Solar Incentives Task Force

SolarTaskForce.MEA@Maryland.gov

July 18, 2023

Task Force objectives under SB 469 (2023)

- Study:
  - Financial incentives and their impacts on the State reaching its RPS Goal
  - Whether different levels or types of incentives should exist for different market segments
  - How solar ACP is calculated and its relationship to the value of S-RECs
  - Impacts of federal solar incentives

Section 48 ITC	Section 45/45Y PTC	Section 25D Homeowner Credit
Calculated on generation asset FMV Base Rate 6% "Bonus Rate" 30% With "Adders" up to 70%	Generation Initially 2.6¢/kWh Future years based on formula	Calculated on direct labor & equipment 30% Base Rate 26% in 2033 22% in 2034

Task Force objectives under SB 469 (2023)

- Make recommendations to ensure:
  - The State reaches its solar RPS goal
  - Minority Business Enterprise Participation in Solar Development
  - Solar development = quality, family-sustaining Maryland jobs
  - Equitable access to renewable energy
  - The efficient use of land, by maximizing development on previously developed property, landfills, brownfields, parking developments, etc.

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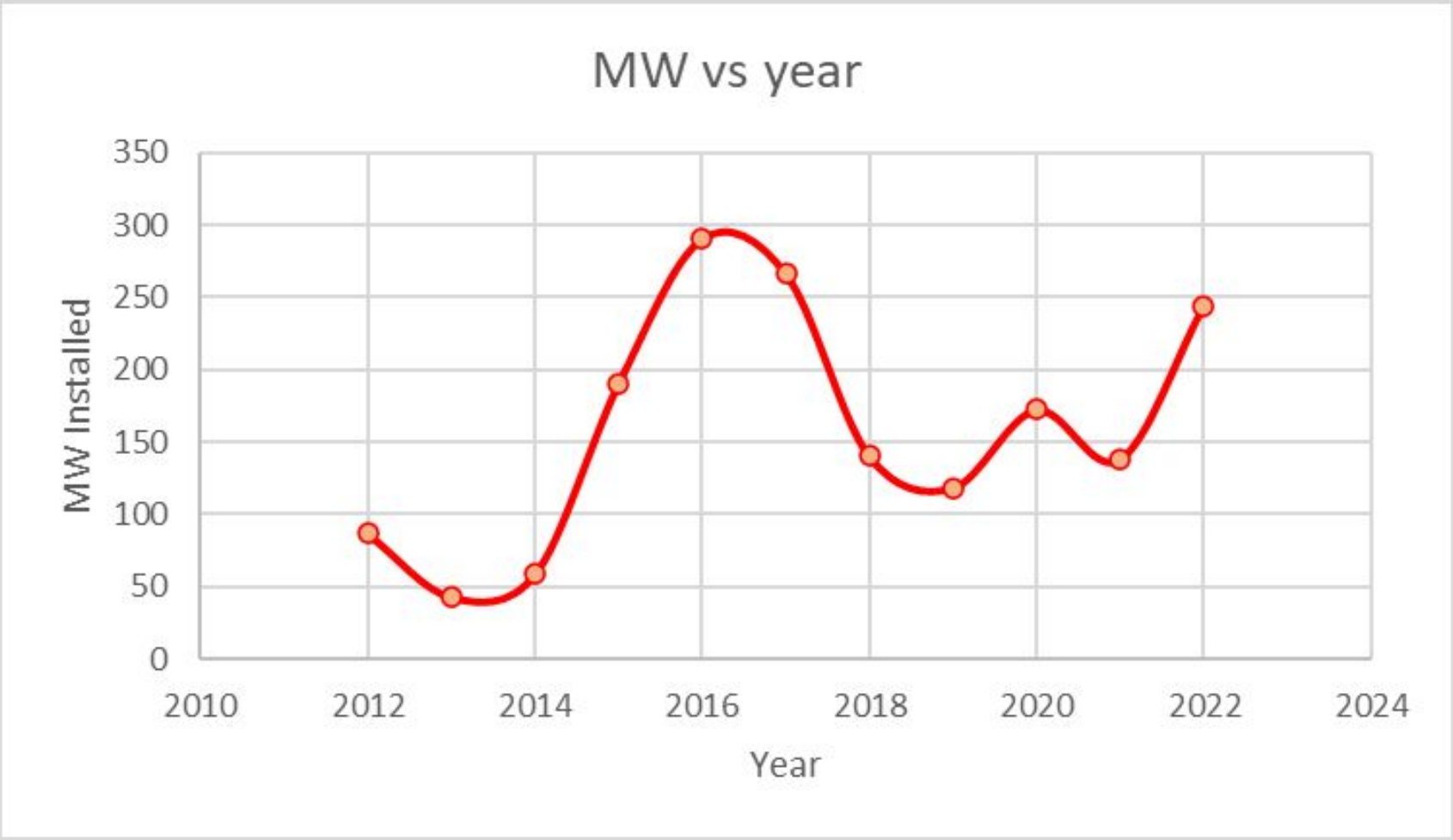
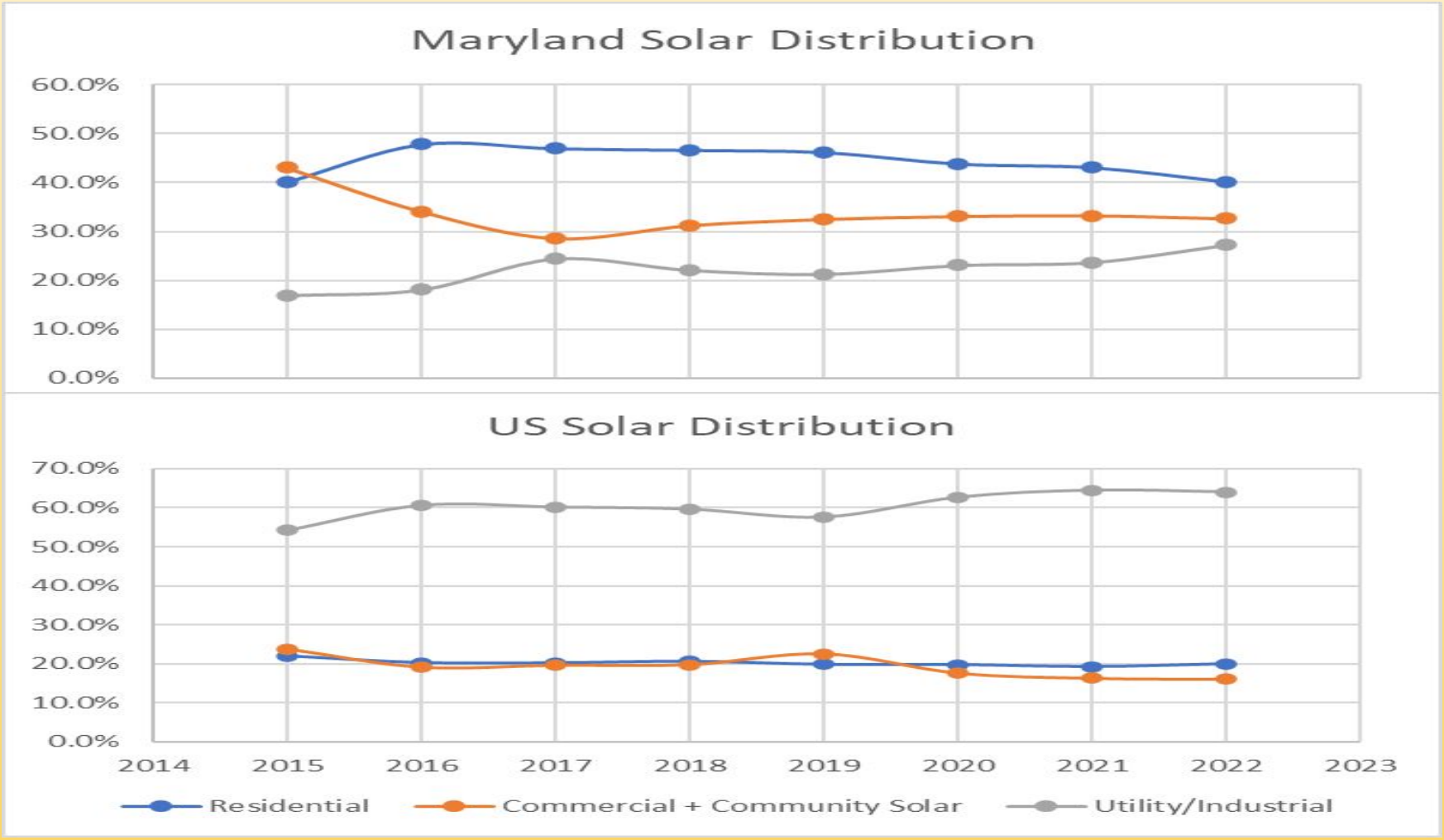
Solar in Maryland
All Sizes

