Appendix A: Supplemental Cross Cutting Activities

Jersey Central Power & Light

PY22: July 1, 2021–June 30, 2022

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1. Introduction

This report describes cross cutting activities that apply to multiple programs. Brief descriptions of section are provided below:

Portfolio Level EM&V Results Tables includes key metrics for all evaluated programs in PY22.

TRM Update Information discusses possible data sources for TRM algorithm parameters to support updates to the TRM for certain measures. These include measures that are not currently present in the TRM, thus leveraged a savings estimation protocol from a neighboring state, and measures that may be considered for a protocol update in subsequent program years.

Program Benchmarking includes a high-level summary of benchmarking studies conducted by the New Jersey utility evaluators. The spreadsheet attachment accompanying this report provides more detail from the benchmarking study.

2. Portfolio Level EM&V Results Tables

This report section provides results tables at the portfolio level. The following metrics are reported:

- Gross Annual Electric Savings (kWh) (Reported and Verified)
- Gross Annual Electric Savings (kWh) Realization Rate
- Gross Lifetime Electric Savings (kWh)
- Gross Lifetime Electric Savings (kWh) Realization Rate
- Gross Annual Electric Peak Demand Reduction (kW)
- Gross Annual Electric Peak Demand Reduction (kW) Realization Rate
- Gross Lifetime Electric Peak Demand (kW)
- Gross Lifetime Electric Peak Demand (kW) Realization Rate
- Gross Annual Natural Gas Savings (Therms)
- Gross Annual Natural Gas Savings (Therms) Realization Rate
- Gross Lifetime Natural Gas Savings (Therms)
- Gross Lifetime Natural Gas Savings (Therms) Realization Rate
- Gross Annual Natural Gas Therms Savings Converted to MMBtu
- Gross Annual Natural Gas Therms Savings Converted to MMBtu Realization Rate
- Gross Lifetime Natural Gas Therms Savings Converted to MMBtu
- Gross Lifetime Natural Gas Therms Savings Converted to MMBtu Realization Rate
- Gross Wholesale Annual Electric Savings
- Gross Wholesale Lifetime Electric Savings

2.1. Gross Annual & Lifetime Retail Electric Savings

Table 2-1: Reported & Verified Retail kWh Savings by Offering

Offering	Reported kWh	Verified kWh	Realization Rate	Lifetime Reported kWh	Lifetime Verified kWh	Realization Rate[1]
EE Products						
Appliance Rebates	991,204	1,108,072	1.12	10,546,257	11,843,599	1.12
Appliance Recycling	5,520,707	5,520,707	1.00	26,737,435	26,737,435	1.00
EE Kits	29,703,573	26,581,399	0.89	379,321,343	323,874,162	0.85
HVAC	534,612	532,170	1.00	8,116,126	8,077,117	1.00
Lighting	47,119,638	49,510,589	1.05	703,585,283	738,377,725	1.05
Online Marketplace	1,494,999	1,525,147	1.02	14,246,875	15,316,839	1.08
Totals	***85,364,733***	***84,778,084***	***0.99***	***1,142,553,318***	***1,124,226,876***	***0.98***

Existing Homes						
HPwES	112,116	112,116	1.00	1,033,393	2,146,036	2.08
QHEC	564,809	571,468	1.01	7,704,342	7,679,732	1.00
MIW	50,576	50,502	1.00	731,005	729,895	1.00
Totals	***727,501***	***734,087***	***1.01***	***9,468,740***	***10,555,664***	***1.11***
Home Energy Education & Management[2]						
Home Energy Education & Management	1,183,580	NA[2]	1.00	1,183,580	NA[2]	1.00
Totals	***1,183,580***	***NA[2]***	***1.00***	***1,183,580***	***NA[2]***	***1.00***
Multifamily						
Multifamily	22,423	25,793	1.15	336,352	386,901	1.15
Totals	***22,423***	***25,793***	***1.15***	***336,352***	***386,901***	***1.15***
Small Business Direct Install						
Small Business Direct Install	818,675	621,989	0.76	11,288,329	8,269,190	0.73
Totals	***818,675***	***621,989***	***0.76***	***11,288,329***	***8,269,190***	***0.73***
Energy Solutions for Business						
Energy Solutions for Business	4,608,300	4,702,303	1.02	67,938,160	61,439,099	0.90
Totals	***4,608,300***	***4,702,303***	***1.02***	***67,938,160***	***61,439,099***	***0.90***

1.Annual and lifetime realization rates differ due to differences between reported and verified measure lives.
2.This offering was not evaluated since adequate time has not elapsed to allow for a billing analysis.

2.2. Gross Annual & Lifetime Retail Peak Demand Reduction

Table 2-2: Reported & Verified Retail kW Reduction by Offering

Offering	Reported Annual kW	Verified Annual kW	Realization Rate	Reported Lifetime kW	Verified Lifetime kW	Realization Rate[1]
EE Products						
Appliance Rebates	129	142	1.10	1,370	1,513	1.10
Appliance Recycling	863	899	1.04	4,110	4,110	1.00
EE Kits	2,319	2,035	0.88	28,358	28,358	1.00
HVAC	311	491	1.58	4,726	7,523	1.59
Lighting	3,551	3,450	0.97	52,914	51,400	0.97

Offering	Reported Annual kW	Verified Annual kW	Realization Rate	Reported Lifetime kW	Verified Lifetime kW	Realization Rate[1]
Online Marketplace	39	39	1.02	516	534	1.04
Totals	**7,212**	**7,056**	**0.98**	**91,994**	**93,438**	**1.02**
Existing Homes						
HPwES	0	0	1.00	0	0	1.00
QHEC	46	45	0.97	606	585	0.97
MIW	4	4	1.00	56	56	1.00
Totals	***50***	***49***	***0.97***	***661***	***641***	***0.97***
Home Energy Education & Management[2]						
Home Energy Education & Management	0	NA[2]	1.00	0	NA[2]	1.00
Totals	**0**	**NA[2]**	**1.00**	**0**	**NA[2]**	**1.00**
Multifamily						
Multifamily	22	19	0.85	330	280	0.85
Totals	***22***	***19***	***0.85***	***330***	***280***	***0.85***
Small Business Direct Install						
Small Business Direct Install	147	127	0.86	2,070	1,784	0.86
Totals	***147***	***127***	***0.86***	***2,070***	***1,784***	***0.86***
Energy Solutions for Business						
Energy Solutions for Business	881	927	1.05	11,725	12,281	1.05
Totals	***881***	***927***	***1.05***	***11,725***	***12,281***	***1.05***

1. Annual and lifetime realization rates differ due to differences between reported and verified measure lives.
2.This offering was not evaluated since adequate time has not elapsed since participation to allow for a billing analysis.

