2020-2021

LBPS GREEN TEAM

Annual Report

OFFICE OF THE SUPERINTENDENT
LONG BRANCH PUBLIC SCHOOLS
540 Broadway, Long Branch, New Jersey 07740

"Together We Can, Juntos Nós Podemos, Juntos Podemos"

FRANCISCO E. RODRIGUEZ
Superintendent of Schools
732-571-2868 x 40010
Fax: 732-229-0797

March 25, 2021

This letter confirms that our 2020-2021 Sustainable & Digital Schools Committee members were approved by the Long Branch Board of Education on March 17, 2021. Each member brings with them an area of expertise and/or passion that will serve to fulfill the chosen actions as they work with the school, district, and city.

The team has my full support as they seek to advance our students' and community's knowledge and understanding of living and acting for a sustainable future through efforts as outlined to achieve certification in your program.

Sincerely,

Francisco E. Rodriguez
Superintendent of Schools

2020-2021 Long Branch Public Schools Sustainable & Digital Schools Committees List

Francisco Rodriguez, Superintendent of Schools
JanetLynn Dudick. Ph.D., Assistant Superintendent for Pupil Personnel Services
Frank Riley, Assistant Superintendent Office of Leadership & Innovation
Alisa Aquino, District Director of Personnel
Bridgette Burtt, Coordinator of Grants & Innovative Programs
Ann Degnan, Assistant Business Administrator for Facilities
Gary Vecchione, Assistant Facilities Manager
Diego DeAssis, Social & Environmental Sustainability Officer
Neil Mastroianni, Education Technology Specialist
Lois Alston, Education Technology Specialist
Markus Rodriguez, Director of Diversity, Equity and Inclusion
Joanne Montanti, Teacher, Middle School/NJEA Union President
Jena Valdiviezo, Supervisor of Science 6-12 District
Karissa Disney, Supervisor of Bilingual Education
Jennifer Steffich, Supervisor of Special Education

Long Branch High School
James Brown, Angela Torres, Erin Lamberson, Tammy Glanzberg, Vanessa Giammanco, Jenna Anderson, Jenna Camacho, Raul Rivera, Roy Palijaro, Vito Terranova, Amanda Roa, Alexander Smiga, Don Clark, Melissa Cooper, Alessandra Farruggio, Marc Hyndsman, Graham Huggins-Filozof

Historic High School/School of Social Justice
Vincent Muscillo, Vito Terranova, Sydney Lasquinha, Amanda Terry, Kristen Clarke

Long Branch Middle School
Christopher Volpe, Kim Hyde, Nicole Esposito, Jessica Dougherty, Dorothy Williams-Reed, Joseph Maratta, Timothy Smith, Meredith Riddle, Vade Hanlon, John O'Shea, Megan Renzo, Delanyard Robinson, II, Christina Bronowich

George L. Catrambone School
Jessica Alonzo, Nikolas Greenwood, Kelly Stone, Michele Morey, Katie Marx, Sarah Kaplan, Kelly Vargas, Maria Manzo, Betsy Kaeli, Kelli Shaughnessy, Nicola Merlucci, Martha Prieto, Amanda Castano, Elizabeth Gannon, Kristin Ciccone, Christine Zergebel, Robert Luehman, Darlene Santos, Katie Wachter

Gregory School
Beth McCarthy, Laura Widdis, Meredith Rindner, Stacy Simms, John O'Neill, Holly Terracciano, Erica Krumich, Angela Robinson, Christina Marra, Brian Roberts, Stephanie Dixon, Jonathan Trzeszkowski, Greg Penta, Jolie Dynak, Chad King, Ebone Lawrence-Smith, Twana Richardson, Amanda MacDonald, Beth Applegate

Amerigo A. Anastasia School
Michelle Merckx, Aisha Wickes, Marina Basile, Denise Woolley, Lee Carey, Melissa Christopher, Lisa Pangborn, Erin Hennelly, Erin Barrett

Morris Avenue School
Matthew Johnson, Kerin Halper, Cathy Svenda, Nicole Trainor, Ed.D, Tracey Cistaro, Kelly McOmber, Elizabeth Lundberg, Kimberly Douglas, Anthony Migliaccio

Lenna W. Conrow School
Bonita Potter-Brown, Jen Gervase, Siobhan Curry, Jennifer Long, Felicia Clark, Dawn O'Grady, Leah Opitto, Tracy McMahon, Anthony DeSantis, Molly Guzman

Joseph M. Ferraina Early Childhood Learning Center
Linda Alston-Morgan, Kim Walker, Ana Rugo, Betsy Callaghan, Leah Roberts, Marianne Carr, Janise Stout, Meg Chavez, Dina Cocuzza, Michelle Widdis, Ryan Munson

Audrey W. Clark School
Kristine Villano, Sarah Hansen, Maureen Hague, Kirsty Corcoran, Victoria Leotsakas, Tracy Miller, Michelle Gargiulo, Caitlyn Walling, Emily Bryk (Beaver), Will Potter

DISTRICT GREEN TEAM MEETING DATES

Virtual – 2:00 p.m.

Zoom Link Will Be Sent Prior to Meeting

November 20, 2020

December 16, 2020

January 28, 2021

April 7, 2021

May 19, 2021

2020-2021 Executive Green Team Meeting

November 20, 2020 at 2:00 PM

- What is SJS and How does it work?
- Planning for the Current School Year - What have you started? What are your plans for the first submission
- Where would we like to go as a district? District Actions that we can workon together this year.
- Email to Select next meeting time in December, Week of the 14th
- Recycling
- Access to SJS Application
- Work on Recycling Video for District
- Create 20-21 SJS Shared Folder

		Present Y/N
Kelly Stone	GLC	Y
Janise Stout	JMF	Y
Diego DeAssis	540	Y
Ann Degnan	540	Y
Jena Valdiviezo	MS/HS	N
Nawal Maroun	SODEXO	N
Elizabeth Gannon	GLC	Y
Caitlin Walling	AWC	Y
Victoria Leotsakas	AWC	Y
Jayce Maxwell	HS	Y
Vito Terranova	HS	N
John O'neill	GRE	Y
Erin Barrett	AAA	N

2020-2021 Executive Green Team Meeting

December 16, 2020 at 2:00 PM

- Outdoor Air Quality - Flag Program (10) District level action if all schools are participating! Flags needed?
- Upcomming Virtual SJS PD Sessions
- SJS Webinar Information
- School Level Green Team and Responsibilities
- power save has one more spot
- Grand Faloons Recycling Assembly
- Extra Hydroponic Unit at GLC to Jayce at HS
- Outdoor Air Quality Program update action, purchase missing flags for LWC, JMF, AWC - Website Widget
- Recycling Webinars
- Send Recyling Posters - AWC send to Villano

		PRESENT Y/N
Kelly Stone	GLC	Y
Janise Stout	JMF	Y
Diego DeAssis	540	Y
Ann Degnan	540	N
Jena Valdiviezo	MS/HS	N
Nawal Maroun	SODEXO	N
Elizabeth Gannon	GLC	Y
Caitlin Walling	AWC	Y
Victoria Leotsakas	AWC	Y
Molly Guzman	LWC	N
Jayce Maxwell	HS	Y
Vito Terranova	HS	Y
John O'neill	GRE	N
Erin Barrett	AAA	N
Cathy Svenda	MA	N

2020-2021 Executive Green Team Meeting

Thursday, January 28, 2021 at 2:00 PM

- School Level Green Team and Responsibilities
- Virtual Green Fair Idea
- Community Outreach
- Community Outreach
- Green Team Member Names for Board Agenda
- Anti-idling
- Sustainable Energy Submission
- Recycling

Present Y/N	
Kelly Stone	GLC
Janise Stout	JMF
Diego DeAssis	540
Ann Degnan	540
jena Valdiviezo	MS/HS
Nawal Maroun	SODEXO
Elizabeth Gannon	GLC
Caitlin Walling	AWC
Victoria Leotsakas	AWC
Jill Careri	MS
Jayce Maxwell	HS
VitoTerranova	HS
John O'neill	GRE
Erin Barrett	AAA
Cathy Svenda	MA
Molly Guzman	LWC

2020-2021 Executive Green Team Meeting

Wednesday, April 7 2021 at 2:00 PM

- **School Level Green Team and Responsibilities**
- Grand Faloons Contact Stephen Ringold/Grand Falloons
- Classroom Cleanup Protocol & Practices
- **Virtual Green Fair Ideas**
- BioDiversity project
- Green Team Member Names for Board Agenda
- Spring Garden Wishlist - indentify lst
- Video project - Ann
- Greenhouse- Electrical Fixed and Leaks Fixed - plastic cups repaired - we had a quote before the pandemic - needs to be revisited
- fix tank underneath - hands on and daily involvement
- Sustainable NJ Grant Questions: timeline & press release

		PRESENT Y/N
Kelly Stone	GLC	Y
Janise Stout	JMF	Y
Diego DeAssis	540	Y
Ann Degnan	540	Y
jena Valdiviezo	MS/HS	N
Nawal Maroun	SODEXO	N
Elizabeth Gannon	GLC	Y
Caitlin Walling	AWC	Y
Victoria Leotsakas	AWC	Y
Jill Careri	MS	Y
Jayce Maxwell	HS	N
Vito Terranova	HS	N
John O'neill	GRE	Y
Erin Barrett	AAA	Y
Cathy Svenda	MA	Y
Michelle Gargilo	AWC	Y
Molly Guzman	LWC	Y

2020-2021 Executive Green Team Meeting

Wednesday, April 7 2021 at 2:00 PM

- **Classroom Cleanup Protocol & Practices**
- How are actions coming?
- **Priority on EfS Student Learning Actions**
- Reporting on Butterfly garden progress (2 schools)
- Virtual Greenfair
- School Gardens
- Sustainable Actions
- Carbon Footprint for all schools

Present Y/N		
Kelly Stone	GLC	Y
Janise Stout	JMF	Y
Diego DeAssis	540	Y
Ann Degnan	540	Y
jena Valdiviezo	MS/HS	N
Nawal Maroun	SODEXO	N
Elizabeth Gannon	GLC	Y
Caitlin Walling	AWC	Y
Victoria Leotsakas	AWC	Y
Jill Careri	MS	Y
Jayce Maxwell	HS	N
Vito Terranova	HS	N
John O'neill	GRE	Y
Erin Barrett	AAA	Y
Nicole Trainor	MA	Y
Cathy Svenda	MA	Y
Michelle Gargilo	AWC	Y
Molly Guzman	LWC	Y

Climate Mitigation & Renewable Energy

Enhanced Renewable Product Opt-In Form

My District: Long Branch BOE

Authorized by: Pete E. Genovesi III

Full Name Here

Official Title: SBA/BS

Title Here

Today's Date: 11/6/19

Date Here

☑ Check This Box

I hereby authorize the ACES Program to enroll my district in the Enhanced Renewable Product program. My district will receive a 40% renewable energy electricity supply for the term of the 2018-2020 contract and may therefore be eligible for additional points towards Sustainable Jersey Certification. I understand that selection of this product will result in my district paying a small premium above the standard ACES contract price. My signature below indicates that I am authorized to Opt-In on the behalf of my district.

Signature

Signature of Authorized Party

Office of the Superintendent
Long Branch Public Schools
540 Broadway, Long Branch, New Jersey 07740

"Together We Can, Juntos Nós Podemos, Juntos Podemos"

Francisco E. Rodriguez
Superintendent of Schools

Peter E. Genovese III, RSBO, QPA
School Business Administrator/Board Secretary

March 22, 2021

Certification to Sustainable Jersey for Schools
Re: Amerigo A. Anastasia Elementary School

This letter is to certify Long Branch Public Schools contracted with EnTech Solar to design a solar collection system for the district. We then competitively bid the project and awarded the installation to RAI, Inc for 8 locations. At the Amerigo A. Anastasia Elementary School we installed Solara roof mounted 103.165 kWDC photovoltaic (solar) energy generation system, operating exclusively as a Net Metering Photovoltaic Solar Electric Facility (SEF).

The Solar Electric Facility is comprised of twenty-seven (27) strings each with thirteen (13) Motech MTPVp-235-MC poly-crystalline silicon photovoltaic modules and eight (8) strings each \Vith eleven (11) Motech MTPVp-235MC Poly- crystalline silicon photovoltaic modules in series with a maximum nominal voltage of 500 VDC. These strings are fed through six (6) Fronius IG Plus 11.4 kW, 277 VAC split phase inverters and three (3) Fronius IG Plus 10.1 kW, 277 VAC split phase inverters each with a 600 volt integrated DC disconnect.

On December 9, 2011 the svstem was interconnected. The entire svstem, is owned outright by the district after the 5 year lease purchase was paid off. The total system cost was $12,365,351.

Power from this new metering system is connected on the Customer side of a JCP&L revenue grade electric meter.

Annual percentage of the school building's energy use offset by Solar was 16%.

Peter E. Genovese III, RSBO, QPA
School Business Administrator /Board Secretary

Office of the Superintendent
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School Business Administrator/Board Secretary

March 22, 2021

Letter of Certification to Sustainable Jersey for Schools
Re: Audrey W. Clark School

This letter is to certify Long Branch Public Schools contracted with EnTech Solar to design a solar collection system for the district. We then competitively bid the project and awarded the installation to RAI, Inc for 8 locations. At the Audrey W. Clark School we installed a ground mounted 100.815 kWDC photovoltaic (solar) energy generation system, operating exclusively as a Net Metering Photovoltaic Solar Electric Facility (SEF).

This Solar Electric Facility is comprised of thirty-three (33) strings each with thirteen (13) Motech MTPVp-235-MSC 235 Watt poly-crystalline silicon photovoltaic modules in series with a maximum nominal voltage of 600 VDC. These strings are fed through three (3) combiner boxes each with a 210 amp, 600 volt integrated DC disconnect and to one (1) PVPowered 100 **kW** three-phase 208 VAC inverter.

On December 9, 2011 the system was interconnected. The entire system is owned outright by the district after the 5 year lease purchase was paid off. The total system cost was $12,365,351

Power from this new metering system is connected on the Customer side of a JCP&L revenue grade electric meter.

Annual percentage of the school building's energy use offset by Solar was 78%.

Peter E. Genovese III, RSBO, QPA
School Business Administrator /Board Secretary

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Superintendent of Schools

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School Business Administrator/Board Secretary

March 22, 2021

Letter of Certification to Sustainable Jersey for School

Re: Gregory Elementary School

This letter is to certify Long Branch Public Schools contracted with EnTech Solar to design a solar collection system for the district. We then competitively bid the project and awarded the installation to RAI, Inc for 8 locations. At the Gregory Elementary School we installed a standing seam roof mounted 62.040 kWDC photovoltaic (solar) energy generation system, operating exclusively as a Net Metering Photovoltaic Solar Electric Facility (SEF).

The Solar Electric Facility is comprised of twenty-four (24) strings each with eleven (11) Motech MTPVp-235-M multi-crystalline silicon photovoltaic modules in series with a maximum nominal voltage of 500 VDC. These strings are fed through **six** (6) Fronius 10kW single-phase inverters. There are six (6) Fronius Inverter systems. Each inverter system has a integrated AC/DC disconnect, and a Fronius 10 **kW** inverter. The single-phase AC output from each inverter is fed through a single-phase 277 VAC isolation transformer within the inverter and the output is connected to the line side of an existing customer distribution panel via six (6) 50 amp breakers to a 600 amp main breaker.

On September 4, 2011 the system was interconnected. The entire system is owned outright by the district after the 5 year lease purchase was paid off. The total system cost was $12,365,351.

Power from this new metering system is connected on the Customer side of a JCP&L revenue grade electric meter.

Annual percentage of the school building's energy use offset by Solar was 9%.

Peter E. Genovese III, RSBO, QPA
School Business Administrator /Board Secretary

Office of the Superintendent
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Francisco E. Rodriguez
Superintendent of Schools

Peter E. Genovese III, RSBO, QPA
School Business Administrator/Board Secretary

March 22, 2021

Letter of Certification to Sustainable Jersey for Schools
Re: Long Branch High School

This letter is to certify Long Branch Public Schools contracted with EnTech Solar to design a solar collection system for the district. We then competitively bid the project and awarded the installation to RAI, Inc for 8 locations. At the High School we installed a canopy & fix-tilt, roof mounted 965.38 kWDC photovoltaic {solar) energy generation system, operating exclusively as a Net Metering Photovoltaic Solar Electric Facility (SEF).

The rooftop Solar Electric Facility is comprised of one hundred and eighty-two (182) strings each with thirteen (13) Motech MTPVp-235-MSC poly-crystalline silicon photovoltaic modules in series with a maximum nominal voltage of 600 VDC. These strings are fed through eight (8) combiner boxes with 200 amp, 600 volt integrated DC disconnects and to one (1) PVPowered 260kW, two (2) 100 kW and two (2) 35kW three-phase 480 VAC inverters.

The Canopy Solar Electric Facility is comprised of one hundred and thirty-three (133) strings each with thirteen (13) Motech MTPVp-235-MSC poly-crystalline silicon photovoltaic modules in series with a maximum nominal voltage of 600 VDC. These strings are fed through twelve (12) combines boxes with 200 amp, 600 volt integrated DC disconnects and to one (1) PVPowered 260 kW and one (1) 100 kW three-phase 480 VAC inverters.

On April 19, 2012 the system was interconnected. The entire system is owned outright by the district after the 5 year lease purchase was paid off. The total system cost was $12,365.351.

Power from this new metering system is connected on the Customer side of a JCP&L revenue grade electric meter.

Annual percentage of the school building's energy use offset by Solar was 35%.

Peter E. Genovese III, RSBO, QPA
School Business Administrator /Board Secretary

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Francisco E. Rodriguez
Superintendent of Schools

Peter E. Genovese III, RSBO, QPA
School Business Administrator/Board Secretary

March 22, 2021

Letter of Certification to Sustainable Jersey for Schools
Re: Lenna W. Conrow School

This letter is to certify Long Branch Public Schools contracted with EnTech Solar to design a solar collection system for the district. We then competitively bid the project and awarded the installation to RAI, Inc. for 8 locations. At the Lenna W. Conrow School we installed a ground mounted 155.805kWDC photovoltaic (solar) energy generation system, operating exclusively as a Net Metering Photovoltaic Solar Electric Facility (SEF).

This Solar Electric Facility is comprised of fifty-one (51) strings each with thirteen (13) Motech MTPVp-235-MSC 235 Watt poly-crystalline silicon photovoltaic modules in series with a maximum nominal voltage of 600 VDC. These strings are fed through four (4) combiner boxes each with a 210 amp, 600 volt integrated DC disconnects and to one (1) PVPowered 100 kW three-phase 208 VAC and one (1) PVPowered 30 kW three-phase 208 VAC inverters.

On November 12, 2011 the system was interconnected. The entire system is owned outright by the district after the 5 year lease purchase was paid off. The total system cost was $12,365,351.

Power from this new metering system is connected on the Customer side of a JCP&L revenue grade electric meter.

Annual percentage of the school building's energy use offset by Solar was 76%.

Peter E. Genovese III, RSBO, QPA
School Business Administrator /Board Secretary

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Francisco E. Rodriguez
Superintendent of Schools

Peter E. Genovese III, RSBO, QPA
School Business Administrator/Board Secretary

March 22, 2021

Letter of Certification to Sustainable Jersey for Schools
Re: Morris Avenue School

This letter is to certify, Long Branch Public Schools contracted with EnTech Solar to design a solar collection system for the district. We then competitively bid the project and awarded the installation to RAI, Inc for 8 locations. At the Morris Avenue School we installed a fix-tilt, roof mounted 189.410 kWDC photovoltaic (solar) energy generation system, operating exclusively as a Net Metering Photovoltaic Solar Electric Facility (SEF).

The rooftop Solar Electric Facility is comprised of sixty two (62) strings each with thirteen (13) Motech MTPVp-235-MSC235 poly-crystalline silicon photovoltaic modules in series with a maximum nominal voltage of 600 VDC. These strings are fed through six (6) combiner boxes with 210 amp, 600 volt integrated DC disconnects and to two (2) PVPowered 75kW three-phase 208 VAC inverters.

On December 9, 2011 the system was interconnected. The entire system is owned outright by the district after the 5 year lease purchase was paid off. The total system cost was $12,365,351.

Power from this new metering system is connected on the Customer side of a JCP&L revenue grade eiectric meter.

Annual percentage of the school building's energy use offset by Solar was 50%.

Peter E. Genovese III, RSBO, QPA
School Business Administrator /Board Secretary

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Francisco E. Rodriguez
Superintendent of Schools

Peter E. Genovese III, RSBO, QPA
School Business Administrator/Board Secretary

March 22, 2021

Letter of Certification to Sustainable Jersey for Schools
Re: Long Branch Middle School

This letter is to certify Long Branch Public Schools contracted with EnTech Solar to design a solar collection system for the district. We then competitively bid the project and awarded the installation to RAI, Inc. for 8 locations. At the Middle School we installed a canopy & fix-tilt, roof mounted 772.920 kWDC photovoltaic (solar) energy generation system, operating exclusively as a Net Metering Photovoltaic Solar Electric Facility (SEF).

The rooftop Solar Electric Facility is comprised of one hundred and nine (109) strings each with thirteen (13) Motech MTPVp0235-MSC poly-crystalline silicon photovoltaic modules in series with a maximum nominal voltage of 600 VDC. These strings are fed through eleven (11) combiner boxes with 210 amp, 600 volt integrated DC disconnects and to two (2) PVPowered 75kWpme (1) 50 kW and one (1) 100kW PVPowered three-phase 480 VAC inverters.

The Canopy Solar Electric Facility is comprised of one hundred and forty-four (144) strings each with thirteen (13) motech MTPVp-235-MSC poly-crystalline silicon photovoltaic modules in series with a maximum nominal voltage of 600 VDC. These strings are fed through fifteen (15) combiner boxes with 210 amp, 600 volt integrated DC disconnects and to two (2) 35kW and one (1) 75 kW and one 260 kW PVPowered three-phase 480 VAC inverters.

On April 19, 2012, the system was interconnected. The entire system is owned outright by the district after the 5 year lease purchase was paid off. The total system cost was $12,365,351.

Power from this new metering system is connected on the Customer side of a JCP&L revenue grade electric meter.

Annual percentage of the school building's energy use offset by Solar was 29%.

Peter E. Genovese III, RSBO, QPA
School Business Administrator /Board Secretary

Diversity & Equity

Office of the Superintendent
Long Branch Public Schools
540 Broadway, Long Branch, New Jersey 07740

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Francisco E. Rodriguez
Superintendent of Schools

Markus W. Rodriguez
Director of Diversity, Equity & Inclusion
732-571-2868 x40331
Fax: 732-571-0797

Superintendent Rodriguez & Board of Education
540 Broadway
Long Branch NJ 07740

RE: Equity Audit of School level Committees

5/07/2021

Superintendent Rodriguez and members of the Board of Education:

The Office of DEI has completed an Equity audit of School Committees for the end of SY2020-21.

In reviewing the individual school level committees, the Director of DEI examined the following; committee purpose, membership process, member responsibilities, diversity of membership and wherever applicable, systems in place for equitable participation. In all cases, the review indicated that reasonable measures were taken by school leadership to foster an inclusive process which consistently resulted in balanced committee membership. Principal oversight of committees is enhanced by empowerment of school stakeholders but would benefit from consultation with readily accessible building staff/ personnel with a specialized understanding on matters of Diversity, Equity and Inclusion.

Next Steps: Building level DEI personnel resources

The Office of DEI has established a Long Branch Public Schools District DEI Council to act as a consulting body made up of collaborating educators and community stakeholders whose mission is the articulation, promotion, development and support of Diversity Equity and Inclusion policies, statutes and initiatives. Council membership is comprised of educators and LBPS employees representing all district schools and additionally is open to community partners and parents. Councils members at each building can lend valuable insight with a DEI lens to a variety of building level entities including but not limited to committees.

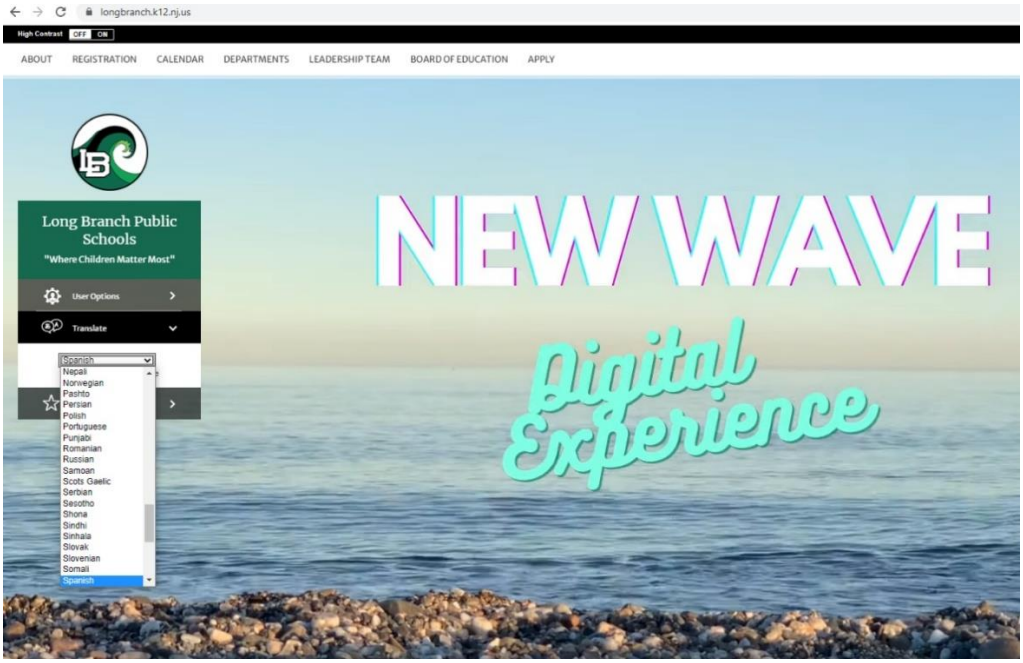
Respectfully submitted,

MWR

Markus W. Rodriguez, Director
Office of Diversity, Equity and Inclusion
Long Branch Public Schools

Long Branch Public Schools

Website Translation Feature



Website Updates

For students having trouble with Class Link, please log on to your classes using Google Classroom.

