



**Three-Year Program Plan  
Energy Efficiency Investment Fund (EEIF),  
E2 Industrial (E2I),  
and Weatherization Assistance Program (WAP)**

**Submitted to:**

**Delaware Energy Efficiency Advisory Council**

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## Portfolio Overview

The document presents the three-year energy efficiency portfolio for the Delaware Department of Natural Resources and Environmental Control (DNREC). DNREC will be offering three energy efficiency programs in the upcoming three year period. Two programs, the Energy Efficiency Investment Fund (EEIF) and E2 Industrial (E2I) are highly cost-effective and are being submitted for Council approval to count towards the statewide goals. The Weatherization Assistance Program (WAP) is not currently cost-effective and is therefore not being submitted for a council vote. However, it is included in this plan for completeness.

EEIF and E2I are designed to reduce market barriers to energy efficiency and thus increase investment in cost-effective measures that will produce net benefits to the state of Delaware. Together, these programs will achieve significant energy and peak demand savings, reduce emissions of greenhouse gases and other pollutants, and yield large financial savings for Delaware ratepayers.

## Energy Efficiency Investment Fund

The EEIF program offers prescriptive and custom incentives to existing commercial and industrial buildings. EEIF will provide incentives up to \$1 million per project. This program is funded from two sources: \$8 million from the settlement in the Pepco Holdings – Exelon merger, to be spent in Delmarva Power (DPL) territory; and \$2 million from the proceeds of the Regional Greenhouse Gas Initiative (RGGI), available to customers statewide. In addition, the Delaware Sustainable Energy Utility (SEU) will contribute \$1.4 million in Program Year 1<sup>1</sup> for non-profit and governmental customers to participate in the program, but all savings associated with these funds will be attributable to the SEU. Therefore, these funds and the associated savings are not included in DNREC's portfolio or any of the projections in this document. As shown in Table 1, the total annual electric savings over all program years from the EEIF program is almost 44,000 MWh. Comparing the benefits from savings in electric energy and demand as well as thermal savings to the costs of the program yields a Total Resource Cost (TRC) benefit-cost ratio of 2.3.

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<sup>1</sup>All activity occurring in both 2016 and 2017 are considered to be Program Year 1; Program Year 2 is 2018 and Program Year 3 is 2019.

## DNREC Three-Year Program Plan

*Table 1: EEIF Program Overview*

	Year 1	Year 2	Year 3	Total
Annual Energy Savings (MWh)	14,651	14,651	14,651	43,954
Annual Demand Savings (kW)	2,446	2,446	2,446	7,339
Annual Thermal Savings (MMBtu)	48,146	48,146	48,146	144,439
Participants	172	172	172	516
Incentive Costs (millions)	\$3.0	\$3.0	\$3.0	\$9.0
Implementation Costs (millions)	\$0.3	\$0.3	\$0.3	\$1.0
Total Program Costs (millions)	\$3.3	\$3.3	\$3.3	\$10.0
TRC Benefit-Cost Ratio	2.3	2.3	2.3	2.3
Electric savings as % of statewide sales	0.13%	0.13%	0.13%	0.39%
Gas savings as % of statewide sales	0.08%	0.08%	0.08%	0.25%

Note: In this and all tables in this report, totals may not equal the sum of individual values due to rounding.

## E2 Industrial

The E2I is available to large energy users (greater than 10,000 MWh annual electric or 95,000 MMBtu annual gas usage) and provides incentives for large custom efficiency projects. Unlike the EEIF program, the \$1 million per-project cap does not apply. This program will ensure that there is an incentive for large industrial users to perform comprehensive energy upgrades, which can produce significant energy savings at low per-unit cost. The E2I program is funded with \$8 million from the DPL merger settlement, and is therefore only available in DPL territory. As shown in Table 2, E2I is expected to generate an additional 21,000 MWh of annual electricity savings over 3 years, with a TRC ratio of 2.6.

*Table 2: E2I Program Overview*

	Year 1	Year 2	Year 3	Total
Annual Energy Savings (MWh)	7,081	7,081	7,081	21,242
Annual Demand Savings (kW)	1,012	1,012	1,012	3,035
Annual Thermal Savings (MMBtu)	61,184	61,184	61,184	183,552
Participants	1	1	1	3
Incentive Costs (millions)	\$2.5	\$2.5	\$2.5	\$7.5
Implementation Costs (millions)	\$0.16	\$0.16	\$0.16	\$0.48
Total Program Costs (millions)	\$2.7	\$2.7	\$2.7	\$8.0
TRC Benefit-Cost Ratio	2.6	2.6	2.5	2.6
Electric savings as % of statewide sales	0.06%	0.06%	0.06%	0.19%
Gas savings as % of statewide sales	0.11%	0.11%	0.11%	0.32%

