



RE+ Mid-Atlantic PA State Briefing: Pennsylvania

- Sharon Pillar, Founder & Executive Director, Pennsylvania Solar Center
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PA Solar Center's Legislative Tracking Guide

https://pasolarcenter.org/wp-content/uploads/2023/07/PA-State-Solar-Legislative-Guide.2023-2024_updated_07182023.pdf

Guide is useful reference for this presentation



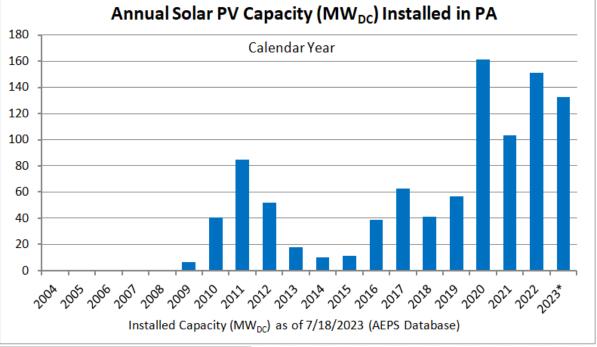
RE+ Mid-Atlantic State Briefing: Pennsylvania 7/26/2023

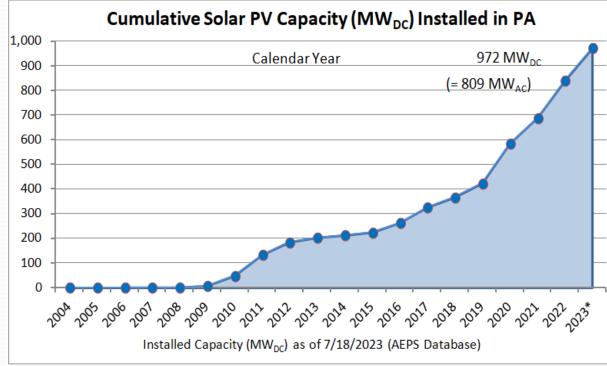
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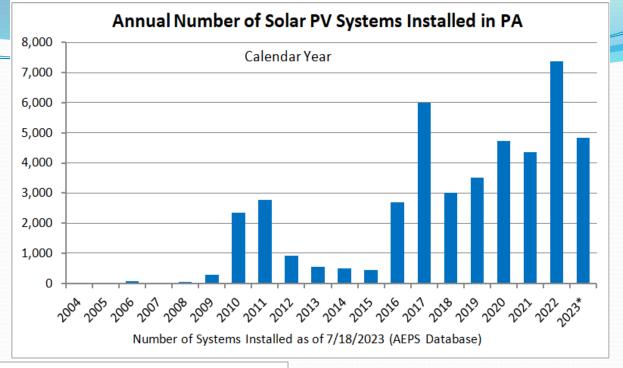


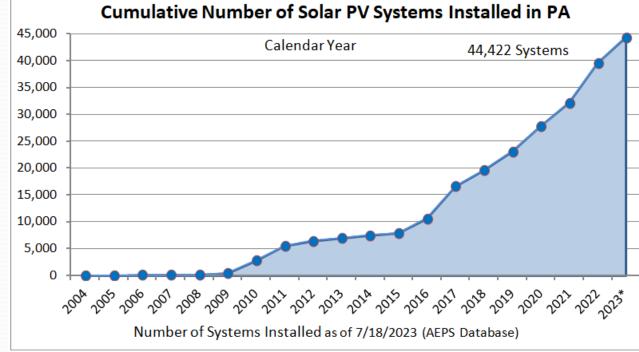
PV Capacity in PA Annual & Cumulative





Number of PV Systems in PA Annual & Cumulative





Breakdown Of PV Installations in PA

Cumulative PV Installed in PA				
Capacity (DC)	# of Systems	Total MW		
<u><</u> 15 kW	37,312	306		
> 15 kW to \leq 250 kW	6,833	205		
> 250 kW to < 1 MW	196	96		
> 1 MW to \leq 3 MW	53	83		
> 3 MW to <u><</u> 5 MW	16	60		
> 5 MW to <u><</u> 10 MW	2	14		
> 10 MW	10	208		
Total	44,422	972		
	,	972		

* as of 7/18/2023 as per PA AEPS (PUC)

Since March 2022: 110 MW Grid Scale

> 3 to < 5 MW : 2 Projects, 8 MW
 > 5 to < 10 MW : 1 Projects, 8 MW
 > 10 MW : 4 Projects, 94 MW

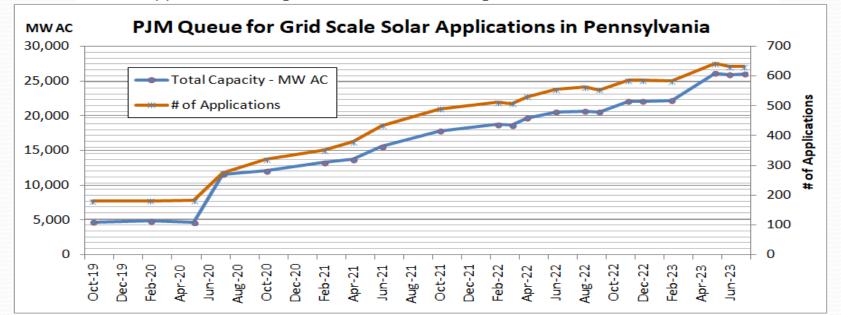
Cumulative PV Installed in PA			
Capacity (DC)	# of Systems	Total MW	
<u><</u> 15 kW	28,189	225	
> 15 kW to < 250 kW	4,700	153	
> 250 kW to < 1 MW	175	86	
$> 1 MW$ to $\leq 3 MW$	47	75	
> 3 MW to <u><</u> 5 MW	14	52	
> 5 MW to <u><</u> 10 MW	1	6	
> 10 MW	6	114	
Total	33,132	711	
* as of 3/12/2022 as per PA AEPS (PUC)			