New data prompts remote learning for all LBPS students to start the school year. With nearly 275 staff requests for accommodations and leaves, and more than 2,100 families opting to start remotely, LBPS is forced to pivot and aims to provide a high-quality digital learning experience beginning September 8, 2020. For childcare, please contact our licensed childcare provider, Champions at 732-571-2868 x40405.

- Restart & Recovery Plan
- Virtual Learning Schedule
- Impact Aid Letter
- NJDOH COVID-19 Toolkit
- At-Home Learning Letter for families
- Video: At-Home learning Announcement
- Equity in Education Letter
- Know Your Rights
- LBPS Health-related School
- 20-21 School Calendar
- Community Video Updates

Grab & Go Meals for Long Branch Public School students can be picked up Monday, Wednesday and Friday at 12 PM at the following locations: Holy Trinity School, Lenna W. Conrow ECLC, Gregory Elementary School, Long Branch Middle School and Pleasure Bay.

Comidas preparadas para los estudiantes de las escuelas públicas de Long Branch se pueden recoger los lunes, miércoles y viernes a las 12 PM en: Holy Trinity School, Lenna W. Conrow ECLC, Gregory Elementary School, Long Branch Middle School y Pleasure Bay.

Almoços preparados para os alunos das escolas públicas de Long Branch podem ser retirados segunda, quarta e sexta-feira às 12 PM na: Holy Trinity School, Lenna W. Conrow ECLC, Gregory Elementary School, Long Branch Middle School e Pleasure Bay.

Facebook Demographics

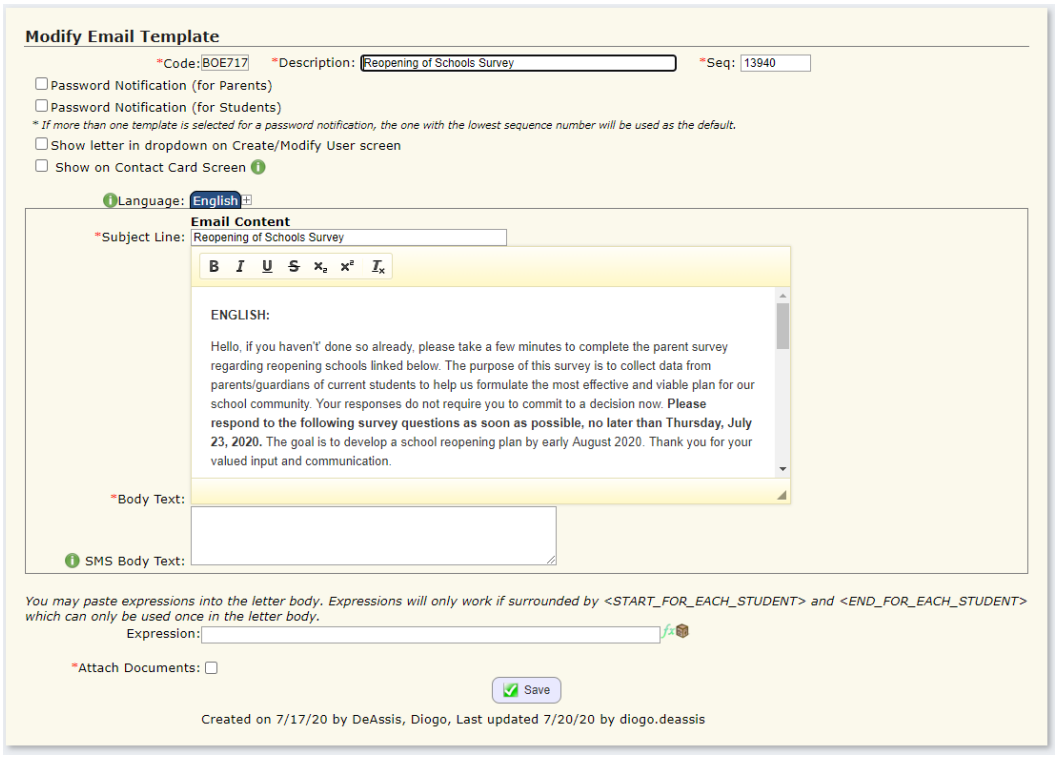
Your Fans | Your Followers | People Reached | People Engaged

Aggregated demographic data about the people who like your Page based on the age and gender information they provide in their user profiles.

Country	Your Fans	City	Your Fans	Language	Your Fans
United States of America	4,679	Long Branch, NJ	2,629	English (US)	3,628
Brazil	155	New York, NY	116	Spanish	657
Mexico	27	West Long Branch, NJ	112	Portuguese (Brazil)	471
Puerto Rico	10	Ocean, NJ	111	Spanish (Spain)	139
Portugal	9	Eatontown, NJ	105	English (UK)	52
Canada	8	Newark, NJ	92	Portuguese (Portugal)	27
Colombia	8	Neptune, NJ	73	French (France)	8
El Salvador	7	Tinton Falls, NJ	63	Arabic	7
India	7	Oceanport, NJ	52	Persian	3
Guatemala	6	Asbury Park, NJ	43	Hungarian	3

See More

District Surveys



Modify Email Template

*Code: BOE717 *Description: Reopening of Schools Survey *Seq: 13940

☐ Password Notification (for Parents)

☐ Password Notification (for Students)

** If more than one template is selected for a password notification, the one with the lowest sequence number will be used as the default.*

☐ Show letter in dropdown on Create/Modify User screen

☐ Show on Contact Card Screen

Language: English

Email Content

*Subject Line: Reopening of Schools Survey

ENGLISH:

Hello, if you haven't' done so already, please take a few minutes to complete the parent survey regarding reopening schools linked below. The purpose of this survey is to collect data from parents/guardians of current students to help us formulate the most effective and viable plan for our school community. Your responses do not require you to commit to a decision now. **Please respond to the following survey questions as soon as possible, no later than Thursday, July 23, 2020.** The goal is to develop a school reopening plan by early August 2020. Thank you for your valued input and communication.

*Body Text:

SMS Body Text:

You may paste expressions into the letter body. Expressions will only work if surrounded by <START_FOR_EACH_STUDENT> and <END_FOR_EACH_STUDENT> which can only be used once in the letter body.

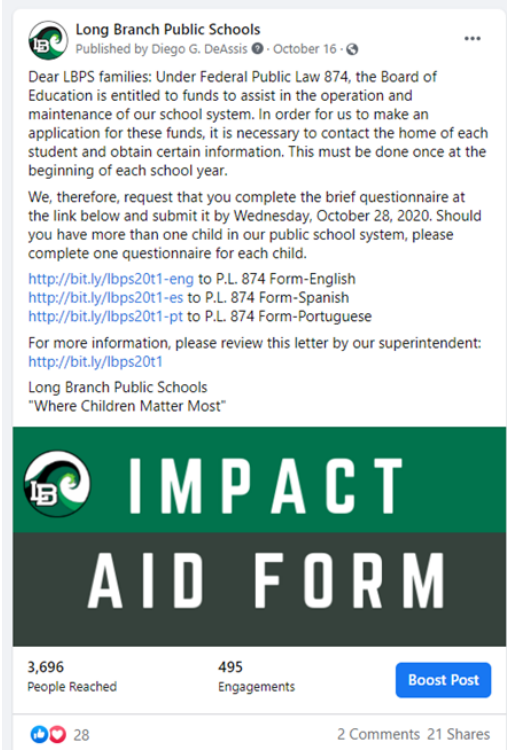
Expression:

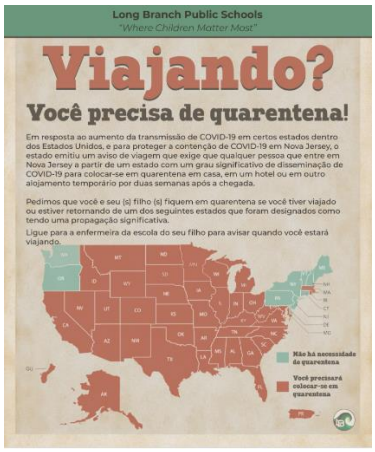
*Attach Documents: ☐

Save

Created on 7/17/20 by DeAssis, Diogo, Last updated 7/20/20 by diogo.deassis

Accessible Communications





NJ SCHOOL PERFORMANCE REPORT

Joseph M. Ferraina Early Childhood Learning Center
(25-2770-085)
Grades Offered: PK-KG
2018-2019

Report Key:
* Data is not displayed in order to protect student privacy
** Accountability calculations require 20 or more students
N No Data is available to display
† This indicates a table specific note,see note below table

Enrollment data reflects enrollment reported at the end of the school year and only includes students attending the school. Students that attend programs at other schools or outside of the district are not included in enrollment counts and percentages.

Enrollment Trends by Grade

This table shows the number of students enrolled by grade for the past three school years. Any students enrolled outside of the grades offered will be included in the total enrollment.

Grade	2016-17	2017-18	2018-19
PK	213	205	209
KG	108	110	117
Total	321	315	326

Enrollment Trends by Student Group

This table shows the percentage of students by student group for the past three school years.

Student Group	2016-17	2017-18	2018-19
Female	52.3%	53.7%	57.4%
Male	47.7%	46.3%	42.6%
Economically Disadvantaged Students	77.6%	75.9%	76.4%
Students with Disabilities	9.7%	6.3%	6.4%
English Learners	40.2%	47.6%	45.7%
Homeless Students	0.0%	0.0%	1.8%
Students in Foster Care	1.2%	0.0%	0.0%
Military-Connected Students	0.6%	0.6%	0.0%
Migrant Students	0.0%	0.0%	0.3%

Enrollment by Racial and Ethnic Group

This table shows the percentage of students by racial and ethnic group for the past three school years.

Racial and Ethnic Group	2016-17	2017-18	2018-19
White	35.8%	32.1%	26.4%
Hispanic	46.7%	49.8%	58.0%
Black or African American	13.7%	11.7%	8.6%
Asian	0.0%	0.6%	0.6%
Native Hawaiian or Pacific Islander	0.3%	0.0%	0.0%
American Indian or Alaska Native	0.0%	0.0%	0.0%
Two or More Races	3.4%	5.7%	6.4%

Enrollment Trends by Full/Half Day PK and KG

This table shows number of students in full day and half day Pre-Kindergarten (PK) and Kindergarten (KG) for the past three school years.

Grade	2016-17	2017-18	2018-19
PK - Half Day	0	0	0
PK - Full Day	213	205	209
KG - Half Day	0	0	0
KG - Full Day	108	110	117

Enrollment by Home Language

This table shows the percentage of students by primary home language. Only the top 5 languages with at least 1% of students are shown, and students with other home languages are included in the Other Languages total.

Home Language	% of Students
English	45.7%
Spanish	36.5%
Portuguese	16.0%
Other Languages	1.8%

NJ SCHOOL PERFORMANCE REPORT

Lenna W. Conrow Elementary School
(25-2770-120)
Grades Offered: PK-KG
2018-2019

Report Key:
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** Accountability calculations require 20 or more students
N No Data is available to display
† This indicates a table specific note,see note below table

Enrollment data reflects enrollment reported at the end of the school year and only includes students attending the school. Students that attend programs at other schools or outside of the district are not included in enrollment counts and percentages.

Enrollment Trends by Grade

This table shows the number of students enrolled by grade for the past three school years. Any students enrolled outside of the grades offered will be included in the total enrollment.

Grade	2016-17	2017-18	2018-19
PK	303	292	268
KG	118	117	120
Total	421	409	388

Enrollment Trends by Student Group

This table shows the percentage of students by student group for the past three school years.

Student Group	2016-17	2017-18	2018-19
Female	50.6%	48.7%	47.4%
Male	49.4%	51.3%	52.6%
Economically Disadvantaged Students	87.6%	87.3%	87.6%
Students with Disabilities	14.5%	17.4%	13.7%
English Learners	51.8%	54.3%	54.9%
Homeless Students	0.7%	1.2%	1.8%
Students in Foster Care	1.7%	0.2%	0.0%
Military-Connected Students	0.2%	0.2%	0.0%
Migrant Students	0.0%	0.0%	0.0%

Enrollment by Racial and Ethnic Group

This table shows the percentage of students by racial and ethnic group for the past three school years.

Racial and Ethnic Group	2016-17	2017-18	2018-19
White	26.1%	24.4%	25.0%
Hispanic	53.7%	57.2%	57.2%
Black or African American	14.5%	14.2%	13.4%
Asian	0.5%	0.7%	0.5%
Native Hawaiian or Pacific Islander	0.0%	0.0%	0.0%
American Indian or Alaska Native	0.2%	0.0%	0.3%
Two or More Races	5.0%	3.4%	3.6%

Enrollment Trends by Full/Half Day PK and KG

This table shows number of students in full day and half day Pre-Kindergarten (PK) and Kindergarten (KG) for the past three school years.

Grade	2016-17	2017-18	2018-19
PK - Half Day	0	0	0
PK - Full Day	303	292	268
KG - Half Day	0	0	0
KG - Full Day	118	117	120

Enrollment by Home Language

This table shows the percentage of students by primary home language. Only the top 5 languages with at least 1% of students are shown, and students with other home languages are included in the Other Languages total.

Home Language	% of Students
Spanish	40.5%
English	37.4%
Portuguese	21.1%
Other Languages	1.0%

NJ SCHOOL PERFORMANCE REPORT

Morris Avenue Elementry School
(25-2770-080)
Grades Offered: PK-KG
2018-2019

Report Key:
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** Accountability calculations require 20 or more students
N No Data is available to display
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Enrollment data reflects enrollment reported at the end of the school year and only includes students attending the school. Students that attend programs at other schools or outside of the district are not included in enrollment counts and percentages.

Enrollment Trends by Grade

This table shows the number of students enrolled by grade for the past three school years. Any students enrolled outside of the grades offered will be included in the total enrollment.

Grade	2016-17	2017-18	2018-19
PK	308	290	293
KG	117	108	105
Total	425	398	398

Enrollment Trends by Student Group

This table shows the percentage of students by student group for the past three school years.

Student Group	2016-17	2017-18	2018-19
Female	49.9%	49.0%	49.2%
Male	50.1%	51.0%	50.8%
Economically Disadvantaged Students	89.4%	89.2%	86.2%
Students with Disabilities	6.4%	6.5%	7.0%
English Learners	55.1%	63.8%	64.8%
Homeless Students	1.2%	2.5%	1.3%
Students in Foster Care	0.9%	0.8%	0.5%
Military-Connected Students	0.0%	0.0%	0.0%
Migrant Students	0.0%	0.0%	0.0%

Enrollment by Racial and Ethnic Group

This table shows the percentage of students by racial and ethnic group for the past three school years.

Racial and Ethnic Group	2016-17	2017-18	2018-19
White	27.8%	30.7%	29.6%
Hispanic	57.2%	56.3%	57.5%
Black or African American	11.3%	10.3%	10.1%
Asian	1.2%	0.5%	0.5%
Native Hawaiian or Pacific Islander	0.0%	0.0%	0.0%
American Indian or Alaska Native	0.2%	0.3%	0.0%
Two or More Races	2.4%	2.0%	2.3%

Enrollment Trends by Full/Half Day PK and KG

This table shows number of students in full day and half day Pre-Kindergarten (PK) and Kindergarten (KG) for the past three school years.

Grade	2016-17	2017-18	2018-19
PK - Half Day	0	0	0
PK - Full Day	308	290	293
KG - Half Day	0	0	0
KG - Full Day	117	108	105

Enrollment by Home Language

This table shows the percentage of students by primary home language. Only the top 5 languages with at least 1% of students are shown, and students with other home languages are included in the Other Languages total.

Home Language	% of Students
Spanish	41.0%
English	29.1%
Portuguese	28.6%
Other Languages	1.3%

NJ SCHOOL PERFORMANCE REPORT

A A Anastasia Elementary School
(25-2770-065)
Grades Offered: KG-05
2018-2019

Report Key:
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** Accountability calculations require 20 or more students
N No Data is available to display
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Enrollment data reflects enrollment reported at the end of the school year and only includes students attending the school. Students that attend programs at other schools or outside of the district are not included in enrollment counts and percentages.

Enrollment Trends by Grade

This table shows the number of students enrolled by grade for the past three school years. Any students enrolled outside of the grades offered will be included in the total enrollment.

Grade	2016-17	2017-18	2018-19
KG	10	1	13
1	104	111	118
2	134	107	95
3	93	127	109
4	140	80	120
5	129	141	80
Total	610	567	535

Enrollment Trends by Student Group

This table shows the percentage of students by student group for the past three school years.

Student Group	2016-17	2017-18	2018-19
Female	47.2%	46.7%	43.9%
Male	52.8%	53.3%	56.1%
Economically Disadvantaged Students	85.7%	84.3%	85.0%
Students with Disabilities	26.9%	26.5%	28.6%
English Learners	5.6%	8.6%	19.4%
Homeless Students	1.1%	1.4%	1.9%
Students in Foster Care	0.5%	0.0%	0.0%
Military-Connected Students	0.2%	0.2%	0.6%
Migrant Students	0.0%	0.0%	0.4%

Enrollment by Racial and Ethnic Group

This table shows the percentage of students by racial and ethnic group for the past three school years.

Racial and Ethnic Group	2016-17	2017-18	2018-19
White	28.2%	28.9%	30.8%
Hispanic	49.7%	50.8%	50.5%
Black or African American	17.5%	15.9%	14.2%
Asian	1.5%	0.9%	0.6%
Native Hawaiian or Pacific Islander	0.2%	0.4%	0.2%
American Indian or Alaska Native	0.2%	0.0%	0.0%
Two or More Races	2.8%	3.2%	3.7%

Enrollment Trends by Full/Half Day PK and KG

This table shows number of students in full day and half day Pre-Kindergarten (PK) and Kindergarten (KG) for the past three school years.

Grade	2016-17	2017-18	2018-19
KG - Half Day	0	0	0
KG - Full Day	10	1	13

Enrollment by Home Language

This table shows the percentage of students by primary home language. Only the top 5 languages with at least 1% of students are shown, and students with other home languages are included in the Other Languages total.

Home Language	% of Students
English	42.4%
Spanish	39.6%
Portuguese	16.8%
Other Languages	1.1%

NJ SCHOOL PERFORMANCE REPORT

Gregory Elementary School
(25-2770-110)
Grades Offered: KG-05
2018-2019

Report Key:
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** Accountability calculations require 20 or more students
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Enrollment Trends by Grade

This table shows the number of students enrolled by grade for the past three school years. Any students enrolled outside of the grades offered will be included in the total enrollment.

Grade	2016-17	2017-18	2018-19
KG	6	4	2
1	110	116	128
2	102	102	123
3	108	98	94
4	124	110	99
5	131	123	115
Total	581	553	561

Enrollment Trends by Student Group

This table shows the percentage of students by student group for the past three school years.

Student Group	2016-17	2017-18	2018-19
Female	45.3%	45.0%	46.7%
Male	54.7%	55.0%	53.3%
Economically Disadvantaged Students	83.5%	85.2%	84.1%
Students with Disabilities	23.1%	23.3%	21.0%
English Learners	3.1%	6.0%	13.9%
Homeless Students	2.1%	1.1%	3.0%
Students in Foster Care	0.3%	0.5%	0.2%
Military-Connected Students	0.0%	0.0%	0.2%
Migrant Students	0.0%	0.0%	0.2%

Enrollment by Racial and Ethnic Group

This table shows the percentage of students by racial and ethnic group for the past three school years.

Racial and Ethnic Group	2016-17	2017-18	2018-19
White	18.2%	19.5%	19.8%
Hispanic	50.3%	49.2%	48.1%
Black or African American	25.5%	24.8%	26.4%
Asian	1.0%	1.1%	0.9%
Native Hawaiian or Pacific Islander	0.2%	0.0%	0.0%
American Indian or Alaska Native	0.3%	0.2%	0.0%
Two or More Races	4.5%	5.2%	4.8%

Enrollment Trends by Full/Half Day PK and KG

This table shows number of students in full day and half day Pre-Kindergarten (PK) and Kindergarten (KG) for the past three school years.

Grade	2016-17	2017-18	2018-19
KG - Half Day	0	0	0
KG - Full Day	6	4	2

Enrollment by Home Language

This table shows the percentage of students by primary home language. Only the top 5 languages with at least 1% of students are shown, and students with other home languages are included in the Other Languages total.

Home Language	% of Students
English	54.4%
Spanish	34.4%
Portuguese	8.9%
Other Languages	2.3%

NJ SCHOOL PERFORMANCE REPORT

George L Catrambone
(25-2770-300)
Grades Offered: KG-05
2018-2019

Report Key:
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Enrollment Trends by Grade

This table shows the number of students enrolled by grade for the past three school years. Any students enrolled outside of the grades offered will be included in the total enrollment.

Grade	2016-17	2017-18	2018-19
PK	0	0	0
KG	56	62	60
1	168	178	152
2	171	164	185
3	142	170	172
4	160	149	178
5	167	163	153
Total	864	886	900

Enrollment Trends by Student Group

This table shows the percentage of students by student group for the past three school years.

Student Group	2016-17	2017-18	2018-19
Female	49.3%	50.6%	50.2%
Male	50.7%	49.4%	49.8%
Economically Disadvantaged Students	91.1%	91.5%	92.7%
Students with Disabilities	3.8%	4.0%	4.1%
English Learners	29.7%	40.0%	49.3%
Homeless Students	1.0%	1.4%	1.8%
Students in Foster Care	0.6%	0.6%	0.4%
Military-Connected Students	0.2%	0.2%	0.1%
Migrant Students	0.0%	0.0%	0.6%

Enrollment by Racial and Ethnic Group

This table shows the percentage of students by racial and ethnic group for the past three school years.

Racial and Ethnic Group	2016-17	2017-18	2018-19
White	29.1%	28.9%	28.1%
Hispanic	58.3%	59.3%	61.4%
Black or African American	10.3%	9.3%	8.0%
Asian	0.2%	0.7%	0.6%
Native Hawaiian or Pacific Islander	0.0%	0.0%	0.0%
American Indian or Alaska Native	0.0%	0.1%	0.1%
Two or More Races	2.1%	1.8%	1.8%

Enrollment Trends by Full/Half Day PK and KG

This table shows number of students in full day and half day Pre-Kindergarten (PK) and Kindergarten (KG) for the past three school years.

Grade	2016-17	2017-18	2018-19
PK - Half Day	0	0	0
PK - Full Day	0	0	0
KG - Half Day	0	0	0
KG - Full Day	56	62	60

Enrollment by Home Language

This table shows the percentage of students by primary home language. Only the top 5 languages with at least 1% of students are shown, and students with other home languages are included in the Other Languages total.

Home Language	% of Students
Spanish	49.6%
Portuguese	25.7%
English	23.7%
Other Languages	1.1%

NJ SCHOOL PERFORMANCE REPORT

Long Branch Middle School
(25-2770-060)
Grades Offered: 06-08
2018-2019

Report Key:
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Enrollment Trends by Grade

This table shows the number of students enrolled by grade for the past three school years. Any students enrolled outside of the grades offered will be included in the total enrollment.

Grade	2016-17	2017-18	2018-19
6	399	409	423
7	371	390	410
8	378	373	395
Total	1,148	1,172	1,228

Enrollment Trends by Student Group

This table shows the percentage of students by student group for the past three school years.

Student Group	2016-17	2017-18	2018-19
Female	47.8%	47.4%	47.8%
Male	52.2%	52.6%	52.2%
Economically Disadvantaged Students	81.7%	82.8%	84.8%
Students with Disabilities	13.6%	14.3%	15.4%
English Learners	9.8%	10.5%	12.8%
Homeless Students	1.3%	1.6%	1.5%
Students in Foster Care	0.4%	0.2%	0.1%
Military-Connected Students	0.0%	0.0%	0.1%
Migrant Students	0.0%	0.0%	0.2%

Enrollment by Racial and Ethnic Group

This table shows the percentage of students by racial and ethnic group for the past three school years.

Racial and Ethnic Group	2016-17	2017-18	2018-19
White	24.7%	24.2%	21.8%
Hispanic	52.8%	55.1%	59.4%
Black or African American	19.8%	17.7%	15.3%
Asian	1.4%	1.3%	1.1%
Native Hawaiian or Pacific Islander	0.0%	0.0%	0.0%
American Indian or Alaska Native	0.2%	0.3%	0.2%
Two or More Races	1.1%	1.5%	2.2%

Enrollment by Home Language

This table shows the percentage of students by primary home language. Only the top 5 languages with at least 1% of students are shown, and students with other home languages are included in the Other Languages total.

Home Language	% of Students
Spanish	44.2%
English	39.9%
Portuguese	15.1%
Other Languages	0.8%

NJ SCHOOL PERFORMANCE REPORT

Long Branch High School
(25-2770-050)
Grades Offered: 09-12
2018-2019

Report Key:
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** Accountability calculations require 20 or more students
N No Data is available to display
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Enrollment Trends by Grade

This table shows the number of students enrolled by grade for the past three school years. Any students enrolled outside of the grades offered will be included in the total enrollment.

Grade	2016-17	2017-18	2018-19
9	393	390	393
10	396	378	384
11	288	358	335
12	333	309	352
Total	1,410	1,435	1,464

Enrollment Trends by Student Group

This table shows the percentage of students by student group for the past three school years.

