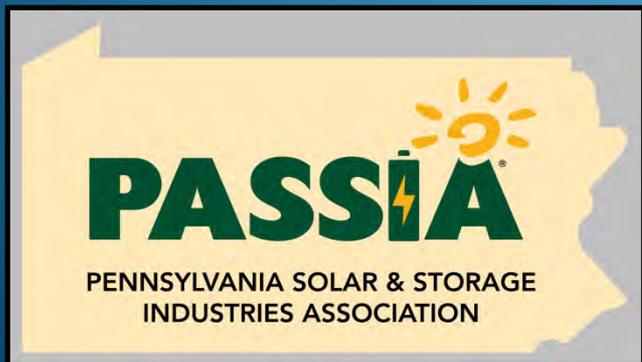




# Pennsylvania Solar Update

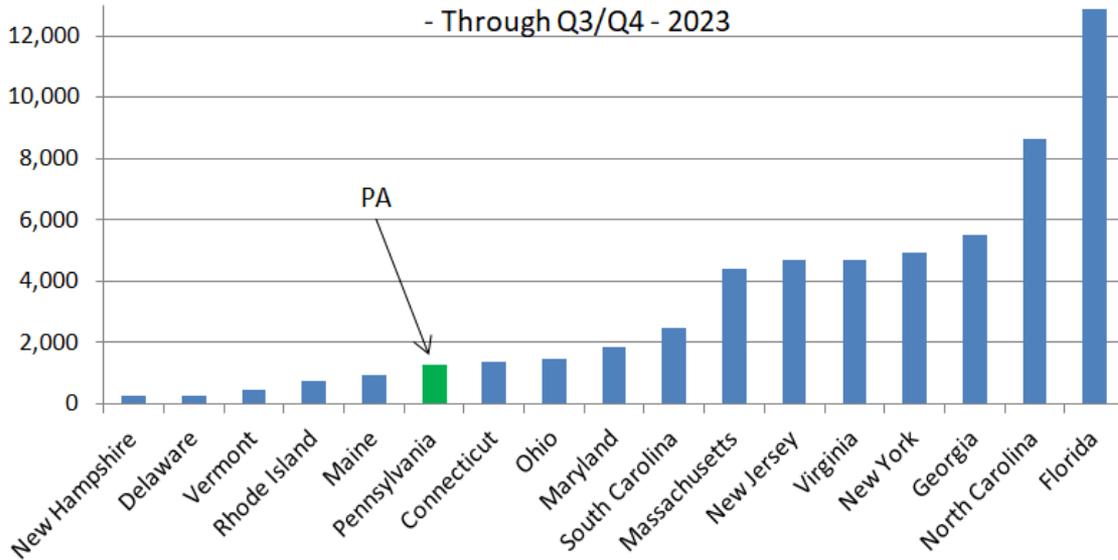
Chester County Solar Adopters Conference  
January 18, 2024



Ron Celentano – 215-740-0439; [CelentanoR@aol.com](mailto:CelentanoR@aol.com)

## Total Solar Capacity (MW) Installed by State on the East Coast

- Through Q3/Q4 - 2023



Nat. Solar Energy Industries Assoc. - [www.seia.org/states-map](http://www.seia.org/states-map)

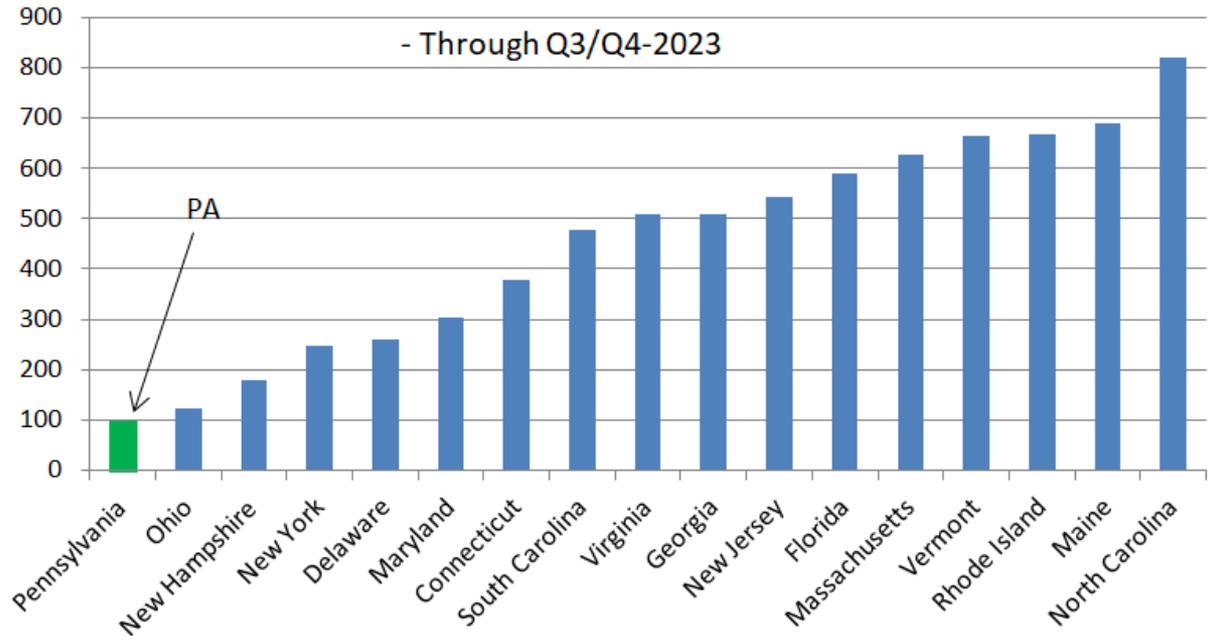
# Solar in Other East Coast States Compared to PA

## Solar in Pennsylvania Ranks 22th in the Nation

Wood Mackenzie/SEIA US Solar Market Insight – Qrt 3/Q4, 2023

## Total Solar PV Installed per Capita (MW/Million)

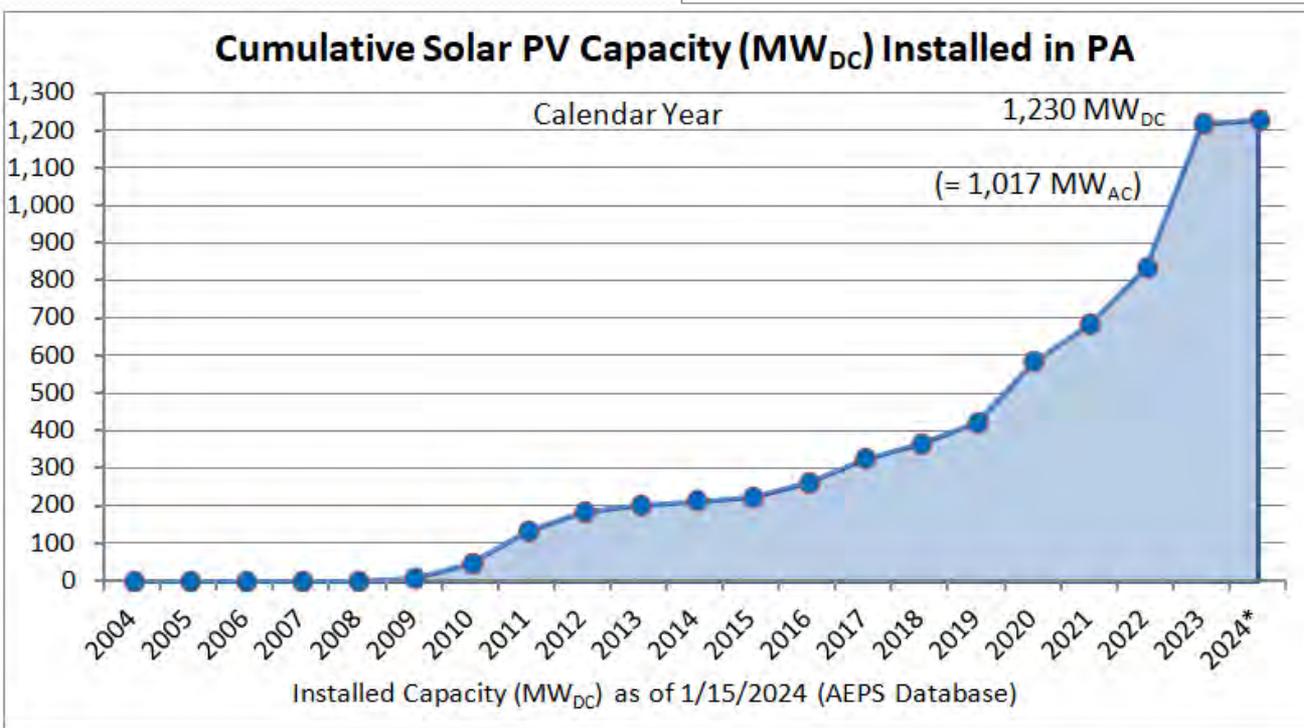
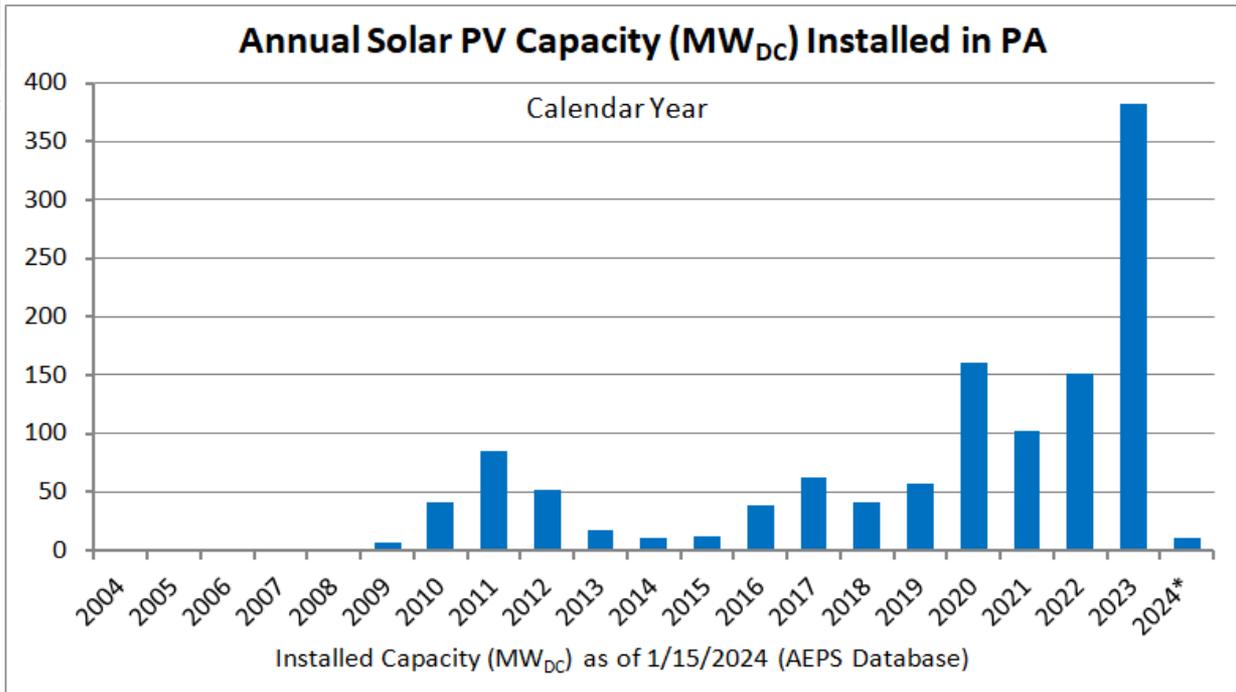
- Through Q3/Q4-2023



# PV Capacity in PA

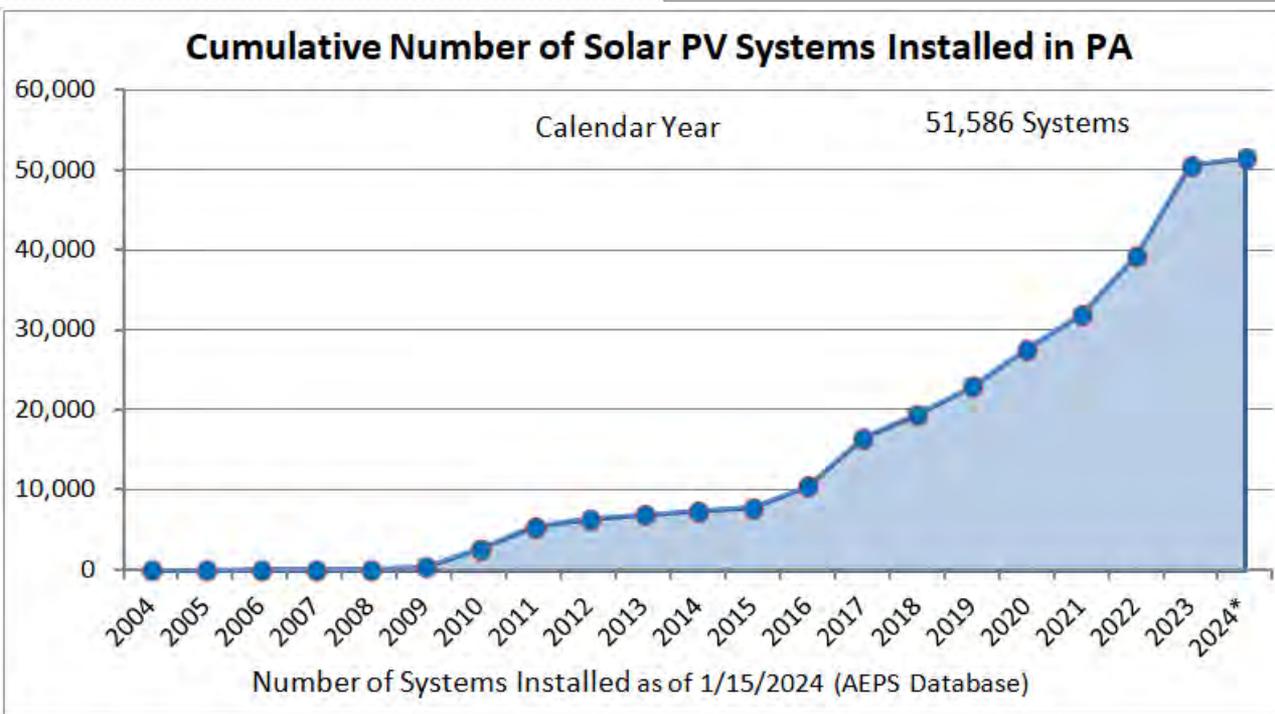
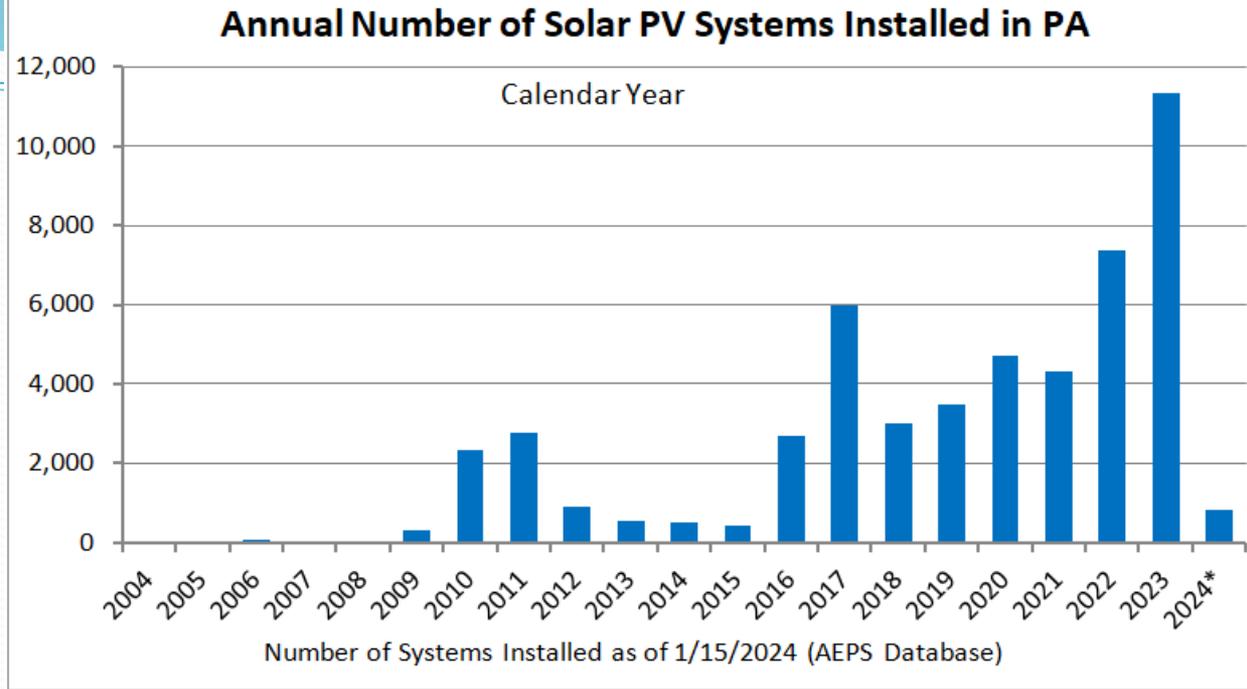
## Annual & Cumulative

As of 1/15/2024



SEIA reports 1,275 MW installed through Qrt 4-2023

# Number of PV Systems in PA Annual & Cumulative As of 1/15/2024



SEIA reports 65,940 systems installed through Qrt 4-2023

# Breakdown Of PV Installations in PA

Cumulative PV Installed in PA		
Capacity (DC)	# of Systems	Total MW
≤ 15 kW	43,006	357
> 15 kW to ≤ 250 kW	8,275	238
> 250 kW to ≤ 1 MW	218	106
> 1 MW to ≤ 3 MW	57	90
> 3 MW to ≤ 5 MW	16	60
> 5 MW to ≤ 10 MW	2	14
> 10 MW	12	366
<b>Total</b>	<b>51,586</b>	<b>1,230</b>

\* as of 1/15/2024 as per PA AEPS (PUC)

## Less Than 2 Yrs Ago

Cumulative PV Installed in PA		
Capacity (DC)	# of Systems	Total MW
≤ 15 kW	28,189	225
> 15 kW to ≤ 250 kW	4,700	153
> 250 kW to ≤ 1 MW	175	86
> 1 MW to ≤ 3 MW	47	75
> 3 MW to ≤ 5 MW	14	52
> 5 MW to ≤ 10 MW	1	6
> 10 MW	6	114
<b>Total</b>	<b>33,132</b>	<b>711</b>

\* as of 3/12/2022 as per PA AEPS (PUC)

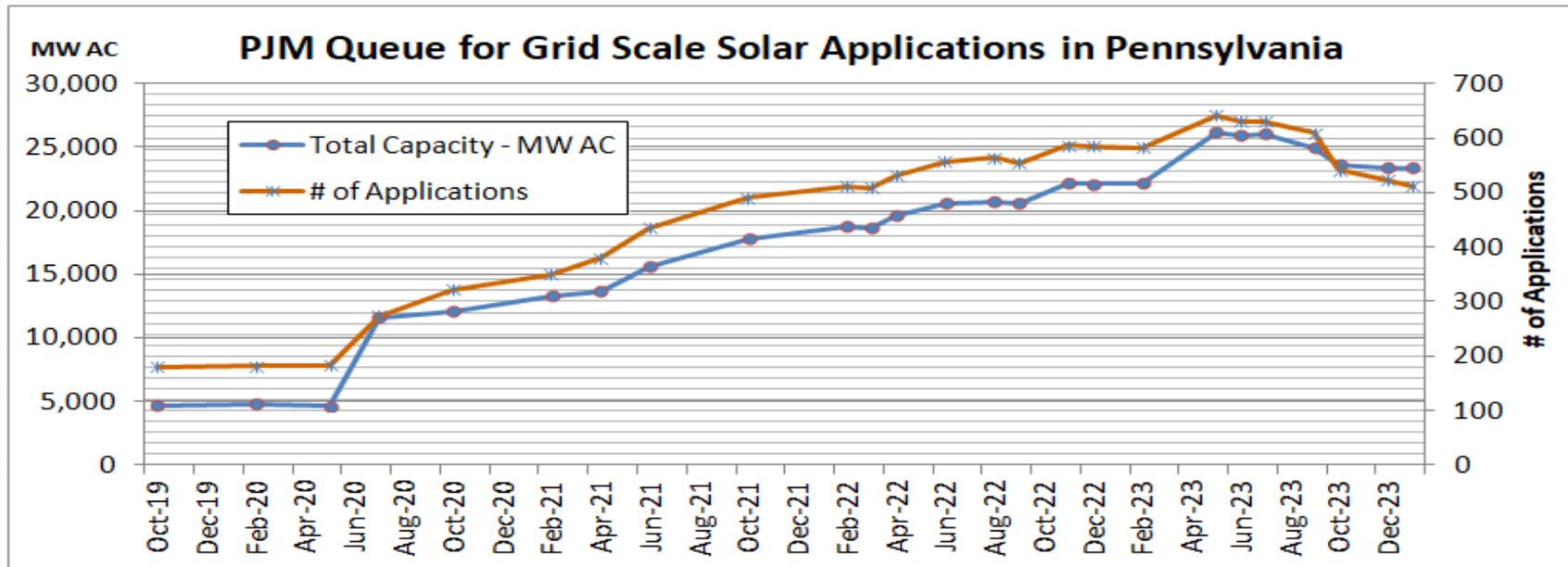
## Since March 2022: 268 MW Grid Scale Solar Facilities Installed

- > 3 to ≤ 5 MW : 2 Projects, 8 MW
- > 5 to ≤ 10 MW : 1 Projects, 8 MW
- > 10 MW : 6 Projects, 252 MW

# PJM Queue for PA Solar Applications

PJM Queue for PA		As of 1/15/2024			
Status	# of Apps	Max Facility Output (MFO)			Total Cap IC Queue Position
		Total Cap AC MW	Capacity Range		
			Min	Max	
Active	445	21,200	1.0	300.0	9,849
Engineering/Procurement Under Construction	53	1,596	2.6	120.0	868
Part in Srvc - Under Const	8	137	13.8	20.0	76
Sub-Total	512	23,313			11,030
In Service	23	461	3.3	100.0	183
<b>Grand Total*</b>	<b>535</b>	<b>23,774</b>			<b>11,214</b>

\* Total Applications categorized as "Solar & Storage" = 91



# PJM Queue for PA Solar Facilities - Under Construction

**Projects Currently Under Construction - Solar PV Facilities in PA (1/15/2024)**

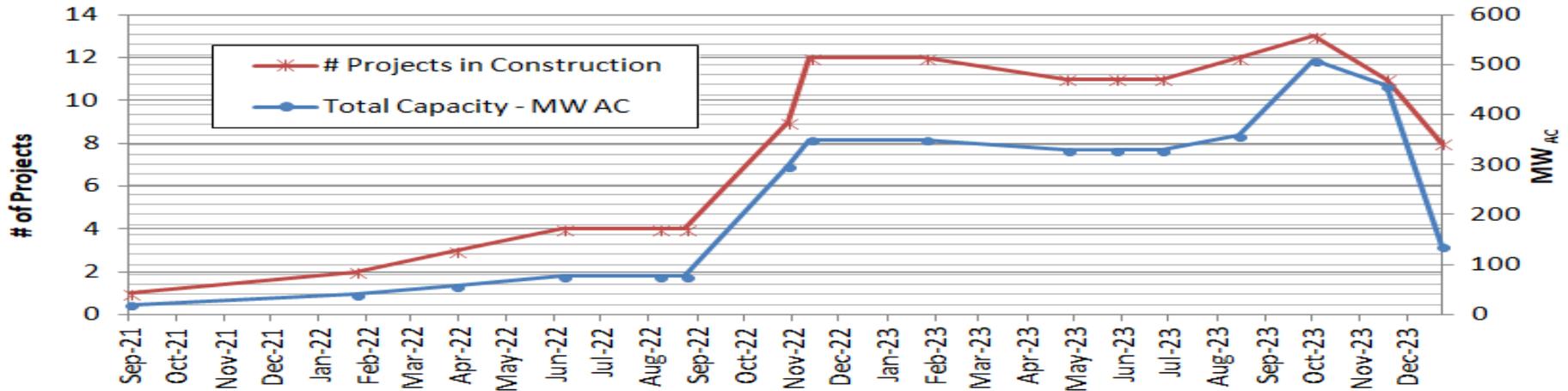
Queue #	Name	Commercial Name	State	County	Transmission Owner	MFO Capacity MW
AE1-185	Hokes-Jackson 69 kV	Cottontail Solar 1	PA	York	ME	20.0
AE1-196	Hokes-Jackson 69 kV II	Cottontail Solar 8	PA	York	ME	20.0
AE2-059	Derry Tap-Derry Bus 69 kV	Cottontail Solar 4 aka East Chil	PA	Northumberland	PPL	20.0
AE2-125	Stahlstown-Ligonier 25 kV	Stahlstown-Ligonier 25 kV	PA	Westmoreland	APS	13.8
AE2-133	Penns Tap-Richfield Tie 69 kV	Penn Solar (Cottontail 6)	PA	Snyder	PPL	20.0
AF1-021	Bethelboro-Connellsville #1 25 kV	Pechin Solar	PA	Fayette	APS	14.0
AF1-022	Lake Lynn-Uniontown 25 kV	Gans Solar Farm	PA	Fayette	APS	14.0
AF1-039	Listonburg-Highpoint 24.9 kV	Listonburg Solar	PA	Somerset	PENELEC	15.0
Total						136.8

**Partially in Service - Under Construction - Solar PV Facilities in PA (1/15/2024)**

Queue #	Name	Commercial Name	State	County	Transmission Owner	MFO Capacity MW
AD1-020	Hunterstown-Lincoln 115 kV	Adams Solar LLC	PA	Adams	ME	100
AD2-009	McConnellsburg 138 kV	Great Cover Solar LLC	PA	Fulton	APS	70
AD2-115	Lyons-Moselem 69kV	Lyons Solar	PA	Berks	ME	20.0
AD2-116	Hokes-Grantley 69 kV	Cottontail Solar 2	PA	York	ME	20.0
AE1-101	McConnellsburg-Texas Eastern 1	Great Cove Solar II	PA	Franklin	APS	150.0
AE2-060	Mifflintown Bus-Mifflintown Tap	Cottontail Solar 5 aka Walker S	PA	Juniata	PPL	20.0
Total						380.0

517 MW<sub>AC</sub>

**PJM Queue: Grid Scale Solar Projects in Construction in Pennsylvania**

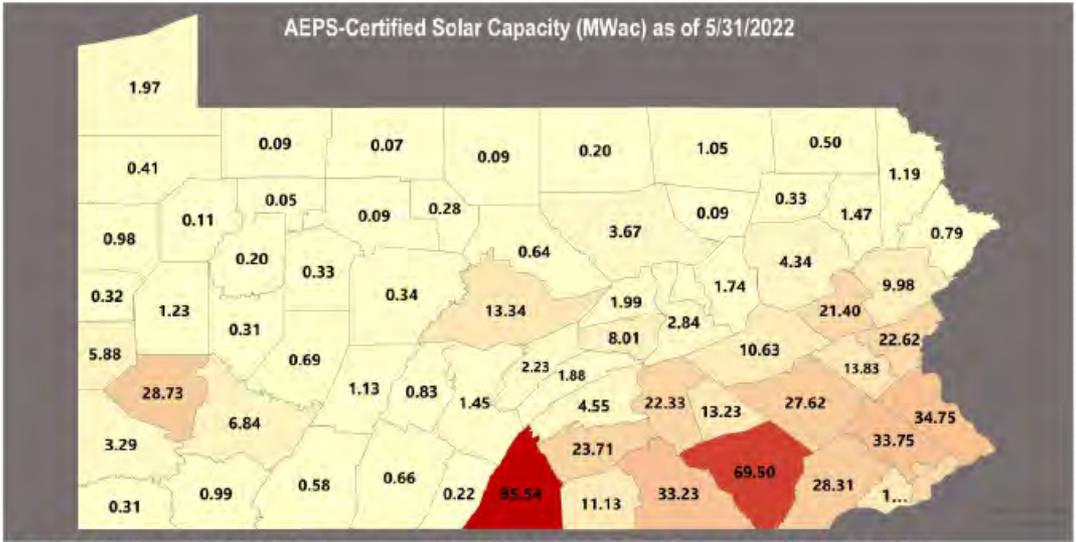


# PA Grid Scale Solar Facilities – In Service in 2023

## In Service in 2023

AE2-129	Philipsburg-Clarence 34.5 kV	Philipsburg-Clarence 34.5 kV	PA	Clearfield	PENELEC	20	1/28/2023
AE2-126	Dubois-Curwensville 34.5 kV	CL-Viaduct	PA	Clearfield	PENELEC	20	3/23/2023
AF2-184	McConnellsburg-Mercersburg 34 kV II		PA	Franklin	APS	20	5/1/2023
AC2-168	Clinton 23kV	Gaicho Solar	PA	Washington	DL	11.7	6/29/2023
AD1-135	Clinton 23 kV II	Gaicho Solar	PA	Washington	DL	20	6/29/2023
AE2-115	Midland 23 kV II	BE-PINE 2 Dam Road	PA	Beaver	DL	17.1	11/5/2023
AE2-114	Midland 23 kV I	BE-PINE 1 Cain Road	PA	Beaver	DL	17.1	11/20/2023
AE2-224	Bearrock-Johnstown 230 kV	CPV Maple Hill Solar	PA	Cambria	PENELEC	100	11/28/2023
Total						225.9	

# AEPS Report 2022 – Observations on Solar Resources

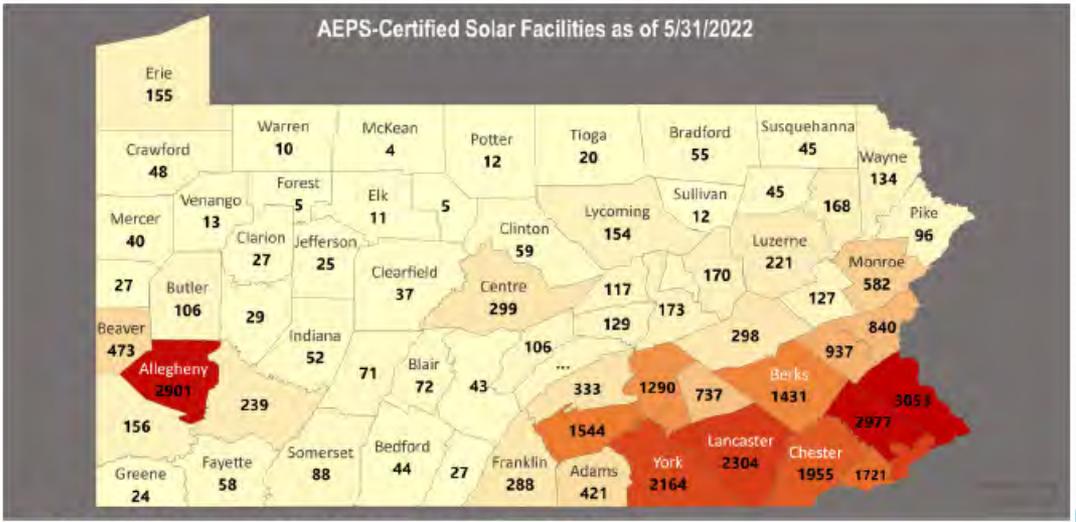


Note: As of 5/31/2022, the AEPS certified solar generation capacity was 12.55 MWac in Delaware County and 21.94 MWac in Philadelphia County.

