New Jersey's Clean Energy Program

LGEA Presentation

New Jersey Transit

September 2, 2021

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TRC

INTRODUCTIONS

- *NJ Transit*
  - Erin R. Hill – Energy and Sustainability Analyst
  - Steven Jenks – Manager, Energy and Sustainability Programs
  - Harrison Weiss - Energy and Sustainability Coordinator
  - Alicia Allen – Headquarters
  - Alexandr Domanksy – Acting Manager, Facilities Services HQ
  - Edward Stangl – Newark Penn Station Manager
  - Marco Fernandez – Project Manager in Capital Programs
- *NJ Clean Energy Program*
  - Brian DeLuca – Director, C&I Programs
  - Aditya Saxena – TRC Auditor
  - Sarah Walters – TRC Account Manager
  - Nauman Khurshid– TRC Outreach Manager
  - Michelle Rossi – ESIP Coordinator (BPU)
  - Arif Welcher – Government/Business Manager (BPU)

AGENDA

- The audit process overview
- Energy use & existing conditions
- Review of **E**nergy **C**onservation **M**easures (ECMs) identified & other recommendations
- Energy Savings Improvement Program (ESIP)
- Overview of NJCEP equipment incentives
- Questions regarding the draft audit report
- Next steps for NJ Transit

LGEA Process

- Application Approval
- Initial Call
- Facility Interviews
- Audit
- Benchmarking & Analysis
- Draft Reports
- LGEA Presentation
- Final Reports

Site Visit & Utility Analysis

Overview of Systems, Baseline & Existing Conditions:

- Lighting System
- HVAC and Mechanical Systems
- Plug Load Equipment
- Energy Management Systems

Utility Consumption:

- Electric Consumption and Costs
- Natural Gas Consumption and Costs

Sites Visited/Analyzed

- 1171 – Station Trenton
- 1172 – Newark Penn Station
- 1173 – Secaucus Junction
- 9102 – Headquarters Building
- Meadowlands Maintenance Complex (MMC):
  - Microwave Tower
  - Fuel Pad
  - Yardmaster Tower
  - Watershed
  - Substation
  - Track Department
  - Yard Crew Quarters
  - Component Storage
  - Water Heating Building
  - Pre-treatment Plant
  - S&I Shop
  - Locomotive Wash House
  - Load Box
  - Train Car Wash
  - Railway Operation Center (ROC)

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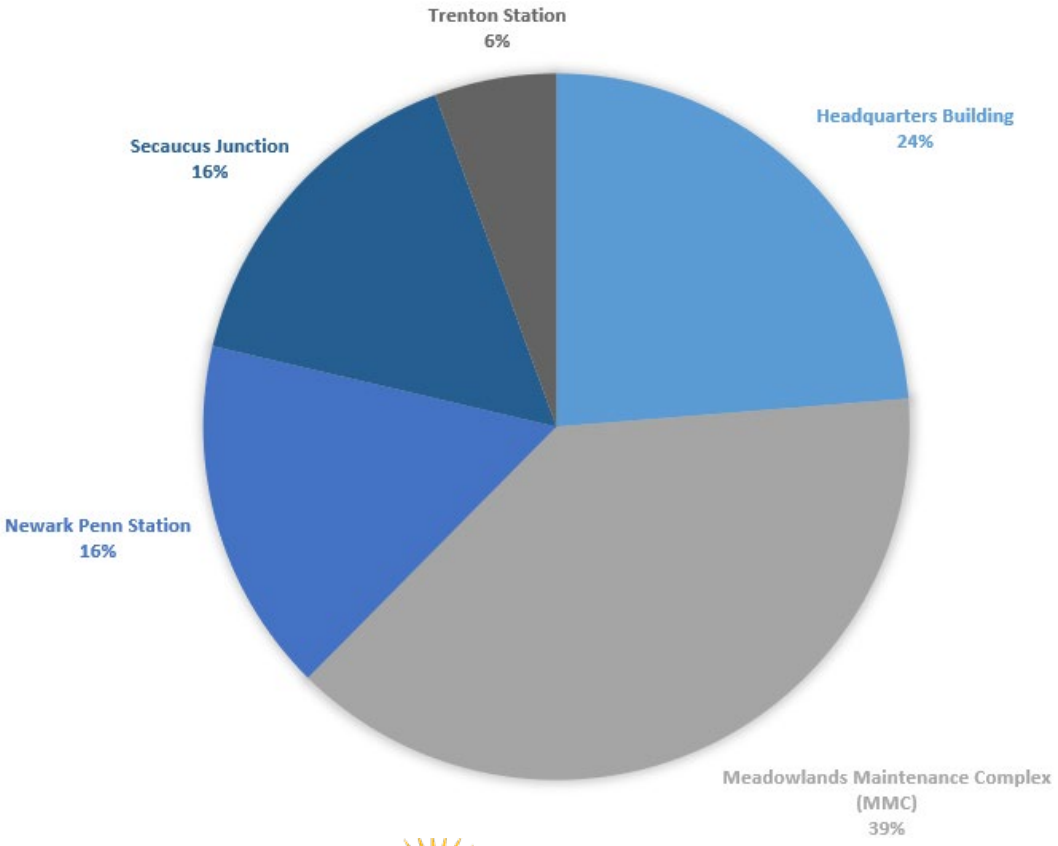
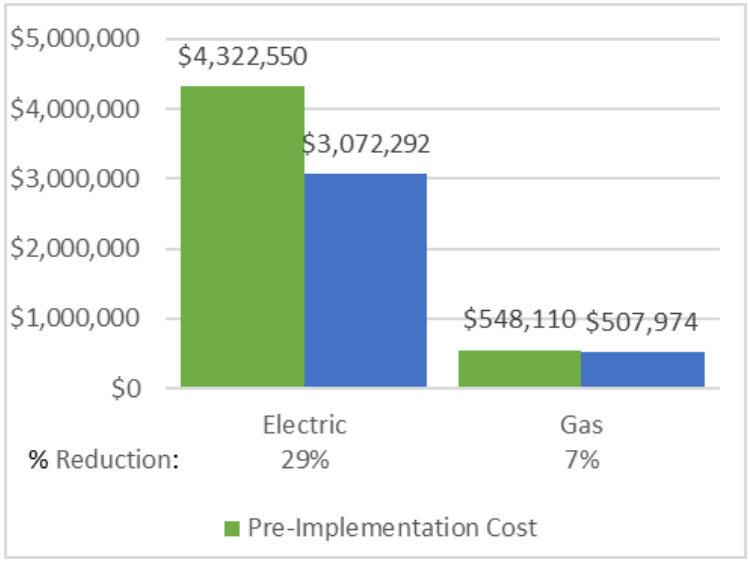
UTILITY BREAKOUT

Percent of Total Annual Energy Costs



Pre & Post Implementation Cost



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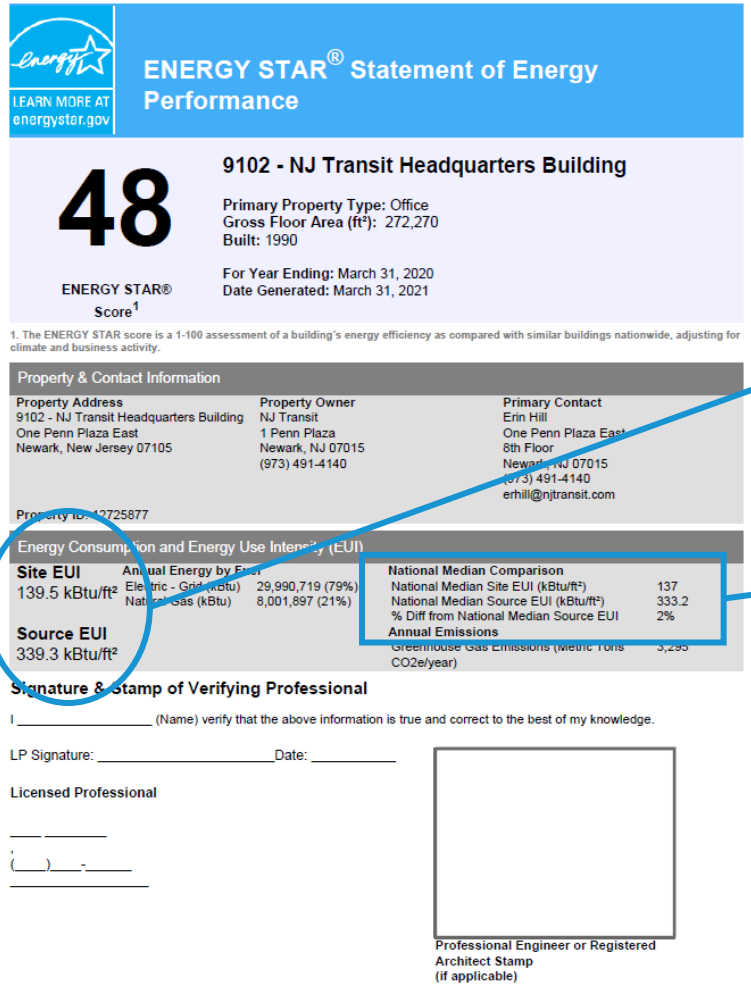
BENCHMARKING