Student Group	2016-17	2017-18	2018-19
Female	48.1%	47.4%	47.3%
Male	51.9%	52.6%	52.7%
Economically Disadvantaged Students	75.9%	75.4%	74.8%
Students with Disabilities	12.0%	12.1%	12.1%
English Learners	10.8%	11.3%	14.0%
Homeless Students	0.9%	1.4%	1.3%
Students in Foster Care	0.2%	0.2%	0.3%
Military-Connected Students	0.0%	0.0%	0.0%
Migrant Students	0.0%	0.0%	0.0%

Enrollment by Racial and Ethnic Group

This table shows the percentage of students by racial and ethnic group for the past three school years.

Racial and Ethnic Group	2016-17	2017-18	2018-19
White	25.6%	25.3%	25.1%
Hispanic	50.9%	51.8%	53.6%
Black or African American	22.0%	21.0%	19.3%
Asian	0.9%	1.1%	1.1%
Native Hawaiian or Pacific Islander	0.0%	0.0%	0.0%
American Indian or Alaska Native	0.1%	0.1%	0.1%
Two or More Races	0.4%	0.7%	0.8%

Enrollment Trends by Full and Shared Time Status

This table shows the number of full and shared time students for the last three years. The full time equivalent is the number of full time students plus half the number of shared time students.

Enrollment Status	2016-17	2017-18	2018-19
Full Time Students	1,389	1,412	1,434
Shared Time Students	39	44	58
Full Time Equivalent	1,409	1,434	1,463

Enrollment by Home Language

This table shows the percentage of students by primary home language. Only the top 5 languages with at least 1% of students are shown, and students with other home languages are included in the Other Languages total.

Home Language	% of Students
English	52.8%
Spanish	33.5%
Portuguese	12.4%
Other Languages	1.4%

Green Culture

LONG BRANCH PUBLIC SCHOOLS
Long Branch, NJ 07740

Building Inventory

School	Built In	Address	Occupancy Scheduled	Square Footage
Audrey W. Clark	1964	192 Garfield Avenue	M-F 6AM-4PM	41,600
Central Office	1800's	540 Broadway	M-F 6AM-6PM	8,500
JMF Pre School	1997	80 Avenel Blvd	M-F 6AM-4PM	42,478
Lenna Conrow	1955	335 Long Branch Avenue	M-F 6AM-4PM	44,640
Morris Avenue	1973	318 Morris Avenue	M-F 6AM-4PM	41,760
Anastasia	2005	92 Seventh Avenue	M-F 6AM-6PM	94,266
Gregory School	2006	201 Monmouth Avenue	M-F 6AM-6PM	94,266
High School	2006	404 Indiana Avenue	M-F 6AM-8PM	290,000
Middle School	2005	350 Indiana Avenue	M-F 6AM-8PM	246,000
George L Catrambone	2014	240 Park Ave	M-F 6AM-6PM	108000
				1,106,551

OFFICE OF THE SUPERINTENDENT
LONG BRANCH PUBLIC SCHOOLS
540 Broadway, Long Branch, New Jersey 07740

MICHAEL SALVATORE, Ph.D.
Superintendent of Schools

"Where Children Matter Most"

PETER E. GENOVESE III, RSBO, QPA
School Business Administrator
Board Secretary
(732) 571-2868 Ext. 40100
Fax: (732) 229-0797

Sustainable Jersey for Schools

In accordance with the States' recommendations to purchase environmentally-preferred cleaning products that minimize potential impacts to human health and the environment, Long Branch School District is committed to purchasing Green Products whenever practical.

We have always been environmentally sensitive when we purchase products, however this year we've taken additional steps to implement a green cleaning system in our schools. This new system minimizes waste while increasing efficiency for cleaning and helps to insure student and staff safety. Attached please find a list of items purchased in the past 12 months to support these efforts.

Thank you for your time and consideration.

Peter E. Genovese III, RSBO, QPA
School Business Administrator/Board Secretary

PEG/sdz
Attachment

7423 GREEN AND HEALTHY SCHOOLS CLEANING POLICY

The Readington Township Board of Education, recognizing the importance of the safety and health of the district's students, teachers and staff, does hereby adopt the following policy regarding products used to clean and maintain school facilities within the district.

Background and Intent

Many chemicals commonly found in cleaning products used to clean and maintain schools pose significant and unnecessary health risks for children as well as teachers and staff. Exposure to some of these chemicals has been associated with an increased incidence of asthma, allergies, certain types of cancer, learning and behavioral disorders, endocrine disruption, chemical sensitivity, and kidney or liver damage. In addition to these potential health impacts, certain cleaning chemicals can negatively impact air and water quality or may be acutely toxic to marine life. The Board believes it is not necessary to jeopardize the health and safety of our students, teachers and staff, or to pollute our environment, when many less toxic or non-toxic alternatives are available.

Therefore the intent of this policy is to reduce student, teacher and staff exposure to these chemicals and reduce environmental pollution by stipulating procurement, implementation and evaluation policies for "green" cleaning products which ensure the highest levels of safety, efficacy and economy.

Classification of Products

The Facilities Manager is hereby directed to classify cleaning products specified for purchase and use in district school facilities into one of the three following categories:

1. Type I products are those which are used daily for routine cleaning in classrooms, hallways and cafeterias, including all-purpose cleaners, cleaning pastes, window and mirror cleaners and dustmop treatments.

2. Type II products are those which are used to sanitize or disinfect in bathrooms, gymnasiums, nurses' offices, kitchens, etc.

3. Type III products are those which are used for floor stripping and finishing, metal polishing, graffiti removal, degreasing and heavy duty, restorative carpet cleaning.

Specifications:

1. Products classified as all-purpose cleaners (Type I) shall meet or exceed the following specifications, as warranted in writing by manufacturers and vendors:

- Products have no or low VOC content (less than 1 %)
- Products are non-reactive, non-caustic and non-corrosive (preferably with a pH of 4.0 to 9.0)
- Products are not delivered in aerosol cans with petrochemical propellants
- Products do not contain known, probable or possible carcinogens, mutagens or teratogens as designated by federal law
- Products do not contain known or suspected endocrine modifiers, alkyl phenyl ethoxylates (APEs), dibutyl phthalate, diethyl phthalate or ingredients that are toxic to the liver or kidneys in environmentally relevant doses
- Products do not contain added fragrances (non-functional fragrances)
- Products do not contain non-food-grade dyes
- Products do not contain disinfectant or antibacterial chemicals (e.g., triclosan)
- Products do not contain 2-butoxyethanol

2. Products classified as sanitizers and disinfectants (Type II) shall meet or exceed the following specifications, as warranted in writing by manufacturers and vendors:

- Products shall NOT be chlorine-based (e.g. sodium hypochlorite)
- Products shall NOT contain quaternary ammonium compounds (e.g. ammonium chloride)
- Products should not contain phenolics (e.g. o-phenyl-phenol)

3. Products used for heavy duty floor care (Type III) shall meet or exceed the following specifications, as warranted in writing by manufacturers and vendors:

- Products shall NOT contain styrene
- Products shall NOT contain "heavy metals" including zinc, chromium or nickel
- Products shall NOT contain petroleum solvents or 2-butoxyethanol.

4. The Business Administrator may develop purchasing strategies that use products and equipment that meet the following standards:

- Green Seal's GS-37 environmental standard for industrial and institutional cleaners;
- EcoLogo's CCD-146 standard for Hard Surface Cleaners;
- Carpet and Rug Institute's Green Label Program for vacuum cleaners;

- US EPA's Comprehensive Procurement Guidelines for janitor paper products and plastic trash bags.

Implementation Guidelines

1. Up to 90% of the dirt in schools is brought in on the soles of shoes. Walk-off mats (15 feet minimum) are part of an effective green cleaning program, and should be installed at all school entrances.

2. All classroom teachers shall be provided with approved Type I cleaning products for use when necessary, and shall be given instruction in their proper use.

3. No parent, teacher or staff member may bring into a school facility any consumer product which is intended to clean, deodorize, sanitize or disinfect.

4. Type II disinfectant products shall be used only for body fluid spills or in areas where there is a high potential for direct contact with body fluids or when a public health concern requires their use. These products contain registered pesticides and should never be used for general cleaning purposes or when children are present.

5. Type III floor stripping and finishing products shall only be used when facilities are not in use (vacation breaks) or over long weekends, when buildings can be properly ventilated before children, teachers and staff return. These products typically contain highly toxic, highly caustic and highly corrosive chemicals. Their high VOC and pH levels require them to be used with personal protection and extreme caution, even when following guidelines.

Training

Custodians shall be trained in the hazards, use, proper dilution, safety, maintenance, and disposal of cleaning chemicals, dispensing equipment, and packaging. Custodians shall provide awareness training to school staff on the Green Cleaning policies on an annual basis.

The school nurse shall be consulted regarding any special health concerns, such as student allergies in the development of the classroom and cafeteria schedules and cleaning practices.

The Facilities Supervisor shall ensure the safe handling, storage, and disposal of cleaning products and other hazardous chemicals.

Effective Date and Notice

This policy shall take effect on January 1, 2016. The district shall undertake to inform all parents, teachers and staff of the contents of this policy and the reasons for its adoption. All custodial staff shall be informed of the policy and trained in the use of "green" cleaning products. The District shall inform all vendors of this policy in writing and it shall be referenced in all new contracts and service agreements. Existing stocks of non-complying products shall be disposed of as directed by the Director of Facilities.

Adopted: 25 August 2015

LONG BRANCH PUBLIC SCHOOLS
540 Broadway, Long Branch, New Jersey 07740

MICHAEL SALVATORE, Ph.D.
Superintendent of Schools

"Where Children Matter Most"

DIEGO G. DEASSIS
S&E Sustainability Officer
(732) 571-2868 Ext. 40051
Fax: (732) 229-0797

December 7, 2020

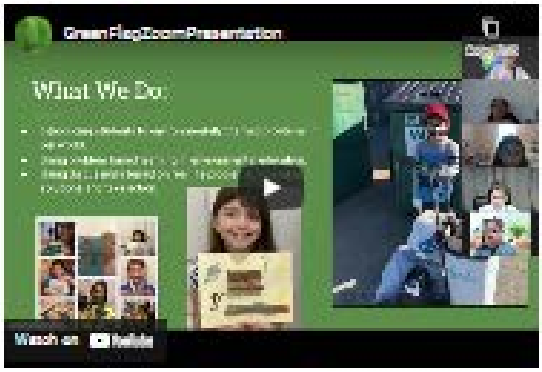
To Whom It May Concern,

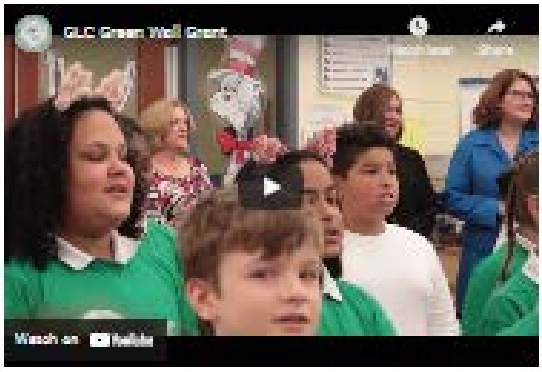
This letter confirms that the schools listed below are actively participating in the Air Quality Flag Program during the 2020-2021 School Year.

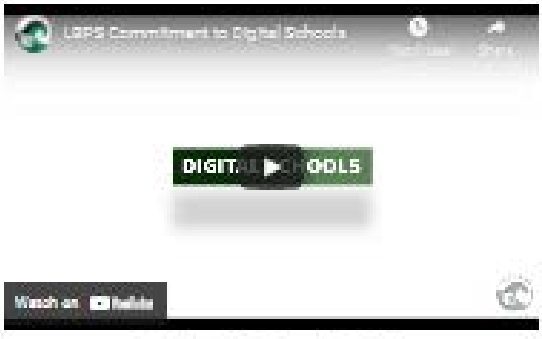
- Morris Avenue, Early Childhood Learning Center
- Joseph M. Ferraina, Early Childhood Learning Center
- Lenna W. Conrow, Early Childhood Learning Center
- Gregory Elementary
- George L. Catrambone Elementary
- Amerigo A. Anastasia Elementary
- Long Branch Middle School
- Long Branch High School
- Audrey W. Clark Alternative Academy

Diego DeAssis
S&E Sust. Officer
Long Branch Public Schools

Social Media







Digital Schools 2021

GLC Green Team SEL

Mrs. Pangborn's Class @lilipang1216 · Jun 4

So excited we were able to add a tomato plant to our school garden today 🪴🍅 **#greenwavegreener** #LBTogetherWeCan #JuntosPodemosLB #littlegarderners @AmerigoSchool

1 1 12

LBPS @LBpublicschools · May 25

Our Virtual Green Fair will premiere today at 5:00 pm on YouTube! We look forward to your attendance: youtu.be/FiCejujzYkE **#GreenWaveGreener**

LBPS Virtual Green Fair 2021 - Tuesday, May 25 at ...
The Long Branch Public Schools Annual Green Fair encourages sustainable lifestyle choices for our ...
youtube.com

4 11

M ❤ Guzman @GuzmanMolly10 · May 21

Love when the students help plant and get the LWC garden ready. 🌱🍃🍏🍅 @lwcschoolnews **#greenwavegreener** #LBtogetherwecan #lwceclc

3 9

Lee Carey @careylee324 · May 19

Planting day with 1st and 5th grade classes. @Esbarrett2000 @LBpublicschools @AmerigoSchool @LBSuptRodriguez @dgdeassis @MsWickes **#greenwavegreener** #LBtogetherwecan #JuntosPodemosLB

4 18

Diego DeAssis @dgdeassis · May 6

Looks like students are embracing the Spring 🌻 Fresh air, head in the sun, hands in the dirt! **#GreenWaveGreener**

> **Lee Carey** @careylee324 · May 6
>
> @Esbarrett2000 @LBpublicschools @AmerigoSchool @dgdeassis @LBSuptRodriguez @MsWickes @greenschoolsorg #greenwavegreener #LBtogetherwecan
>
> Show this thread

11

Lee Carey @careylee324 · May 6

@Esbarrett2000 @LBpublicschools @AmerigoSchool @dgdeassis @LBSuptRodriguez @MsWickes @greenschoolsorg **#greenwavegreener** #LBtogetherwecan

1 3 15

Show this thread

Kelley Stiles @StilesKelley · May 3

Today our students presented UPCYCLED creations to to their peers! Taking things that would normally be thrown away & giving them a 2nd life! I'm so proud of their hard work & enthusiasm! ♻️ @MsWickes **#GreenWaveGreener** #LBtogetherwecan

You and 2 others

2 3 23

GLC GREENER @greener_glc · Apr 30

🌳🌲Happy Arbor Day from @ElementaryGlc 🌲🌳 Happy students today with their Easter White Pines. Thank you @NJ_Forestry @LBpublicschools **#GreenWaveGreener**

1 11

GLC GREENER @greener_glc · Apr 23

Join our @ElementaryGlc family and make An Earth Day Pledge for Earth Week this year. We are hoping to reach #athousandactsofgreenatGLC @lroesch04 padlet.com/kstone28/xnzsd... **#GreenWaveGreener** @LBpublicschools

An Earth Day Pledge
I can make a difference by...
padlet.com

1 3 10

Michele Morey @michele_morey · Apr 23

To celebrate Earth🌎 Week we made bird🦜 feeders to place in our school garden @ElementaryGlc. We hope the birds come & eat! #EarthWeek2021 #LBTogetherWeCan **#GreenWaveGreener** @LBpublicschools @Peekapak @dgdeassis @NWF @SJ_Schools @NJAudubon @ngwood25 @NaturiCuriosity @anjeeorg

1 4 23

M❤Guzman @GuzmanMolly10 · Apr 22

Amazing Earth Day by the teachers and students of Lenna Conrow. Students took a walk and picked up trash around the school and made projects out of recycled material.
#greenwavegreener #LBtogetherwecan #JuntospodemosLB #lwceclc @lwcschoolnews

2

Michele Morey @michele_morey · Apr 22

When you get to bring home a reusable bag♻️ for your family on Earth Day!🌎 💚#EarthWeek2021 #LBTogetherWeCan **#GreenWaveGreener** @ElementaryGlc @ngwood25 @LBpublicschools @dgdeassis @green07740 @SJ_Schools @anjeeorg @greenschoolsorg @wasterecycling @TheNAAEE

2 15

Leah Oppito @MissOppitoLWC · Apr 22

Happy Earth Day 🌎 we planted dill seeds in our repurposed juice containers to celebrate today! **#greenwavegreener** #lwceclc #EarthDay2021 #lbtogetherwecan

1 4

jaime @MrsJaimeReilly · Apr 22

We recycled our milk cartons and drink boxes to plant seeds. **#greenwavegreener** #**#lwcecIc** @lwcschoolnews

2 2 19

Michele Morey @michele_morey · Apr 22

Students learn @ElementaryGlc about the environmental impact of animal agriculture & ways they can work to save the planet and animals. 🌎🍦🐓 #EarthWeek2021 **#GreenWaveGreener** #LBTogetherWeCan #JuntosPodemosLB @LBpublicschools @dgdeassis @ngwood25 @WWF @Peekapak @SJ_Schools @NWF

1 14

Michele Morey @michele_morey · Apr 22

Teaching @ElementaryGlc students how to show kindness to nature and discovering some little insect friends along the way! #EarthWeek2021 #LBTogetherWeCan **#GreenWaveGreener** #JuntosPodemosLB @NaturlCuriosity @LBpublicschools @dgdeassis @SJ_Schools @green07740 @greenschoolsorg

2 20

LBPS @LBpublicschools · Apr 22

Today is #EarthDay! Let's consider the many ways we can create a greener and healthier future for our children. **#GreenWaveGreener** #LBTogetherWeCan #JuntosPodemosLB

6 34

LBPS @LBpublicschools · Apr 19

Help us celebrate #earthweek2021 by sharing your classroom celebrations! **#GreenWaveGreener** #LBTogetherWeCan #JuntosPodemosLB

4 15

LBPS @LBpublicschools · Apr 17

Keeping the Jersey Shore beautiful! Our AWC School student green team dedicated their time and effort to do a beach sweep this morning! @CleanOcean Thank you to all students and staff! #LBTogetherWeCan #JuntosPodemosLB **#GreenWaveGreener**

4 36

Janise Stout @JaniseStout · Aug 23, 2020

Just checking on our garden!!! It's looking good! New this year broccoli! @greener_glc @michele_morey **#greenwavegreener** #wcmm @jmfeclc

1 2 19

Janise Stout @JaniseStout · Jul 29, 2020

When my little men, and Long Branch students, help harvest the @jmfeclc gardens! 100 cherry tomatoes harvested today along with more tomatoes, cucumbers, and jalapeños! **#greenwavegreener** @greener_glc @michele_morey

1 25

Diego DeAssis @dgdeassis · Jul 28, 2020

A conversation with NJ First Lady and a panel of amazing educators, which includes @LBpublicschools teacher, Kelly Stone! Way to go Kelly! Thank you for making NJ a greener place for our students! @greener_glc @Msalvatore2020 @GLC_Elementary2 **#GreenWaveGreener**

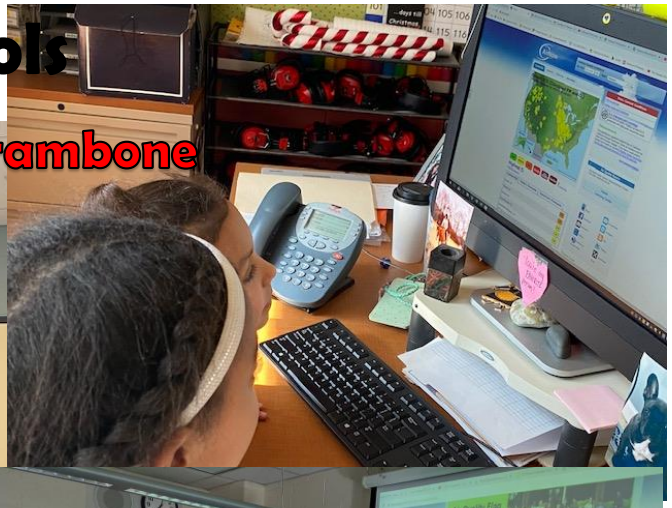
1 1 36

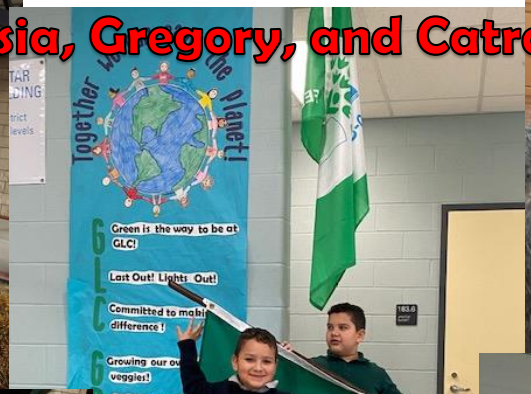
Early Childhood Schools

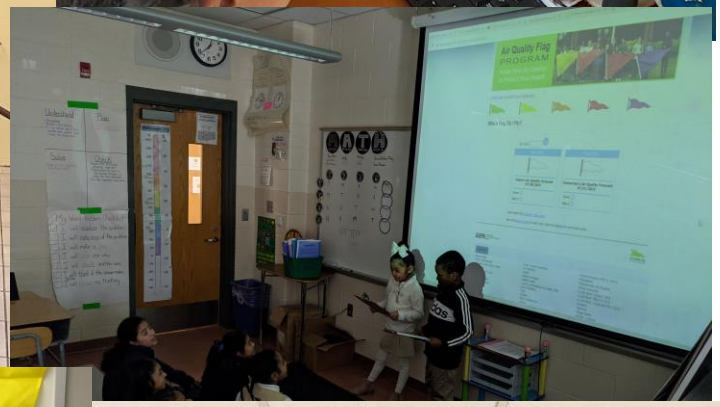
JMF, LWC, and Morris Avenue

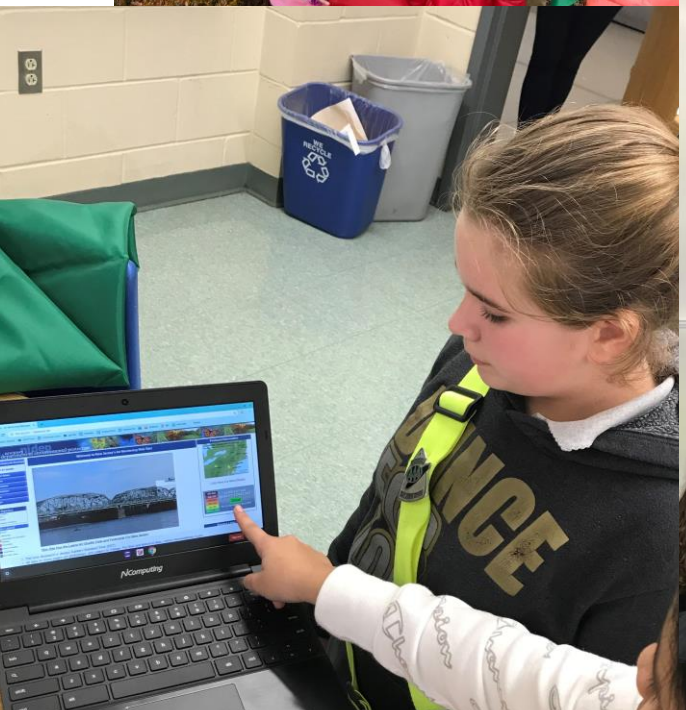
Elementary Schools

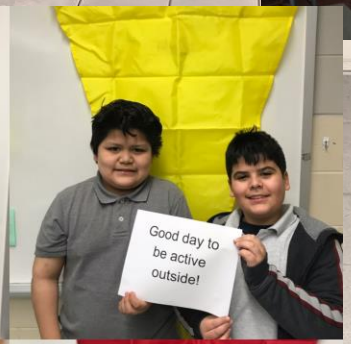
Anastasia, Gregory, and Catrambone

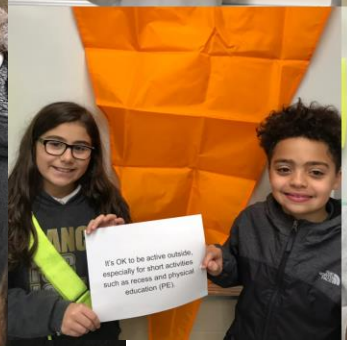


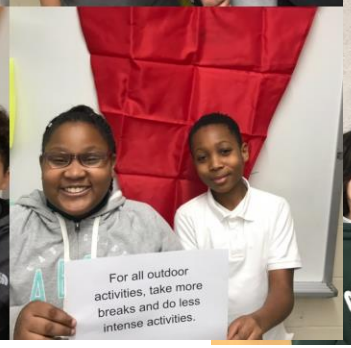




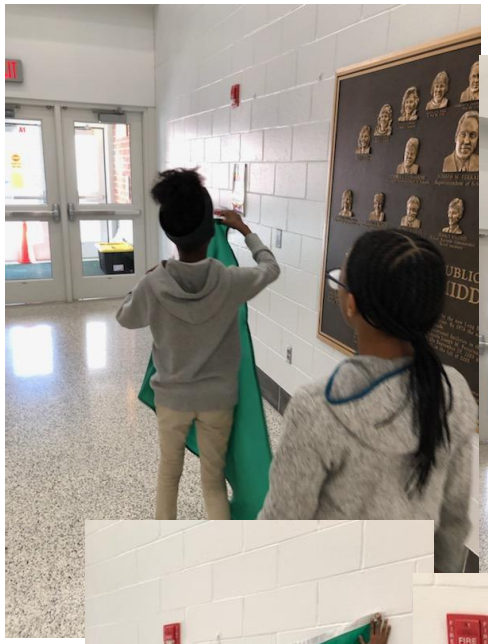








Alternative, Middle and High Schools



Here is the AP Environmental Science class learning about the Air quality index flag. Students will rotate who is in charge of changing the flag in the high school main lobby depending on the air quality index.

