



# Energy Savings Through Upgrades and Education

NJSBA Virtual Workshop 2020

October 22, 2020





# Session Speakers

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## Speakers

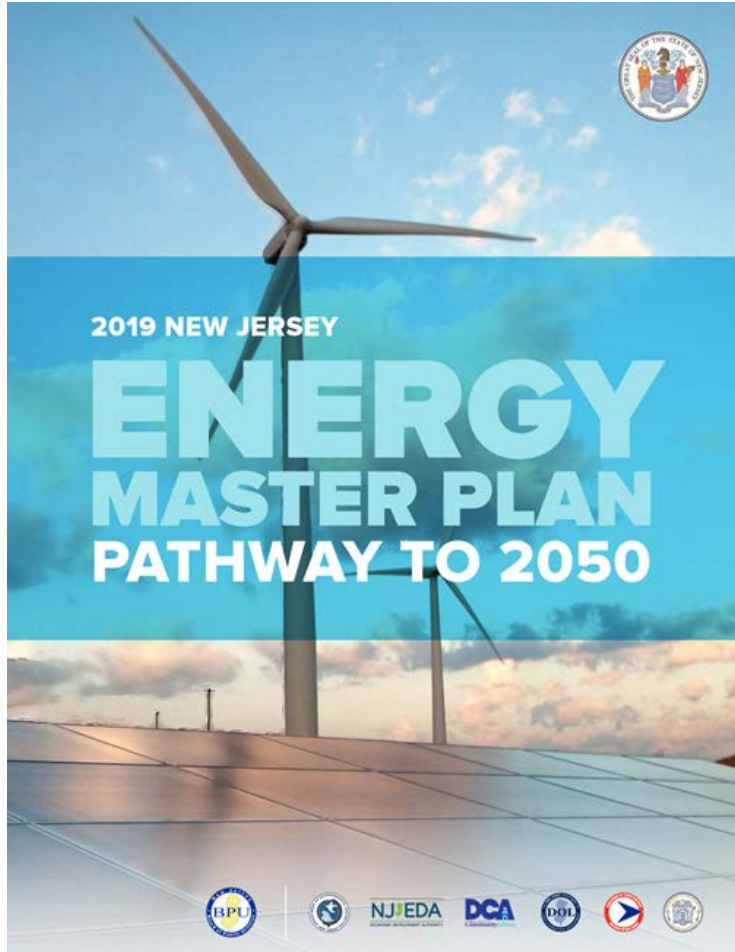
- **Michelle Rossi**
  - NJ Board of Public Utilities
- **Erica DeMichele**
  - Delran Township Public Schools
- **Carolyn Tagmire**
  - Winslow Township High School

## Moderator

- **Nancy Quirk**
  - Sustainable Jersey



# New Jersey Energy Master Plan



## Strategies

1. Reduce Energy Consumption from Transportation
2. Accelerate Renewable Energy
3. Maximize Energy Efficiency and Conservation
4. Reduce Energy Consumption from Buildings
5. Modernize NJ's Energy System
6. Support Community Energy Planning and Support Participation by Low- and Moderate-Income and Environmental Justice Communities
7. Expand the Clean Energy Innovation Economy



# Sustainable Jersey for Schools

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## Certification program for municipalities and schools

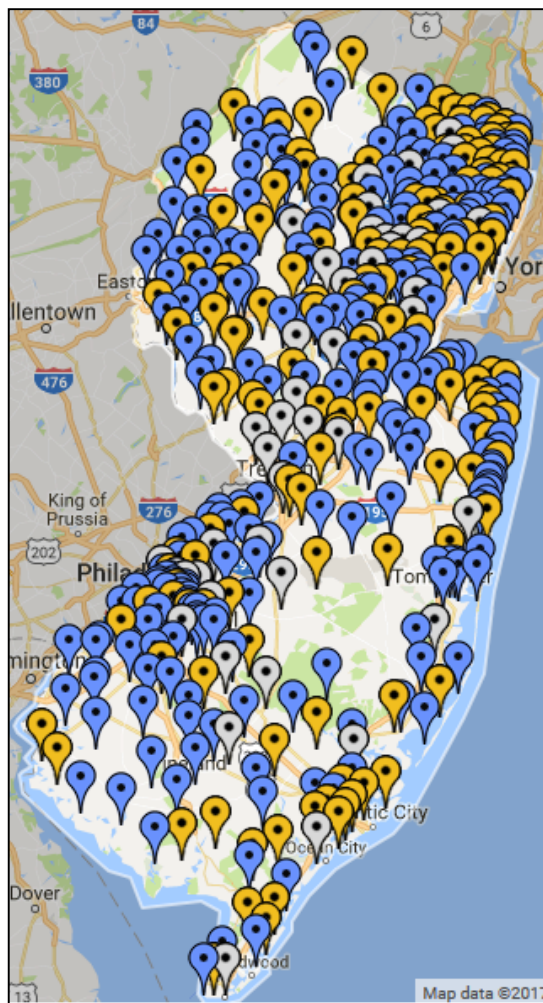
- Tools, resources, and guidance to help municipalities and schools become more sustainable
- Grants and funding for municipalities and schools







# Program Participants



**Municipal Program**



**Schools Program**

## **Municipal Program**

457 (81%) participating

204 Certified

- 151 Bronze
- 53 Silver

## **Schools Program**

353 Districts

969 Schools

321 Schools Certified

- 298 Bronze
- 23 Silver



# Energy Actions

## Facilities and Operations

Energy Efficiency	Renewable Energy	Alternative Fuel Vehicles
<ul style="list-style-type: none"><li>• Carbon Footprint *</li><li>• Energy Tracking and Management</li><li>• Energy Efficiency for School Facilities *</li></ul>	<ul style="list-style-type: none"><li>• On-Site Solar Energy +10 storage for resilience</li><li>• On-Site Geothermal</li><li>• Buy Renewable Energy</li></ul>	<ul style="list-style-type: none"><li>• Sustainable Fleets</li></ul>

\* = priority action

## Student Engagement

Student Engagement and Community Outreach Actions
<ul style="list-style-type: none"><li>• Behavior-Based Energy Efficiency in Schools</li><li>• Civic &amp; Stewardship Volunteer Initiatives</li><li>• Community Education and Outreach *</li><li>• Education for Sustainability</li><li>• Enrichment Programs through Partnership</li><li>• Green Challenges</li><li>• Professional Development for Sustainability *</li></ul>



# Energy Efficiency for Facilities Action

- **5 points** - Audit on at least one building
- **10 points** - Local Government Energy Audit (LGEA)
- **15 points** - Significant upgrade work
- **20 points** - LGEA on all buildings PLUS significant upgrade work
- **30 points** - Efficiency upgrades; 10%-19% decreased energy use
- **40 points** - Efficiency upgrades; 20%-29% decreased energy use
- **50 points** - Efficiency upgrades; at least 30% decreased energy use







# Local Government Energy Audit (LGEA)






[HOME](#) | [RESIDENTIAL](#) | [COMMERCIAL, INDUSTRIAL, LOCAL GOV & MULTIFAMILY](#)


**COMMERCIAL, INDUSTRIAL, LOCAL GOV. & MULTIFAMILY**  
▼ PROGRAMS  
▶ NJ SMARTSTART BUILDINGS  
▶ PAY FOR PERFORMANCE  
▼ MULTIFAMILY PROGRAM  
GET STARTED  
LEARN MORE  
RESOURCES AND NEWS  
COMBINED HEAT AND POWER - FUEL CELL  
LOCAL GOVERNMENT ENERGY AUDIT  
LARGE ENERGY USERS PROGRAM  
ENERGY SAVINGS IMPROVEMENT PROGRAM (ESIP)  
▶ DIRECT INSTALL