### Weatherization Assistance Program

The WAP provides energy efficiency retrofits for low-income residential customers. It is funded the \$7.4 million from the US Department of Energy (DOE). These retrofits are designed to both improve the health and safety of the home and lower the monthly energy cost for the household. As shown in Table 3, WAP is expected to achieve annual energy savings of almost 600 MWh over three years. The TRC benefit-cost ratio is 0.6, although this increases to 0.7 if expenses associated with health and safety improvements in the home are excluded. Because the benefit-cost ratio for the WAP program is below 1.0, we are not currently proposing that this program count towards the statewide energy savings goal established by the Energy Efficiency Advisory Council (EEAC). However, in other states, programs serving low-income customers have been shown to yield significant non-energy benefits, such as reduced sick days; reduced medical expenses from asthma, heat stress, and cold stress; and reduced arrearages for the utility. If the EEAC or the Public Service Commission adopt non-energy benefits for inclusion in cost-effectiveness calculations in Delaware, and if these benefits result in a TRC BCR for WAP that exceeds 1.0 DNREC will resubmit the program for EEAC approval and inclusion in savings counted towards the statewide goals.

*Table 3: WAP Program Overview*

	Year 1	Year 2	Year 3	Total
Annual Energy Savings (MWh)	175	198	226	598
Annual Demand Savings (kW)	102	111	127	340
Annual Thermal Savings (MMBTU)	7,417	8,450	9,657	25,524
Participants	300	350	400	1050
Incentive Costs (millions)	\$1.2	\$1.4	\$1.6	\$4.2
Health and Safety Costs (millions)	\$0.4	\$0.4	\$0.5	\$1.2
Implementation Costs (millions)	\$0.6	\$0.7	\$0.7	\$2.0
Total Program Costs (millions)	\$2.2	\$2.5	\$2.8	\$7.4
TRC Benefit-Cost Ratio	0.6	0.6	0.6	0.6
TRC Benefit-Cost Ratio w/o Health and Safety Costs	0.7	0.7	0.8	0.7

Table 4 shows the total savings from the EEIF and E2I programs. As noted above, WAP results are not included at this time. By program year three, the two programs will be producing over 65,000 MWh of annual electric energy savings for the state of Delaware, in addition to a large reduction in peak demand (over 10,000 kW) and thermal energy (approximately 328,000 MMBtu).

## DNREC Three-Year Program Plan

*Table 4: Total Portfolio Overview*

Total Portfolio	Year 1	Year 2	Year 3	Total
Annual Energy Savings (MWh)	21,732	21,732	21,732	65,197
Annual Demand Savings (kW)	3,458	3,458	3,458	10,374
Annual Thermal Savings (MMBTU)	109,330	109,330	109,330	327,991
Participants	173	173	173	519
Incentive Costs (millions)	\$5.5	\$5.5	\$5.5	\$16.5
Implementation Costs (millions)	\$0.5	\$0.5	\$0.5	\$1.5
Total Program Costs (millions)	\$6.0	\$6.0	\$6.0	\$18.0
TRC Benefit-Cost Ratio	2.4	2.4	2.4	2.4
Electric savings as % of statewide sales	0.19%	0.19%	0.19%	0.58%
Gas savings as % of statewide sales	0.19%	0.19%	0.19%	0.57%

### Portfolio Summary and Progress Towards Statewide Energy Savings Goals

Table 5 below shows the contribution of the DNREC portfolio (EEIF and E2I programs only) to the overall statewide energy savings goals approved by the EEAC. As the goals increase from year-to-year, the DNREC portfolio will likely represent a smaller portion of overall energy savings needed to reach the goals in the second and third years. This is based on the assumption that program activity is evenly distributed over the three program years, which may or may not be an accurate assumption. Note that the equivalent percentage savings for electric and natural gas energy is a coincidence, not the result of any assumptions or intentional calculations.

*Table 5: DNREC Portfolio Contribution to Statewide Goals*

	Program Year 1	Program Year 2	Program Year 3	Total
<b>Annual Electric Energy Savings (MWh)</b>				
EEIF	14,651	14,651	14,651	43,954
E2I	7,081	7,081	7,081	21,242
Portfolio Total	21,732	21,732	21,732	65,197
Electric Savings as % of Sales	0.19%	0.19%	0.19%	0.58%
Electric Savings Goal	0.40%	0.70%	1.00%	2.10%
<b>Annual Natural Gas Savings (MMBtu)</b>				
EEIF	48,146	48,146	48,146	144,439
E2I	61,184	61,184	61,184	183,552
Portfolio Total	109,330	109,330	109,330	327,991
Natural Gas Savings as % of Sales	0.19%	0.19%	0.19%	0.57%
Natural Gas Savings Goal	0.20%	0.30%	0.50%	1.00%

## **1. Program Design, Portfolio Analysis, and Evaluation, Measurement and Verification**

### **1.1 Program Design Philosophy and Overview**

DNREC's two programs to be submitted for Council vote, EEIF and E2I, are designed to provide cost-effective energy savings to Delaware businesses and residents. Together, these programs are designed to overcome common market barriers to adopting energy efficiency measures and practices. Further, DNREC ensures that the programs are cost-effective as defined by the TRC test under Delaware statute, which means that they create net benefits for the state of Delaware. Because the Weatherization Assistance Program does not currently pass the TRC, DNREC is not proposing it for inclusion in achievement towards the statewide energy savings goal established by the EEAC. If non-energy impacts are later approved that make the program cost-effective, DNREC will resubmit this program plan to the EEAC.