Energy Efficiency

Local Government Energy Audit:
Energy Audit Report

Board of Education Office

Long Branch Board of Education

540 Broadway
Long Branch, NJ 07740

October 27, 2017

Draft Report by:
TRC Energy Services

Disclaimer

The intent of this energy analysis report is to identify energy savings opportunities and recommend upgrades to the facility's energy using equipment and systems. Approximate savings are included in this report to help make decisions about reducing energy use at the facility. This report, however, is not intended to serve as a detailed engineering design document. Further design and analysis may be necessary in order to implement some of the measures recommended in this report.

The energy conservation measures and estimates of energy savings have been reviewed for technical accuracy. However, estimates of final energy savings are not guaranteed, because final savings may depend on behavioral factors and other uncontrollable variables. TRC Energy Services and New Jersey Board of Public Utilities (NJBPU) shall in no event be liable should the actual energy savings vary.

Estimated installation costs are based on TRC's experience at similar facilities, pricing from local contractors and vendors, and/or cost estimates from *RS Means*. The owner of the facility is encouraged to independently confirm these cost estimates and to obtain multiple estimates when considering measure installations. Since actual installed costs can vary widely for certain measures and conditions, TRC and NJBPU do not guarantee installed cost estimates and shall in no event be held liable should actual installed costs vary from estimates.

New Jersey's Clean Energy Program (NJCEP) incentive values provided in this report are estimates based on program information available at the time of the report. Incentive levels are not guaranteed. The NJBPU reserves the right to extend, modify, or terminate programs without prior notice. The owner of the facility should review available program incentives and eligibility requirements prior to selecting and installing any energy conservation measures.

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Table of Figures

1 EXECUTIVE SUMMARY

The New Jersey Board of Public Utilities (NJBPU) has sponsored this Local Government Energy Audit (LGEA) Report for the Board of Education Office.

The goal of an LGEA report is to provide you with information on how your facility uses energy, identify energy conservation measures (ECMs) that can reduce your energy use, and provide information and assistance to help facilities implement ECMs. The LGEA report also contains valuable information on financial incentives from New Jersey's Clean Energy Program (NJCEP) for implementing ECMs.

This study was conducted by TRC Energy Services, as part of a comprehensive effort to assist the Long Branch BOE in controlling energy costs and protecting our environment by offering a wide range of energy management options and advice.

1.1 Facility Summary

Board of Education Office is a 40,000 square foot facility comprised of two (2) floors of office space, a basement comprised of classrooms and an attic floor. The building was originally constructed in 1890. The building is occupied all year round. Monday through Friday the building is open between 6AM and 8PM, on Saturday and Sundays the building is open between 10AM and 5PM. The building has on average 75 to 110 occupants a day.

The building is 100% heated and cooled. The heating and cooling equipment at the Board of Education Office consists of aging and inefficient HVAC equipment which is in need of replacement. Per discussions with facility personnel, the furnaces and condensing units require frequent and costly maintenance. A thorough description of the facility and our observations are located in Section 2, "Facility Information and Existing Conditions".

1.2 Your Cost Reduction Opportunities

Energy Conservation Measures

TRC Energy Services evaluated 14 measures which together represent an opportunity for Board of Education Office to reduce annual energy costs by roughly $19,347 and annual greenhouse gas emissions by 159,598 lbs CO_2e. We estimate that if all measures were implemented as recommended, the project would pay for itself in roughly 8.2 years. The breakdown of existing and potential utility costs after project implementation are illustrated in Figure 1 and Figure 2b – Potential Post-Implementation Costs – Actual (With the PV System Electric Generation taken into account), respectively. Together these measures represent an opportunity to reduce Board of Education Office's annual energy use by 32%.

Figure 1 – Previous 12 Month Utility Costs

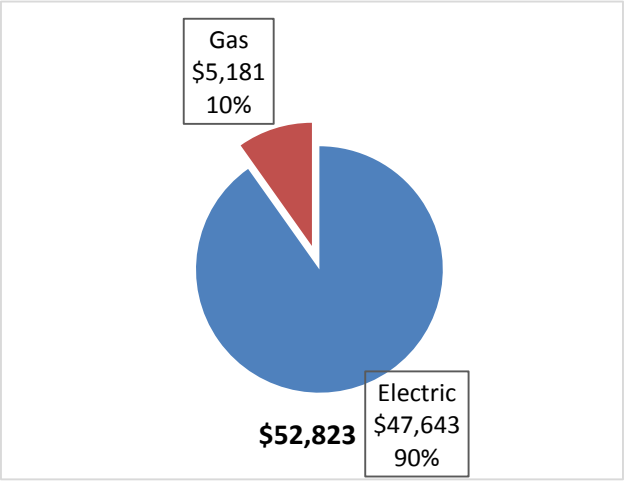


Figure 2b – Potential Post-Implementation Costs – Actual (With the PV System Electric Generation taken into account)

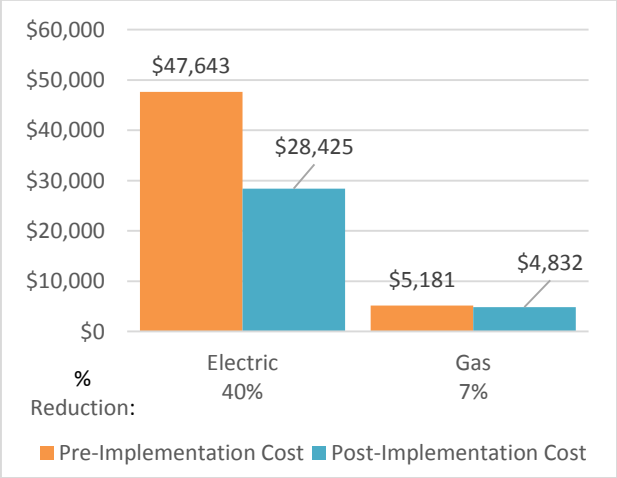
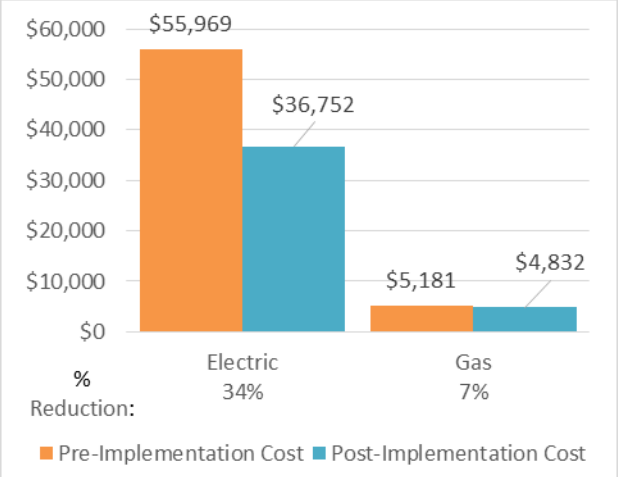


Figure 3a – Potential Post-Implementation Costs – Theoretical (Without the PV System Electric Generation taken into account)



A detailed description of Board of Education Office's existing energy use can be found in Section 3, "Site Energy Use and Costs".

Since there is an existing PV System installed at the facility. The actual building electrical consumption and costs are higher than what is paid for and shown on utility bills. Therefore, in order to demonstrate the post-implementation costs, two (2) figures are shown above. The first shows the theoretical building electrical costs and impact of energy conservation measures. The second shows the actual costs which results from energy conservation measures.

Estimates of the total cost, energy savings, and financial incentives for the proposed energy efficient upgrades are summarized below in Figure 4. A brief description of each category can be found below and a description of savings opportunities can be found in Section 4, "Energy Conservation Measures".

Figure 4 – Summary of Energy Reduction Opportunities

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_2e Emissions Reduction (lbs)
Lighting Upgrades			**73,157**	**9.4**	**0.0**	**$8,962.53**	**$75,862.50**	**$4,750.00**	**$71,112.50**	**7.9**	**73,668**
ECM 1	Install LED Fixtures	Yes	14,877	0.3	0.0	$1,822.65	$28,162.65	$400.00	$27,762.65	15.2	14,981
ECM 2	Retrofit Fluorescent Fixtures with LED Lamps and Drivers	Yes	52,997	8.5	0.0	$6,492.72	$45,926.00	$4,185.00	$41,741.00	6.4	53,368
ECM 3	Retrofit Fixtures with LED Lamps	Yes	5,282	0.6	0.0	$647.16	$1,773.85	$165.00	$1,608.85	2.5	5,319
Lighting Control Measures			**12,175**	**1.8**	**0.0**	**$1,491.58**	**$12,896.00**	**$1,900.00**	**$10,996.00**	**7.4**	**12,260**
ECM 4	Install Occupancy Sensor Lighting Controls	Yes	12,175	1.8	0.0	$1,491.58	$12,896.00	$1,900.00	$10,996.00	7.4	12,260
Electric Unitary HVAC Measures			**15,297**	**5.0**	**0.0**	**$1,874.03**	**$38,901.72**	**$2,392.00**	**$36,509.72**	**19.5**	**15,404**
ECM 5	Install High Efficiency Electric AC	Yes	15,297	5.0	0.0	$1,874.03	$38,901.72	$2,392.00	$36,509.72	19.5	15,404
Gas Heating (HVAC/Process) Replacement			**0**	**0.0**	**91.6**	**$1,087.79**	**$24,923.07**	**$9,200.00**	**$15,723.07**	**14.5**	**10,730**
ECM 6	Install High Efficiency Furnaces	Yes	0	0.0	91.6	$1,087.79	$24,923.07	$9,200.00	$15,723.07	14.5	10,730
HVAC System Improvements			**417**	**0.0**	**0.0**	**$51.10**	**$43.50**	**$0.00**	**$43.50**	**0.9**	**420**
ECM 7	Install Pipe Insulation	Yes	417	0.0	0.0	$51.10	$43.50	$0.00	$43.50	0.9	420
Domestic Water Heating Upgrade			**32,056**	**1.4**	**-86.4**	**$2,901.56**	**$8,401.12**	**$50.00**	**$8,351.12**	**2.9**	**22,163**
ECM 8	Install High Efficiency Gas Water Heater	Yes	25,322	1.4	-86.4	$2,076.67	$8,286.40	$50.00	$8,236.40	4.0	15,383
ECM 9	Install Low-Flow Domestic Hot Water Devices	Yes	6,733	0.0	0.0	$824.89	$114.72	$0.00	$114.72	0.1	6,780
Plug Load Equipment Control - Vending Machine			**1,612**	**0.0**	**0.0**	**$197.47**	**$230.00**	**$0.00**	**$230.00**	**1.2**	**1,623**
ECM 10	Vending Machine Control	Yes	1,612	0.0	0.0	$197.47	$230.00	$0.00	$230.00	1.2	1,623
Custom Measures			**22,150**	**1.0**	**24.2**	**$3,000.32**	**$15,310.00**	**$0.00**	**$15,310.00**	**5.1**	**25,133**
ECM 11	Computer Power Management Software	Yes	13,029	0.0	0.0	$1,596.14	$3,385.00	$0.00	$3,385.00	2.1	13,120
ECM 12	Replace Refrigerator with Compact Energy Star Equipment	Yes	2,784	1.0	0.0	$341.10	$500.00	$0.00	$500.00	1.5	2,804
ECM 13	Weatherstrip Exterior Doors	Yes	1,173	0.0	2.4	$172.10	$625.00	$0.00	$625.00	3.6	1,461
ECM 14	Retro-Commissioning Study & HVAC Improvements	Yes	5,164	0.0	21.8	$890.99	$10,800.00	$0.00	$10,800.00	12.1	7,748
TOTALS			**156,863**	**18.6**	**29.4**	**$19,566.38**	**$176,567.91**	**$18,292.00**	**$158,275.91**	**8.1**	**161,401**

* - 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).

Lighting Upgrades generally involve the replacement of existing lighting components such as lamps and ballasts (or the entire fixture) with higher efficiency lighting components. These measure save energy by reducing the power used by the lighting components due to improved electrical efficiency.

Lighting Controls measures generally involve the installation of automated controls to turn off lights or reduce light output when not needed. Automated control reduces reliance on occupant behavior for adjusting lights. These measures save energy by reducing the amount of time lights are on.

Electric Unitary HVAC measures generally involve replacing older inefficient air conditioning systems with modern energy efficient systems. New air conditioning systems can provide equivalent cooling to older air condition systems at a reduced energy cost. These measures save energy by reducing the power used by the air conditioning systems, due to improved electrical efficiency.

Gas Heating (HVAC/Process) measures generally involve replacing older inefficient hydronic heating systems with modern energy efficient systems. Gas heating systems can provide equivalent heating compared to older systems at a reduced energy cost. These measures save energy by reducing the fuel demands for heating, due to improved combustion and heat transfer efficiency.

HVAC System Improvements generally involve the installation of automated controls to reduce heating and cooling demand during periods of reduced demand. These measures could encompass changing temperature setpoints, using outside air for free cooling, or limiting excessive outside air during extreme outdoor air temperature conditions. These measures save energy by reducing the demand on HVAC systems and the amount of time systems operate.

Domestic Hot Water upgrade measures generally involve replacing older inefficient domestic water heating systems with modern energy efficient systems. New domestic hot water heating systems can

provide equivalent, or greater, water heating capacity compared to older systems at a reduced energy cost. These measures save energy by reducing the fuel used for domestic hot water heating due to improved heating efficiency or reducing standby losses.

Plug Load Equipment control measures generally involve installing automated devices that limit the power usage or operation of equipment that is plugged into an electric outlets when not in use.

Energy Efficient Practices

TRC Energy Services also identified 17 low cost or no cost energy efficient practices. A facility's energy performance can be significantly improved by employing certain behavioral or operational adjustments and by performing better routine maintenance on building systems. These practices can extend equipment lifetime, improve occupant comfort, provide better health and safety, as well as reduce annual energy and O&M costs. Potential opportunities identified at Board of Education Office include:

For details on these Energy Efficient Practices, please refer to section 5.

On-Site Generation Measures

TRC Energy Services evaluated the potential for installing on-Site generation for Board of Education Office. Solar PV panels were previously installed. Based on the configuration of the site and its loads there is a low potential for installing combined heat and power self-generation measure.

1.3 Implementation Planning

To realize the energy savings from the ECMs listed in this report, a project implementation plan must be developed. Available capital must be considered and decisions need to be made whether it is best to pursue individual ECMs separately, groups of ECMs, or a comprehensive approach where all ECMs are implemented together, possibly in conjunction with other facility upgrades or improvements.

Rebates, incentives, and financing are available from NJCEP, as well as other sources, to help reduce the costs associated with the implementation of energy efficiency projects. Prior to implementing any measure, please review the relevant incentive program guidelines before proceeding. This is important because in most cases you will need to submit applications for the incentives prior to purchasing materials or commencing with installation.

The ECMs outlined in this report may qualify under the following program(s):

- SmartStart (SS)
- Direct Install (DI)
- Energy Savings Improvement Program (ESIP)
- Demand Response Energy Aggregator

For facilities wanting to pursue only selected individual measures (or planning to phase implementation of selected measures over multiple years), incentives are available through the SmartStart program. To participate in this program you may utilize internal resources, or an outside firm or contractor, to do the final design of the ECM(s) and do the installation. Program pre-approval is required for some SS incentives, so only after receiving pre-approval should you proceed with ECM installation. The incentive estimates listed above in Figure 4 are based on the SS program. More details on this program and others are available in Section 7.

For larger facilities with limited capital availability to implement ECMs, project financing may be available through the Energy Savings Improvement Program (ESIP). Supported directly by the NJBPU, ESIP provides government agencies with project development, design, and implementation support services, as well as, attractive financing for implementing ECMs. An LGEA report (or other approved energy audit) is required for participation in ESIP. Please refer to Section 7.3 for additional information on the ESIP Program.

The Demand Response Energy Aggregator is a (non-NJCEP) program designed to reduce electric loads at commercial facilities, when wholesale electricity prices are high or when the reliability of the electric grid is threatened due to peak power demand. Demand Response (DR) service providers (a.k.a. Curtailment Service Providers) are registered with PJM, the independent system operator (ISO) for mid-Atlantic state region that is charged with maintaining electric grid reliability. By enabling grid operators to call upon commercial facilities to reduce their electric usage during times of peak demand, the grid is made more reliable and overall transmission costs are reduced for all ratepayers. Curtailment Service Providers provide regular payments to medium and large consumers of electric power for their participation in DR programs. Program participation is voluntary and facilities receive payments whether or not they are called upon to curtail their load during times of peak demand. Refer to Section 6 for additional information on this program.

Additional information on relevant incentive programs is located in Section 7. You may also check the following website for more details: www.njcleanenergy.com/ci

2 FACILITY INFORMATION AND EXISTING CONDITIONS

2.1 Project Contacts

Figure 5 – Project Contacts

Name	Role	E-Mail	Phone #
Customer			
Ann Degnan	Facilities Manager	adegnan@longbranch.k12.nj.us	732-733-3521
Gary Vecchione	Assistant Facilities	gvecchione@longbranch.k12.nj.us	732-600-7979
Peter Genovese III	Business	pgenovese@longbranch.k12.nj.us	
TRC Energy Services			
Aimee Lalonde	Auditor	alalonde@trcsolutions.com	(732) 855-0033

2.2 General Site Information

On March 17, 2017, TRC Energy Services performed an energy audit at Board of Education Office located in Long Branch, NJ. TRC Energy Services' team met with Dean or Kenny to review the facility operations and help focus our investigation on specific energy-using systems.

Board of Education Office is a 40,000 square foot facility comprised of two (2) floors of office space, a basement comprised of classrooms and an attic floor. The building was originally constructed in 1890. The building is 100% heated and cooled. The heating and cooling equipment at the Board of Education Office consists of aging and inefficient HVAC equipment which is in need of replacement. Per discussions with facility personnel, the furnaces and condensing units require frequent and costly maintenance. The replacement of this equipment is therefore recommended. The site is interested in a new EMS, but has been unable to fund the project. The existing system is said to be old and there is a likelihood that operation and components may be upgraded to improve efficiency. It is recommended that a qualified contractor be contacted for a retro-commissioning study of the HVAC system and control system and for all low/no-cost measures resulting from this study be implemented.

2.3 Building Occupancy

The building is occupied all year round. Monday through Friday the building is open between 6AM and 8PM, on Saturday and Sundays the building is open between 10AM and 5PM. The building has on average 75 to 110 occupants a day. The typical schedule is presented in the table below.

Figure 6 - Building Schedule

Building Occupancy Schedule		
Building Name	**Weekday/Weekend**	**Operating Schedule**
Board of Education Office	Weekday	6AM - 8PM
Board of Education Office	Weekend	10AM - 5PM

2.4 Building Envelope

The building is constructed of concrete masonry units with a brick façade. The building has a pitched and a flat roof which appear in fair condition. The building has double pane operable windows with metal frames. The exterior doors are typically metal with glass panes and metal frames. The sealant around

these frames appears to be in good condition. However it is recommended that caulking frames be included in a maintenance schedule every five (5) years. The main entrance doors have worn weather-stripping materials which show signs of excessive infiltration.

2.5 On-Site Generation

Board of Education Office installed a 14.1 kW solar energy project in 2011. The project included a roof mounted photovoltaic (PV) system. There are approximately 62 PV panels in total. The systems is estimated to provide 15% of the electricity required by the facility. Ray Angelini, Inc. had installed the roof mounted 14.1 kWDC photovoltaic (solar) energy generation system, operating exclusively as a Net Metering Photovoltaic Solar Electric Facility (SEF).

The PV System generates 15% of the total annual electrical consumption for the building. Based on the information provided for the PV system generation and the building utility bills, the chart below demonstrates the estimates actual electric consumption of the building is in comparison to what is generated and what is paid for from the grid.

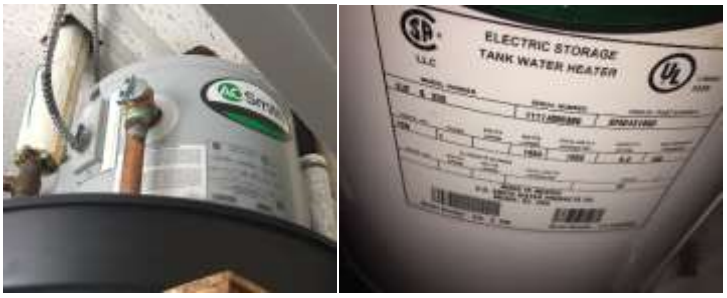
2.6 Energy-Using Systems

Lighting & Controls – The building is primarily lit by linear fluorescent fixtures which contain 32W T8 lamps. Majority of fixtures are 2 lamp while some areas have 1L and 3L fixtures. In general purpose areas there are screw in compact fluorescent and incandescent lamps. Majority of rooms throughout the building have manual wall switches for lighting controls. The exterior lighting includes pole mounted flood fixtures with high pressure sodium lamps. These are controlled by a timeclock. The trailers have compact fluorescent lamp wall pack fixtures.

There is an opportunity for energy savings by upgrading to LED technology throughout the interior and exterior applications. There is an opportunity for energy savings by installing occupancy based sensors in beneficial locations.

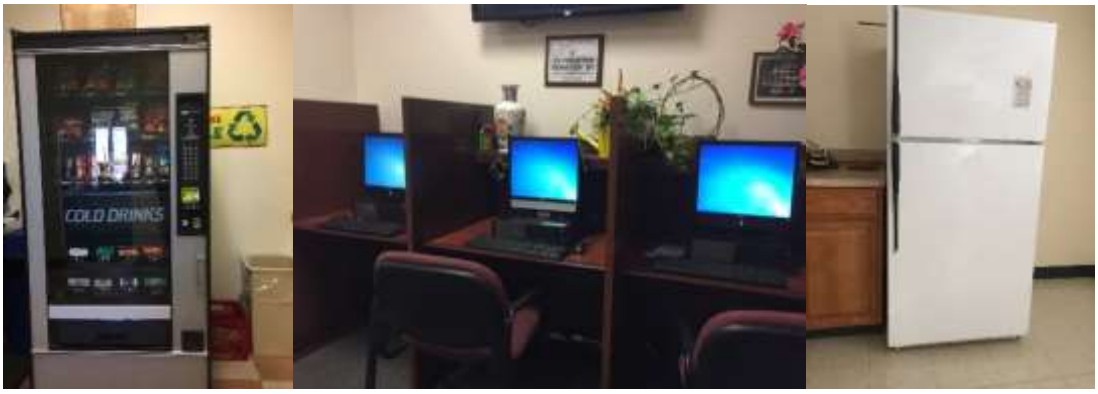
Motors – The HVAC systems that serve the building include fan motors which are generally in fair condition. These standard supply fan motors are located in the furnaces throughout the building. There are also exhaust fan motors located on the roof and are assumed in fair condition.

Domestic Hot Water – There are electric storage tank domestic hot water heaters. These are in good condition and of standard efficiency. The largest unit which serves the majority of the building is 30 gallons in capacity. There is an opportunity for energy and cost savings by replacing with a high efficiency condensing storage tank water heater and switching to natural gas. The copper domestic hot water piping was noted to be uninsulated and therefore presents an opportunity for energy savings by insulating the pipe.

HVAC System & Controls – The building is conditioned by forced air gas-fired furnaces which are also equipped with a cooling coil served by outdoor or attic condensing units. Per discussions with facility personnel, this equipment is in poor condition, requires frequent and costly maintenance and in need of replacement. There is an opportunity for energy savings by replacing the furnaces and condensing units with high efficiency equipment. The HVAC systems and equipment are controlled by a Building Management System (BMS), which is said to be old and outdated. There are manual dial thermostat/temperature sensors in the space that were set between 69 and 75 degrees. There is an opportunity for energy savings by having a qualified retro-commissioning contractor come in and perform a study and then implement low/no cost measures to increase control ability of the system and ensure all faulty sensors and devices are replaced.

Plug Load Equipment – There is general office and café equipment throughout the building. There were also a number of computers that were left on while not being used. The building has an elevator as well. There is a snack/drink vending machine in the building that is currently not controlled and runs 24/7. The computers throughout the building also provide a potential for implementing energy management software. Refrigerators were not filled to capacity, in fair condition and not energy star. There is also an opportunity to replace a refrigerator with a compact energy star fridge.



2.7 Water-Using Systems

The restrooms throughout the facility have faucets fit with higher flow devices. A sampling of restrooms found that the faucets are rated for 2.0 gpm or higher. Toilets and urinals do not contribute to excessive energy usage with higher flow rates, however when water conservation and costs are considered their flow rates may provide potential for operational savings through replacement with low flow devices. We recommend considering low flow devices when existing water fixtures reach the end of their useful life.

3 SITE ENERGY USE AND COSTS

Utility data for Electricity and Natural Gas was analyzed to identify opportunities for savings. In addition, data for Electricity and Natural Gas was evaluated to determine the annual energy performance metrics for the building in energy cost per square foot and energy usage per square foot. These metrics are an estimate of the relative energy efficiency of this building. There are a number of factors that could cause the energy use of this building to vary from the "typical" energy usage profile for facilities with similar characteristics. Local weather conditions, building age and insulation levels, equipment efficiency, daily occupancy hours, changes in occupancy throughout the year, equipment operating hours, and energy efficient behavior of occupants all contribute to benchmarking scores. Please refer to the Benchmarking section within Section 3.4 for additional information.