2.3. Gross Annual & Lifetime Retail Natural Gas Savings

Table 2-3: Reported & Verified Retail Therms Savings by Offering[1]

Offering	Reported Annual Therms	Verified Annual Therms	Realization Rate	Reported Lifetime Therms	Verified Lifetime Therms	Realization Rate[1]
EE Products						
Appliance Rebates	4,989	3,031	0.61	54,879	33,341	0.61
Appliance Recycling	0	0	1.00	0	0	1.00
EE Kits	-329,430	-478,206	1.45	-4,242,339	-4,036,569	0.95
HVAC	9,605	9,605	1.00	60,513	94,206	1.56
Lighting	-713,486	-697,149	0.98	-10,698,675	-10,457,238	0.98
Online Marketplace	224,505	221,766	0.99	1,433,078	1,731,103	1.21
Totals	***-803,818***	***-940,953***	***1.17***	***-13,392,544***	***-12,635,156***	***0.94***
Existing Homes						
HPwES	3,688	3,688	1.00	21,359	79,407	3.72
QHEC	-5,496	-4,509	0.82	-93,571	-81,943	0.88
MIW	-654	-652	1.00	-10,522	-10,491	1.00
Totals	***-2,462***	***-1,472***	***0.60***	***-82,734***	***-13,027***	***0.16***
Home Energy Education & Management[2]						
Home Energy Education & Management	0	NA[2]	1.00	0	NA[2]	1.00
Totals	**0**	**NA[2]**	**1.00**	**0**	**NA[2]**	**1.00**
Multifamily						
Multifamily	-41	-141	3.48	-2,883	-2,906	1.01
Totals	***-41***	***-141***	***3.48***	***-2,883***	***-2,906***	***1.01***
Small Business Direct Install						
Small Business Direct Install	-42,594	-2,706	0.06	-638,910	-39,450	0.06
Totals	***-42,594***	***-2,706***	***0.06***	***-638,910***	***-39,450***	***0.06***
Energy Solutions for Business						

[1] The verified gas impacts were calculated according to TRM algorithms specified in the New Jersey Coordinated Measures List. The gas impact values passed to gas partner utilities will be net of lighting-HVAC interactive effects.

Offering	Reported Annual Therms	Verified Annual Therms	Realizati on Rate	Reported Lifetime Therms	Verified Lifetime Therms	Realization Rate[1]
Energy Solutions for Business	-14,577	-13,356	0.92	-195,222	-180,728	0.93
Totals	***-14,577***	***-13,356***	***0.92***	***-195,222***	***-180,728***	***0.93***

1. Annual and lifetime realization rates differ due to differences between reported and verified measure lives.
2.This offering was not evaluated since adequate time has not elapsed since participation to allow for a billing analysis.

2.4. Gross Annual & Lifetime Retail Natural Gas Savings Converted to MMBTU

Table 2-4: Reported & Verified Retail MMBtu Savings by Program Component[2]

Program Component	Reported Annual MMBtu	Verified Annual MMBtu	Realization Rate	Reported Lifetime MMBtu	Verified Lifetime MMBtu	Realization Rate[1]
EE Products						
Appliance Rebates	499	303	0.61	5,488	3,334	0.61
Appliance Recycling	0	0	1.00	0	0	1.00
EE Kits	-32,943	-47,821	1.45	-424,234	-403,657	0.95
HVAC	961	961	1.00	6,051	9,421	1.56
Lighting	-71,349	-69,715	0.98	-1,069,867	-1,045,724	0.98
Online Marketplace	22,450	22,177	0.99	143,308	173,110	1.21
Totals	***-80,382***	***-94,095***	***1.17***	***-1,339,254***	***-1,263,516***	***0.94***
Existing Homes						
HPwES	369	369	1.00	2,136	7,941	3.72
QHEC	-550	-451	0.82	-9,357	-8,194	0.88
MIW	-65	-65	1.00	-1,052	-1,049	1.00
Totals	***-246***	***-147***	***0.60***	***-8,273***	***-1,303***	***0.16***
Home Energy Education & Management[2]						
Home Energy Education & Management	0	NA[2]	1.00	0	NA[2]	1.00
Totals	**0**	**NA[2]**	**1.00**	**0**	**NA[2]**	**1.00**
Multifamily						

[2] The verified gas impacts were calculated according to TRM algorithms specified in the New Jersey Coordinated Measures List. The gas impact values passed to gas partner utilities will be net of lighting-HVAC interactive effects.

Program Component	Reported Annual MMBtu	Verified Annual MMBtu	Realization Rate	Reported Lifetime MMBtu	Verified Lifetime MMBtu	Realization Rate[1]
Multifamily	-4	-14	3.48	-288	-291	1.01
Totals	***-4***	***-14***	***3.48***	***-288***	***-291***	***1.01***
Small Business Direct Install						
Small Business Direct Install	-4,259	-271	0.06	-63,891	-3,944	0.06
Totals	***-4,259***	***-271***	***0.06***	***-63,891***	***-3,944***	***0.06***
Energy Solutions for Business						
Energy Solutions for Business	-1,458	-1,336	0.92	-19,522	-18,448	0.94
Totals	***-1,458***	***-1,336***	***0.92***	***-19,522***	***-18,448***	***0.94***

1. Annual and lifetime realization rates differ due to differences between reported and verified measure lives.
2.This offering was not evaluated since adequate time has not elapsed since participation to allow for a billing analysis.