### **1.2 Stakeholder Process**

DNREC chairs the EEAC, which allows all stakeholders to provide input to program design and other policy issues related to energy efficiency in Delaware. DNREC is fully committed to working collaboratively with the EEAC as the changes in the efficiency landscape take place and, where possible, to take into account input from other stakeholders.

The energy efficiency landscape in Delaware is in the midst of a rapid change. While this plan assumes that the EEIF and E2I programs will continue as designed, there is significant uncertainty as to the specific shape of each program in the future. DNREC will continue to engage with Program Administrators (PAs) and other stakeholders during monthly EEAC meetings and other regular communication. During this process, we will continue to ensure that all programs are cost-effective, that program designs are effectively removing market barriers to efficiency investment, that EM&V is performed according to Delaware regulations, and that the efficiency programs of the various PAs complement each other in an effective and equitable manner.

Due to the rapidly evolving nature of energy efficiency in Delaware, it is likely that changes to the assumptions made for this plan will be necessary. For example, federal funding for WAP is based on annual budget allocations. Although our analysis assumes that future allocations will remain relatively constant, funding for the second and third years of the plan is not assured. If this or other similar change results in a significant change to the forecasted costs and savings of DNREC's portfolio, DNREC will update the numbers in this plan and present a revised version for a new council vote.

### **1.3 Review of Program Past Performance**

Prior to 2014, the EEIF program only offered custom incentives, with payment based solely on estimated energy savings. For fiscal year 2014, the EEIF program began providing both prescriptive and custom incentives. The prescriptive track offers standard per-unit rebates (e.g.,

per lighting fixture) for relatively basic efficiency measures that have straightforward specifications, are readily available, and provide clear and simple value propositions for upgrading from baseline technologies. This modification proved to be highly successful, and program participation has dramatically increased. In the past two years the EEIF program has provided prescriptive and custom funding to over 400 commercial facilities at an average cost of \$0.14 per first year kWh saved.<sup>2</sup>

The sub-grantee administering WAP has changed multiple times in the last several years. As a result, participation in the program has been uneven, and DNREC did not fully expend the available funds in 2015. However, there have been no major changes in program design.

The E2 Industrial Program is new for the next program year, and so has no established program history.

### 1.4 Planned Program Enhancements

As stated earlier, the basic structure of the EEIF program will remain the same, although new funding means that there will be multiple sources of money with unique participation requirements. In particular, funds received from the Pepco – Exelon merger must be spent in DPL territory. In addition, DNREC is adding the E2 Industrial Program to complement EEIF in DPL territory. We believe that this combination of programs most effectively uses the available funds to maximize the benefits to the state of Delaware.

The prescriptive approach for EEIF will continue largely unchanged, although the incentive structure and rebate amounts will be revised to account for changing market conditions. These changes include:

- A prescriptive incentive for linear LED replacement lamps.
- A shift of away from high performance fluorescent technology and towards LED from 2016 to 2019.
- Modifications in incentive amounts based on the actual costs of projects performed to date.

Enhancements to WAP are focused mainly on ensuring the stability of WAP in the marketplace. Catholic Charities will increase program activity towards a goal of 400 audits per year by Program Year 3. Further, DNREC expects administrative costs for WAP to decrease from \$2,200 per home to \$1,800 per home between now and program year 3. The program is also in the process of implementing a software-based system to replace paper invoicing. This

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<sup>2</sup> This unit of measure refers to the program cost for each unit of annual energy savings saved. Annual energy savings continue for the lifetime of the measure, which may be between 5 and 25 years. The \$0.14 per kWh for the EEIF is the average historical cost across both custom and prescriptive projects. Custom incentives are paid at \$0.12 per kWh but prescriptive projects have a slightly higher cost of savings, bringing the average program cost to \$0.14 per kWh.



will increase the accuracy of the reporting and allow DNREC to track measure-level costs and savings.

### **1.5 Portfolio Evaluation, Measurement, and Verification**

Evaluation, measurement, and verification (EM&V) regulations have been proposed for promulgation; they dictate the EM&V requirements necessary in order for programs to count towards statewide energy savings goals. DNREC plans to follow these requirements for the EEIF and E2I programs.