0.5% Solar PV Requirement = 525.0 MW<sub>AC</sub> Solar PV Capacity

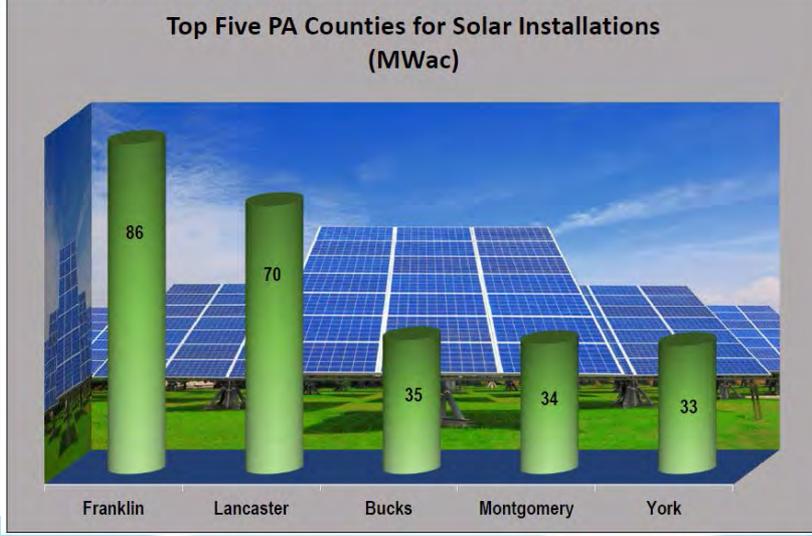
534.4 MW<sub>AC</sub> had been installed in PA by 5/31/2021

Currently, 1,017 MW<sub>AC</sub> is installed (as of 1/15/2024), or the solar share = 0.97%



Note: As of 5/31/2022, Philadelphia County has 2,277 AEPS certified solar generation facilities.

Chart 12: Top Five Pennsylvania Counties for Installed Solar Capacity



# Solar Map of PA Projects – PA PUC Administrator

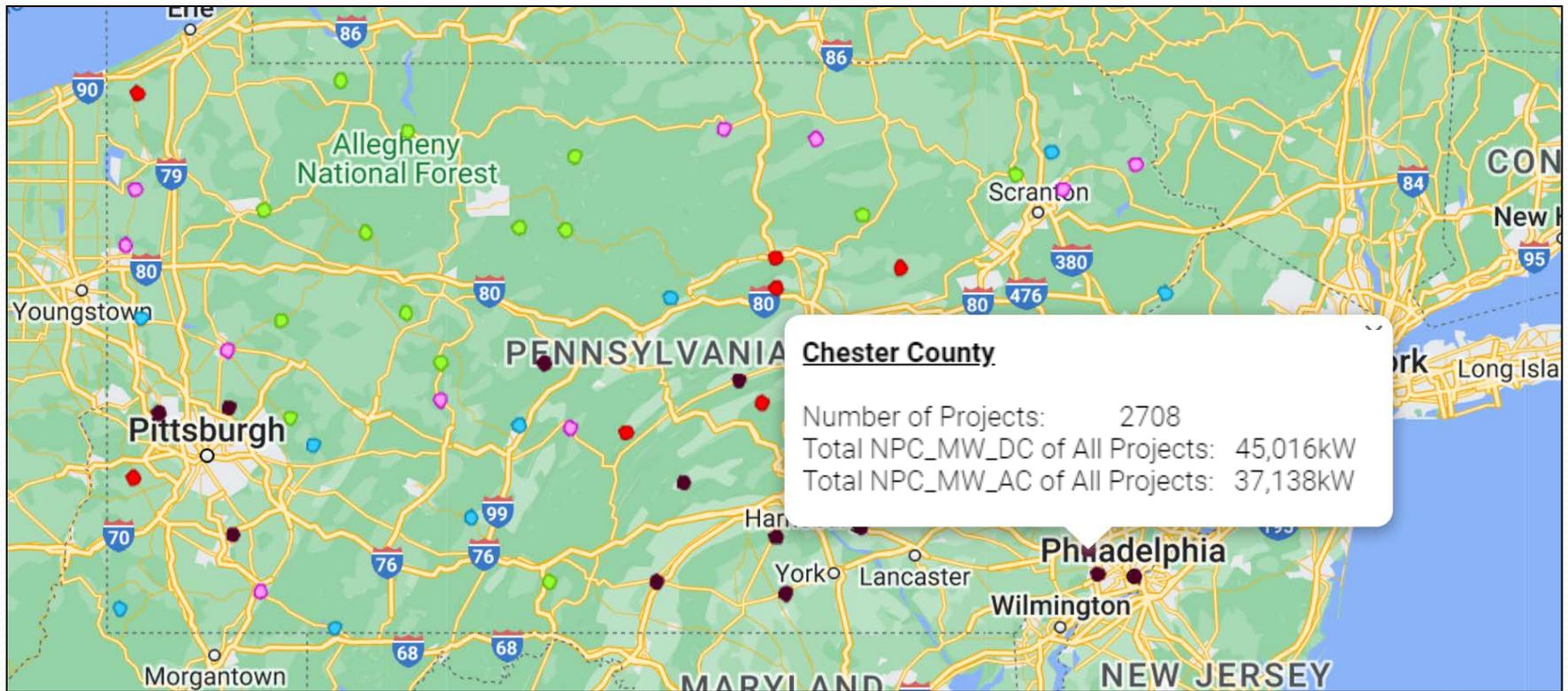
Total AC kW by County

> 5000 kW
2000 - 5000 kW
1000 - 2000 kW
500 - 1000 kW
0 - 500 kW

Select Fuel Type: Photovoltaic-In PA

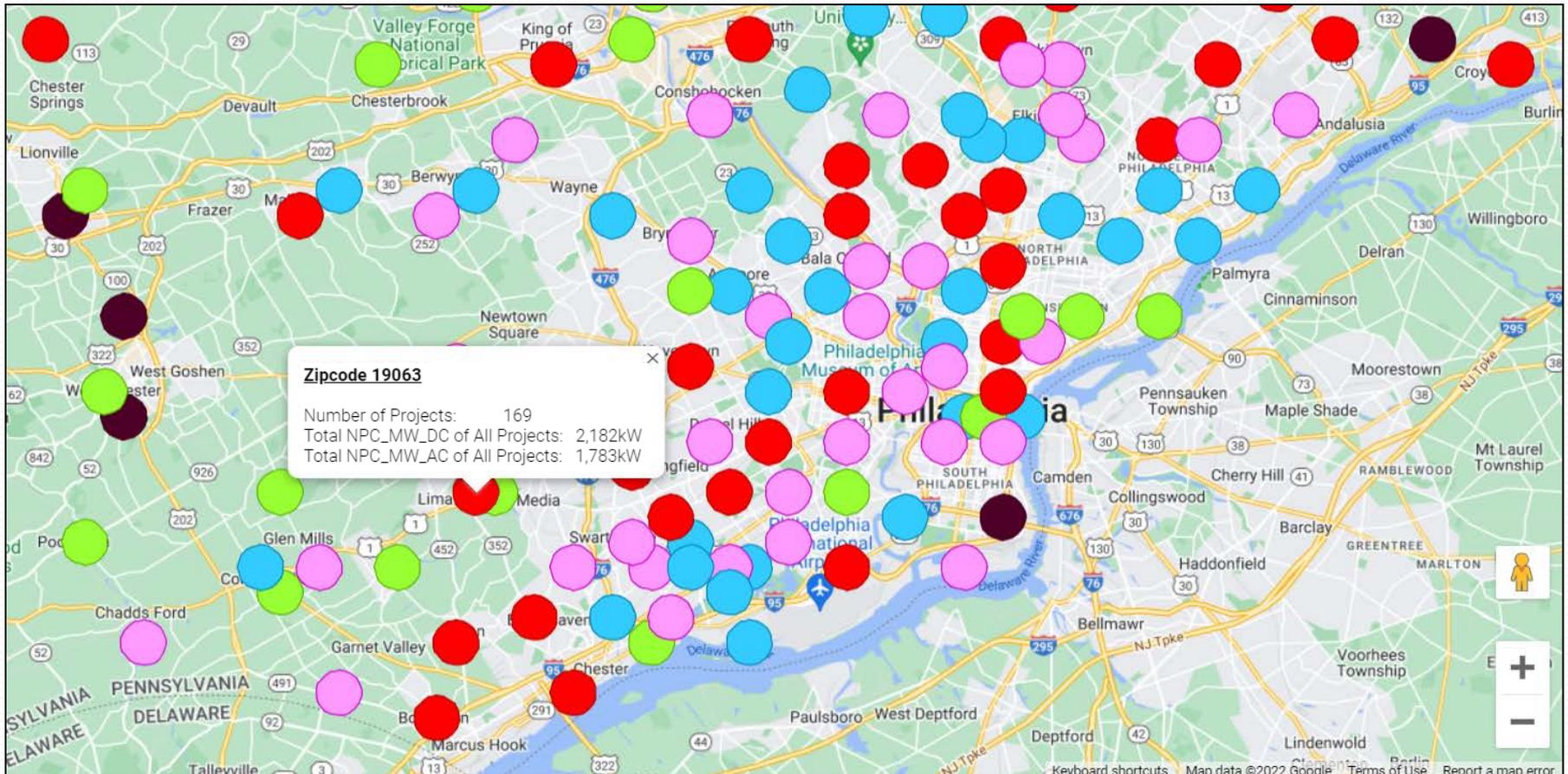
Group By:  Zipcode  County

View Project Map



<https://pennaeps.com/reports/>  
Click on **QUALIFIED FACILITIES MAP** Button

# Solar Map of PA Projects – Zoomed In By Zip Code



# Total Solar PV Installed in PA by County as of 1/15/2024

## Top 25 Counties

12/5/2022 – Last Year

Rank	County	MW <sub>DC</sub>	Rank	County	# Systems
1	Franklin	143.70	1	Allegheny	3,756
2	Lancaster	88.56	2	Bucks	3,356
3	Bucks	45.85	3	Montgomery	3,338
4	Montgomery	43.75	4	Lancaster	2,719
5	York	42.23	5	York	2,602
6	Allegheny	42.14	6	Philadelphia	2,549
7	Chester	37.06	7	Chester	2,165
8	Berks	34.61	8	Delaware	1,912
9	Cumberland	31.08	9	Cumberland	1,841
10	Northampton	30.33	10	Berks	1,820
11	Dauphin	29.33	11	Dauphin	1,573
12	Philadelphia	29.30	12	Lehigh	1,204
13	Carbon	26.93	13	Northampton	1,084
14	Lebanon	20.48	14	Lebanon	927
15	Lehigh	18.57	15	Monroe	655
16	Centre	16.76	16	Beaver	638
17	Delaware	16.60	17	Adams	533
18	Adams	13.62	18	Schuylkill	393
19	Schuylkill	13.18	19	Perry	388
20	Monroe	12.18	20	Franklin	356
21	Snyder	10.50	21	Centre	353
22	Westmoreland	9.66	22	Westmoreland	306
23	Beaver	8.00	23	Luzerne	300
24	Perry	6.22	24	Northumberland	243
25	Luzerne	5.68	25	Columbia	214

Rank	County	MW <sub>DC</sub>	Rank	County	# Systems
1	Franklin	145.29	1	Allegheny	5,336
2	Cambria	130.69	2	Montgomery	4,075
3	Lancaster	109.86	3	Bucks	3,962
4	Allegheny	56.33	4	Lancaster	3,670
5	Bucks	54.63	5	Philadelphia	3,380
6	Montgomery	53.41	6	York	3,366
7	York	50.83	7	Chester	2,595
8	Clearfield	50.01	8	Berks	2,496
9	Berks	48.23	9	Cumberland	2,445
10	Chester	43.08	10	Delaware	2,238
11	Cumberland	41.30	11	Dauphin	2,121
12	Beaver	40.58	12	Lehigh	1,833
13	Dauphin	39.17	13	Northampton	1,517
14	Philadelphia	35.07	14	Lebanon	1,211
15	Northampton	33.03	15	Beaver	971
16	Carbon	27.88	16	Monroe	799
17	Lehigh	26.18	17	Adams	724
18	Lebanon	24.28	18	Schuylkill	688
19	Delaware	19.89	19	Perry	532
20	Centre	18.51	20	Luzerne	510
21	Schuylkill	16.94	21	Centre	474
22	Monroe	16.07	22	Northumberland	467
23	Adams	15.96	23	Franklin	466
24	Snyder	13.51	24	Westmoreland	439
25	Westmoreland	11.18	25	Snyder	370

# Breakdown of Solar PV Installed by County in the Philadelphia Region as of 1/15/2024

Capacity (DC)	Total MW				
	Bucks	Montgomery	Chester	Delaware	Philadelphia
≤ 15 kW	29.3	29.4	18.4	15.2	19.4
> 15 kW to ≤ 250 kW	14.5	11.8	14.7	3.8	4.6
> 250 kW to ≤ 1 MW	5.3	7.3	3.5	0.9	6.9
> 1 MW to ≤ 3 MW	5.5	4.8	6.5	0.0	1.0
> 3 MW to ≤ 5 MW	0	0.0	0.0	0.0	3.2
> 5 MW to ≤ 10 MW	0	0.0	0.0	0.0	0.0
> 10 MW	0	0.0	0.0	0.0	0.0
<b>Total</b>	<b>54.6</b>	<b>53.4</b>	<b>43.1</b>	<b>19.9</b>	<b>35.1</b>

Number of Municipalities	54	58	73	49	1
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Capacity (DC)	# of Systems				
	Bucks	Montgomery	Chester	Delaware	Philadelphia
≤ 15 kW	3,406	3,613	2,128	2,105	3,266
> 15 kW to ≤ 250 kW	542	443	454	130	99
> 250 kW to ≤ 1 MW	11	15	8	3	13
> 1 MW to ≤ 3 MW	3	4	5	0	1
> 3 MW to ≤ 5 MW	0	0	0	0	1
> 5 MW to ≤ 10 MW	0	0	0	0	0
> 10 MW	0	0	0	0	0
<b>Total</b>	<b>3,962</b>	<b>4,075</b>	<b>2,595</b>	<b>2,238</b>	<b>3,380</b>

# PA Utility Solar Incentive Programs for C&I Customers

Four utilities currently provide an incentive for solar projects for commercial customers, including schools, under their Act 129 energy efficiency plans. PECO, Duquesne Light Company (DLC), First Energy (including Met-Ed, Penn Power, Penelec and West Penn Power) and PPL have announced solar incentives in their current Act 129 plans. Most of them require the project meets a minimum Total Resource Cost Test (“TRC”) value. The utilities will reimburse commercial/industrial customers for every solar kWh generated and used on site for the first 12-month period.

Utility	Payment per kWh	Min TRC Requirement	For solar systems put in service	Cap
PECO	\$0.10	May not apply	1/1/23 - 5/31/26	Must not exceed system cost
DLC - Duquesne	\$0.05	0.90 is acceptable	Uncertain	Up to 90% of system costs, capped at \$500,000
First Energy	\$0.03	0.85	1/1/23 - 5/31/26	Up to 50% of system costs, capped at \$500,000
PPL	\$0.03	0.85	1/1/23 - TBD	Up to 50% of system costs, capped at \$500,000

*Note: Utility program availability & incentive levels are subject to change without prior notice.*

**Current PA SACP = \$82.90/SREC**

# Current PA SREC Prices

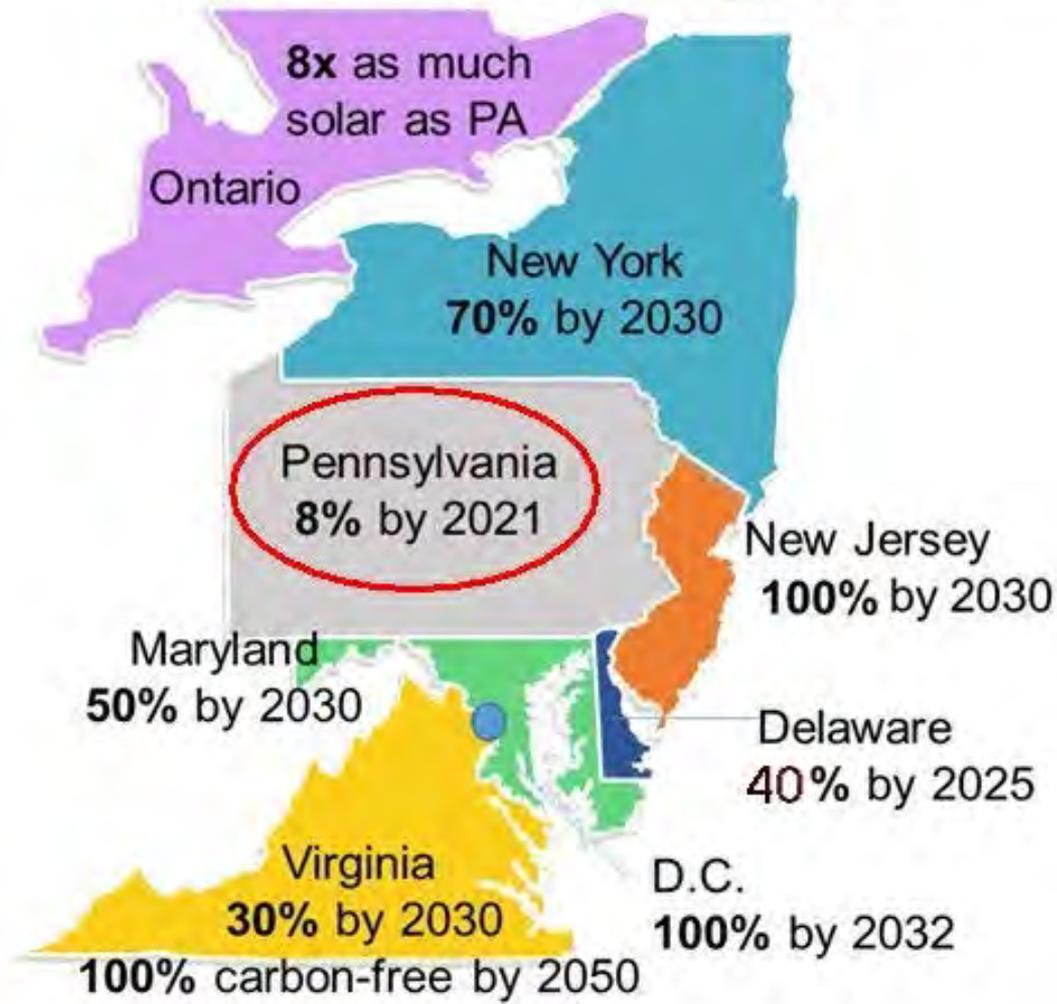
PA

Latest Bid Price: \$31.00



*This graph is protected by copyright laws and contains material proprietary to SRETrade, Inc. All bid pricing and notes included are indicative and subject to change. Please contact us for most current markets. If a market is not quoted herein, please [contact us](#) directly for further information.*

## Regional Renewable Energy Goals



**- Including Additional Listing of Memos – PASSIA -**

## Quick Reference Guide for Key Bills

Guide	Bill #	Prime Sponsors	History
<b>INCREASING RENEWABLE ENERGY GOALS</b>			
<b><i>Increases Renewable Goals in the AEPS to 30% with 14% Solar by 2030 and Enables Community Solar</i></b>			
	<a href="#"><b>SB 230</b></a>	Steven Santarsiero (D-Bucks County)	Referred to the Senate Consumer Protection and Professional Licensure Committee, March 15, 2023
	<a href="#"><b>HB 1467</b></a>	Danielle Friel Otten (D-Chester County)	Referred to the House Environmental Resources and Energy Committee, June 21, 2023
<b><i>Increases Renewable Goals in the AEPS to 15% with 5.5% Solar by 2032 No Community Solar Mentioned; Revisions to Net Metering</i></b>			
	<a href="#"><b>SB 1040</b></a>	<b>Prime:</b> Sen. Lisa Boscola (D-Lehigh/Northampton Counties)	Introduced 1/12/2024

[https://pasolarcenter.org/wp-content/uploads/2023/07/PA-State-Solar-Legislative-Guide.2023-2024\\_updated\\_07182023.pdf](https://pasolarcenter.org/wp-content/uploads/2023/07/PA-State-Solar-Legislative-Guide.2023-2024_updated_07182023.pdf)



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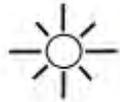
COMMUNITY SOLAR/SHARED SOLAR		
<i>Enables Community or Shared Solar Programs in Pennsylvania</i>		
	<a href="#"><u>SB 550</u></a>	<b>Prime:</b> Rosemary Brown (R-Lackawanna, Monroe and Wayne Counties) Referred to the Senate Consumer Protection and Professional Licensure Committee, April 13, 2023
	<a href="#"><u>MEMO</u></a>	<b>Prime:</b> Aaron Kaufer (R-Luzerne County) and Joseph Hohenstein (D-Philadelphia County) Memo circulated on April 10, 2023 ( <i>likely a companion bill to SB 550</i> )
	<a href="#"><u>HB 330</u></a>	<b>Prime:</b> Perry Stambaugh (R-Perry, Juniata Counties) Referred to the House Consumer Protection, Technology and Utilities Committee, March 13, 2023
	<a href="#"><u>MEMO</u></a>	<b>Prime:</b> Daniel Laughlin (R-Erie County) Memo circulated on March 24, 2023 ( <i>likely a companion bill to SB 330</i> )
	<a href="#"><u>HB 1842</u></a>	<b>Prime:</b> Rep. Peter Schweyer (D-Lehigh County) Introduced 11/13/2023



- Continued -

### SOLAR FOR SCHOOLS

#### Allocates Grant Funding for Schools to go Solar



[HB 1032](#)

**Prime:** Elizabeth Fiedler  
(D-Bradford, Philadelphia  
County)

Final House passage (Y-134; N-69), June  
29, 2023. Awaiting action in the Senate.

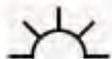
[MEMO](#)

**Prime:** Vincent Hughes  
(D-Montgomery and  
Philadelphia Counties) &  
Carolyn Comitta  
(D-Chester County)

Memo circulated on April 13, 2023 (*likely  
a companion bill to HB 1032*)

### DECOMMISSIONING AND BONDING OF SOLAR ENERGY PROJECTS

#### Requires decommissioning plans and financial assurances



[SB 211](#)

**Prime:** Gene Yaw  
(R-Bradford, Lycoming,  
Sullivan, Tioga and Union  
Counties)

Final Senate passage (Y-36; N-13), March  
8, 2023. Referred to the House  
Environmental Resources and Energy  
Committee, April 25, 2023



[HB 925](#)

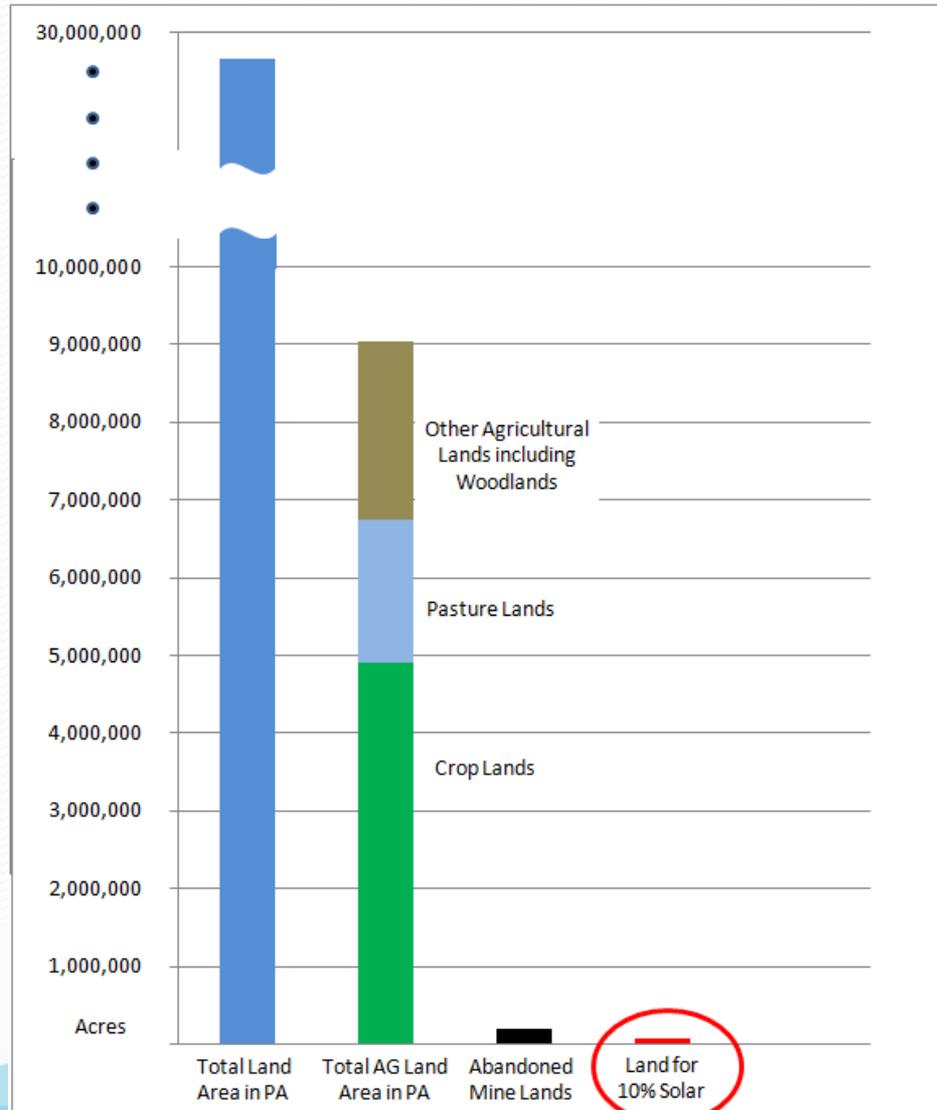
**Prime:** Kathy Rapp  
(R-Warren, Crawford and  
Forest Counties)

Referred to the House Environmental  
Resources and Energy Committee, April  
25, 2023



# Land Area in Pennsylvania

## Relative to Land Usage for Grid Scale Solar PV





**Thank You!**

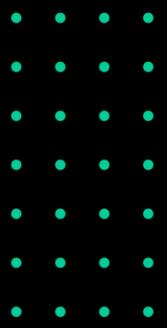


# STATION A

the climate action platform

**Solar Adopters Conference**

@stationainc | [www.stationa.com](http://www.stationa.com)



# Our thesis

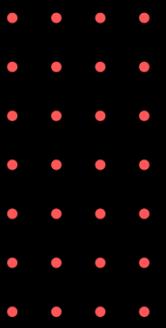
We need new infrastructure to develop decarbonization projects fast, easily, and transparently.

## Climate requires action, not just reporting.

The imminent challenge in climate is action, i.e. “how do we achieve our climate goals?” or “how do we reduce emissions?”. Today, there’s no single solution that answers these questions.

**Station A offers the foundation  
to make real climate action easy.**





# What's broken today?

55% of the total price of any clean energy project is soft costs, making decarbonization more painful, complicated, and expensive.



## **Hard to understand the opportunity**

Most people don't have an easy, unbiased place to determine if clean energy will work on their building.



## **Hard to find the right provider**

Screening random offers or relying on a sole-sourced deal presents significant risk of over paying



## **Hard to find time**

Buyers aren't solely focused on buying clean energy and it is frequently a distraction from their core business.