[Press Room](#) | [Library](#) | [FAQ](#)

[Home](#) » [Commercial & Industrial](#) » [Programs](#)  
**Local Government Energy Audit**  
**LEAD BY EXAMPLE**  
All across New Jersey, residents and business owners are looking for ways to save energy environment. In order to understand how they can save, the Local Government Energy Audit (LGEA) Program allows local government entities, state contracting agencies, public agencies, state colleges and state universities, and select non-profit agencies, to examine their facilities see how they can improve their energy use. The program can help you identify cost-justified energy-efficiency measures, as well as subsidize the full cost of the audit. The entire audit process including customer assistance, application processing and auditing will be performed by TRC Energy Services, Program Manager for New Jersey's Clean Energy Program (NJCEP). More details are available about the LGEA program in this [brochure](#), [Video Overview](#), [Program Guide](#) and [FAQs](#).  
**Eligibility**  
The LGEA Program targets buildings owned by many local government-related entities, New Jersey Colleges and Universities, and 501(c)(3) non-profit agencies. Such facilities may include but are not limited to: offices, courtrooms, town halls, police and fire stations, sanitation buildings, transportation structures, [schools](#) and community centers.  
**Your Expense is Covered**  
NJCEP will subsidize 100% of the cost of the audit, up to an incentive cap, so there are no out of pocket expenses associated with services provided under this program.  
**Audit Scope**  
The audit includes an inventory of all energy-consuming equipment and systems, including heating, ventilation, air conditioning, lighting, and electrical systems. The audit also includes a review of energy bills and a recommendation of energy efficiency measures that will help reduce energy consumption and costs. The audit also includes a review of energy bills and a recommendation of energy efficiency measures that will help reduce energy consumption and costs.  


[njcleanenergy.com/](https://njcleanenergy.com/)





**Local Government Energy Audit Report**  
Dwight D. Eisenhower Elementary School  
February 8, 2019  
  
Prepared for:  
Sayreville Public Schools  
601 Ermon Rd  
Parsippany, NJ 08859  
  
Prepared by:  
TRC Energy Services  
900 Route 9 North  
Woodbridge, New Jersey 07095





# Energy Savings Improvement Plan

## ESIP How-To Guide

- Case Studies
- Flow chart
- Contracting options
- Glossary

How to Implement an Energy Savings Improvement Plan  
Sustainable Jersey How-To Guide, V.2



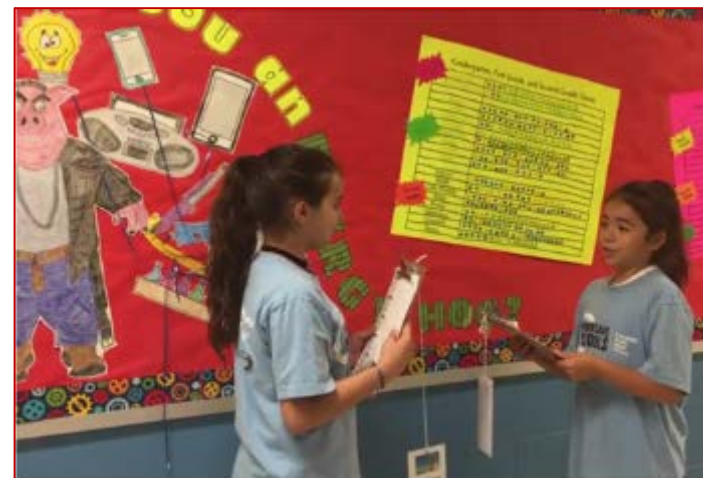
Sustainable Jersey  
Sustainability Institute at The College of New Jersey  
Forcina Hall, 3<sup>rd</sup> Floor  
2000 Pennington Rd.  
Ewing, NJ 08628-0718

<http://www.sustainablejersey.com/grants-resources/publications/>



# Behavior-Based Energy Conservation

- Activities to change energy behaviors
  - “Energy Patrol” contests
  - Walk-through audit checklists
  - Holiday-shutdown activities
- “Energy Campaign”
  - Brochures, flyers, email blasts
  - School Assembly presentations



GLC PowerSave Team 2017





# Sustainable Transportation Action



- Healthier Air
- Reduced CO2 emissions
- Quieter
- Less expensive O&M

- Nation's largest fleet
  - 480,000 school buses in operation
- Largest form of mass transit
- Alternative fuel vehicles cost more than diesel
- Save 40-50% on fuel costs





# Funding Opportunities

## **NJDEP It Pay\$ to Plug In**

- Public and Workplace EV charging stations
  - \$750 per Level 1 charging station
  - \$4,000 per port Level 2 charging

[www.drivegreen.nj.gov/plugin.html](http://www.drivegreen.nj.gov/plugin.html)

## **NJBPU Clean Fleet Electric Vehicle Incentive Program**

- \$4,000 grant toward purchase of Electric Vehicle
- \$1,500 toward purchase of dual-port Level 2 EV charging station

[https://www.bpu.state.nj.us/bpu/pdf/publicnotice/Updated\\_Application\\_Clean%20Fleet%20Electric%20Vehicle%20Incentive%20Program.pdf](https://www.bpu.state.nj.us/bpu/pdf/publicnotice/Updated_Application_Clean%20Fleet%20Electric%20Vehicle%20Incentive%20Program.pdf)







# Gardinier Environmental Fund

## Grants for innovative energy projects

- Six @ \$10,000 grants
- Two @ \$30,000 grants

DEADLINE to apply

- October 30, 2020



### Sustainable Jersey Grants Program

#### Funding Available for Energy Projects!

We are pleased to announce that the Gardinier Environmental Fund is contributing \$100,000 to support a Sustainable Jersey Grants Program cycle for municipal governments and public school districts. For this grant cycle, the Gardinier Environmental Fund will fund energy projects focused on energy conservation, efficiency, and renewable energy.

Sustainable Jersey will be flexible with all grant recipient requests to modify their project scope, timeline, and budget due to changing circumstances caused by the COVID-19 pandemic.

**Funded By:** 

<b>Available Grants</b>	Two \$20,000 Grants Six \$10,000 Grants
<b>Access Application</b>	The online application can be found here: <a href="http://bit.ly/2020SJEnergyGrants">http://bit.ly/2020SJEnergyGrants</a>
<b>Application Due</b>	Friday, October 30, 2020 at 11:59pm
<b>Eligible Applicants</b>	The applicant must be either a New Jersey municipality or public school district registered with Sustainable Jersey or Sustainable Jersey for Schools with an appointed green team.