Last Year

PJM Queue for PA Solar Applications

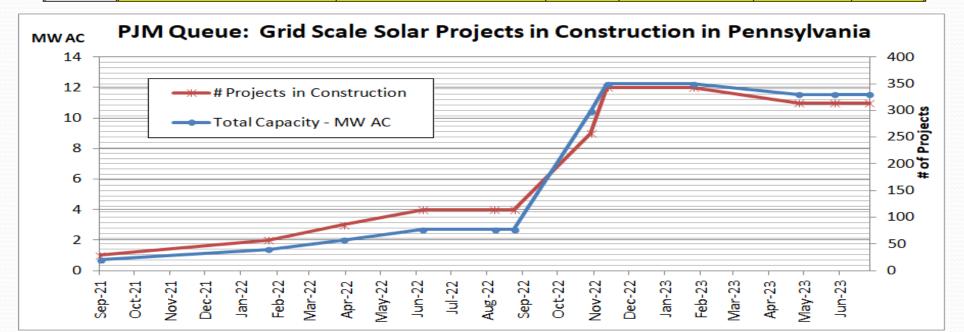
PJM Queue for PA	As of 7/18/2023					
		Max Facility Output (MFO)			Total Cap	
		Total Cap	Capacity Range		IC Queue	
Status	# of Apps	AC MW	Min	Max	Position	
Active	529	23,332	1.0	401.6	10,887	
Engineering/Procurement	91	2,360	2.0	150.0	1,157	
Under Construction	11	330	11.7	100.0	191	
Part in Srvc - Under Const	0	-	-	-	-	
Sub-Total	<mark>631</mark>	26,021			12,235	
In Service	17	275	3.3	20.0	89	
Grand Total*	l* 648 26,297 12				12,325	

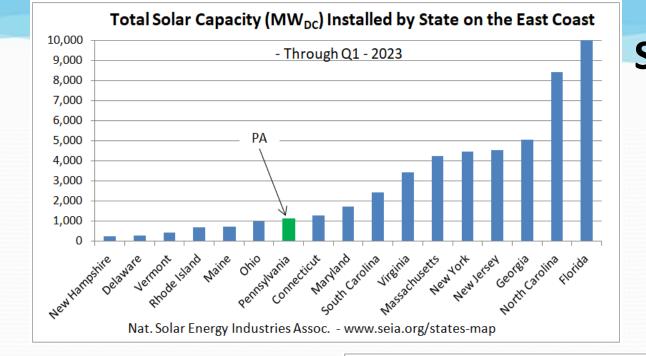
* Total Applications catagorized as "Solar & Storage" = 106



PJM Queue for PA Solar Facilities - Under Construction

	Under Construction - Solar PV Facilities in PA- 7/18/2023					MFO
					Transmission	Capacity
Queue #	Name	Commercial Name	State	County	Owner	MW
AC2-168	Clinton 23kV	Gaucho Solar	PA	Washington	DL	11.7
AD1-135	Clinton 23 kV II	Gaucho Solar	PA	Washington	DL	20.0
AD2-009	McConnellsburg 138 kV	Great Cover Solar LLC	PA	Fulton	APS	70.0
AD2-116	Hokes-Grantley 69 kV	Cottontail Solar 2	PA	York	ME	20.0
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
AE2-060	Mifflintown Bus-Mifflintown Ta	s-Mifflintown Tar Cottontail Solar 5 aka Walker S		Juniata	PPL	20.0
AE2-114	Midland 23 kV I	BE-PINE 1 Cain Road	PA	Beaver	DL	17.1
AE2-115	Midland 23 kV II	BE-PINE 2 Dam Road	PA	Beaver	DL	17.1
AE2-125	Stahlstown-Ligonier 25 kV	Stahlstown-Ligonier 25 kV	PA	Westmoreland	APS	13.8
AE2-224	Bearrock-Johnstown 230 kV	CPV Maple Hill Solar	PA	Cambria	PENELEC	100.0
	Total					329.7
		In Service - 3/23/2023				
AE2-126	Dubois-Curwensville 34.5 kV	CL-Viaduct	PA	Clearfield	PENELEC	20.0