### **1.6 Cost-Effectiveness Methodology Overview**

In order to assess the cost-effectiveness of DNREC's proposed programs, we performed a bottom-up analysis to estimate three-year program budgets and savings for each program. First, we characterized each measure expected to be installed in the program. This involved defining the measure life, cost, energy savings, peak demand reduction, natural gas savings, and operation and maintenance (O&M) savings for each prescriptive measure. We relied on assumptions presented in the Delaware Technical Reference Manual (TRM) as our key resource.<sup>3</sup> The TRM is a public document, officially part of Delaware EM&V regulations, and identifies most necessary assumptions and algorithms needed for measure screening. For custom measures, we reviewed the cost of savings from custom projects completed in fiscal years 2015 and 2016 and assumed similar costs going forward. For the Weatherization Assistance Program, we replicated typical costs per measure by using the WAP price list. However, going forward, Catholic Charities and DNREC will start tracking measure level cost and savings data. These data will make it easier to project likely costs and savings in the future.

Once the costs and savings for each measure were defined, we projected participation based on a combination of experience with similar programs in other jurisdictions and professional judgement. Each program was then screened for cost effectiveness using the TRC test. This test compares the total lifetime economic benefit resulting from the energy and peak demand savings and other monetized benefits to the total costs of the program.

Under the TRC test, costs include all measure costs (whether paid by the program participant or the program administrator) plus any additional implementation costs such as administrative costs and the costs of EM&V. Benefits from the efficiency programs include avoided spending from primary fuels savings (electricity and natural gas), the value of avoided spending on other resources (e.g., delivered fossil fuels and water), and operation and maintenance (O&M) savings resulting from efficiency measures. The largest component of the program benefits are the avoided energy and avoided capacity costs. Avoided costs used in the analysis are based on the values from the latest avoided cost study from the Maryland Energy

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<sup>3</sup> As defined in Proposed Regulation 2105 Evaluation, Measurement & Verification Regulations Proposed to Implement 29 Del. C. §8059

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Administration (MEA)<sup>4</sup>. At this time, we did not include any benefits resulting from non-energy impacts, as these have not yet been approved by the EEAC. Going forward, the avoided costs will be updated to reflect current and expected market conditions. Avoided transmission and distribution capacity values are also included. As discussed elsewhere, both the EEIF and E2I programs are projected to have benefits more than twice their costs; future changes to avoided costs are unlikely to render these programs not cost-effective.

Table 6 below shows the projected costs and benefits of the proposed EEIF and E2I programs for the three year plan in present value (PV) terms. That is, the total discounted costs and benefits over the life of the program and savings measure life. The programs are highly cost-effective, with TRCs of 2.3 and 2.6, respectively. This means that each dollar spent on these programs provides between \$2.30 and \$2.60 in lifetime benefits to Delaware's economy.

*Table 6: Benefit and Cost Summary*

	PV of Benefits (millions)	PV of Costs (millions)	PV of Net Benefits	TRC Ratio
EEIF	\$64	\$28	\$36	2.3
E2I	\$43	\$17	\$26.19	2.6
Total	\$107	\$45	\$62	2.4

## 2. Energy Efficiency Programs Detail

The table below shows the total planned savings from DNREC's 2017-2019 efficiency portfolio. It excludes costs and savings from WAP, because DNREC is not proposing that this program count towards achievement of statewide goals.

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<sup>4</sup> Exeter. *Avoided Energy Costs in Maryland: Assessment of the Costs Avoided through Energy Efficiency and Conservation Measures in Maryland*. April 2014.

Table 7: EE Portfolio: EEIF and E2I

Total Portfolio	Year 1	Year 2	Year 3	Total
Annual Energy Savings (MWh)	21,732	21,732	21,732	65,197
Annual Demand Savings (kW)	3,458	3,458	3,458	10,374
Annual Thermal Savings (MMBTU)	109,330	109,330	109,330	327,991
Participants	173	173	173	519
Incentive Costs (millions)	\$5.5	\$5.5	\$5.5	\$16.5
Implementation Costs (millions)	\$0.5	\$0.5	\$0.5	\$1.5
Total Program Costs (millions)	\$6.0	\$6.0	\$6.0	\$18.0
TRC Benefit-Cost Ratio	2.4	2.4	2.4	2.4

## 2.1 Energy Efficiency Investment Fund Program

### 2.1.1 Program Overview

As outlined above, the current EEIF program is designed to address market barriers to efficiency investment in the commercial and industrial sectors while maximizing administrative efficiency, using both a custom and a prescriptive approach. The prescriptive approach focuses on relatively basic measures that have straightforward specifications, are readily available, and provide clear and simple value propositions for upgrading from baseline technologies. Incentives are typically established to cover a portion of the cost to upgrade from a baseline standard or code, with the projected savings compensating for the customer’s added investment. For example, because high performance T8 (HPT8) fixtures are common, well-understood, and have been screened to be cost effective versus a standard T8 baseline, EEIF offers a \$5 prescriptive incentive for each HP T8 fixture. This means lighting contractors can promise their customers \$5 for each HPT8 fixture, without worrying about any uncertainty in the incentive amount or eligibility. The prescriptive incentive also lowers DNREC’s administrative burden. Because the measure has been pre-vetted and shown to be cost-effective in general, DNREC does not need to perform the same level of application review as compared to custom projects. This approach also supports direct and accurate calculation of energy savings, with clear energy (both electric and natural gas) savings values for each unit documented by the Delaware TRM.