2.5. Gross Annual & Lifetime Wholesale Electric Savings

Table 2-5: Reported & Verified Wholesale kWh Savings by Program Component

Program Component	Reported Annual kWh	Verified Annual kWh	Reported Lifetime kWh	Verified Lifetime kWh[1]
EE Products				
Appliance Rebates	1,161,930	1,298,927	12,362,752	13,883,550
Appliance Recycling	6,471,598	6,471,598	31,342,712	31,342,712
EE Kits	34,819,740	31,159,801	444,655,956	379,658,508
HVAC	626,694	623,832	9,514,054	9,468,326
Lighting	55,235,562	58,038,332	824,771,376	865,556,496
Online Marketplace	1,752,499	1,787,839	16,700,768	17,955,024
Totals	***100,068,023***	***99,380,329***	***1,339,347,619***	***1,317,864,616***
Existing Homes				
HPwES	131,427	131,427	1,211,386	2,515,672
QHEC	662,092	669,899	9,031,344	9,002,495
MIW	59,287	59,201	856,914	855,613
Totals	***852,806***	***860,527***	***11,099,644***	***12,373,779***
Home Energy Education & Management[2]				
Home Energy Education & Management	1,387,441	NA[2]	1,387,441	NA[2]
Totals	***1,387,441***	***NA[2]***	***1,387,441***	***NA[2]***

Multifamily	26,285	30,236	394,286	453,541
Totals	***26,285***	***30,236***	***394,286***	***453,541***
Small Business Direct Install				
Small Business Direct Install	959,684	729,121	13,232,640	9,693,482
Totals	***959,684***	***729,121***	***13,232,640***	***9,693,482***
Energy Solutions for Business				
Energy Solutions for Business	5,402,037	5,512,232	79,639,883	72,021,419
Totals	***5,402,037***	***5,512,232***	***79,639,883***	***72,021,419***

1. Annual and lifetime realization rates differ due to differences between reported and verified measure lives.
2.This offering was not evaluated since adequate time has not elapsed since participation to allow for a billing analysis.

2.6. Gross Annual & Lifetime Wholesale Peak Demand Reduction

Table 2-6: *Reported & Verified Wholesale kW Reduction by Program Component*

Program Component	Reported Annual kW	Verified Annual kW	Reported Lifetime kW	Verified Lifetime kW
EE Products				
Appliance Rebates	151	166	1,606	1,774
Appliance Recycling	1,012	1,054	4,818	4,818
EE Kits	2,718	2,386	33,242	33,242
HVAC	364	575	5,540	8,819
Lighting	4,163	4,044	62,028	60,253
Online Marketplace	45	46	605	626
Totals	**8,454**	**8,272**	**107,839**	**109,532**
Existing Homes				
HPwES	0	0	0	0
QHEC	54	52	710	686
MIW	5	5	65	65
Totals	***58***	***57***	***775***	***751***
Home Energy Education & Management[2]				
Home Energy Education & Management	0	NA[2]	0	NA[2]
Totals	**0**	**NA[2]**	**0**	**NA[2]**
Multifamily				

Program Component	Reported Annual kW	Verified Annual kW	Reported Lifetime kW	Verified Lifetime kW
Multifamily	26	22	387	329
Totals	***26***	***22***	***387***	***329***
Small Business Direct Install				
Small Business Direct Install	173	149	2,427	2,091
Totals	**173**	**149**	**2,427**	**2,091**
Energy Solutions for Business				
Energy Solutions for Business	1,033	1,086	13,745	14,397
Totals	***1,033***	***1,086***	***13,745***	***14,397***

1. Annual and lifetime realization rates differ due to differences between reported and verified measure lives.
2.This offering was not evaluated since adequate time has not elapsed since participation to allow for a billing analysis.

3. TRM Update Information

This section includes relevant information gathered in PY22 that can be used to inform future TRM updates. It also includes additional information that will be gathered in future program years, as programs scale. This section discusses potential TRM updates that may be aided by ADM's data gathering or technical review during the PY22 evaluation effort. Sample sizes for some of the data collection activities described below are small, but we describe the data collection activities in case the SWE Team will compile the available data from all utility evaluators to boost statistical precision associated with the stated parameters. ADM will provide quantitative results from PY22 impact evaluation data gathering to the SWE team in time for the upcoming TRM update process.

3.1. PY22 Residential: TRM update information by program

EE Products

Appliance Turn In

The current version of the TRM fully deems energy impacts for recycled refrigerators, freezers, room air conditioners, and dehumidifiers. A more common and widely accepted approach to determining energy impacts is through algorithmic protocols. The Uniform Methods Project (UMP) regression equations are typically used for refrigerators and freezers. Recycled room air conditioner impacts are determined using a "usage-times-hours" equation, and dehumidifier retirement savings are determined by regression of weather influences and unit capacity.

Survey data yields behavioral parameters such as usage patterns, installation locations, and whether recycling appliances are primary appliances or secondary appliances. For recycled Refrigerators and Freezers, these measure attributes coupled with sizes and ages provided in the tracking data can be used to populate a UMP-based regression equation to determine gross impacts. For recycled Dehumidifiers and Room Air Conditioners, the tracking data provides capacity while survey data confirms pickup zip code to map to weather-related parameters such as heating or cooling degree hours or equivalent full-load hours of operation.

Refrigerators and Freezers

Equation 1: UMP regression equation for Refrigerators

$$
\begin{aligned}
kWh_{Refrigerator} &= Verification\ Rate\ X\ PART\_USE\ X\ 365.25\ days \\
&\times \Big(0.582 + 0.027 \times AGE\ + 1.055 \times PRE1990 \\
&+ 0.067 \times AV - 1.977 \times CONFIG_{single-door} + 1.071 \times CONFIG_{side-by-side} \\
&+ 0.605 \times PRIMARY + 0.02 \times \Big(UNCONDITIONED \times CDD \div 365.25 \frac{days}{year}\Big) \\
&- 0.045 \times \Big(UNCONDITIONED \times HDD \div 365.25 \frac{days}{year}\Big)\Big)
\end{aligned}
$$

Equation 2: UMP regression equation for Freezers

$$
\begin{aligned}
kWh_{Freezer} &= Verification\ Rate\ X\ PART\_USE\ X\ 365.25\ days \\
&\times \Bigg(-0.955 + 0.0454 \times AGE\ + 0.543 \times PRE1990 + 0.120 \times AV \\
&+ 0.298 \times CONFIG_{chest} + 0.082 \times \Big(UNCONDITIONED \times CDD \div 365.25 \frac{days}{year}\Big) \\
&- 0.031 \times \Big(UNCONDITIONED \times HDD \div 365.25 \frac{days}{year}\Big)\Bigg)
\end{aligned}
$$

- Survey parameters: Working Factor, Primary / Secondary, Installed in conditioned space, Part Use
- Tracking Data parameters: Volume, Age, Configuration (Top Freezer, Bottom Freezer, Single Door, Chest / Upright, etc.)

In PY22, 55 survey respondents answered the above questions for refrigerators; 16 responded to the freezer questions.

Room Air Conditioners

Equation 3: Savings algorithm for Room Air Conditioners

$$\Delta\ kWh \quad = \left(\frac{CAPY}{EER_{RetRAC}}\right) \times EFLH_{RAC}$$

- Survey parameters: Working Factor, Zip Code
- Tracking Data parameters: Capacity, Zip Code
- TRM parameters: Efficiency (EER)

In PY22, 21 survey respondents answered the above questions for room air conditioners.