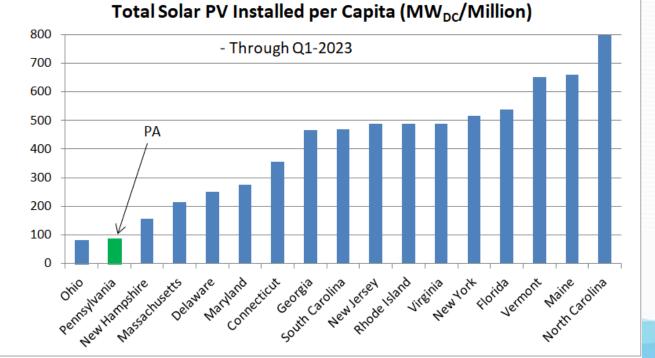


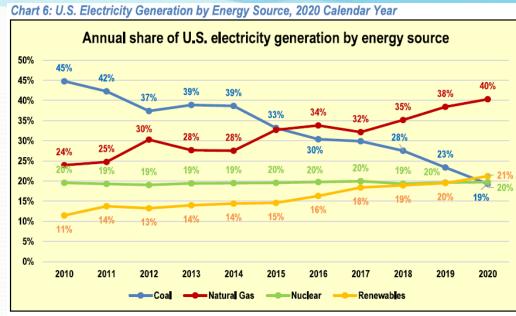


Solar in Other East Coast States Compared to PA

Solar in Pennsylvania Ranks 27th in the Nation

Wood Mackenzie/SEIA US Solar Market Insight - 2022 Year in Review; March 2023

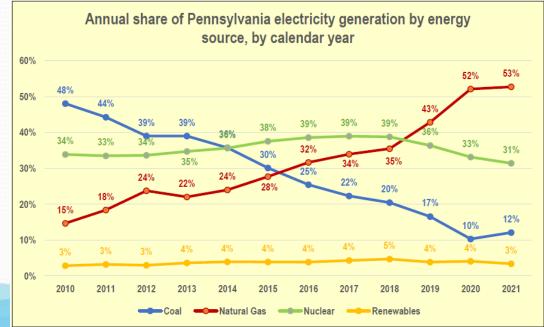




AEPS Report 2022 – Observations on Renewable Energy Resources

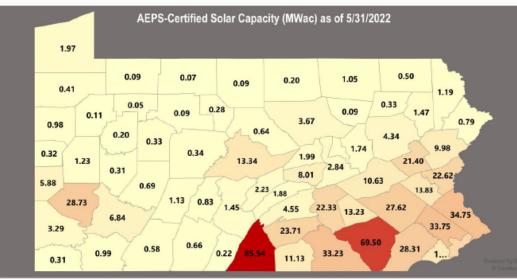
Source: Energy Information Administration Electricity Data Browser





Source: Energy Information Administration Electricity Data Browser

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_{AC} Solar PV Capacity

534.4 MW_{AC} had been installed in PA by 5/31/2021

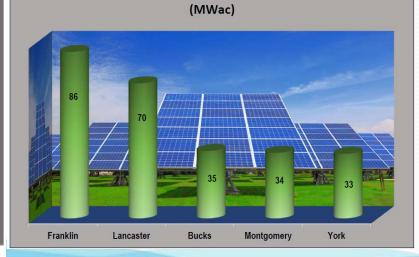
Currently, 809 MW_{AC} is installed (as of 7/18/2023), or the solar share = 0.770%

Top Five PA Counties for Solar Installations

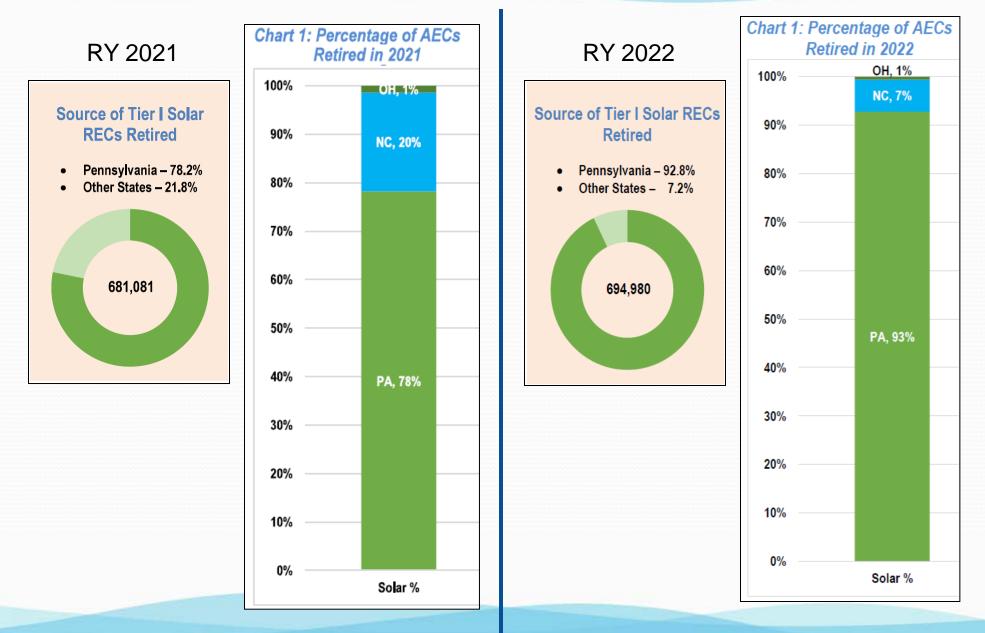


Note: As of 5/31/2022, Philadelphia County has 2,277 AEPS certified solar generation facilities.





AEPS Reports 2021/2022 – Observations on Solar Resources



AEPS Report 2022 – Observations on Solar Resources

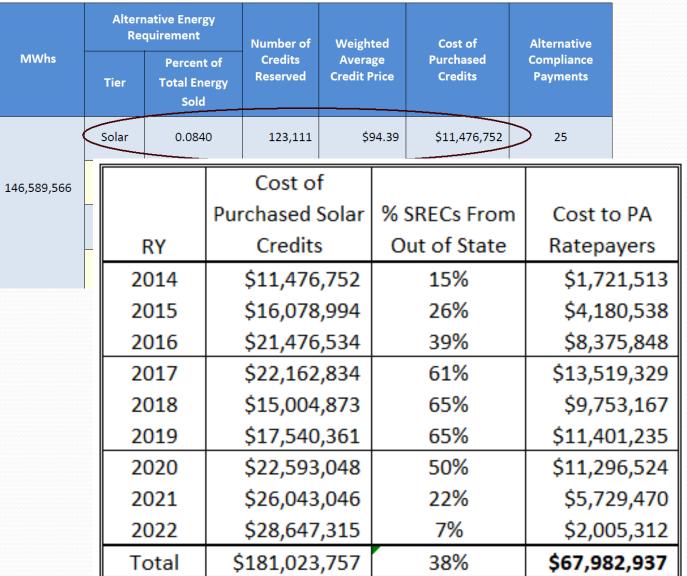


Due to nuances associated with the multitude of contracts, the numbers shown in the chart above are approximate.

