

New Jersey's Clean Energy Program

<u>LGEA Exit Meeting for</u>: *Morris Hills Regional District*

Aimee Lalonde, TRC

April 9, 2018

Agenda



- Introductions
- Overview of LGEA process
- Energy use & existing conditions
- Review of Energy Conservation Measures (ECMs) identified
- Questions or concerns regarding the draft audit report
- Overview of NJCEP equipment incentives
- Next steps for Morris Hills Regional District

Introductions

Morris Hills Regional District

- Business Administrator:
- Supervisor of Buildings & Grounds:
- Assistant to Supervisor of Buildings & Grounds
- District Engineer LJM Engineering Group:
- District Architect FKA Architects:

NJ Clean Energy Program Team

- Auditor:
- Outreach Manager:
- Manager, NJCEP:
- ESIP Coordinator:

Joann Gilman Auricchio Steven Ternosky Robert O'Boyle Greg Cheney Michael Bieri

Aimee Lalonde Jim Friedl Scott Hunter Mike Thulen



Process to Draft Report



- Application submitted to NJCEP
- Site Visit Performed
- Utility Analysis
- Baseline Conditions
- Analysis
- Recommendations
- Report



Morris Hills High School

Overview of Systems, Baseline & Existing Conditions:

- Building Envelope
- Lighting System
- HVAC and Mechanical Systems
- Domestic Water Heating System
- Energy Management System
- Food Service and Refrigeration Equipment

Utility Consumption:

- Electric Consumption and Costs
 - PV System Generation
- Natural Gas Consumption and Costs
- Fuel Oil Consumption and Costs



Morris Hills High School



Figure 3 – Potential Post-Implementation Costs (Total Project Measures with a 10.1 year payback)



Figure 2 – Potential Post-Implementation Costs (High Priority Measures with an 8.8 year payback)