Another positive feature of the prescriptive approach is the less burdensome administrative and technical requirements to process and approve applications compared to a custom approach. Application approval focuses on confirming accuracy of data entry and completeness of any supporting documentation, because the measure specifications, savings, and incentives are pre-established.

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The custom incentive path focuses on capturing savings from any cost-effective energy efficiency measure that is not offered on a prescriptive basis. Incentives are based on the amount of energy saved. Projects under the custom program are highly site-specific. Unlike the prescriptive program, which relies on TRM-derived savings algorithms or deemed savings values, the energy savings for each custom project may require a unique calculation. Additional quality control is required for custom projects, to ensure that energy savings algorithms are based on industry best practices, and that any input assumptions are reasonable and well sourced. In line with previous non-lighting custom incentives, DNREC expects the program to have an average incentive size of about \$50,000 per participant, equating to 43 participants per year.

As of now, EEIF is funded at \$10 million over the next three years in total, composed of \$2 million from RGGI proceeds for use statewide and \$8 million from merger settlement funds for use in DPL territory. Regardless of whether program supports comes in the form of prescriptive or custom incentives (or potentially both), projects will be limited to receiving a total incentive of no more than 30% of the project cost. Not that there is an additional \$1.4 million from the SEU to be spent on non-profit and governmental buildings, but all impacts associated with this funding are attributable to the SEU, and thus are not included in any aspect of this plan and analysis

### 2.1.2 Target Market

Both prescriptive and custom incentives are available to non-residential entities that pay the Public Utility Tax. This includes all commercial and industrial facilities, except for political subdivisions, state government agencies, public schools, and automobile manufacturers. A portion of the program funds from the Pepco-Exelon merger settlement will be reserved for DPL customers only. It is expected that the average prescriptive participant will be a smaller energy user than the average custom incentive participant.

### 2.1.3 Market Analysis and Trends

A large portion of the savings from the EEIF program are likely to come from measures that address lighting energy consumption. Therefore, it is important to consider the rapid pace of change in the lighting market in developing the three-year plan. First, the Energy Information and Security Act of 2007 (EISA) effectively eliminated T12 lamps and certain types of screw-in incandescent lamps. Therefore, we assume a baseline of T8 lamps for linear fluorescent lighting and a baseline of the more efficient halogen incandescent for the affected types of screw-in lamps. These more efficient baselines translate to somewhat lower savings for the same measures for the coming program years as compared to previous results. However, all prescriptive measures remain cost-effective.

Secondly, the price of LED lighting has been declining steadily in recent years, making this highly efficient lighting technology much more financially viable and cost-effective. Market analysts and efficiency experts expect this trend to continue, and therefore we project a significant shift in program activities away from efficient fluorescent technology and towards

LED lighting. DNREC will monitor LED costs to ensure that prescriptive incentives are lowered in tandem with the falling prices to avoid over-paying for this technology.

#### 2.1.4 Eligible Measures/Service and Customer Incentives

The table on the following page lists the eligible prescriptive measures and their corresponding incentives.

#### 2.1.5 Marketing

To date, the EEIF program has only performed limited marketing activities; it has been fully subscribed largely via word-of-mouth from Delaware contractors. Due to higher funding levels for the next three years, DNREC anticipates a need for marketing campaigns to ensure sufficient program activity. These campaigns would likely focus on promoting a wider awareness of the EEIF program among Delaware contractors.

#### 2.1.6 Expected Savings, Costs, and Cost-effectiveness

*Table 8: EEIF Program Total Savings*

	Year 1	Year 2	Year 3	Total
Annual Energy Savings (MWh)	14,651	14,651	14,651	43,954
Annual Demand Savings (kW)	2,446	2,446	2,446	7,339
Annual Thermal Savings (MMBtu)	48,146	48,146	48,146	144,439
Participants	172	172	172	516
Incentive Costs (millions)	\$3.0	\$3.0	\$3.0	\$9.0
Implementation Costs (millions)	\$0.3	\$0.3	\$0.3	\$1.0
Total Program Costs (millions)	\$3.3	\$3.3	\$3.3	\$10.0
TRC Ratio	2.3	2.3	2.3	2.3

See Appendix A for tables showing details of participation and cost-effectiveness by measure.