<http://www.sustainablejerseyschools.com/grants-resources/>

# Sustainable Jersey for Schools Supporters & Sponsors

## Program Underwriters




## Grants Program



## Corporate Sponsors



# ENERGY SAVINGS THROUGH UPGRADES AND EDUCATION



NJSBA Virtual Conference  
Thursday, October 22, 2020

Michelle Rossi, ESIP Coordinator  
NJ Board of Public Utilities

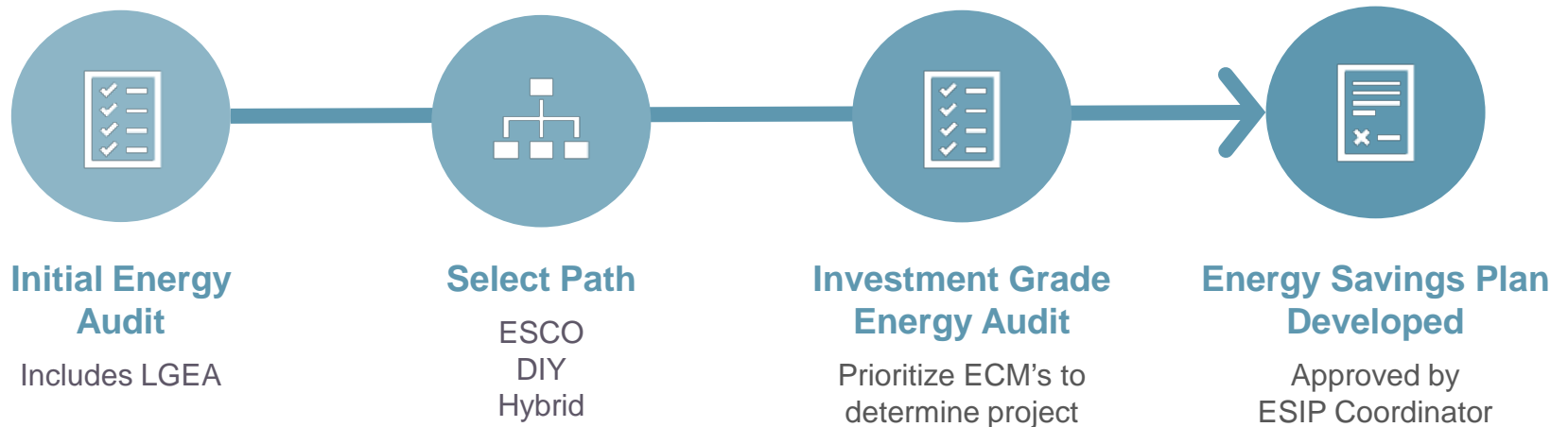
# What is ESIP?

## ENERGY SAVINGS IMPROVEMENT PROGRAM

- **Funding mechanism** for all government entities used to pay for energy efficiency upgrades
- Administered directly by the NJBPU
- 15 or 20 year repayment term
- Must remain cash flow positive
- Board approved incentives/rebates
- No voter approval needed



# ESIP Pathway



# The Pandemic

- Returning to normalcy, **safely**
- Indoor Air Quality
- HVAC Filtration, Enhanced HVAC systems
- Budget Constraints
- ESIP



# Delran's STEM Ecosystem Alliance & Delran Township Board of Education

## Energy Savings Improvement Program and Workforce Development with Schneider Electric



# Achieving the District's Key Capital Goals

## *through a budget-neutral Energy Savings Improvement Program*

Energy Conservation Measure (ECM)	Delran High School	Delran Middle School	Delran Intermediate School	Millbridge Elementary School
Hot Water Pump Variable Frequency Drives & Control Valve Upgrades				
Building Automation System (BAS) Upgrade				
Rooftop Unit (RTU) Upgrade with AC - Music Room				
Retro-commissioning - D Wing				
Lighting Upgrade - Interior				
Lighting Upgrade - Exterior				
Urinal Replacement - Faculty Lounge & Boys Locker Room				
Building Envelope Upgrades				
Walk-In Cooler & Freezer Controls				
Vending Misers				
Plug Load Controllers				
Solar Power Purchase Agreement (PPA)				
Water Conservation				

Once completed, the project will provide an environmental impact equivalent to:



**1,927**  
eTONS OF GHG



**414**  
CARS REMOVED



**249**  
HOMES POWERED



# Financial Impact

**Annual Savings:**

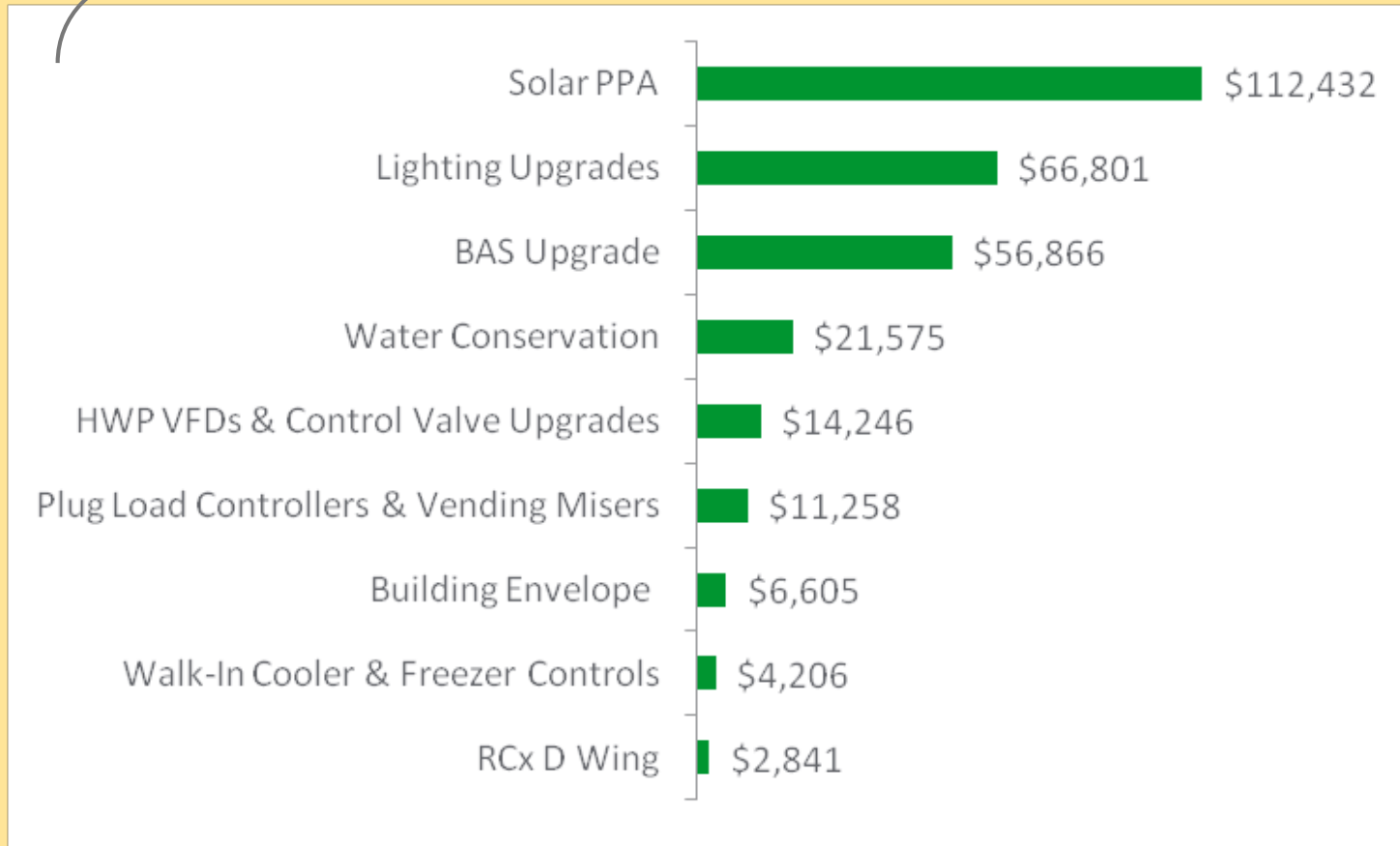
**\$283,343**

**Anticipated  
Incentives:**

**\$325,555**

**Project Cost:**

**\$4,512,672**

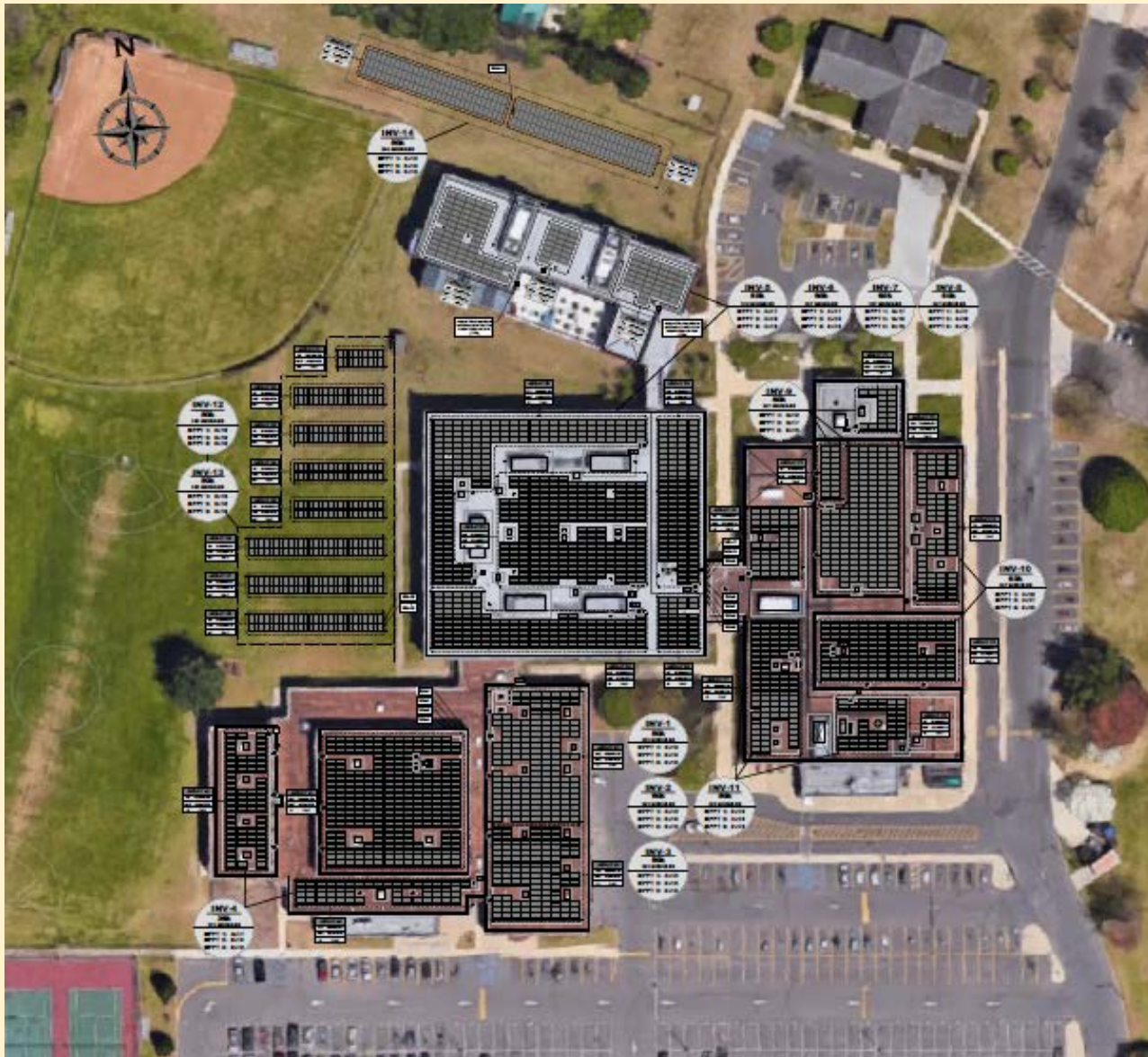


# Solar PV Deployment by School

School	System Size
High School	908.8 kW
Middle School	531.6 kW
Intermediate School	355.8 kW
Elementary School	316.2 kW
<b>Total</b>	<b>2,112 kW</b>

- > Current electric: \$0.1258 - \$0.1276/kWh (not including demand)
- > PPA Option: \$0.084 with 2.2% Escalator
- > **Results:**
  - > \$112,000 in Year 1 Savings
  - > \$1.8M in ESIP scope
  - > 83% electric offset
  - > New roofs at High School and Millbridge