# What we do

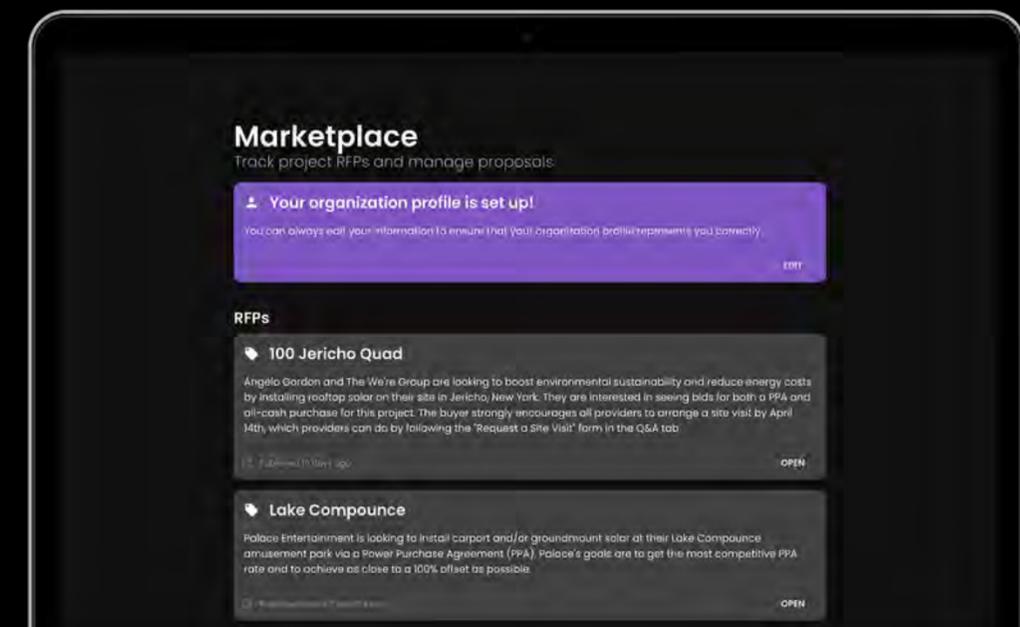
We help any company identify financially viable clean energy projects in their portfolio, and we help those companies source competitive proposals from developers who can build those projects.

## We evaluate any building

We have built and patented AI tech to model and instantly grade clean energy viability for any building in the U.S., making it easy to proactively identify project opportunities.

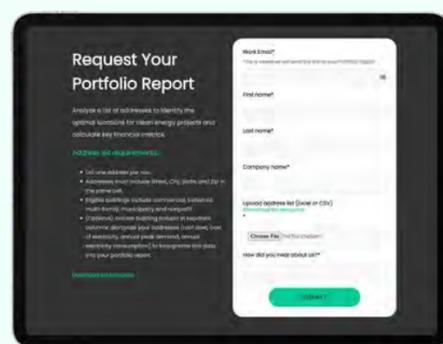
## We make climate action easy

Our platform and provider network enables us to transparently solicit competitive offers for any clean energy technology, and **go net-zero faster and easier.**



## What can you do with Station A?

# Automated evaluation

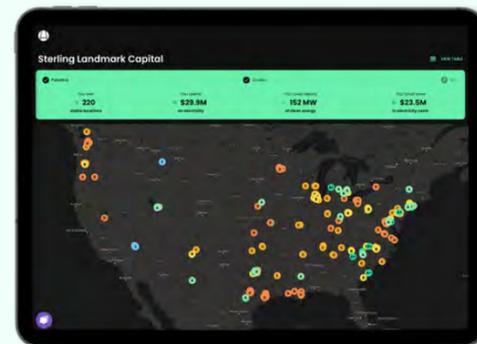


1

### Submit addresses

All we need is a single address or .csv list of building addresses. Our platform analyzes and grades each building to identify your best sites for clean energy.

[Submit Address List](#)  
[Get a Building Grade](#)

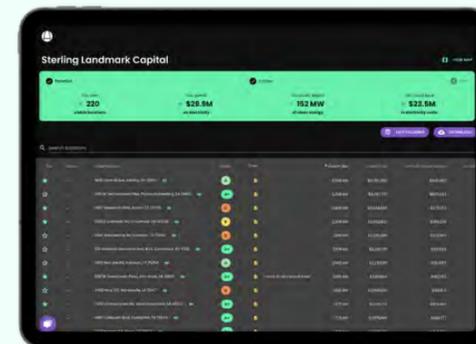


2

### View Portfolio

Our automated Portfolio evaluations delivered via a private link, include the key technical, financial, and site-specific outputs needed to identify the best sites for solar.

[Create an Account](#)

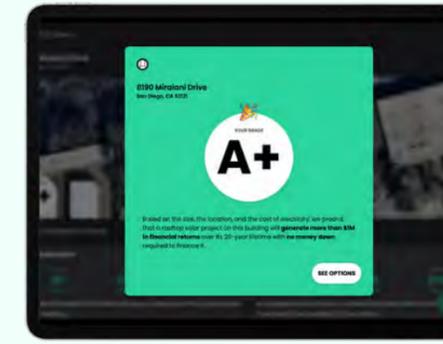


3

### Enrich your data

Add building actuals to your portfolio via our platform to dynamically enrich or customize the analysis. For a fee, enlist our technical team to collect building data on your behalf.

[Talk to an Advisor](#)



4

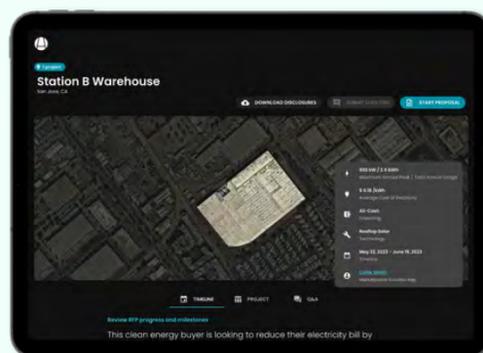
### Prioritize sites

With as little or as much help as you'd like from our team, build a business case for your best buildings based on actuals.

If needed, Station A can also conduct a **Feasibility Study** (see more below) that provides a granular analysis of project financials and technicals to better inform a go/no-go decision.

## What can you do with Station A?

# Streamlined sourcing

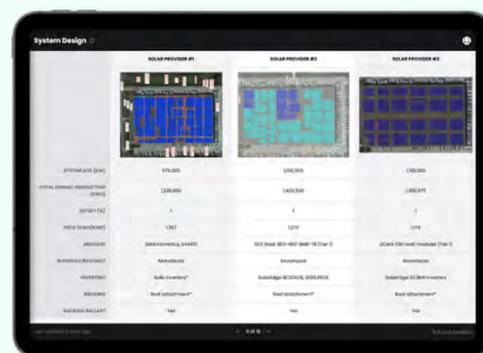


5

### Create & publish a project

We work with you to collect the right details about your project and goals to ensure reliable and accurate bids. Once the project details are approved by all parties, Station A will publish it in our [Marketplace](#).

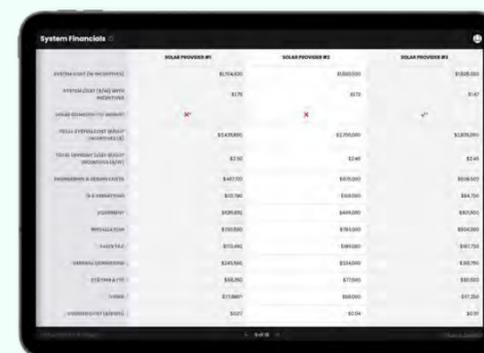
[List a Project](#)



6

### Evaluate proposals & shortlist

Bids on your project are sourced from our network of 2000+ qualified providers. Our Marketplace Success team ensures an apples-to-apples comparison process that aligns assumptions, contingencies and project specs.



7

### Select a provider

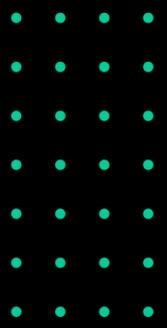
We facilitate a Q/A process between you and the shortlisted providers to help refine the bids and allow you to confidently select a winning provider.



8

### Project kickoff

Sign the term sheet and begin the implementation of your project proposal with your chosen provider.



# What solutions do we support?

## Onsite Solar

- We accommodate rooftop, ground-mount, or carport solar

## EV chargers

- EV chargers can be L2 or DC fast chargers, depending on the charging speed you need.

## Battery storage

- Battery storage systems can supplement solar systems to store and discharge energy when needed

## Community solar

- If you can't install solar on your property, you can still potentially subscribe to a community solar farm!
- Your clients can save ~10% on their electricity bills
- No upfront cost, just savings



**64.27%**

**AVERAGE % DIFFERENCE BETWEEN THE  
LOWEST AND HIGHEST BID**

**\$1,410,178**

**AVERAGE \$ DIFFERENCE BETWEEN THE  
LOWEST AND HIGHEST BID**

**1.57 MW**

**AVERAGE PROJECT SIZE**

**1,549**

**AVERAGE # OF PROVIDERS REACHED PER RFP**

## Solar Adopters Master List Port Review 1.18.24

[VIEW MAP](#)
 Potential

 Grades

 3 RFPs

You own

**142**

viable locations

You spend

**\$6.8M / yr**

on electricity

You could deploy

**40 MW**

of clean energy

You could save

**\$5.6M / yr**

in electricity costs

[EDIT COLUMNS](#)
[DOWNLOAD](#)

**2.3 MW**

LARGEST PROJECT SIZE IDENTIFIED

**0.3 MW**

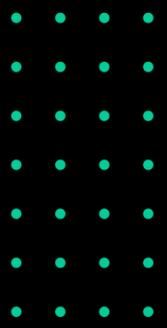
AVERAGE PROJECT SIZE IDENTIFIED

**77**

TOTAL NUMBER OF A LOCATIONS (PAYBACK IN 4-5 YEARS)

**48**

TOTAL NUMBER OF LOCATIONS THAT QUALIFY FOR AT LEAST ONE ITC ADDER (LOW INCOME/TRIBAL COMMUNITY OR ENERGY COMMUNITY)



# Your Station A contact

**Leo Menard**

Director of Business Development & Sales

Email | [leo@stationa.com](mailto:leo@stationa.com)

Call or text | 207.271.0197



**SCEP**  
STATE & COMMUNITY ENERGY PROGRAMS

# Community Energy Programs & Resources

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**Christine Knapp**, Community Innovation & Technical Assistance Program Manager

Chester County Solar Adopters Conference  
January 18, 2024

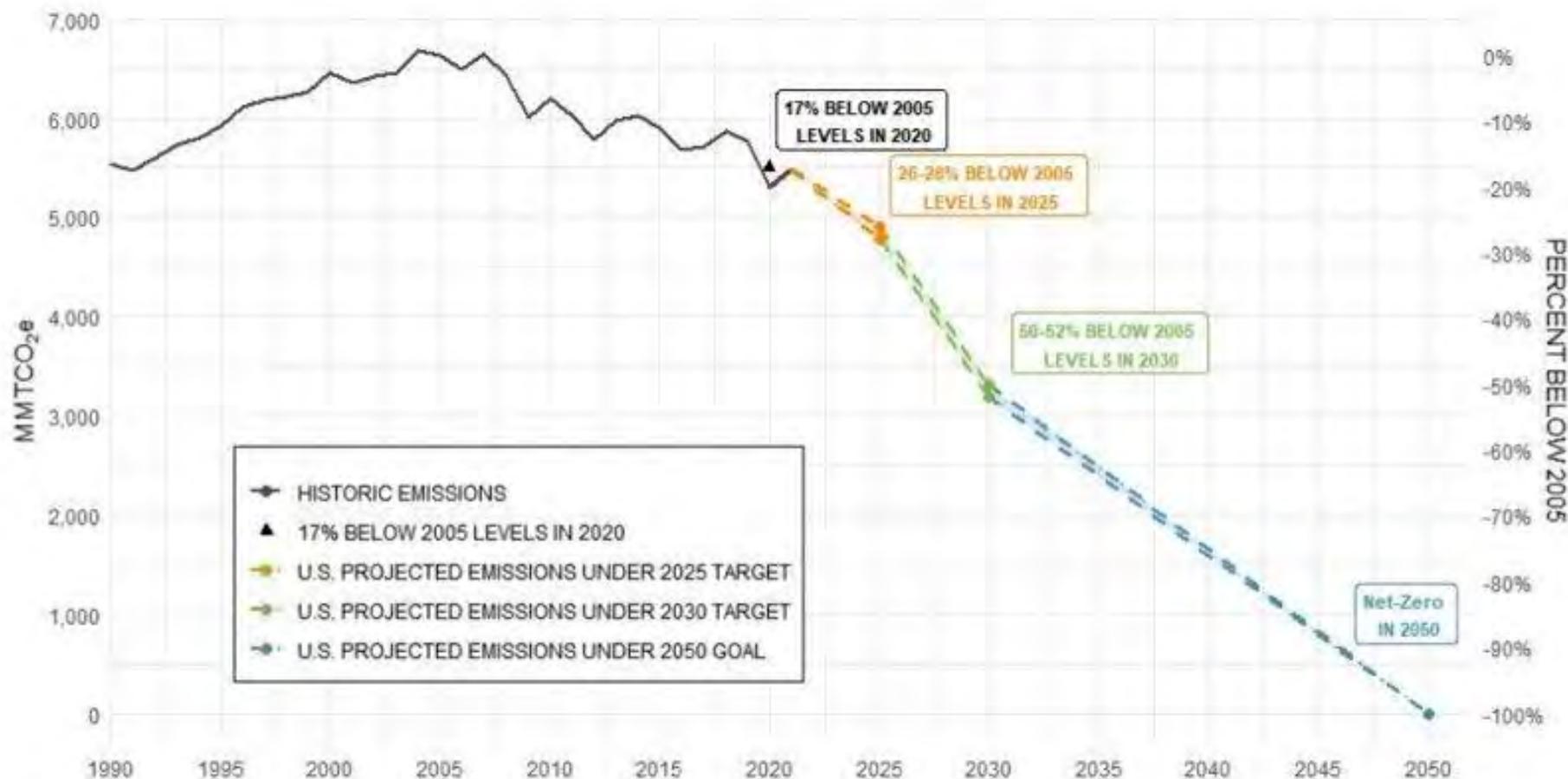


# DOE investments align with the Administration's near- and long-term climate and clean energy goals

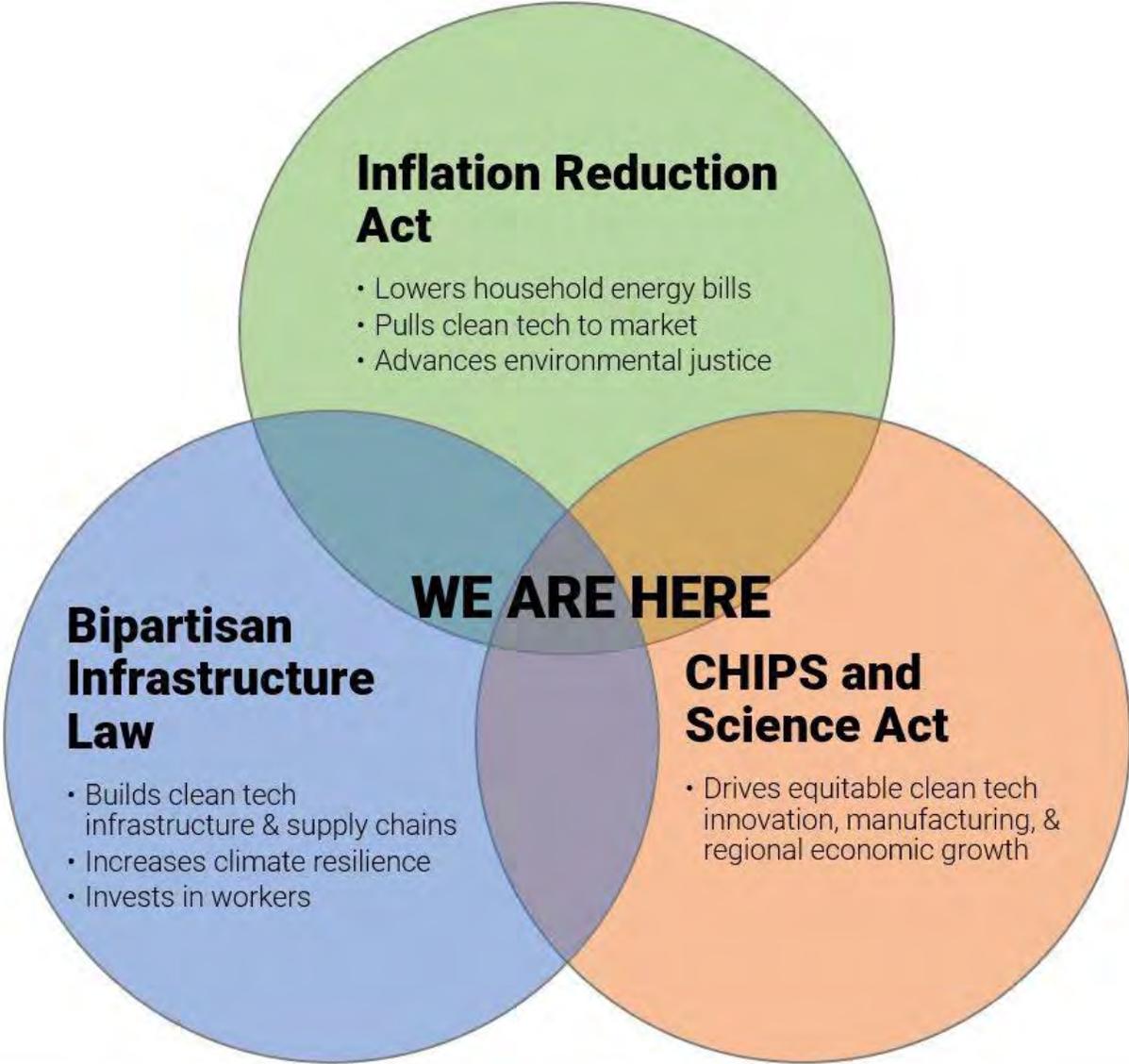
**50-52%**  
GHG reductions by  
2030

**100%**  
clean electricity by  
2035

**Net-Zero**  
emissions by  
2050



# Over \$500 BILLION invested in the clean energy transition



# Congress has given DOE new mandates and unprecedented funding

Hydrogen

Buildings: efficiency & electrification

Carbon Management

Energy Storage

Electric Grid

Cybersecurity

~\$100B in Grants and Rebates  
\$250B+ In Loans and Loan Guarantees

Critical Minerals/Materials

Domestic Supply Chains

EVs and Chargers

State, Local, Tribal Partnership

Workforce

Clean Energy Projects



# SCEP

STATE & COMMUNITY ENERGY PROGRAMS

## Whole Greater than Sum of its Parts

SCEP's Mission is to partner with State, Local, and Tribal governments and community organizations to catalyze local economic development and job creation through equitable, clean energy solutions.

SCEP does this through the **management and oversight of \$16 billion** in formula grants, competitive grant awards, consumer rebate grants, and technical assistance.



Prioritize  
Justice40  
Initiative



Deploy clean  
energy  
technologies



Catalyze local  
economic  
development



Create  
jobs and  
increase hiring



Avoid pollution  
through place-based  
strategies



Reduce  
energy costs

# 28+ Programs Coming Out of SCEP

\$3.5B for  
Weatherization Assistance Program

\$260M for  
Building  
Efficiency  
Workforce  
Training

\$750M for  
State Energy  
Program &  
Revolving Loan  
Fund

\$500M for  
Energy Efficiency  
& Renewable  
Energy in Public  
Schools

\$100M for  
Energy  
Future  
Grants

\$50M for  
Energy  
Efficiency for  
Non-Profits

\$550M for  
Energy Efficiency  
& Conservation  
Block Grants  
Program

\$1B for  
Energy Codes  
Technical Assistance

\$8.8B for Home Energy Rebates

# Grant Programs

# EECBG Program Investing in **Over 2,700 Communities** Across U.S



**EECBG  
provides  
\$431.2M in  
formula grant  
funding and  
\$8.8M in  
competitive  
funding**



# Renew America's Schools and Renew America's Nonprofits

**New competitive grant programs for clean energy improvements at public school and nonprofit facilities**

**Funding:** \$500M available for Schools  
\$50M available for Nonprofits

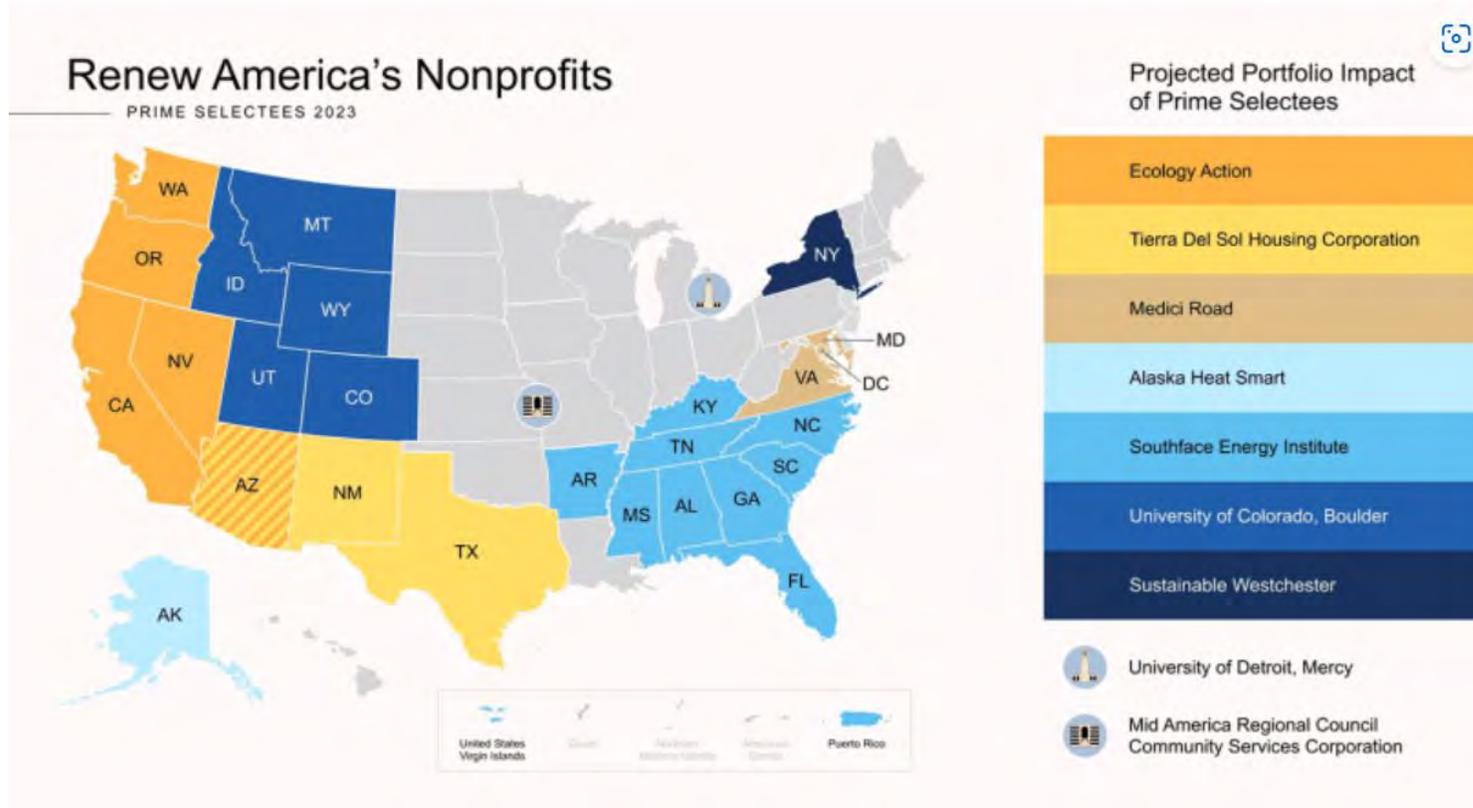
**Qualifying Energy Improvements:** Improvements, repairs, or renovations that reduce energy costs or lead to improved teacher and student health and achieve energy savings, installation of renewable energy, installation of alternative fueled vehicle (AFV) infrastructure, and purchases or leases of AFV.



# Renew America's Schools Round 1 winners



# Renew America's Nonprofits Round 1 winners



Nine nonprofit organizations will share \$45 million in awards, and collaborate with 38 partners, to deliver energy improvements in approximately 300 nonprofit buildings across the country - including 28 states, the District of Columbia, Puerto Rico, and the U.S. Virgin Islands.

# Energy Future Grants: Place-Based Innovation

Teams (e.g., city-city, city-state, county-tribes) develop innovative, deployment-based strategies inclusive of transportation, buildings, and power sectors.



## Program Information

- Annual program
- Year 1 closed November 10
- Website: <https://www.energy.gov/scep/energy-future-grants>

**\$27M**

**Competitive FOA** to help scale local strategies that drive demand for affordable clean energy



**Local, states, and tribal governments** partner with community organizations, utilities, academia and NGOs.



**Multi-tiered awards** with 2<sup>nd</sup> round of funding for subset of awardees that make the most progress.



**Technical assistance** provides analytical and team support to scale innovative solutions.

# Energy Improvements in Rural or Remote Areas

## Investing in Small Towns and Communities

- **Overview:** Grants for projects in rural/remote areas that increase energy efficiency or improve overall cost-effectiveness of energy generation, transmission, and distribution lines
- **Funding:** \$1 billion
- **Eligible Entities:** Utilities, state/local gov'ts, community-based organizations, Tribes, and cities, towns, and unincorporated areas with **populations <10k**
- **Status:** First \$300M announced March 1, concept papers due April 14. Full application deadline June 28. Next round likely summer of 2024.



# Community-Led Innovation Prize

Ready to bring equitable clean energy and energy efficiency initiatives to your community? Join the \$7.49 million Community Energy Innovation Prize and strategize ways to provide support, build trust, and strengthen relationships and partnerships with underserved communities while advancing the clean energy transition.



- Clean Energy Ecosystem Track**  
\$4.9M available for community-led projects across a wide range of clean energy initiatives that advance local clean energy transitions. Due 2/2/24
- Manufacturing Ecosystem Track:**  
\$2.1M available for projects that advance clean energy manufacturing innovation ecosystems in historically underserved communities. Due 2./2/24.
- Collegiate Track:** 450,000 available for student-led teams to work alongside a community partner on a project related to the clean energy transition. Due 11/3/23

# Grid Resilience and Innovation Partnership Program

## Ensuring the Resiliency and Reliability of our Grid



- **Overview:** Grants to enhance grid flexibility and improve the resilience of the power system against extreme weather
- **Funding:** \$10.5 billion
- **Eligible Entities:** Utilities, state/local gov'ts, for-profit entities, non-profit entities, institutions of higher education, public utility commissions
- **Status:** First \$3.8B announced in 2022, applications closed late 2022/early 2023. Second round of funding anticipated FY 2024.

# Local Government Energy Program: Coming Soon!

- Annual appropriation of **\$10M** in FY22 and **\$12M** in FY23
- Eligible for **energy communities & disadvantaged** or **small-to-medium jurisdictions**
- **Technical assistance, on-site capacity** and **peer learning** will support on-the ground implementation

## Intended LGEP recipients:

- Energy Communities
- Disadvantaged Communities (DACs):
- Small and Medium-Sized Jurisdictions
  - “Small” jurisdictions: under 100,000 people;
  - “Medium” jurisdictions: under 250,000 people

**Coming in 2024!**

# Industrial Assessment Centers (IAC) Implementation Grants

- **IAC Implementation Grants Program provide up to \$400 million in grants to small and medium-sized manufacturers (SMMs) to implement recommendations made by:**
  - An Industrial Assessment Center (IAC)
  - A Combined Heat & Power Technical Assistance Partnership (CHP TAP) or “Onsite Energy TAP” assessment
  - A third-party assessor as “IAC-equivalent” so that recipients of those assessments can be eligible for implementation grants (see below).
- Grant awards are up to \$300,000 per manufacturer (covering one or multiple projects), at a 50% cost share (i.e. if a project costs \$50,000, an implementation grant can cover up to \$25,000).
- An SMM is defined as a manufacturer, including water and wastewater treatment facilities, with the following characteristics either in either the most recently completed fiscal year OR in the year the assessment was conducted (if different):
  - Gross annual sales less than \$100,000,000;
  - Under 500 employees at the facility site; and
  - Annual energy bills of more than \$100,000 but less than \$3,500,000.

## When to Apply

The IAC grant program operates on a rolling basis. Applications may be submitted at any time throughout the year as funds are available and will be reviewed quarterly after the following deadlines:

- March 31, 2024
- June 30, 2024
- September 30, 2024

**How to Apply** In contrast to traditional DOE funding opportunities, the IAC grant programs works through a Partnership Intermediary Agreement, called ENERGYWERX, resulting in a very simple and straightforward application form and process via Submittable.

To learn more visit: <https://www.energywerx.org/opportunities/iac-round-2>

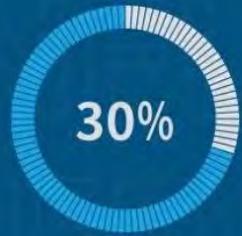
# Clean Energy Tax Credits and Elective Pay

# Tax Credits Available for Consumers

Category	Examples
<b>Efficient Appliances</b>	<ul style="list-style-type: none"><li>Heat pumps, air conditioners, and water heaters – 30% of cost (with limits)</li></ul>
<b>Home Improvements</b>	<ul style="list-style-type: none"><li>Home energy audits - up to \$150</li><li>Efficiency upgrades like electric panels, insulation</li></ul>
<b>Clean Energy</b>	<ul style="list-style-type: none"><li>Solar panels and battery storage - 30% of cost</li></ul>
<b>Clean Vehicles</b>	<ul style="list-style-type: none"><li>New vehicles - up to \$7,500 depending on manufacturing requirements</li><li>Used vehicles - up to \$4,000</li><li>Charging equipment – 30% of cost up to \$1,000</li></ul>



# Qualifying Advanced Energy Project Credit 48C Program



An investment tax credit of up to **30%** of qualified **INVESTMENTS** for certified projects.