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Table 9:EEIF Prescriptive Measures

Measure	Incentive
Relamp/Reballast to HP T8	\$5
New HP T8 Fixture	\$5
New or Retrofit 2-Lamp HPT8 High Efficiency Troffer Fixture	\$15
HP T8 High Bay Fixture	\$25
New T5 Fixture	\$5
New or Retrofit 2-Lamp T5 High Efficiency Troffer Fixture	\$15
T5 HO High Bay Fixture	\$30
LED Linear Lamp	\$8
LED screw based lamps	\$7
Recessed and Surface/Pendant-Mounted Downlight Fixtures	\$20
LED Track Lighting Fixtures	\$30 per head
LED Refrigerated Case Fixture	\$10 per foot
LED Freezer Case Fixture	\$10 per foot
LED Display Case Fixtures	\$10 per foot
1'X4', 2'X4', 2'X2' LED Troffer or Panel Ambient Light Fixtures	\$40
LED High and Low Bay Fixtures	\$100
Outdoor Fixtures, <5,000 lumens	\$75
Outdoor Fixtures, >=5,000 lumens and <10,000 lumens	\$100
Outdoor Fixtures, >10,000 lumens	\$125
Vending Misers - Refrigerated Vending Machine	\$115
Vending Misers - Non-Refrigerated Vending Machine	\$45
Vending Misers - Glass Front Refrigerated Cooler	\$115
95 AFUE Gas Furnace, <150 MBH	\$500
97 AFUE Gas Furnace, <150 MBH	\$800
Condensing Unit Heater, <300 MBH	\$750
Infrared Heater	\$750
90 AFUE Condensing Boiler, <300 MBH	\$1,000
95 AFUE Condensing Boiler, <300 MBH	\$1,500
On-demand tankless water heater, EF >0.82	\$500
On-demand tankless water heater, EF >0.95	\$800
HE Indirect Water Heater	\$400
Condensing Stand-alone water heater	\$500
High Efficiency Pre-rinse Spray Valve	\$25
After Market Boiler Reset Controls	\$225
Steam Traps	\$50
Energy Star Programmable thermostats	\$25

## 2.2 E2 Industrial Program

### 2.2.1 Program Overview

The E2 Industrial program will bridge the gap between standard EEIF and the unique needs of comprehensive energy savings projects for very large customers. Specifically, E2I is aimed customers with annual energy electric usage exceeding 10,000 MWh or annual gas usage of more than 95,000 MMBtu. The program will review and award projects on a quarterly basis for as long as program funds remain available.

In order to encourage significant savings at large facilities, the incentive for electric savings, \$0.14 per kWh, will be slightly higher than for EEIF custom projects (\$0.12 per kWh), while the rate for gas savings will remain at \$5 per MMBtu. In addition, additional incentive will be provided for peak electric demand reduction in the range of \$500-\$800 per kW, with an anticipated average incentive of \$700 per kW.<sup>5</sup> This will encourage significant demand savings for the successful applicant, thus reducing congestion and delaying needed grid upgrades and additions. The grants will be awarded competitively, based on factors such as total savings, project cost, and cost effectiveness. All projects must pass the TRC test and comply with the evaluation, measurement & verification regulations. Incentive payments may not exceed 30% of the total project cost. Payment will be made to awardees upon project completion and receipt of final invoices for the scope of work.

The Pepco – Exelon merger settlement will provide E2I with \$8 million over the three program years. Therefore, the program will only be available in DPL territory. The plan assumes that these funds will be disbursed evenly over the three program years, but there is no requirement that this be the case; spending and savings may end up concentrated in one or two program years.

### 2.2.2 Target Market

The program is targeted towards very large facilities, with annual energy usage greater than 10,000 MWh of electricity or 95,000 MMBtu of natural gas.

### 2.2.3 Market Analysis and Trends

Because this market segment tends to have specialized energy using equipment and needs, projects are expected to be highly differentiated based on the specific customer. Each project will therefore require its own process to identify the opportunity, estimate savings, and determine appropriate M&V procedures to meet the requirements of the EM&V regulations.

### 2.2.4 Eligible Measures/Service and Customer Incentives

Because all projects in this program will be treated as custom, any measures that save gas and/or electricity are eligible for incentives.

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<sup>5</sup> Cost and savings projections for E2I assume an average incentive of \$700 per kW.

### 2.2.5 Marketing

Participation in this program will be secured via a quarterly review of applications, until funds are expended. In the event that the program is not fully subscribed, DNREC will perform a targeted marketing effort towards the state’s large industrial consumers.

### 2.2.6 Expected Savings, Costs, and Cost-effectiveness

Table 10: E2I Program Total Savings

	Year 1	Year 2	Year 3	Total
Annual Energy Savings (MWh)	7,081	7,081	7,081	21,242
Annual Demand Savings (kW)	1,011.5	1,011.5	1,011.5	3,035
Annual Thermal Savings (MMBtu)	61,184	61,184	61,184	183,552
Participants	1	1	1	3
Incentive Costs (millions)	\$2.5	\$2.5	\$2.5	\$7.5
Implementation Costs (millions)	\$0.2	\$0.2	\$0.2	\$0.5
Total Program Costs (millions)	\$2.7	\$2.7	\$2.7	\$8.0
TRC Benefit-Cost Ratio	2.6	2.6	2.5	2.6

## 2.3 Weatherization Assistance Program

### 2.3.1 Program Overview

As noted above, WAP is not currently projected to be cost-effective, with a TRC benefit-cost ratio below 1.0. DNREC is therefore not submitting this plan for contribution to the statewide goals, and the costs and savings of WAP are not included in portfolio totals of this document. However, we describe the program here to provide a complete accounting of DNREC’s energy efficiency portfolio.