ENERGY STAR® Statement of Energy Performance

LEARN MORE AT energystar.gov

48

ENERGY STAR® Score[1]

9102 - NJ Transit Headquarters Building

Primary Property Type: Office
Gross Floor Area (ft²): 272,270
Built: 1990

For Year Ending: March 31, 2020
Date Generated: March 31, 2021

1. The ENERGY STAR score is a 1-100 assessment of a building's energy efficiency as compared with similar buildings nationwide, adjusting for climate and business activity.

Property & Contact Information

Property Address	Property Owner	Primary Contact
9102 - NJ Transit Headquarters Building One Penn Plaza East Newark, New Jersey 07105	NJ Transit 1 Penn Plaza Newark, NJ 07015 (973) 491-4140	Erin Hill One Penn Plaza East 8th Floor Newark, NJ 07015 (973) 491-4140 erhill@njtransit.com

Property ID: 12725877

Energy Consumption and Energy Use Intensity (EUI)

Site EUI
139.5 kBtu/ft²

Source EUI
339.3 kBtu/ft²

Annual Energy by Fuel

Electric - Grid (kBtu)	29,990,719 (79%)
Natural Gas (kBtu)	8,001,897 (21%)

National Median Comparison

National Median Site EUI (kBtu/ft²)	137
National Median Source EUI (kBtu/ft²)	333.2
% Diff from National Median Source EUI	2%

Annual Emissions

Greenhouse Gas Emissions (Metric Tons CO2e/year)	3,295

Signature & Stamp of Verifying Professional

I _____ (Name) verify that the above information is true and correct to the best of my knowledge.

LP Signature: _____ Date: _____

Licensed Professional

___ _____

(___)___-_____

_____

Professional Engineer or Registered Architect Stamp (if applicable)

Site EUI
139.5 kBtu/ft²

Source EUI
339.3 kBtu/ft²

National Median Comparison

National Median Site EUI (kBtu/ft²)	137
National Median Source EUI (kBtu/ft²)	333.2
% Diff from National Median Source EUI	2%

Annual Emissions

Greenhouse Gas Emissions (Metric Tons CO2e/year)	3,295

ENERGY STAR® scores are percentile ranking from 1 (least efficient) to 100 (most efficient). It compares your building's energy performance to similar buildings nationwide.

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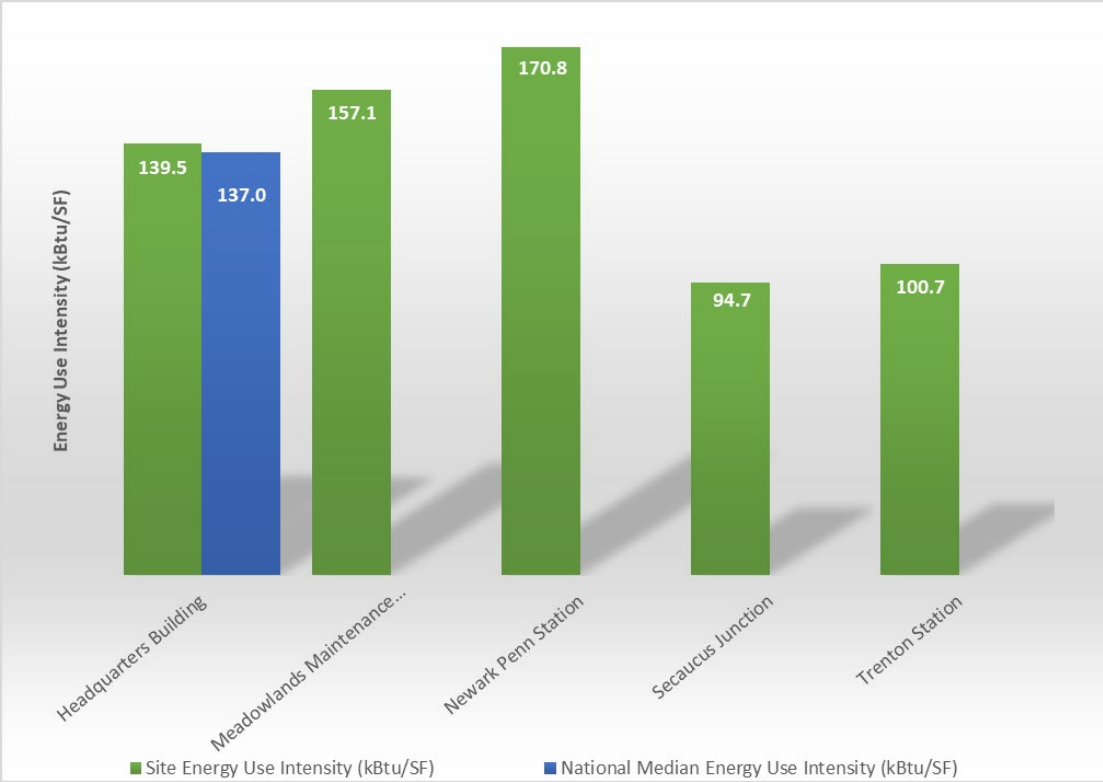
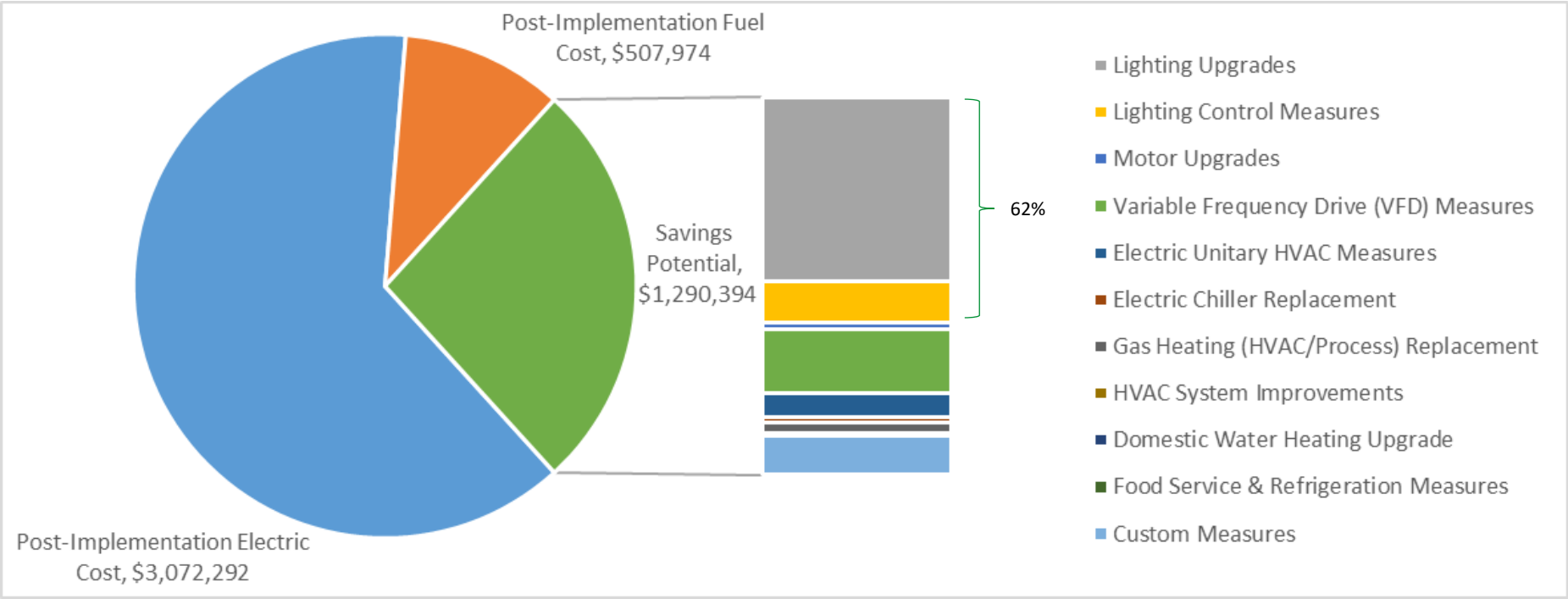
BENCHMARKING