**ROUND 1:** The §48C Program allocates approx. **\$4 BILLION** to projects that expand clean energy manufacturing and recycling + critical materials refining, processing and recycling, and for projects that **reduce greenhouse gas emissions** at industrial facilities.



The §48C Program sets aside 40% of funds for projects in designated communities with closed coal plants or mines — approximately \$1.6 Billion in round 1.

Applicants submitted concept papers seeking a total of nearly **\$42 BILLION** in funding across all categories of §48C projects, including nearly **\$11 BILLION** for projects in designated

## ENERGY COMMUNITIES.



Together, these proposed projects identify over **\$142 BILLION** in potential investments to strengthen American industry and clean energy supply chains.

[www.energy.gov/mesc](http://www.energy.gov/mesc)



**MESC**  
OFFICE OF MANUFACTURING AND ENERGY SUPPLY CHAINS

# Energy Savings Hub



## Air Conditioners (energy efficient)

[MORE INFO ON AIR CONDITIONERS](#)

**Incentive Type:** Tax Credit ✕

**Incentive Amount:** 30% of the cost paid by the consumer, up to \$600.

**How to Access:** Submit IRS Form 5695<sup>a</sup> if you meet the requirements detailed on [IRS.gov](#)<sup>d</sup>.

 Subject to a cumulative, annual cap of \$1,200.

 Believe it or not, another option for energy-efficient home cooling is a heat pump, which provides both air conditioning and heating! Credits exist for both air-source and geothermal heat pumps, which could save you additional money on your monthly costs in the long-run.

[www.energy.gov/save](http://www.energy.gov/save)

The Energy Savings Hub is a comprehensive tool that shows consumers how they can save money on energy efficient appliances and equipment through tax credits and other incentives.

# Elective Pay



Tax-exempt and governmental entities can now receive a **payment equal to the full value of clean energy tax credits** even though they do not owe taxes.



Tax credits earned through Elective Pay **can be combined with DOE grants and loans** with some limitations.



Eligible entities must complete a **pre-filing registration** and then claim the credit by filing a tax return with the IRS after the project or property is placed in service.

# Elective Pay – Cash for Clean Energy

Elective pay allows **local governments and tax-exempt entities to receive a cash payment** from the IRS for eligible clean energy investments.

- Example: local government invests \$1,000,000 in tax-credit eligible solar, battery storage, and EV chargers at a community center.
- Cash-back: Through elective pay, local government receives a **\$300,000 cash payment from the IRS** as they qualify for a 30% investment tax credit for each of the eligible investments.



# Elective Pay

- **12 of the Inflation Reduction Act clean energy tax credits** are eligible for elective pay including:

Investment tax credit (ITC)

Clean electricity, storage, microgrids, other energy projects

Production tax credit (PTC)

Clean electricity

Bonus credits

For ITC and PTC projects located in “Energy Communities”, using domestic content, or benefiting low-income communities

Clean commercial vehicles

Credit eligible for passenger EVs and other clean vehicles

EV chargers

Credit for chargers installed in low-income or non-urban areas

- See the full list of credits and details at: [IRS.gov/ElectivePay](https://www.irs.gov/ElectivePay)

# Other Resources and Assistance

# 50001 Ready Assistance

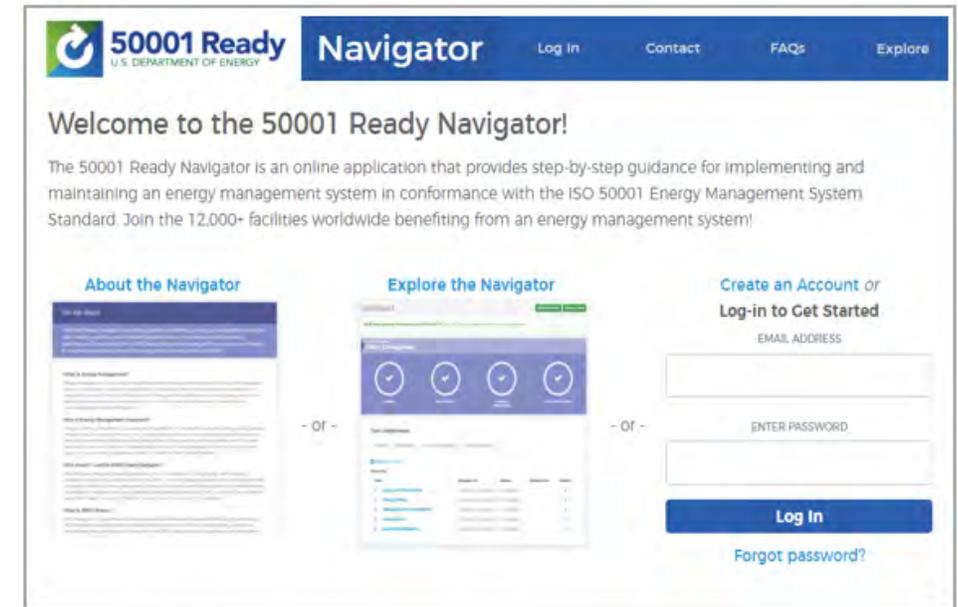
DOE's 50001 Ready Program recognizes facilities and organizations that attest to the implementation of an ISO 50001-based energy management system. The program is a self-paced, no-cost way for organizations to build a culture of structured energy improvement that leads to deeper and sustained savings that does not require any external audits or certifications. 50001 Ready partners with utilities and other organizations that support and facilitate the implementation of 50001 Ready energy management systems.

## ISO 50001

ISO 50001 is an energy management system standard that gives organizations a recognized framework for developing an effective energy management system. ISO 50001 provides a set of requirements that enable organizations to:

- Develop a policy for more efficient use of energy
- Fix targets and objectives to meet that policy
- Gather data to better understand and make decisions concerning energy use
- Measure the results obtained
- Review the effectiveness of the policy
- Continually improve energy management

DOE's 50001 Ready Navigator online tool provides step-by-step guidance and useful tools and templates to help you implement your energy management system



[50001 Ready Program | Better Buildings Initiative \(energy.gov\)](https://www.energy.gov/50001ready)

# BIL and IRA Energy Efficiency Workforce Development Programs

	Statute	Total Appropriations & Availability	Allocation of Funds	Building Segment Served
 <b>State Based Energy Efficiency Contractor Training Grants</b>	IRA Sec. 50123	\$200,000,000 Until September 30, 2031	<b>State Energy Offices</b>	Residential
 <b>Energy Auditor Training Program</b>	BIL Sec. 40503	\$40,000,000 Until Fiscal Year 2026	<b>State Energy Offices</b>	Residential, Commercial
 <b>Building Training and Assessment Centers Program</b>	BIL Sec. 40512	\$10,000,000 Until expended	<b>Institutions of higher education</b>	Commercial, Institutional
 <b>Career Skills Training Program</b>	BIL Sec. 40513	\$10,000,000 Until expended	<b>Nonprofits</b>	All buildings

# SCEP offers Technical Assistance: Website Hubs, Newsletters, Tools & Resources

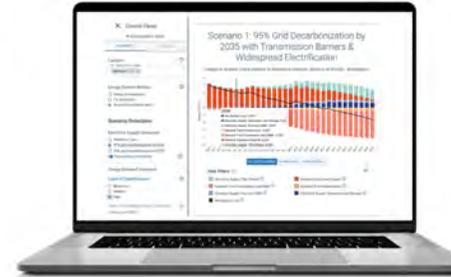
State and Local Solution Center: 400+ tools, resources, and best practices



Examples Highlighting Key Tools

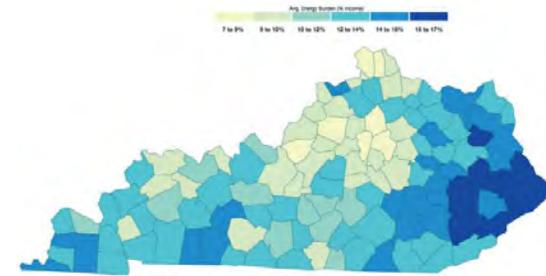


State and Local Spotlight: Monthly newsletter with 34,000+ subscribers



## State and Local Planning for Energy (SLOPE) Platform

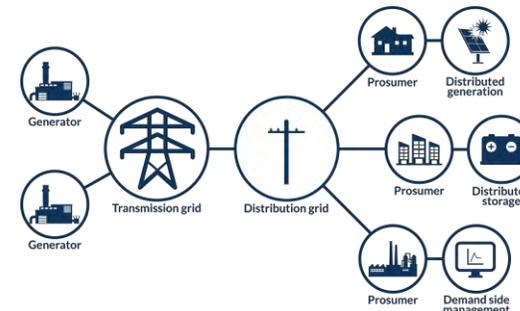
SLOPE integrates over 50 leading data sources to enable users to explore untapped energy savings opportunities and identify the most cost-effective strategies to meet their clean energy and climate goals



Average energy burden in Kentucky

## Low-Income Energy Affordability Data (LEAD) Tool

A web-based interactive tool that enables stakeholders to visualize energy burden and housing characteristics at the national, state, city, and census across the U.S.

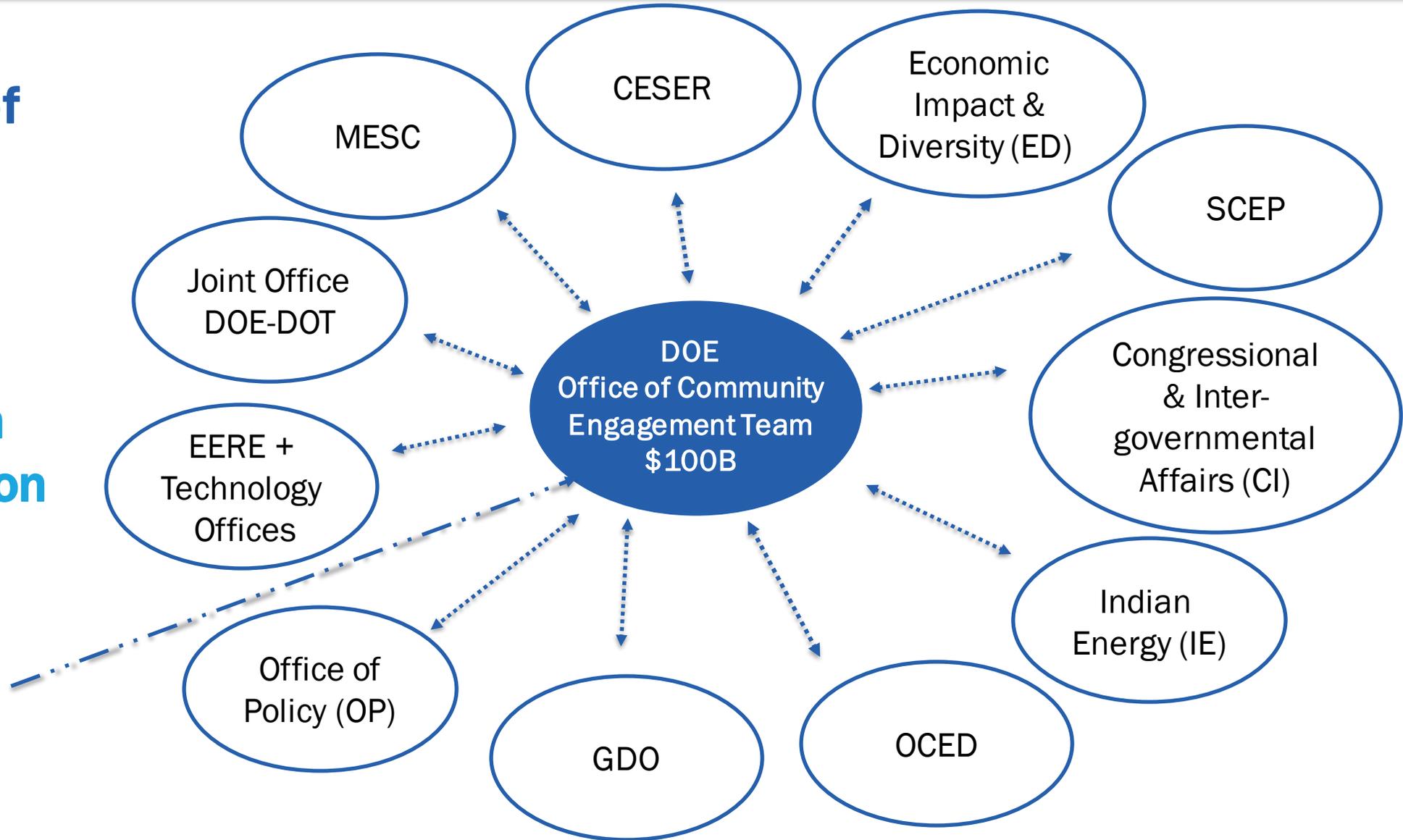


## How DER Can Improve Resilience in Public Buildings

Guide that describes the benefits of integrating energy efficiency with other distributed energy resources to assess resilience benefits through the specific application of two DOE tools (REopt Lite and DER-CAM)

# DOE Community Engagement Hub-and-Spoke Model

**DOE's Office of  
Community  
Engagement:  
\$390 Billion  
Interagency  
Collaboration  
and Coordination**



# Stay Connected

Visit [energy.gov/bil](https://energy.gov/bil) for announcements and sign up for Bipartisan Infrastructure Law email updates.

### Email Updates

To receive the latest news and updates about the BIL programs at DOE, submit your e-mail address.

Visit [energy.gov/scep/slsc/all-state-local-solution-center-resources](https://energy.gov/scep/slsc/all-state-local-solution-center-resources) for state and local TA resources from SCEP, as well as the Spotlight newsletter.

WHAT ARE YOU TRYING TO ACCOMPLISH?

- Develop Plans and Programs
- Empower Organizations
- Establish Financing
- Implement Data Management

Showing 1 to 10 of 485 entries

Search:

**RESOURCE**

**Standard Energy Efficiency Data Platform (SEED) Platform**  
The Standard Energy Efficiency Data Platform (SEED) Platform is an open-source software application designed to manage building performance data (such as required by a benchmarking ordinance) which can be costly and time consuming for states, local governments, and other organizations. SEED helps users combine data from multiple sources, clean and validate it, and generate queries and reports.

Sign up to receive SCEP's monthly **State and Local Spotlight** newsletter for detailed information.

Office of STATE AND COMMUNITY ENERGY PROGRAMS

**\$4.5 Million in Awards Available for Energy Efficiency Upgrades in Public Schools**

DOE Office of State and Community Energy Programs sent this bulletin at 02/24/2023 11:17 AM EST

Having trouble viewing this email? [View it as a Web page.](#) | [SHARE](#)



**SCEP**  
STATE & COMMUNITY ENERGY PROGRAMS

**State & Local Spotlight**  
February 23, 2023

**News**

**\$4.5 Million in Awards Available for Energy Efficiency Capacity Building in Public Schools**



Calling all local education agencies to apply for the U.S. Department of Energy's (DOE) Energy CLASS Prize. Through this prize, energy managers will receive training on ways to identify, plan, and implement energy upgrades in school facilities so students can learn in comfortable, healthy classrooms.

Watch a recording of the Energy CLASS Prize Office Hours for answers to common questions including what is required of a full application, eligibility rules, and upcoming deadlines.



# SCEP

STATE & COMMUNITY ENERGY PROGRAMS

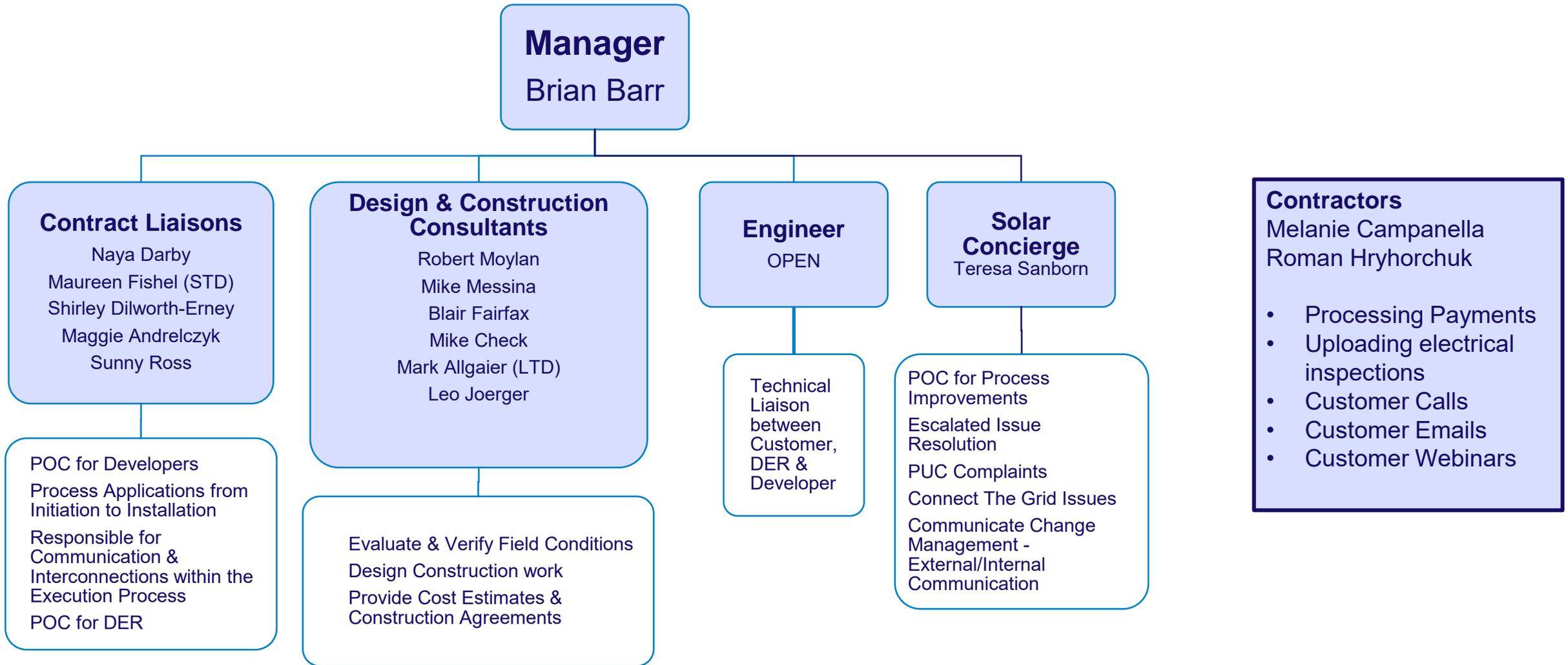


January 18, 2024

# PECO Green Power Connect Overview

Brian Barr, Manager Green Power Connect

# Green Power Connect – Staffing Update





**peco**<sup>SM</sup>

AN EXELON COMPANY

# Interconnection Application Process

# Interconnection Application Process

## Step 1: Completeness Check

- Timeline: 10 business days
- Definition: Complete Application Includes
  - Interconnection Agreement (signed by owner)
  - Service and Meter Application (signed by developer)
  - Specification Sheets
  - Plot Plan
  - Single-Line Drawing
  - Application Fee

## Step 2: Initial Technical Review

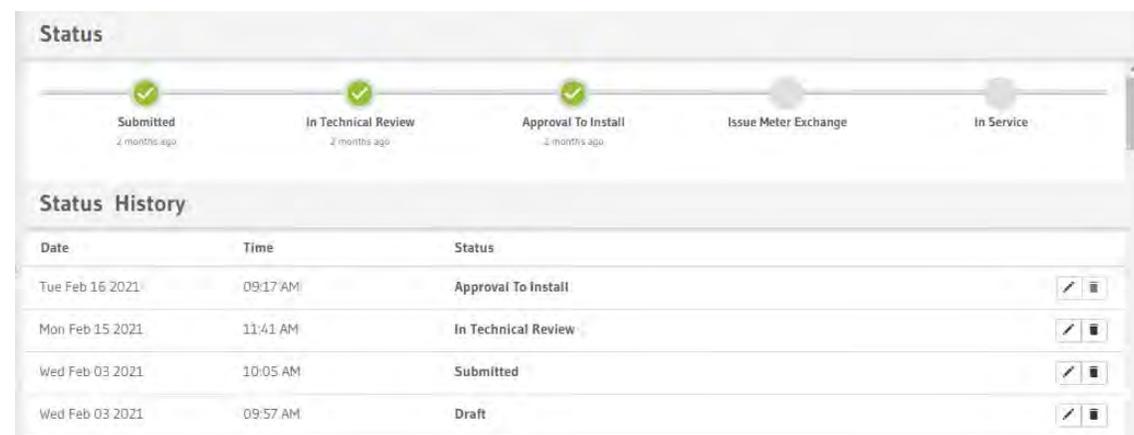
- Timelines:
  - Level 1 – 15 business days
  - Level 2, 3, 4 – 20 business days
- Definition:
  - Review documents for equipment locations, equipment specifications, etc.
  - Check circuit information, transformer information, and perform analysis from transformer to meter
  - After initial review, the application can be: approved, conditionally approved pending simple solution acceptance, or require an engineering study

# Application Process (Continued)

- ▶ Step 2b: Conditionally Approved - Simple Solutions
- ▶ Timeline: Varies with solution
  - ▶ Definition: Application documentation changes, design changes, small circuit changes that impact customers local to applicant.
  - ▶ Lower kW, Upgrade Triplex, Change customer URD Cable, Move Pole or Transformer, Inverter option.
- ▶ Step 2c: Engineering Study
- ▶ Timeline: Varies – Typically 6-8 weeks
  - ▶ Definition: PECO models the entire circuit serving the customer to find a solution. The solution will allow the full system size to be interconnected while not negatively impacting other customers.
  - ▶ Phase swaps, regulators, capacitor banks fixed to switched, Change Auto Voltage Control (AVC) switch settings.

# Application Process (Continued)

- ▶ Step 3: Approved to Install
  - ▶ Timeline: Varies depending upon initial review and next steps
  - ▶ Definition: The customer's application is approved for installation
  
- ▶ Step 4: Installation
  - ▶ Timeline: Varies, dependent on customer and solar developer
  - ▶ Definition: Customer and solar developer install the approved system. PECO is not involved in this step.



# Application Process (Continued)

- ▶ Step 5: Metering
  - ▶ Timeline: 10 business days
  - ▶ Definition: After PECO receives the Part II document, picture of meter box and inspection certificate, PECO they will set the bi-directional meter or second meter capable of reading power flow in and power flow out.
- ▶ Step 6: Return Permission to Operate
  - ▶ Timeline: 10 business days.
  - ▶ Definition: After PECO sets the customer's meter, they will return the official Permission to Operate documentation to the customer and solar developer.

## Status





**peco**<sup>SM</sup>

AN EXELON COMPANY

# Interconnection Application Best Practices

# PECO's Digital Solar Toolkit

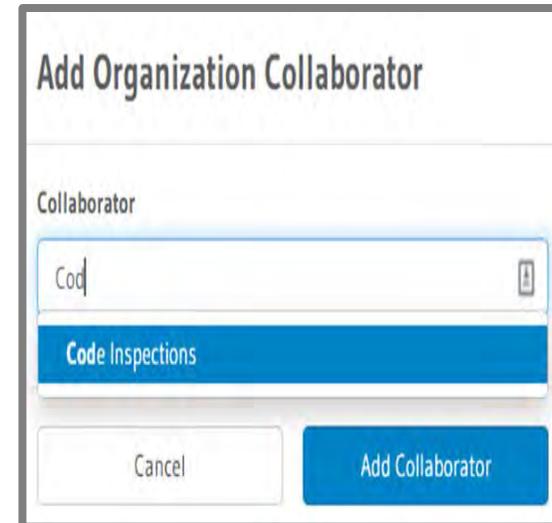
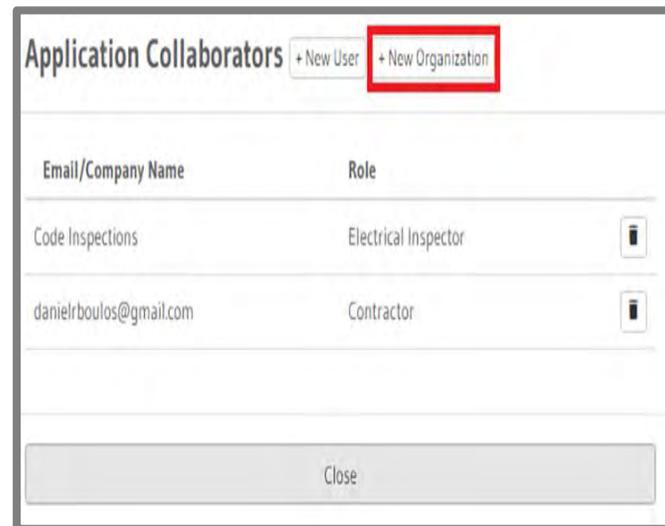
<https://www.peco.com/SmartEnergy/MyGreenPowerConnection/Pages/default.aspx>

The screenshot shows the PECO website's 'My Green Power Connection' page. The header features the PECO logo (An Exelon Company) on the left, and navigation links for 'Smell Natural Gas?', 'Outage', 'Pay Bill', 'Moving', and 'Contact Us' in the center. A search bar and a 'Sign In' button are on the right. Below the header is a navigation bar with 'My Account', 'Outages', 'Ways to Save', 'Smart Energy' (highlighted), and 'Safety & Community'. The main content area has a breadcrumb trail: 'Home > Smart Energy > My Green Power Connection'. The title 'My Green Power Connection' is prominently displayed. Below the title, a paragraph states: 'Green Power Connection is our resource for customers interested in generating their own electricity and connecting to the smart energy grid.' There are two main content blocks: one titled 'Solar for Home & Business' with an image of a couple and text about installing rooftop systems and using a solar calculator; another with an image of solar panels and text about resources for interconnection. On the right side, there is a 'LAUNCH OUR Solar Calculator' button, a section titled 'Is Solar Right for You?' with a solar panel image and a link to a PDF calculator, and a chat icon at the bottom right. A left sidebar contains a menu with 'Smart Grid & Smart Meter', 'Innovation & Technology', 'My Green Power Connection' (selected), 'Solar for Home & Business', 'Developers & Contractors', and 'FAQs'.

# Collaborator

## Add a Customer and Inspection Agency as a Collaborator

- Customer will receive updates
- Inspection agency will be able to upload electrical inspection into application



# Part 2 Interconnection Application – Certificate of Completion

- Required documents
  - Meter photos
    - Upload meter photos in the Files section
  - Signed Part 2
    - Upload the signed Part 2 in the Supplemental Forms section
    - This will update the application status to “Part 2 Submitted”
  - Inspection certificate – this must come directly from inspection agency

Supplemental Forms

Part II

Final Electrical Inspection and Interconnection Customer Signature

The Customer-Generator Facility is complete and ready for interconnected operation in accordance with all of the provisions of the Interconnection Application/Agreement. The Customer-Generator acknowledges that it shall **not** operate the Facility until receipt of Final Acceptance, or as otherwise provided for by regulation.

SUBMITTED

# New Construction

- New building structure with a pending account number
- Pending Account Number accepted in Connect The Grid – check the box for new construction



**New Application**

Project Name

  
 New Construction?

Customer Full Name      Account Number

Operating Company

# Metering

- Currently, all new residential Form 2S (240V Single Phase) and Form 2se (400amp Single Phase) solar installations are single bi-directional meter. Every other Form and Rate combinations are two-meter.

METER FORM	CIMS Size	SERVICE TYPE	RESIDENTIAL	COMMERCIAL
1S	30	120V, 2 Wire, Single Phase	2 Meters	2 Meters
2S	47	240V, 200 Amp, 3 Wire, Single Phase	Single Meter	2 Meters
2Se	55	240V, 400 Amp, 3 Wire, Single Phase	Single Meter	2 Meters
4S	5	Transformer Rated, Single Phase	2 Meters	2 Meters
9S	2	Transformer Rated, 3 Phase Wye	2 Meters	2 Meters
15S	48	240V, 200 Amp, 4 Wire, 3 Phase, Delta	2 Meters	2 Meters
16S	49	120/208, 200 Amp, 4 Wire, 3 Phase, Wye	2 Meters	2 Meters
25S	46	120/208, 200 Amp, 3 Wire, Network Wye	2 Meters	2 Meters
56S	1	Transformer Rated, 3 Phase Delta	2 Meters	2 Meters

# Metering

- Submit photos of existing meter socket location and include a closeup of meter itself.
- Be sure to notify PECO if access to the meter needs to be scheduled due to dogs or locked gate.



# Unauthorized Installations

- ✓ Installation of solar prior to receiving authorization from PECO to install the system
- ✓ Safety concern - Hazardous for PECO technicians and line crews working on power lines due to potential for back feed into PECO's distribution system
- ✓ Unauthorized Installations are provided to the PUC

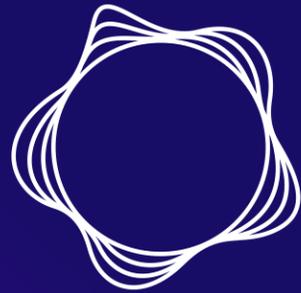


# Questions





# Thank you



peco<sup>SM</sup>

AN EXELON COMPANY



# Sustainable Energy Fund

**Chester County  
Solar Adopters Conference  
January 18, 2024 @ 8:30AM**

**PA C-PACE**  
PROPERTY ASSESSED CLEAN ENERGY

# SUSTAINABLE ENERGY FUND

## Who we are:

- Non-profit focused on promoting sustainable energy in PA for over 20 years
- ENERGOPATH – conference bringing together students, educators, and industry professionals
- Recently completed Net-Zero office building
- Administrator, PA C-PACE Program



# SOCIAL IMPACT COMMERCIAL LOAN PROGRAM



Finance 100% of your project



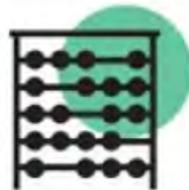
Competitive interest rates with a social impact



Amortization schedule up to 20 years



No prepayment penalty



Interest only period



Will take a subordinate lien position



Asset and cash flow based lending



Payments structured so that energy savings exceed loan payments

The background of the slide features a blurred image of solar panels, with the top and bottom portions being more prominent than the middle section where the text is located.