Dehumidifiers

Equation 4: Polynomial for Dehumidifier Savings

$$kWh = -8.36 \cdot 10^{-3} \times THI_{PJM}{}^{2} + 1.19 \times THI_{PJM} + 4.07 \cdot 10^{-2} \times CAPY + -38.37$$

- Survey parameters: Working Factor, Zip Code
- Tracking Data parameters: Capacity, Zip Code

In PY22, 17 survey respondents answered the above questions for dehumidifiers. Note that the original regressions used the Temperature-Humidity Index (THI) as an explanatory variable. If the Pennsylvania protocol will be adapted for New Jersey, then scaling is necessary to develop deemed savings by climate zone in New Jersey. It is possible that a simple regression of the impacts as a function of cooling-degree days may provide sufficient accuracy and rigor given the relatively low impact of this measure within the CEA.

Appliance Rebate

Of the 7 types of appliances rebated in PY22, 4 are fully deemed in the 2020 NJ Protocols. This approach can be updated to a more algorithmic approach using a combination of survey responses, tracking data, and TRM default parameter values.

Energy Star Unique Identifiers provided in the Tracking Data can be used to determine measure attributes for a TRM algorithm of the form (Capacity) / (Efficiency) X (Hours). In general, capacities and efficiencies can be looked up on Energy Star. Hours and coincidence factors can be taken from the TRM. Survey responses yield fuel saturations and verification rates.

Air Purifiers (no TRM update needed)

- Energy Star – CADR

Clothes Washers

Clothes washers savings follow an algorithm in the FY21 Protocols, but could be tuned to allow for known water heater and clothes dryer fuel types:

Equation 5: Algorithm for Clothes Washer Savings

$$\Delta kWh = (\Delta kWh_{washer}) + (\Delta kWh_{dryer}) + (\Delta kWh_{wh})$$

Where:

$$\Delta kWh_{washer} = Capacity \times (\frac{1}{IMEF_b} - \frac{1}{IMEF_{ee}}) \times \frac{Cycles}{yr} \times SF_{washer}$$

$$\Delta kWh_{dryer} = Capacity \times (\frac{1}{IMEF_b} - \frac{1}{IMEF_{ee}}) \times \frac{Cycles}{yr} \times SF_{dryer} \times F_{elec,dryer}$$

$$\Delta kWh_{wh} = Capacity \times (\frac{1}{IMEF_b} - \frac{1}{IMEF_{ee}}) \times \frac{Cycles}{yr} \times SF_{wh} \times F_{elec,wh}$$

Currently, the TRM assumes fuel splits of 25% electric for water heating and 71% electric for dryers. EDCs specifically target customers with electric water heating for clothes washer rebates, so we expect fuel saturation to be higher than TRM defaults. In PY22, ADM conducted participant surveys and asked about water heater fuel and clothes dryer fuel. Average values of 64% electric water heating and 55% electric dryers were obtained from 11 survey respondents.

- Energy Star – Capacity (cu. ft.), IMEF_ee
- Survey Data – F_elec,wh, F_elec,dryer
- TRM – Cycles/year, hrs/yr, SF_washer, SF_wh, SF_dryer

Clothes Dryers

- Energy Star Data – CEF, Fuel Type
- TRM – Loads/year, lbs/Load

Dehumidifiers

- Energy Star Data – Capacity (pt. per day), IEF
- Survey Data – Months per year, Hours per Day. In PY2021, there were not enough survey responses to calculate a meaningful average, so the TRM is a better source for hours per year (future years may scale up, so it's worth watching).
- TRM – Hours, CF

Heat Pump Water Heaters

Heat Pump Water Heaters are fully deemed in the 2020 NJ Protocols and can be updated to an algorithm.

Equation 6: Algorithm for Heat Pump Water Heater Savings

$$\Delta kWh = \frac{\left(\frac{1}{UEF_{base}} - \frac{1}{UEF_{ee}}\right) \times HotWaterUse \times 8.3\frac{\text{BTU}}{\text{gal}\cdot°\text{F}} \times (T_{out} - T_{in})}{3412\frac{\text{BTU}}{\text{kWh}}}$$

Survey responses can be used to determine daily hot water use, but the quality of such data is uncertain. It would be better to obtain this value from literature reviews of large studies and provide a default in the TRM. The PA TRM gives a value of 45.5 gallons per day and comes from a 2016 Water Research Foundation study.

- Energy Star Data – Capacity (gal), UEF
- TRM – Hot water use (gal/yr)

Refrigerators/Freezers

Refrigerator and Freezer rebates were fully deemed in the FY2020 Protocols but have been updated to an algorithm in the FY2021 Addendum which calculates the difference in usage between the rebated Energy Star model and an equivalent Federal Standard unit.

Equation 7: Algorithms for Energy Star Refrigerator or Freezer Impacts

$$\Delta kWh = kWh_{base} - kWh_{ee}$$

$$\Delta kW_{peak} = (kWh_{base} - kWh_{ee}) \times ETDF$$

The TRM states these algorithms are only applicable to refrigerators with adjusted volume of 39 ft^3 or less and freezers with adjusted volume of 30 ft^3 or less. This covers 'Product Classes' 1 through 18, so no update is necessary.

- Energy Star Data – Annual Energy Use of Energy Star unit, Annual Energy Use of Federal Standard unit
- TRM – Energy to Demand Factor (ETDF)

Room Air Conditioners

Room Air Conditioner impacts follow an algorithmic approach.

Equation 8: Algorithms for Room Air Conditioner Impacts

$$\text{Energy Savings } (\frac{\text{kWh}}{\text{yr}}) = (\text{EFLH}_c * \text{BTU/hour} * (1/\text{CEER}_{\text{base}} - 1/\text{CEER}_{\text{ee}}))/1{,}000$$

$$\text{Peak Demand Savings (kW)} = \text{BTU/hour} * (1/\text{CEER}_{\text{base}} - 1/\text{CEER}_{\text{ee}})/1{,}000 * \text{CF}$$

The TRM gives a single-point estimate of the equivalent full load hours, which is the same as central HVAC equipment (600 hours). Survey responses can be used to show different usage patterns for room air conditioners but may need improvement to yield a better estimate of full load hours. TRM coincident factors for room air conditioners are different than central systems (31% for RACs vs 69% for central systems). Machine attributes, such as capacity and efficiency, are easily fetched from Energy Star's qualified products listings.