Site Name	ENERGY STAR® Score
Headquarters Building	48
MMC	N/A
Newark Penn Station	N/A
Secaucus Junction	N/A
Trenton Station	N/A

All Opportunities

Savings Potential



ALL OPPORTUNITIES

#	Energy Conservation Measure	Annual Electric Savings (kWh)	Peak Demand Savings (kW)	Annual Fuel Savings (MMBtu)	Annual Energy Cost Savings ($)	Estimated M&L Cost ($)	Estimated Incentive ($)*	Estimated Net M&L Cost ($)	Simple Payback Period (yrs)**	CO_2e Emissions Reduction (lbs)
Lighting Upgrades		**6,196,828**	**512.3**	**-911.7**	**$627,151**	**$942,752**	**$193,739**	**$749,013**	**1.2**	**6,133,409**
ECM 1	Install LED Fixtures	2,022,971	109.3	-220.7	$201,034	$319,399	$40,015	$279,384	1.4	2,011,274
ECM 2	Retrofit Fluorescent Fixtures with LED Lamps and Drivers	190,619	26.8	-39.3	$20,325	$34,290	$4,955	$29,335	1.4	187,347
ECM 3	Retrofit Fixtures with LED Lamps	3,983,238	376.2	-651.7	$405,793	$589,062	$148,769	$440,294	1.1	3,934,787
Lighting Control Measures		**1,439,048**	**93.2**	**-175.1**	**$145,160**	**$516,314**	**$231,135**	**$285,179**	**2.0**	**1,428,605**
ECM 4	Install Occupancy Sensor Lighting Controls	222,094	31.4	-47.0	$22,749	$125,169	$15,705	$109,464	4.8	218,147
ECM 5	Install Daylight Dimming/Photocell Controls	667,977	24.2	-49.9	$67,285	$164,500	$27,700	$136,800	2.0	666,800
ECM 6	Install High/Low Lighting Controls	548,976	37.7	-78.2	$55,126	$226,645	$187,730	$38,915	0.7	543,658
Motor Upgrades		**198,264**	**21.7**	**0.0**	**$19,955**	**$193,181**	**$0**	**$193,181**	**9.7**	**199,651**
ECM 7	Premium Efficiency Motors	198,264	21.7	0.0	$19,955	$193,181	$0	$193,181	9.7	199,651
Variable Frequency Drive (VFD) Measures		**2,190,294**	**349.9**	**4.5**	**$220,267**	**$1,471,199**	**$149,900**	**$1,321,299**	**6.0**	**2,206,132**
ECM 8	Install VFD on Variable Air Volume (VAV) Fans	301,279	42.9	0.0	$30,128	$65,877	$10,100	$55,777	1.9	303,385
ECM 9	Install VFDs on Constant Volume (CV) Fans	1,603,499	274.5	0.0	$161,327	$688,566	$98,150	$590,416	3.7	1,614,710
ECM 10	Install VFDs on Chilled Water Pumps	109,405	20.9	0.0	$10,988	$223,348	$17,200	$206,148	18.8	110,170
ECM 11	Install VFDs on Heating Water Pumps	169,387	10.8	0.0	$17,126	$483,134	$24,100	$459,034	26.8	170,571
ECM 12	Install Boiler Draft Fan VFDs	1,886	0.6	0.0	$185	$3,493	$200	$3,293	17.8	1,899
ECM 13	Install VFDs on Kitchen Hood Fan Motors	4,838	0.2	4.5	$514	$6,781	$150	$6,631	12.9	5,395
Electric Unitary HVAC Measures		**706,566**	**261.8**	**311.7**	**$78,634**	**$1,902,486**	**$114,493**	**$1,787,993**	**22.7**	**748,004**
ECM 14	Install High Efficiency Air Conditioning Units	526,201	216.5	311.7	$59,010	$1,801,945	$104,216	$1,697,729	28.8	566,378
ECM 15	Install High Efficiency Heat Pumps	180,365	45.3	0.0	$19,624	$100,541	$10,277	$90,264	4.6	181,626
Electric Chiller Replacement		**163,893**	**8.2**	**0.0**	**$17,912**	**$245,771**	**$37,560**	**$208,211**	**11.6**	**165,039**
ECM 16	Install High Efficiency Chillers	163,893	8.2	0.0	$17,912	$245,771	$37,560	$208,211	11.6	165,039

ALL OPPORTUNITIES

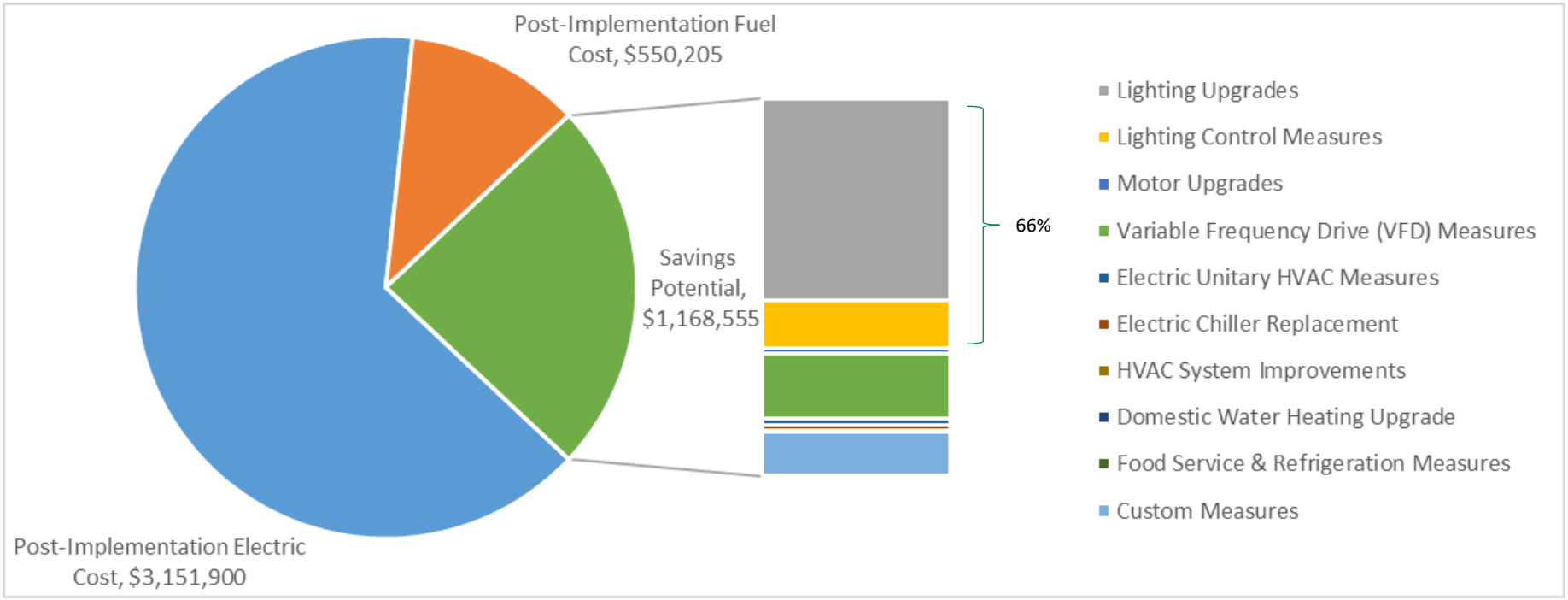
#	Energy Conservation Measure	Annual Electric Savings (kWh)	Peak Demand Savings (kW)	Annual Fuel Savings (MMBtu)	Annual Energy Cost Savings ($)	Estimated M&L Cost ($)	Estimated Incentive ($)*	Estimated Net M&L Cost ($)	Simple Payback Period (yrs)**	CO_2e Emissions Reduction (lbs)
Gas Heating (HVAC/Process) Replacement		**0**	**0.0**	**5,734.4**	**$39,770**	**$1,233,629**	**$44,131**	**$1,189,498**	**29.9**	**671,427**
ECM 17	Install High Efficiency Hot Water Boilers	0	0.0	1,476.5	$10,726	$342,350	$12,831	$329,519	30.7	172,883
ECM 18	Install High Efficiency Unit Heaters	0	0.0	1,854.6	$12,651	$511,118	$0	$511,118	40.4	217,146
ECM 19	Install Infrared Heaters	0	0.0	2,403.3	$16,394	$380,161	$31,300	$348,861	21.3	281,398
HVAC System Improvements		**13,951**	**0.0**	**5.1**	**$1,465**	**$992**	**$422**	**$570**	**0.4**	**14,650**
ECM 20	Install Pipe Insulation	13,951	0.0	5.1	$1,465	$992	$422	$570	0.4	14,650
Domestic Water Heating Upgrade		**10,124**	**0.0**	**22.2**	**$1,181**	**$2,386**	**$894**	**$1,491**	**1.3**	**12,798**
ECM 21	Install High Efficiency Gas-Fired Water Heater	0	0.0	5.9	$45	$1,769	$526	$1,243	27.4	685
ECM 22	Install Low-Flow DHW Devices	10,124	0.0	16.4	$1,136	$617	$369	$248	0.2	12,113
Food Service & Refrigeration Measures		**44,988**	**5.1**	**0.0**	**$4,747**	**$33,850**	**$1,775**	**$32,075**	**6.8**	**45,303**
ECM 23	Replace Refrigeration Equipment	5,720	0.7	0.0	$578	$24,880	$475	$24,405	42.2	5,760
ECM 24	Vending Machine Control	39,268	4.5	0.0	$4,169	$8,970	$1,300	$7,670	1.8	39,543
Custom Measures		**1,261,479**	**0.0**	**759.9**	**$134,151**	**$538,528**	**$0**	**$538,528**	**4.0**	**1,359,310**
ECM 25	Retro-Commissioning Study	340,510	0.0	759.9	$41,104	$161,517	$0	$161,517	3.9	431,865
ECM 26	Install Heat Pump Water Heaters	15,421	0.0	0.0	$1,529	$4,140	$0	$4,140	2.7	15,529
ECM 27	Install Motor Controller for Escalators	862,461	0.0	0.0	$87,209	$344,271	$0	$344,271	3.9	868,528
ECM 28	High Frequency Battery Chargers	43,087	0.0	0.0	$4,309	$28,600	$0	$28,600	6.6	43,388
TOTALS		**12,225,434**	**1,252.3**	**5,751.1**	**$1,290,394**	**$7,081,089**	**$774,049**	**$6,307,040**	**4.9**	**12,984,326**