According to the above, by May 31, 2023, end of RY 2023, > 99% of all Required SRECs will come from PA solar projects

Out-of-State SREC Cost to PA Ratepayers

TABLE 2 2014 AEPS COMPLIANCE REPORT BY TIER



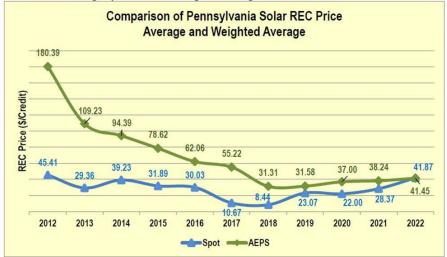
PA Alternative Energy Portfolio Standards (AEPS) Act of 2004 / Compliance for Reporting Years 2014 - 2022

Current & Historic PA SREC Prices



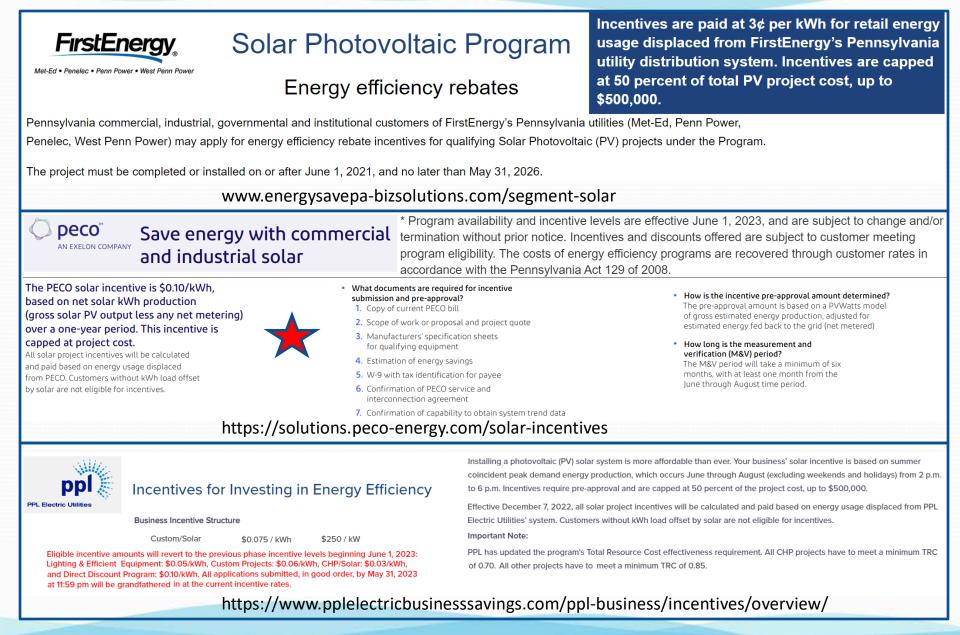
This graph is protected by copyright laws and contains material proprietary to SRECTrade, Inc. All bid pricing and notes included are indicative and subject to change. Please contact us for most current markets. If a market is not quoted herein, please contact us directly for further information.

Chart 6: Solar Average Spot Market vs. Weighted Average AEC Credit Prices



Current PA SACP = \$82.90/SREC

PA Utility Solar Incentive Programs



PA Utility Solar Incentive Programs - Continued



DLC has a solar rebate program for C & I, but does not publicize it at all. Managed by Franklin Energy, contact Liz McQuaide.

- Solar rebate \$0.05 cents/kwh
- Capped at \$500,000 or 90% of total project cost (materials and labor)
- Only pays for current usage offset not on any overproduction
- DLC rebate can be combined/stacked with other funding, including grants. There is no interest in how the project will be funded.
- No virtual net metering projects accepted.
- DLC does look for a TRC score as close to 1 as possible. TRC of 0.9 may be acceptable.

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Our Vision and Mission

Our vision is that Pennsylvania becomes a leader in renewable energy through rapid and broad expansion of in-state solar generation.

We will accomplish this by providing trusted guidance to usher *all Pennsylvanians* into the clean energy economy in order to create more resilient communities.

Guiding All Pennsylvanians to a Clean Energy Future



Walking the Walk GET Solar Technical Assistance Program - Commercial Sector







EDUCATE

Outreach, Public Awareness & Resources Statewide Solar Resource Hub & Savvy Communications





Policy Education & Advocacy Supporting Robust Solar Policies







LEGISLATIVE GUIDE TO STATE SOLAR POLICY PENNSYLVANIA 2023-2024

Updated April 17, 2023

The Pennsylvania Solar Center is a nonprofit organization dedicated to helping all Pennsylvanians benefit from solar energy. With decades of experience represented by our staff, Board and partners, the Pennsylvania Solar Center provides research and education on important topics impacting Pennsylvania's solar industry.

The following legislative guide contains information on policy proposals currently under consideration by Pennsylvania's General Assembly that have potential to impact Pennsylvania's solar industry. This document and its references are provided for educational purposes only and do not necessarily reflect the views or opinions of the Pennsylvania Solar Center's funders, members, partners, Board, or individual staff.