# Delran High School



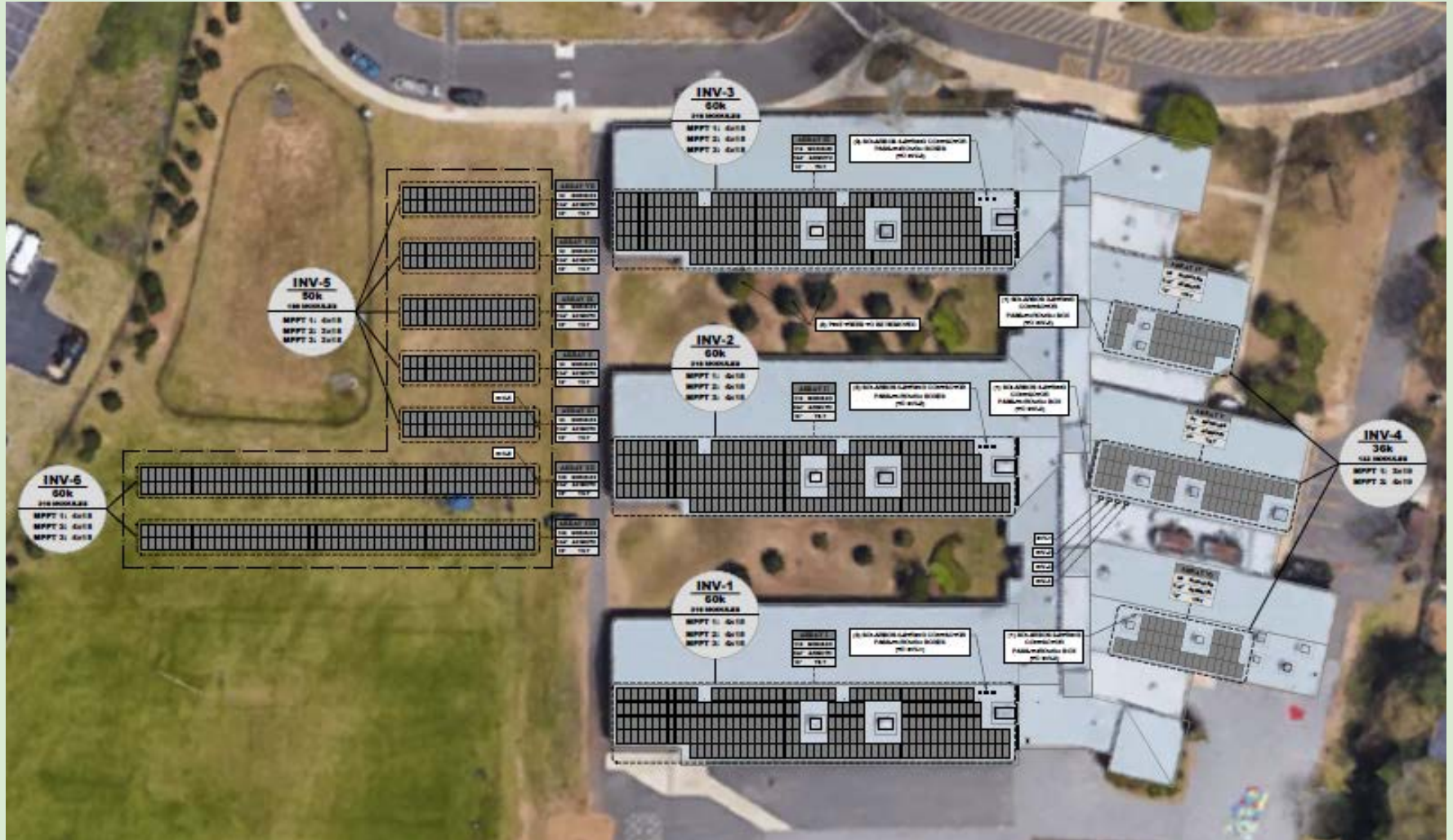


# Delran Middle School

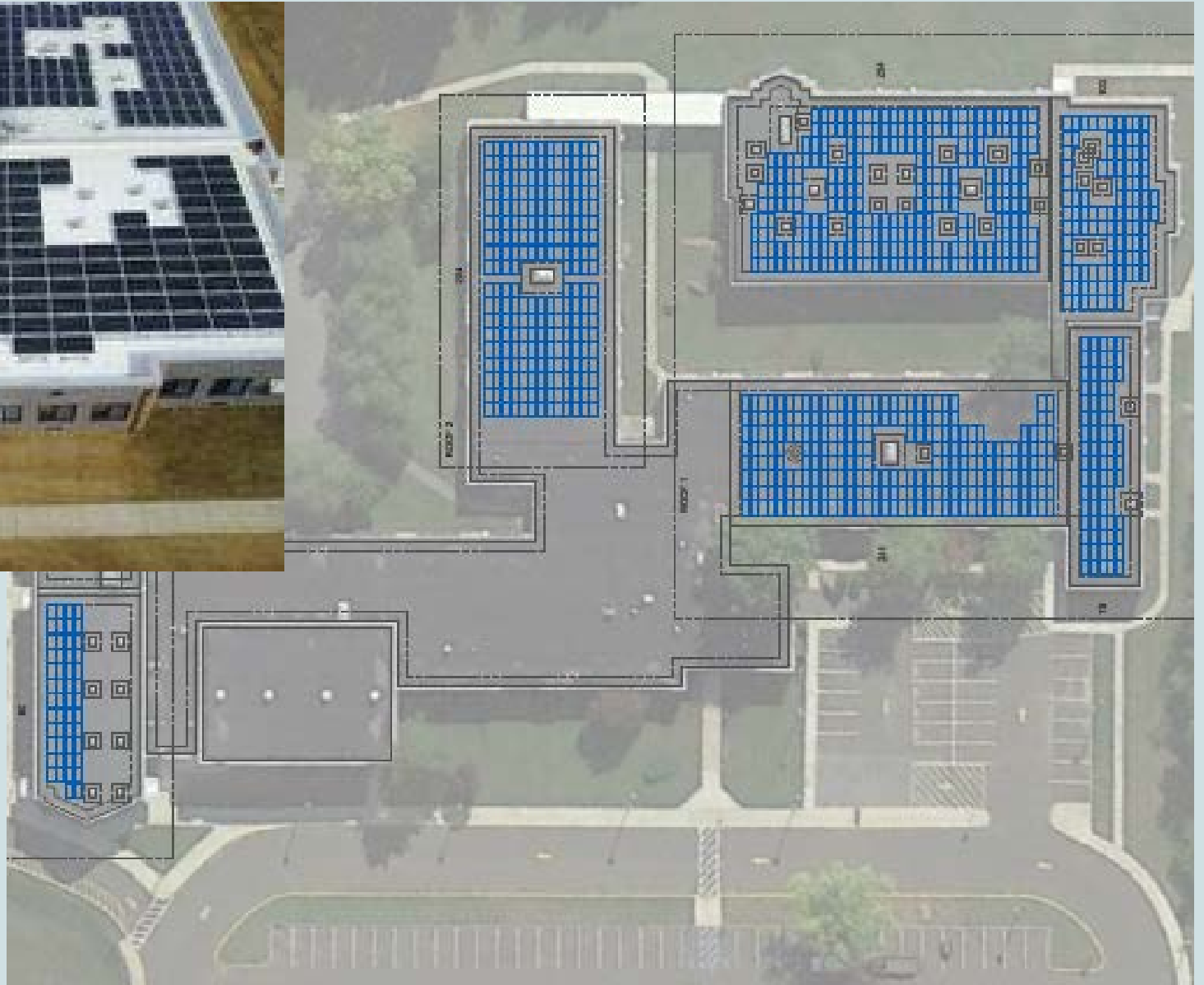




# Delran Intermediate School

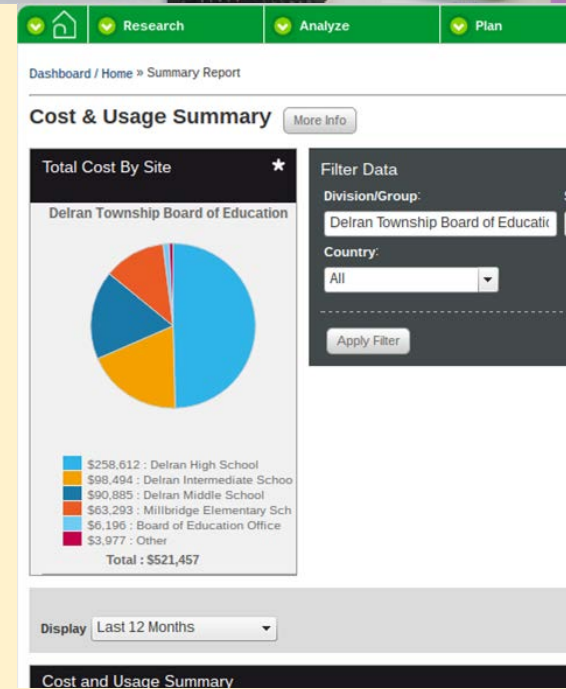


# Millbridge Elementary School



# Value to Delran Schools and the Community

- **\$4.5+ M of capital improvements-** *With no increase in the budget*
- **Improved learning environment** - *Through upgrades to BAS, HVAC, and lighting systems*
- **Increased awareness-** *Through an energy dashboard system & marketing program*  
*Education for our students, K-12*
- **Sustainability-** *With 80% of electricity use from onsite solar PV*





# Energy Dashboards



## Delran Township Public Schools

Delran Township Public Schools and Schneider Electric have partnered to improve energy efficiency and sustainability.

**32%**  
energy cost  
reduction

**\$5.6M**  
in total savings

Produce **80%**  
of electric needs  
through on-site  
solar PV

Renovations to create an improved learning environment for students will be made to all of the District's facilities. Improvements include:

- > Building automation system upgrades
- > Interior & exterior LED lighting
- > HVAC tuning and equipment upgrades
- > Water conservation
- > Partial roof replacements at Delran High School and Millbridge Elementary School
- > Solar panels at all 4 schools

Once completed, the project will provide an environmental impact equivalent to:



**1,927**  
TONS OF CO<sub>2</sub>



**414**  
CARS REMOVED



**249**  
HOMES POWERED

## Energy Savings Improvement Program (ESIP) Solar Power Purchase Agreement (PPA)

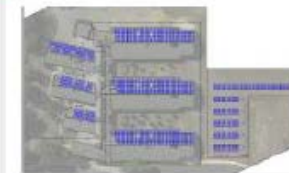
Delran High School



Delran Middle School



Delran Intermediate School



Millbridge Elementary School



### Benefits:

- Over 2 MW of onsite solar, providing 80% of the District's electricity
- \$112,000 in annual savings
- 90,000 square foot of new roof at the High School and Millbridge