* - All incentives presented in this table are based on previously run state rebate programs. Contact your utilty provider for details on current programs.

** - Simple Payback Period is based on net measure costs (i.e. after incentives).

Cost Effective Opportunities

Savings Potential



COST EFFECTIVE OPPORTUNITIES

#	Energy Conservation Measure	Annual Electric Savings (kWh)	Peak Demand Savings (kW)	Annual Fuel Savings (MMBtu)	Annual Energy Cost Savings ($)	Estimated M&L Cost ($)	Estimated Incentive ($)*	Estimated Net M&L Cost ($)	Simple Payback Period (yrs)**	CO_2e Emissions Reduction (lbs)
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ECM 1	Install LED Fixtures	2,022,971	109.3	-220.7	$201,034	$319,399	$40,015	$279,384	1.4	2,011,274
ECM 2	Retrofit Fluorescent Fixtures with LED Lamps and Drivers	190,619	26.8	-39.3	$20,325	$34,290	$4,955	$29,335	1.4	187,347
ECM 3	Retrofit Fixtures with LED Lamps	3,983,238	376.2	-651.7	$405,793	$589,062	$148,769	$440,294	1.1	3,934,787
Lighting Control Measures		**1,439,048**	**93.2**	**-175.1**	**$145,160**	**$516,314**	**$231,135**	**$285,179**	**2.0**	**1,428,605**
ECM 4	Install Occupancy Sensor Lighting Controls	222,094	31.4	-47.0	$22,749	$125,169	$15,705	$109,464	4.8	218,147
ECM 5	Install Daylight Dimming/Photocell Controls	667,977	24.2	-49.9	$67,285	$164,500	$27,700	$136,800	2.0	666,800
ECM 6	Install High/Low Lighting Controls	548,976	37.7	-78.2	$55,126	$226,645	$187,730	$38,915	0.7	543,658
Motor Upgrades		**192,588**	**19.2**	**0.0**	**$19,398**	**$180,938**	**$0**	**$180,938**	**9.3**	**193,934**
ECM 7	Premium Efficiency Motors	192,588	19.2	0.0	$19,398	$180,938	$0	$180,938	9.3	193,934
Variable Frequency Drive (VFD) Measures		**1,965,957**	**325.0**	**4.5**	**$197,752**	**$836,465**	**$111,800**	**$724,665**	**3.7**	**1,980,227**
ECM 8	Install VFD on Variable Air Volume (VAV) Fans	301,279	42.9	0.0	$30,128	$65,877	$10,100	$55,777	1.9	303,385
ECM 9	Install VFDs on Constant Volume (CV) Fans	1,603,499	274.5	0.0	$161,327	$688,566	$98,150	$590,416	3.7	1,614,710
ECM 10	Install VFDs on Chilled Water Pumps	56,342	7.4	0.0	$5,783	$75,242	$3,400	$71,842	12.4	56,736
ECM 13	Install VFDs on Kitchen Hood Fan Motors	4,838	0.2	4.5	$514	$6,781	$150	$6,631	12.9	5,395
Electric Unitary HVAC Measures		**197,965**	**49.9**	**0.0**	**$21,295**	**$114,818**	**$13,728**	**$101,090**	**4.7**	**199,349**
ECM 14	Install High Efficiency Air Conditioning Units	22,210	7.1	0.0	$2,178	$21,886	$4,351	$17,535	8.0	22,365
ECM 15	Install High Efficiency Heat Pumps	175,755	42.7	0.0	$19,117	$92,932	$9,377	$83,555	4.4	176,984

COST EFFECTIVE OPPORTUNITIES

#	Energy Conservation Measure	Annual Electric Savings (kWh)	Peak Demand Savings (kW)	Annual Fuel Savings (MMBtu)	Annual Energy Cost Savings ($)	Estimated M&L Cost ($)	Estimated Incentive ($)*	Estimated Net M&L Cost ($)	Simple Payback Period (yrs)**	CO_2e Emissions Reduction (lbs)
Electric Chiller Replacement		**153,346**	**2.2**	**0.0**	**$16,878**	**$186,688**	**$35,160**	**$151,528**	**9.0**	**154,418**
ECM 16	Install High Efficiency Chillers	153,346	2.2	0.0	$16,878	$186,688	$35,160	$151,528	9.0	154,418
HVAC System Improvements		**13,951**	**0.0**	**5.1**	**$1,465**	**$992**	**$422**	**$570**	**0.4**	**14,650**
ECM 20	Install Pipe Insulation	13,951	0.0	5.1	$1,465	$992	$422	$570	0.4	14,650
Domestic Water Heating Upgrade		**10,124**	**0.0**	**16.4**	**$1,136**	**$617**	**$369**	**$248**	**0.2**	**12,113**
ECM 22	Install Low-Flow DHW Devices	10,124	0.0	16.4	$1,136	$617	$369	$248	0.2	12,113
Food Service & Refrigeration Measures		**39,268**	**4.5**	**0.0**	**$4,169**	**$8,970**	**$1,300**	**$7,670**	**1.8**	**39,543**
ECM 24	Vending Machine Control	39,268	4.5	0.0	$4,169	$8,970	$1,300	$7,670	1.8	39,543
Custom Measures		**1,261,479**	**0.0**	**759.9**	**$134,151**	**$538,528**	**$0**	**$538,528**	**4.0**	**1,359,310**
ECM 25	Retro-Commissioning Study	340,510	0.0	759.9	$41,104	$161,517	$0	$161,517	3.9	431,865
ECM 26	Install Heat Pump Water Heaters	15,421	0.0	0.0	$1,529	$4,140	$0	$4,140	2.7	15,529
ECM 27	Install Motor Controller for Escalators	862,461	0.0	0.0	$87,209	$344,271	$0	$344,271	3.9	868,528
ECM 28	High Frequency Battery Chargers	43,087	0.0	0.0	$4,309	$28,600	$0	$28,600	6.6	43,388
TOTALS		**11,470,553**	**1,006.2**	**-300.9**	**$1,168,555**	**$3,327,081**	**$587,652**	**$2,739,430**	**2.3**	**11,515,557**

* - All incentives presented in this table are based on NJ Smart Start Building equipment incentives and assume proposed equipment meets minimum performance criteria for that program.