LEGEND

These icons indicate if the PA Solar Center interprets the bill to have positive or negative impact to the solar industry in Pennsylvania as well as consideration of a bill's likeliness to garner support. This is not intended to imply endorsement, lack of support, or otherwise, for any particular legislation.

The Inflation Reduction Act







Bills of significant interest to watch and have potential positive impacts for solar development in Pennsylvania. Bills that are unlikely to pass in the current legislative session (January 2021 to December 2022) but would likely have a positive impact on solar.

Bills of significant interest to watch and for which the Pennsylvania Solar Center has concern for the possible negative impact(s) on solar development in Pennsylvania.



Policy Education & Advocacy Supporting Robust Solar Policies



TOP PRIORITIES

1) Increase Pennsylvania's Renewable Goals to 30% by 2030

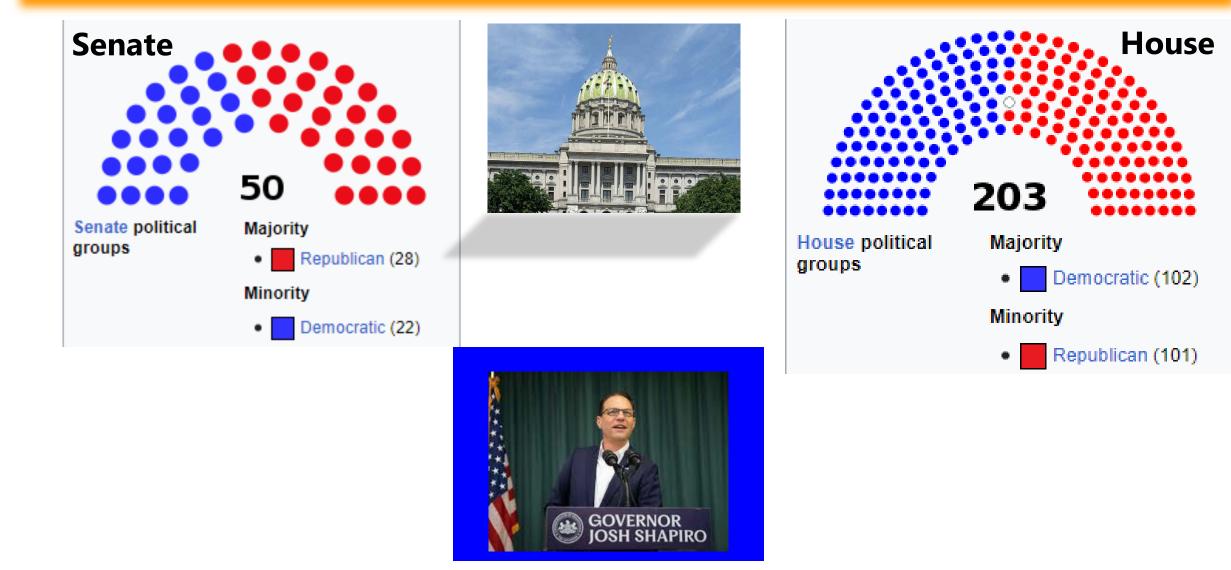
- Enhance the solar carveout
- > Expand market opportunities
- > Diversify the grid

2) Enable Community Solar

- Promote solar access
- > Defend consumer protections
- > Encourage economic development

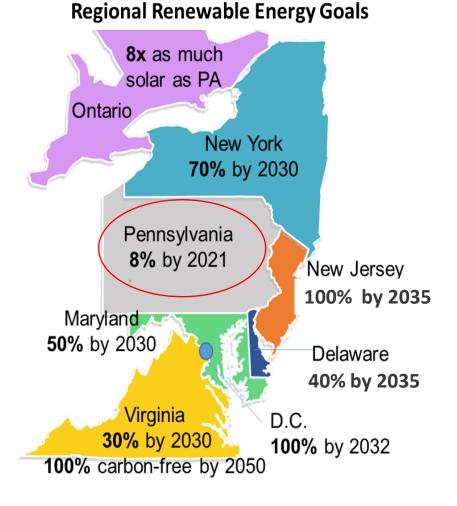
3) Defend Against Unfriendly Solar Policies

Pennsylvania Balance of Power



Alternative Energy Portfolio Standards (AEPS)

- Signed into law November 2004
- Requires Pennsylvania utilities obtain 18% retail electricity from alternative resources by May 2021
 - Tier I 8% Solar photovoltaics and solar thermal, wind, low-impact hydropower, geothermal, biomass, fuel cells
 - <u>0.5% of the 8%</u> to come from in-state solar photovoltaics (PV)
 - Tier II 10 % Large-scale hydropower, waste coal, energy efficiency, municipal solid waste, byproducts of wood processing, etc.



Key PA Policies to Watch

- House Bill 467 30% Renewables by 2030 with 14% in-state solar + Enables Community Solar – Amends the Alternative Energy Portfolio Standard (AEPS)
- Senate Bill 550 Enables Community Solar and provides a Grid Service Payment as Incentive
- House Bill 330 PA Local Solar Utility sponsored bill to permit utilities to enter into contracts with solar developers and offer subscriptions for a solar
- Senate Bill 211 Decommissioning & Bonding on utility scale solar
- Senate Bill 798 Prohibition of Solar on Class 1 & 2 farmland soils
- Attacks on Net Metering