3.1 Total Cost of Energy

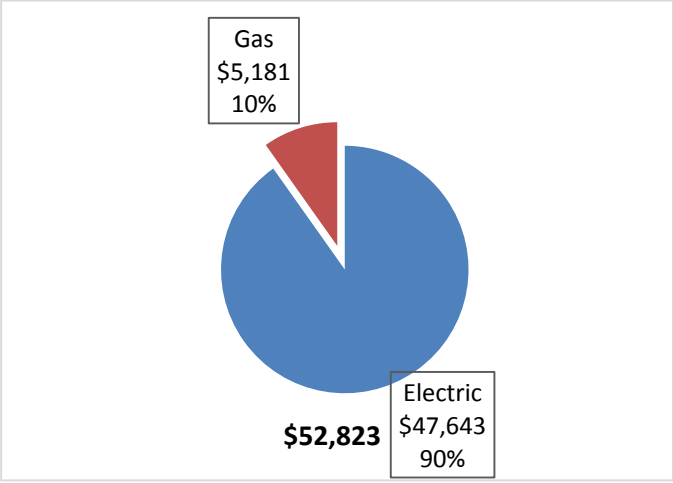
The following energy consumption and cost data is based on the last 12-month period of utility billing data that was provided for each utility. A profile of the annual energy consumption and energy cost of the facility was developed from this information.

Figure 7 - Utility Summary

Utility Summary for Board of Education Office		
Fuel	**Usage**	**Cost**
Electricity	388,883 kWh	$47,643
Natural Gas	4,364 Therms	$5,181
Total		**$52,823**

The current annual energy cost for this facility is $52,823 as shown in the chart below.

Figure 8 - Energy Cost Breakdown



3.2 Electricity Usage

Electricity is provided by JCP&L. The average electric cost over the past 12 months was $0.123/kWh, which is the blended rate that includes energy supply, distribution, and other charges. This rate is used throughout the analyses in this report to assess energy costs and savings. The facility pays electric demand costs. The monthly electricity consumption and peak demand are shown in the chart below.

Figure 9 - Graph of 12 Months Electric Usage & Demand

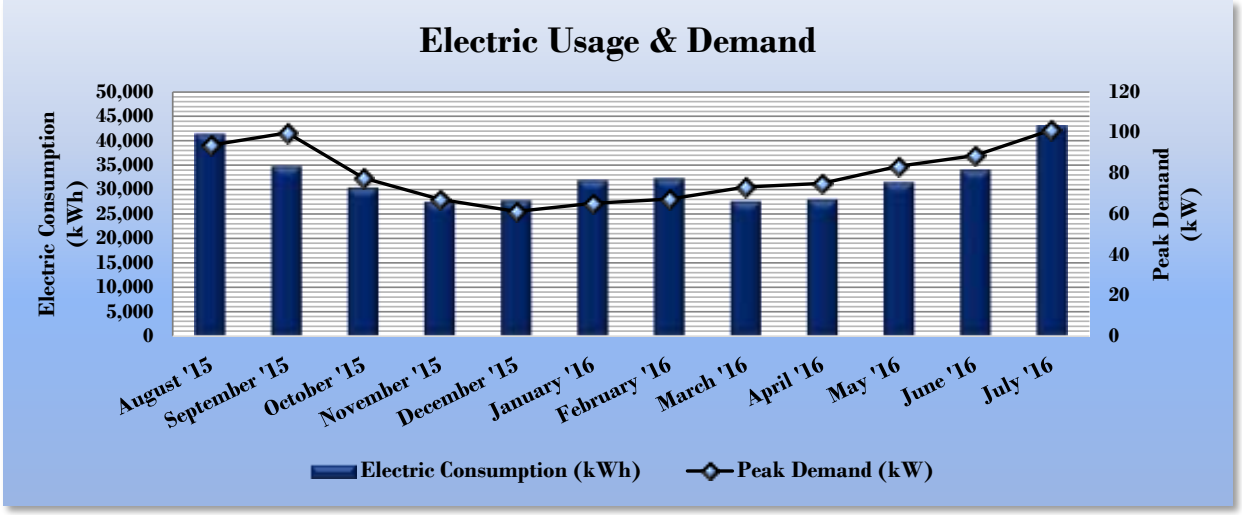


Figure 10 - Table of 12 Months Electric Usage & Demand

Electric Billing Data for Board of Education Office					
Period Ending	Days in Period	Electric Usage (kWh)	Demand (kW)	Demand Cost	Total Electric Cost
9/2/15	33	41,243	94	$554	$4,903
10/2/15	30	34,651	100	$552	$4,345
11/3/15	32	30,304	78	$436	$3,714
12/4/15	31	27,375	67	$377	$3,368
1/5/16	32	27,730	61	$336	$3,382
2/2/16	28	31,798	65	$366	$3,807
3/2/16	29	32,181	67	$378	$3,840
3/31/16	29	27,539	73	$410	$3,417
4/29/16	29	27,900	75	$421	$3,470
5/31/16	32	31,369	84	$502	$3,884
7/1/16	31	33,920	89	$525	$4,270
7/30/16	29	42,873	101	$601	$5,244
Totals	**365**	**388,883**	**101.3**	**$5,457**	**$47,643**
Annual	**365**	**388,883**	**101.3**	**$5,457**	**$47,643**

3.3 Natural Gas Usage

Natural Gas is provided by NJ Natural Gas. The average gas cost for the past 12 months is $1.187/therm, which is the blended rate used throughout the analyses in this report. The monthly gas consumption is shown in the chart below.

Figure 11 - Graph of 12 Months Natural Gas Usage

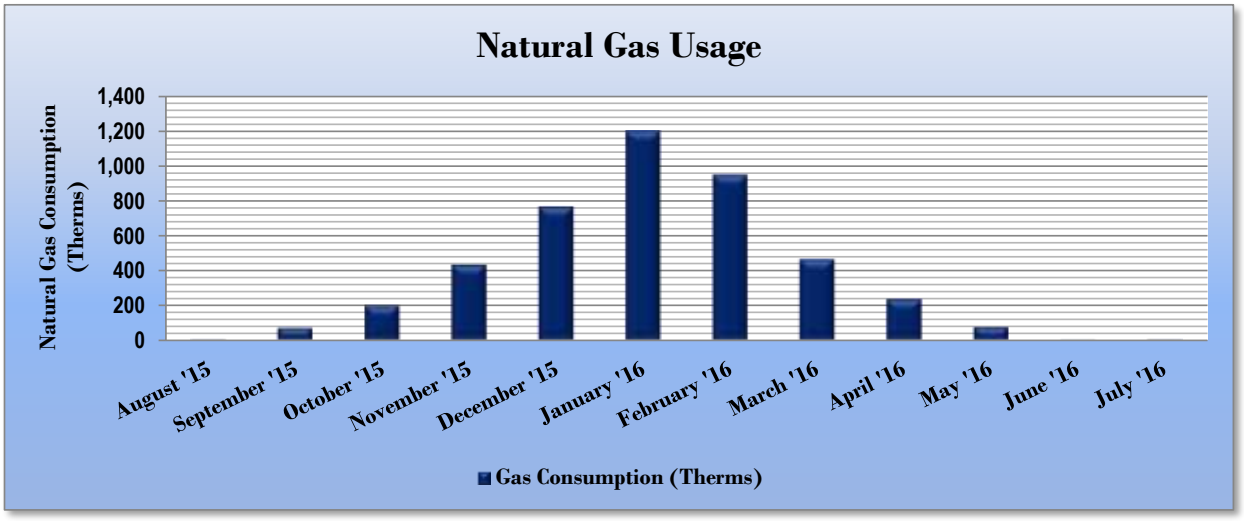


Figure 12 - Table of 12 Months Natural Gas Usage

Gas Billing Data for Board of Education Office			
Period Ending	Days in Period	Natural Gas Usage (Therms)	Natural Gas Cost
9/10/15	30	2	$144
10/8/15	28	70	$198
11/9/15	32	199	$299
12/10/15	31	432	$487
1/12/16	33	764	$753
2/12/16	31	1,198	$1,099
3/15/16	32	946	$898
4/11/16	27	463	$512
5/11/16	30	236	$330
6/13/16	33	75	$202
7/14/16	31	1	$143
8/12/16	29	2	$144
Totals	**367**	**4,388**	**$5,209**
Annual	**365**	**4,364**	**$5,181**

3.4 Benchmarking

This facility was benchmarked using *Portfolio Manager*, an online tool created and managed by the U.S. Environmental Protection Agency (EPA) through the ENERGY STAR™ program. Portfolio Manager analyzes your building's consumption data, cost information, and operational use details and then compares its performance against a national median for similar buildings of its type. Metrics provided by this analysis are Energy Use Intensity (EUI) and an ENERGY STAR Score for select building types.

Energy Use Intensity is a measure of a facility's energy consumption per square foot, and it is the standard metric for comparing buildings' energy performance. Comparing the EUI of a building with the national median EUI for that building type illustrates whether that building uses more or less energy than similar buildings of its type on a square foot basis. EUI is presented in terms of "site energy" and "source energy". Site energy is the amount of fuel and electricity consumed by a building as reflected in utility bills. Source energy includes fuel consumed to generate electricity consumed at the site, factoring in electric production and distribution losses for the region.

Figure 13 - Energy Use Intensity Comparison – Existing Conditions

Energy Use Intensity Comparison - Existing Conditions		
	Board of Education Office	National Median Building Type: Office
Source Energy Use Intensity (kBtu/ft^2)	115.6	148.1
Site Energy Use Intensity (kBtu/ft^2)	44.1	67.3

Implementation of all recommended measures in this report would improve the building's estimated EUI significantly, as shown in the Table below:

Figure 14 - Energy Use Intensity Comparison – Following Installation of Recommended Measures

Energy Use Intensity Comparison - Following Installation of Recommended Measures		
	Board of Education Office	National Median Building Type: Office
Source Energy Use Intensity (kBtu/ft^2)	72.8	148.1
Site Energy Use Intensity (kBtu/ft^2)	30.0	67.3

Many types of commercial buildings are also eligible to receive an ENERGY STAR™ score. This score is a percentile ranking from 1 to 100. It compares your building's energy performance to similar buildings nationwide. A score of 50 represents median energy performance, while a score of 75 means your building performs better than 75 percent of all similar buildings nationwide and may be eligible for ENERGY STAR® certification. Your building is not is one of the building categories that are eligible to receive a score.

This facility has a current score of 89.

A Portfolio Manager Statement of Energy Performance (SEP) was generated for this facility, see **Appendix B: EPA Statement of Energy Performance**.

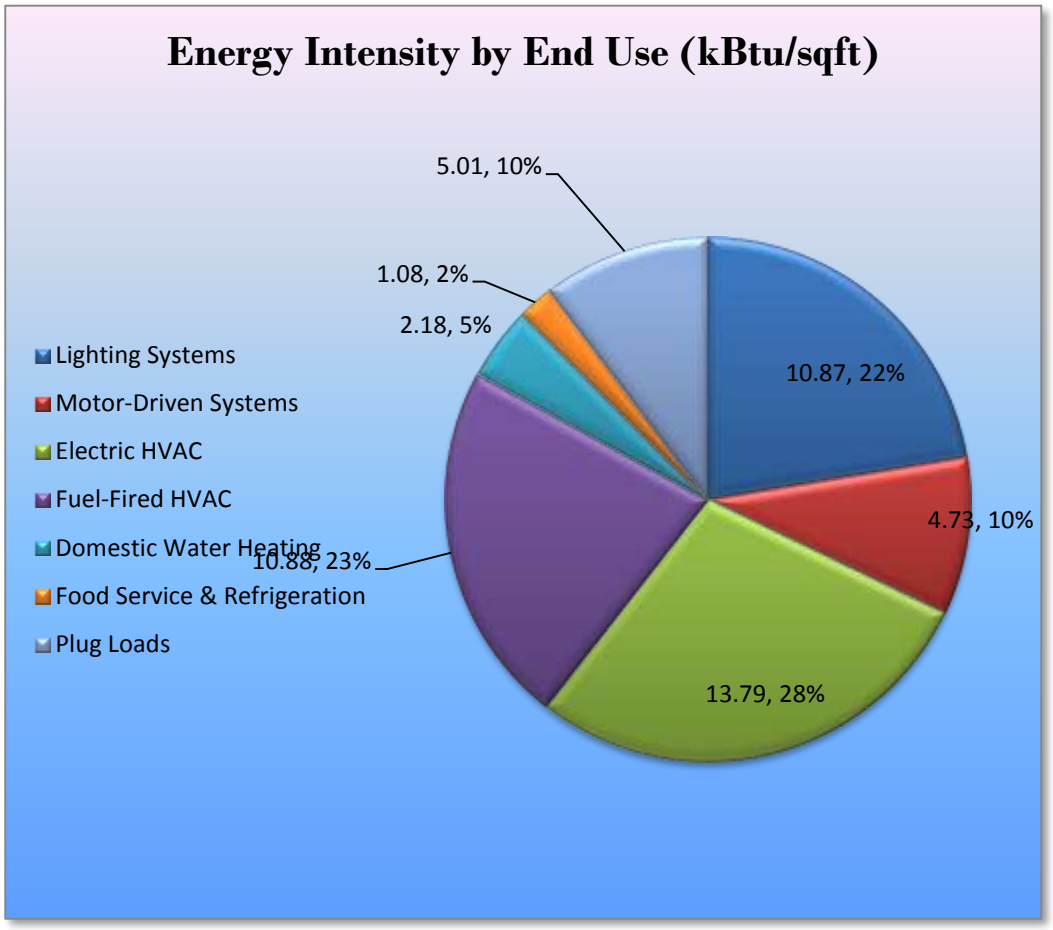
For more information on Energy Star certification go to: https://www.energystar.gov/buildings/facility-owners-and-managers/existing-buildings/earn-recognition/energy-star-certification/how-app-1

A Portfolio Manager account has been created online for your facility and you will be provided with the login information for the account. We encourage you to update your utility information in Portfolio Manager regularly, so that you can keep track of your building's performance. Free online training is available to help you use Energy Star Portfolio Manager to track your building's performance at: https://www.energystar.gov/buildings/training

3.5 Energy End-Use Breakdown

In order to provide a complete overview of energy consumption across building systems, an energy balance was performed at this facility. An energy balance utilizes standard practice engineering methods to evaluate all components of the various electric and fuel-fired systems found in a building to determine their proportional contribution to overall building energy usage. This chart of energy end uses highlights the relative contribution of each equipment category to total energy usage. This can help determine where the greatest benefits might be found from energy efficiency measures.

Figure 15 - Energy Balance (% and kBtu/SF)



4 ENERGY CONSERVATION MEASURES

Level of Analysis

The goal of this audit report is to identify potential energy efficiency opportunities, help prioritize specific measures for implementation, and provide information to the Board of Education Office regarding financial incentives for which they may qualify to implement the recommended measures. For this audit report, most measures have received only a preliminary analysis of feasibility which identifies expected ranges of savings and costs. This level of analysis is usually considered sufficient to demonstrate project cost-effectiveness and help prioritize energy measures. Savings are based on the New Jersey Clean Energy Program Protocols to Measure Resource Savings dated March 17, 2014, approved by the New Jersey Board of Public Utilities. Further analysis or investigation may be required to calculate more precise savings based on specific circumstances. A higher level of investigation may be necessary to support any custom SmartStart or Pay for Performance, or Direct Install incentive applications. Financial incentives for the ECMs identified in this report have been calculated based the NJCEP prescriptive SmartStart program. Some measures and proposed upgrade projects may be eligible for higher incentives than those shown below through other NJCEP programs as described in Section 7.

The following sections describe the evaluated measures.

4.1 Recommended ECMs

The measures below have been evaluated by the auditor and are recommended for implementation at the facility.

Figure 16 – Summary of Recommended ECMs

Energy Conservation Measure		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_2e Emissions Reduction (lbs)
Lighting Upgrades		**73,157**	**9.4**	**0.0**	**$8,962.53**	**$75,862.50**	**$4,750.00**	**$71,112.50**	**7.9**	**73,668**
ECM 1	Install LED Fixtures	14,877	0.3	0.0	$1,822.65	$28,162.65	$400.00	$27,762.65	15.2	14,981
ECM 2	Retrofit Fluorescent Fixtures with LED Lamps and Drivers	52,997	8.5	0.0	$6,492.72	$45,926.00	$4,185.00	$41,741.00	6.4	53,368
ECM 3	Retrofit Fixtures with LED Lamps	5,282	0.6	0.0	$647.16	$1,773.85	$165.00	$1,608.85	2.5	5,319
Lighting Control Measures		**12,175**	**1.8**	**0.0**	**$1,491.58**	**$12,896.00**	**$1,900.00**	**$10,996.00**	**7.4**	**12,260**
ECM 4	Install Occupancy Sensor Lighting Controls	12,175	1.8	0.0	$1,491.58	$12,896.00	$1,900.00	$10,996.00	7.4	12,260
Electric Unitary HVAC Measures		**15,297**	**5.0**	**0.0**	**$1,874.03**	**$38,901.72**	**$2,392.00**	**$36,509.72**	**19.5**	**15,404**
ECM 5	Install High Efficiency Electric AC	15,297	5.0	0.0	$1,874.03	$38,901.72	$2,392.00	$36,509.72	19.5	15,404
Gas Heating (HVAC/Process) Replacement		**0**	**0.0**	**91.6**	**$1,087.79**	**$24,923.07**	**$9,200.00**	**$15,723.07**	**14.5**	**10,730**
ECM 6	Install High Efficiency Furnaces	0	0.0	91.6	$1,087.79	$24,923.07	$9,200.00	$15,723.07	14.5	10,730
HVAC System Improvements		**417**	**0.0**	**0.0**	**$51.10**	**$43.50**	**$0.00**	**$43.50**	**0.9**	**420**
ECM 7	Install Pipe Insulation	417	0.0	0.0	$51.10	$43.50	$0.00	$43.50	0.9	420
Domestic Water Heating Upgrade		**32,056**	**1.4**	**-86.4**	**$2,901.56**	**$8,401.12**	**$50.00**	**$8,351.12**	**2.9**	**22,163**
ECM 8	Install High Efficiency Gas Water Heater	25,322	1.4	-86.4	$2,076.67	$8,286.40	$50.00	$8,236.40	4.0	15,383
ECM 9	Install Low-Flow Domestic Hot Water Devices	6,733	0.0	0.0	$824.89	$114.72	$0.00	$114.72	0.1	6,780
Plug Load Equipment Control - Vending Machine		**1,612**	**0.0**	**0.0**	**$197.47**	**$230.00**	**$0.00**	**$230.00**	**1.2**	**1,623**
ECM 10	Vending Machine Control	1,612	0.0	0.0	$197.47	$230.00	$0.00	$230.00	1.2	1,623
Custom Measures		**22,150**	**1.0**	**24.2**	**$3,000.32**	**$15,310.00**	**$0.00**	**$15,310.00**	**5.1**	**25,133**
ECM 11	Computer Power Management Software	13,029	0.0	0.0	$1,596.14	$3,385.00	$0.00	$3,385.00	2.1	13,120
ECM 12	Replace Refrigerator with Compact Energy Star Equipment	2,784	1.0	0.0	$341.10	$500.00	$0.00	$500.00	1.5	2,804
ECM 13	Weatherstrip Exterior Doors	1,173	0.0	2.4	$172.10	$625.00	$0.00	$625.00	3.6	1,461
ECM 14	Retro-Commissioning Study & HVAC Improvements	5,164	0.0	21.8	$890.99	$10,800.00	$0.00	$10,800.00	12.1	7,748
TOTALS		**156,863**	**18.6**	**29.4**	**$19,566.38**	**$176,567.91**	**$18,292.00**	**$158,275.91**	**8.1**	**161,401**

* - 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).

4.1.1 Lighting Upgrades

Recommended upgrades to existing lighting fixtures are summarized in Figure 17 below.

Figure 17 – Summary of Lighting Upgrade ECMs

Energy Conservation Measure		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_2e Emissions Reduction (lbs)
Lighting Upgrades		**73,157**	**9.4**	**0.0**	**$8,962.53**	**$75,862.50**	**$4,750.00**	**$71,112.50**	**7.9**	**73,668**
ECM 1	Install LED Fixtures	14,877	0.3	0.0	$1,822.65	$28,162.65	$400.00	$27,762.65	15.2	14,981
ECM 2	Retrofit Fluorescent Fixtures with LED Lamps and Drivers	52,997	8.5	0.0	$6,492.72	$45,926.00	$4,185.00	$41,741.00	6.4	53,368
ECM 3	Retrofit Fixtures with LED Lamps	5,282	0.6	0.0	$647.16	$1,773.85	$165.00	$1,608.85	2.5	5,319

During lighting upgrade planning and design, we recommend a comprehensive approach that considers both the efficiency of the lighting fixtures and how they are controlled. Please see **Appendix A: Equipment Inventory & Recommendations** for a detailed list of the locations and recommended upgrades for each lighting measure.

ECM 1: Install LED Fixtures

Summary of Measure Economics

Interior/ Exterior	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_2e Emissions Reduction (lbs)
Interior	0	0.0	0.0	$0.00	$0.00	$0.00	$0.00	0.0	0
Exterior	14,877	0.3	0.0	$1,822.65	$28,162.65	$400.00	$27,762.65	15.2	14,981

Measure Description

We recommend replacing existing exterior fixtures containing high pressure sodium lamps with new high performance LED light fixtures. This measure includes the replacement of the area head fixtures while re-using the existing poles. A detailed evaluation will need to be conducted to ensure proper spread of light in parking lot areas. This measure also includes the replacement of exterior wall mounted fixtures one-for-one with new LED wall pack fixtures. This measure saves energy by installing LEDs which use less power than other technologies with a comparable or improved light output. Additional savings from lighting maintenance can be anticipated since LEDs have lifetimes much greater than less advanced technologies.

ECM 2: Retrofit Fluorescent Fixtures with LED Lamps and Drivers

Summary of Measure Economics

Interior/ Exterior	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_2e Emissions Reduction (lbs)
Interior	52,997	8.5	0.0	$6,492.72	$45,926.00	$4,185.00	$41,741.00	6.4	53,368
Exterior	0	0.0	0.0	$0.00	$0.00	$0.00	$0.00	0.0	0

Measure Description

We recommend retrofitting existing fluorescent fixtures by removing fluorescent tubes and ballasts and replacing them with LEDs and LED drivers (if necessary), which are designed to be used retrofitted fluorescent fixtures. The measure uses the existing fixture housing but replaces the rest of the components with more efficient lighting technology. This measure saves energy by installing LEDs which use less power than other lighting technologies yet provide equivalent lighting output for the space. Additional savings from lighting maintenance can be anticipated since LEDs have lifetimes which are more than twice that of a fluorescent tubes.

For the purpose of this report, we recommend retrofitting the existing fixtures rather than just replacing the lamps. It should be noted that the existing T8 electronic ballasts may be compatible with turn-key LED lamp replacements which would reduce the estimated installation costs and provide comparable energy savings.

ECM 3: Retrofit Fixtures with LED Lamps

Summary of Measure Economics

Interior/ Exterior	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_2e Emissions Reduction (lbs)
Interior	4,338	0.6	0.0	$531.46	$1,021.31	$95.00	$926.31	1.7	4,368
Exterior	944	0.0	0.0	$115.70	$752.54	$70.00	$682.54	5.9	951

Measure Description

We recommend retrofitting existing incandescent and compact fluorescent technologies with LED lamps. Existing fixtures in the interior and exterior applications are included within this measure. This measure saves energy by installing LEDs which use less power than other lighting technologies yet provide equivalent lighting output for the space. Additional savings from lighting maintenance can be anticipated since LEDs have lifetimes which are more than twice that of a fluorescent lamps and more than 10 times longer than many incandescent lamps.

4.1.2 Lighting Control Measures

Figure 18 – Summary of Lighting Control ECMs

Energy Conservation Measure		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_2e Emissions Reduction (lbs)
Lighting Control Measures		**12,175**	**1.8**	**0.0**	**$1,491.58**	**$12,896.00**	**$1,900.00**	**$10,996.00**	**7.4**	**12,260**
ECM 4	Install Occupancy Sensor Lighting Controls	12,175	1.8	0.0	$1,491.58	$12,896.00	$1,900.00	$10,996.00	7.4	12,260

During lighting upgrade planning and design, we recommend a comprehensive approach that considers both the efficiency of the lighting fixtures and how they are controlled. Please see **Appendix A: Equipment Inventory & Recommendations** for a detailed list of the locations and recommended lighting controls upgrades for each lighting measure.

ECM 4: Install Occupancy Sensor Lighting Controls

Summary of Measure Economics

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_2e Emissions Reduction (lbs)
12,175	1.8	0.0	$1,491.58	$12,896.00	$1,900.00	$10,996.00	7.4	12,260

Measure Description

We recommend installing occupancy sensors to control lighting fixtures that are currently controlled by manual switches in classrooms, offices, corridor areas and restrooms. Lighting sensors detect occupancy using ultrasonic and/or infrared sensors. For most spaces, we recommend lighting controls use dual technology sensors, which can eliminate the possibility of any lights turning off unexpectedly. Lighting systems are enabled when an occupant is detected. Fixtures are automatically turned off after an area has been vacant for a preset period. Some controls also provide dimming options and all modern occupancy controls can be easily over-ridden by room occupants to allow them to manually turn fixtures on or off, as desired. Energy savings results from only operating lighting systems when they are required.

Occupancy sensors may be mounted on the wall at existing switch locations, mounted on the ceiling, or in remote locations. In general, wall switch replacement sensors are recommended for single occupant offices and other small rooms. Ceiling-mounted or remote mounted sensors are used in locations without local switching or where wall switches are not in the line-of-sight of the main work area and in large spaces. We recommend a comprehensive approach to lighting design that upgrades both the lighting fixtures and the controls together for maximum energy savings and improved lighting for occupants.

4.1.3 Electric Unitary HVAC Measures

Our recommendations for unitary HVAC measures are summarized in Figure 19 below.

Figure 19 - Summary of Unitary HVAC ECMs

Energy Conservation Measure		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_2e Emissions Reduction (lbs)
Electric Unitary HVAC Measures		**15,297**	**5.0**	**0.0**	**$1,874.03**	**$38,901.72**	**$2,392.00**	**$36,509.72**	**19.5**	**15,404**
ECM 5	Install High Efficiency Electric AC	15,297	5.0	0.0	$1,874.03	$38,901.72	$2,392.00	$36,509.72	19.5	15,404

Please see **Appendix A: Equipment Inventory & Recommendations** for more information about existing HVAC equipment and proposed upgrades.