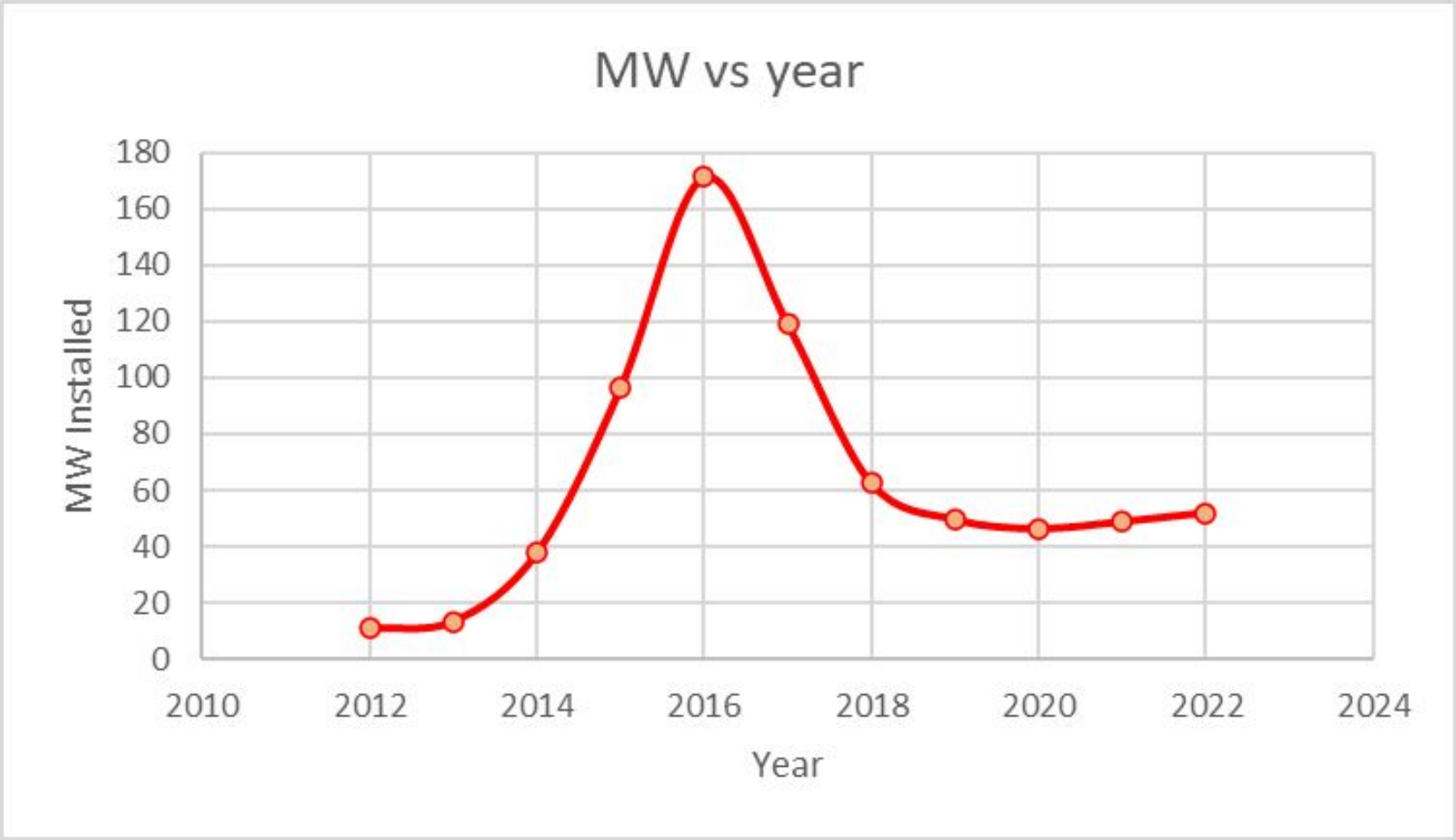


Solar Distribution (Maryland vs. US)