** - Simple Payback Period is based on net measure costs (i.e. after incentives).

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1171 – Station Trenton

#	Energy Conservation Measure	Cost Effective?	Annual Electric Savings (kWh)	Peak Demand Savings (kW)	Annual Fuel Savings (MMBtu)	Annual Energy Cost Savings ($)	Estimated M&L Cost ($)	Estimated Incentive ($)*	Estimated Net M&L Cost ($)	Simple Payback Period (yrs)**	CO_2e Emissions Reduction (lbs)
Lighting Upgrades			**398,379**	**38.1**	**-62**	**$43,369**	**$134,634**	**$14,531**	**$120,103**	**2.8**	**393,925**
ECM 1	Install LED Fixtures	Yes	228,579	20.4	-28	$24,944	$108,682	$8,315	$100,367	4.0	226,934
ECM 2	Retrofit Fluorescent Fixtures with LED Lamps and Drivers	Yes	8,136	0.8	-2	$882	$1,375	$200	$1,175	1.3	7,990
ECM 3	Retrofit Fixtures with LED Lamps	Yes	161,663	16.9	-32	$17,543	$24,577	$6,016	$18,561	1.1	159,001
Lighting Control Measures			**52,183**	**4.4**	**-11**	**$5,657**	**$18,079**	**$13,440**	**$4,639**	**0.8**	**51,247**
ECM 4	Install Occupancy Sensor Lighting Controls	Yes	5,012	0.7	-1	$543	$3,704	$460	$3,244	6.0	4,922
ECM 5	Install Daylight Dimming/Photocell Controls	Yes	26,784	1.9	-6	$2,904	$4,700	$4,085	$615	0.2	26,303
ECM 6	Install High/Low Lighting Controls	Yes	20,388	1.9	-4	$2,210	$9,675	$8,895	$780	0.4	20,022
Motor Upgrades			**4,324**	**0.4**	**0**	**$476**	**$4,495**	**$0**	**$4,495**	**9.4**	**4,354**
ECM 7	Premium Efficiency Motors	Yes	4,324	0.4	0	$476	$4,495	$0	$4,495	9.4	4,354
Variable Frequency Drive (VFD) Measures			**117,085**	**14.3**	**0**	**$12,887**	**$157,656**	**$16,800**	**$140,856**	**10.9**	**117,903**
ECM 8	Install VFDs on Constant Volume (CV) Fans	Yes	75,983	11.6	0	$8,363	$46,277	$9,200	$37,077	4.4	76,514
ECM 9	Install VFDs on Heating Water Pumps	No	41,102	2.7	0	$4,524	$111,379	$7,600	$103,779	22.9	41,389
Unitary HVAC Measures			**19,768**	**11.5**	**0**	**$2,176**	**$81,235**	**$3,733**	**$77,502**	**35.6**	**19,906**
ECM 10	Install High Efficiency Air Conditioning Units	No	15,158	8.9	0	$1,668	$73,626	$2,833	$70,793	42.4	15,264
ECM 11	Install High Efficiency Heat Pumps	No	4,610	2.5	0	$507	$7,609	$900	$6,709	13.2	4,642
Electric Chiller Replacement			**153,346**	**2.2**	**0**	**$16,878**	**$186,688**	**$35,160**	**$151,528**	**9.0**	**154,418**
ECM 12	Install High Efficiency Chillers	Yes	153,346	2.2	0	$16,878	$186,688	$35,160	$151,528	9.0	154,418
Domestic Water Heating Upgrade			**0**	**0.0**	**7**	**$56**	**$1,798**	**$554**	**$1,243**	**22.1**	**852**
ECM 13	Install High Efficiency Gas-Fired Water Heater	No	0	0.0	6	$45	$1,769	$526	$1,243	27.5	685
ECM 14	Install Low-Flow DHW Devices	Yes	0	0.0	1	$11	$29	$29	$0	0.0	167
Food Service & Refrigeration Measures			**1,954**	**0.2**	**0**	**$215**	**$460**	**$100**	**$360**	**1.7**	**1,968**
ECM 15	Vending Machine Control	Yes	1,954	0.2	0	$215	$460	$100	$360	1.7	1,968
Custom Measures			**62,774**	**0.0**	**116**	**$7,810**	**$31,021**	**$0**	**$31,021**	**4.0**	**76,845**
ECM 16	Retro-Commissioning Study	Yes	40,877	0.0	116	$5,400	$20,800	$0	$20,800	3.9	54,794
ECM 17	Install Motor Controller for Escalators	Yes	21,897	0.0	0	$2,410	$10,221	$0	$10,221	4.2	22,050
TOTALS (COST EFFECTIVE MEASURES)			**748,942**	**56.8**	**45**	**$82,779**	**$421,683**	**$72,460**	**$349,224**	**4.2**	**759,437**
TOTALS (ALL MEASURES)			**809,812**	**71.0**	**51**	**$89,524**	**$616,066**	**$84,318**	**$531,748**	**5.9**	**821,418**