# **PA C-PACE**

---

**PROPERTY ASSESSED CLEAN ENERGY**

# WHAT IS C-PACE?

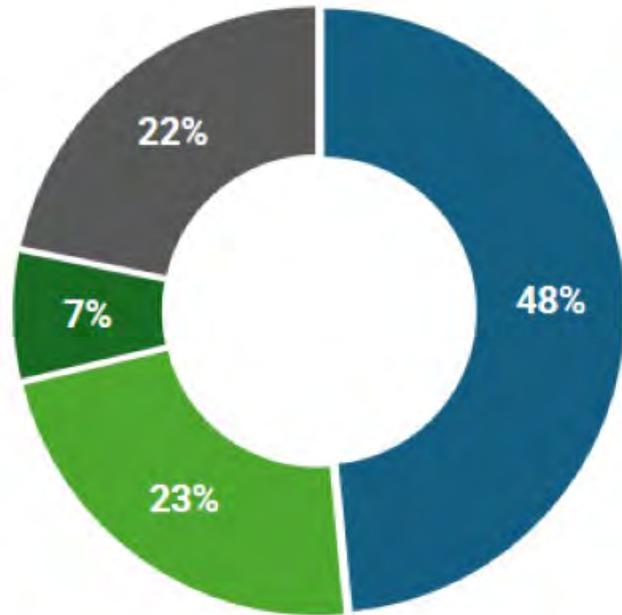
## Commercial Property Assessed Clean Energy:

- **C-PACE is a financial mechanism** to provide long-term financing for energy efficiency, renewable energy, water conservation, indoor air quality and resiliency projects.
  - **Creates measurable savings:** Projects must result in energy savings or reductions in water usage for commercial properties
  - **Through a special tax assessment:** Collection is through a special payment like a property tax that stays with the property upon sale or transfer



# HOW IS C-PACE USED?

## C-PACE funding by category:



■ Energy efficiency ■ Renewable energy  
■ Resilience ■ Mixed projects

## Commercial and agricultural properties:

- Office
- Industrial
- Retail
- Farms
- Nonprofit
- Private schools
- Multi-family 5+ units

**\*No government owned**

# WHY C-PACE?

<b>C-PACE Element</b>	<b>Why It Matters</b>
Covers 100% of eligible hard & soft costs	<b>Limited upfront cash needed for new project</b>
Term of up to 30 years	<b>Long-term repayment can match project useful life</b>
Rates are generally low	<b>Displaces expensive mezzanine debt and equity</b>
Under certain leases, building owner can pass repayments to tenant	<b>Addresses energy usage split incentive issue</b>
If sale of property occurs, C-PACE obligation transfers with the sale	<b>Allows for longer payback periods</b>

# ELIGIBLE IMPROVEMENTS

- Energy efficient equipment and installation (HVAC, boilers, lighting, etc.)
- Renewable energy systems
- Demand control energy storage
- Water conservation fixtures
- Indoor air quality
- Resilience measures (flooding, wind, etc.)
- Ancillary costs can also be included
- Projects costs – hard & soft



# ELIGIBLE IMPROVEMENTS

## New Construction

- Net Zero Building: DOE and National Institute of Building Sciences (NIBS);
- Green Building Initiative: Green Globes for New Construction;
- LEED: New commercial construction (LEED-NC), Commercial interiors projects (LEED-CI);
- LEED: Core and shell projects (LEED-CS) that exceeds current building code requirements;
- Living Building Challenge: <https://living-future.org/lbc/>;
- EPA Energy Star;
- PHIUS Passive House Commercial Requirements.

## Retroactive Financing

- **Within 2 years of project completion**
- Refinance energy saving measures with long term ROI

# ELIGIBLE IMPROVEMENTS

- A 20% reduction in energy consumption for the ECM
- Utilization of best-in-class equipment.

## Prescriptive measures:

- Measures listed in Pennsylvania's Public Service Commission's Technical Resource Manual
- Measures listed in the NYSERDA's Technical Manual
- Measures identified as being eligible for utility incentive
- Energy efficiency products certified by Energy Star that are permanently affixed to the land or building
- Products on the list of Energy Efficient Equipment published by the Consortium for Energy Efficiency, Inc.
- Energy efficiency products certified by the Federal Energy Management Program.



# HOW C-PACE WORKS



# 200 SCHOOL ALLEY

# MONTGOMERY COUNTY



Image Courtesy of Nuveen Green Capital

## Project Overview

**Project Type:** Retrofit and Renewable Energy

**Property Address:** 200 School Alley, Green Lane, PA

**Financing Amount:** \$1,338,137

### Building Measures:

390.9 kW Solar Array

LED Lighting

Upgraded Lighting Controls

### Annual Savings and Environmental Impact:

587,143 kWh

\$50,827

Over 400 Metric Tons of Carbon Dioxide Equivalent Greenhouse Gases

**Property Owner:** Cook Technologies, LLC

**Capital Provider:** Nuveen Green Capital

# 1 CASCADE DRIVE

# LEHIGH COUNTY



Image Courtesy of Nuveen Green Capital

## Project Overview

**Project Type:** Renewable Energy

**Property Address:** 1 Cascade Drive, Allentown, PA

**Financing Amount:** \$2,380,615

### Building Measures:

1.189 MW Solar Array

### Annual Savings and Environmental Impact:

1,491,206 kWh

\$141,121

Over 1,000 Metric Tons of Carbon Dioxide Equivalent Greenhouse Gases

**Property Owner:** FR Cascade Property Holding, LP

**Capital Provider:** Nuveen Green Capital



# Sustainable Energy Fund

Renee L. Riley  
Relationship Manager of Eastern PA  
[rriley@theseef.org](mailto:rriley@theseef.org)  
(610) 264-4440 Ext. 2330



# Introduction to Microgrids

Presented by:

David Santoleri  
CEO, TerraSol Energies, Inc.



# Why should you care about microgrids?



## Financial Benefits

- OPEX savings on your utility bill
- Avoid business losses with continuity of operations.
- Federal Tax Credits
- Solar Renewable Energy Credits
- PECO Incentives

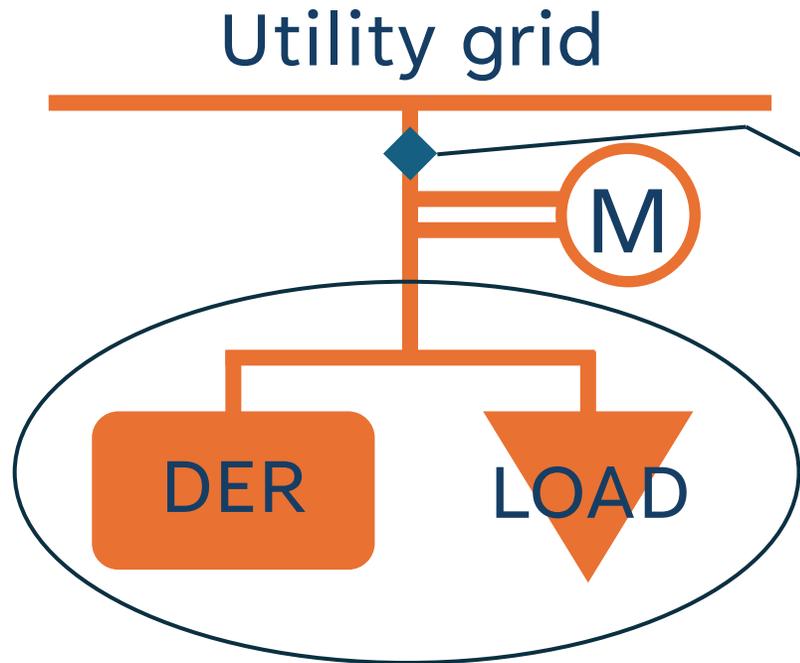
## Operational Benefits

- Energy Independence
- Reduced greenhouse emissions

## Securing a future for Renewable Energies

The electric grid will reach saturation without microgrid capabilities

# What is a microgrid?

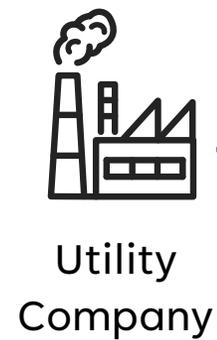
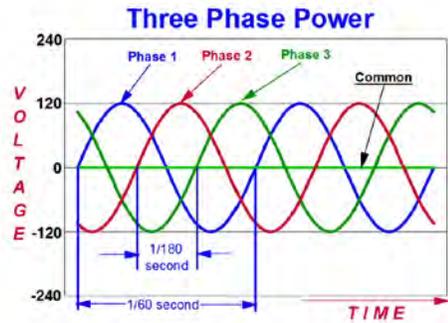


A group of interconnected loads and distributed energy resources (DER)

Within clearly defined electrical boundaries that acts as a single controllable entity with respect to the grid.

Microgrids can connect and disconnect from the grid to enable them to operate in both grid-connected or island mode.

# Microgrid Schematic – On Grid Mode



Transmission/  
Distribution  
Network



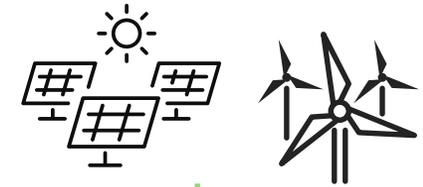
Grid  
Interface  
Switchgear

Energy Management System

Demand  
Resource with  
Loads

Distributed Energy Resources

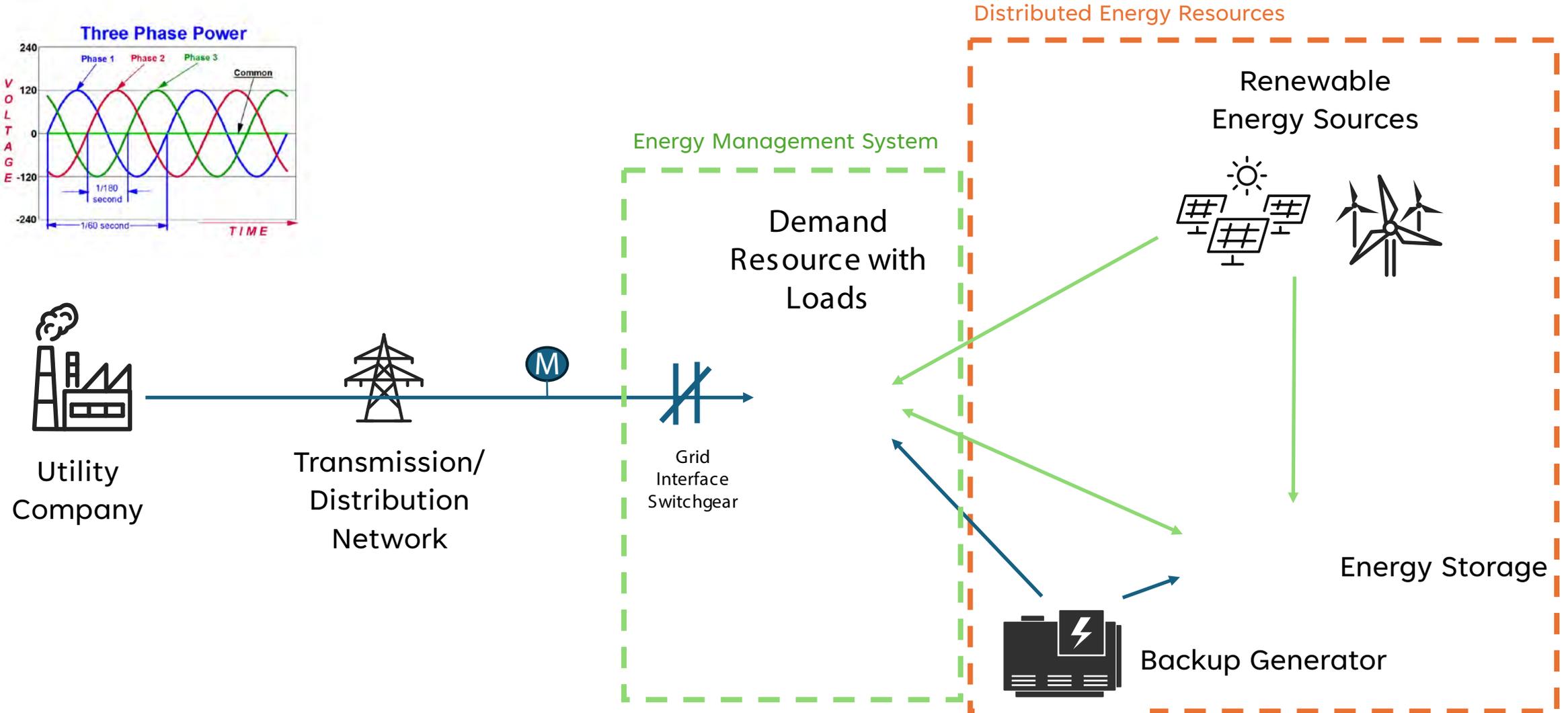
Renewable  
Energy Sources



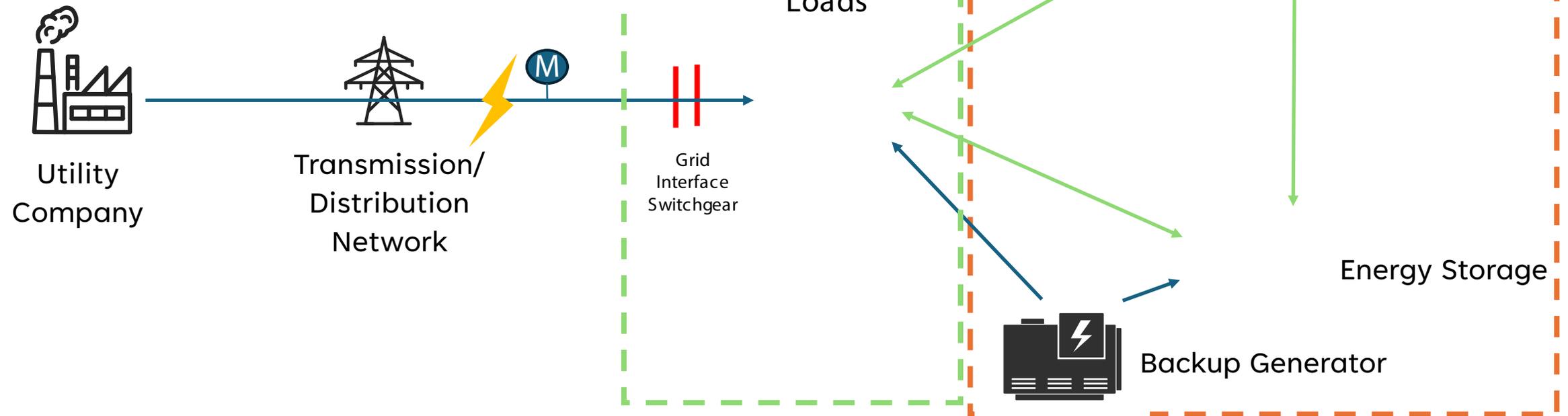
Energy Storage



Backup Generator



# Microgrid Schematic – Island Mode



# Real World Microgrid Installation



**Sycamore**  
Sustainable Electronics Recycling

West Grove, PA

## System Components:

- Operating Loads
- Distributed Energy Sources
  - Photovoltaic Solar Power
  - Energy Storage
- Grid connected
- Energy Management System

110 kW DC  
Solar System

150 kW / 1,000kWh  
Energy Storage

Utility Connection  
150 kVA



# Financial Benefits of Microgrids

## Lower Electric Costs

- Reduce utility consumption (kWh) with Solar Renewable Energy
- Reduce demand (kW) charges by Peak Shaving.

## Additional Revenue Potential

- Ancillary services market or demand response.
- Adjust demand during peak hours.
- Time of Use

## Renewable Energy Incentives

- Federal tax credits
- Solar Renewable Energy Credits (SREC)
- PECO Solar Production Incentive



Name: [Redacted]  
 Account Number: [Redacted]  
 Phone Number: [Redacted]  
 Issue Date: [Redacted]

**Emergency and Repairs**  
 800-841-4141  
 This is the number to call to report power outages, gas leaks or odors, and safety hazards related to PECO Equipment.

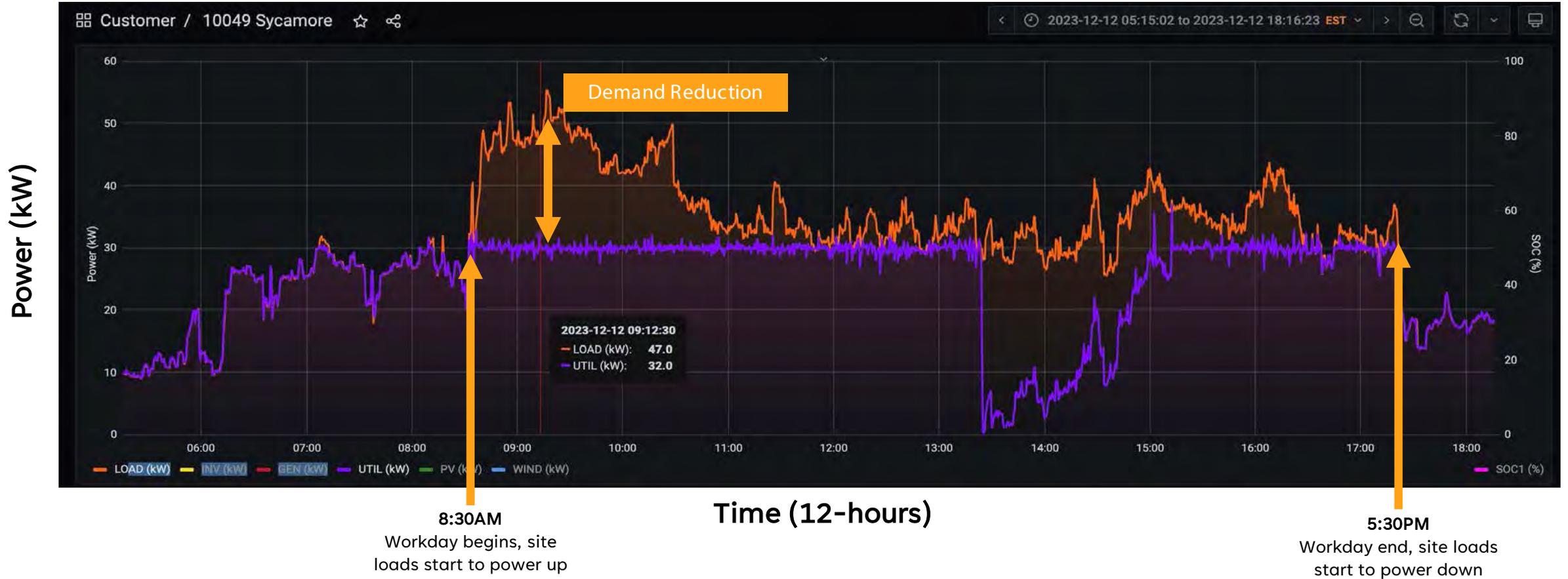
**Meter Information**

Read Date	Meter Number	Load Type	Reading Type	Meter Reading		Diff	Mult	X	Usage	
				Previous	Present					
08/11	127896093	General Service	Tot kwh	273283 ACT	278589 ACT	5306			5306	
08/11	127896093	General Service	Pk kw	0.00 ACT	30.34 ACT	30.34		1	30.34	
Total kwh Used.....				5,306	Distribution kw - Measured.....		30.3			

**Current Period**  
**Electric Commercial Service 0-100kw** Service 07/13/2020 to 08/11/2020 - 29 Days

Customer Charge			
Distribution Charges	30.30 kw	X	\$8.57000
Distribution Charges	5,306 kwh	X	-0.00060
Distribution System Improvement			
Energy Efficiency Charge	5,306 kwh	X	0.00271
Sales Tax			
<b>Inspire Energy Holdings Charges / 866-403-2620</b>			
Flat Monthly Price of \$234.99			
Commodity Charge 5306 KWH @ 0			
<b>Total current charges</b>			

# What is Demand Reduction? (Peak Shaving)



— Total Site Demand

— Load Demand from PECO

# What is Demand Reduction? (Peak Shaving)



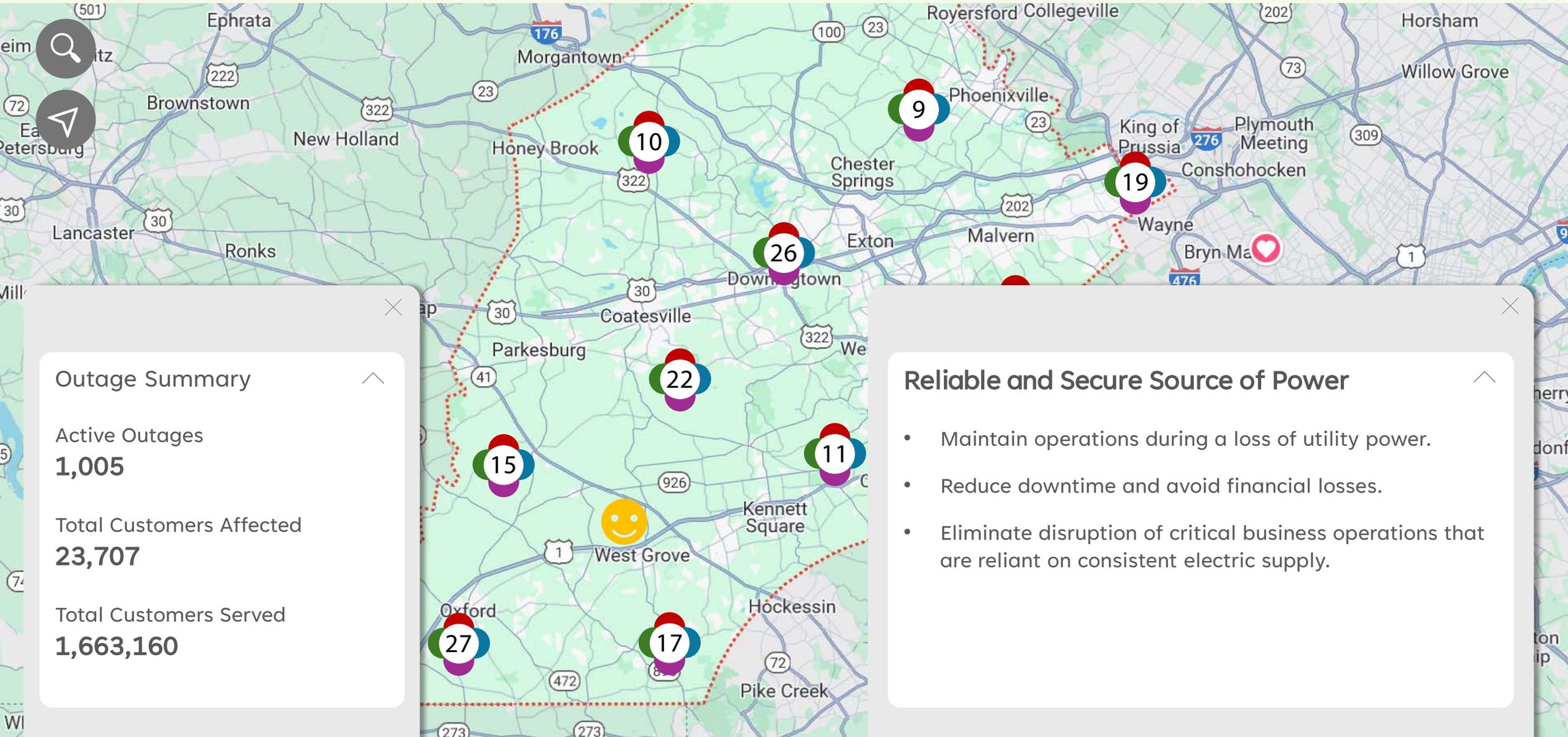
— Total Site Demand

— Load Demand from PECO

— PV Solar Power

— Battery State of Charge (%)

# Operational Benefits of Microgrids

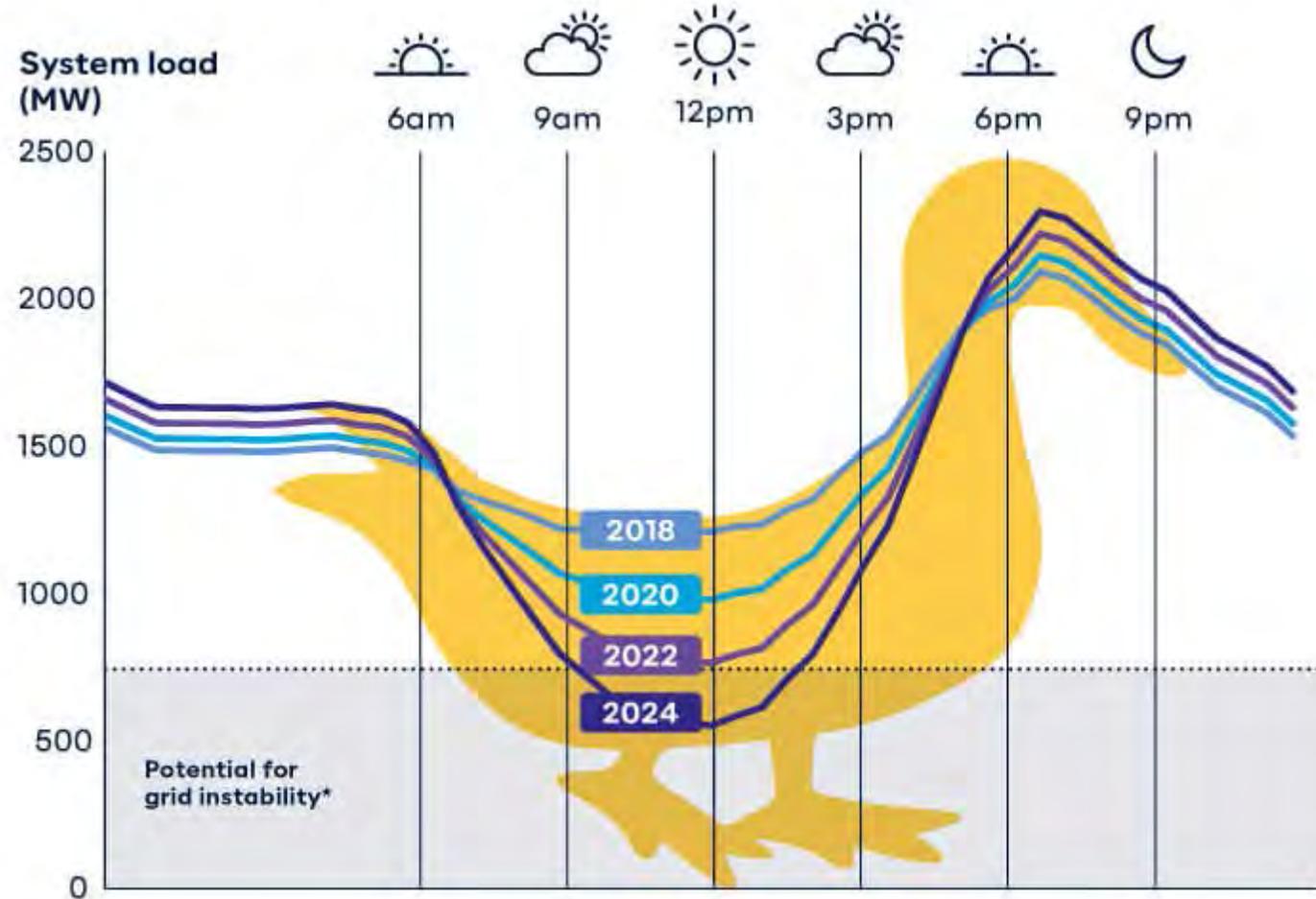
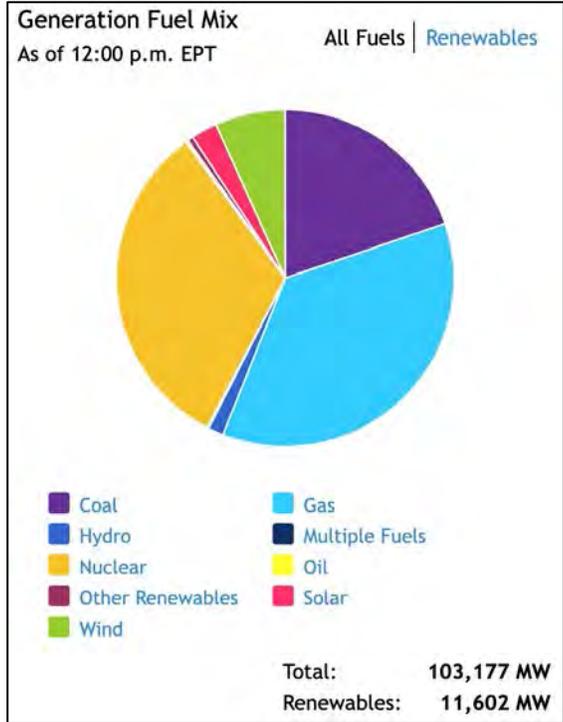