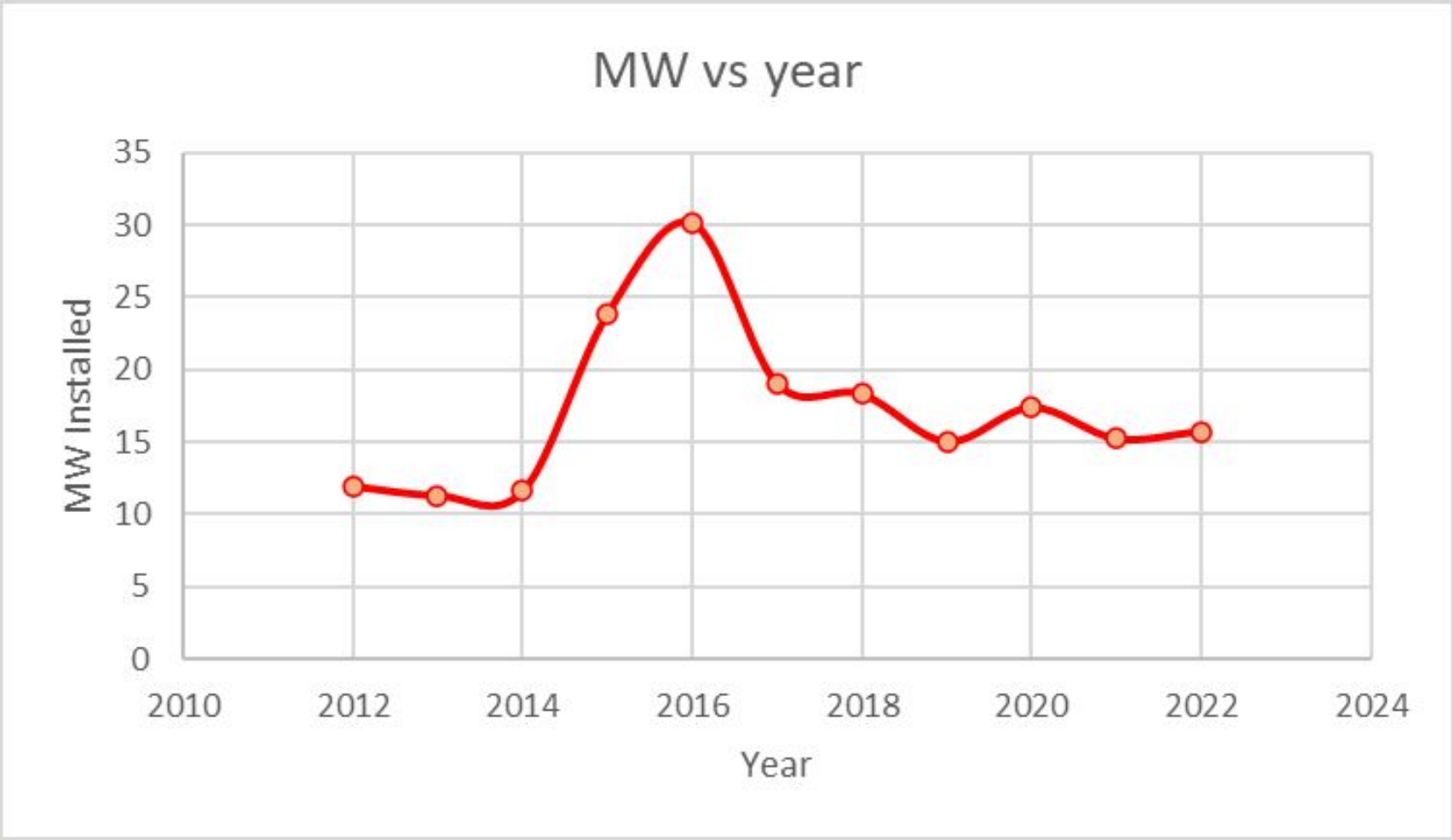


US Data from SEIA https://www.seia.org/solar-industry-research-data

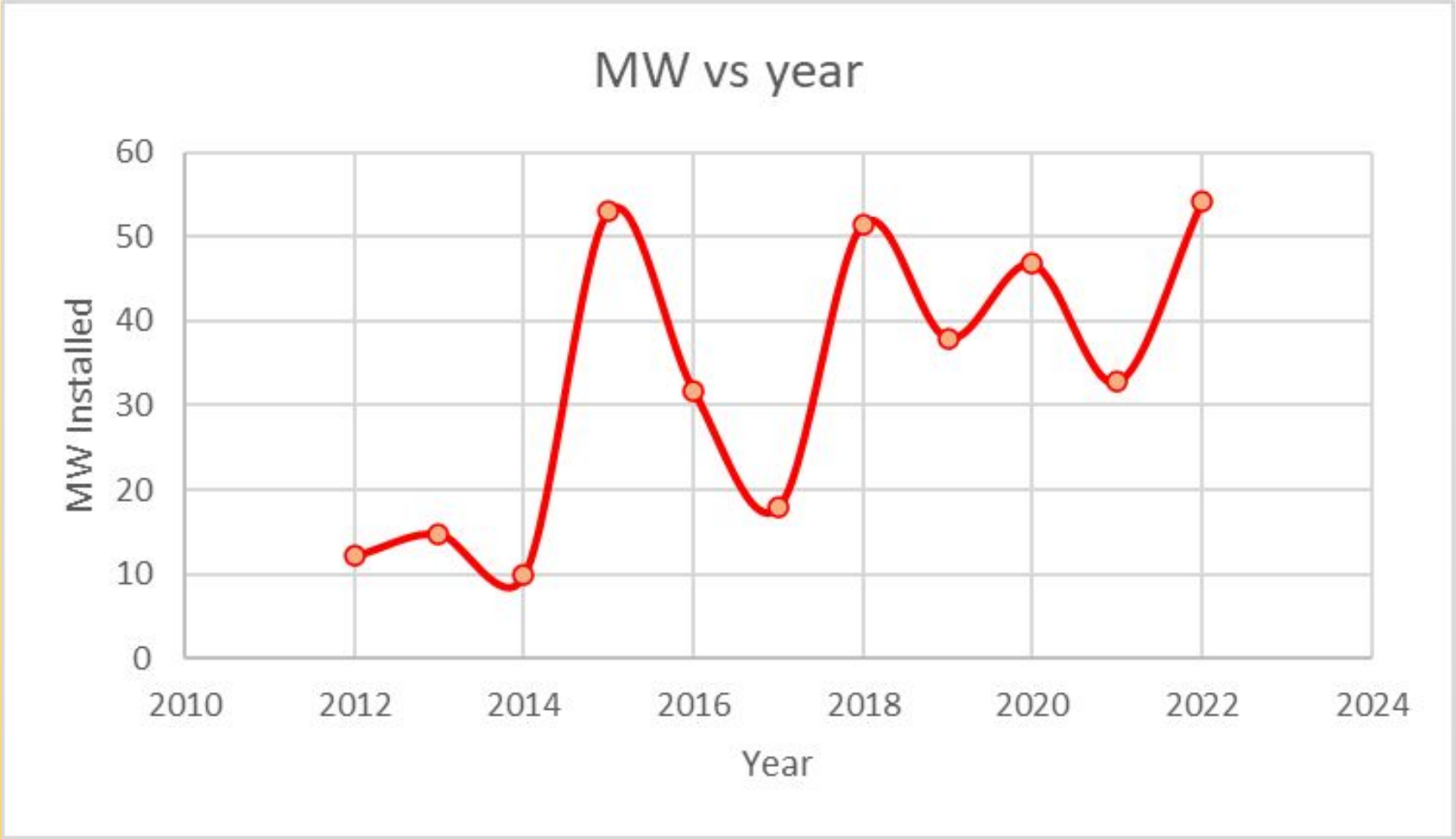
Residential Scale Solar