- Energy Star Data – Capacity (Btu/hr), CEER

- Survey Data – Months per year, Auto-Use. These don’t readily translate into hours per year, so the TRM is a better source for ELFH.
- TRM – Hours, CF

Marketplace

Two measures in the Online Marketplace program component do not have NJ Protocols and a couple others have protocols that should be updated.

LED Holiday Lights – used PA TRM

LED Nightlights

In PY22, ADM used in-service rates (ISRs) from survey responses. The TRM does not include ISRs in the algorithm. This measure is listed under the Residential Low-Income Program in the TRM but is implemented across both residential sectors.

Smart Thermostats

In PY22, ADM calculated electric impacts with the MidAtlantic TRM which has deemed usages for Maryland and savings fractions by controlled system type. ISRs for the Marketplace program component were determined using survey responses. Using New Jersey-specific EFLHs would be more accurate. Survey responses also can provide the type of thermostat that was replaced. Savings should be higher if manual thermostats are replaced than if conventional programmable thermostats are replaced.

Smart (Advanced) Power Strips

NJ protocols are fully deemed by tier of power strip. Savings should vary by the load controlled. Survey responses can provide what type of equipment the participant plugs in. Entertainment Center loads are expected to save more than office equipment loads.

Air Purifiers

No updates are required because this protocol was recently updated and is part of the NJ FY2022 Addendum which has updated deemed savings based on the NJ A5160 legislation that went into effect on 1/1/2023.

HVAC

In PY22, surveys were conducted to determine verification rates. Survey questions which asked about existing HVAC and water heating systems were also included. For minisplits, we also asked which room the new system serves. For smart thermostats we also asked about the thermostat that was previously installed and who installed the new thermostat. Some of this information can be used to improve savings estimating algorithms in the TRM.

Central Air Conditioners (CACs), Air Source Heat Pumps (ASHPs), Ground Source Heat Pumps (GSHPs), and Furnaces

The PY22 evaluation did not yield primary data to update key parameters in the TRM algorithm, such as peak coincidence factor or equivalent full-load hours.

Minisplits (MSHPs and MSACs)

The TRM treats minisplits the same as the other HVAC systems above. Survey data can be used to determine how minisplits are used differently. One way to model the different behavior is by allowing EFLH values to vary by room installed. In PY22, we only obtained 6 survey responses which included room served, but surveys are ongoing and can be scaled up to collect more.

Heat Pump Water Heaters (HPWHs)

Heat Pump Water Heaters are fully deemed in the TRM at 1,687 kWh and 0.37 kW. Instead, an algorithm could be provided in the form of (Capy)/(Efficiency)X(Hours) to estimate impacts more accurately from individual measures.

Smart Thermostats

Smart Thermostats in the HVAC program component can be updated similarly to the suggestions above for the Online Marketplace program component.

Existing Homes

QHEC

No primary data were collected during the evaluation of this offering measure, other than in-service rates. However, a clerical error was discovered in the TRM for the pipe insulation measure and was noted on the NJ CML. The NJ Protocol states fuel savings in MMBtu/yr, but the algorithm works out to Btu/yr. The NJ CML advised dividing by a factor of 10^6 to convert to MMBtu/yr, or 10^5 to get to Therms/yr.

Home Energy Education and Management

This program includes an “Online Audit” offering, where customers can enter information about their homes and appliances and receive specific tips on how to save energy. Gross impact evaluation requires a billing analysis. As of this writing, enough time has not elapsed in the post-participation period to allow for such a study. No verified impacts are reported for this program at this time.

3.2. PY22 Commercial/Industrial: TRM update information by program

The following measures were present in PY22 for which there was either no NJ protocol available or the statewide Coordinated Measure List (CML) relied on another source for prescriptive energy impacts algorithms. The New Jersey protocols could be updated to include these measures.

Table 3-1: Prescriptive Measures outside of NJ Protocols

Measure Name	Program	CML Reference	Percent of Program kWh
Lighting: Commercial Exterior Hours of use	SBDI, C&P	NY TRM V9	1%
Refrigeration: Door Gaskets	SBDI	MidAtlantic TRM V10 TRM (Pg. 350)	6%
Refrigeration: Strip curtain for walk in Coolers and Freezers	SBDI	PA TRM (Pg. 185)	4%
Refrigeration: Reach-In Door Closer	SBDI	PA TRM (Pg. 171)	1%
< 75 HP VSD Air Compressors	C&P	MidAtlantic TRM v10	1%

4. Program Benchmarking

The SWE's evaluation guidelines for the first triennium include benchmarking comparisons to similar programs in other states. The utility evaluators in New Jersey collaborated to build a database of comparable programs to CEA programs offered by utilities in New Jersey.

For each program or program component described below, a minimum of three utility programs were reviewed – indicated by the reference number, program year (PY), and state/region. The remainder of this section discusses the benchmarking results at the program level. Full program benchmarking details can be found in *Attachment A - PY22-NJ Benchmarking-Master Table* . The program evaluation reports also include comparisons to other programs. Those discussions tend to focus on comparable programs' performance and launch ordering during the initial portfolio year, while the following discussions focus on comparing the range of offerings between mature programs and the programs offered by JCP&L in PY22.

4.1. Appliance Rebates

For the Appliance Rebates component of the Energy Efficient Products Program, utility evaluators reviewed five programs between 2019 and 2022 located in Pennsylvania (n=2), Indiana, New York, and Louisiana. Free ridership and spillover were reported for four programs with the averages being 44.5% for free ridership and 4.3% for spillover. Net-to-gross percentages were available for all programs with the average being 59.9%. None of the reviewed evaluation efforts reported participant satisfaction, while two program reports provided some indicators of program awareness. All the programs are downstream programs with savings being calculated from TRM deemed values. Twenty-seven measure types were reviewed with the breakdown noted in Table 4-1 below. Measures with the high portions of electric energy savings include heat pumps, smart thermostats. The last column of the table indicates if the Appliance Rebate program provided rebates for the corresponding measure in PY22. The program appears to include all measures that are significant in other programs, except for those that are either strategically offered in other program components (most HVAC measures, as indicated by the asterisk in the last column), or are inappropriate for the service territory (e.g., electric resistance water heaters do not adequately promote CEA efficiency objectives, and pool pumps are unlikely to scale to meaningful quantities).