ECM 5: Install High Efficiency Air Conditioning Units

Summary of Measure Economics

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_2e Emissions Reduction (lbs)
15,297	5.0	0.0	$1,874.03	$38,901.72	$2,392.00	$36,509.72	19.5	15,404

Measure Description

We recommend replacing standard efficiency packaged air conditioning units with high efficiency packaged air conditioning units. There have been significant improvements in both compressor and fan motor efficiencies over the past several years. Therefore, electricity savings can be achieved by replacing older units with new high efficiency units. A higher EER or SEER rating indicates a more efficient cooling system. The magnitude of energy savings for this measure depends on the relative efficiency of the older unit versus the new high efficiency unit, the average cooling load, and the estimated annual operating hours.

4.1.4 Gas-Fired Heating System Replacements

Our recommendations for gas-fired heating system replacements are summarized in Figure 20 below.

Figure 20 - Summary of Gas-Fired Heating Replacement ECMs

Energy Conservation Measure		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_2e Emissions Reduction (lbs)
Gas Heating (HVAC/Process) Replacement		**0**	**0.0**	**91.6**	**$1,087.79**	**$24,923.07**	**$9,200.00**	**$15,723.07**	**14.5**	**10,730**
ECM 6	Install High Efficiency Furnaces	0	0.0	91.6	$1,087.79	$24,923.07	$9,200.00	$15,723.07	14.5	10,730

Please see **Appendix A: Equipment Inventory & Recommendations** for more details on existing

ECM 6: Install High Efficiency Furnaces

Summary of Measure Economics

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_2e Emissions Reduction (lbs)
0	0.0	91.6	$1,087.79	$24,923.07	$9,200.00	$15,723.07	14.5	10,730

Measure Description

We recommend replacing existing standard efficiency furnaces with condensing furnaces. Improved combustion technology and heat exchanger design optimize heat recovery from the combustion gases which can significantly improve furnace efficiency. Savings result from improved system efficiency. The existing equipment require significant maintenance and associated costs has reached over $20,000. This measure is recommended based on the potential energy savings, utility and maintenance savings. The summary of measure economics above does not include estimated O&M savings and therefore the economics are even more attractive.

4.1.5 HVAC System Upgrades

Our recommendation for HVAC system improvement are summarized in Figure 21 below.

Figure 21 - Summary of HVAC System Improvement ECMs

Energy Conservation Measure		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_2e Emissions Reduction (lbs)
HVAC System Improvements		**417**	**0.0**	**0.0**	**$51.10**	**$43.50**	**$0.00**	**$43.50**	**0.9**	**420**
ECM 7	Install Pipe Insulation	417	0.0	0.0	$51.10	$43.50	$0.00	$43.50	0.9	420

ECM 7: Install Pipe Insulation

Summary of Measure Economics

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_2e Emissions Reduction (lbs)
417	0.0	0.0	$51.10	$43.50	$0.00	$43.50	0.9	420

Measure Description

We recommend installing insulation on domestic hot water system piping. Distribution system losses are dependent on heating water system temperature, the size of the distribution system, and the level of insulation of the piping. Significant energy savings can be achieved when insulation is not existing or has not been well maintained. When the insulation is exposed to water, when the insulation has been removed from some areas of the pipe, or when valves have not been properly insulated system efficiency

can be significantly reduced. This measure saves energy by reducing heat losses from the heating distribution system.

4.1.6 Domestic Hot Water Heating System Upgrades

Our recommendations for domestic water heating system improvements are summarized in Figure 22 below.

Figure 22 - Summary of Domestic Water Heating ECMs

Energy Conservation Measure		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_2e Emissions Reduction (lbs)
Domestic Water Heating Upgrade		**32,056**	**1.4**	**-86.4**	**$2,901.56**	**$8,401.12**	**$50.00**	**$8,351.12**	**2.9**	**22,163**
ECM 8	Install High Efficiency Gas Water Heater	25,322	1.4	-86.4	$2,076.67	$8,286.40	$50.00	$8,236.40	4.0	15,383
ECM 9	Install Low-Flow Domestic Hot Water Devices	6,733	0.0	0.0	$824.89	$114.72	$0.00	$114.72	0.1	6,780

Please see **Appendix A: Equipment Inventory & Recommendations** for more details on the facility's existing domestic hot water equipment and recommended system upgrades.

ECM 8: Install High Efficiency Gas-Fired Water Heater

Summary of Measure Economics

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_2e Emissions Reduction (lbs)
25,322	1.4	-86.4	$2,076.67	$8,286.40	$50.00	$8,236.40	4.0	15,383

Measure Description

We recommend replacing the existing tank water heater with a high efficiency condensing storage tank water heater. Improvements in combustion efficiency and reductions in heat losses have improved the overall efficiency of storage water heaters. Energy savings results from using less gas to heat water, due to higher unit efficiency, and fewer run hours to maintain the tank water temperature. This measure is also recommended based on the utility cost reduction associated with switching from electric to natural gas. On a per-unit-of-energy basis, the costs for electricity are three (3) times higher than that for natural gas.

Electric	$35.90	per MMBtu
Natural Gas	$11.87	per MMBtu

ECM 9: Install Low-Flow DHW Devices

Summary of Measure Economics

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_2e Emissions Reduction (lbs)
6,733	0.0	0.0	$824.89	$114.72	$0.00	$114.72	0.1	6,780

Measure Description

We recommend installing low-flow domestic hot water devices to reduce overall hot water demand. Energy demand from domestic hot water heating systems can be reduced by reducing water usage in general. Low flow faucet aerators can reduce hot water usage, relative to standard aerators, which saves energy. Low-flow devices reduce the overall water flow from the fixture, while still adequate pressure for washing. This reduces the amount of water used per day resulting in energy and water savings.

4.1.7 Plug Load Equipment Control - Vending Machines

ECM 10: Vending Machine Control

Summary of Measure Economics

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_2e Emissions Reduction (lbs)
1,612	0.0	0.0	$197.47	$230.00	$0.00	$230.00	1.2	1,623

Measure Description

Vending machines operate continuously, even during non-business hours. It is recommended to install occupancy sensor controls to reduce the energy use. These controls power down vending machines when the vending machine area has been vacant for some time, then power up at regular intervals, as needed, to turn machine lights on or keep the product cool. Energy savings are a dependent on vending machine and activity level in the area surrounding the machines.

Please see **Appendix A: Equipment Inventory & Recommendations** for more details on existing equipment and proposed measures.

4.1.8 Custom Measures

Additional custom measure energy saving opportunities are addressed in this section. Recommended custom measures are summarized in Figure 23 below.

Figure 23 - Summary of Custom ECMs

Energy Conservation Measure		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_2e Emissions Reduction (lbs)
Custom Measures		**22,150**	**1.0**	**24.2**	**$3,000.32**	**$15,310.00**	**$0.00**	**$15,310.00**	**5.1**	**25,133**
ECM 11	Computer Power Management Software	13,029	0.0	0.0	$1,596.14	$3,385.00	$0.00	$3,385.00	2.1	13,120
ECM 12	Replace Refrigerator with Compact Energy Star Equipment	2,784	1.0	0.0	$341.10	$500.00	$0.00	$500.00	1.5	2,804
ECM 13	Weatherstrip Exterior Doors	1,173	0.0	2.4	$172.10	$625.00	$0.00	$625.00	3.6	1,461
ECM 14	Retro-Commissioning Study & HVAC Improvements	5,164	0.0	21.8	$890.99	$10,800.00	$0.00	$10,800.00	12.1	7,748

ECM 11: Computer Power Management Software

Summary of Measure Economics

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_2e Emissions Reduction (lbs)
13,029	0.0	0.0	$1,596.14	$3,385.00	$0.00	$3,385.00	2.1	13,120

Measure Description

We recommend the implementation of computer power management software. The computing environment in most school and office facilities includes desktops, which are typically left on over nights, weekends and holidays. Screen savers are commonly confused as a power management strategy. This contributes to excessive electrical energy consumption, which may be avoided by proper management. There are innovative software packages available in the market today that are designed to deliver significant energy saving and provide ongoing tracking measurements. Operational and maintenance benefits are captured through the use of a central power management platform where issues may be diagnosed and problematic devices may be isolated. Energy savings policies may be enforced as well as identifying and eliminating underutilized devices. This measure investigates the potential benefits to implementing computer power management software to better match the energy use to user needs. The image to the right is for demonstration purposes only and represents the difference between potential duration of devices being in Power-On States vs. the duration of User Activity. This difference provides an opportunity for energy savings by implementing power management software.

Please see **Appendix A: Equipment Inventory & Recommendations** for more details on existing equipment and proposed measures.

ECM 12: Replace Refrigerator with Compact Energy Star Equipment

Summary of Measure Economics

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_2e Emissions Reduction (lbs)
2,784	1.0	0.0	$341.10	$500.00	$0.00	$500.00	1.5	2,804

Measure Description

There were two (2) stand-up solid door refrigerators which were noted to be more than half empty during the site visit. There is an opportunity for energy savings by replacing these with half the size refrigerators that are compact and Energy Star units.

Please see **Appendix A: Equipment Inventory & Recommendations** for more details on existing equipment and proposed measures.

ECM 13: Weather-strip Exterior Doors

Summary of Measure Economics

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_2e Emissions Reduction (lbs)
1,173	0.0	2.4	$172.10	$625.00	$0.00	$625.00	3.6	1,461

Measure Description

We recommend weather-stripping the exterior single and double doors. There were five (5) doors in total which were noted to have missing or worn weather-stripping with clear air gaps. Building envelopes that limit air infiltration and that have adequate insulation play a key role in optimizing heating and cooling efficiency, controlling moisture, and providing occupant comfort. Cracks and gaps throughout your building – around windows and doors, through utility openings, at the foundation and roof – may not seem significant, but their effects add up. Reducing uncontrolled air infiltration through air sealing is a cost effective way to improve the performance and energy efficiency of your facility. The proper sealing of sources for air infiltration and exfiltration will mitigate the air through the building and thus reduce the load on the facility's heating and cooling equipment. Exterior doors should be properly weather-stripped which may include the installation of a bottom sweep, center sweep and weather-stripping around the perimeter of the door.

Please see **Appendix A: Equipment Inventory & Recommendations** for more details on existing equipment and proposed measures.

ECM 14: Retro-Commissioning Study & HVAC Improvements

Summary of Measure Economics

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_2e Emissions Reduction (lbs)
5,164	0.0	21.8	$890.99	$10,800.00	$0.00	$10,800.00	12.1	7,748

Measure Description

Due to the complexity of today's HVAC systems and controls, it is likely for systems to be operating incorrectly or not as efficiently as they could be. Retro-commissioning studies reveal hidden deficiencies and highlights operational & maintenance (O&M) issues that could have been avoided as well as exposes hidden control system problems. There are valuable benefits to retro-commissioning in existing buildings. It is a detailed and specialized process that reviews how an HVAC system is controlled and designed to operate. Applying retro-commissioning to existing facilities includes planning, discovering root causes of inefficiencies, development of a cost-effective project delivery and a focus on optimizing value to the building owner. The study includes functional system testing under various modes, such as heating or cooling loads, occupied and unoccupied modes, varying outside air temperature and space temperatures. This is a systematic process to ensure that the building energy systems perform interactively according to the original design intent and the current operational needs of the facility. Retro-commissioning is a common practice recommended by the American Society of Heating Refrigeration and Energy (ASHRAE) to be revisited every couple of years. We recommend that an engineering firm who specializes in energy control systems and retro-commissioning be contacted for a detailed evaluation and implementation costs. Facility operations personnel would work with the engineers to develop goals and objectives. During on site testing, the qualified personnel conducting the study would immediately make any no/low-cost improvements as identified. Furthermore, any suggested corrective actions which require the purchase of material, a contractor who specializes in that scope of work would be contacted to implement the remaining improvements.

Please see **Appendix A: Equipment Inventory & Recommendations** for more details on existing equipment and proposed measures.

5 ENERGY EFFICIENT PRACTICES

In addition to the quantifiable savings estimated in Section 4, a facility's energy performance can also be improved through application of many low cost or no-cost energy efficiency strategies. By employing certain behavioral and operational changes and performing routine maintenance on building systems, equipment lifetime can be extended; occupant comfort, health and safety can be improved; and energy and O&M costs can be reduced. The recommendations below are provided as a framework for developing a whole building maintenance plan that is customized to your facility. Consult with qualified equipment specialists for details on proper maintenance and system operation.

Reduce Air Leakage

Air leakage, or infiltration, occurs when outside air enters a building uncontrollably through cracks and openings. Properly sealing such cracks and openings can significantly reduce heating and cooling costs, improve building durability, and create a healthier indoor environment. This includes caulking or installing weather stripping around leaky doors and windows allowing for better control of indoor air quality through controlled ventilation.

Close Doors and Windows

Ensure doors and windows are closed in conditioned spaces. Leaving doors and windows open leads to a significant increase in heat transfer between conditioned spaces and the outside air. Reducing a facility's air changes per hour (ACH) can lead to increased occupant comfort as well as significant heating and cooling savings, especially when combined with proper HVAC controls and adequate ventilation.

Use Window Treatments/Coverings

A substantial amount of heat gain can occur through uncovered or untreated windows, especially older single pane windows and east or west-facing windows. Treatments such as high-reflectivity films or covering windows with shades or shutters can reduce solar heat gain and, consequently, cooling load and can reduce internal heat loss and the associated heating load.

Perform Proper Lighting Maintenance

In order to sustain optimal lighting levels, lighting fixtures should undergo routine maintenance. Light levels decrease over time due to lamp aging, lamp and ballast failure, and buildup of dirt and dust on lamps, fixtures and reflective surfaces. Together, these factors can reduce total illumination by 20% - 60% or more, while operating fixtures continue drawing full power. To limit this reduction, lamps, reflectors and diffusers should be thoroughly cleaned of dirt, dust, oil, and smoke film buildup approximately every 6 – 12 months.

Develop a Lighting Maintenance Schedule

In addition to routine fixture cleaning, development of a maintenance schedule can both ensure maintenance is performed regularly and can reduce the overall cost of fixture re-lamping and re-ballasting. By re-lamping and re-ballasting fixtures in groups, lighting levels are better maintained and the number of site visits by a lighting technician or contractor can be minimized, decreasing the overall cost of maintenance.

Ensure Lighting Controls Are Operating Properly

Lighting controls are very cost effective energy efficient devices, when installed and operating correctly. As part of a lighting maintenance schedule, lighting controls should be tested annually to ensure proper functioning. For occupancy sensors, this requires triggering the sensor and verifying that the sensor's timer settings are correct. For daylight sensors, maintenance involves cleaning of sensor lenses and confirming setpoints and sensitivity are appropriately configured.

Turn Off Unneeded Motors

Electric motors often run unnecessarily, and this is an overlooked opportunity to save energy. These motors should be identified and turned off when appropriate. For example, exhaust fans often run unnecessarily when ventilation requirements are already met. Reducing run hours for these motors can result in significant energy savings. Whenever possible, use automatic devices such as twist timers or occupancy sensors to ensure that motors are turned off when not needed.

Perform Routine Motor Maintenance

Motors consist of many moving parts whose collective degradation can contribute to a significant loss of motor efficiency. In order to prevent damage to motor components, routine maintenance should be performed. This maintenance consists of cleaning surfaces and ventilation openings on motors to prevent overheating, lubricating moving parts to reduce friction, inspecting belts and pulleys for wear and to ensure they are at proper alignment and tension, and cleaning and lubricating bearings. Consult a licensed technician to assess these and other motor maintenance strategies.

Use Fans to Reduce Cooling Load

Utilizing ceiling fans to supplement cooling is a low cost strategy to reduce cooling load considerably. Thermostat settings can be increased by 4°F with no change in overall occupant comfort when the wind chill effect of moving air is employed for cooling.

Practice Proper Use of Thermostat Schedules and Temperature Resets

Ensure thermostats are correctly set back. By employing proper set back temperatures and schedules, facility heating and cooling costs can be reduced dramatically during periods of low or no occupancy. As such, thermostats should be programmed for a setback of 5-10 °F during low occupancy hours (reduce heating setpoints and increase cooling setpoints). Cooling load can be reduced further by increasing the facility's occupied setpoint temperature. In general, during the cooling season, thermostats should be set as high as possible without sacrificing occupant comfort.

Ensure Economizers are Functioning Properly

Economizers, when properly configured, can be used to significantly reduce mechanical cooling. However, if the outdoor thermostat or enthalpy control is malfunctioning or the damper is stuck or improperly adjusted, benefits from the economizer may not be fully realized. As such, periodic inspection and maintenance is required to ensure proper operation. This maintenance should be scheduled with maintenance of the facility's air conditioning system and should include proper setting of the outdoor thermostat/enthalpy control, inspection of control and damper operation, lubrication of damper connections, and adjustment of minimum damper position. A malfunctioning economizer can significantly increase the amount of heating and mechanical cooling required by introducing excess amounts of cold or hot outside air.

Clean Evaporator/Condenser Coils on AC Systems

Dirty evaporators and condensers coils cause a restriction to air flow and restrict heat transfer. This results in increased evaporator and condenser fan load and a decrease in cooling system performance. Keeping the coils clean allows the fans and cooling system to operate more efficiently.

Clean and/or Replace HVAC Filters

Air filters work to reduce the amount of indoor air pollution and increase occupant comfort. Over time, filters become less and less effective as particulate buildup increases. In addition to health concerns related to clogged filters, filters that have reached saturation also restrict air flow through the facility's air conditioning or heat pump system, increasing the load on the distribution fans and decreasing occupant comfort levels. Filters should be checked monthly and cleaned or replaced when appropriate.

Check for and Seal Duct Leakage

Duct leakage in commercial buildings typically accounts for 5 to 25 percent of the supply airflow. In the case of rooftop air handlers, duct leakage can occur to the outside of the building, significantly increasing cooling and heating costs. By sealing sources of leakage, cooling, heating, and ventilation energy use can be reduced significantly, depending on the severity of air leakage.

Perform Proper Furnace Maintenance

Preventative furnace maintenance can extend the life of the system, maintain energy efficiency, and ensure safe operation. Following the manufacturer's instructions, a yearly tune-up should include tasks such as checking for gas / carbon monoxide leaks; changing the air and fuel filters; checking components for cracks, corrosion, dirt, or debris build-up; ensuring the ignition system is working properly; testing and adjusting operation and safety controls; inspecting the electrical connections; and ensuring proper lubrication for motors and bearings.

Perform Proper Water Heater Maintenance

At least once a year, drain a few gallons out of the water heater using the drain valve. If there is a lot of sediment or debris, then a full flush is recommended. Turn the temperature down and then completely drain the tank. Once a year check for any leaks or heavy corrosion on the pipes and valves. For gas water heaters, check the draft hood and make sure it is placed properly, with a few inches of air space between the tank and where it connects to the vent. Look for any corrosion or wear on the gas line and on the piping. If you noticed any black residue, soot or charred metal, this is a sign you may be having combustion issues and you should have the unit serviced by a professional. For electric water heaters, look for any signs of leaking such as rust streaks or residue around the upper and lower panels covering the electrical components on the tank. For water heaters over three to four years old have a technician inspect the sacrificial anode annually.

Plug Load Controls

There are a variety of ways to limit the energy use of plug loads including increasing occupant awareness, removing under-utilized equipment, installing hardware controls, and using software controls. Some control steps to take are to enable the most aggressive power settings on existing devices or install load sensing or occupancy sensing (advanced) power strips. For additional information refer to "Assessing and Reducing Plug and Process Loads in Office Buildings" http://www.nrel.gov/docs/fy13osti/54175.pdf, or "Plug Load Best Practices Guide" http://www.advancedbuildings.net/plug-load-best-practices-guide-offices

6 DEMAND RESPONSE

Demand Response (DR) is a program designed to reduce the electric load of commercial facilities when electric wholesale prices are high or when the reliability of the electric grid is threatened due to peak demand. Demand Response service providers (a.k.a. Curtailment Service Providers) are registered with PJM, the independent system operator (ISO) for mid-Atlantic state region that is charged with maintaining electric grid reliability.

By enabling grid operators to call upon Curtailment Service Providers and commercial facilities to reduce electric usage during times of peak demand, the grid is made more reliable and overall transmission costs are reduced for all ratepayers. Curtailment Service Providers provide regular payments to medium and large consumers of electric power for their participation in DR programs. Program participation is voluntary and participants receive payments whether or not their facility is called upon to curtail their electric usage.

Typically an electric customer needs to be capable of reducing their electric demand, within minutes, by at least 100 kW or more in order to participate in a DR program. Customers with a greater capability to quickly curtail their demand during peak hours will receive higher payments. Customers with back-up generators onsite may also receive additional DR payments for their generating capacity if they agree to run the generators for grid support when called upon. Eligible customers who have chosen to participate in a DR programs often find it to be a valuable source of revenue for their facility because the payments can significantly offset annual electric costs.

Participating customers can often quickly reduce their peak load through simple measures, such as temporarily raising temperature set points on thermostats, so that air conditioning units run less frequently, or agreeing to dim or shut off less critical lighting. This usually requires some level of building automation and controls capability to ensure rapid load reduction during a DR curtailment event. DR program participants may need to install smart meters or may need to also sub-meter larger energy-using equipment, such as chillers, in order to demonstrate compliance with DR program requirements.

DR does not include the reduction of electricity consumption based on normal operating practice or behavior. For example, if a company's normal schedule is to close for a holiday, the reduction of electricity due to this closure or scaled-back operation is not considered a demand response activity in most situations.

The first step toward participation in a DR program is to contact a Curtailment Service Provider. A list of these providers is available on PJM's website and it includes contact information for each company, as well as the states where they have active business (www.pjm.com/markets-and-operations/demand-response/csps.aspx). PJM also posts training materials that are developed for program members interested in specific rules and requirements regarding DR activity (www.pjm.com/training/trainingmaterial.aspx), along with a variety of other DR program information.

Curtailment Service Providers typically offer free assessments to determine a facility's eligibility to participate in a DR program. They will provide details regarding program rules and requirements for metering and controls, assess a facility's ability to temporarily reduce electric load, and provide details on payments to be expected for participation in the program. Providers usually offer multiple options for DR to larger facilities and may also install controls or remote monitoring equipment of their own to help ensure compliance with all terms and conditions of a DR contract.

7 PROJECT FUNDING / INCENTIVES

The NJCEP is able to provide the incentive programs described below, and other benefits to ratepayers, because of the Societal Benefits Charge (SBC) Fund. The SBC was created by the State of New Jersey's Electricity Restructuring Law (1999), which requires all customers of investor-owned electric and gas utilities to pay a surcharge on their monthly energy bills. As a customer of a state-regulated electric or gas utility and therefore a contributor to the fund your organization is eligible to participate in the LGEA program and also eligible to receive incentive payment for qualifying energy efficiency measures. Also available through the NJBPU are some alternative financing programs described later in this section. Please refer to Figure 24 for a list of the eligible programs identified for each recommended ECM.

Figure 243 - ECM Incentive Program Eligibility

Energy Conservation Measure		SmartStart Prescriptive	SmartStart Custom	Direct Install	Pay For Performance Existing Buildings	Large Energy Users Program	Combined Heat & Power and Fuel Cell
ECM 1	Install LED Fixtures	x		x			
ECM 2	Retrofit Fluorescent Fixtures with LED Lamps and Drivers	x		x			
ECM 3	Retrofit Fixtures with LED Lamps	x		x			
ECM 4	Install Occupancy Sensor Lighting Controls	x		x			
ECM 5	Install High Efficiency Electric AC	x		x			
ECM 6	Install High Efficiency Furnaces	x		x			
ECM 7	Install Pipe Insulation			x			
ECM 8	Install High Efficiency Gas Water Heater						
ECM 9	Install Low-Flow Domestic Hot Water Devices			x			
ECM 10	Vending Machine Control						
ECM 11	Computer Power Management Software						
ECM 12	Replace Refrigerator with Compact Energy Star Equipment						
ECM 13	Weatherstrip Exterior Doors						
ECM 14	Retro-Commissioning Study & HVAC Improvements						

SmartStart (SS) is generally well-suited for implementation of individual measures or small group of measures. It provides flexibility to install measures at your own pace using in-house staff or a preferred contractor. Direct Install (DI) caters to small to mid-size facilities that can bundle multiple ECMs together. This can greatly simplify participation and may lead to higher incentive amounts, but requires the use of pre-approved contractors. The Pay for Performance (P4P) program is a "whole-building" energy improvement program designed for larger facilities. It requires implementation of multiple measures meeting minimum savings thresholds, as well as use of pre-approved consultants. The Large Energy Users Program (LEUP) is available to New Jersey's largest energy users giving them flexibility to install as little or as many measures, in a single facility or several facilities, with incentives capped based on the entity's annual energy consumption. LEUP applicants can use in-house staff or a preferred contractor.

Generally, the incentive values provided throughout the report assume the SS program is utilized because it provides a consistent basis for comparison of available incentives for various measures, though in many cases incentive amounts may be higher through participation in other programs.

Brief descriptions of all relevant financing and incentive programs are located in the sections below. Further information, including most current program availability, requirements, and incentive levels can be found at: www.njcleanenergy.com/ci

7.1 SmartStart

Overview

The SmartStart (SS) program offers incentives for installing prescriptive and custom energy efficiency measures at your facility. Routinely the program adds, removes or modifies incentives from year to year for various energy efficiency equipment based on market trends and new technologies.