0-20 kW-dc



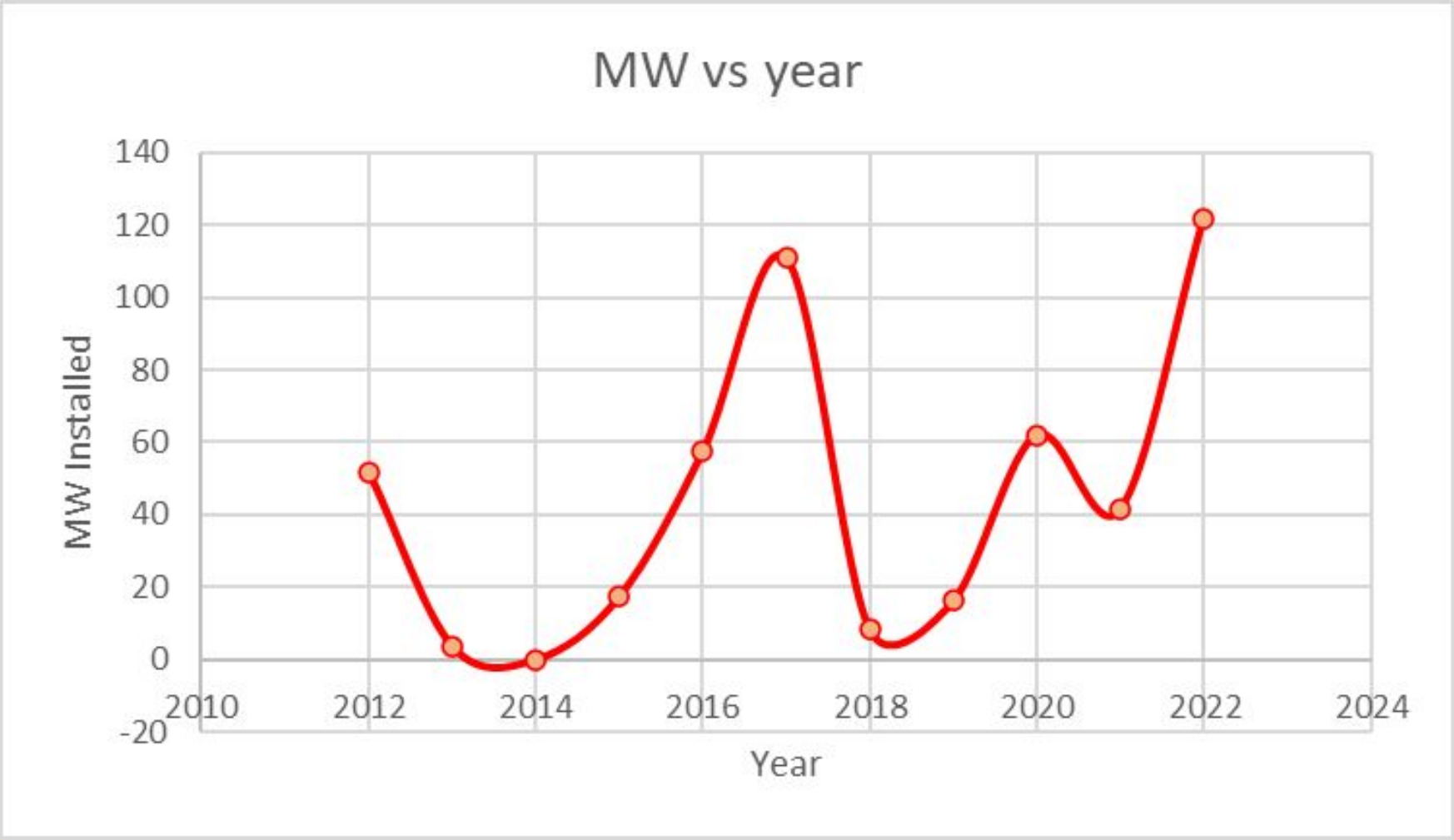
Commercial Rooftop Solar 20-800 kW-dc



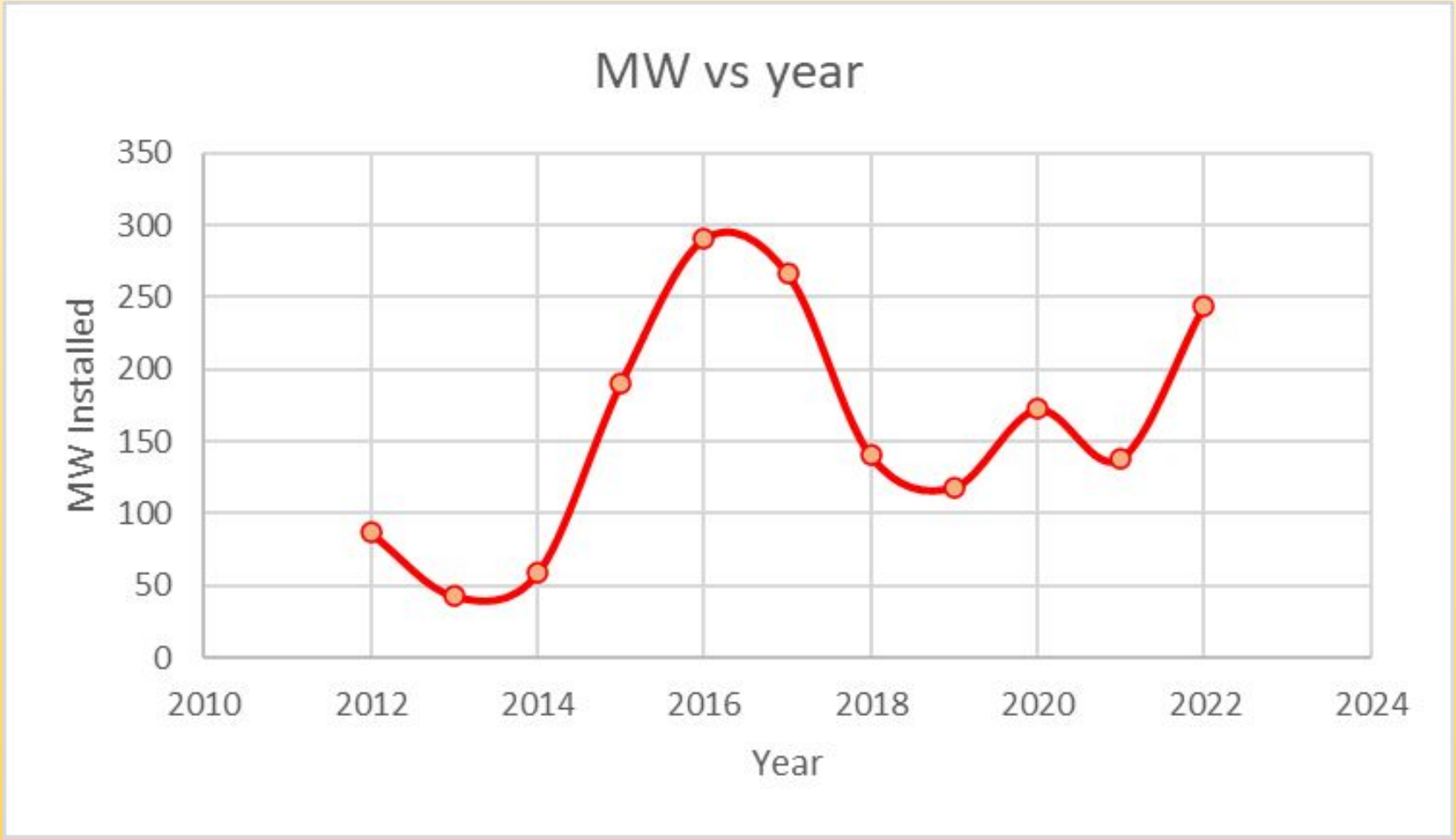
Commercial Ground Based Solar 800-3000 kW-dc