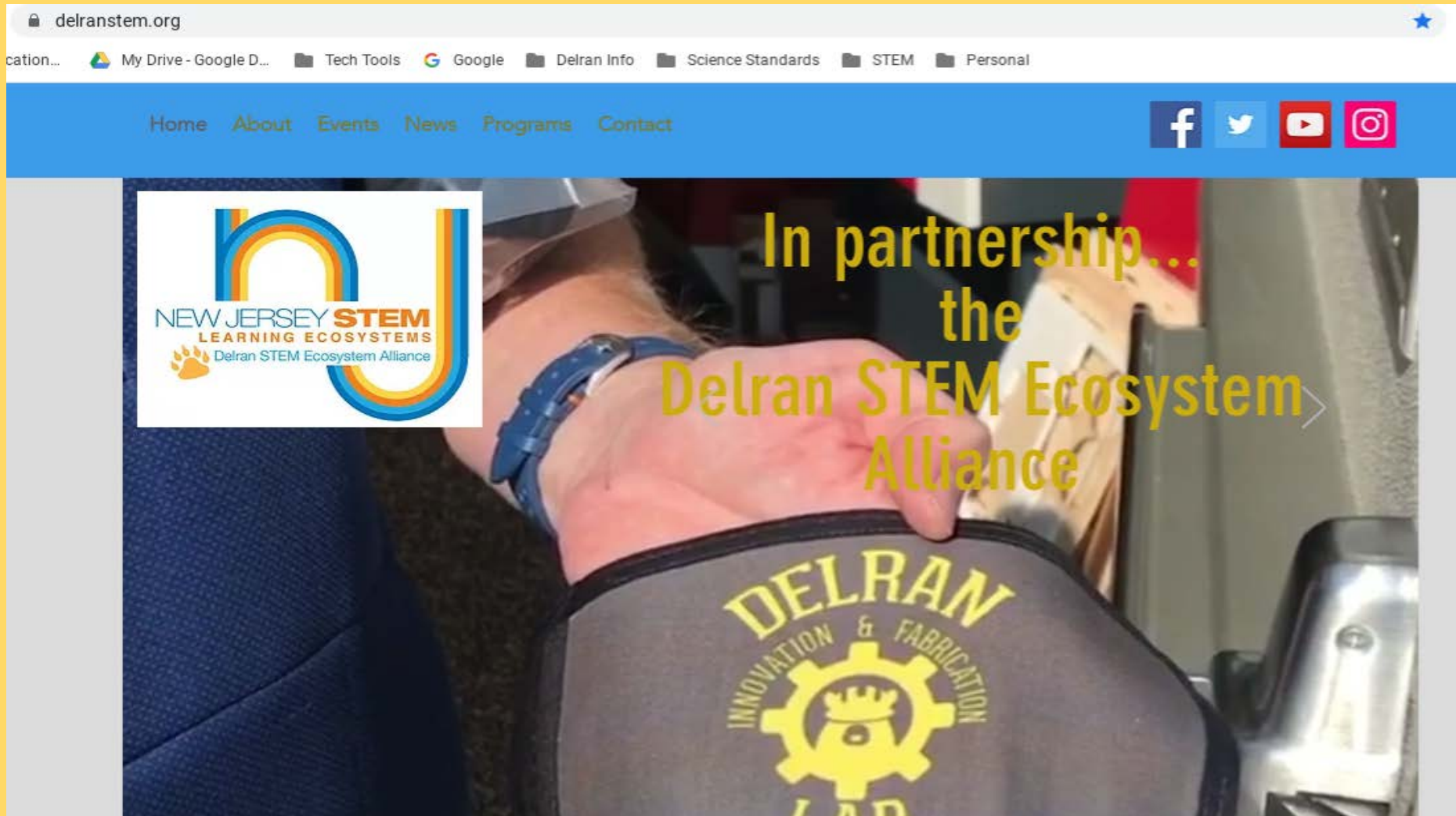
# A Case Study





# Delran STEM Ecosystem Alliance

## delranstem.org



# Delran STEM Ecosystem Alliance



THE POWER OF THE ECOSYSTEM



RESEARCH & DEVELOPMENT COUNCIL OF NEW JERSEY



# Delran STEM Ecosystem Alliance



## DELRAN'S CRADLE TO CAREER STEM PATHWAY



### DHS Class of 2018

32%  
2-year college  
(97% of those ~ RCBC)

53%  
4-year college

5%  
Trade Schools

8%  
Workforce

2%  
Military



# STEAM and STEM to Workforce



## LIGHT UP THE WINTER SOLSTICE 12/4/19

- Learn about the shortest day of the year
- Work with real solar energy technicians
- Create your own light-up/pop-up card

**Schneider**  
Electric



**Delran Elementary PTO**

Family engagement, understanding science phenomena, applying electronic circuitry to a design and learning with the help of a real solar engineer technician!





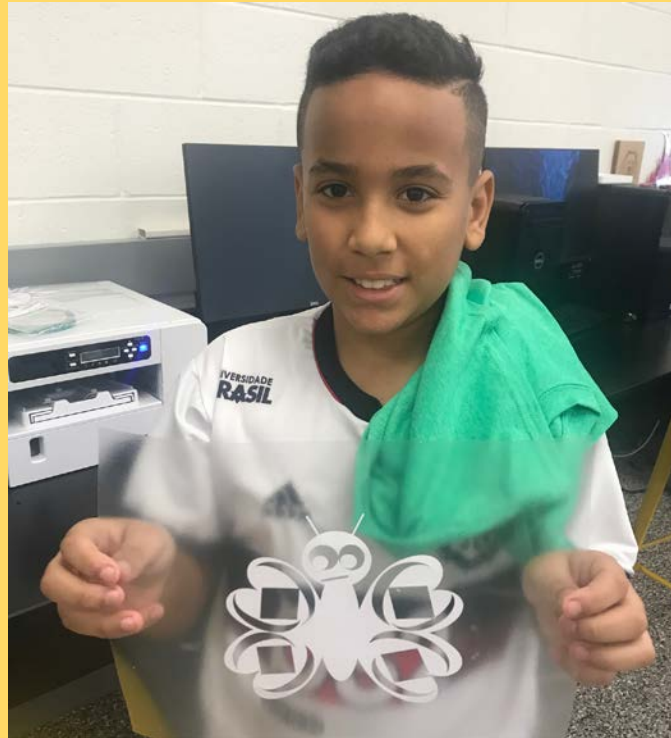
# STEAM and STEM to Workforce



DIS Green Team and  
Schneider Electric

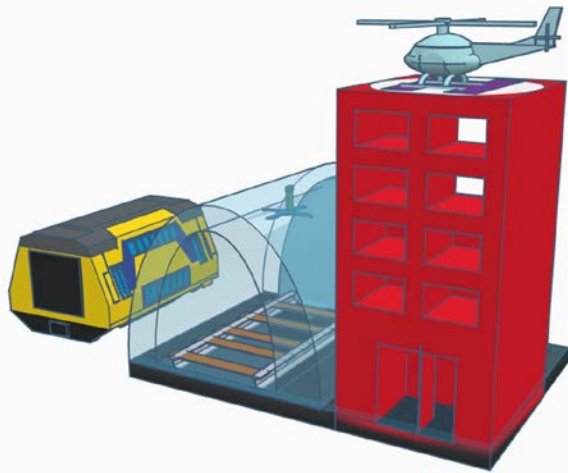
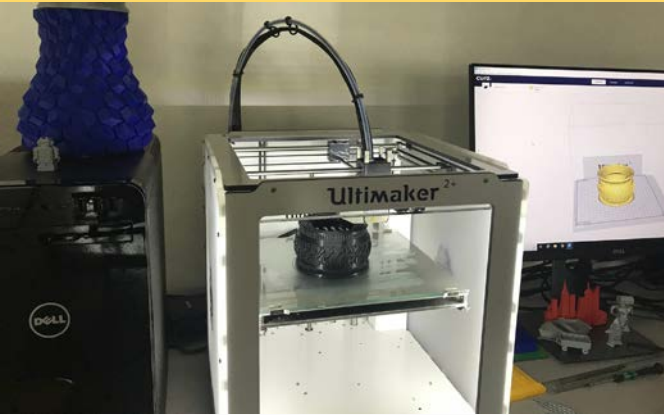


# STEAM and Sustainability Contests



Green Team messaging the importance of habitat preservation, via the Philadelphia Zoo UNLESS Contest, while learning digital design and fabrication in the process

# DHS Engineering Curriculum: Sustainable Cities



Digital fabrication aligned to sustainability. Prompt: How can we design our cities to provide more sustainable practices, due to simply changing the design process?