Equipment with Prescriptive Incentives Currently Available:

Electric Chillers
Electric Unitary HVAC
Gas Cooling
Gas Heating
Gas Water Heating
Ground Source Heat Pumps
Lighting
Lighting Controls
Refrigeration Doors
Refrigeration Controls
Refrigerator/Freezer Motors
Food Service Equipment
Variable Frequency Drives

Most equipment sizes and types are served by this program. This program provides an effective mechanism for securing incentives for energy efficiency measures installed individually or as part of a package of energy upgrades.

Incentives

The SS prescriptive incentive program provides fixed incentives for specific energy efficiency measures, whereas the custom SS program provides incentives for more unique or specialized technologies or systems that are not addressed through prescriptive incentive offerings for specific devices.

Since your facility is an existing building, only the Retrofit incentives have been applied in this report. Custom Measure incentives are calculated at $0.16/kWh and $1.60/therm based on estimated annual savings, capped at 50% of the total installed incremental project cost, or a project cost buy down to a one year payback (whichever is less. Program incentives are capped at $500,000 per electric account and $500,000 per natural gas account, per fiscal year.

How to Participate

To participate in the SmartStart program you will need to submit an application for the specific equipment to be installed. Many applications are designed as rebates, although others require application approval prior to installation. Applicants may work with a contractor of their choosing and can also utilize internal personnel, which provides added flexibility to the program. Using internal personnel also helps improve the economics of the ECM by reducing the labor cost that is included in the tables in this report.

Detailed program descriptions, instructions for applying and applications can be found at: www.njcleanenergy.com/SSB

7.2 Direct Install

Overview

Direct Install (DI) is a turnkey program available to existing small to medium-sized facilities with a peak electric demand that does not exceed 200 kW for any recent 12-month period. You will work directly with a pre-approved contractor who will perform a free energy assessment at your facility, identify specific eligible measures, and provide a clear scope of work for installation of selected measures. Energy efficiency measures may include lighting and lighting controls, refrigeration, HVAC, motors, variable speed drives and controls.

Incentives

The program pays up to **70%** of the total installed cost of eligible measures, up to $125,000 per project. Direct Install participants will also be held to a fiscal year cap of $250,000 per entity.

How to Participate

To participate in the DI program you will need to contact the participating contractor who the region of the state where your facility is located. A complete list of DI program partners is provided on the DI website linked below. The contractor will be paid the measure incentives directly by the program which will pass on to you in the form of reduced material and implementation costs. This means up to 70% of eligible costs are covered by the program, subject to program caps and eligibility, while the remaining 30% of the cost is paid to the contractor by the customer.

Since DI offers a free assessment of eligible measures, DI is also available to small businesses and other commercial facilities too that may not be eligible for the more detailed facility audits provided by LGEA.

Detailed program descriptions and applications can be found at: www.njcleanenergy.com/DI

7.3 Energy Savings Improvement Program

The Energy Savings Improvement Program (ESIP) is an alternate method for New Jersey's government agencies to finance the implementation of energy conservation measures. An ESIP is a type of "performance contract", whereby school districts, counties, municipalities, housing authorities and other public and state entities enter in to contracts to help finance building energy upgrades. This is done in a manner that ensures that annual payments are lower than the savings projected from the ECMs, ensuring that ESIP projects are cash flow positive in year one, and every year thereafter. ESIP provides government agencies in New Jersey with a flexible tool to improve and reduce energy usage with minimal expenditure of new financial resources. NJCEP incentive programs can be leveraged to help further reduce the total project cost of eligible measures.

This LGEA report is the first step to participating in ESIP. Next, you will need to select an approach for implementing the desired ECMs:

(1) Use an Energy Services Company or "ESCO";
(2) Use independent engineers and other specialists, or your own qualified staff, to provide and manage the requirements of the program through bonds or lease obligations;
(3) Use a hybrid approach of the two options described above where the ESCO is utilized for some services and independent engineers, or other specialists or qualified staff, are used to deliver other requirements of the program.

After adopting a resolution with a chosen implementation approach, the development of the Energy Savings Plan (ESP) can begin. The ESP demonstrates that the total project costs of the ECMs are offset by

the energy savings over the financing term, not to exceed 15 years. The verified savings will then be used to pay for the financing.

The ESIP approach may not be appropriate for all energy conservation and energy efficiency improvements. Entities should carefully consider all alternatives to develop an approach that best meets their needs. A detailed program descriptions and application can be found at: www.njcleanenergy.com/ESIP

Please note that ESIP is a program delivered directly by the NJBPU and is not an NJCEP incentive program. As mentioned above, you may utilize NJCEP incentive programs to help further reduce costs when developing the ESP. You should refer to the ESIP guidelines at the link above for further information and guidance on next steps.

7.4 Demand Response Energy Aggregator

The first step toward participation in a Demand Response (DR) program is to contact a Curtailment Service Provider. A list of these providers is available on PJM's website and it includes contact information for each company, as well as the states where they have active business (www.pjm.com/markets-and-operations/demand-response/csps.aspx). PJM also posts training materials that are developed for program members interested in specific rules and requirements regarding DR activity (www.pjm.com/training/trainingmaterial.aspx), along with a variety of other program information.

Curtailment Service Providers typically offer free assessments to determine a facility's eligibility to participate in a DR program. They will provide details regarding the program rules and requirements for metering and controls, a facility's ability to temporarily reduce electric load, as well as the payments involved in participating in the program. Also, these providers usually offer multiple options for DR to larger facilities and may also install controls or remote monitoring equipment to help ensure compliance of all terms and conditions of a DR contract.

See Section 6 for additional information.

8 ENERGY PURCHASING AND PROCUREMENT STRATEGIES

8.1 Retail Electric Supply Options

In 1999, New Jersey State Legislature passed the Electric Discount & Energy Competition Act (EDECA) to restructure the electric power industry in New Jersey. This law deregulated the retail electric markets, allowing all consumers to shop for service from competitive electric suppliers. The intent was to create a more competitive market for electric power supply in New Jersey. As a result, utilities were allowed to charge Cost of Service and customers were given the ability to choose a third party (i.e. non-utility) energy supplier.

Energy deregulation in New Jersey has increased energy buyers' options by separating the function of electricity distribution from that of electricity supply. So, though you may choose a different company from which to buy your electric power, responsibility for your facility's interconnection to the grid and repair to local power distribution will still reside with the traditional utility company serving your region.

If your facility is not purchasing electricity from a third party supplier, consider shopping for a reduced rate from third party electric suppliers. If your facility is purchasing electricity from a third party supplier, review and compare prices at the end of the current contract or every couple years.

A list of third party electric suppliers, who are licensed by the state to provide service in New Jersey, can be found online at: www.state.nj.us/bpu/commercial/shopping.html.

8.2 Retail Natural Gas Supply Options

The natural gas market in New Jersey has also been deregulated. Most customers that remain with the utility for natural gas service pay rates that are market-based and that fluctuate on a monthly basis. The utility provides basic gas supply service (BGSS) to customers who choose not to buy from a Third Party Supplier for natural gas commodity.

A customer's decision about whether to buy natural gas from a retail supplier is typically dependent upon whether a customer seeks budget certainty and/or longer-term rate stability. Customers can secure longer-term fixed prices by signing up for service through a third party retail natural gas supplier. Many larger natural gas customers may seek the assistance of a professional consultant to assist in their procurement process.

If your facility is not purchasing natural gas from a third party supplier, consider shopping for a reduced rate from third party natural gas suppliers. If your facility is purchasing natural gas from a third party supplier, review and compare prices at the end of the current contract or every couple years.

A list of third party natural gas suppliers, who are licensed by the state to provide service in New Jersey, can be found online at: www.state.nj.us/bpu/commercial/shopping.html.

Appendix A: Equipment Inventory & Recommendations

Lighting Inventory & Recommendations

	Existing Conditions					Proposed Conditions							Energy Impact & Financial Analysis						
Location	Fixture Quantity	Fixture Description	Control System	Watts per Fixture	Annual Operating Hours	Fixture Recommendation	Add Controls?	Fixture Quantity	Fixture Description	Control System	Watts per Fixture	Annual Operating Hours	Total Peak kW Savings	Total Annual kWh Savings	Total Annual MMBtu Savings	Total Annual Energy Cost Savings	Total Installation Cost	Total Incentives	Simple Payback w/ Incentives in Years
Lobby	5	Linear Fluorescent - T8: 2' T8 (17W) - 3L	Wall Switch	53	5,242	Relamp & Reballast	Yes	5	LED - Linear Tubes: (3) 2' Lamps	Occupancy Sensor	26	3,669	0.12	921	0.0	$112.86	$862.50	$110.00	6.67
Vestibule	2	Linear Fluorescent - T8: 2' T8 (17W) - 3L	Wall Switch	53	5,242	Relamp & Reballast	Yes	2	LED - Linear Tubes: (3) 2' Lamps	Occupancy Sensor	26	3,669	0.06	431	0.0	$52.82	$353.00	$50.00	5.74
Office/Café	2	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	4,368	Relamp & Reballast	Yes	2	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	3,058	0.07	426	0.0	$52.22	$350.00	$40.00	5.94
Hallway	11	Linear Fluorescent - T8: 2' T8 (17W) - 3L	Wall Switch	53	5,242	Relamp & Reballast	Yes	11	LED - Linear Tubes: (3) 2' Lamps	Occupancy Sensor	26	3,669	0.31	2,371	0.0	$290.50	$1,573.50	$200.00	4.73
Office Room 111	6	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	4,368	Relamp & Reballast	Yes	6	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	3,058	0.20	1,279	0.0	$156.65	$818.00	$80.00	4.71
Office Room 110	5	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	4,368	Relamp & Reballast	Yes	5	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	3,058	0.17	1,066	0.0	$130.54	$701.00	$70.00	4.83
Private Office	4	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Occupancy Sensor	62	3,058	Relamp & Reballast	No	4	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	3,058	0.11	472	0.0	$57.85	$468.00	$40.00	7.40
Private Office	4	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Occupancy Sensor	62	3,058	Relamp & Reballast	No	4	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	3,058	0.11	472	0.0	$57.85	$468.00	$40.00	7.40
Men's Restroom	1	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	4,368	Relamp & Reballast	Yes	1	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	3,058	0.03	213	0.0	$26.11	$233.00	$30.00	7.78
Women's Restroom	1	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	4,368	Relamp & Reballast	Yes	1	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	3,058	0.03	213	0.0	$26.11	$233.00	$30.00	7.78
Restroom	1	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	4,368	Relamp & Reballast	Yes	1	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	3,058	0.03	213	0.0	$26.11	$233.00	$30.00	7.78
Closet	1	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	1,000	Relamp & Reballast	Yes	1	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	700	0.03	49	0.0	$5.98	$233.00	$30.00	33.96
Copy Room	2	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	4,368	Relamp & Reballast	Yes	2	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	3,058	0.07	426	0.0	$52.22	$350.00	$40.00	5.94
Open Office Room 108	9	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	4,368	Relamp & Reballast	Yes	9	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	3,058	0.30	1,918	0.0	$234.98	$1,169.00	$110.00	4.51
Hallway	1	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	5,242	Relamp & Reballast	Yes	1	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	3,669	0.03	256	0.0	$31.33	$233.00	$30.00	6.48
Office Room 109	4	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	4,368	Relamp & Reballast	Yes	4	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	3,058	0.13	852	0.0	$104.43	$584.00	$60.00	5.02
Office Room 107	4	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	4,368	Relamp & Reballast	Yes	4	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	3,058	0.13	852	0.0	$104.43	$584.00	$60.00	5.02
Hallway/Stairs	5	Linear Fluorescent - T8: 2' T8 (17W) - 3L	Wall Switch	53	5,242	Relamp & Reballast	Yes	5	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	3,669	0.13	1,003	0.0	$122.84	$701.00	$70.00	5.14
Room GL4	2	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	1,000	Relamp & Reballast	Yes	2	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	700	0.07	98	0.0	$11.95	$350.00	$40.00	25.93
Hallway	7	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	5,242	Relamp & Reballast	Yes	7	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	3,669	0.23	1,790	0.0	$219.31	$935.00	$90.00	3.85
Restroom	1	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	1,000	Relamp & Reballast	Yes	1	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	700	0.03	49	0.0	$5.98	$233.00	$30.00	33.96
Room GL5	6	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	4,368	Relamp & Reballast	Yes	6	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	3,058	0.20	1,279	0.0	$156.65	$818.00	$80.00	4.71
Storage	1	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	1,000	Relamp & Reballast	Yes	1	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	700	0.03	49	0.0	$5.98	$233.00	$30.00	33.96
Restroom	1	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	1,000	Relamp & Reballast	Yes	1	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	700	0.03	49	0.0	$5.98	$233.00	$30.00	33.96
Conference Room	7	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	4,368	Relamp & Reballast	Yes	7	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	3,058	0.23	1,492	0.0	$182.76	$935.00	$90.00	4.62

	Existing Conditions					Proposed Conditions							Energy Impact & Financial Analysis						
Location	Fixture Quantity	Fixture Description	Control System	Watts per Fixture	Annual Operating Hours	Fixture Recommendation	Add Controls?	Fixture Quantity	Fixture Description	Control System	Watts per Fixture	Annual Operating Hours	Total Peak kW Savings	Total Annual kWh Savings	Total Annual MMBtu Savings	Total Annual Energy Cost Savings	Total Installation Cost	Total Incentives	Simple Payback w/ Incentives in Years
Copy Room	1	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	4,368	Relamp & Reballast	Yes	1	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	3,058	0.03	213	0.0	$26.11	$233.00	$30.00	7.78
Room GL2	4	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	4,368	Relamp & Reballast	Yes	4	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	3,058	0.13	852	0.0	$104.43	$584.00	$60.00	5.02
Entrance	3	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	5,242	Relamp & Reballast	Yes	3	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	3,669	0.10	767	0.0	$93.99	$467.00	$50.00	4.44
Room GL3	12	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	4,368	Relamp & Reballast	Yes	12	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	3,058	0.40	2,557	0.0	$313.30	$1,520.00	$140.00	4.40
Stairs	1	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	5,242	Relamp & Reballast	Yes	1	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	3,669	0.03	256	0.0	$31.33	$233.00	$30.00	6.48
Restrooms	2	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	4,368	Relamp & Reballast	Yes	2	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	3,058	0.07	426	0.0	$52.22	$350.00	$40.00	5.94
Hallway	1	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	5,242	Relamp & Reballast	Yes	1	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	3,669	0.03	256	0.0	$31.33	$233.00	$30.00	6.48
Storage Room 106	5	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	4,368	Relamp & Reballast	Yes	5	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	3,058	0.17	1,066	0.0	$130.54	$701.00	$70.00	4.83
Classroom 106A	8	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	4,368	Relamp & Reballast	Yes	8	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	3,058	0.27	1,705	0.0	$208.87	$1,052.00	$100.00	4.56
Hallway	6	Linear Fluorescent - T8: 2' T8 (17W) - 3L	Wall Switch	53	5,242	Relamp & Reballast	Yes	6	LED - Linear Tubes: (3) 2' Lamps	Occupancy Sensor	26	3,669	0.17	1,293	0.0	$158.45	$981.00	$125.00	5.40
Room 104	4	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	4,368	Relamp & Reballast	Yes	4	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	3,058	0.13	852	0.0	$104.43	$584.00	$60.00	5.02
Storage Room 105	3	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	4,368	Relamp & Reballast	Yes	3	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	3,058	0.10	639	0.0	$78.33	$467.00	$50.00	5.32
Office Room 102	5	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	4,368	Relamp & Reballast	Yes	5	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	3,058	0.17	1,066	0.0	$130.54	$701.00	$70.00	4.83
Storage Room 103	4	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	4,368	Relamp & Reballast	Yes	4	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	3,058	0.13	852	0.0	$104.43	$584.00	$60.00	5.02
Office Room 100	2	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	4,368	Relamp & Reballast	Yes	2	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	3,058	0.07	426	0.0	$52.22	$350.00	$40.00	5.94
Office Room 101	4	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	4,368	Relamp & Reballast	Yes	4	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	3,058	0.13	852	0.0	$104.43	$584.00	$60.00	5.02
Office Room 101A	3	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Occupancy Sensor	62	3,058	Relamp & Reballast	No	3	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	3,058	0.08	354	0.0	$43.39	$351.00	$30.00	7.40
Hallway	3	Linear Fluorescent - T8: 2' T8 (17W) - 3L	Wall Switch	53	5,242	Relamp & Reballast	Yes	3	LED - Linear Tubes: (3) 2' Lamps	Occupancy Sensor	26	3,669	0.08	647	0.0	$79.23	$625.50	$80.00	6.89
Stairwells	2	Linear Fluorescent - T8: 2' T8 (17W) - 3L	Wall Switch	53	5,242	Relamp & Reballast	Yes	2	LED - Linear Tubes: (3) 2' Lamps	Occupancy Sensor	26	3,669	0.06	431	0.0	$52.82	$507.00	$65.00	8.37
Stairs	2	Linear Fluorescent - T8: 2' T8 (17W) - 3L	Wall Switch	53	5,242	Relamp & Reballast	Yes	2	LED - Linear Tubes: (3) 2' Lamps	Occupancy Sensor	26	3,669	0.06	431	0.0	$52.82	$507.00	$65.00	8.37
Office Room 212	3	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	4,368	Relamp & Reballast	Yes	3	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	3,058	0.10	639	0.0	$78.33	$467.00	$50.00	5.32
Office Room 212	2	Incandescent: <Enter Fixture Description>	Wall Switch	40	4,368	Relamp	No	2	LED Screw-In Lamps: <Enter Fixture Description>	Wall Switch	9	4,368	0.05	317	0.0	$38.82	$107.51	$10.00	2.51
Office Room 211	1	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Occupancy Sensor	62	3,058	Relamp & Reballast	No	1	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	3,058	0.03	118	0.0	$14.46	$117.00	$10.00	7.40
Storage	1	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	1,000	Relamp & Reballast	Yes	1	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	700	0.03	49	0.0	$5.98	$387.00	$45.00	57.22
Private Office	4	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Occupancy Sensor	62	3,058	Relamp & Reballast	No	4	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	3,058	0.11	472	0.0	$57.85	$468.00	$40.00	7.40

	Existing Conditions					Proposed Conditions							Energy Impact & Financial Analysis						
Location	Fixture Quantity	Fixture Description	Control System	Watts per Fixture	Annual Operating Hours	Fixture Recommendation	Add Controls?	Fixture Quantity	Fixture Description	Control System	Watts per Fixture	Annual Operating Hours	Total Peak kW Savings	Total Annual kWh Savings	Total Annual MMBtu Savings	Total Annual Energy Cost Savings	Total Installation Cost	Total Incentives	Simple Payback w/ Incentives in Years
Office Hallway	1	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	5,242	Relamp & Reballast	Yes	1	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	3,669	0.03	256	0.0	$31.33	$387.00	$45.00	10.92
Café	2	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	4,368	Relamp & Reballast	Yes	2	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	3,058	0.07	426	0.0	$52.22	$504.00	$55.00	8.60
Copy Room	3	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	4,368	Relamp & Reballast	Yes	3	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	3,058	0.10	639	0.0	$78.33	$621.00	$65.00	7.10
Private Office	2	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	4,368	Relamp & Reballast	Yes	2	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	3,058	0.07	426	0.0	$52.22	$504.00	$55.00	8.60
Private Office	2	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	4,368	Relamp & Reballast	Yes	2	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	3,058	0.07	426	0.0	$52.22	$504.00	$55.00	8.60
Server Room	2	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	4,368	Relamp & Reballast	Yes	2	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	3,058	0.07	426	0.0	$52.22	$504.00	$55.00	8.60
Hallway	10	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	5,242	Relamp & Reballast	Yes	10	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	3,669	0.33	2,557	0.0	$313.30	$1,440.00	$135.00	4.17
Restroom	1	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	4,368	Relamp & Reballast	No	1	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	4,368	0.03	169	0.0	$20.66	$117.00	$10.00	5.18
Women's Restroom	1	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	4,368	Relamp & Reballast	No	1	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	4,368	0.03	169	0.0	$20.66	$117.00	$10.00	5.18
Men's Restroom	1	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	4,368	Relamp & Reballast	No	1	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	4,368	0.03	169	0.0	$20.66	$117.00	$10.00	5.18
Mail Room	2	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	4,368	Relamp & Reballast	Yes	2	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	3,058	0.07	426	0.0	$52.22	$504.00	$55.00	8.60
Buisness Offices	6	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	4,368	Relamp & Reballast	Yes	6	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	3,058	0.20	1,279	0.0	$156.65	$972.00	$95.00	5.60
Private Office	2	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	4,368	Relamp & Reballast	Yes	2	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	3,058	0.07	426	0.0	$52.22	$504.00	$55.00	8.60
Office Room 207	2	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	4,368	Relamp & Reballast	Yes	2	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	3,058	0.07	426	0.0	$52.22	$504.00	$55.00	8.60
Private Office	6	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	4,368	Relamp & Reballast	Yes	6	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	3,058	0.20	1,279	0.0	$156.65	$972.00	$95.00	5.60
Office Room 208	2	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	4,368	Relamp & Reballast	Yes	2	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	3,058	0.07	426	0.0	$52.22	$504.00	$55.00	8.60
Open Office	18	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	4,368	Relamp & Reballast	Yes	18	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	3,058	0.60	3,836	0.0	$469.95	$2,376.00	$215.00	4.60
Private Office	4	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	4,368	Relamp & Reballast	Yes	4	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	3,058	0.13	852	0.0	$104.43	$738.00	$75.00	6.35
Mechanical Room	1	Incandescent: <Enter Fixture Description>	Wall Switch	60	4,368	Relamp	No	1	LED Screw-In Lamps: <Enter Fixture Description>	Wall Switch	9	4,368	0.04	261	0.0	$31.93	$53.75	$5.00	1.53
Copy Room	4	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	4,368	Relamp & Reballast	Yes	4	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	3,058	0.13	852	0.0	$104.43	$584.00	$60.00	5.02
Office Room 203	3	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	4,368	Relamp & Reballast	Yes	3	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	3,058	0.10	639	0.0	$78.33	$467.00	$50.00	5.32
Office Room 201	7	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	4,368	Relamp & Reballast	Yes	7	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	3,058	0.23	1,492	0.0	$182.76	$935.00	$90.00	4.62
Bathroom	1	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	4,368	Relamp & Reballast	No	1	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	4,368	0.03	169	0.0	$20.66	$117.00	$10.00	5.18
Vestibule	3	Linear Fluorescent - T8: 2' T8 (17W) - 3L	Wall Switch	53	5,242	Relamp & Reballast	Yes	3	LED - Linear Tubes: (3) 2' Lamps	Occupancy Sensor	26	3,669	0.08	647	0.0	$79.23	$471.50	$65.00	5.13
Office Room 200	7	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	4,368	Relamp & Reballast	Yes	7	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	3,058	0.23	1,492	0.0	$182.76	$935.00	$90.00	4.62

	Existing Conditions					Proposed Conditions							Energy Impact & Financial Analysis						
Location	Fixture Quantity	Fixture Description	Control System	Watts per Fixture	Annual Operating Hours	Fixture Recommendation	Add Controls?	Fixture Quantity	Fixture Description	Control System	Watts per Fixture	Annual Operating Hours	Total Peak kW Savings	Total Annual kWh Savings	Total Annual MMBtu Savings	Total Annual Energy Cost Savings	Total Installation Cost	Total Incentives	Simple Payback w/ Incentives in Years
Bathroom	1	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	4,368	Relamp & Reballast	No	1	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	4,368	0.03	169	0.0	$20.66	$117.00	$10.00	5.18
Office Room 202	5	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	4,368	Relamp & Reballast	Yes	5	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	3,058	0.17	1,066	0.0	$130.54	$701.00	$70.00	4.83
Office Room 204	4	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	4,368	Relamp & Reballast	Yes	4	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	3,058	0.13	852	0.0	$104.43	$584.00	$60.00	5.02
Bathroom	1	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	4,368	Relamp & Reballast	No	1	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	4,368	0.03	169	0.0	$20.66	$117.00	$10.00	5.18
File Room	2	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	4,368	Relamp & Reballast	Yes	2	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	3,058	0.07	426	0.0	$52.22	$350.00	$40.00	5.94
Stairs	8	Incandescent: <Enter Fixture Description>	Wall Switch	60	5,242	Relamp	No	8	LED Screw-In Lamps: <Enter Fixture Description>	Wall Switch	9	5,242	0.32	2,502	0.0	$306.54	$430.02	$40.00	1.27
Classroom 302	11	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	4,368	Relamp & Reballast	Yes	11	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	3,058	0.36	2,344	0.0	$287.19	$1,403.00	$130.00	4.43
Closet	2	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Occupancy Sensor	62	3,058	Relamp & Reballast	No	2	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	3,058	0.05	236	0.0	$28.93	$234.00	$20.00	7.40
Storage Room	2	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	4,368	Relamp & Reballast	No	2	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	4,368	0.05	337	0.0	$41.32	$234.00	$20.00	5.18
Hallway	6	Linear Fluorescent - T8: 2' T8 (17W) - 3L	Wall Switch	53	5,242	Relamp & Reballast	Yes	6	LED - Linear Tubes: (3) 2' Lamps	Occupancy Sensor	26	3,669	0.17	1,293	0.0	$158.45	$981.00	$125.00	5.40
Mechanical/Attic	1	LED Screw-In Lamps: <Enter Fixture Description>	Wall Switch	9	4,368	None	No	1	LED Screw-In Lamps: <Enter Fixture Description>	Wall Switch	9	4,368	0.00	0	0.0	$0.00	$0.00	$0.00	0.00
Storage Room 300	2	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	4,368	Relamp & Reballast	No	2	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	4,368	0.05	337	0.0	$41.32	$234.00	$20.00	5.18
Bathroom	1	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Occupancy Sensor	62	3,058	Relamp & Reballast	No	1	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	3,058	0.03	118	0.0	$14.46	$117.00	$10.00	7.40
Foyer	4	Linear Fluorescent - T8: 2' T8 (17W) - 3L	Wall Switch	53	5,242	Relamp & Reballast	No	4	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	5,242	0.08	589	0.0	$72.13	$468.00	$40.00	5.93
Foyer	2	Incandescent: <Enter Fixture Description>	Wall Switch	60	5,242	Relamp	No	2	LED Screw-In Lamps: <Enter Fixture Description>	Wall Switch	9	5,242	0.08	626	0.0	$76.63	$107.51	$10.00	1.27
Elevator Room	1	Linear Fluorescent - T8: 4' T8 (32W) - 1L	Wall Switch	32	1,000	Relamp & Reballast	No	1	LED - Linear Tubes: (1) 4' Lamp	Wall Switch	15	1,000	0.01	20	0.0	$2.51	$98.00	$5.00	37.08
Elevator Room	1	Linear Fluorescent - T12: 4' T12 (40W) - 1L	Wall Switch	46	4,368	Relamp & Reballast	No	1	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	4,368	0.01	87	0.0	$10.64	$117.00	$10.00	10.05
Back Stairs	4	Incandescent: <Enter Fixture Description>	Wall Switch	60	5,242	Relamp	No	4	LED Screw-In Lamps: <Enter Fixture Description>	Wall Switch	9	5,242	0.16	1,251	0.0	$153.27	$215.01	$20.00	1.27
Basement B4	4	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	4,368	Relamp & Reballast	No	4	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	4,368	0.11	675	0.0	$82.65	$468.00	$40.00	5.18
Basement Restrooms	2	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	4,368	Relamp & Reballast	No	2	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	4,368	0.05	337	0.0	$41.32	$234.00	$20.00	5.18
Basement Hallway	10	Linear Fluorescent - T8: 2' T8 (17W) - 3L	Wall Switch	53	5,242	Relamp & Reballast	Yes	10	LED - Linear Tubes: (3) 2' Lamps	Occupancy Sensor	26	3,669	0.28	2,156	0.0	$264.09	$1,455.00	$185.00	4.81
Basement B2	8	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	4,368	Relamp & Reballast	Yes	8	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	3,058	0.27	1,705	0.0	$208.87	$1,206.00	$115.00	5.22
Pathway	4	Linear Fluorescent - T8: 2' T8 (17W) - 3L	Wall Switch	53	5,242	Relamp & Reballast	Yes	4	LED - Linear Tubes: (3) 2' Lamps	Occupancy Sensor	26	3,669	0.11	862	0.0	$105.64	$744.00	$95.00	6.14
Batsement B1	10	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	4,368	Relamp & Reballast	Yes	10	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	3,058	0.33	2,131	0.0	$261.08	$1,440.00	$135.00	5.00
Basement B3	8	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	4,368	Relamp & Reballast	Yes	8	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	3,058	0.27	1,705	0.0	$208.87	$1,206.00	$115.00	5.22

