





ABOUT US.

- Established as a 501(c)(3) nonprofit in 2012, we work alongside residents, businesses, nonprofits and local government to make our community more sustainable.
- Our mission is to inspire the community to develop and implement solutions that positively impact the environment.







TONIGHT'S AGENDA.

• What Do We Know About The PPS Buildings?

- Energy Efficiency Updates
- Energy Use: Electricity and Natural Gas
- Carbon Footprint Analysis
- Water Use by Each School
- Food Waste Management Update

• Planning for the Future.

- Sustainability Timeline
- Plans for Solar and Greater Energy Efficiency
- Workplace Charging Potential
- Stormwater Basin Considerations
- **Sustainable Jersey for Schools:** Progress Updates
- Questions anyone?









This webinar is being recorded and will be available on the district's YouTube channel within a day or two.







SUBSCRIBED

SAVE THE DATE.

- March 16, 7:00 9:00 PM
 - You are cordially invited to grab a cup of your favorite drink, sit in a comfortable chair and bring your ideas to our World Café discussion.
 - Throughout this event, you will engage in three rounds of small group conversation around questions that matter – each conversation building upon the next.
 - Depending on interest, we may offer additional opportunities to participate.







ENERGY TRACKING & ANALYSIS.

- The district is now using Energy STAR Portfolio Manager to benchmark electricity, natural gas, and water data.
- Portfolio Manager is an interactive resource management tool that enables us to measure and compare our building's energy to similar buildings, past consumption, or a reference performance level.
- Nearly 25% of U.S. commercial building space is already actively benchmarking in Portfolio Manager, making it the industry-leading benchmarking tool.



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ENERGY STAR SCORE

- The 1 100 ENERGY STAR score is used to understand how your building's energy consumption measures up against similar buildings nationwide.
- A score of 50 represents median energy performance, while a score of 75 or higher indicates your building is a top performer
- All schools are underperforming.
- Why do CP and PMS have lower scores?

Vi	ew All Properties (6)	✓ Energy	/ Performance Higl	nlight: 🗸	Refresh Metrics
Add	d/Edit/Delete Groups	Add/Ec	lit/Delete Views		
	Name -	Energy Current ¢ Date	ENERGY STAR Score ^{\$}	Site EUI (kBtu/ft²) 🗘	% Difference from National Median Site EUI
	Community Park Elementary School 6400953	08/31/2021	17	101.0	42.0
	Johnson Park Elementary School 6554257	08/31/2021	20	89.4	37.3
	Littlebrook Elementary School 6549873	08/31/2021	25	78.9	27.7
	Princeton High School 6564225	08/31/2021	42	84.0	8.2
	Princeton Middle School 6564207	08/31/2021	18	117.7	27.9
	Riverside Elementary School 6549885	08/31/2021	40	70.6	9.6





ENERGY USAGE (Sum of Sep 2020 - Aug 2021)



SUSTAINABLE PRINCETON.



SCHOOL CARBON FOOTPRINT ANALYSIS.



- In total, these six schools produced
 6,500 metric Tons CO₂, the bulk of which are from energy use.
- This analysis does not consider the footprint of all of the vehicles that get staff and students to schools.





WATER USE ANALYSIS.



- This analysis is currently limited to less than one year of data from American Water.
- PMS peak is explained by the swimming pool.
 - Still looking for explanations for CP's enhanced summer water use.





FOOD WASTE ANALYSIS.

- All six schools are collecting food waste again to keep it from the landfill.
- Organic Diversion collected 6.5 tons of food waste from the six schools in the last 4 months of 2021.
- Trenton Biogas accepts PPS food scraps and converts it into renewable energy.







FOOD WASTE HIGHLIGHTS.

- Reduced 3.5 metric tons of CO₂E
- Equivalent to planting 58 tree seedlings for 10 years
- Generated 1,800 kWh Class I renewable energy
- Can charge 1,500 smartphones
- Recaptured 2,000 kWh heat (from cogen system)
- Can provide ¼ of a home's electricity use in one year.
- Created 1.4 tons of compost
- Fills 2 compact pickup trucks



Sources: EPA Waste Reduction Model (WARM) and Greenhouse Gas Equivalencies Calculator