Morris Hills High School

Energy Conservation Measure	Recommend?	Annual Electric Savings (kWh)	Peak Demand Savings (kW)	Annual Fuel Savings (MMBtu)	Annual Energy Cost Savings (\$)	Estimated Install Cost (\$)	Estimated Incentive (\$)*	Estimated Net Cost (\$)	Simple Payback Period (yrs)**	CO ₂ e Emissions Reduction (Ibs)
Lighting Upgrades		431,803	110.6	0.0	\$51,192.08	\$513,476.74	\$49,580.00	\$463,896.74	9.1	434,822
ECM 1 Install LED Fixtures	Yes	132,699	23.1	0.0	\$15,732.04	\$363,720.34	\$30,245.00	\$333,475.34	21.2	133,627
ECM 2 Retrofit Fluorescent Fixtures with LED Lamps and Drivers	Yes	3,943	1.3	0.0	\$467.44	\$6,576.33	\$170.00	\$6,406.33	13.7	3,970
ECM 3 Retrofit Fixtures with LED Lamps	Yes	294,566	86.2	0.0	\$34,921.98	\$142,749.85	\$19,165.00	\$123,584.85	3.5	296,625
ECM 4 Install LED Exit Signs	Yes	596	0.0	0.0	\$70.62	\$430.22	\$0.00	\$430.22	6.1	600
Lighting Control Measures		89,807	19.3	0.0	\$10,646.96	\$55,654.00	\$7,340.00	\$48,314.00	4.5	90,435
ECM 5 Install Occupancy Sensor Lighting Controls	Yes	83,004	18.5	0.0	\$9,840.44	\$52,054.00	\$7,340.00	\$44,714.00	4.5	83,584
ECM 6 Install High/Low Lighting Controls	Yes	6,803	0.8	0.0	\$806.52	\$3,600.00	\$0.00	\$3,600.00	4.5	6,851
Variable Frequency Drive (VFD) Measures		20,062	2.7	0.0	\$2,378.38	\$17,602.50	\$0.00	\$17,602.50	7.4	20,202
ECM 7 Install VFDs on Chilled Water Pumps	Yes	13,311	1.8	0.0	\$1,578.13	\$10,388.90	\$0.00	\$10,388.90	6.6	13,405
ECM 8 Install VFDs on Hot Water Pumps	Yes	6,750	0.9	0.0	\$800.25	\$7,213.60	\$0.00	\$7,213.60	9.0	6,797
Electric Unitary HVAC Measures		14,940	14.5	0.0	\$1,771.17	\$52,400.04	\$3,956.00	\$48,444.04	27.4	15,044
Install High Efficiency Electric AC	No	14,940	14.5	0.0	\$1,771.17	\$52,400.04	\$3,956.00	\$48,444.04	27.4	15,044
Gas Heating (HVAC/Process) Replacement		0	0.0	148.7	\$1,334.97	\$24,469.92	\$3,600.00	\$20,869.92	15.6	24,322
Install High Efficiency Furnaces	No	0	0.0	148.7	\$1,334.97	\$24,469.92	\$3,600.00	\$20,869.92	15.6	24,322
Domestic Water Heating Upgrade		0	0.0	7.7	\$86.20	\$258.12	\$0.00	\$258.12	3.0	900
ECM 9 Install Low-Flow Domestic Hot Water Devices	Yes	0	0.0	7.7	\$86.20	\$258.12	\$0.00	\$258.12	3.0	900
Food Service Equipment & Refrigeration Measures		2,009	0.2	0.0	\$238.18	\$4,136.60	\$80.00	\$4,056.60	17.0	2,023
ECM 10 Refrigerator/Freezer Case Electrically Commutated Motors	Yes	391	0.0	0.0	\$46.40	\$606.60	\$80.00	\$526.60	11.3	394
Replace Refrigeration Equipment	No	1,618	0.2	0.0	\$191.78	\$3,530.00	\$0.00	\$3,530.00	18.4	1,629
Plug Load Equipment Control - Vending Machine		8,059	0.0	0.0	\$955.45	\$1,150.00	\$0.00	\$1,150.00	1.2	8,116
ECM 11 Vending Machine Control	Yes	8,059	0.0	0.0	\$955.45	\$1,150.00	\$0.00	\$1,150.00	1.2	8,116
Custom Measures		54,402	0.0	954.1	\$14,071.94	\$227,932.12	\$0.00	\$227,932.12	16.2	202,170
ECM 12 Computer Power Management Software	Yes	12,588	0.0	0.0	\$1,492.33	\$7,825.00	\$0.00	\$7,825.00	5.2	12,676
ECM 13 Retro-Commissioning Study & HVAC Improvements	Yes	7,990	0.0	342.5	\$4,278.44	\$68,928.00	\$0.00	\$68,928.00	16.1	58,844
ECM 14 Building Envelope Weatherization	Yes	63	0.0	228.3	\$2,228.22	\$36,414.00	\$0.00	\$36,414.00	16.3	33,929
Expand Energy Management System	No	33,761	0.0	383.4	\$6,072.94	\$114,765.12	\$0.00	\$114,765.12	18.9	96,722
TOTALS		621,081	147.3	1,110.5	\$82,675.33	\$897,080.04	\$64,556.00	\$832,524.04	10.1	798,034
TOTALS (High Priority)		570,763	132.6	578.4	\$73,304.47	\$701,914.96	\$57,000.00	\$644,914.96	8.8	660,317

* - 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).

Main Concerns for Morris Hills High School



- Fuel Oil to Natural Gas Conversion
 - Cost of Fuel Oil is about \$9/MMBtu vs. Cost of Natural Gas at about \$11.21/MMBtu
- Steam to Hot Water Heating System Conversation
 - Not Recommended based on our Protocol
 - Cannot be justified solely on energy savings
 - Does not meet our threshold based on payback alone
 - We don't account for O&M savings
- Heating System Design Phase Considerations and Suggestions
 - Install multiple smaller capacity modular boilers to:
 - Increase part load efficiency
 - Increase redundancy/reliability
 - Save on mechanical room space
 - Install condensing boilers as long as they may be configured to operate with return water temperatures lower than 130 F
 - Well maintained boilers (< 300MBH) will typically last more than 25 years

Morris Hills High School Continued



- Could be included within a comprehensive energy project under the ESIP
- High Priority ECMs +Adjusted Baseline Heating System Upgrade Results:
 - \$1,830,000 Total Project Cost
 - \$203,000 Annual Estimated Cost Savings
 - 9 year Simple Payback Period
- High Level Evaluation with Adjusted Baseline
 - Steam to Hot Water Heating System Conversation
 - Existing Energy Use 7,650 MMBtu of Fuel Oil for Large Steam Boilers
 - Existing Actual Energy Costs \$68,800 of Fuel Oil for Large Steam Boilers
 - Assuming Existing Energy Costs were \$85,800 (As if already gas)
 - Proposed Energy Use 6,580 MMBtu of Natural Gas for Condensing Hot Water Boilers
 - Proposed Estimated Energy Costs \$73,800 of Gas for Condensing Hot Water Boilers
 - Estimated Installation Costs \$840,000 with \$48,000 potential incentive
 - Estimated Cost Savings with Adjusted Baseline \$12,000
 - 60+ year Simple Payback Period
 - High Level Evaluation with Adjusted Baseline