PENNSYLVANIA LEGISLATIVE UPDATE: Modifying the AEPS & Enabling Community Solar

House Bill 467/Senate Bill 230

Representative Otten and Senator Santarsiero

- Increases the Tier 1 goal from 8% to 30%
- Enables community solar
- Increases the in-state solar carve-out from 0.5% to 14% by 2030 and creates three categories within the solar carve-out:
 - 0 4% Customer Generators/Distributed Generation
 - (aka: onsite solar)
 - o 2% Community Solar
 - o 8% Grid-Scale/Utility Scale



	Current AEPS Goal	Proposed Addition	Proposed Total by 2030
Tier I resources (permitted from PJM)	7.5%	8.5%	16%
Tier I In-State Solar Carve out:	0.5% ———		
Customer Generators	Not specified	3.5%	→ 4%*
Utility Scale	Not specified	8%	8%
Community Solar	Not permitted	2%	2%
TOTAL TIER I GOALS	8%	22%	30%



Current Alternative Compliance Payments (ACP)

ACP acts as a ceiling on AEC prices

Current ACPs:

• Tier I:

\$45

• Tier I (in-state solar carve out): Formula

"200% of the average market value of solar renewable energy credits sold during the reporting period within the service region of the regional transmission organization, including, where applicable, the levelized up-front rebates received by sellers of solar [renewable] alternative energy credits in other jurisdictions in the PJM Interconnection, L.L.C. transmission organization (PJM) or its successor"

• Tier II:

Proposed Alternative Compliance Payments (ACP) – House Bill 1467

• Tier I (in PJM):

\$45

• Tier I (in-state solar carve out):

- Utility scale solar \$45
- Community solar
 \$70
- Customer generator \$100
- Tier II:

\$45

15-year lifetime on community solar and customer generator RECs; after that time they would fall into Tier I.

PENNSYLVANIA LEGISLATIVE UPDATE: COMMUNITY SOLAR and SHARED SOLAR

House Bill 1467 (Rep. Otten)

- Proposes an in-state community solar category at 2% in the solar carveout from Tier I of the AEPS
- Provides a REC structure that is consistent with Pennsylvania's existing solar market structure
- Bill credit at Price to Compare
- Mirrors most of language from SB 550 except for the incentive language

SENATE BILL 550 (Sen. Brown) (House cosponsor memo - Rep. Kaufer)

- Proposes a standalone community solar program
- May have impacts on Pennsylvania's existing SREC and electricity markets
- No other state has adopted a community solar program as described in SB 550
- Overly inflated incentive for the grid service payment that has significant customer rate impacts.

HOUSE BILL 330 (Rep. Stambaugh) (Senate cosponsor memo – Sen. Laughlin)

- Proposes a non-competitive "shared solar" program that would provide utilities exclusive control over the building of large-scale projects
- Would establish a "Solar Energy Rate," net metering customers cannot participate, and sets a maximum of 15% LMI customer participation



PENNSYLVANIA LEGISLATIVE UPDATE: Statewide Bonding and Decommissiong

Guide	Bill #	Sponsors		History
×	<u>SB 211</u>	Prime: Gene Yaw (R-Bradford, Lycoming, Sullivan, Tioga and Union Counties) Republicans - 7 Democrats - 0		Final Senate passage (Y-36; N-13), March 8, 2023. Referred to the House Environmental Resources and Energy Committee, April 25, 2023
24	Prime: Kathy Rapp (R-Warren, Crawford and Forest		Referred to Environmental Resources and Energy Committee,	
Counties)		Democrats - 0	April 25, 2023	

- → Create statewide decommissioning requirements + proof of financial assurance for solar > 2MWac unless net-metered
- → Require the PA DEP to consult with the solar industry in the development of a statewide standard decommissioning plan and for decommissioning plans to be submitted to the appropriate county recorder of deeds
- \rightarrow Decommissioning to take effect 18 months after facility stopped producing electricity
- → Require a specific percentage of the decommissioning costs to be secured through a financial assurance mechanism 30 days before construction start. SB 211 includes considerations for salvage value, and HB 925 does. not Bonded amounts are to be updated every 5 years until year 25.
 - o SB 211:
 - 30 days before construction: 10% of decommissioning cost;
 - Year 5: 10% of decommissioning cost;
 - Year 10: 40% minus salvage value but not < 25% of decommissioning cost;
 - Year 15: 60% minus salvage value but not < 40% of decommissioning cost;
 - Year 20: 80% minus salvage value but not < 60% of decommissioning cost;
 - Year 25: 100% minus salvage value but not < 70% of decommissioning cost.

Salvageable material is limited to steel, aluminum and copper

PENNSYLVANIA LEGISLATIVE UPDATE: Prohibition of Solar on Class 1 & 2 farmland soils

Guide	Bill #	Sponsors		History
	<u>SB 798</u>	-		Referred to Senate Agriculture and Rural Affairs Committee, June 28, 2023
ļ		Republicans - 5	Democrats - 0	

- → Creates the "Solar Energy Facility Location Act" which would restrict landowners from leasing their land for solar or building solar on Class 1 or Class 2 soils
- → Would not apply to existing solar projects, projects with a nameplate capacity of 2 MWac or less, or customer-generators
- → Authorizes Attorney General to take action to remove a solar project that violates the bill's restrictions on solar projects developed on Class 1 and Class 2 soils
- → Landowners developing solar on brownfields, abandoned mine lands, capped landfills, warehouse rooftops, and parking canopies would be eligible for a tax credit equal to \$0.03/kW (\$30/W) but no greater than 30% of the project's cost of electricity generated for the first 10 years of operation. Tax credit available on a first-come, first-served basis and capped at \$5 million per year

Senate Hearing on Solar and Ratepayer Impacts

On June 20, 2023, a 2-hour hearing held by the Senate Consumer Protection & Professional Licensure Committee covered some familiar terrain including utility opposition to community solar and critiques of net metering. Chairman Stefano ended the hearing by endorsing legislation to change net metering laws in Pennsylvania.