Table 4-1 Appliance Measure Relative Impact Breakdown

End-Use	Measure	Average Percent of Program Savings*	Number of Programs Offering Measure*	Rebated in PY22[3]	Offered in PY22
HVAC	Ductless Heat Pump	46%	1	No*	No
HVAC	Central Heat Pump	39%	3	No*	No
HVAC	Smart Thermostat	31%	2	No*	No
HVAC	Dehumidifier	10%	3	Yes	Yes
HVAC	Room AC	5%	2	Yes	Yes
HVAC	Ground Source Heat Pump	0%	1	No*	No
HVAC	ECM Fan Motor	0%	1	No	No
Water Heating	Heat Pump Water Heater	11%	4	Yes	Yes
Water Heating	Electric Resistance Water Heater	5%	1	No	No
Appliances	Pool Pump	19%	3	No	No
Appliances	Clothes Washer	13%	2	Yes	Yes
Appliances	Air Purifier	6%	1	Yes	Yes
Appliances	Dishwasher	4%	1	No	No
Appliances	Clothes Dryer	2%	2	Yes	Yes
Refrigeration	Refrigerator	12%	3	Yes	No
Refrigeration	Freezer	0%	2	No	Yes

*These are average percentages of program savings for the subset of comparison programs that offer the measure.

4.2. Appliance Recycling

For the Appliance Recycling program component, three programs in 2020 and 2021 located in Indiana (n=2) and Illinois were reviewed. Free-ridership and spillover were only reported for one program, being 38% and 0% respectively, but free ridership values were available for all reviewed programs and averaged 55.2%. Two of the three reviewed programs provided program satisfaction rating with the average being 93.5% and one of those programs indicated that participants learned of the program through bill inserts, billboards, emails, website, social media, and cross promotion. All of the reviewed appliances turn-in programs are downstream programs, but savings calculation methodologies varied in each case. Both TRM algorithms and regression analysis were

[3] * Indicates this measure is offered in another program or offering (typically HVAC)

used, although the TRM algorithms often incorporate regression results from past studies. Three measure types were reviewed with the breakdown noted in Table 4-2 below. Note that the average percentages of program kWh savings do not add to 100%, since the table shows average savings portions in programs that offer a given measure, but not all programs offer the same set of measures. Jersey Central Power & Light Company's (JCP&L's) Appliance Recycling program component offers incentives for all measures identified in the comparable programs as well as dehumidifier recycling.

Table 4-2 Appliance Recycling Relative Impact Breakdown

Measure	Count	Average % of Saving (kWh)	Rebated in PY22	Offered in PY22
Refrigerator	3	59.7%	Yes	Yes
Freezer	3	34.5%	Yes	Yes
Room Air Conditioner	1	8.6%	Yes	Yes
*These are average percentages of program savings for the subset of comparison programs that offer the measure.				

4.3. Energy Efficiency Kits Program

For the Energy Efficiency Kits Program, five programs from 2018 to 2022 located in Missouri, Pennsylvania, California, Idaho, and Washington were reviewed. Free ridership and spillover were averaged across the four programs with values provided, with scores being 17% for free ridership and 5.3% for spillover. The average net-to-gross score across all reviewed programs was 82.4%. Participants were highly satisfied with the program with the average satisfaction rating for four of the five reviewed programs being 91%. Additionally, program satisfaction was provided for four of the programs with participants learning about the energy efficiency kits program through utility websites, bill inserts, and newsletters. In MO, the kits were distributed through school delivery and via property managers for the multifamily kits. Savings are determined from TRM deemed values, and as noted in the program name the implementation strategy is via kits. Eight measure types were reviewed with the breakdown noted in Table 4-3 below. JCP&L's EE Kits program currently offers six of the eight measures.

Table 4-3 Energy Efficiency Kit Measure Breakdown

Measure	Percent of Program Savings*	Rebated in PY22*	Offered in PY22
LED	26.7%	Yes	Yes
Outlet Gaskets	6.2%	No	No
Aerator	13.7%	Yes	Yes

Measure	Percent of Program Savings*	Rebated in PY22*	Offered in PY22
Showerhead	22.1%	Yes	Yes
Showerhead and Aerator[4]	85.0%	Yes	Yes
LED Night Light	2.4%	Yes	Yes
Furnace Whistle	10.5%	Yes	Yes
Water Heater Pipe Wrap	3.7%	No	No
Advanced Power Strip	6.6%	Yes	Yes
*These are average percentages of program savings for the subset of comparison programs that offer the measure.			

4.4. Energy Management (SEM) Program

For the Strategic Energy Management (SEM) Program, three programs between 2015 and 2019 located in Illinois (n=2) and Rhode Island were reviewed. The net-to-gross average was 95.3% (n=2) and one program reported program satisfaction being 80%. For two of the three programs participants learned of the SEM program through previous experience with energy efficient program. All reviewed programs are considered downstream programs with savings methodologies being regression analysis via IPMVP-C (whole facility consumption or billing/metered data), model reviews, and participant surveys. The measure mix breakdown was not supplied for the reviewed programs.

4.5. Home Performance with Energy Star (HPwES) Program

For the HPwES Program, five programs from 2017 to 2021 located in Maryland, Michigan, New Hampshire, Pennsylvania, and Oklahoma were reviewed. Free ridership and spillover were averaged across the four programs with values provided, with scores being 30.1% for free ridership and 3.3% for spillover. Net-to-gross on average was 81.3% (n=4). Participant satisfaction was 83.8% across four programs, with the other program indicating that “overall, the program participants and trade allies are satisfied.” One of the reviewed programs indicated program awareness coming primarily from word of mouth (24%), contractors (16%), and utility outreach (15%). All the reviewed programs were implemented by consultation with savings methodologies varying in each program – TRM deemed values (n=3), regression analysis (n=2), TRM algorithms (n=1), and engineering modeling (n=2) – with some programs using multiple methodologies. TRL, and/or engineering modeling. Electric and gas energy savings for several measure types, or

[4] Separate savings for showerheads and aerators are not available for this program

combinations thereof were available in the reviewed reports with the average breakdowns noted in Table 4-4 below. JCP&L's HPwES program offers all of the capital cost measures offered by other programs. In PY22, no rebates were provided for lighting or smart thermostats, or refrigerators, since the program was focused on improving the efficiency of the edifice itself, rather than equipment or appliances within the building.

Table 4-4 HPwES Measure Breakdown

Measure	Percent of Program Electric Savings*	Percent of Program Gas Savings*	Number of Programs Offering Measure	Rebated in PY22	Offered in PY22
Insulation	26.5%	34.0%	5	Yes	Yes
Air Conditioner	44.0%	0.0%	1	Yes	Yes
Insulation and Air Sealing	50.0%	50.0%	1	Yes	Yes
Air Sealing	16.0%	26.0%	2	Yes	Yes
Furnace	0.0%	40.0%	1	Yes	Yes
Lighting	29.0%	0%	1	No	No
HVAC	17.0%	3.0%	1	Yes	Yes
Smart Thermostat	12.0%	8.0%	2	No	Yes
Water Heating	18.0%	0.0%	1	Yes	Yes
Refrigerators	2.0%	2.0%	1	No	No
*These are average percentages of program savings for the subset of comparison programs that offer the measure.					