Morris Knolls High School

Overview of Systems, Baseline & Existing Conditions:

- Building Envelope
- Lighting System
- HVAC and Mechanical Systems
- Domestic Water Heating System
- Energy Management System
- Food Service and Refrigeration Equipment

Utility Consumption:

- Electric Consumption and Costs
 - PV System Generation
- Natural Gas Consumption and Costs
- Fuel Oil Consumption and Costs



Morris Knolls High School



Figure 2 – Potential Post-Implementation Costs (High Priority Measures with an 11.3 year payback)



Figure 3 – Potential Post-Implementation Costs (Total Project Measures with an 11.4 year payback)





Morris Knolls High School

	Energy Conservation Measure	Recommend?	Annual Electric Savings (kWh)	Peak Demand Savings (kW)	Annual Fuel Savings (MMBtu)	Annual Energy Cost Savings (\$)	Estimated Install Cost (\$)	Estimated Incentive (\$)*	Estimated Net Cost (\$)	Simple Payback Period (yrs)**	CO ₂ e Emissions Reduction (lbs)
	Lighting Upgrades		443,592	96.2	0.0	\$50,741	\$811,798	\$97,125	\$714,673	14.1	446,693
ECM 1	Install LED Fixtures	Yes	137,326	31.5	0.0	\$15,708	\$626,400	\$68,415	\$557,985	35.5	138,286
ECM 2	Retrofit Fixtures with LED Lamps	Yes	305,880	64.7	0.0	\$34,988	\$184,968	\$28,710	\$156,258	4.5	308,019
ECM 3	Install LED Exit Signs	Yes	385	0.0	0.0	\$44	\$430	\$0	\$430	9.8	388
	Lighting Control Measures		74,565	15.7	0.0	\$8,529	\$107,404	\$13,185	\$94,219	11.0	75,086
ECM 4	Install Occupancy Sensor Lighting Controls	Yes	74,365	15.7	0.0	\$8,506	\$107,134	\$13,050	\$94,084	11.1	74,885
ECM 5	Install Photocell Controls	Yes	200	0.0	0.0	\$23	\$270	\$135	\$135	5.9	201
	Electric Unitary HVAC Measures		6,670	2.2	0.0	\$763	\$10,474	\$644	\$9,830	12.9	6,716
	Install High Efficiency Electric AC	No	6,670	2.2	0.0	\$763	\$10,474	\$644	\$9,830	12.9	6,716
	Domestic Water Heating Upgrade		0	0.0	97.2	\$1,090	\$409	\$0	\$409	0.4	11,383
ECM 6	Install Low-Flow Domestic Hot Water Devices	Yes	0	0.0	97.2	\$1,090	\$409	\$0	\$409	0.4	11,383
	Food Service Equipment & Refrigeration Measures		3,421	0.4	0.0	\$391	\$6 ,035	\$230	\$5,805	14.8	3,445
ECM 7	Refrigerator/Freezer Case Electrically Commutated Motors	Yes	524	0.1	0.0	\$60	\$607	\$80	\$527	8.8	528
	Replace Refrigeration Equipment	No	2,897	0.3	0.0	\$331	\$5,428	\$150	\$5,278	15.9	2,917
	Plug Load Equipment Control - Vending Machine		11,283	0.0	0.0	\$1,291	\$1,610	\$0	\$1,610	1.2	11,362
ECM 8	Vending Machine Control	Yes	11,283	0.0	0.0	\$1,291	\$1,610	\$0	\$1,610	1.2	11,362
	Custom Measures		78,768	0.0	1,198.7	\$19,984	\$113,125	\$0	\$113,125	5.7	271,478
ECM 9	Computer Power Management Software	Yes	13,403	0.0	0.0	\$1,533	\$8,170	\$0	\$8,170	5.3	13,497
ECM 10	Retro-Commissioning Study & HVAC Improvements	Yes	63,643	0.0	666.0	\$13,377	\$78,920	\$0	\$78,920	5.9	170,844
ECM 11	Building Envelope Weatherization	Yes	1,721	0.0	532.8	\$5,074	\$26,035	\$0	\$26,035	5.1	87,137
	TOTALS		618,297	114.5	1,295.9	\$82,789	\$1,050,853	\$111,184	\$939,669	11.4	826,163
	TOTALS (High Priority)		608,731	112.0	1,295.9	\$81,694.25	\$1,034,951.60	\$110,390.00	\$924,561.60	11.3	816,530

* - 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).