This hearing was primarily initiated because of the exponential growth of merchant generators submitting BTM interconnection applications for 3 MW facilities for new accounts with no existing loads.

The PUC witnesses supported changes to net metering and gently endorsed community solar. They made the following recommendations for community solar in their testimony:

- Consider providing the Commission flexibility to revise the value of bill credits.
- Consider providing the Commission flexibility to revise the value of any grid services payments, if applicable.
- Ensure clarification on how to deal with any unsubscribed energy.
- Include reasonable coordination between utilities and project developers without unduly burdensome requirements.

Link to the recording of the hearing : https://consumer.pasenategop.com/cppl-062023/

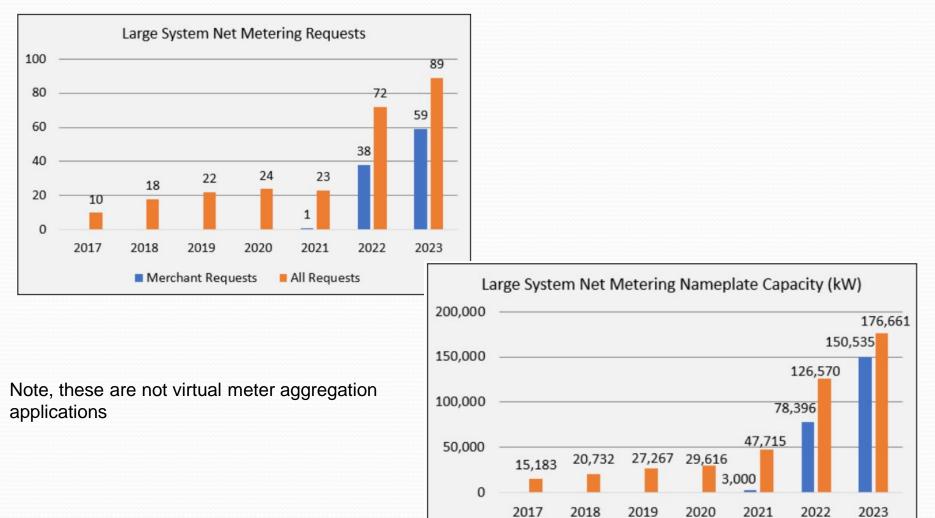
Current Net Metering in PA

- System Capacity Limit:
 - 50 kW for Residential
 - 3 MW for Non-residential
 - 5 MW for micro-grid and emergency systems
- No Aggregate Capacity Limit
- Net Excess Generation: Credited to customer's next bill at full retail rate; generation above usage reconciled annually at "price-to-compare"

Virtual Net Metering vs Virtual Meter Aggregation

- Virtual Net Metering very similar to a customer with onsite solar - same benefits of net metering to the customer. Participating customers see their share of the community solar facility's output net metered on their own electric bill. PA currently does *not* allow virtual net metering.
- But, PA *does* allow Virtual Meter Aggregation, which is similar except all participating meters (accounts) must be in the same customer name, all meters and the solar PV system must be located within two miles of each other, and the customer must own or lease the properties with the related accounts.

Explosion of Merchant Generator BTM Interconnection Applications in PA



Merchant kW

Total kW

CONTACT US

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> Ron Celentano President PASSIA <u>CelentanoR@aol.com</u>



Seizing the Opportunity

• Job Creation

65,000+ jobs with 10% solar

• Economic Development

\$9 billions in private investments and \$5 billion in local PA economic benefit

• Electricity Cost Savings for Everyone

Just 5% solar on the grid starts to decrease cost of electricity for everyone

Energy Diversification

Increases grid resiliency and price stability

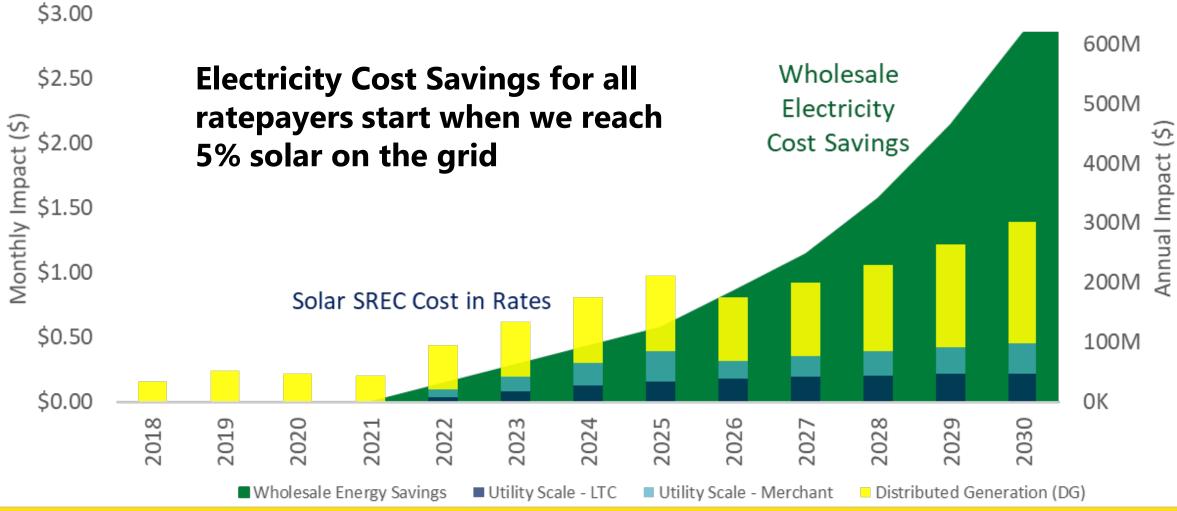
• Preserving Family Farms

\$2+ Billion in Farmer Lease Payments, and keeps land in hands of farmers/landowners rather than selling for development