# PowerSave Schools

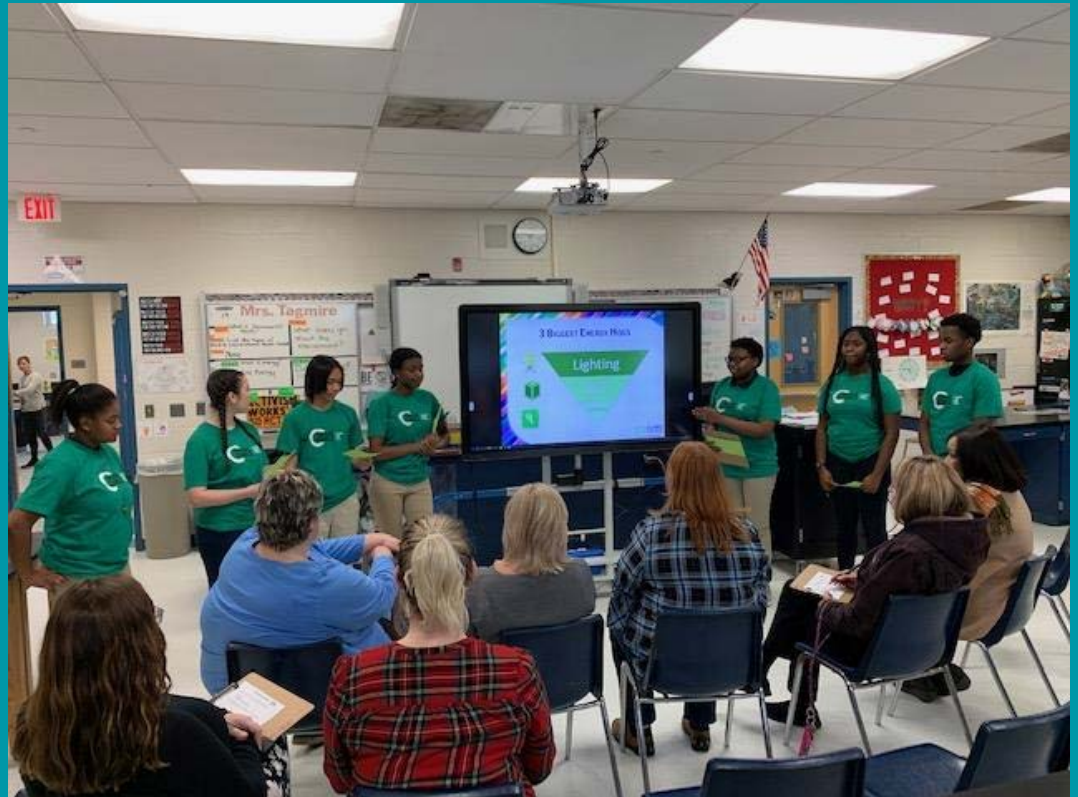
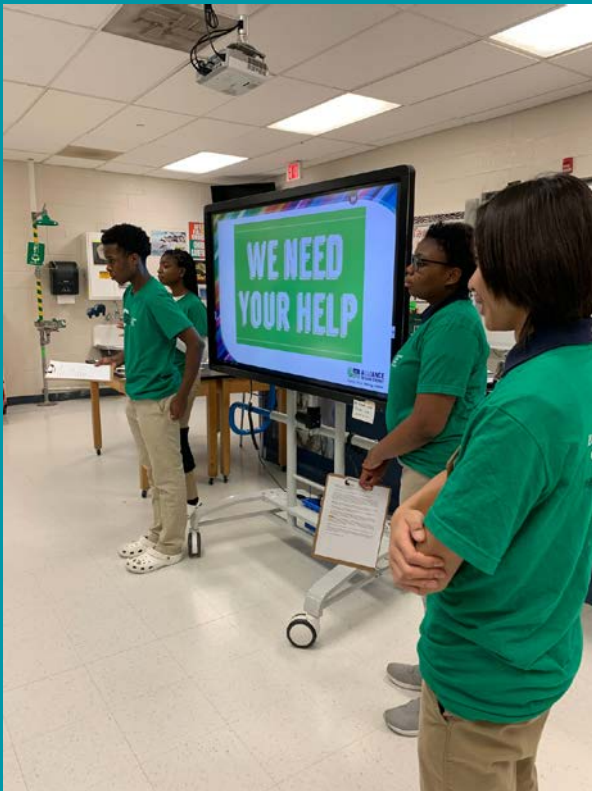
## Winslow Twp High School

Carolyn Tagmire

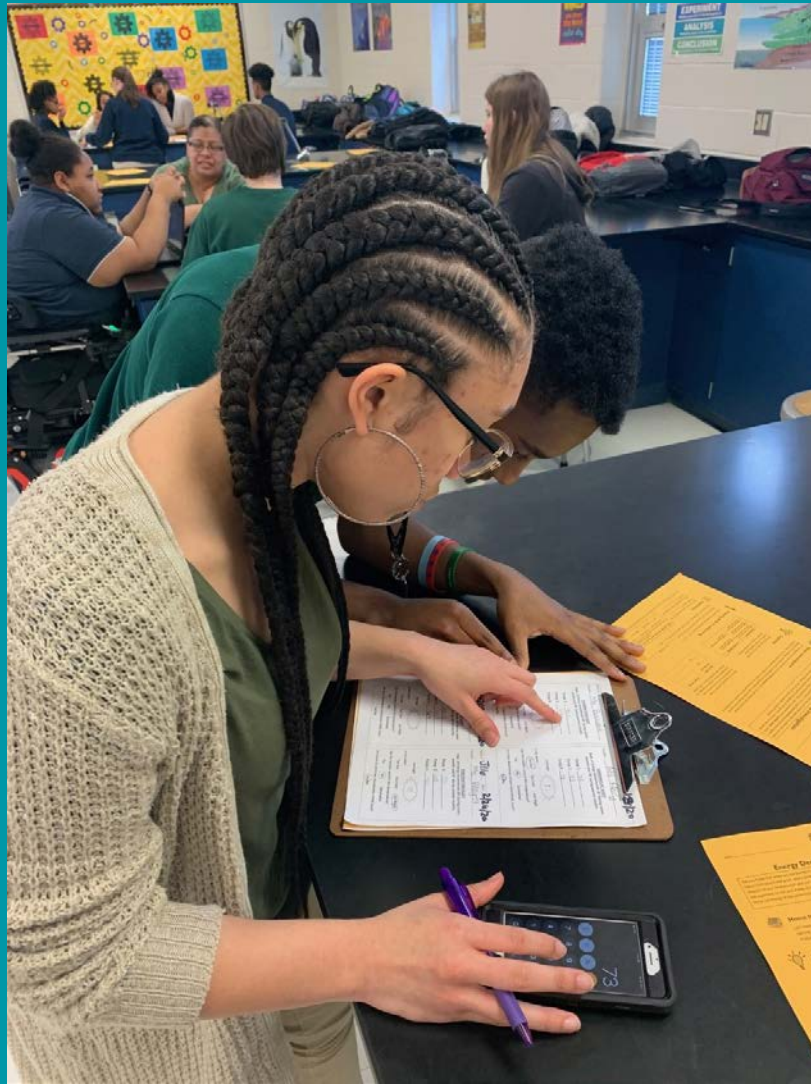


# PowerSave Program Highlights

- Student led presentations for their peers, teachers, administrators and the community.
- Students took on active leadership roles and stood behind their message to spread the word about saving energy.