The design of the WAP, developed by DOE, relies on a network of community service organizations to provide weatherization services to low income customers with the objectives of lowering energy costs and improving home health, safety, and comfort. DOE provides grant funding to states to implement the programs and improve energy efficiency of the homes of low-income families. In Delaware, DNREC receives funding for WAP from DOE and implements the program through a sub-grantee, Catholic Charities. Catholic Charities employs a program manager and three home energy auditors who perform audits to customers participating in the program. Catholic Charities is also responsible for hiring, overseeing, and paying subcontractors who perform weatherization services that are recommended based on the results of the audit. DNREC plays an active role in training auditors and subcontractors.

Catholic Charities is also responsible for participant intake. Intake offices are located in each county in Delaware. During the intake process, Catholic Charities collects customer information



including income and energy use. Customers requesting an audit and weatherization services are then prioritized based on their usage and energy cost burden. Customers can apply and receive weatherization services any time and will remain in the database for one year. If a customer does not receive weatherization services within that time, they may reapply to the program.

Once a customer has been selected for the program, a Catholic Charities auditor will visit the home and look for energy savings opportunities. The auditor will prioritize the most cost-effective measures as well as health and safety related measures. If the auditor identifies safety-related conditions that preclude weatherization from proceeding (e.g., unsafe wiring or improper combustion source ventilation), the customer will be deferred until deficiencies can be remedied. Following a successful audit, Catholic Charities provides a work order to a weatherization subcontractor who installs efficiency and safety measures. Following the weatherization work, a final audit is completed by a trained auditor.

Catholic Charities began implementing the program in 2014. DNREC expects growth in participation and program activity as the sub-grantee gains more experience with the program, and projects a steady increase activity to 400 units per year by Program Year 3. Audit reports will be provided in full reportable format in coming years, which will allow for better review of program impacts.

### **2.3.2 Target Market**

WAP targets low income customers in Delaware, where eligibility is defined as income falling below the 200 percent of the poverty line standard. The program emphasizes serving children, the elderly, and the disabled, and prioritizes customers with the highest usage and energy cost burden. Participants may be either home-owners or renters, although renters must obtain permission from the property owner to participate.

### **2.3.3 Market Analysis and Trends**

The DOE estimates that the average household saves \$437 per year on their energy costs after receiving weatherization services. WAP provides an opportunity to significantly reduce the fuel assistance needed by low-income households, who spend a large amount of their total annual income on energy costs. Prioritizing customers with the highest usage and energy burden ensures customers who are most in need receive services as soon as possible.

### **2.3.4 Eligible Measures/Service and Customer Incentives**

Weatherization measures promoted may include air sealing, insulation, and shell work. In some instances, customers may receive a heating system replacement or water heater replacement. Health and safety improvements are also an important aspect of the program; contractors will install measures such as smoke detectors and CO monitors or fix gas leaks and other hazards. Additional measures will be prioritized by cost-effectiveness and may include lighting, thermostats, bath fans, and range hoods, among others. WAP does not install windows or doors.

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### 2.3.5 Marketing

Catholic Charities is responsible for program marketing and outreach.

### 2.3.6 Expected Savings, Costs, and Cost-effectiveness

*Table 11: WAP Savings*

Measure	Year 1	Year 2	Year 3	Total
Annual Energy Savings (MWh)	175	198	226	598
Annual Demand Savings (kW)	102	111	127	340
Annual Thermal Savings (MMBtu)	7,417	8,450	9,657	25,524
Participants	300	350	400	1050
Incentive Costs (millions)	\$1.2	\$1.4	\$1.6	\$4.2
Health and Safety Costs (millions)	\$0.4	\$0.4	\$0.5	\$1.2
Implementation Costs (millions)	\$0.6	\$0.7	\$0.7	\$2.0
Total Program Costs (millions)	\$2.2	\$2.5	\$2.8	\$7.4
TRC Benefit-Cost Ratio	0.6	0.6	0.6	0.6
TRC Benefit-Cost Ratio w/o Health and Safety	0.7	0.7	0.8	0.7