1172 – Newark Penn Station

#	Energy Conservation Measure	Cost Effective?	Annual Electric Savings (kWh)	Peak Demand Savings (kW)	Annual Fuel Savings (MMBtu)	Annual Energy Cost Savings ($)	Estimated M&L Cost ($)	Estimated Incentive ($)*	Estimated Net M&L Cost ($)	Simple Payback Period (yrs)**	CO_2e Emissions Reduction (lbs)
Lighting Upgrades			**1,675,615**	**106.9**	**-238**	**$162,840**	**$163,369**	**$39,207**	**$124,162**	**0.8**	**1,659,463**
ECM 1	Install LED Fixtures	Yes	1,238,217	81.2	-185	$120,274	$93,570	$24,850	$68,720	0.6	1,225,209
ECM 2	Retrofit Fluorescent Fixtures with LED Lamps and Drivers	Yes	28,075	2.4	-5	$2,720	$2,794	$400	$2,394	0.9	27,654
ECM 3	Retrofit Fixtures with LED Lamps	Yes	409,323	23.2	-48	$39,845	$67,005	$13,957	$53,048	1.3	406,600
Lighting Control Measures			**517,367**	**14.2**	**-37**	**$50,510**	**$98,875**	**$61,460**	**$37,415**	**0.7**	**516,657**
ECM 4	Install Occupancy Sensor Lighting Controls	Yes	33,459	3.5	-7	$3,237	$15,550	$1,730	$13,820	4.3	32,858
ECM 5	Install Daylight Dimming/Photocell Controls	Yes	235,544	1.1	-8	$23,050	$12,450	$2,155	$10,295	0.4	236,233
ECM 6	Install High/Low Lighting Controls	Yes	248,364	9.5	-22	$24,223	$70,875	$57,575	$13,300	0.5	247,566
Motor Upgrades			**5,677**	**2.5**	**0**	**$557**	**$12,243**	**$0**	**$12,243**	**22.0**	**5,716**
ECM 7	Premium Efficiency Motors	No	5,677	2.5	0	$557	$12,243	$0	$12,243	22.0	5,716
Variable Frequency Drive (VFD) Measures			**289,917**	**40.1**	**0**	**$28,435**	**$548,588**	**$45,550**	**$503,038**	**17.7**	**291,944**
ECM 8	Install VFDs on Constant Volume (CV) Fans	Yes	116,996	18.6	0	$11,475	$55,501	$15,450	$40,051	3.5	117,814
ECM 9	Install VFDs on Chilled Water Pumps	No	53,064	13.5	0	$5,204	$148,106	$13,800	$134,306	25.8	53,435
ECM 10	Install VFDs on Heating Water Pumps	No	117,971	7.4	0	$11,571	$341,487	$16,100	$325,387	28.1	118,796
ECM 11	Install Boiler Draft Fan VFDs	No	1,886	0.6	0	$185	$3,493	$200	$3,293	17.8	1,899
Unitary HVAC Measures			**44,942**	**14.1**	**0**	**$4,408**	**$65,090**	**$9,741**	**$55,349**	**12.6**	**45,256**
ECM 12	Install High Efficiency Air Conditioning Units	Yes	22,210	7.1	0	$2,178	$21,886	$4,351	$17,535	8.0	22,365
ECM 13	Install High Efficiency Heat Pumps	Yes	22,732	6.9	0	$2,230	$43,204	$5,390	$37,814	17.0	22,891
Electric Chiller Replacement			**10,547**	**6.0**	**0**	**$1,034**	**$59,084**	**$2,400**	**$56,684**	**54.8**	**10,621**
ECM 14	Install High Efficiency Chillers	No	10,547	6.0	0	$1,034	$59,084	$2,400	$56,684	54.8	10,621
Gas Heating (HVAC/Process) Replacement			**0**	**0.0**	**122**	**$769**	**$34,974**	**$5,877**	**$29,096**	**37.8**	**14,240**
ECM 15	Install High Efficiency Hot Water Boilers	No	0	0.0	122	$769	$34,974	$5,877	$29,096	37.8	14,240
HVAC System Improvements			**3,950**	**0.0**	**0**	**$387**	**$225**	**$156**	**$69**	**0.2**	**3,978**
ECM 16	Install Pipe Insulation	Yes	3,950	0.0	0	$387	$225	$156	$69	0.2	3,978
Domestic Water Heating Upgrade			**1,022**	**0.0**	**0**	**$100**	**$65**	**$52**	**$13**	**0.1**	**1,029**
ECM 17	Install Low-Flow DHW Devices	Yes	1,022	0.0	0	$100	$65	$52	$13	0.1	1,029
Food Service & Refrigeration Measures			**5,449**	**0.6**	**0**	**$534**	**$2,954**	**$300**	**$2,654**	**5.0**	**5,487**
ECM 18	Replace Refrigeration Equipment	No	271	0.0	0	$27	$2,034	$0	$2,034	76.4	273
ECM 19	Vending Machine Control	Yes	5,178	0.6	0	$508	$920	$300	$620	1.2	5,214
Custom Measures			**298,213**	**0.0**	**379**	**$31,647**	**$164,312**	**$0**	**$164,312**	**5.2**	**344,703**
ECM 20	Retro-Commissioning Study	Yes	140,958	0.0	379	$16,223	$65,342	$0	$65,342	4.0	186,348
ECM 21	Install Heat Pump Water Heater	Yes	7,255	0.0	0	$712	$2,070	$0	$2,070	2.9	7,306
ECM 22	Install Motor Controller for Escalators	Yes	150,000	0.0	0	$14,712	$96,900	$0	$96,900	6.6	151,049
TOTALS (COST EFFECTIVE MEASURES)			**2,663,282**	**154.2**	**104**	**$261,875**	**$548,357**	**$126,366**	**$421,991**	**1.6**	**2,694,114**
TOTALS (ALL MEASURES)			**2,852,698**	**184.4**	**226**	**$281,221**	**$1,149,778**	**$164,743**	**$985,035**	**3.5**	**2,899,094**

1173 – SECAUCUS JUNCTION

#	Energy Conservation Measure	Cost Effective?	Annual Electric Savings (kWh)	Peak Demand Savings (kW)	Annual Fuel Savings (MMBtu)	Annual Energy Cost Savings ($)	Estimated M&L Cost ($)	Estimated Incentive ($)*	Estimated Net M&L Cost ($)	Simple Payback Period (yrs)**	CO_2e Emissions Reduction (lbs)
Lighting Upgrades			**1,152,512**	**56.7**	**-86**	**$116,317**	**$187,125**	**$44,789**	**$142,336**	**1.2**	**1,150,449**
ECM 1	Install LED Fixtures	Yes	173,538	7.6	-8	$17,552	$33,147	$6,850	$26,297	1.5	173,819
ECM 2	Retrofit Fluorescent Fixtures with LED Lamps and Drivers	Yes	2,384	0.2	-1	$238	$404	$40	$364	1.5	2,341
ECM 3	Retrofit Fixtures with LED Lamps	Yes	976,590	48.8	-78	$98,527	$153,573	$37,899	$115,674	1.2	974,288
Lighting Control Measures			**329,431**	**8.4**	**-17**	**$33,307**	**$72,569**	**$41,155**	**$31,414**	**0.9**	**329,764**
ECM 4	Install Occupancy Sensor Lighting Controls	Yes	13,561	1.8	-3	$1,355	$9,994	$1,275	$8,719	6.4	13,317
ECM 5	Install Daylight Dimming/Photocell Controls	Yes	231,817	1.0	-2	$23,510	$18,900	$2,290	$16,610	0.7	233,177
ECM 6	Install High/Low Lighting Controls	Yes	84,053	5.6	-12	$8,443	$43,675	$37,590	$6,085	0.7	83,270
Motor Upgrades			**64,290**	**5.7**	**0**	**$6,525**	**$69,680**	**$0**	**$69,680**	**10.7**	**64,739**
ECM 7	Premium Efficiency Motors	Yes	64,290	5.7	0	$6,525	$69,680	$0	$69,680	10.7	64,739
Variable Frequency Drive (VFD) Measures			**293,854**	**74.5**	**0**	**$29,822**	**$115,964**	**$18,400**	**$97,564**	**3.3**	**295,908**
ECM 8	Install VFDs on Constant Volume (CV) Fans	Yes	293,854	74.5	0	$29,822	$115,964	$18,400	$97,564	3.3	295,908
Unitary HVAC Measures			**82,887**	**53.3**	**307**	**$10,708**	**$264,795**	**$21,340**	**$243,455**	**22.7**	**119,362**
ECM 9	Install High Efficiency Air Conditioning Units	No	82,887	53.3	307	$10,708	$264,795	$21,340	$243,455	22.7	119,362
HVAC System Improvements			**1,061**	**0.0**	**0**	**$108**	**$58**	**$20**	**$38**	**0.4**	**1,068**
ECM 10	Install Pipe Insulation	Yes	1,061	0.0	0	$108	$58	$20	$38	0.4	1,068
Domestic Water Heating Upgrade			**8,341**	**0.0**	**0**	**$847**	**$258**	**$144**	**$114**	**0.1**	**8,399**
ECM 11	Install Low-Flow DHW Devices	Yes	8,341	0.0	0	$847	$258	$144	$114	0.1	8,399
Food Service & Refrigeration Measures			**3,675**	**0.4**	**0**	**$373**	**$2,995**	**$100**	**$2,895**	**7.8**	**3,701**
ECM 12	Replace Refrigeration Equipment	No	512	0.1	0	$52	$2,305	$0	$2,305	44.4	515
ECM 13	Vending Machine Control	Yes	3,163	0.4	0	$321	$690	$100	$590	1.8	3,185
Custom Measures			**690,600**	**0.0**	**0**	**$70,087**	**$237,150**	**$0**	**$237,150**	**3.4**	**695,429**
ECM 14	Install Motor Controller for Escalators	Yes	690,600	0.0	0	$70,087	$237,150	$0	$237,150	3.4	695,429
TOTALS (COST EFFECTIVE MEASURES)			**2,543,251**	**145.6**	**-103**	**$257,333**	**$683,493**	**$104,608**	**$578,885**	**2.2**	**2,548,942**
TOTALS (ALL MEASURES)			**2,626,650**	**198.9**	**203**	**$268,092**	**$950,593**	**$125,948**	**$824,645**	**3.1**	**2,668,819**