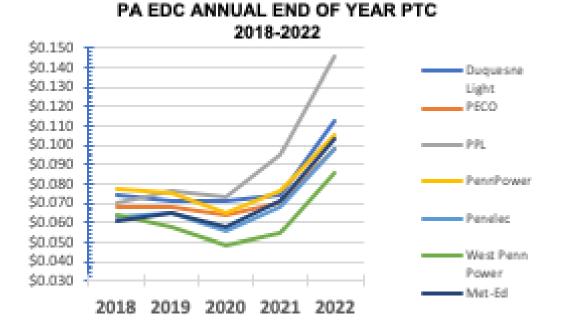




Monthly & Annual Bill Impact of 10% Pennsylvania Solar

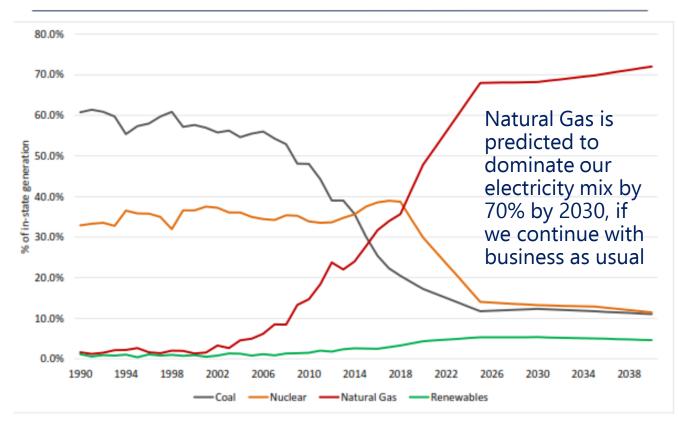


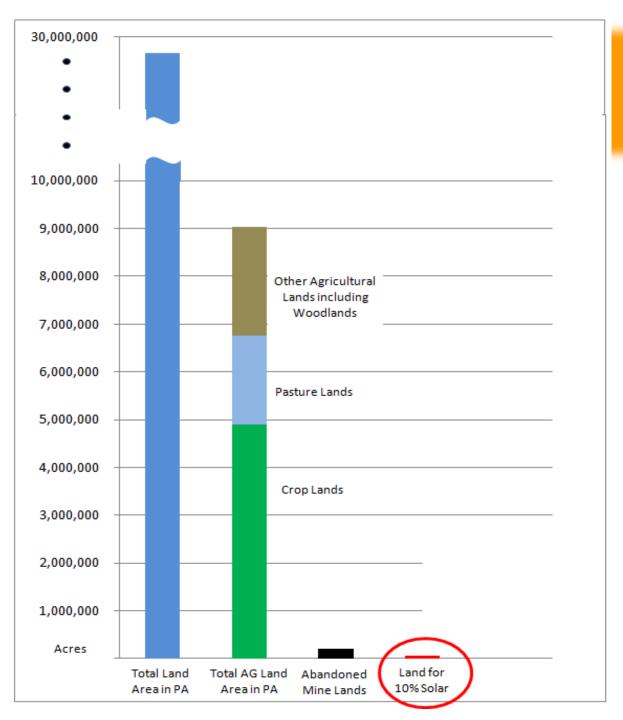
PowerGEM/CEI Pennsylvania 2030 Solar Generation Study - https://www.communityenergyinc.com/pasolarstudy



Increasing renewables will diversify our energy mix, making our grid and energy prices more stable

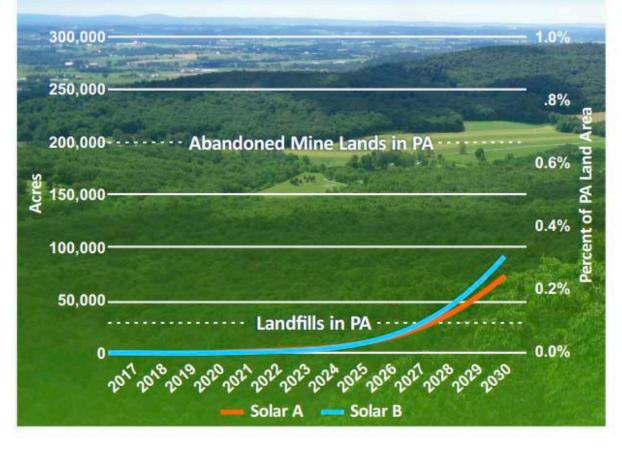
Putting forecasted generation into perspective





Land Needed for 10% Grid-Scale Solar in Pennsylvania is Small

PA Solar Future Land Use



Solar Preserves Family Farms

ENNSYLVANIA

• Solar provides supplemental income that can help sustain PA farms.

- Landowners are paid about a fixed price of \$800 to \$1,400 per acre per year to lease land for solar development for 20 years or more
- Pennsylvania lost more than 6,000 farms between 2012 and 2017 and more than 700 dairy farms in the past two years. (American Farm Bureau Federation)
- The solar equipment is removed at the end of the life of the solar and the improved land can revert to farming
- AgriSolar incorporates benefits of grazing, pollinator friendly plants and shadegrown crops
- Prime farmland under farmland preservation cannot go solar