# Securing a future for Renewable Energy

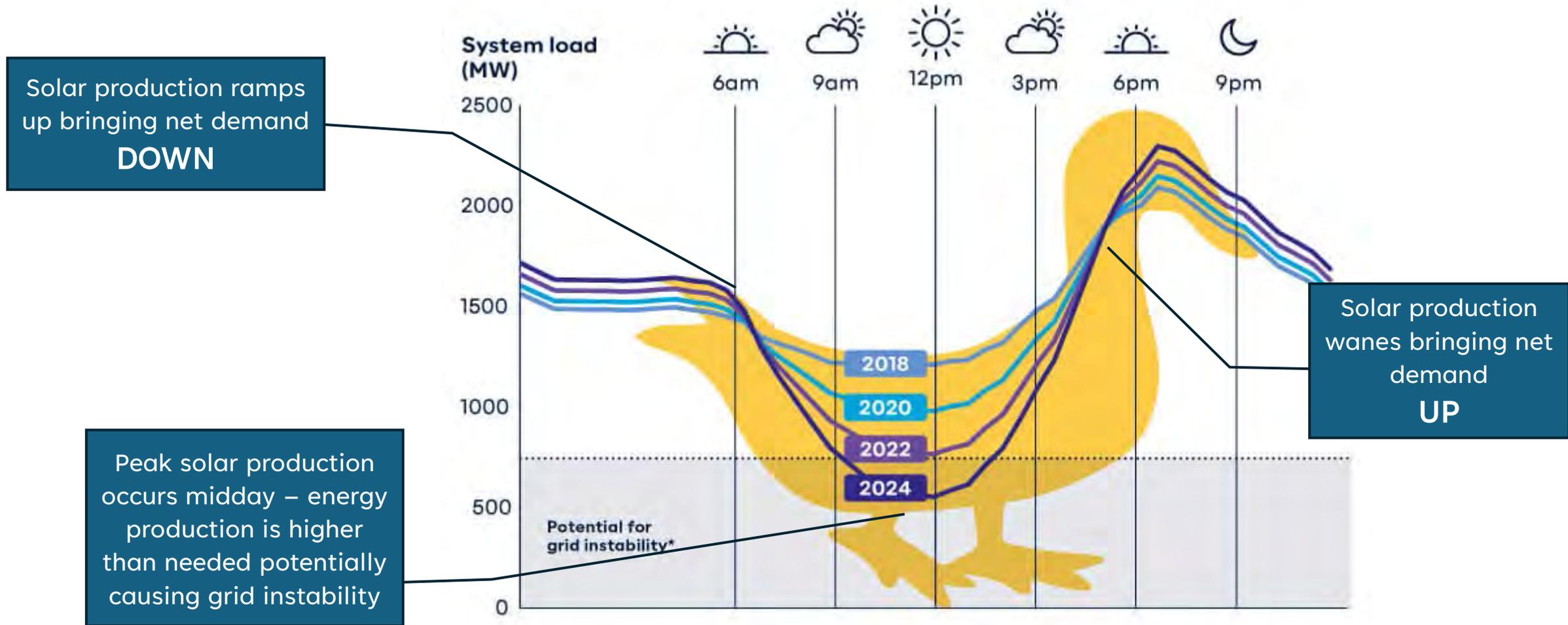
- Microgrids are path to allow greater adoption of renewable energy
  - Energy Storage allows excess renewable generation to be captured instead of being curtailed.
  - Grid Infrastructure may not be able to support a RE project without a microgrid (i.e. feeder issues)
- Environmental Sustainability
  - Reduce Reliance on Fossil Fuels
  - Reduce Use of Less Efficient “peaker” generators
- Stabilize the grid during high demand periods (brown outs)
  - Microgrids can support the grid during these periods



# The Duck Curve (Net Utility Demand = Total Demand – Wind – Solar)



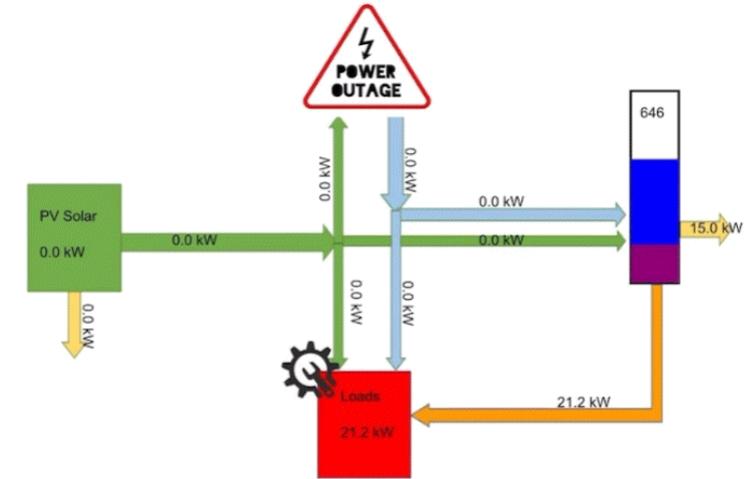
# The Duck Curve (Net Utility Demand = Total Demand – Wind – Solar)



# Factors to design your microgrid

## To Do List

- Hourly Site demand and consumption data (kW and kWh)
- PECO limits (kW)
  - Back Feed capacity
  - Local Infrastructure
- Solar System Capacity (kW and kWh)
- Battery Sizing (kW and kWh)
- Utility Rates and expected future rates (\$/kW and \$/kWh)
- Critical Loads analysis for Continuity of Operations



# Acknowledgements



Chadds Ford, PA  
[www.tse-solar.com](http://www.tse-solar.com)  
888-873-9995

- Steve Figgatt, CEO of Sycamore International
- Matt Santoleri, TerraSol Energies
- Rob Santoleri, TerraSol Energies

# Solar Schools Toolkit

January 18, 2024

Philadelphia Solar Energy Association



# Solar Schools Toolkit



**Go Solar Now  
10 Steps**

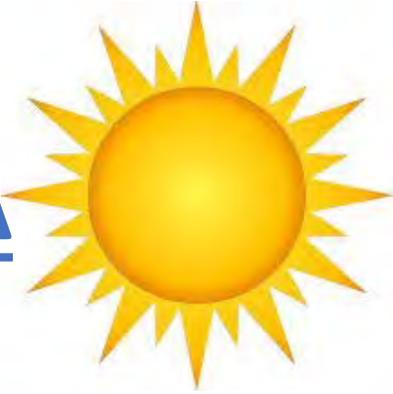
# Inflation Reduction Act (IRA)

## \$369 Billion for Climate Action

### Game changer for Schools and Nonprofits



# Investment Tax Credit per the IRA



- Solar Investment Tax Credit (ITC) = 30% if the project < 1 MW; or if project  $\geq$  1MW & meets prevailing wage and apprenticeship rules.
- ITC now includes battery storage
- 10% adder for domestic content (“Buy America”)
- 10% adder for location in “[energy communities](#)” (communities near a brownfield, a closed coal mine or coal power plant, or with employment/tax revenue from fossil fuel operation - most of PA)
- 10% **competitive** adder for location in a low-income census tract
- IRS has issued [guidance](#)

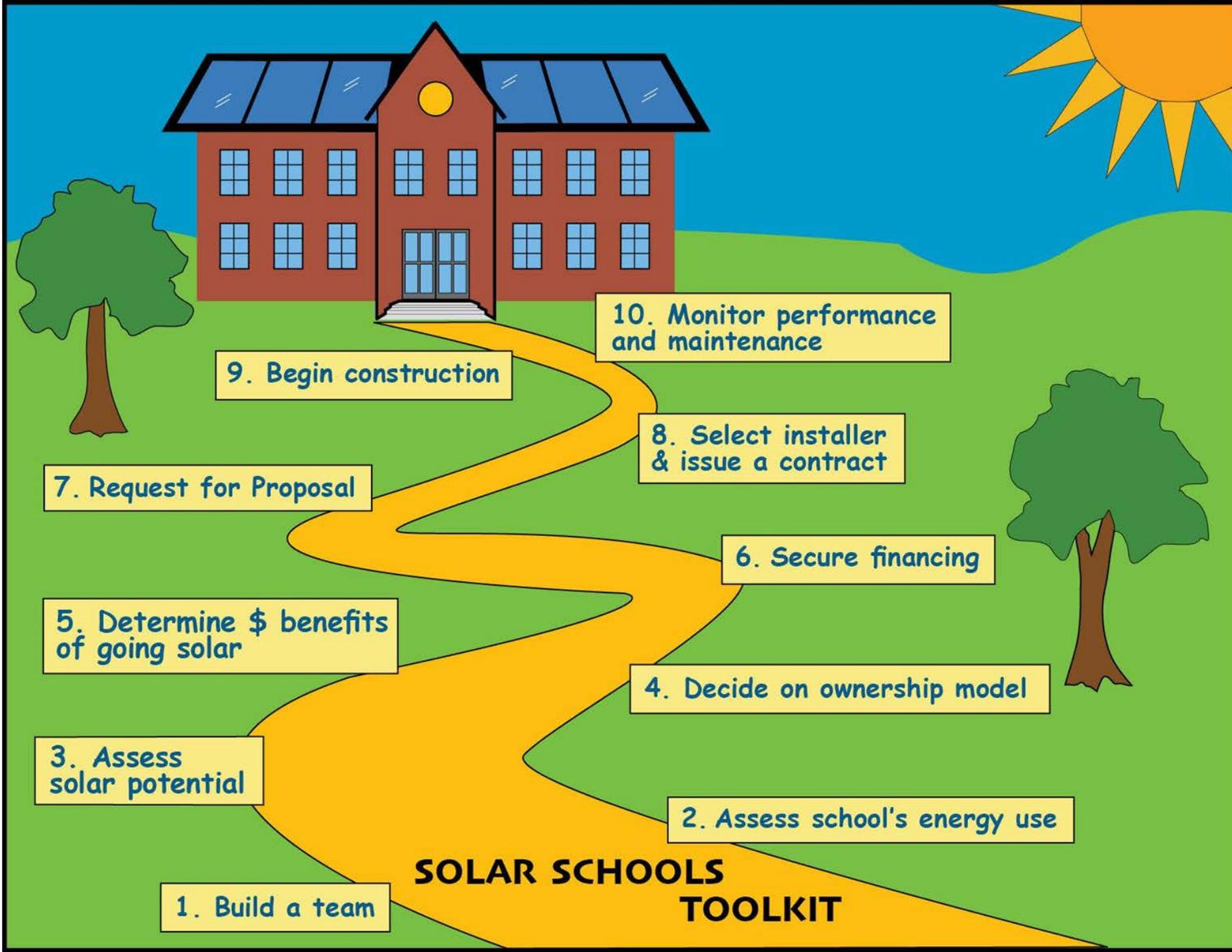
# Tax-exempt entities are included!

- For schools, government entities, non-profit organizations, and rural electric co-ops, the ITC is available as an elective payment (*i.e.* IRS will send you a check) in lieu of a tax credit.

# Advantages of Going Solar



- **Energy Bill Savings**
  - Offset electricity consumption
  - Reduce peak
  - Earn Solar Renewable Energy Credits
- **Improve Resilience**
- **Reduce CO2 emissions**
  - Help meet local, state & nat'l goals
- **Increase stability of energy costs**
  - Avoid future rate hikes
- **Create educational opportunities for students and staff**
  - Strengthen STEM education and career readiness



# 1. Build a Team

If possible, include resources, decision makers and worker bees, *e.g.*

- Facility Manager
- Chief Finance Officer
- Champions: People committed to getting the project done
- Students

Consultants



# 2: Assess your School's Energy Use

## Know your Electric Bill:

Customer charge

Distribution Charges

Monthly Energy Usage - kWh, and rate (\$/kWh)

Monthly Peak Demand - kW, and rate (\$/kW)

Supply Charges (third party supplier - EGS )

Monthly Energy Usage - kWh, and rate (\$/kWh)

Monthly Peak Demand - kW, and rate (\$/kW)

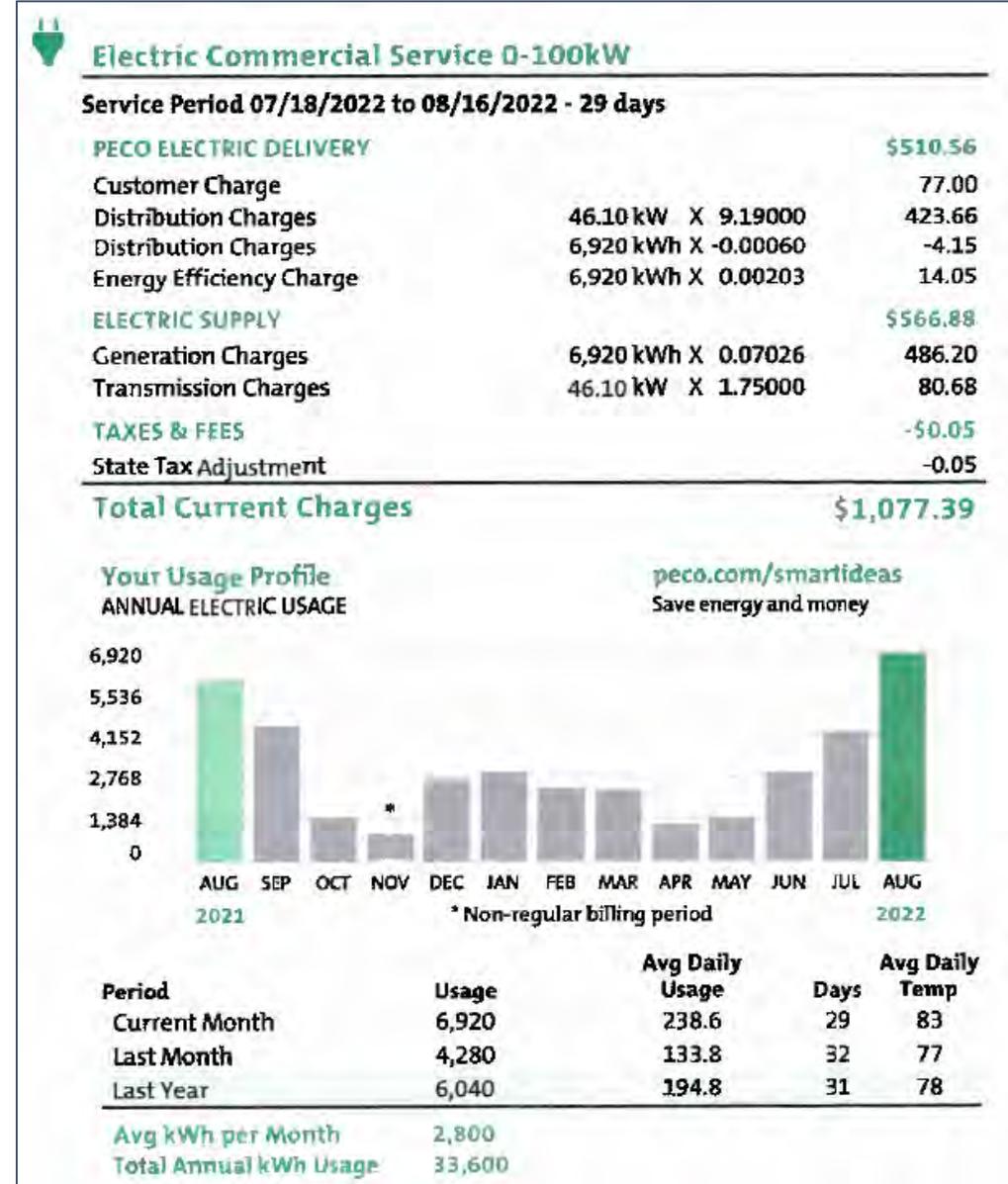
Annual Electric Usage (kWh/yr)

**Benchmarking:** Energy usage, efficiency improvements

**Project future uses and costs:**

EV buses, Charging stations

Decarbonization



# 3. Assess School's Potential for Solar Generation

Final design is the responsibility of the solar installer, but early assessment is worthwhile.

- **Location of solar array and inverters** - roof(s) or ground-mount
- **Roof conditions** - age of roof equipment
- **Ground conditions** - parking lots, available land
- **Solar access** - orientation and shading
- **Safety** - access to system hardware
- **Interconnection point**

The logo for Solar Edge, featuring the word "solar" in black and "edge" in white on a red rectangular background.

**Predict solar generation -**

PVWatts, Solar Edge and other free simulation tools



## 4. Decide your Ownership Model

### Direct Ownership

Benefits not shared with a third-party

But you need to: arrange for financing

select the solar installer

maintain the system - O&M contract

### Third-Party Ownership

Power Purchase Agreement (PPA); Lease

**Toolkit has 2 Proformas** to help you decide which model is best for you.



## 5. Evaluate the Financial Benefits of Solar

- **Offset your electricity consumption - kWh**  
Net metering / virtual meter aggregation
- **Reduce Demand - kW - probably not significantly**
- **SREC income**
- **O&M expense + finance costs (if direct ownership)**
- **PPA/lease costs (for third-party ownership)**



# 6. Secure Financing for your Solar Project

For **Direct Ownership** (3rd party is responsible if PPA or lease)

1. **Cash on hand**

2. **Grants:**

ITC elective payment (30%) + Adders

Utility rebates;

RENEW America's Schools grants; state grants; others

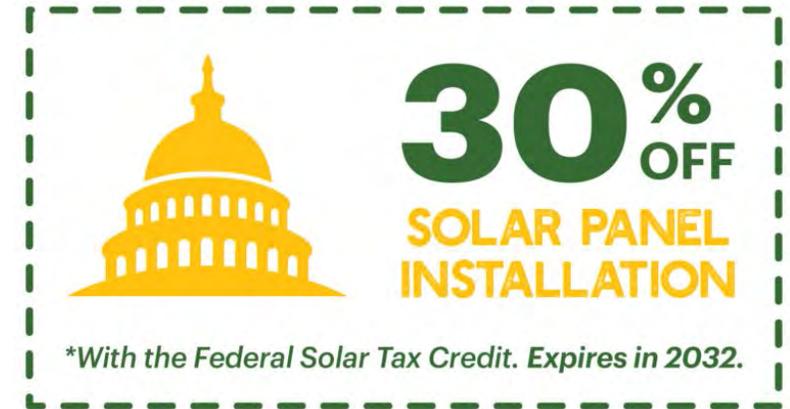
3. **Public Finance:** school bonds, govt. finance programs,

Green Banks, PA Sustainable Energy Funds

4. **Private Finance** - other lenders



# The 30% Base Credit



## Two threshold requirements:

1. The project must have have an Alternating Current (“AC”) generating capacity of less than 1 megawatt (“MW<sub>AC</sub>”); or
2. For projects 1 MW<sub>AC</sub> and larger, the project must satisfy prevailing wage and apprenticeship requirements.

## Situations that reduce the 30% credit:

- If a project is  $1\text{MW}_{AC}$  or larger and the solar installer fails to pay prevailing wages for construction or satisfy the apprenticeship requirements, the ITC 30% percentage is reduced to **6%**.
- If schools (and other tax-exempt entities) finance their project with tax-exempt financing, the 30% ITC is reduced by the lesser of **15%** or the percentage of the total project cost that was financed by tax exempt financing.

# Process to apply for Elective Pay ITC

1. Submit pre-filing application on-line through IRS portal – This includes specific information about the nonprofit and the project itself.
2. IRS reviews application and issues registration number for each project.
3. Nonprofit then files in the federal tax return (usually the 990) for the elective payment after the system is in place. IRS treats the elective payment as an overpayment of taxes.
4. IRS processes the request and issues a check for the amount of the ITC.

[IRS guidance](#)

# 30% Base Credit - Key Links

## General:

- The White House - Clean Energy Updates page - <https://www.whitehouse.gov/cleanenergy/clean-energy-updates/>
- The White House - *Building a Clean Energy Economy: A Guidebook To The Inflation Reduction Act's Investments In Clean Energy And Climate Action* - <https://www.whitehouse.gov/wp-content/uploads/2022/12/Inflation-Reduction-Act-Guidebook.pdf>

## Prevailing Wage / Apprenticeship Requirements:

- IRS Guidance 2022–61 - Prevailing Wage and Apprenticeship Initial Guidance Under Section 45(b)(6)(B)(ii) and Other Substantially Similar Provisions - <https://www.govinfo.gov/content/pkg/FR-2022-11-30/pdf/2022-26108.pdf>
- PA Department of Labor - Bureau of Labor Law Compliance - Prevailing Wage Projects website - <https://www.dli.pa.gov/Individuals/Labor-Management-Relations/lc/prevailing-wage/Pages/default.aspx>

# Renew America's Schools (BIL Provision 40541)

New competitive grant program for energy improvements at public school facilities

**Funding:** \$500M (\$100M over five years), until expended, through competitive grants. Initial FOA release announced \$80M in available funding with award sizes between \$500,000 and \$15,000,000.

**Qualifying Energy Improvements:** Improvements, repairs, or renovations that reduce energy costs or lead to improved teacher and student health and achieve energy savings, installation of renewable energy, installation of alternative fueled vehicle (AFV) infrastructure, and purchases or leases of AFV.

**Eligible Entities:** Consortia of 1 local educational agency (LEA) and one or more schools, non-profits, for-profits, or community partners. LEA Definitions include School Board, Bureau of Indian Education Schools, Educational Service Agencies.

**Prioritization:** Schools with improvement funding needs, high free and reduced-price lunch percentage or rural locale, and leverage private sector funding through performance contracting.

First FOA, "Renew America's Schools", released November 2022. Selection announcement expected late June 2023.



# RENEW AMERICA's NONPROFITS

<https://www.energy.gov/scep/renew-americas-nonprofits>

Grants to improve energy efficiency in nonprofits; Justice 40



## School Updates

Sign-up for updates for about the Renew America's School program

<https://www.energy.gov/scep/renew-americas-schools>

## Campaign

Join the Efficient and Healthy Schools Campaign as a Participant or Supporter

[2022/2023 Recognition | Healthy Schools \(lbl.gov\)](https://www.lbl.gov/2022/2023-Recognition-Healthy-Schools)



# 7. Issue a Request for Proposal

Toolkit has a generic RFP

Important elements: Installer qualifications, Experience, References

Consider bidding the project both ways  
(Direct ownership and Third-party) to  
learn best option

Send RFP to qualified installers

## 8. Select Solar Installer & Issue Contract

Scoring responses to the RFP - what is important to you and the project

What to include in the project contract

What to watch out for in the project contract



# 9. **Oversee Construction and Installation**

Importance of regular communication - Facilities Manager

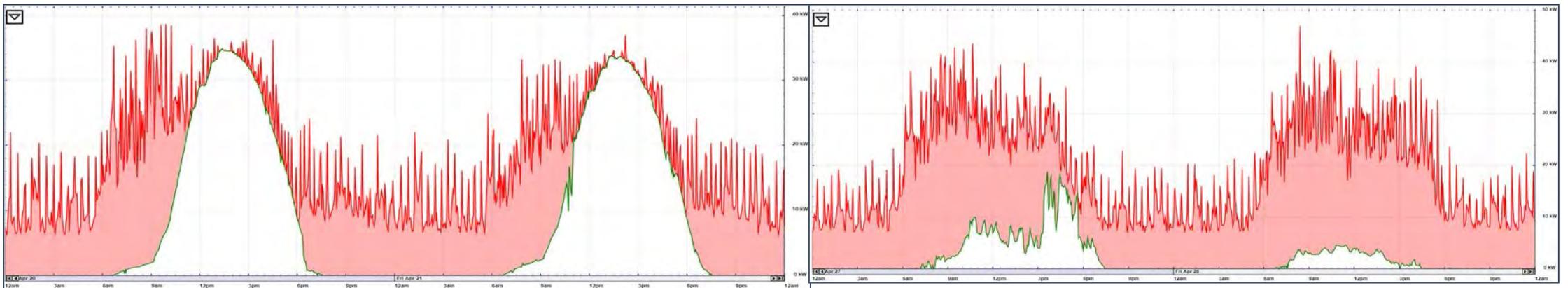
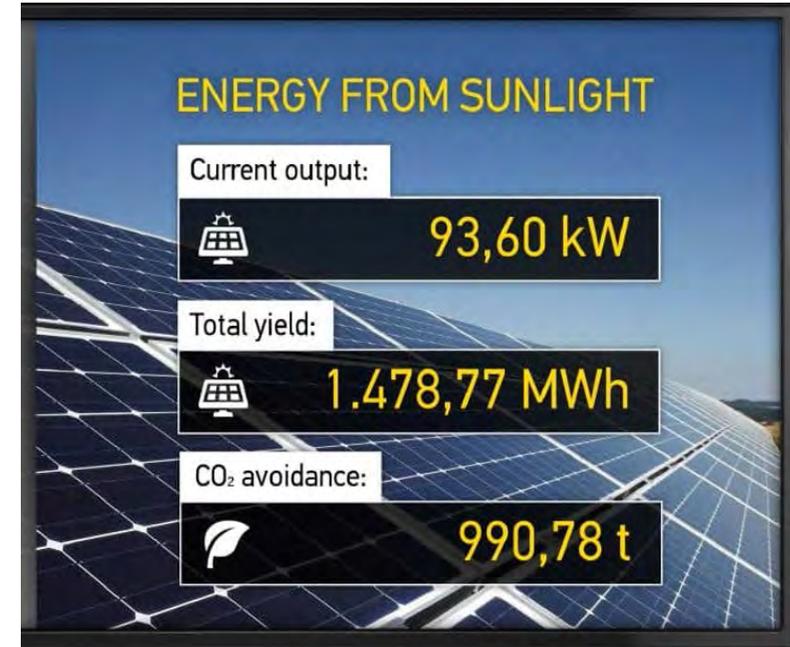
Contract deliverables / milestones:

- system design
- equipment selection
- interconnection approval
- permits
- construction
- commissioning
- inspection
- Permission to Operate (PTO)

# 10. Monitor Performance and Maintenance

Monitoring performance - paying attention to output

- O&M contract
- Inverter replacement - 10-12 years
- Using data for STEM education



# Questions & Discussion

Liz Robinson

Executive Director

**Philadelphia Solar Energy Association**

[lizhrob2@gmail.com](mailto:lizhrob2@gmail.com)



# Solar on Schools Toolkit

## Generic Solar PV Proformas

- Direct Ownership
- Power Purchase Agreement

Solar PV Proformas

***DIRECT OWNERSHIP***



# Project Description

## Solar on Schools Toolkit - Solar PV Proforma - Direct Ownership



*NOTE: Blue cells represent assumptions that can be changed. White cells are calculated and should not be overwritten*

Project Name:

Project Location:

Electric Distribution Company:

Electricity Generation Supplier:

Project Developer:

Solar Configuration:

Roof Mount

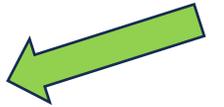
# Solar PV System Design and Cost Assumptions

System Assumptions	
System Size (kW <sub>DC</sub> )	600
System Size (kW <sub>AC</sub> )	480
Estimated Electrical Generation - kWh/kW	1,220
Estimated System Output - kWh (Year 1)	732,000
Annual PV Output Derate Factor	0.50%
Estimated System Cost - \$/watt <sub>DC</sub>	\$2.00
Estimated System Hard Costs	\$1,200,000
Estimated System Soft Costs as % of project	15.00%
Estimated System Soft Costs	\$180,000
Total Estimated System Costs	\$1,380,000

$$\$1,380,000 / 600,000w = \$2.30/w$$

# Assumptions – Electricity Assumptions

Electricity Price and Other Financial Assumptions	
Electricity price - \$/kWh (energy only) - Year 1	\$0.085
Electricity price escalation - Years 1-5	1.5%
Electricity price escalation - Years 6-10	1.5%
Electricity price escalation - Years 11-15	1.0%
Electricity price escalation - Years 16-20	1.0%
Electricity price escalation - Years 21-30	1.0%
Inflation Rate for Other Expenses	2.0%
Discount Rate	5.0%



# Most Input cells have **Notes!**

System Size (kW <sub>DC</sub> )	600
System Size (kW <sub>AC</sub> )	480
<p>Use the energy price only for your electricity price and for any costs that are based on kWh usage (such as the Gross Receipts Tax). Do <u>not</u> take your annual electric bill and divide by the number of kWh to calculate your electricity price.</p> <p>Your electric bill includes fixed customer charges that are definitely not offset by the solar, as well as demand charges that may in some months be reduced by solar but in most months will not be affected by your solar project. If you overstate the value of the electricity offset by your solar project, you will overstate the economic value of the project.</p> <p>You can find energy price or generation price on your electric bill.</p>	
<b>Electricity Price and Other Financial Assumptions</b>	
Electricity price - \$/kWh (energy only) - Year 1	\$0.085
Electricity price escalation - Years 1-5	1.5%
Electricity price escalation - Years 6-10	1.5%
Electricity price escalation - Years 11-15	1.0%
Electricity price escalation - Years 16-20	1.0%
Electricity price escalation - Years 21-30	1.0%
Inflation Rate for Other Expenses	2.0%
Discount Rate	5.0%



# Annual System Operating Expense Assumptions

Annual System Operating Expense Assumptions	
O&M - \$/yr per kW <sub>DC</sub> (w/ inverter replacement)	\$16.00
O&M Cost - Year 1	\$9,600
Insurance - \$ per \$ of system cost	\$0.0035
Insurance Cost - Year 1	\$4,200
Project Management Fee - Year 0	\$0
Other Fees/Expenses - Year 1	\$0
Total annual operating expenses (Year 1)	\$13,800