9102 – HEADQUARTERS BLDG

#	Energy Conservation Measure	Cost Effective?	Annual Electric Savings (kWh)	Peak Demand Savings (kW)	Annual Fuel Savings (MMBtu)	Annual Energy Cost Savings ($)	Estimated M&L Cost ($)	Estimated Incentive ($)*	Estimated Net M&L Cost ($)	Simple Payback Period (yrs)**	CO_2e Emissions Reduction (lbs)
Lighting Upgrades			**1,093,267**	**165.1**	**-229**	**$118,945**	**$192,344**	**$45,048**	**$147,296**	**1.2**	**1,074,146**
ECM 1	Retrofit Fluorescent Fixtures with LED Lamps and Drivers	Yes	146,596	22.5	-31	$15,949	$28,015	$4,125	$23,890	1.5	144,032
ECM 2	Retrofit Fixtures with LED Lamps	Yes	946,671	142.6	-198	$102,996	$164,329	$40,923	$123,406	1.2	930,114
Lighting Control Measures			**237,775**	**37.6**	**-50**	**$25,869**	**$204,448**	**$57,210**	**$147,238**	**5.7**	**233,616**
ECM 3	Install Occupancy Sensor Lighting Controls	Yes	83,414	14.6	-17	$9,075	$51,798	$6,650	$45,148	5.0	81,955
ECM 4	Install Daylight Dimming Controls	Yes	65,394	12.0	-14	$7,115	$100,000	$9,410	$90,590	12.7	64,250
ECM 5	Install High/Low Lighting Controls	Yes	88,967	11.0	-19	$9,679	$52,650	$41,150	$11,500	1.2	87,411
Variable Frequency Drive (VFD) Measures			**14,384**	**1.6**	**0**	**$1,587**	**$16,159**	**$1,000**	**$15,159**	**9.6**	**14,484**
ECM 6	Install VFDs on Chilled Water Pumps	Yes	14,384	1.6	0	$1,587	$16,159	$1,000	$15,159	9.6	14,484
Unitary HVAC Measures			**522,457**	**171.4**	**0**	**$57,657**	**$1,403,852**	**$76,377**	**$1,327,475**	**23.0**	**526,110**
ECM 7	Install High Efficiency Air Conditioning Units	No	369,434	135.6	0	$40,770	$1,354,124	$72,390	$1,281,734	31.4	372,017
ECM 8	Install High Efficiency Heat Pumps	Yes	153,023	35.8	0	$16,887	$49,728	$3,987	$45,741	2.7	154,093
Gas Heating (HVAC/Process) Replacement			**0**	**0.0**	**1,128**	**$8,409**	**$224,617**	**$0**	**$224,617**	**26.7**	**132,077**
ECM 9	Install High Efficiency Hot Water Boilers	No	0	0.0	1,128	$8,409	$224,617	$0	$224,617	26.7	132,077
HVAC System Improvements			**3,973**	**0.0**	**0**	**$438**	**$277**	**$96**	**$181**	**0.4**	**4,001**
ECM 10	Install Pipe Insulation	Yes	3,973	0.0	0	$438	$277	$96	$181	0.4	4,001
Food Service & Refrigeration Measures			**22,530**	**2.6**	**0**	**$2,486**	**$8,179**	**$650**	**$7,529**	**3.0**	**22,687**
ECM 11	Replace Refrigeration Equipment	No	568	0.1	0	$63	$3,119	$50	$3,069	48.9	572
ECM 12	Vending Machine Control	Yes	21,961	2.5	0	$2,424	$5,060	$600	$4,460	1.8	22,115
Custom Measures			**158,676**	**0.0**	**264**	**$19,481**	**$75,375**	**$0**	**$75,375**	**3.9**	**190,722**
ECM 13	Retro-Commissioning Study	Yes	158,676	0.0	264	$19,481	$75,375	$0	$75,375	3.9	190,722
TOTALS (COST EFFECTIVE MEASURES)			**1,683,058**	**242.5**	**-14**	**$185,632**	**$543,391**	**$107,941**	**$435,451**	**2.3**	**1,693,177**
TOTALS (ALL MEASURES)			**2,053,061**	**378.2**	**1,114**	**$234,874**	**$2,125,251**	**$180,381**	**$1,944,870**	**8.3**	**2,197,843**

MEADOWLANDS MAINTENANCE COMPLEX (MMC)

#	Energy Conservation Measure	Cost Effective?	Annual Electric Savings (kWh)	Peak Demand Savings (kW)	Annual Fuel Savings (MMBtu)	Annual Energy Cost Savings ($)	Estimated M&L Cost ($)	Estimated Incentive ($)*	Estimated Net M&L Cost ($)	Simple Payback Period (yrs)**	CO_2e Emissions Reduction (lbs)
Lighting Upgrades			**1,877,056**	**145.6**	**-297**	**$185,681**	**$265,280**	**$50,164**	**$215,116**	**1.2**	**1,855,427**
ECM 1	Install LED Fixtures	Yes	382,637	0.0	0	$38,264	$84,000	$0	$84,000	2.2	385,312
ECM 2	Retrofit Fluorescent Fixtures with LED Lamps and Drivers	Yes	5,427	1.0	-1	$535	$1,702	$190	$1,512	2.8	5,330
ECM 3	Retrofit Fixtures with LED Lamps	Yes	1,488,992	144.7	-296	$146,882	$179,578	$49,974	$129,604	0.9	1,464,785
Lighting Control Measures			**302,292**	**28.7**	**-61**	**$29,817**	**$122,343**	**$57,870**	**$64,473**	**2.2**	**297,322**
ECM 4	Install Occupancy Sensor Lighting Controls	Yes	86,649	10.8	-18	$8,539	$44,123	$5,590	$38,533	4.5	85,095
ECM 5	Install Daylight Dimming/Photocell Controls	Yes	108,439	8.2	-20	$10,706	$28,450	$9,760	$18,690	1.7	106,838
ECM 6	Install High/Low Lighting Controls	Yes	107,204	9.6	-22	$10,571	$49,770	$42,520	$7,250	0.7	105,389
Motor Upgrades			**123,974**	**13.1**	**0**	**$12,397**	**$106,763**	**$0**	**$106,763**	**8.6**	**124,840**
ECM 7	Premium Efficiency Motors	Yes	123,974	13.1	0	$12,397	$106,763	$0	$106,763	8.6	124,840
Variable Frequency Drive (VFD) Measures			**1,475,055**	**219.5**	**4**	**$147,536**	**$632,832**	**$68,150**	**$564,682**	**3.8**	**1,485,892**
ECM 8	Install VFD on Variable Air Volume (VAV) Fans	Yes	301,279	42.9	0	$30,128	$65,877	$10,100	$55,777	1.9	303,385
ECM 9	Install VFDs on Constant Volume (CV) Fans	Yes	1,116,666	169.9	0	$111,667	$470,824	$55,100	$415,724	3.7	1,124,474
ECM 10	Install VFDs on Chilled Water Pumps	Yes	41,958	5.8	0	$4,196	$59,082	$2,400	$56,682	13.5	42,252
ECM 11	Install VFDs on Heating Water Pumps	No	10,314	0.7	0	$1,031	$30,268	$400	$29,868	29.0	10,386
ECM 12	Install VFDs on Kitchen Hood Fan Motors	Yes	4,838	0.2	4	$514	$6,781	$150	$6,631	12.9	5,395
Unitary HVAC Measures			**36,512**	**11.5**	**5**	**$3,686**	**$87,515**	**$3,302**	**$84,213**	**22.8**	**37,370**
ECM 13	Install High Efficiency Air Conditioning Units	No	36,512	11.5	5	$3,686	$87,515	$3,302	$84,213	22.8	37,370
Gas Heating (HVAC/Process) Replacement			**0**	**0.0**	**4,485**	**$30,592**	**$974,039**	**$38,254**	**$935,785**	**30.6**	**525,110**
ECM 14	Install High Efficiency Hot Water Boilers	No	0	0.0	227	$1,548	$82,760	$6,954	$75,806	49.0	26,566
ECM 15	Install High Efficiency Unit Heaters	No	0	0.0	1,855	$12,651	$511,118	$0	$511,118	40.4	217,146
ECM 16	Install Infrared Heaters	No	0	0.0	2,403	$16,394	$380,161	$31,300	$348,861	21.3	281,398
HVAC System Improvements			**4,967**	**0.0**	**5**	**$532**	**$433**	**$150**	**$283**	**0.5**	**5,603**
ECM 17	Install Pipe Insulation	Yes	4,967	0.0	5	$532	$433	$150	$283	0.5	5,603
Domestic Water Heating Upgrade			**761**	**0.0**	**15**	**$178**	**$265**	**$144**	**$121**	**0.7**	**2,517**
ECM 18	Install Low-Flow DHW Devices	Yes	761	0.0	15	$178	$265	$144	$121	0.7	2,517
Food Service & Refrigeration Measures			**11,380**	**1.3**	**0**	**$1,138**	**$19,262**	**$625**	**$18,637**	**16.4**	**11,459**
ECM 19	Replace Refrigeration Equipment	No	4,368	0.5	0	$437	$17,422	$425	$16,997	38.9	4,399
ECM 20	Vending Machine Control	Yes	7,012	0.8	0	$701	$1,840	$200	$1,640	2.3	7,061
Custom Measures			**51,253**	**0.0**	**0**	**$5,126**	**$30,670**	**$0**	**$30,670**	**6.0**	**51,611**
ECM 21	Install Heat Pump Water Heater	Yes	8,166	0.0	0	$817	$2,070	$0	$2,070	2.5	8,223
ECM 22	High Frequency Battery Chargers	Yes	43,087	0.0	0	$4,309	$28,600	$0	$28,600	6.6	43,388
TOTALS (COST EFFECTIVE MEASURES)			**3,832,055**	**407.0**	**-333**	**$380,936**	**$1,130,157**	**$176,278**	**$953,880**	**2.5**	**3,819,888**
TOTALS (ALL MEASURES)			**3,883,249**	**419.7**	**4,157**	**$416,683**	**$2,239,402**	**$218,659**	**$2,020,743**	**4.8**	**4,397,153**