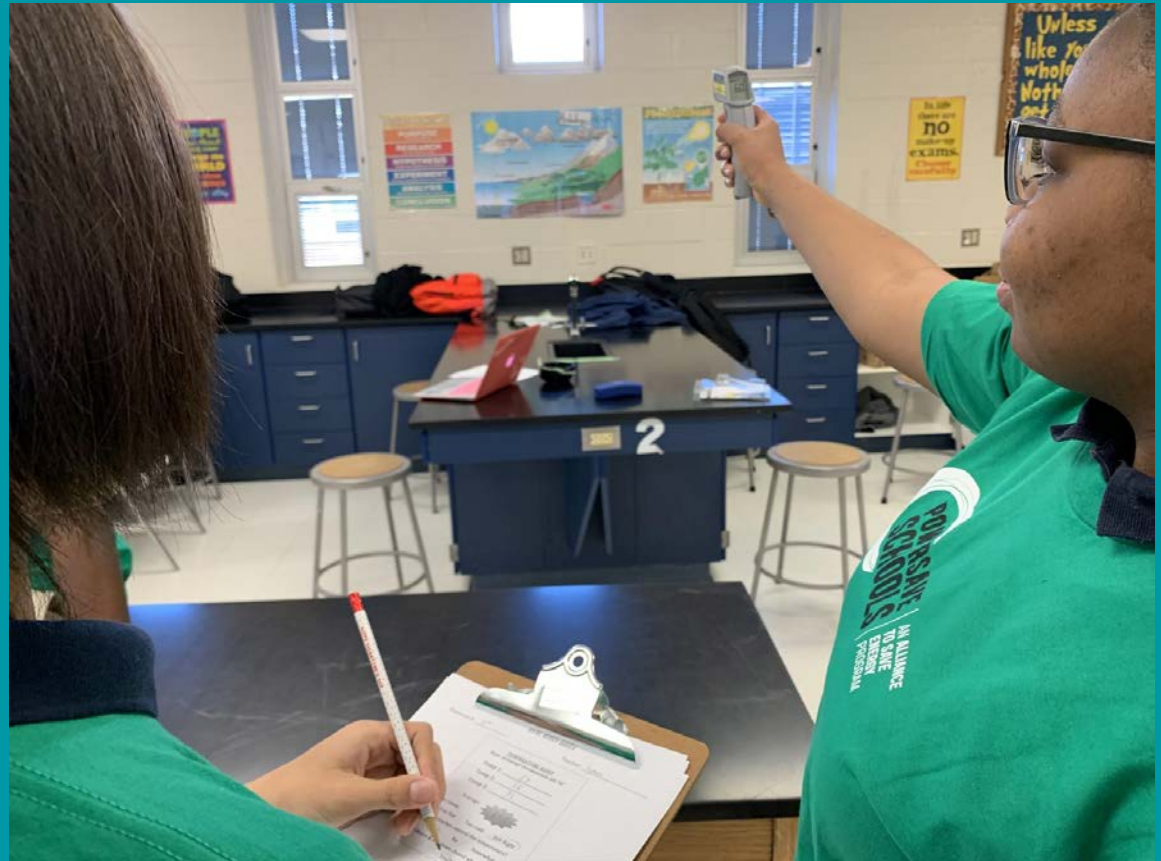
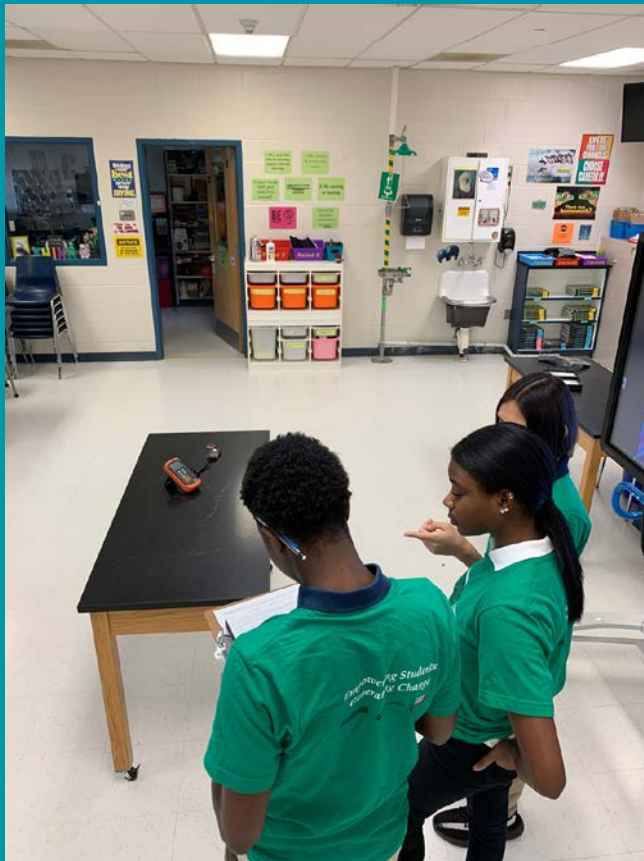


- Students were taught practical skills that they can use in their everyday lives and far into the future.
- Lessons were hands-on and engaging.





- Students were provided with the tools to perform energy audits throughout the school.
- These common tools are used by professionals and provided the students with the data to make suggestions to help save energy.



- The program included a variety of activities that encouraged student creativity and kept the entire team engaged.





# After Covid-19 Forced Schools to Shut Down

- The PowerSave Program was quickly adapted so the students could learn about saving energy at home.
- Students performed at home energy audits.



- Students continued to be advocates for saving energy by presenting to their families and reaching out through the internet to their audiences.



- Students remained motivated throughout entire experience.
- Weekly updates and a leaderboard were shared each week.

## Overall Leaders

Standing	School	Total Points
	Winslow High School	<b>790</b>
	Pennsylvania Avenue School	<b>715</b>
	Newbury Elementary School & Winslow Middle School	<b>690</b>



# 2019-2020 PowerSave Champions: Winslow Township High School



# ESIP & Education

- Energy Savings Plans(ESP's) contain education/curriculum based Energy Conservation Measures (ECM's) adopted by School Boards
- Student Engagement
- Teacher Training
- District Tailored Program



**Michelle Rossi**  
**ESIP Coordinator, NJBPU**  
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**MOBILE (609)915-0903**

**OFFICE (609)633-9641**





# Thank You!

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## Speakers

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  - NJ Board of Public Utilities
- **Erica DeMichele** <edemichele@delranschools.org>
  - Delran Township Public Schools
- **Carolyn Tagmire** <tagmirca@winslow-schools.com>
  - Winslow Township High School

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  - Sustainable Jersey