## Appendix A: Program Tables

Table 12: Savings (MWh) and Cost-Effectiveness by Measure, EEIF – Electric

Measure	Year 1	Year 2	Year 3	TRC
Relamp/Reballast T8 to HP T8	35	35	35	1.6
HP T8 Fixture	6	6	6	3.7
HP T8 2-Lamp Troffer Fixture	2	2	2	2.8
HP T8 High Bay Fixture	2	2	2	10.4
T5 Troffer Fixture	1	1	1	3.5
T5 HO High Bay Fixture	149	149	149	5.7
LED Linear Lamp	366	366	366	4.5
LED screw based lamps	966	966	966	16.1
LED Interior, Pendant, Recessed, Surface	449	449	449	7.8
LED Track Lighting	245	245	245	2.6
LED Refrigerated/Freezer Case Fixtures	22	22	22	1.4
LED Display Case Fixtures (ft)	4	4	4	1.0
LED Interior Panel, 1x4 Troffer	63	63	63	1.4
LED Interior Panel, 2x2 Troffer	81	81	81	2.6
LED Interior Panel, 2x4 Troffer	117	117	117	1.8
LED High and Low Bay Fixtures	457	457	457	3.4
Outdoor Fixtures, < 5,000 lumens	259	259	259	5.1
Outdoor Fixtures, >= 5,000 lumens and < 10,000 lumens	383	383	383	2.6
Outdoor Fixtures, > 10,000 lumens	588	588	588	2.7
Vending Misers - refrigerated beverage machine	34	34	34	3.5
Vending Misers - Non-refrigerated machine	4	4	4	1.0
Custom Electric (MWh)	10,400	10,400	10,400	1.8
<b>TOTAL</b>	<b>14,634</b>	<b>14,634</b>	<b>14,634</b>	<b>2.2<sup>6</sup></b>
Note: Savings do not quite add up to total EEIF electric savings, since a couple of the gas measures are expected to yield some electric savings as well.				

<sup>6</sup> Does not include administrative expenses.

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Table 13: Savings (MMBtu) and Cost-Effectiveness by Measure, EEIF – Gas

Measure	Year 1	Year 2	Year 3	TRC
Furnace, 125 MBH, 95 AFUE with ECM	321	321	321	2.8
Furnace, 125 MBH, 97 AFUE with ECM	178	178	178	2.2
Boiler, 150 MBH, 90 AFUE	127	127	127	1.8
Boiler, 150 MBH, 95 AFUE	196	196	196	2.1
Boiler, 280 MBH, 90 AFUE	237	237	237	2.7
Boiler, 280 MBH, 95 AFUE	365	365	365	3.4
Condensing Unit Heater	139	139	139	1.6
Infrared Unit Heater	164	164	164	1.6
Tankless Gas Water Heater	216	216	216	0.4
High Efficiency Indirect	497	497	497	1.3
Condensing Stand Alone Water Heater	752	752	752	1.1
Boiler Reset Controls	1,686	1,686	1,686	3.3
Steam Traps	2,056	2,056	2,056	7.5
ENERGY STAR Programmable thermostats	366	366	366	5.6
Custom Gas	45,760	45,760	45,760	3.2
<b>TOTAL</b>	<b>53,060</b>	<b>53,060</b>	<b>53,060</b>	<b>3.0<sup>7</sup></b>
Note: Gas savings are higher than shown for total EEIF program, as indoor lighting measure are expected to cause a slight increase in gas usage.				

Table 14: Savings and Cost-Effectiveness by Measure, E2I

Measure	Year 1	Year 2	Year 3	TRC
Custom Electric (MWh)	7,081	8,851	8,851	1.91
Custom Gas (MMBtu)	61,184	61,184	61,184	4.94

<sup>7</sup> Does not include administrative expenses.

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Table 15: Savings (Electric and Natural Gas) by Measure, WAP

Measure	Electric (MWh)			Natural Gas (MMBtu)			TRC
	Year 1	Year 2	Year 3	Year 1	Year 2	Year 3	
Audit	-	-	-	-	-	-	-
CFLs	46	-	-	(65)	-	-	2.2
LEDs	-	53	60	-	(75)	(86)	4.4
Programmable thermostat	-	-	-	716	835	955	3.0
Air sealing	35	35	40	1,218	1,218	1,392	1.0
Attic insulation	18	21	24	4,491	5,240	5,989	1.9
Duct Sealing	11	13	15	482	562	642	5.2
Sidewall insulation	(2)	(3)	(3)	117	137	156	0.1
Basement insulation	(4)	(5)	(6)	312	364	416	0.2
Heat Pump Water heater	18	22	24	-	-	-	0.7
DHW pipe insulation	-	-	-	83	97	110	2.9
DHW tank insulation	4	4	5	-	-	-	1.6
Low flow showerheads	34	39	45	40	46	53	5.1
Faucet aerators	5	6	7	22	26	30	2.8
Clean and evaluate AC	11	12	14	-	-	-	4.4
Misc Costs	-	-	-	-	-	-	-
Health and Safety	-	-	-	-	-	-	-
<b>TOTAL</b>	<b>175</b>	<b>198</b>	<b>226</b>	<b>7,417</b>	<b>8,450</b>	<b>9,657</b>	<b>0.84<sup>8</sup></b>
<p>This table shows both electric and gas savings, compared to the tables for EEIF and E2I that have separate tables for electric measures and gas measures. This is because many measures in WAP yield both electric and gas savings, while measures in EEIF are mostly only electric or only gas.</p>							

<sup>8</sup> Does not include administrative expenses.