Energy Efficient Best Practices

- Reduce Air Leakage
- Close Doors and Windows
- Develop a Lighting Maintenance Schedule
- Ensure Lighting Controls Are Operating Properly
- Use Fans to Reduce Cooling Load
- Use Window Treatments/Coverings
- Clean and/or Replace HVAC filters
- Check and Seal Duct Leakage
- Perform Proper Boiler Maintenance
- Perform Proper Water Heater Maintenance
- Plug Load Controls
- Water Conservation

See individual reports for specific EE practices by building

Measures for Future Consideration

- Building Envelope Improvements
- Thermostat Control for Electric Baseboard Heating
- Electric Sub Metering
- Eliminate Oversized Domestic Hot Water Heating Systems
- Disaggregate Boiler System
- Upgrade to a Heat Pump System
- Implement Data Center Energy Efficiency Measures
- Insulating Pipes above Drop Ceiling

Solar Energy Generation Potential

	MMC	Newark Penn	Secaucus	HQ
Potential:	**HIGH**	**HIGH**	**HIGH**	**HIGH**
System Potential: (kW)	1,160	625	820	161
Electric Generation: (kWh per year)	1,381,990	744,606	976,924	191,811
Displaced Cost: (per year)	$138,200	$73,030	$99,140	$21,170

Transition Incentive (TI) Program:

https://www.njcleanenergy.com/renewable-energy/programs/transition-incentive-program

Community Solar Energy Pilot Program:

http://www.NJCleanEnergy.com/CommunitySolar

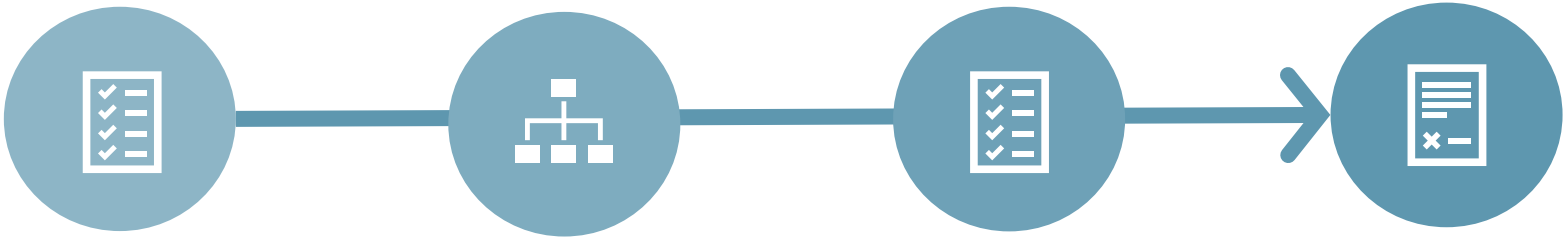
BPU | New Jersey's cleanenergy program™

FINANCING MECHANISM: ESIP

ENERGY SAVINGS IMPROVEMENT PROGRAM (ESIP)

- Provides alternative financing for energy savings projects at public institutions
- Administered directly by the NJBPU
- Project is paid for with the value of its own energy savings
- 15 or 20-year repayment term
- NJCEP incentives/rebates are layered within an ESIP
- No upfront capital expenses
- Doesn't require voter approval

FINANCING MECHANISM: ESIP



Initial Energy Audit

Includes LGEA

Select Path

ESCO (requires RFP)
Hybrid
DIY

Investment Grade Energy Audit

Prioritize ECM's to determine project

Energy Savings Plan Developed & Approved

Plan includes use of incentive programs

Energy Savings Improvement Program (ESIP)

FOR MORE INFORMATION

Michelle Rossi

ESIP Coordinator

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COMMERCIAL & INDUSTRIAL PROGRAMS

https://www.njcleanenergy.com/transition

	EXISTING BUILDINGS		NEW CONSTRUCTION	DISTRIBUTED ENERGY RESOURCES
	MEASUREMENT & AUDITS	RETROFITS		
LOCAL GOVERNMENT CUSTOMERS	FREE Energy Audits	Prescriptive & Custom Rebates Direct Install Engineered Solutions **And more from your local utility!**	Prescriptive & Custom Rebates for New Construction and Gut Rehabs	Combined Heat & Power and Fuel Cell Installation Incentives Microgrid Development Battery Storage Muni EV Fleets
COMMERCIAL & INSTITUTIONAL CUSTOMERS				
LARGE ENERGY CUSTOMERS		Incentives up to $4 million for eligible projects	Pay for Performance incentives for buildings over 50,000 sq. ft.	

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Key:

Programs run by NJCEP

Programs run by investor-owned utility companies

Large Energy Users

NJCleanEnergy.com/LEUP

What is LEUP: The Large Energy Users Program (LEUP) encourages large C&I utility customers to self-invest in energy efficiency and combined heat & power projects and fuel cells.

Qualifications:

- Applicants qualify into the program as an entity (not specific buildings)
- Applicants contribute at least $200,000 in NJCEP funds within the prior fiscal year.
- For applicants who have not used LEUP in the prior fiscal year, and additional years' worth of energy can be utilized to increase their overall incentive cap.

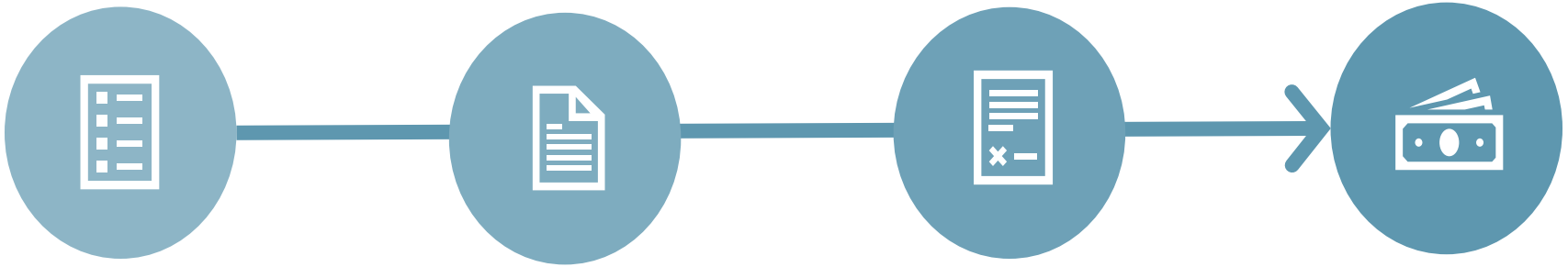
Incentive Cap: Maximum incentive* is:

- $4 million
- 75% of total project
- 90% of NJCEP contribution
- Annual energy saving cap ($0.33/kWh and $3.75/Therm)

*Maximum incentive is whichever is less

Large Energy Users

NJCleanEnergy.com/LEUP



Program Enrollment

Submission and Approval of Application

Submission of DEEP

Reservation of Incentives (optional)

Submission of FEEP

Commitment of Incentives

Confirmation of Installation

Incentives Paid

Customers may submit up to <u>three</u> Draft Energy Efficiency Plans (DEEPs) or Final Energy Efficiency Plans (FEEPs) within the fiscal year enrolled

For More Information

NJ Clean Energy Program

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QUESTIONS