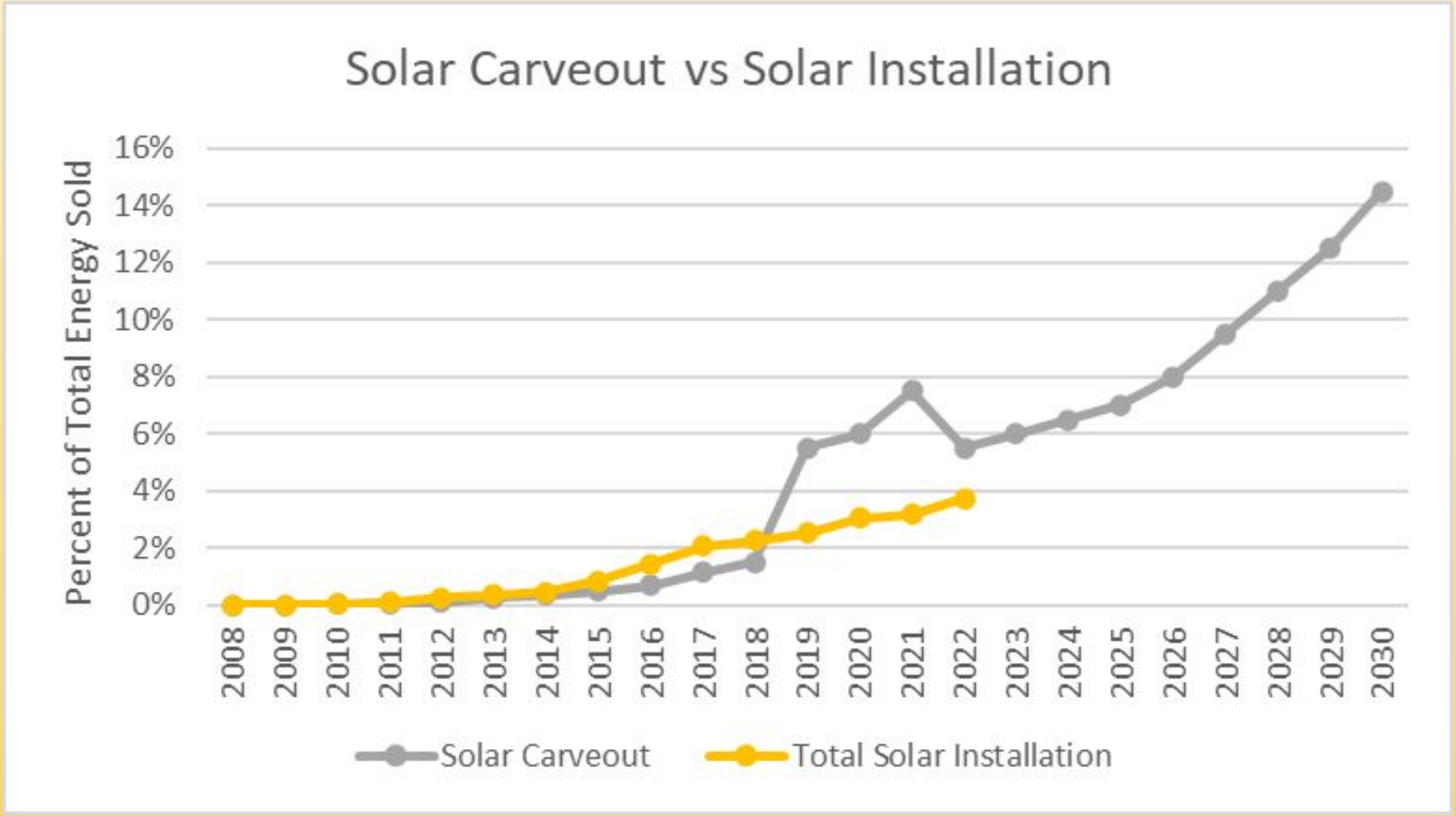
Utility Scale Ground Based Solar 3000+ kW-dc