	Existing Conditions					Proposed Conditions							Energy Impact & Financial Analysis						
Location	Fixture Quantity	Fixture Description	Control System	Watts per Fixture	Annual Operating Hours	Fixture Recommendation	Add Controls?	Fixture Quantity	Fixture Description	Control System	Watts per Fixture	Annual Operating Hours	Total Peak kW Savings	Total Annual kWh Savings	Total Annual MMBtu Savings	Total Annual Energy Cost Savings	Total Installation Cost	Total Incentives	Simple Payback w/ Incentives in Years
Closet	1	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	1,000	Relamp & Reballast	No	1	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	1,000	0.03	39	0.0	$4.73	$117.00	$10.00	22.62
Exterior	4	High-Pressure Sodium: (1) 400W Lamp	None	465	4,368	Fixture Replacement	No	4	LED - Fixtures: Large Pole/Arm-Mounted Area/Roadway Fixture	None	120	4,368	1.10	7,053	0.0	$864.02	$13,299.97	$0.00	15.39
Exterior	2	High-Pressure Sodium: (1) 150W Lamp	None	188	4,368	Fixture Replacement	No	2	LED - Fixtures: Outdoor Wall-Mounted Area Fixture	None	70	4,368	0.19	1,206	0.0	$147.76	$781.35	$200.00	3.93
Exterior	2	Compact Fluorescent: <Enter Fixture Description>	None	39	4,368	Relamp	No	2	LED Screw-In Lamps: <Enter Fixture Description>	None	9	4,368	0.05	307	0.0	$37.57	$107.51	$10.00	2.60
Exterior	4	High-Pressure Sodium: (1) 400W Lamp	None	465	4,368	Fixture Replacement	No	4	LED - Fixtures: Large Pole/Arm-Mounted Area/Roadway Fixture	None	120	4,368	1.10	7,053	0.0	$864.02	$13,299.97	$0.00	15.39
Exterior	2	Compact Fluorescent: <Enter Fixture Description>	None	23	4,368	Relamp	No	2	LED Screw-In Lamps: <Enter Fixture Description>	None	9	4,368	0.02	143	0.0	$17.53	$107.51	$10.00	5.56
Exterior	2	High-Pressure Sodium: (1) 250W Lamp	None	295	4,368	Fixture Replacement	No	2	LED - Fixtures: Outdoor Wall-Mounted Area Fixture	None	90	4,368	0.33	2,095	0.0	$256.70	$781.35	$200.00	2.26
Trailor A6 Exterior	5	Compact Fluorescent: <Enter Fixture Description>	None	23	4,000	Relamp	No	5	LED Screw-In Lamps: <Enter Fixture Description>	None	9	4,000	0.06	328	0.0	$40.13	$268.77	$25.00	6.07
Trailor A6 Interior	16	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	2,400	Relamp & Reballast	No	16	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	2,400	0.42	1,483	0.0	$181.64	$1,872.00	$160.00	9.43
Trailor A6 Interior	1	Linear Fluorescent - T12: 4' T12 (40W) - 2L	Wall Switch	88	2,400	Relamp & Reballast	No	1	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	2,400	0.05	166	0.0	$20.30	$117.00	$10.00	5.27
Bathrooms	2	Incandescent: <Enter Fixture Description>	Wall Switch	60	1,000	Relamp	No	2	LED Screw-In Lamps: <Enter Fixture Description>	Wall Switch	9	1,000	0.08	119	0.0	$14.62	$107.51	$10.00	6.67
Trailor A7 Exterior	5	Compact Fluorescent: <Enter Fixture Description>	None	23	4,000	Relamp	No	5	LED Screw-In Lamps: <Enter Fixture Description>	None	9	4,000	0.06	328	0.0	$40.13	$268.77	$25.00	6.07
Trailor A7 Interior	15	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	2,400	Relamp & Reballast	No	15	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	2,400	0.39	1,390	0.0	$170.29	$1,755.00	$150.00	9.43
Bathroom	1	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	1,000	Relamp & Reballast	No	1	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	1,000	0.03	39	0.0	$4.73	$117.00	$10.00	22.62

Motor Inventory & Recommendations

		Existing Conditions						Proposed Conditions				Energy Impact & Financial Analysis						
Location	Area(s)/System(s) Served	Motor Quantity	Motor Application	HP Per Motor	Full Load Efficiency	VFD Control?	Annual Operating Hours	Install High Efficiency Motors?	Full Load Efficiency	Install VFDs?	Number of VFDs	Total Peak kW Savings	Total Annual kWh Savings	Total Annual MMBtu Savings	Total Annual Energy Cost Savings	Total Installation Cost	Total Incentives	Simple Payback w/ Incentives in Years
Various	Various	23	Supply Fan	0.3	60.0%	No	4,380	No	60.0%	No		0.00	0	0.0	$0.00	$0.00	$0.00	0.00
Mechanical Room	Elevators	2	Other	20.0	80.0%	No	730	No	80.0%	No		0.00	0	0.0	$0.00	$0.00	$0.00	0.00
Roof	Exhaust Fans	12	Exhaust Fan	0.1	60.0%	No	3,285	No	60.0%	No		0.00	0	0.0	$0.00	$0.00	$0.00	0.00
Trailors	Elec Heaters	2	Supply Fan	0.1	60.0%	No	524	No	60.0%	No		0.00	0	0.0	$0.00	$0.00	$0.00	0.00

Electric HVAC Inventory & Recommendations

		Existing Conditions				Proposed Conditions								Energy Impact & Financial Analysis						
Location	Area(s)/System(s) Served	System Quantity	System Type	Cooling Capacity per Unit (Tons)	Heating Capacity per Unit (kBtu/hr)	Install High Efficiency System?	System Quantity	System Type	Cooling Capacity per Unit (Tons)	Heating Capacity per Unit (kBtu/hr)	Cooling Mode Efficiency (SEER/EER)	Heating Mode Efficiency (COP)	Install Dual Enthalpy Economizer?	Total Peak kW Savings	Total Annual kWh Savings	Total Annual MMBtu Savings	Total Annual Energy Cost Savings	Total Installation Cost	Total Incentives	Simple Payback w/ Incentives in Years
Outdoor	Various	3	Split-System AC	5.00		No							No	0.00	0	0.0	$0.00	$0.00	$0.00	0.00
Outdoor	Various	2	Split-System AC	5.00		No							No	0.00	0	0.0	$0.00	$0.00	$0.00	0.00
Outdoor	Various	2	Split-System AC	3.00		Yes	2	Split-System AC	3.00		14.00		No	1.14	3,530	0.0	$432.47	$8,977.32	$552.00	19.48
Outdoor	Various	1	Split-System AC	5.00		Yes	1	Split-System AC	5.00		14.00		No	0.95	2,942	0.0	$360.39	$7,481.10	$460.00	19.48
Outdoor	Various	2	Split-System AC	2.00		Yes	2	Split-System AC	2.00		14.00		No	0.76	2,353	0.0	$288.31	$5,984.88	$368.00	19.48
Outdoor	Various	1	Split-System AC	4.00		No							No	0.00	0	0.0	$0.00	$0.00	$0.00	0.00
Outdoor	Various	3	Split-System AC	2.00		Yes	3	Split-System AC	2.00		14.00		No	1.14	3,530	0.0	$432.47	$8,977.32	$552.00	19.48
Outdoor	Various	1	Split-System AC	5.00		Yes	1	Split-System AC	5.00		14.00		No	0.95	2,942	0.0	$360.39	$7,481.10	$460.00	19.48
Outdoor	GL4	1	Split-System AC	3.00		No							No	0.00	0	0.0	$0.00	$0.00	$0.00	0.00
Outdoor	GL3	1	Split-System AC	2.00		No							No	0.00	0	0.0	$0.00	$0.00	$0.00	0.00
Outdoor	GL5	1	Split-System AC	2.00		No							No	0.00	0	0.0	$0.00	$0.00	$0.00	0.00
Outdoor	Electric Heat for Trailors	2	Electric Forced Air Furnace		34.10	No							No	0.00	0	0.0	$0.00	$16,556.83	$0.00	0.00
Attic	Various	1	Split-System AC	2.50		No							No	0.00	0	0.0	$0.00		$0.00	0.00
Attic	Various	1	Split-System AC	2.76		No							No	0.00	0	0.0	$0.00	$0.00	$0.00	0.00

Fuel Heating Inventory & Recommendations

		Existing Conditions			Proposed Conditions						Energy Impact & Financial Analysis						
Location	Area(s)/System(s) Served	System Quantity	System Type	Output Capacity per Unit (MBh)	Install High Efficiency System?	System Quantity	System Type	Output Capacity per Unit (MBh)	Heating Efficiency	Heating Efficiency Units	Total Peak kW Savings	Total Annual kWh Savings	Total Annual MMBtu Savings	Total Annual Energy Cost Savings	Total Installation Cost	Total Incentives	Simple Payback w/ Incentives in Years
Various	Various	3	Furnace	60.00	Yes	3	Furnace	60.00	95.00%	AFUE	0.00	0	15.0	$178.00	$4,078.32	$1,200.00	16.17
Various	Various	18	Furnace	40.00	Yes	18	Furnace	40.00	95.00%	AFUE	0.00	0	60.0	$712.01	$16,313.28	$7,200.00	12.80
Various	Various	1	Furnace	100.00	Yes	1	Furnace	100.00	95.00%	AFUE	0.00	0	8.3	$98.89	$2,265.73	$400.00	18.87
Various	Various	1	Furnace	100.00	Yes	1	Furnace	100.00	95.00%	AFUE	0.00	0	8.3	$98.89	$2,265.73	$400.00	18.87

Pipe Insulation Recommendations

		Recommendation Inputs		Energy Impact & Financial Analysis						
Location	Area(s)/System(s) Affected	Length of Uninsulated Pipe (ft)	Pipe Diameter (in)	Total Peak kW Savings	Total Annual kWh Savings	Total Annual MMBtu Savings	Total Annual Energy Cost Savings	Total Installation Cost	Total Incentives	Simple Payback w/ Incentives in Years
Mechanical Room	DHW System	10	1.00	0.00	417	0.0	$51.10	$43.50	$0.00	0.85

DHW Inventory & Recommendations

		Existing Conditions		Proposed Conditions						Energy Impact & Financial Analysis						
Location	Area(s)/System(s) Served	System Quantity	System Type	Replace?	System Quantity	System Type	Fuel Type	System Efficiency	Efficiency Units	Total Peak kW Savings	Total Annual kWh Savings	Total Annual MMBtu Savings	Total Annual Energy Cost Savings	Total Installation Cost	Total Incentives	Simple Payback w/ Incentives in Years
Restrooms	Restrooms	1	Storage Tank Water Heater (≤ 50 Gal)	Yes	1	Storage Tank Water Heater (≤ 50 Gal)	Natural Gas	96.00%	Et	1.35	25,322	-86.4	$2,076.67	$8,286.40	$50.00	3.97
Trailors	Restrooms	1	Storage Tank Water Heater (≤ 50 Gal)	No						0.00	0	0.0	$0.00	$0.00	$0.00	0.00
Trailors	Restrooms	1	Tankless Water Heater	No						0.00	0	0.0	$0.00	$0.00	$0.00	0.00
Restrooms	Restrooms	1	Storage Tank Water Heater (≤ 50 Gal)	No						0.00	0	0.0	$0.00	$0.00	$0.00	0.00

Low-Flow Device Recommendations

	Recommedation Inputs				Energy Impact & Financial Analysis						
Location	Device Quantity	Device Type	Existing Flow Rate (gpm)	Proposed Flow Rate (gpm)	Total Peak kW Savings	Total Annual kWh Savings	Total Annual MMBtu Savings	Total Annual Energy Cost Savings	Total Installation Cost	Total Incentives	Simple Payback w/ Incentives in Years
Restrooms	13	Faucet Aerator (Lavatory)	2.00	1.00	0.00	5,471	0.0	$670.22	$93.21	$0.00	0.14
Trailor Restroom	3	Faucet Aerator (Lavatory)	2.00	1.00	0.00	1,262	0.0	$154.67	$21.51	$0.00	0.14

Commercial Refrigerator/Freezer Inventory & Recommendations

	Existing Conditions			Proposed Condi	Energy Impact & Financial Analysis						
Location	Quantity	Refrigerator/ Freezer Type	ENERGY STAR Qualified?	Install ENERGY STAR Equipment?	Total Peak kW Savings	Total Annual kWh Savings	Total Annual MMBtu Savings	Total Annual Energy Cost Savings	Total Installation Cost	Total Incentives	Simple Payback w/ Incentives in Years
Various	1	Stand-Up Refrigerator, Solid Door (16 - 30 cu. ft.)	No	No	0.00	0	0.0	$0.00	$0.00	$0.00	0.00
Various	8	Stand-Up Refrigerator, Solid Door (≤15 cu. ft.)	No	No	0.00	0	0.0	$0.00	$0.00	$0.00	0.00
Various	2	Stand-Up Refrigerator, Solid Door (16 - 30 cu. ft.)	No	No	0.00	0	0.0	$0.00	$0.00	$0.00	0.00

Plug Load Inventory

	Existing Conditions			
Location	Quantity	Equipment Description	Energy Rate (W)	ENERGY STAR Qualified?
Office Building	59	Computers	120.0	
Office Building	14	Printers	250.0	
Office Building	1	Projectors	350.0	
Office Building	5	TV	90.0	
Office Building	5	Water Cooler	120.0	
Office Building	6	Microwave	1,200.0	
Office Building	4	Large Scanner	600.0	
Office Building	6	Coffee Maker	900.0	
Office Building	5	Electric Unit Hetaers	1,500.0	

Vending Machine Inventory & Recommendations

	Existing Conditions		Proposed Conditions	Energy Impact & Financial Analysis						
Location	Quantity	Vending Machine Type	Install Controls?	Total Peak kW Savings	Total Annual kWh Savings	Total Annual MMBtu Savings	Total Annual Energy Cost Savings	Total Installation Cost	Total Incentives	Simple Payback w/ Incentives in Years
Café	1	Refrigerated	Yes	0.00	1,612	0.0	$197.47	$230.00	$0.00	1.16

Custom Measure Recommendations

Computer Power Management Software

# of Desktops	Normal Running Mode					Idle Running Mode					Suspended/Off Mode				
59	*Mon - Fri 8AM-5PM*	*Mon - Fri 5PM-8AM*	*Weekends & Holidays*	Energy Rate (W)*	Weekly Run Hours	Mon - Fri 8AM-5PM	Mon - Fri 5PM-8AM	*Weekends & Holidays*	*Energy Rate (W)**	*Weekly Run Hours*	Mon - Fri 8AM-5PM	Mon - Fri 5PM-8AM	Weekends & Holidays	Energy Rate (W)*	*Weekly Run Hours*
Existing Conditions	90%	25%	5%	120	**58**	5%	50%	10%	80	**47**	5%	25%	85%	5	**63**
Proposed Conditions	85%	5%	0%	120	**38**	5%	0%	0%	80	**2**	10%	95%	100%	5	**128**

Usage per Device			Energy Impact & Financial Analysis					
Weeks of Use	Annual kWh Usage	*Diversity Factor***	Total Annual kWh Savings	Total Annual Energy Cost Savings	*Cost per Desktop*	*Add'l Hardware Cost*	Total Installation Cost	Simple Payback Period (Years)
43	476	90%	13,029	$1,596	$15.00	$2,500.0	$3,385	2.12
43	230							

Replace Refrigerators with Compact Energy Star Equipment

Existing Conditions					Proposed Conditions					Energy Impact & Financial Analysis					
Qty	*Volume per Unit (cu. ft.)*	*Total kW*	*Total Annual kWh*	% Empty as Noted on Site	Qty	Description	Volume per Unit (cu. ft.)	Total kW	Total Annual kWh	Total Annual kW Savings	Total Annual kWh Savings	Total Annual Energy Cost Savings	*Cost per Compact Energy Star Fridge*	Total Installation Cost	Simple Payback Period (Years)
2	22	1.1	3,095	50%	1	Replace	11	0.11	311	1.0	2,784	$341	$500.00	$500	1.47

Weather-Strip Exterior Doors

# of Doors: 5

Existing Conditions										Proposed Conditions		Energy Impact & Financial Analysis			
Average Heating Season OAT (degF)	Average Heating Season IAT (degF)	Average Cooling Season OAT (degF)	Average Cooling Season IAT (degF)	Volume of Main Corridor (cubic ft)	ACH	Heating Season Infiltration (Btu/hr)	Cooling Season Infiltration (Btu/hr)	Annual Heating EFLH	Annual Cooling EFLH	Heating Season Energy Savings (mmBtu)	Cooling Season Energy Savings (kWh)	Total Annual Energy Cost Savings	*Cost per Single Door*	Total Installation Cost	Simple Payback Period (Years)
55	71	78.0	72	10,000	3	8,640	3,240	277	1,236	2.4	1,173	$172	$125.00	$625	3.63

Retro-Commissioning Study & HVAC Improvements

Existing Conditions				Proposed Conditions				Energy Impact & Financial Analysis					
	Annual Cooling Energy Use (kWh)	*Annual Heating Energy Use (mmBtu)*	*Annual Fan Energy Use (kWh)*		Assumed % Cooling Savings	Assumed % Heating Savings	Assumed % Motor Savings		Total Annual kWh Savings	Total Annual mmBtu Savings	Total Annual Energy Cost Savings	Total Installation Cost	Simple Payback Period (Years)
	151,255	435.3	31,313		3%	5%	2%		5,164	22	$891	$10,800	12.12

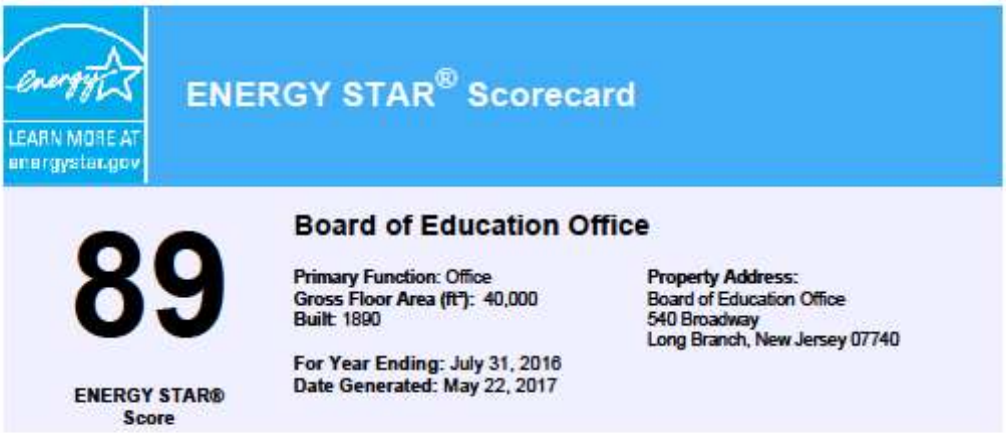
Equations: (Based on Industry Standards)

Average Cost for retro-commissioining studies and control improvements is $0.30/sqft

Energy savings range between 5% and 20% with a typical payback of two years or less

Based on a comprehensive study by the Environmental Protection Agency, the value of energy savings range from $0.11 and $0.72/sqft

Appendix B: EPA Statement of Energy Performance



ENERGY STAR® Scorecard

LEARN MORE AT energystar.gov

89

ENERGY STAR® Score

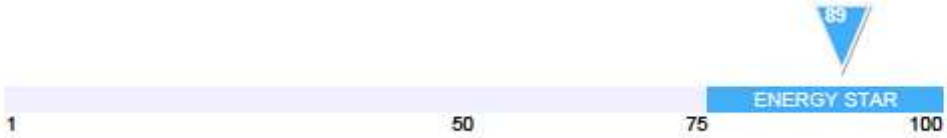
Board of Education Office

Primary Function: Office
Gross Floor Area (ft²): 40,000
Built: 1890

For Year Ending: July 31, 2016
Date Generated: May 22, 2017

Property Address:
Board of Education Office
540 Broadway
Long Branch, New Jersey 07740

For the year ending in July 2016, this building used 116.0 (kBtu/ft²) on a source energy basis. The Environmental Protection Agency's (EPA's) 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.



Buildings with a score of 75 or higher may qualify for EPA's ENERGY STAR.

Signature of Verifying Professional

I _____ (Name) verify that the information regarding energy use and property use details is true and correct to the best of my knowledge.

Signature: _____ Date: _____

ENERGY STAR® Data Verification Checklist

LEARN MORE AT energystar.gov

89

ENERGY STAR ® Score[1]

Board of Education Office

Registry Name: Board of Education Office
Property Type: Office
Gross Floor Area (ft²): 40,000
Built: 1890

For Year Ending: 07/31/2016
Date Generated: 05/22/2017

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

Property & Contact Information

Property Address	Property Owner	Primary Contact
Board of Education Office 540 Broadway Long Branch, New Jersey 07740	Long Branch Public Schools 540 Broadway Long Branch, NJ 07740 732-571-2868 x 40710	Ann Degnan 540 Broadway Long Branch, NJ 07740 732-571-2868 x 40710 adegnan@longbranch.k12.nj.us

Property ID: 5879137

1. Review of Whole Property Characteristics

Basic Property Information

1) **Property Name:** Board of Education Office
Is this the official name of the property? ☐ Yes ☐ No
If "No", please specify: _____

2) **Property Type:** Office
Is this an accurate description of the primary use of this property? ☐ Yes ☐ No

3) **Location:**
540 Broadway
Long Branch, New Jersey 07740
Is this correct and complete? ☐ Yes ☐ No

4) **Gross Floor Area:** 40,000 ft² ☐ Yes ☐ No

ENERGY STAR® Statement of Energy Performance

LEARN MORE AT energystar.gov

89

ENERGY STAR® Score[1]

Board of Education Office

Primary Property Type: Office
Gross Floor Area (ft²): 40,000
Built: 1890

For Year Ending: July 31, 2016
Date Generated: May 22, 2017

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

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Board of Education Office 540 Broadway Long Branch, New Jersey 07740	Long Branch Public Schools 540 Broadway Long Branch, NJ 07740 732-571-2868 x 40710	Ann Degnan 540 Broadway Long Branch, NJ 07740 732-571-2868 x 40710 adegnan@longbranch.k12.nj.us

Property ID: 5879137

Energy Consumption and Energy Use Intensity (EUI)

Site EUI
44.2 kBtu/ft²

Source EUI
116 kBtu/ft²

Annual Energy by Fuel		
Electric - Grid (kBtu)	1,331,254 (75%)	
Natural Gas (kBtu)	438,746 (25%)	

National Median Comparison	
National Median Site EUI (kBtu/ft²)	79.6
National Median Source EUI (kBtu/ft²)	208.7
% Diff from National Median Source EUI	-44%
Annual Emissions	
Greenhouse Gas Emissions (Metric Tons CO2e/year)	153

Signature & Stamp of Verifying Professional

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

Signature: _____ Date: _____

Licensed Professional

Ann Degnan
540 Broadway
Long Branch, NJ 07740
732-571-2868 x 40710
adegnan@longbranch.k12.nj.us

Professional Engineer Stamp (if applicable)