# Solar Renewable Energy Credit - SRECs

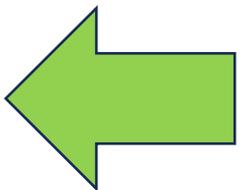
Solar Renewable Energy Credits	
Do you plan to retire the SRECs or sell them?	Sell
Number of years SRECs are assumed to be available	20
SREC value - Year 1	\$37.50
SREC value escalation - Years 1-5	2.0%
SREC value escalation - Years 6-10	2.0%
SREC value escalation - Years 11-15	2.0%
SREC value escalation - Years 16-20	2.0%
Do you wish to assume SREC income beyond Year 20?	No
SREC value escalation - Years 21-30	0.0%



x MWh

# Financing Assumptions

<b>System Financing (Sources)</b>	
School Cash/Equity	\$75,000
ITC Elective Payments	\$690,000
Commonwealth of PA and other grants	\$0
Utility Commercial Solar Rebate (under Act 129 program)	\$36,600
Taxable debt financing	\$578,400
Tax-exempt debt or bond financing	\$0
<b>TOTAL SOURCES</b>	<b>\$1,380,000</b>
<b>System Financing (Uses)</b>	
Hard costs	\$1,200,000
Soft costs	\$180,000
<b>TOTAL USES</b>	<b>\$1,380,000</b>
<b>Debt financing assumptions</b>	
Bridge financing interest rate	6.5%
Construction financing interest rate	6.5%
Permanent Loan Maturity (years)	20
Permanent Loan interest rate	6.5%
Debt Service Coverage Ratio (DSCR)	1.20



# Federal Solar Investment Tax Credit Elective Payment

Federal Solar Investment Tax Credit (ITC) Elective Payment	
Basis of Project for ITC purposes	<b>\$1,380,000</b>
<b>The 30% Credit</b>	Yes
If the Project is 1 MW <sub>AC</sub> and larger, are prevailing wage/apprenticeship requirements satisfied?	Not Applicable
Does the Project satisfy the prevailing wage/apprenticeship requirements?	Yes
Base ITC credit in light of prevailing wage/apprenticeship requirements	\$414,000
Dollar reduction due to failure to satisfy prevailing wage/apprenticeship	\$0
Percentage of project financed with tax-exempt financing	0.0%
Dollar reduction due to tax-exempt financing	\$0
How many dollars of Elective Payment does the Project qualify for under the Base Credit?	<b>\$414,000</b>



# ITC - 2 x 10% Adders, Utility Rebates and PA Grants

<b>The Domestic Content 10% Adder</b>	
Is all steel in the Project of US origin?	Yes
What is the percentage of the total cost of all of the Project's "manufactured products" that need to be produced in the U.S. (depends on the year the solar project begins construction)?	40.0%
Does the percentage of the total cost of all of the Project's "manufactured products" produced in the U.S. satisfy the percentage in the cell directly above?	Yes
How many dollars of Elective Payment does the Project qualify for under the Domestic Content Adder?	\$138,000
<b>The Energy Community 10% Adder</b>	
Is the Project located in a Census tract or adjacent to a census tract in which any coal mine has closed after December 31, 1999 or in which any coal power plant has been retired after December 31, 2009?	No
Is the Project located within a Metropolitan Statistical Area ("MSA") and non-MSA where, after December 31, 2009, industries tied to fossil fuels have accounted for (a) at least 0.17% of direct employment or 25% of local tax revenue; and (b) where the unemployment rate is above the national average for the previous year?	Yes
Is the Project located on a Brownfield site that is not a Superfund site?	No
How many dollars of Elective Payment does the Project qualify for under the Energy Community Adder?	\$138,000
<b>The Low Income Community 10% Adder</b>	
Has the Project been awarded Low Income Community status (requires application to US DOE for recognition as a Low Income Community)?	No
How many dollars of Elective Payment does the Project qualify for under the Low Income Community Adder?	\$0
<b>Total Federal Investment Tax Credit Elective Payment Dollars for Project</b>	<b>\$690,000</b>
<b>Utility Act 129 Rebate</b>	
Over the course of a year, how many kWh will be produced by the solar project in excess of on-site electricity usage?	0
What is the solar rebate per kWh offered by your electric utility?	\$0.05
Total Electric Utility Rebate	\$36,600
<b>Commonwealth or Other Grant Support</b>	
State support %	0.0%
Applicable basis	\$653,400
Total Grants	\$0



# Project Budget, Phasing, and Payments

## Optional System Budget Details:

System Budget (Uses)	
<b>Hard costs</b>	
Hardware (modules, inverters, etc.)	\$0
Interconnection	\$0
Installation Labor	\$0
Hard cost contingency	\$0
<b>Subtotal: Hard Costs</b>	<b>\$0</b>
<b>Soft Costs</b>	
Predevelopment	
System Design	\$0
3rd party engineering	\$0
Legal	\$0
Permits	\$0
Interconnection	\$0
Financing	
Loan Origination Fees	\$0
Lender Legal (loan documents)	\$0
Document filing fees, etc.	\$0
Cost review / inspections	\$0
Construction Loan Interest	\$0
Bridge Loan Interest	\$0
Permanent Loan Interest	\$0
Soft Cost Contingency	\$0
<b>Subtotal: Soft Costs</b>	<b>\$0</b>
<b>TOTAL USES</b>	<b>\$0</b>

Project Phase / Milestones	Months in Stage before next Milestone	Milestone Completion Date	Construction Draw Payout at Milestone Completion as % of Project Cost	Construction Draw Payout at Milestone Completion as \$	Cumulative Construction Payout
Solar Installer Contract Signed / Construction Loan Closing		03/31/24	2%	\$27,600	\$27,600
60% Project Design submitted / Customer Approval / Application for Interconnection filed	1	04/30/24	10%	\$138,000	\$165,600
Interconnection approved / Building and Electrical Permits Filed / Equipment Ordered	4	08/31/24	25%	\$345,000	\$510,600
Permits issued / Equipment received on site	5	01/31/25	23%	\$317,400	\$828,000
Mechanical completion / System Commissioning / Third-party Electrical inspection	3	04/30/25	25%	\$345,000	\$1,173,000
Permission to Operate / Placed in Service	2	06/30/25	15%	\$207,000	\$1,380,000
Pay-off Date of Construction Loan / Conversion to Permanent Loan / Bridge Loan Closing	0	06/30/25			
Checks:			100%	\$1,380,000	

ITC Elective Payment / Utility Commercial Solar Rebate / Grants	Time from Placed-In-Service until Receipt of Funds	Date Funds Received	Month Funds Received	Project Year	Amount of Funds
Commonwealth of PA and other grants received	6	12/31/25	12/31/25	1	#REF!
Utility Commercial Solar rebate under Act 129 program received	8	02/28/26	02/28/26	1	\$36,600
ITC Elective Payment received		07/15/26	07/31/26	2	#REF!
Pay-off Date of Bridge Loan	07/15/26				
Pay-off Date of Permanent Loan	06/30/25				

# Project Budget, Phasing, and Payments

## Optional System Budget Details:

System Budget (Uses)	
<b>Hard costs</b>	
Hardware (modules, inverters, etc.)	\$0
Interconnection	\$0
Installation Labor	\$0
Hard cost contingency	\$0
<b>Subtotal: Hard Costs</b>	<b>\$0</b>
<b>Soft Costs</b>	
Predevelopment	
System Design	\$0
3rd party engineering	\$0
Legal	\$0
Permits	\$0
Interconnection	\$0
Financing	
Loan Origination Fees	\$0
Lender Legal (loan documents)	\$0
Document filing fees, etc.	\$0
Cost review / inspections	\$0
Construction Loan Interest	\$0
Bridge Loan Interest	\$0
Permanent Loan Interest	\$0
Soft Cost Contingency	\$0
<b>Subtotal: Soft Costs</b>	<b>\$0</b>
<b>TOTAL USES</b>	<b>\$0</b>

Project Phase / Milestones	Months in Stage before next Milestone	Milestone Completion Date	Construction Draw Payout at Milestone Completion as % of Project Cost	Construction Draw Payout at Milestone Completion as \$	Cumulative Construction Payout
Solar Installer Contract Signed / Construction Loan Closing		03/31/24	2%	\$27,600	\$27,600
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Pay-off Date of Construction Loan / Conversion to Permanent Loan / Bridge Loan Closing	0	06/30/25			
Checks:			100%	\$1,380,000	

ITC Elective Payment / Utility Commercial Solar Rebate / Grants	Time from Placed-In-Service until Receipt of Funds	Date Funds Received	Month Funds Received	Project Year	Amount of Funds
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ITC Elective Payment received		07/15/26	07/31/26	2	#REF!
Pay-off Date of Bridge Loan	07/15/26				
Pay-off Date of Permanent Loan	06/30/25				

# Proforma - Direct Ownership

A9 KEY ASSUMPTIONS

Solar on Schools Toolkit - Solar PV Proforma - Direct Ownership		Date: 12/1/23																														
Placed in Service Date: 6/30/2025																																
Project Year:	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29		
From:	6/30/2024	6/30/2025	6/30/2026	6/30/2027	6/30/2028	6/30/2029	6/30/2030	6/30/2031	6/30/2032	6/30/2033	6/30/2034	6/30/2035	6/30/2036	6/30/2037	6/30/2038	6/30/2039	6/30/2040	6/30/2041	6/30/2042	6/30/2043	6/30/2044	6/30/2045	6/30/2046	6/30/2047	6/30/2048	6/30/2049	6/30/2050	6/30/2051	6/30/2052	6/30/2053	6/30/2054	6/30/2055
To:	6/30/2025	6/30/2026	6/30/2027	6/30/2028	6/30/2029	6/30/2030	6/30/2031	6/30/2032	6/30/2033	6/30/2034	6/30/2035	6/30/2036	6/30/2037	6/30/2038	6/30/2039	6/30/2040	6/30/2041	6/30/2042	6/30/2043	6/30/2044	6/30/2045	6/30/2046	6/30/2047	6/30/2048	6/30/2049	6/30/2050	6/30/2051	6/30/2052	6/30/2053	6/30/2054	6/30/2055	
<b>KEY ASSUMPTIONS</b>																																
kWh delivered	-	722,000	728,240	724,499	721,075	717,469	713,882	710,313	706,761	703,227	699,711	696,213	692,732	689,268	685,822	682,392	678,980	675,586	672,209	668,847	665,502	662,175	658,864	655,576	652,302	649,020	645,785	642,586	639,344	636,147	632,964	
Default Electricity Price per kWh	-	\$0.0950	\$0.0963	\$0.0976	\$0.0989	\$0.0992	\$0.0996	\$0.0999	\$0.0993	\$0.0998	\$0.0992	\$0.0997	\$0.0991	\$0.0991	\$0.0991	\$0.0991	\$0.0992	\$0.0992	\$0.0992	\$0.0992	\$0.0992	\$0.0992	\$0.0992	\$0.0992	\$0.0992	\$0.0992	\$0.0992	\$0.0992	\$0.0992	\$0.0992	\$0.0992	
SREO price per kWh	-	\$27.50	\$28.25	\$29.02	\$29.79	\$30.59	\$31.40	\$32.23	\$33.08	\$33.94	\$34.82	\$35.71	\$36.63	\$37.56	\$38.51	\$39.48	\$40.47	\$41.48	\$42.51	\$43.56	\$44.63	\$45.72	\$46.84	\$47.98	\$49.15	\$50.34	\$51.55	\$52.78	\$54.04	\$55.32	\$56.62	
OM contract	-	\$5,600	\$5,792	\$5,988	\$6,188	\$6,391	\$6,599	\$6,811	\$7,027	\$7,248	\$7,473	\$7,702	\$7,936	\$8,175	\$8,419	\$8,667	\$8,920	\$9,178	\$9,441	\$9,709	\$9,982	\$10,260	\$10,543	\$10,831	\$11,125	\$11,425	\$11,731	\$12,044	\$12,364	\$12,691	\$13,025	
Insurance	-	\$4,200	\$4,284	\$4,370	\$4,457	\$4,546	\$4,637	\$4,730	\$4,824	\$4,921	\$5,019	\$5,120	\$5,222	\$5,327	\$5,433	\$5,542	\$5,653	\$5,766	\$5,881	\$5,999	\$6,119	\$6,241	\$6,364	\$6,492	\$6,623	\$6,755	\$6,891	\$7,028	\$7,169	\$7,312	\$7,459	
Project Management Fee	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	
Other Fees/Expense	-	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	
<b>REVENUE</b>																																
Electric bill savings	-	\$62,220	\$62,828	\$63,461	\$64,091	\$64,727	\$65,370	\$66,010	\$66,674	\$67,335	\$68,004	\$68,679	\$69,359	\$70,044	\$70,734	\$71,429	\$72,129	\$72,834	\$73,544	\$74,259	\$74,979	\$75,704	\$76,434	\$77,169	\$77,909	\$78,654	\$79,404	\$80,159	\$80,919	\$81,684	\$82,454	
SREO revenue	-	\$27,450	\$27,959	\$28,474	\$28,995	\$29,522	\$30,055	\$30,597	\$31,144	\$31,697	\$32,256	\$32,821	\$33,392	\$33,969	\$34,552	\$35,141	\$35,736	\$36,337	\$36,944	\$37,557	\$38,176	\$38,801	\$39,432	\$40,069	\$40,712	\$41,361	\$42,016	\$42,677	\$43,344	\$44,017	\$44,696	
Commonwealth and other grants	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Utility Act 12 rebate/ rebates	-	\$36,600	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
ITD Electric Payment	-	-	\$69,000	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Other project revenue - specify	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
<b>Subtotal Revenue</b>	<b>\$0</b>	<b>\$126,270</b>	<b>\$198,697</b>	<b>\$211,725</b>	<b>\$222,786</b>	<b>\$232,858</b>	<b>\$242,926</b>	<b>\$252,994</b>	<b>\$262,994</b>	<b>\$272,918</b>	<b>\$282,732</b>	<b>\$292,436</b>	<b>\$302,030</b>	<b>\$311,614</b>	<b>\$321,188</b>	<b>\$330,752</b>	<b>\$340,306</b>	<b>\$349,850</b>	<b>\$359,384</b>	<b>\$368,908</b>	<b>\$378,422</b>	<b>\$387,926</b>	<b>\$397,420</b>	<b>\$406,904</b>	<b>\$416,378</b>	<b>\$425,842</b>	<b>\$435,296</b>	<b>\$444,740</b>	<b>\$454,174</b>	<b>\$463,598</b>	<b>\$473,012</b>	
<b>EXPENSES</b>																																
Cash contributions	\$75,000	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
Construction Financing Interest Payment	\$30,239	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
Bridge Financing Interest Payment	-	\$31,740	\$16,943	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
Bridge Financing Principal Payment	-	\$36,600	\$69,000	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
Permanent Financing Debt Service Payment	-	\$51,749	\$51,749	\$51,749	\$51,749	\$51,749	\$51,749	\$51,749	\$51,749	\$51,749	\$51,749	\$51,749	\$51,749	\$51,749	\$51,749	\$51,749	\$51,749	\$51,749	\$51,749	\$51,749	\$51,749	\$51,749	\$51,749	\$51,749	\$51,749	\$51,749	\$51,749	\$51,749	\$51,749	\$51,749		
OM contract	-	\$5,600	\$5,792	\$5,988	\$6,188	\$6,391	\$6,599	\$6,811	\$7,027	\$7,248	\$7,473	\$7,702	\$7,936	\$8,175	\$8,419	\$8,667	\$8,920	\$9,178	\$9,441	\$9,709	\$9,982	\$10,260	\$10,543	\$10,831	\$11,125	\$11,425	\$11,731	\$12,044	\$12,364	\$12,691	\$13,025	
Insurance	-	\$4,200	\$4,284	\$4,370	\$4,457	\$4,546	\$4,637	\$4,730	\$4,824	\$4,921	\$5,019	\$5,120	\$5,222	\$5,327	\$5,433	\$5,542	\$5,653	\$5,766	\$5,881	\$5,999	\$6,119	\$6,241	\$6,364	\$6,492	\$6,623	\$6,755	\$6,891	\$7,028	\$7,169	\$7,312	\$7,459	
Project Management Fee	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	
Other Fees/Expense	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
<b>Subtotal Expense</b>	<b>\$105,239</b>	<b>\$132,997</b>	<b>\$172,746</b>	<b>\$164,196</b>	<b>\$164,393</b>	<b>\$164,686</b>	<b>\$164,985</b>	<b>\$165,290</b>	<b>\$165,601</b>	<b>\$165,918</b>	<b>\$166,241</b>	<b>\$166,571</b>	<b>\$166,907</b>	<b>\$167,250</b>	<b>\$167,601</b>	<b>\$167,958</b>	<b>\$168,322</b>	<b>\$168,693</b>	<b>\$169,072</b>	<b>\$169,459</b>	<b>\$169,853</b>	<b>\$170,254</b>	<b>\$170,661</b>	<b>\$171,074</b>	<b>\$171,493</b>	<b>\$171,918</b>	<b>\$172,349</b>	<b>\$172,786</b>	<b>\$173,229</b>	<b>\$173,678</b>	<b>\$174,133</b>	
<b>NET ANNUAL SAVINGS</b>	<b>(\$10,239)</b>	<b>(\$6,277)</b>	<b>\$7,928</b>	<b>\$25,629</b>	<b>\$26,393</b>	<b>\$27,164</b>	<b>\$27,941</b>	<b>\$28,726</b>	<b>\$29,517</b>	<b>\$30,316</b>	<b>\$31,121</b>	<b>\$31,935</b>	<b>\$32,757</b>	<b>\$33,589</b>	<b>\$34,431</b>	<b>\$35,282</b>	<b>\$36,143</b>	<b>\$37,014</b>	<b>\$37,895</b>	<b>\$38,787</b>	<b>\$39,690</b>	<b>\$40,604</b>	<b>\$41,529</b>	<b>\$42,464</b>	<b>\$43,409</b>	<b>\$44,364</b>	<b>\$45,329</b>	<b>\$46,304</b>	<b>\$47,289</b>	<b>\$48,284</b>	<b>\$49,289</b>	
Discount rate	5.0%	5.0%	5.0%	5.0%	5.0%	5.0%	5.0%	5.0%	5.0%	5.0%	5.0%	5.0%	5.0%	5.0%	5.0%	5.0%	5.0%	5.0%	5.0%	5.0%	5.0%	5.0%	5.0%	5.0%	5.0%	5.0%	5.0%	5.0%	5.0%	5.0%		
Discount factor	1.00	0.95	0.91	0.86	0.82	0.78	0.75	0.71	0.68	0.64	0.61	0.58	0.55	0.50	0.48	0.46	0.44	0.42	0.40	0.38	0.36	0.34	0.33	0.31	0.30	0.28	0.27	0.26	0.24	0.00		
Discounted cash flow	(\$10,239)	(\$7,263)	\$7,190	\$22,126	\$21,711	\$21,281	\$20,847	\$19,412	\$19,976	\$19,539	\$19,103	\$18,670	\$17,236	\$17,259	\$16,830	\$16,407	\$15,971	\$15,542	\$14,528	\$14,020	\$13,547	\$13,409	\$13,214	\$13,040	\$12,866	\$12,692	\$12,519	\$12,347	\$12,176	\$11		
Cumulative cash flow	(\$10,239)	(\$10,066)	(\$10,239)	(\$7,309)	(\$6,916)	(\$3,752)	(\$5,010)	\$2,016	\$2,433	\$2,740	\$10,069	\$14,464	\$17,535	\$20,044	\$24,113	\$26,624	\$30,619	\$34,500	\$38,068	\$41,526	\$44,476	\$50,770	\$54,008	\$56,604	\$58,295	\$70,231	\$76,234	\$80,450	\$89,919	\$10,504	\$61,141	
Permanent Financing Debt Service Coverage	1.47	1.48	1.50	1.51	1.52	1.54	1.57	1.59	1.60	1.61	1.62	1.63	1.64	1.65	1.66	1.67	1.68	1.69	1.69	1.69	1.69	1.69	1.69	1.69	1.69	1.69	1.69	1.69	1.69	1.69		
Net Present Value (NPV)	\$353,249																															
Internal Rate of Return (IRR)	17.9%																															
TOTAL SAVINGS OVER 30 YEARS	\$9,611,141																															
Total Levelized Cost of Electricity (\$/kWh)	\$9.89374																															
Value of Energy Generated (\$/kWh)	\$9.97345																															



Instructions | Assumptions | **Proforma** | Construction Financing | Bridge Financing | Permanent Financing | ...

# Proforma - Direct Ownership – 0-5 Years

Placed in Service Date: 07/01/2025

Project Year:	1	2	3	4	5	6	
From:	07/01/24	07/01/25	07/01/26	07/01/27	07/01/28	07/01/29	07/01/30
To:	06/30/25	06/30/26	06/30/27	06/30/28	06/30/29	06/30/30	06/30/31

KEY ASSUMPTIONS		1	2	3	4	5	6
MWh delivered	-	732,000	728,340	724,630	721,875	719,165	716,402
Default Electricity Price per MWh	-	\$8.8558	\$8.8568	\$8.8678	\$8.8688	\$8.8698	\$8.8708
SREC price per MWh	-	\$37.58	\$38.25	\$38.82	\$39.39	\$40.00	\$40.60
O&M annual	-	\$3,600	\$3,732	\$3,864	\$4,000	\$4,131	\$4,265
Insurance	-	\$4,200	\$4,284	\$4,378	\$4,457	\$4,546	\$4,637
Project Management Fee	\$8	\$8	\$8	\$8	\$8	\$8	\$8
Other Fees/Expenses	-	\$8	\$8	\$8	\$8	\$8	\$8

REVENUE		1	2	3	4	5	6
Electric bill savings	-	\$47,580	\$48,852	\$49,529	\$49,811	\$49,437	\$49,300
SREC revenue	-	\$27,428	\$27,825	\$28,274	\$28,635	\$29,129	\$29,557
Commercial and other credits	-	-	-	-	-	-	-
Utility Net 525 solar rebate	-	\$35,600	-	-	-	-	-
ITC Electric Payment	-	-	\$58,000	-	-	-	-
Other project revenue - specific	-	-	-	-	-	-	-
<b>Subtotal Revenue</b>	<b>\$8</b>	<b>\$113,608</b>	<b>\$136,677</b>	<b>\$178,883</b>	<b>\$177,785</b>	<b>\$178,629</b>	<b>\$178,565</b>

EXPENSES		1	2	3	4	5	6
Cash contributions	\$75,000	-	-	-	-	-	-
Construction financing interest payments	\$38,233	-	-	-	-	-	-
Bridge financing interest payments	-	\$31,740	\$16,349	-	-	-	-
Bridge financing principal payments	-	\$35,600	\$38,888	-	-	-	-
Permanental financing debt service payments	-	\$51,743	\$51,743	\$51,743	\$51,743	\$51,743	\$51,743
O&M annual	-	\$3,600	\$3,732	\$3,864	\$4,000	\$4,131	\$4,265
Insurance	-	\$4,200	\$4,284	\$4,378	\$4,457	\$4,546	\$4,637
Project Management Fee	-	-	-	-	-	-	-
Other Fees/Expenses	-	-	-	-	-	-	-
<b>Subtotal Expense</b>	<b>\$113,233</b>	<b>\$135,837</b>	<b>\$177,758</b>	<b>\$166,385</b>	<b>\$166,333</b>	<b>\$166,686</b>	<b>\$166,385</b>

NET ANNUAL SAVINGS	1	2	3	4	5	6	
	(\$116,233)	(\$22,267)	(\$6,857)	\$10,697	\$11,319	\$11,334	\$12,568

Discount rate	5.8%	5.8%	5.8%	5.8%	5.8%	5.8%	5.8%
Discount Factors	1.00	0.95	0.91	0.86	0.82	0.78	0.75
Discounted cash flows	(\$116,233)	(\$21,284)	(\$6,243)	\$9,233	\$9,286	\$9,349	\$9,374
Continued cash flows	(\$116,233)	(\$195,586)	(\$142,363)	(\$128,666)	(\$128,353)	(\$188,413)	(\$35,853)
Permanental Financing Debt Service Coverage Rat		1.18	1.15	1.21	1.22	1.23	1.24

Net Present Value (NPV)	\$118,628
Internal Rate of Return (IRR)	9.9%
TOTAL SAVINGS OVER 30 YEARS	\$478,843
Total Levelized Cost of Electricity (\$/MWh)	\$8.88374
Value of Energy Generated (\$/MWh)	\$8.88883

# Proforma - Direct Ownership – 0-5 Years

Placed in Service Date: 6/30/2025

Project Year:	<u>0</u>	<u>1</u>	<u>2</u>	<u>3</u>	<u>4</u>	<u>5</u>
From:	03/31/24	07/01/25	07/01/26	07/01/27	07/01/28	07/01/29
To:	06/30/25	06/30/26	06/30/27	06/30/28	06/30/29	06/30/30

KEY ASSUMPTIONS						
kWh delivered	-	732,000	728,340	724,698	721,075	717,469
Default Electricity Price per kWh	-	\$0.0850	\$0.0863	\$0.0876	\$0.0889	\$0.0902
SREC price per MWh	-	\$37.50	\$38.25	\$39.02	\$39.80	\$40.59
O&M contract	-	\$9,600	\$9,792	\$9,988	\$10,188	\$10,391
Insurance	-	\$4,200	\$4,284	\$4,370	\$4,457	\$4,546
Project Management Fee	\$0	\$0	\$0	\$0	\$0	\$0
Other Fees/Expenses	-	\$0	\$0	\$0	\$0	\$0



# Direct Ownership – Revenue, Expenses & Net Savings

A	B	C	D	E	F	G
Placed in Service Date:	6/30/2025					
Project Year:	0	1	2	3	4	5
From:	03/31/24	07/01/25	07/01/26	07/01/27	07/01/28	07/01/29
To:	06/30/25	06/30/26	06/30/27	06/30/28	06/30/29	06/30/30
<b>REVENUE</b>						
Electric bill savings	-	\$62,220	\$62,838	\$63,461	\$64,091	\$64,727
SREC revenue	-	\$27,450	\$27,859	\$28,274	\$28,695	\$29,123
Commonwealth and other grants	-	-	-	-	-	-
Utility Act 129 solar rebate	-	\$36,600	-	-	-	-
ITC Elective Payment	-	-	\$690,000	-	-	-
Other project revenue - specify	-	-	-	-	-	-
<b>Subtotal: Revenue</b>	<b>\$0</b>	<b>\$76,270</b>	<b>\$780,697</b>	<b>\$91,735</b>	<b>\$92,786</b>	<b>\$93,850</b>
<b>EXPENSES</b>						
Cash contribution	\$75,000	-	-	-	-	-
Construction Financing interest payments	\$38,239	-	-	-	-	-
Bridge Financing interest payments	-	\$31,748	\$16,943	-	-	-
Bridge Financing principal repayments	-	\$36,600	\$690,000	-	-	-
Permanent Financing debt service payments	-	\$51,749	\$51,749	\$51,749	\$51,749	\$51,749
O&M contract	-	\$9,600	\$9,792	\$9,988	\$10,188	\$10,391
Insurance	-	\$4,200	\$4,284	\$4,370	\$4,457	\$4,546
Project Management Fee	-	-	-	-	-	-
Other Fees/Expenses	-	-	-	-	-	-
<b>Subtotal: Expenses</b>	<b>\$113,239</b>	<b>\$133,897</b>	<b>\$772,768</b>	<b>\$66,106</b>	<b>\$66,393</b>	<b>\$66,686</b>
<b>NET ANNUAL SAVINGS</b>	<b>(\$113,239)</b>	<b>(\$7,627)</b>	<b>\$7,928</b>	<b>\$25,629</b>	<b>\$26,393</b>	<b>\$27,164</b>

# Direct Ownership – Net Savings, Cash Flow, LCOE

**50% ITC**



Placed in Service Date: 6/30/2025

Project Year:	0	1	2	3	4	5	6	7
From:	03/31/24	07/01/25	07/01/26	07/01/27	07/01/28	07/01/29	07/01/30	07/01/31
To:	06/30/25	06/30/26	06/30/27	06/30/28	06/30/29	06/30/30	06/30/31	06/30/32

<b>NET ANNUAL SAVINGS</b>	(\$113,239)	(\$7,627)	\$7,928	\$25,629	\$26,393	\$27,164	\$27,941	\$28,726
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Discount rate	5.0%	5.0%	5.0%	5.0%	5.0%	5.0%	5.0%	5.0%
Discount factors	1.00	0.95	0.91	0.86	0.82	0.78	0.75	0.71
Discounted cash flows	(\$113,224)	(\$7,263)	\$7,190	\$22,136	\$21,711	\$21,281	\$20,847	\$20,412



<b>CUMULATIVE CASH FLOWS</b>	(\$113,239)	(\$120,866)	(\$112,938)	(\$87,309)	(\$60,916)	(\$33,752)	(\$5,810)	\$22,915
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Permanent Financing Debt Service Coverage Ratio (DSCR)		1.47	1.48	1.50	1.51	1.52	1.54	1.56
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<b>Net Present Value (NPV)</b>	<b>\$353,269</b>
<b>Internal Rate of Return (IRR)</b>	<b>17.9%</b>
<b>TOTAL SAVINGS OVER 30 YEARS</b>	<b>\$961,141</b>
<b>Total Levelized Cost of Electricity (LCOE) (\$/kWh)</b>	<b>\$0.084</b>
<b>Value of Energy Generated (\$/kWh)</b>	<b>\$0.073</b>

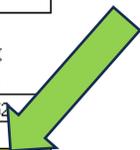


# Direct Ownership – Net Savings, Cash Flow, LCOE

40% ITC



	Project Year:		0	1	2	3	4	5	6	7	8	9	10	11
	From:	To:	03/31/24	07/01/25	07/01/26	07/01/27	07/01/28	07/01/29	07/01/30	07/01/31	07/01/32	07/01/33	07/01/34	07/01/35
<b>NET ANNUAL SAVINGS</b>			(\$113,239)	(\$13,944)	(\$1,030)	\$13,282	\$14,046	\$14,817	\$15,595	\$16,379	\$17,171	\$17,969	\$18,774	\$19,248
Discount rate			5.0%	5.0%	5.0%	5.0%	5.0%	5.0%	5.0%	5.0%	5.0%	5.0%	5.0%	5.0%
Discount factors			1.00	0.95	0.91	0.86	0.82	0.78	0.75	0.71	0.68	0.64	0.61	0.58
Discounted cash flows			(\$113,224)	(\$13,278)	(\$934)	\$11,472	\$11,554	\$11,608	\$11,635	\$11,639	\$11,620	\$11,581	\$11,524	\$11,252
<b>CUMULATIVE CASH FLOWS</b>			(\$113,239)	(\$127,183)	(\$128,213)	(\$114,930)	(\$100,884)	(\$86,067)	(\$70,472)	(\$54,093)	(\$36,922)	(\$18,954)	(\$179)	\$19,069
Permanent Financing Debt Service Coverage Ratio (DSCR)				1.18	1.20	1.21	1.22	1.23	1.24	1.26	1.27	1.28	1.29	1.30