4.6. HVAC Program

For the HVAC Program, five programs from 2019 to 2022 located in Indiana, Oklahoma, Pennsylvania, California, and Idaho were reviewed. On average (n=4) free ridership was 33.3% and spillover was 12.9%. All programs reported net-to-gross values which averaged 67.6%. Participant satisfaction and program awareness were provided for two of reviewed programs with average satisfaction being 77.0% and participants learning of the program via billboard, bill inserts, in-store promotion, as well as previous experience with energy efficiency programs. The reviewed programs are considered downstream (n=4) or midstream (n=1) programs, with savings methodologies varying – TRM deemed values, TRM algorithms, TRL, and/or engineering modeling. The reviewed reports included gas and electric impacts for the measure types listed noted in Table 4-5 below. JCP&L's HVAC program offers all major HVAC types that were encountered in the reviewed reports, but does not include water heating or maintenance measures, as those fall in other components of JCP&L's residential portfolio.

Table 4-5 HVAC Measure Breakdown

Measure	Percent of Program Electric Savings*	Percent of Program Gas Savings*	Number of Programs Offering Measure	Rebated in PY22	Offered in PY22
Furnace with ECM	55.0%	33.0%	1	No	Yes
Ductless Heat Pump	46.6%	0.0%	3	Yes	Yes
Smart Thermostat	22.5%	23.0%	4	Yes	Yes
Air Source Heat Pump	20.5%	0.0%	4	Yes	Yes
Duct Sealing and Insulation	12.5%	0.0%	1	No	No
Ground Source Heat Pump	10.4%	0.0%	1	Yes	Yes
Central Air Conditioner	9.5%	0.0%	5	Yes	Yes
Furnace Fan	3.9%	0.0%	2	No	No
Duct Sealing	1.5%	0.0%	1	No	No
Air Conditioner Tune-up	1.0%	0.0%	1	No	No
Evaporative Cooler	0.1%	0.0%	1	No	No
Water Heater	0.0%	0.0%	1	No	Yes
Boiler	0.0%	0.0%	1	No	No
*These are average percentages of program savings for the subset of comparison programs that offer the measure.					

4.7. Moderate Income Weatherization (MIW) Program

For the MIW Program, four programs between 2012 and 2022 located in Oklahoma, Rhode Island, New Jersey, and Pennsylvania were reviewed. Free ridership and spillover were not reported for any program, and the net-to-gross average was 100% (n=2). Additionally, average participant satisfaction (n=2) was very high at 93%. One of the reviewed programs reported participant program awareness coming from word of mouth (27%), the utility directly (18%), government/ community agencies (16%), or contractors (15%). All programs implemented by consultation with saving being determined by TRM algorithm for three out of four programs; the fourth program, based out of NJ, determined savings by going house-to-house and regression analysis. The evaluation reports had some information regarding the relative gas and electric impacts of measures, although in some cases measure-level resolution was limited by the evaluation methodology (billing analysis). Furthermore, gas energy impacts were not fully reported for any program. The New Jersey utility evaluators attempted to estimate impacts in these cases. The results are shown in Table 4-6 below. Note that the percentages of relative impacts do not add up to 100% because these are averages of reported impact shares across programs, and not all programs included the same measures. There is also some overlap within measure groups, for example “Weatherization” likely includes insulation, duct

sealing, and air sealing. The lack of standardization or measure-level measurement resolution is not a significant issue in this initial benchmarking effort because the differences between the comparison programs and the MIW programs are categorical: The MIW program focuses is designed to make modest energy impacts to participants, at an attractive acquisition cost, while the comparison programs are more similar to the *Comfort Partners* program that is offered in New Jersey but administered by the BPU. The evaluators will endeavor to find programs that are more directly comparable to MIW. For example, the "Warm Extra Measures" program component offered by the FirstEnergy operating companies in Pennsylvania may yield a more fruitful comparison.

Table 4-6 MIW Measure Breakdown

Measure	Percent of Program Electric Savings*	Percent of Program Gas Savings*	Number of Programs Offering Measure	Rebated in PY22	Offered in PY22
Duct Sealing	39.0%	0.0%	1	No	No
Attic Insulation	36.0%	0.0%	1	No	No
Weatherization	30.5%	4.0%	2	No	No
Air Sealing	22.0%	0.0%	1	No	No
Lighting	22.0%	0.0%	1	Yes	Yes
Heating Systems	15.0%	0.0%	1	No	No
Refrigerator Replacement	6.0%	0.0%	2	No	No
Educational Materials	3.0%	0.0%	1	No	Yes
Water Heater Jacket	0.5%	0.0%	1	No	No
Water Heater Pipe Insulation	0.5%	0.0%	1	No	Yes
*These are average percentages of program savings for the subset of comparison programs that offer the measure.					

4.8. Online Marketplace Program

For the Online Marketplace Program, four programs between 2019 and 2021 located in Indiana (n=3) and New York were reviewed. On average free ridership was 21.5%, spillover was 3.5%, and net-to-gross was 81.5%. Overall participants were satisfied with the program with an average rating of 76.3% (n=3) and tended to learn about the program through email and print outreach, bill inserts, word of mouth, and the utility website. Savings were determined by TRM deemed values (n=3) or TRM algorithm (n=1) with all programs being downstream programs. While two program reports mentioned specific measures, only one program evaluation report included a breakdown of savings by measures or measure groups, with the breakdown noted in Table 4-7 below. In comparison to the table below, JCP&L's program impacts were driven by smart thermostats (68%) and lighting (27%), with the remaining savings attributable to air purifiers and advanced power strips.

Table 4-7 Online Marketplace Measure Breakdown

Measure	Percent of Program Electric Savings*	Percent of Program Gas Savings*	Number of Programs Offering Measure	Rebated in PY22	Offered in PY22
Retail Kit	24.0%	10.6%	1	No	
Restaurant Kit	14.0%	57.6%	1	No	
Screw-based LEDs	8.5%	0.0%	2	Yes	
TLEDs	6.7%	0.0%	1	No	
Office Kit	0.4%	31.8%	1	No	
*These are average percentages of program savings for the subset of comparison programs that offer the measure.					