DRAFT Sustainability Timeline for PPS Facilities Department

	2021 2022				20	023		2024					2025					
ENERGY	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4
Energy Tracking & Management																		
Populate EnergySTAR Portfolio Manager	Х																	
Begin benchmarking analysis		Х																
School carbon footprint analysis		Х	х								1							
Energy Efficiency																		
Upgrades for CP, LB, JP, RS (DI)	Х																	
Explore upgrades for PHS & PMS (ESIP)		X	Х															
Install upgrades for PHS & PMS																		
Renewable Energy					-													
Explore solar opportunities (PPAs)		х	Х		1													
Solar installation (after roof work completed)																		
TRANSPORTATION	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4
Charging stations		S			·													
Evaluate ability to bring charging stations		×	×				2											
Implement charging																		
Fleet electricfication							<u>.</u>											
Explore opportunites to electrify fleet																		
NATURAL RESOURCES	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4
Landscaping equipment							1											
Explore electrification of landscaping equipment	X	X	X															
Green infrastructure																		
Explore opportunities to naturalize new basin		X	X															
Establish maintenance plan for old and new basin																		
MATERIALS MANAGEMENT	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4
Green Cleaning																		
Explore green cleaning policies and plans																		
Waste					-													
Perform a comprehensive waste audit																		
Establish a waste reduction and recycling plan															· · · · · · ·			
Purchasing																		
Establish a green purchasing policy																		
RESILIENCY	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4
Microgrid																		
Explore opportunities for a microgrid																		





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	20	021		2022				20)23			20	24		2025			
ENERGY	Q3	Q4	Q1	Q2	03	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4
Energy Tracking & Management																		
Populate EnergySTAR Portfolio Manager	Х																	
Begin benchmarking analysis		Х				N												
School carbon footprint analysis		Х	X			Ν					Î.							
Energy Efficiency																		
Upgrades for CP, LB, JP, RS (DI)	х																	
Explore upgrades for PHS & PMS (ESIP)		X	Х															
Install upgrades for PHS & PMS																		
Renewable Energy																		
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Solar installation (after roof work completed)																		
TRANSPORTATION	G	Q4	01	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4
Charging stations																		
Evaluate ability to bring charging stations		X	X				2											
Implement charging																		
Fleet electricfication							<u>.</u>											
Explore opportunites to electrify fleet																		
NATURAL RESOURCES	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4
Landscaping equipment																		
Explore electrification of landscaping equipment	X	X	X															
Green infrastructure					-													
Explore opportunities to naturalize new basin		X	X															
Establish maintenance plan for old and new basin																		
MATERIALS MANAGEMENT	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4
Green Cleaning																		
Explore green cleaning policies and plans				5						-								
Waste								-										
Perform a comprehensive waste audit																		
Establish a waste reduction and recycling plan																		
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RESILIENCY	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4
Microgrid																		
Explore opportunities for a microgrid																		





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ENERGY EFFICIENCY AT ALL FOUR ELEMENTARY SCHOOLS.

As of this summer,

- All four elementary schools have new LED lighting throughout the schools, thanks to the NJCEP's Direct Install Program.
- Dozens of new HVAC units were installed, several mini-splits and a heat pump were replaced, and hot water heaters were upgraded.
- The Direct Install Program covered 80% of the cost of the district's upgrades, allowing the district to pay about \$114,000 for a \$571,000 project.







ENERGY INITIATIVES.

- Energy Savings Improvement Plan (ESIP).
 - An ESIP is a financing mechanism that allows schools in NJ to make energy-related improvements to their facilities using the value of energy savings that result from the improvements.
 - The ESIP method is a way for public schools to finance new energy-efficient infrastructure at no cost to the taxpayer.



 The district is currently considering opportunities to use an ESIP to fund energy efficiency projects at the PMS and PHS, in particular.





ENERGY INITIATIVES.

- Power Purchase Agreement (PPA).
 - Most schools utilize a PPA to get solar because it avoids a capital expenditure or a referendum.
 - A PPA is a method to finance a solar panel system, similar to leasing or renting.



- With a PPA, a third party buys, installs, and maintains the solar array and collects the tax incentives and solar credits to offset these costs.
- In return, the district hosts the panels and gets to reduce its utility bills, often markedly, without any upfront costs.





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	20	021	2022					20	23			20	24					
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Energy Tracking & Management																		
Populate EnergySTAR Portfolio Manager	Х																	
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School carbon footprint analysis		Х	X				1											
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TRANSPORTATION	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4
Charging stations			-															
Evaluate ability to bring charging stations		×	X															
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NATURAL RESOURCES	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4
Landscaping equipment																		
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Green Cleaning						-												
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Why EV Chargers at PPS?