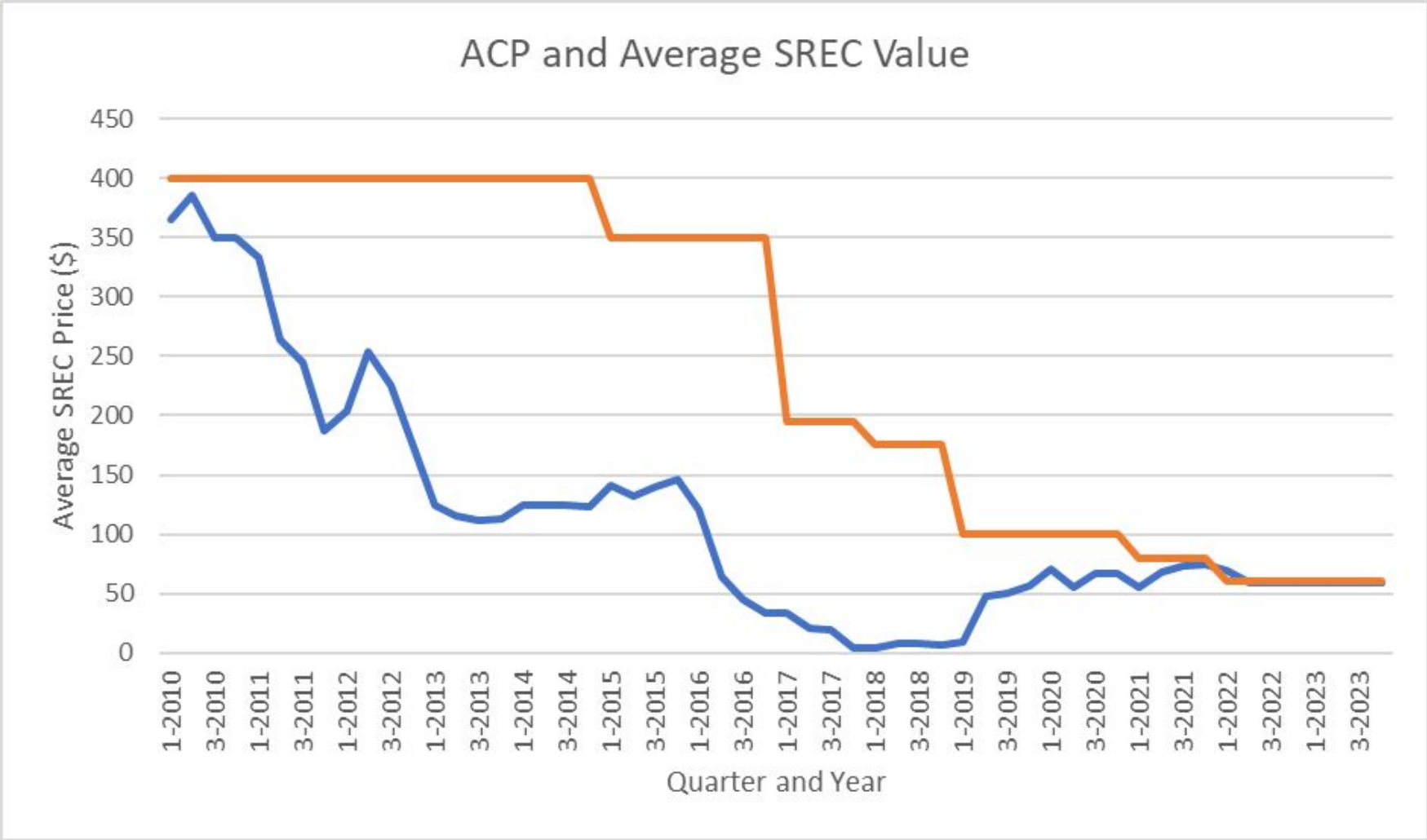
Solar in Maryland
All Sizes



RPS: Solar Carveout vs. Solar Installation



SREC Price vs. ACP



Assumptions

- There were 1,800 MW of solar installed by December 2022.
- Rooftop solar is equally spread across the azimuth from east-south-west, while ground based solar is uniformly facing south.
- The bulk of solar energy generation will shift from rooftop to ground based.
- Ground based production will shift over time from fixed tilt (1,347 kWh-ac/kW-dc) to single axis tracking (1,550 kWh/kw).
- 80% of future solar generation capacity will be derived from ground mounted PV, with 60% of that being developed on agricultural land.
- Calculations use “Energy Use, Net of Demand Side Management” (which includes behind the meter generation).
- Nuclear, biomass, municipal solid waste, solar thermal, hydroelectric, and terrestrial wind generation output will remain constant.
- Annual 5% year over year escalation rate for solar PV installation.

Land Use to Reach RPS Requirement

- Assume ~4 acres/MW-dc solar
- 12,215 acres of land required
- 7,329 acres of farmland

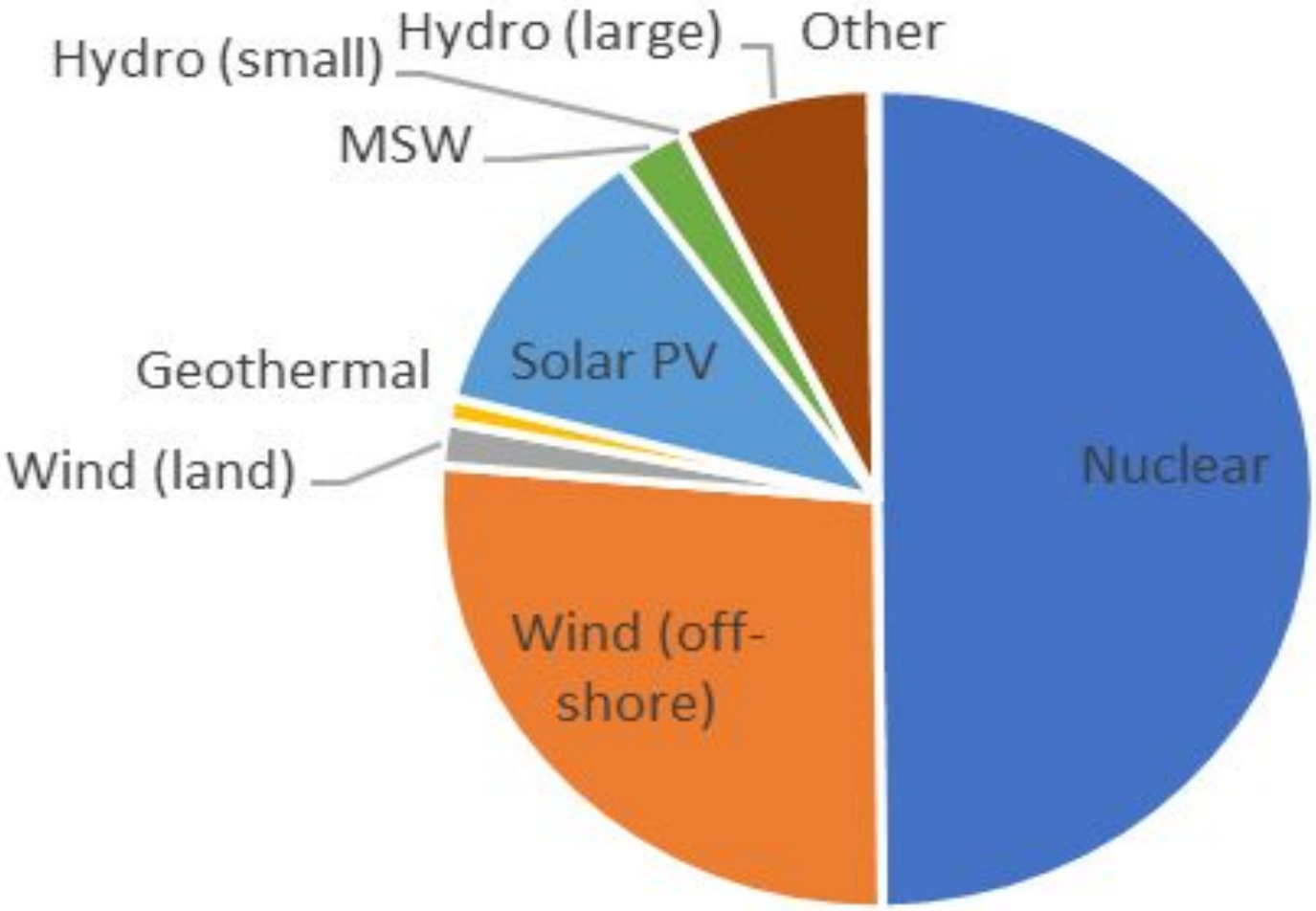
58,165,000	Energy (MWH-ac) used in state in 2028*
53,151,000	MWH-ac 14.5% solar carveout (major utilities)
5,014,000	MWH-ac 2.5% solar carvout (coops)
7,832,245	Solar energy (MWH-ac) required by RPS
1,798	Solar capacity (MW-dc) in MD as of 12/31/2022
1,121	(MWH/MW) for existing solar
2,015,028	Energy (MWH-ac) from existing solar
5,817,217	Energy (MWH-ac) required from new solar
80.00%	Ground mounted percentage (assumed)
4,653,774	MWH-ac from ground mounted solar
1,524	(MWH-ac/MW-dc) for new solar
3,054	MW-dc required from new ground mounted solar
4	Acres per MW-dc
12,215	Acres of land required for new land based solar
60%	Agricultural land percentage (assumed)
7,329	Acres on agricultural land

Rooftop Issues to Reach RPS Requirement

- 113,369,661 ft^2 rooftop needed
- Average household = 8 kW system
- ~130,000 additional homes with solar

1,163,443	MWH-ac required from new rooftop/residential
1,121	MWH-ac/MW-dc
1,038	MW-dc rooftop required
54,617	sq ft/MW
56,684,831	sq.ft. of rooftop solar required
50%	Percent of roof that will accept solar (assumed)
113,369,661	sq.ft. of rooftop needed
8	average home solar size
54.62	sq.ft./kW for rooftop space
129,725	# of homes with new solar