4.9. Quick Home Energy Check Up (QHEC) Program

For the QHEC Program, four programs from 2016-2021 located in Maryland, Pennsylvania, Missouri, and Indiana were reviewed. On average free ridership was 19.8%, spillover was 4.8%, and net-to-gross was 87.5%. Overall participants were satisfied with the program with an average rating of 86.7%. Only one reviewed program noted program awareness, with the primary methods being through the utility website (30%), bill inserts (19%), or via word of mouth (18%). Savings were determined by TRM deemed values with two programs being direct install programs and one was an in -home audit plus kit program.[5] Six measure types were reviewed with the breakdown noted in Table 4-8 below. The QHEC Program offers most of the measures that are offered by the comparison programs, with a focus on measures with attractive energy-saving acquisition costs.

Table 4-8 QHEC Measure Breakdown

Measure	Percent of Program Electric Savings	Percent of Program Gas Savings	Number of Programs Offering Measure	Rebated in PY22	Offered in PY22
Lighting	54.5%	-2.0%	4	Yes	Yes
Showerhead	14.5%	77.0%	4	Yes	Yes
Advanced Power Strip	23.5%	1.0%	2	Yes	Yes
Faucet Aerator	3.0%	10.0%	4	Yes	Yes
Pipe Insulation	1.0%	4.0%	2	Yes	Yes
Pipe Insulation/ Water Heater Tank Wrap	2.0%	0.0%	2	No	No

[5] For the Indiana program implementation strategy/ program design and savings methodology were not provided.

4.10. Upstream Lighting Program

For the Upstream Lighting Program, five 2019-2020 programs located in Washington, California, Idaho, Wyoming, and Pennsylvania were reviewed. Although, free ridership and spillover were only reported for one of the reference programs – 72% and 0%, respectively – the net-to-gross average for the five reviewed programs was 80%. All reviewed programs are considered midstream programs and savings were determined by TRM deemed values. Participant satisfaction, program awareness, and the measure mix breakdown was not supplied for the reviewed program.

4.11. Multifamily Program

For the Multifamily Program, four programs between 2019 and 2021 located in Michigan, Illinois, Oklahoma, and Arizona were reviewed. Although, free ridership and spillover were only reported for one of the reference programs – 15.2% and 0%, respectively– the net-to-gross average for four out of five reviewed programs was 92.3%. Additionally, participant satisfaction (n=2) was high with one program having an 87% rating and another stating "overall, most were satisfied". Three of the four programs were direct install and prescriptive programs, while the AZ program was direct install only. Savings were determined by TRM deemed values for three programs, while savings for the OK program were determined by engineering review and site visits. Nine measure types were reviewed with the breakdown noted in Table 4-9 below. JCP&L's Multifamily Program tends to focus on low-cost, high-savings measures that have a track record of being approved for installation by apartment owners, while one of the comparison programs also includes capital cost measures, which are not included in the Multifamily program's design.

Table 4-9 Multifamily Measure Breakdown

Measure	Percent of Program Electric Savings	Percent of Program Gas Savings	Number of Programs Offering Measure	Rebated in PY22	Offered in PY22
Lighting	63.3%	0.0%	4	Yes	Yes
HVAC	27.0%	0.0%	2	No	No
Domestic Hot Water	3.0%	0.0%	2	Yes	No
Building Envelope	26.0%	0.0%	1	No	No
Showerhead	14.0%	0.0%	2	Yes	Yes
Faucet Aerator	5.0%	0.0%	2	Yes	Yes
Consumer Electronics	5.0%	0.0%	1	No	No
Refrigeration	0.0%	0.0%	1	No	No
Appliances	0.5%	0.0%	1	No	No
*These are average percentages of program savings for the subset of comparison programs that offer the measure.					

4.12. Small Business Direct Install (SBDI) Program

For the SBDI Program, five 2019/2020 programs located in Oklahoma, Pennsylvania, Illinois, Indiana, and Louisiana were reviewed. Although, free ridership and spillover were only reported for two of the reference programs – respective averages of 3.6% and 0%– the net-to-gross average for the five reviewed programs was 88.3%. Additionally, participant satisfaction (n=2) was 96.5% and one program noted that participants primarily learned of the program through contractors and vendors. Four of the five programs were direct install programs, while the PA program was considered a downstream and midstream program. Savings were determined from the TRM, either by deemed values (n=3) or algorithm (n=2). Fourteen measure types were reviewed with the breakdown noted in Table 4-10 below. The SBDI program had a similar electric savings profile to the comparison programs, with the exception of one program that had a significant amount of savings from vending machine sensors and smart thermostats. While thermostats are offered by the SBDI program, the measure did not provide a significant share of overall savings in PY22.

Table 4-10 SBDI Measure Breakdown

Measure	Percent of Program Electric Savings	Percent of Program Gas Savings	Number of Programs Offering Measure	Rebated in PY22	Offered in PY22
Lighting	73.8%	0.0%	4	Yes	YES
Thermostat	38.6%	0.0%	1	Yes	YES
Vending Machine Sensors	27.7%	0.0%	1	No	YES
Energy Conservation Measures (ECM)	7.0%	0.0%	1	Yes	YES
Non-lighting	2.3%	0.0%	1	Yes	YES
Controls	2.3%	0.0%	1	No	YES
Refrigeration	0.6%	0.0%	2	Yes	YES
HVAC	0.1%	0.0%	2	No	YES
Steam Trap	0.0%	83.9%	1	No	NO
Boiler Tune Up	0.0%	11.6%	1	No	NO
Compressed Air Projects	0.0%	0.0%	1	No	NO
Process Improvements	0.0%	0.0%	1	No	NO
Prescribed HVAC	0.0%	0.0%	1	Yes	YES
Food Service	0.0%	0.0%	1	No	NO
*These are average percentages of program savings for the subset of comparison programs that offer the measure.					

4.13. C&I Prescriptive and Custom

For the C&I Prescriptive and Custom Program components, seven programs in 2020 and 2021 located in Maryland (n=5), Illinois, and Pennsylvania were reviewed. Free ridership and spillover were only reported for the PA program – 31% and 0%, respectively – however net-to-gross values were available for all programs with the average being 80%. All savings were determined from TRM deemed values and six of the seven programs are downstream programs with the PA program being a combination program of midstream, Downstream, SBDI, and New Construction. All programs included lighting, HVAC, refrigeration, and appliance measures with the IL program also including data centers; however, no savings values (kWh or Therms) are available as of this writing.

5. Appendix A: Program Benchmarking

The accompanying *Attachment A - PY22-NJ Benchmarking-Master Table* includes more information from the benchmarking comparison.