- Workplace charging is key to reducing vehicle GHG emissions in NJ and supports Objective 5 of the <u>Princeton Climate Action Plan</u>.
- EV sales are booming with <u>38% of new-vehicle</u> shoppers are now considering an EV.
- Workplace charging continues to climb. There are now 10,000 private workplace chargers in the US.
- Attract new staff. <u>Millennials are prioritizing</u> <u>sustainability</u> in the workforce.

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Local workplaces with charging.

Educational Facilities:

- Princeton University
- Institute for Advanced Studies
- Rider University
- The College of New Jersey
- Rutgers University

Large Companies:

- NRG Energy, Inc.
- Carnegie Center
- Educational Testing Service
- Bristol Myers Squibb
- Janssen Pharmaceuticals
- Black Rock







NJ public schools with charging.

Be among the first. PPS could join the few primary public schools in New Jersey who have taken this step.

- Neptune, NJ
 - Neptune Middle School
 - Midtown Community Elementary School







EV CHARGING AT PPS.

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- PPS Teachers and staff, be on the lookout for a survey to ascertain your interest.
- In our region, there are over 60 electric vehicle (EV) models available, including everything from small coupes to SUVs and minivans.
- Explore this calculator of annual fuel costs: <u>www.chargevc.org/ev-calculator/</u>
- Check out this map of NJ's 600 public charging stations: <u>nj.gov/dep/drivegreen/dg-charging.html</u>
- Learn about the different incentives: <u>nj.gov/dep/</u> <u>drivegreen/dg-electric-vehicles-affordability.html</u>





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Green Cleaning																		
Explore green cleaning policies and plans														-	9			
Waste					-			-										
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Microgrid																		
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LANDSCAPING EQUIPMENT INITIATIVES.

- PPS, in partnership with the Municipality of Princeton, received a \$10,000 Sustainable Jersey grant funded by the Gardinier Environmental Fund to explore the transition from gas-powered landscaping equipment.
- The grounds crew has worked with us to quantify the different equipment. CAPERS is working to calculate the carbon footprint.
- The PPS grounds crew received a new battery-powered backpack leaf blower. We are working to collect their experience with this equipment.

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• The EcoLab has provided numerous educational opportunities for high school students.



www.princetonnaturenotes.org/2017/06/hands-on-learning-about-invasiveness-in.html







• It has also provided habitat for birds, butterflies, and more.



www.princetonnaturenotes.org















- It has changed over the years.
- About 15 years ago, the PHS EcoLab was transformed from grassy turf to native wetland.
- PHS teachers, students, and grounds crew, along with members of the community replanted the area with support from the US Fish and Wildlife Service.





www.princetonnaturenotes.org/2009/05/high-school-ecolab-wetland-spring.html





 Almost immediately, fast-growing willow trees moved in.



www.princetonnaturenotes.org/2010/06/tour-of-hs-ecolab-wetland-this-saturday.html





• With time, the trees continued to grow.



www.princetonnaturenotes.org/2011/08/princeton-high-school-floods-again.html





• There have been a number of efforts to rein in the willow trees and weeds.





www.princetonnaturenotes.org/2015/04/working-with-nature-at-high-school.html





However, the trees have taken over.



www.princetonnaturenotes.org/2016/07/delight-and-tragedy-in-summers-downpour.html











- This is a challenge, since trees are not recommended near critical infrastructure.
- We are currently helping the district to consider better ways to manage this area.
- Outflows and inflows need to be clear and accessible.
- The flood risk to adjacent buildings needs to be considered.
- Could it be restored to something like this?



www.princetonnaturenotes.org/2011/08/princeton-high-school-floods-again.html





Striving for Certification.

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- All efforts are being documented as we go:
 - Energy Efficiency for School Facilities, 10-50 points
 - Energy Tracking and Management, 20 points
 - School Carbon Footprint, 10 points
 - District Sustainability Policy, 10 points
- All six PPS schools are still registered in Sustainable Jersey for Schools, but certifications have lapsed.
- With this documentation, each school now has a strong backing so that they can reclaim certification.
- Certification brings bragging rights, sustainable grant opportunities, and a wealth of resources.





School Green Teams.

- Green Teams are active at most every school:
 - Princeton High School
 - Community Park Elementary
 - Johnson Park Elementary
 - Littlebrook Elementary
 - Riverside Elementary

We need you!

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- If you want to help plan upcoming events, please reach out to me at jenny@sustainableprinceton.org.
- If you want to help your school's green team, please contact your PTO or me.





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Thank you!

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