Some Energy Efficient Best Practices



- Close Doors and Windows
- Use Window Treatments/Coverings
- Perform Proper Lighting Maintenance
- Develop a Lighting Maintenance Schedule
- Ensure Lighting Controls Are Operating Properly
- Reduce Motor Short Cycling
- Install Destratification Fans
- Assess Chillers & Request Tune-Ups
- Clean Evaporator/Condenser Coils on AC Systems
- Clean and/or Replace HVAC Filters
- Repair/Replace Steam Traps
- Perform Proper Boiler Maintenance
- Perform Proper Water Heater Maintenance
- Water Conservation

See Section 5 of the building reports for complete lists of best practices

PROGRAM PORTFOLIO





PROGRAMS

Commercial, Industrial, Government, Non-Profit, Institutional and Multifamily

Equipment Rebates:

- Retrofit Existing Buildings
- New Construction
- Direct Install Small Business
- Large Energy Users

Whole Buildings:

- Pay for Performance Existing Buildings
- Pay for Performance New Construction

Energy Generation:

• Combined Heat and Power (CHP) and Fuel Cells



Recommended NJCEP Incentives

Pay for Performance (P4P)

SmartStart Buildings (i.e. Retrofit – Existing Buildings)

SmartStart Prescriptive: Overview



- Two types of incentives for high efficiency equipment installation: Prescriptive and Custom
- Includes New Construction, Rehab and Retrofit projects
- Project pre-approval required for certain equipment
- Incentives up to \$500,000 per electric account & \$500,000 per natural gas account
- Project Categories:
 - New Construction
 - Renovation
 - Remodeling
 - Equipment Replacement
- Specific incentives and individual applications for Lighting, HVAC, VFDs, Refrigeration, Controls and more!

NJNG Financing Option



- Eligible NJNG customers can finance through the "SAVEGREEN Project[®] On-Bill Repayment Program" (OBRP).
- NJNG offers financing options for SmartStart projects that will cover up to \$130,000 per year.



NJNG – Financing Option



• <u>Questions? Contact Jerry at the following:</u>

Jerry Ryan

Energy Efficiency Operations Manager New Jersey Natural Gas 732-433-4362 (cell) 732 378 4920 (office) jryan@njng.com



P4P EB: Process







P4P EB: Incentives

	Incentive #1: Energ	y Reduction	n Plan
	Incentive Amount:	\$0.15	per sq ft
	Minimum Incentive:	\$7,500	
	Maximum Incentive:	\$50,000	or 50% of facility annual energy cost
	Incentive #2: Installation of	Recommen	nded Measures
	Minimum Performance Target:	15%	
Electric	Base Incentive based on 15% savings:	\$0.09	
	For each % over 15% add:	\$0.005	per projected kWh saved
incentives	Maximum Incentive:	\$0.11	
Gas Incentives	Base Incentive based on 15 % savings:	\$0.90	
	For each % over 15% add:	\$0.05	per projected Therm saved
	Maximum Incentive:	\$1.25	
	Incentive Cap:	25%	of total project cost
	Incentive #3: Post-Construct	tion Benchr	narking Report
	Minimum Performance Target:	15%	
Electric Incentives	Base Incentive based on 15% savings:	\$0.09	
	For each % over 15% add:	\$0.005	per projected kWh saved
	Maximum Incentive:	\$0.11	
Gas Incentives	Base Incentive based on 15% savings:	\$0.90	
	For each % over 15% add:	\$0.05	per projected Therm saved
	Maximum Incentive:	\$1.25	
	Incentive Cap:	25%	of total project cost



Energy Savings Improvement Program (ESIP)

- Program administered directly by BPU
- Provides alternative financing for energy savings projects at public institutions.
- Value of energy savings leveraged to pay for cost of EE projects over a 15 year contract.
- Does <u>not</u> count as debt or require voter approval.
- Requires an audit as 1st step (LGEA satisfied this requirement)





NJCleanEnergy.com



FOR MORE INFORMATION

ESIP

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Questions

?



NJCleanEnergy.com



FOR MORE INFORMATION

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