Net Present Value (NPV)	\$210,028
Internal Rate of Return (IRR)	12.0%
<b>TOTAL SAVINGS OVER 30 YEARS</b>	<b>\$723,626</b>
Levelized Cost of Electricity (LCOE) (\$/kWh)	\$0.085
Value of Energy Generated (\$/kWh)	\$0.073



Solar PV Proformas

*Power Purchase Agreement*

# Solar PV Proformas – Power Purchase Agreement

B3

Solar on Schools Toolkit - PV Proforma - Power Purchase Agreement

Date: 08/20/23  
Author:

Project Name:

Project Location:

Electric Distribution Company:

Project Developer:

Solar Configuration: Roof Mount

System Assumptions	
System Size (kW <sub>dc</sub> )	600
System Size (kW <sub>ac</sub> )	480
Est. Electrical Generation - kWh/yr	1,220
Est. System Output - kWh (Year 1)	732,000
Annual PV Output Derate Factor	0.50%

Electricity Price and Other Financial Assumptions	
Electricity price - \$/kWh (energy only) - Year 1	\$0.085
Electricity price escalation - Years 1-5	1.5%
Electricity price escalation - Years 6-10	1.5%
Electricity price escalation - Years 11-15	1.0%
Electricity price escalation - Years 16-20	1.0%
Electricity price escalation - Years 21-30	1.0%
Inflation Rate for Other Expenses	2.0%
Discount Rate	5.0%

PPA Pricing	
Initial PPA price - \$/kWh	\$0.075
PPA price escalation rate	1.0%
PPA term - years	25
System acquisition cost at end of PPA	#####

Solar Renewable Energy Credits	
Do you plan to retire your SRECs?	No
Do you plan to assign your SRECs to the solar developer?	Yes
Do you plan to sell your SRECs yourself?	No
SREC value - Year 1	\$34.00
SREC value escalation - Years 1-5	2.0%
SREC value escalation - Years 6-10	2.0%
SREC value escalation - Years 11-15	2.0%
SREC value escalation - Years 16-20	2.0%
SREC value escalation - Years 21-25	0.0%

Annual System Operating Expenses - Years 26-30	
Costs shown are for 2023 - these are inflated to Yr 26	
O&M - \$/yr per kW <sub>dc</sub> (w/ inverter replacement)	\$16,000
O&M Cost - Year 1	\$9,600
Insurance - \$ per \$ of system cost	\$0.0035
Insurance Cost - Year 1	\$4,200
Other Expenses (project management, etc.)	\$1,500

Key Project Dates	
PPA executed	#####
Start of Construction	#####
Completion of Construction	#####
Completion of Commissioning	#####
Permission to Operate	#####
Conversion to School Ownership	#####

Utility Act 129 Rebate	
Do you plan to assign your Act 129 solar rebate to the project developer (i.e. not keep it for yourself)?	Yes
Over the course of a year, how many kWh will be produced by the solar project in excess of on-site electricity usage?	0
What is the solar rebate per kWh offered by your electric utility?	\$0.05
Total Electric Utility Rebate	\$36,600

Instructions | **Assumptions** | Proforma | +



# Solar PV System Assumptions - *The Same*

PPA

System Assumptions	
System Size (kW <sub>DC</sub> )	600
System Size (kW <sub>AC</sub> )	480
Est. Electrical Generation - kWh/kW	1,220
Est. System Output - kWh (Year 1)	732,000
Annual PV Output Derate Factor	0.50%

Direct

System Assumptions	
System Size (kW <sub>DC</sub> )	600
System Size (kW <sub>AC</sub> )	480
Estimated Electrical Generation - kWh/kW	1,220
Estimated System Output - kWh (Year 1)	732,000
Annual PV Output Derate Factor	0.50%
Estimated System Cost - \$/watt <sub>DC</sub>	\$2.00
Estimated System Hard Costs	\$1,200,000
Estimated System Soft Costs as % of project	15.00%
Estimated System Soft Costs	\$180,000
Total Estimated System Costs	\$1,380,000

$$\$1,380,000 / 600,000w = \$2.30/w$$

# Solar Renewable Energy Credit – SRECs – *The Same*

PPA

Direct

Solar Renewable Energy Credits	
Do you plan to retire your SRECs?	No
Do you plan to assign your SRECs to the solar developer?	Yes
Do you plan to sell your SRECs yourself?	No
SREC value - Year 1	\$37.50
SREC value escalation - Years 1 - 5	2.0%
SREC value escalation - Years 6 - 10	2.0%
SREC value escalation - Years 11 - 15	2.0%
SREC value escalation - Years 16 - 20	2.0%
SREC value escalation - Years 21 - 30	0.0%

Solar Renewable Energy Credits	
Do you plan to retire the SRECs or sell them?	Sell
Number of years SRECs are assumed to be available	20
SREC value - Year 1	\$37.50
SREC value escalation - Years 1-5	2.0%
SREC value escalation - Years 6-10	2.0%
SREC value escalation - Years 11-15	2.0%
SREC value escalation - Years 16-20	2.0%
Do you wish to assume SREC income beyond Year 20?	No
SREC value escalation - Years 21-30	0.0%

# ITC Adders, Utility Rebates and PA Grants

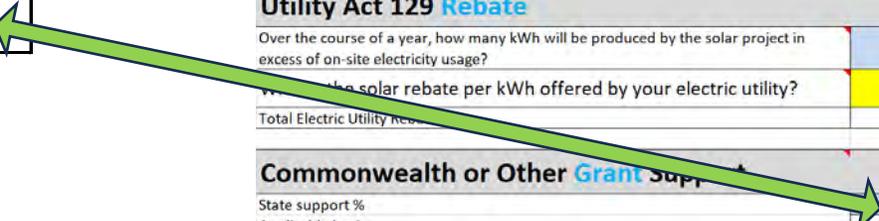
PPA

Direct

Utility Act 129 Rebate	
Do you plan to assign your Act 129 solar rebate to the project developer ( <i>i.e.</i> not keep it for yourself)?	Yes
Over the course of a year, how many kWh will be produced by the solar project in excess of on-site electricity usage?	0
What is the solar rebate per kWh offered by your electric utility?	\$0.05
<b>Total Electric Utility Rebate</b>	<b>\$36,600</b>

Only Utility Rebate

The Domestic Content 10% Adder	
Is all steel in the Project of US origin?	Yes
What is the percentage of the total cost of all of the Project's "manufactured products" that need to be produced in the U.S. (depends on the year the solar project begins construction)?	40.0%
Does the percentage of the total cost of all of the Project's "manufactured products" produced in the U.S. satisfy the percentage in the cell directly above?	Yes
How many dollars of Elective Payment does the Project qualify for under the Domestic Content Adder?	\$138,000
The Energy Community 10% Adder	
Is the Project located in a Census tract or adjacent to a census tract in which any coal mine has closed after December 31, 1999 or in which any coal power plant has been retired after December 31, 2009?	No
Is the Project located within a Metropolitan Statistical Area ("MSA") and non-MSA where, after December 31, 2009, industries tied to fossil fuels have accounted for (a) at least 0.17% of direct employment or 25% of local tax revenue; and (b) where the unemployment rate is above the national average for the previous year?	Yes
Is the Project located on a Brownfield site that is not a Superfund site?	No
How many dollars of Elective Payment does the Project qualify for under the Energy Community Adder?	\$138,000
The Low Income Community 10% Adder	
Has the Project been awarded Low Income Community status (requires application to US DOE for recognition as a Low Income Community)?	No
How many dollars of Elective Payment does the Project qualify for under the Low Income Community Adder?	\$0
<b>Total Federal Investment Tax Credit Elective Payment Dollars for Project</b>	<b>\$690,000</b>
Utility Act 129 Rebate	
Over the course of a year, how many kWh will be produced by the solar project in excess of on-site electricity usage?	0
What is the solar rebate per kWh offered by your electric utility?	\$0.05
<b>Total Electric Utility Rebate</b>	<b>\$36,600</b>
Commonwealth or Other Grant Support	
State support %	0.0%
Applicable basis	\$653,400
<b>Total Grants</b>	<b>\$0</b>



# Electricity Assumptions – *The Same*

PPA

DIRECT



Electricity Price and Other Financial Assumptions	
Electricity price - \$/kWh (energy only) - Year 1	\$0.085
Electricity price escalation - Years 1-5	1.5%
Electricity price escalation - Years 6-10	1.5%
Electricity price escalation - Years 11-15	1.0%
Electricity price escalation - Years 16-20	1.0%
Electricity price escalation - Years 21-30	1.0%
Inflation Rate for Other Expenses	2.0%
Discount Rate	5.0%



Electricity Price and Other Financial Assumptions	
Electricity price - \$/kWh (energy only) - Year 1	\$0.085
Electricity price escalation - Years 1-5	1.5%
Electricity price escalation - Years 6-10	1.5%
Electricity price escalation - Years 11-15	1.0%
Electricity price escalation - Years 16-20	1.0%
Electricity price escalation - Years 21-30	1.0%
Inflation Rate for Other Expenses	2.0%
Discount Rate	5.0%

# PPA Pricing

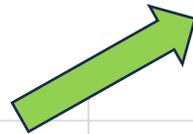
PPA Pricing	
Initial PPA price - \$/kWh	\$0.075
PPA price escalation rate	1.0%
PPA term - years	25
System acquisition cost at end of PPA	\$120,000





# Power Power Agreement – Net Annual Savings

Year:	1	2	3	4	5	6	7	8	9	10	11
<b>Savings / Revenue</b>											
Avoided Utility Bill for Electricity	\$62,220	\$62,838	\$63,461	\$64,091	\$64,727	\$65,370	\$66,018	\$66,674	\$67,335	\$68,004	\$68,679
SREC revenue	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
Utility Act 129 incentive	\$0										
<i>Subtotal: Savings / Revenue</i>	<i>\$62,220</i>	<i>\$62,838</i>	<i>\$63,461</i>	<i>\$64,091</i>	<i>\$64,727</i>	<i>\$65,370</i>	<i>\$66,018</i>	<i>\$66,674</i>	<i>\$67,335</i>	<i>\$68,004</i>	<i>\$68,679</i>
<b>NET ANNUAL SAVINGS</b>	<b>\$7,320</b>	<b>\$7,666</b>	<b>\$8,016</b>	<b>\$8,372</b>	<b>\$8,732</b>	<b>\$9,097</b>	<b>\$9,468</b>	<b>\$9,843</b>	<b>\$10,223</b>	<b>\$10,609</b>	<b>\$11,000</b>
<b>TOTAL SAVINGS OVER 30 YEARS</b>	<b>\$454,033</b>										
TOTAL 30 YEAR COST OF ELECTRICITY	\$2,161,868										
<b>LEVELIZED 30 YEAR COST OF ELECTRICITY (LCOE) per kWh</b>	<b>\$ 0.084</b>										

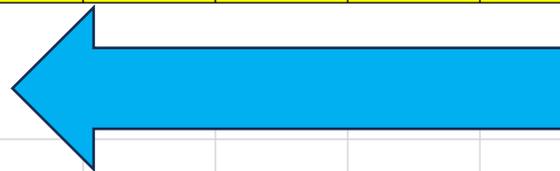


# Proforma - Power Power Agreement

**Fair Market Value of Solar System at End of PPA – Year 25 - \$120,000**



Year:	1	2	3	4	5	24	25	26	27	28	29	30
<b>Savings / Revenue</b>												
Avoided Utility Bill for Electricity	\$62,220	\$62,838	\$63,461	\$64,091	\$64,727	\$78,087	\$78,862	\$79,645	\$80,435	\$81,234	\$82,040	\$82,854
SREC revenue	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
Utility Act 129 incentive	\$0											
<i>Subtotal: Savings / Revenue</i>	<i>\$62,220</i>	<i>\$62,838</i>	<i>\$63,461</i>	<i>\$64,091</i>	<i>\$64,727</i>	<i>\$78,087</i>	<i>\$78,862</i>	<i>\$79,645</i>	<i>\$80,435</i>	<i>\$81,234</i>	<i>\$82,040</i>	<i>\$82,854</i>
<b>NET ANNUAL SAVINGS</b>	<b>\$7,320</b>	<b>\$7,666</b>	<b>\$8,016</b>	<b>\$8,372</b>	<b>\$8,732</b>	<b>\$16,584</b>	<b>(\$102,945)</b>	<b>\$54,544</b>	<b>\$54,832</b>	<b>\$55,118</b>	<b>\$55,402</b>	<b>\$55,684</b>
<b>TOTAL SAVINGS OVER 30 YEARS</b>	<b>\$454,033</b>											
<b>TOTAL 30 YEAR COST OF ELECTRICITY</b>	\$2,161,868											
<b>LEVELIZED 30 YEAR COST OF ELECTRICITY (LCOE) per kWh</b>	<b>\$ 0.084</b>											

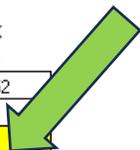


# Direct Ownership – Net Savings, Cash Flow, LCOE

**40% ITC**



Project Year:	0	1	2	3	4	5	6	7	8	9	10	11
From:	03/31/24	07/01/25	07/01/26	07/01/27	07/01/28	07/01/29	07/01/30	07/01/31	07/01/32	07/01/33	07/01/34	07/01/35
To:	06/30/25	06/30/26	06/30/27	06/30/28	06/30/29	06/30/30	06/30/31	06/30/32	06/30/33	06/30/34	06/30/35	06/30/36
<b>NET ANNUAL SAVINGS</b>	(\$113,239)	(\$13,944)	(\$1,030)	\$13,282	\$14,046	\$14,817	\$15,595	\$16,379	\$17,171	\$17,969	\$18,774	\$19,248
Discount rate	5.0%	5.0%	5.0%	5.0%	5.0%	5.0%	5.0%	5.0%	5.0%	5.0%	5.0%	5.0%
Discount factors	1.00	0.95	0.91	0.86	0.82	0.78	0.75	0.71	0.68	0.64	0.61	0.58
Discounted cash flows	(\$113,224)	(\$13,278)	(\$934)	\$11,472	\$11,554	\$11,608	\$11,635	\$11,639	\$11,620	\$11,581	\$11,524	\$11,252
<b>CUMULATIVE CASH FLOWS</b>	(\$113,239)	(\$127,183)	(\$128,213)	(\$114,930)	(\$100,884)	(\$86,067)	(\$70,472)	(\$54,093)	(\$36,922)	(\$18,954)	(\$179)	\$19,069
Permanent Financing Debt Service Coverage Ratio (DSCR)		1.18	1.20	1.21	1.22	1.23	1.24	1.26	1.27	1.28	1.29	1.30
<b>Net Present Value (NPV)</b>	<b>\$210,028</b>											
<b>Internal Rate of Return (IRR)</b>	<b>12.0%</b>											
<b>TOTAL SAVINGS OVER 30 YEARS</b>	<b>\$723,626</b>											
<b>Levelized Cost of Electricity (LCOE) (\$/kWh)</b>	<b>\$0.085</b>											
<b>Value of Energy Generated (\$/kWh)</b>	<b>\$0.073</b>											



Total 30 yr. Savings - \$723k (40% ITC) Own v. \$454k PPA = **\$269k**

# Project:

## ChargeBliss – KPO, Ontario CA

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Eos. Positively ingenious.



# Who We Are & What We Do



Originally founded in 2008, 300+ team members

NASDAQ: EOSE since Q4 2020

HQ and lab in Edison - Manufacturing in Pittsburgh (PA)

200+ years' experience in senior leadership in energy industry

Owner of the IP for a fully designed and manufactured product in America

## Our core technology

Patented, safe, reliable & sustainable battery technology

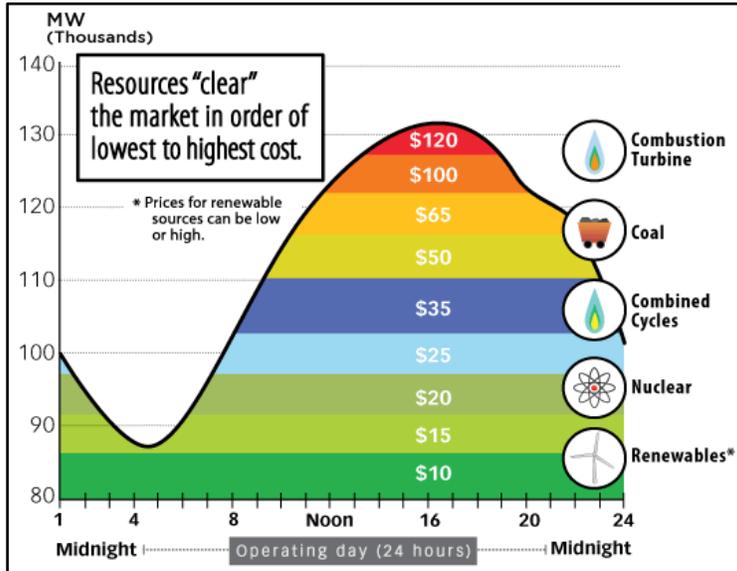
Zinc electrolyte-based chemistry ideal for long duration 4 - 12 hour discharge

Non-flammable and fully recyclable system manufactured with abundantly available materials

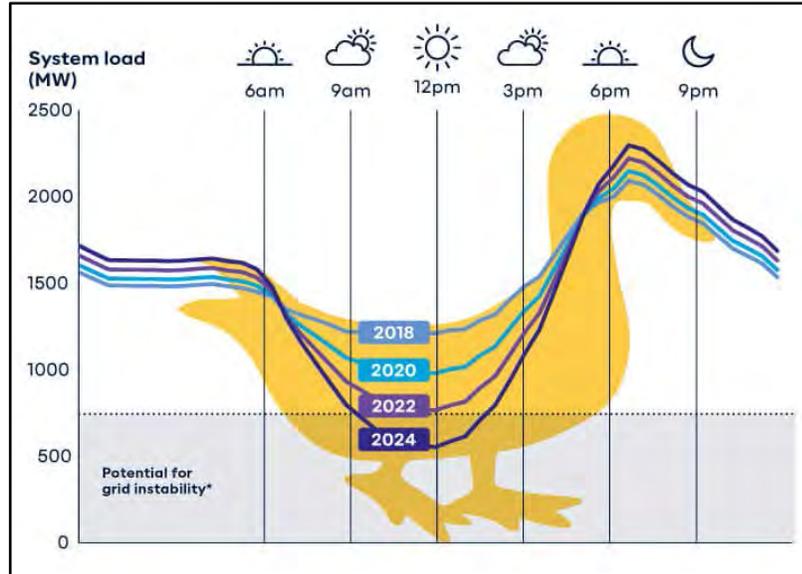
Static batteries with very limited operational requirements: wide temperature range, 20+ year lifespan, low auxiliary power requirement

# CAISO generation stack

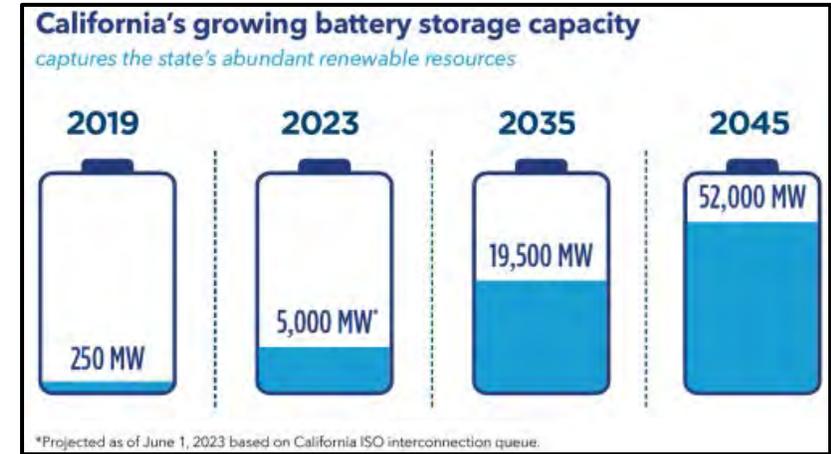
- Just like PV in the 2000's, starts in CA, then comes east



Generation Stack



Duck Curve



Storage Forecast

Once PJM's interconnection queue starts to be constructed, storage will be paired with PV

# Charge Bliss – Kaiser Permanente (2MW / 8.5MWh - 18 Gen 2.3 Energy Cubes)

## Project Background

- **Microgrid design incorporating solar, fuel cells, batteries(EOS) & existing diesel generators.**
- **Reduce Fossil Fuel Consumption.**
- **Tap into Ancillary Utility Services for Revenue.**
- **Power the entire emergency system with Solar, Batteries, and Fuel Cells.**

### Milestones Achieved

First & only stacked system installed @ Eos Energy

Largest BESS site purchased by California Energy Commission (CEC), in their 11 years of business.

\$8.35 million Grant awarded for the Project.

Full Approval from HCAI & OSHPD.

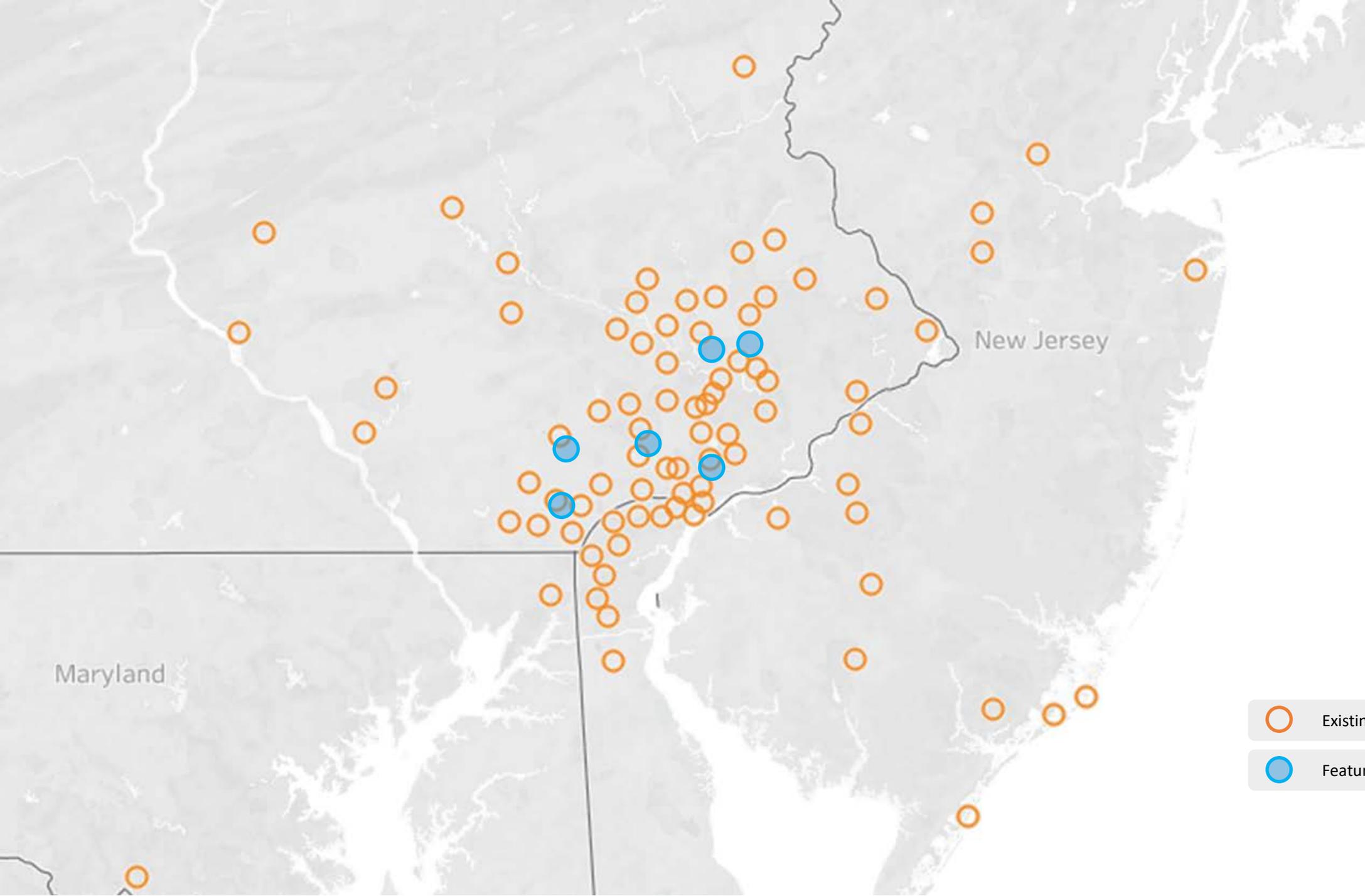


# Pennsylvania

- \$500M investment in BESS manufacturing
- 8,000 MWh annual capacity
- Current product serving non-PJM projects
- Renewables provide best cost of generation
- Queue reform will build PA market



Eos BESS spotted on the highway!



- Existing TerraSol PV Solar Sites
- Featured Commercial Sites



# Sycamore International – Sustainable Electronics Recycling

431 W Baltimore Pike, West Grove, PA 19390  
Chester County

## Physical Details

Number of Solar Panels: 253  
Location of Panels: Mounted to Corrugated Metal Roof  
Annual Sunlight Exposure: 96% access to sunlight year round

## Energy Details

Energy Produced Annually: 142,200 kWh/yr  
Offset of Base Electric Load Onsite: 100%  
Warranty Period: 25-year production guarantee  
Carbon Offset: 68 tons of CO2 per year

## Investment Details

Capital Investment Payback Period: 5 years  
Federal Incentive Value: \$62,000  
Annual Electric Bill Savings: \$10,000  
Annual SREC Revenue: \$4,000





# Faulkner Buick GMC West Chester

705 Autopark Blvd, West Chester, PA 19382  
Chester County

## Physical Details

Number of Solar Panels: 621  
Location of Panels: Ballasted to Flat Roof  
Annual Sunlight Exposure: 98% access to sunlight year round

## Energy Details

Energy Produced Annually: 370,690 kWh/yr  
Offset of Base Electric Load Onsite: 80%  
Warranty Period: 25-year production guarantee  
Carbon Offset: 290 tons of CO2 per year

## Investment Details

Capital Investment Payback Period: 5 years  
Federal Incentive Value: \$184,000  
Annual Electric Bill Savings: \$37,000  
Annual SREC Revenue: \$14,000





# Brandywine Valley Veterinary Hospital

2580 Strasburg Road, Coatesville, PA 19320  
Chester County

Physical Details	Number of Solar Panels:	86
	Location of Panels:	Penetration Flashing to Shingle Roof
	Annual Sunlight Exposure:	85% access to sunlight year round
Energy Details	Energy Produced Annually:	34,830 kWh/yr
	Offset of Base Electric Load Onsite:	58%
	Warranty Period:	25-year production guarantee
	Carbon Offset:	290 tons of CO2 per year
Investment Details	Capital Investment Payback Period:	6 years
	Federal Incentive Value:	\$26,000
	Annual Electric Bill Savings:	\$3,241
	Annual SREC Revenue:	\$1,414





# Strata Company

5166 Campus Drive, Plymouth Meeting, PA 19462  
Montgomery County

## Physical Details

Number of Solar Panels: 300

Location of Panels: Ballasted Flat Roof

Annual Sunlight Exposure: 95% access to sunlight year round

## Energy Details

Energy Produced Annually: 197,163 kWh/yr

Offset of Base Electric Load Onsite: 65%

Warranty Period: 25-year production guarantee

Carbon Offset: 290 tons of CO2 per year

## Investment Details

Capital Investment Payback Period: 5 years

Federal Incentive Value: \$89,000

Annual Electric Bill Savings: \$14,196

Annual SREC Revenue: \$5,915





# American Reading Company

201 South Gulph Road, King of Prussia, PA 19406  
Montgomery County

## Physical Details

Number of Solar Panels: **960**

Location of Panels: **Ballasted Flat Roof**

Annual Sunlight Exposure: **99% access to sunlight year round**

## Energy Details

Energy Produced Annually: **470,000 kWh/yr**

Offset of Base Electric Load Onsite: **100%**

Warranty Period: **25-year production guarantee**

Carbon Offset: **290 tons of CO2 per year**

## Investment Details

Capital Investment Payback Period: **6 years**

Federal Incentive Value: **\$239,000**

Annual Electric Bill Savings: **\$49,280**

Annual SREC Revenue: **\$14,268**





# Williamson College of the Trades

106 S New Middletown Road, Media, PA 19063  
Delaware County

## Physical Details

Number of Solar Panels: **368**  
Location of Panels: **Mix: Ballast and Penetration Flashing**  
Annual Sunlight Exposure: **92% access to sunlight year round**

## Energy Details

Energy Produced Annually: **149,228 kWh/yr**  
Offset of Base Electric Load Onsite: **76%**  
Warranty Period: **25-year production guarantee**  
Carbon Offset: **290 tons of CO2 per year**

## Investment Details

Capital Investment Payback Period: **6 years**  
Federal Incentive Value: **\$88,486**  
Annual Electric Bill Savings: **\$20,774**  
Annual SREC Revenue: **\$3,731**

