0	559.585	\$8,393.78	\$50,382.69	0	86	86	86	86
DR Aggregator Program, PJM-enrolled	Customer	Retail or Trade Ally/Contractor	0.0	481.963	\$4,196.89	\$25,181.34	0	123	122	121	120

Appendix F. Exhibits RAS

Exhibits RAS-1, RAS-2, RAS-3 and RAS-4 are attached to the Direct Testimony of Richard A. Schlesinger.

**PHASE III ENERGY EFFICIENCY AND CONSERVATION PLAN
PROGRAM COST BY RATE CLASS (PY2016 -PY2020)**

Exhibit RAS-1

Program	Residential	Small C&I	Large C&I	Municipal	Total
Residential					
1. Residential (Exclusive of Low-Income)					
	\$100,070,556	\$0	\$0	\$0	\$100,070,556
2. Residential Low-Income	\$29,399,456	\$0	\$0	\$0	\$29,399,456
3. Residential DR	\$13,716,919 \$20,116,919	\$0	\$0	\$0	\$13,716,919 \$20,116,919
Subtotal Residential Programs	143,186,931 \$149,586,931	\$0	\$0	\$0	143,186,931 \$149,586,931
Small Commercial					
4. Small Commercial	\$0	\$39,580,311	\$0	\$0	\$39,580,311
5. Small Commercial G/E/NP	\$0	\$4,674,354	\$0	\$0	\$4,674,354
6. Small Commercial Low-Income	\$0	\$3,554,143	\$0	\$0	\$3,554,143
7. Small C&I CHP (Exclusive of G/E/NP)	\$0	\$779,201	\$0	\$0	\$779,201
8. Small C&I CHP G/E/NP	\$0	\$654,224	\$0	\$0	\$654,224
9. Small Commercial DR	\$0	\$942,773	\$0	\$0	\$942,773
Subtotal C&I Small Programs	\$0	\$50,185,005	\$0	\$0	\$50,185,005
Large Commercial					
10. Large Commercial	\$0	\$0	\$47,576,988	\$0	\$47,576,988
11. Large Commercial G/E/NP	\$0	\$0	\$7,457,153	\$0	\$7,457,153
12. Large Commercial Low-Income	\$0	\$0	\$3,192,104	\$0	\$3,192,104
13. CHP (Exclusive of G/E/NP)	\$0	\$0	\$13,411,937	\$0	\$13,411,937
14. CHP G/E/NP	\$0	\$0	\$10,129,741	\$0	\$10,129,741
15. Large Commercial DR	\$0	\$0	\$27,136,803	\$0	\$27,136,803
Subtotal C&I Large Programs	\$0	\$0	\$108,904,726	\$0	\$108,904,726
Municipal					
16. LED Retrofit (Small Commercial)	\$0	\$0	\$0	\$209,602	\$209,602
17. LED Retrofit (Large Commercial)	\$0	\$0	\$0	\$90,596	\$90,596
Subtotal Municipal Programs	\$0	\$0	\$0	\$300,198	\$300,198
Subtotal Com., Ind. & Muni. Programs	\$0	\$50,185,005	\$108,904,726	\$300,198	\$159,389,929
Support Services	\$49,619,414	\$17,390,907	\$37,739,399	\$104,030	\$104,853,750
Research and Development	\$9,443,309 \$3,043,309	\$3,309,747	\$7,182,366	\$19,798	\$19,995,220 \$13,555,220
Grand Total	\$202,249,654	\$70,885,659	\$153,826,491	\$424,026	\$427,385,830

VERIFICATION

I, Doreen Masalta, hereby declare that I am the Director of Energy and Marketing Services for PECO Energy Company; that, as such, I am authorized to make this verification on its behalf; that the facts set forth in the foregoing Petition are true and correct to the best of my knowledge, information and belief; and that I make this verification subject to the penalties of 18 Pa.C.S. § 4904 pertaining to false statements to authorities.

Date: 12/17/19

Doreen Masalta

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SECRETARY'S BUREAU

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SECRETARY'S BUREAU

**BEFORE THE
PENNSYLVANIA PUBLIC UTILITY COMMISSION**

PETITION OF PECO ENERGY :
COMPANY FOR APPROVAL OF ITS :
ACT 129 PHASE III ENERGY : **Docket No. M-2015-2515691**
EFFICIENCY AND CONSERVATION :
PLAN :

CERTIFICATE OF SERVICE

I hereby certify that I have this date served true and correct copies of the **Petition of PECO Energy Company for Approval of Minor Changes to Its Phase III EE&C Plan Pursuant to the Commission's Expedited Review Process** on the following individuals in the matter specified in accordance with the requirements of 52 Pa. Code § 1.54:

VIA ELECTRONIC MAIL & FIRST CLASS MAIL

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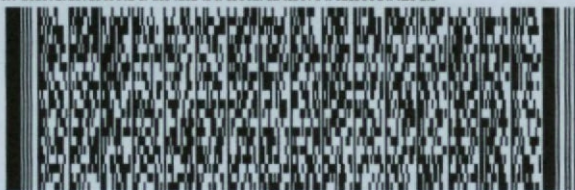
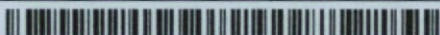
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400 NORTH ST FL 2**

HARRISBURG PA 17120

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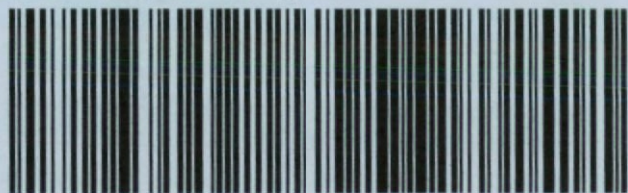
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