Clean Energy (few RPS goals met)
52% of demand

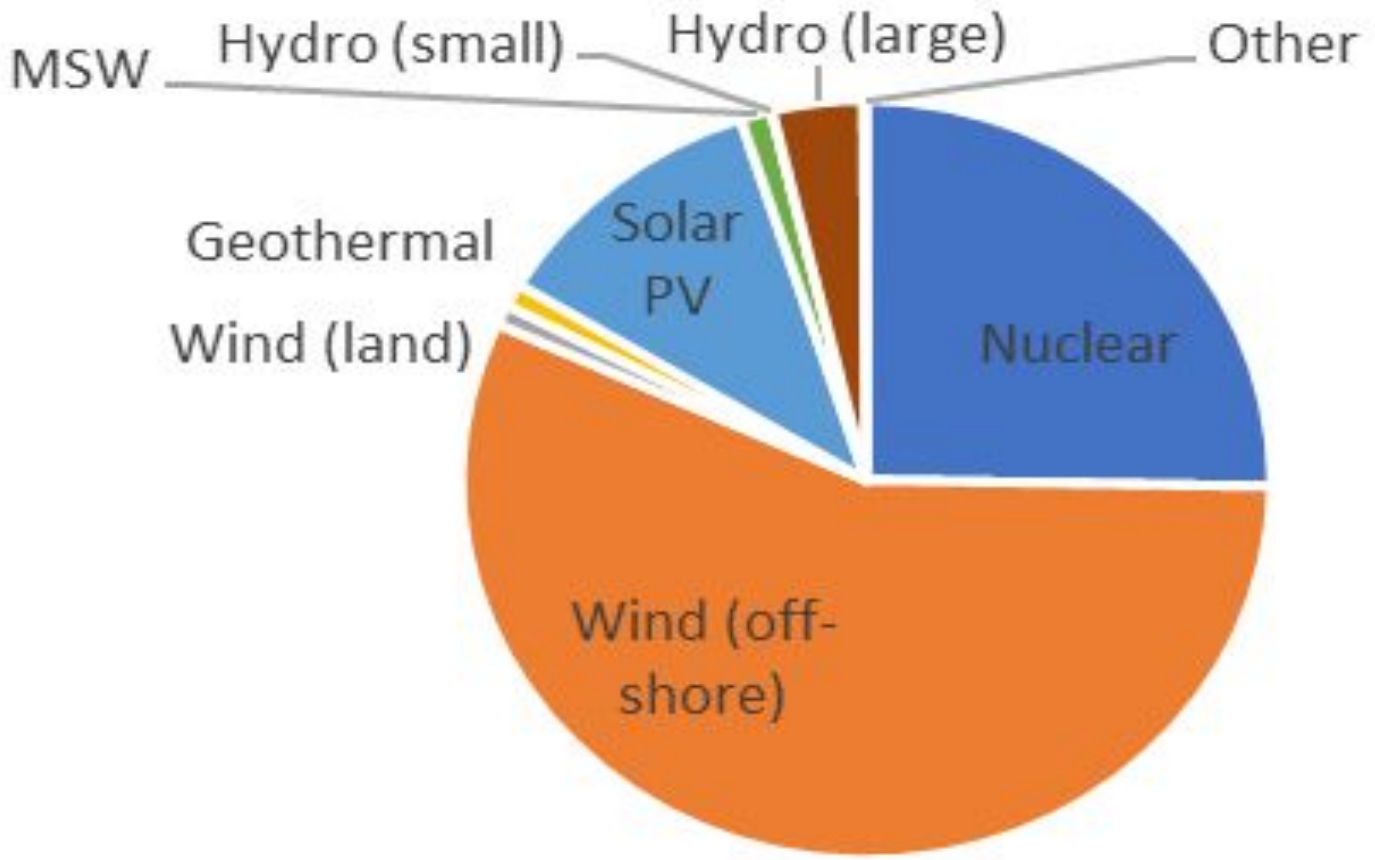


Assumptions:

2.023 GW Offshore Wind
5% yearly increase Solar PV
0.5% Geothermal

Existing amounts of:
Nuclear Energy
Land based wind
Small Hydro
Large Hydro
MSW (waste)
Wood
Landfill Gas
Solar Thermal

Clean Energy (all RPS goals met)
102% of demand

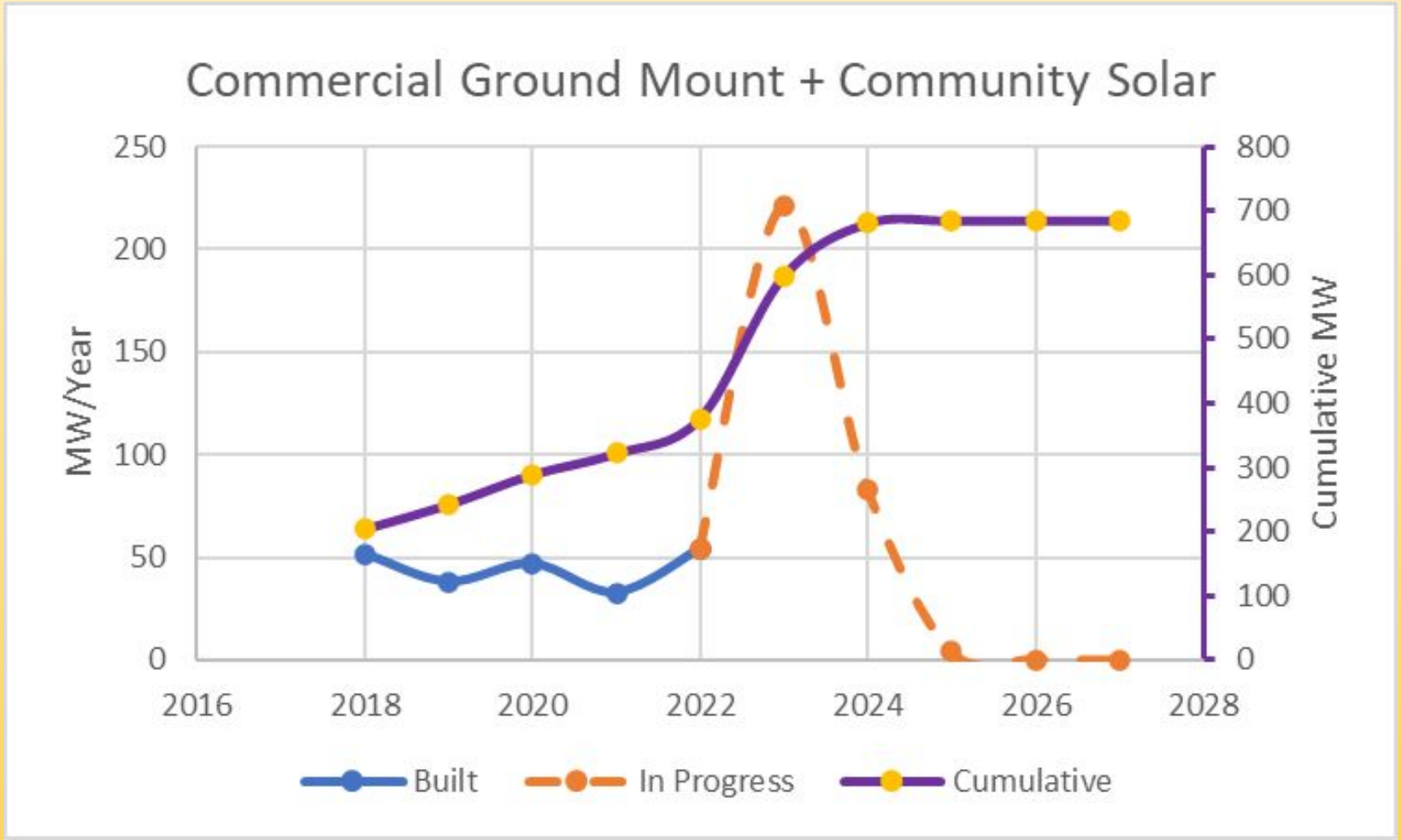


Assumptions:

8.5 GW Offshore Wind
14.5% Solar PV
1% Geothermal

Existing amounts of:
Nuclear Energy
Land based wind
Small Hydro
Large Hydro
MSW (waste)
Wood
Landfill Gas
Solar Thermal

Commercial Ground Mount with new Community Solar



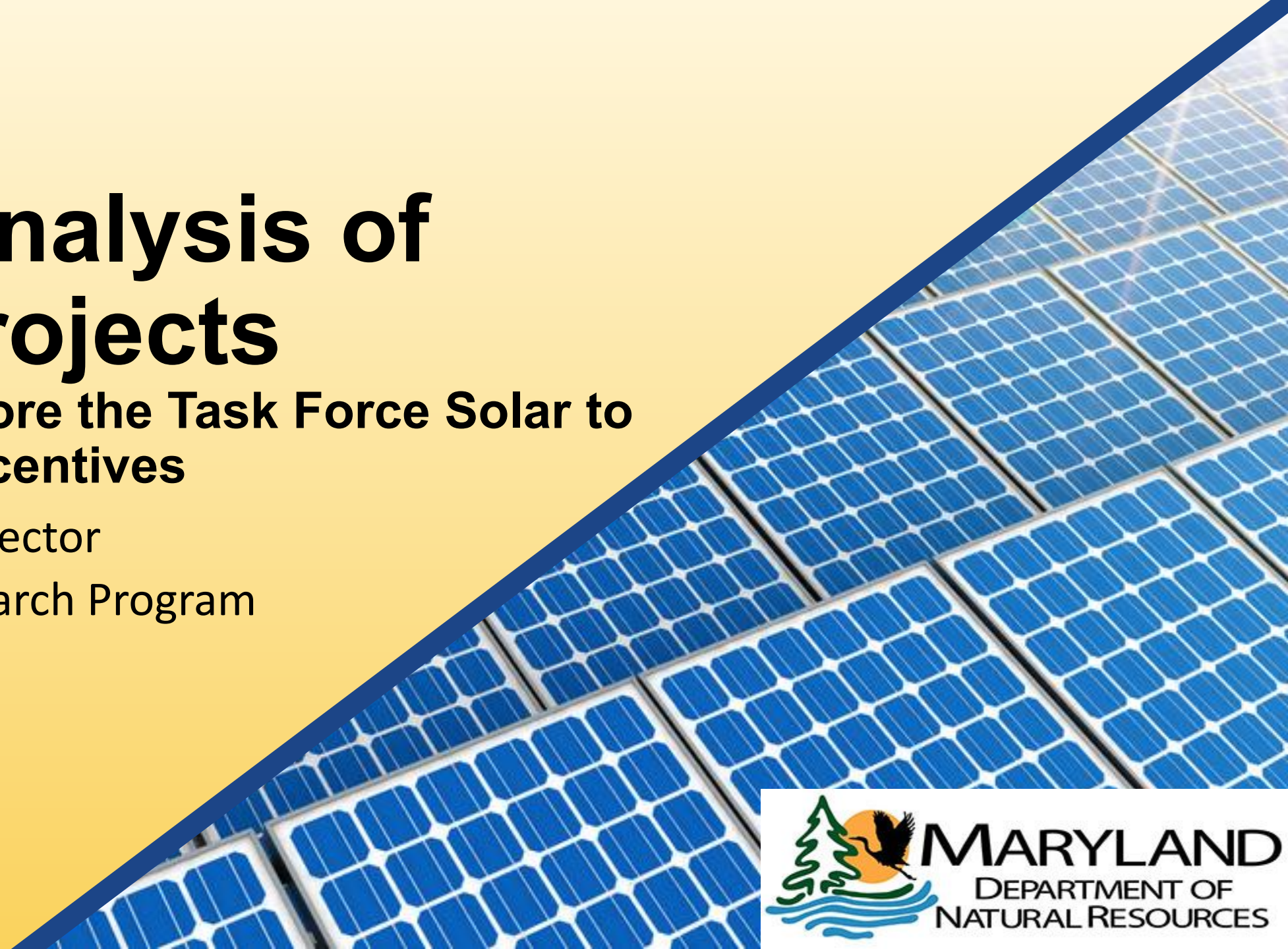
PPRP Analysis of Solar Projects

Presented Before the Task Force Solar to Study Solar Incentives

Bob Sadzinski, Director

Power Plant Research Program

July 18, 2023



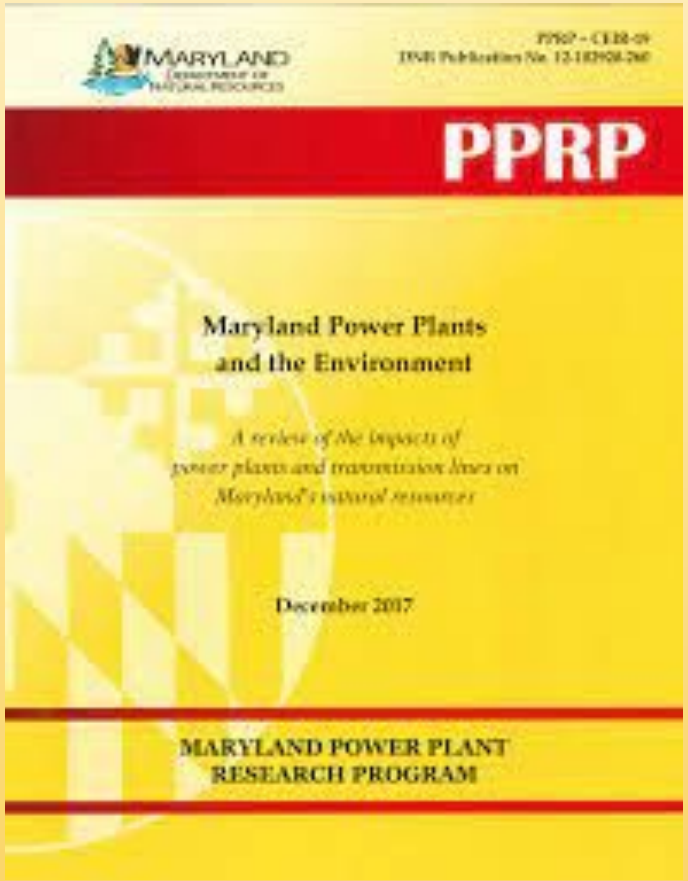
MARYLAND DEPARTMENT OF NATURAL RESOURCES

The Power Plant Research Program (PPRP)

Conducts comprehensive, objective assessments based on sound science of electrical generation and transmission lines for the PSC.

<u>PPRP also:</u>

- Writes a Biannual, Cumulative Environmental Impact Report (CEIR)
- Prepare reports as required by the Maryland General Assembly such as the Renewable Portfolio Standard
- Currently responsible for the 100% clean and renewable energy analyses through CEJA.
- Analyze PJM queue and energy data mining
- Conduct energy-related studies (matting, pollinators, SWM, mercury, etc.)



General Permitting Process for Power Plants in Maryland

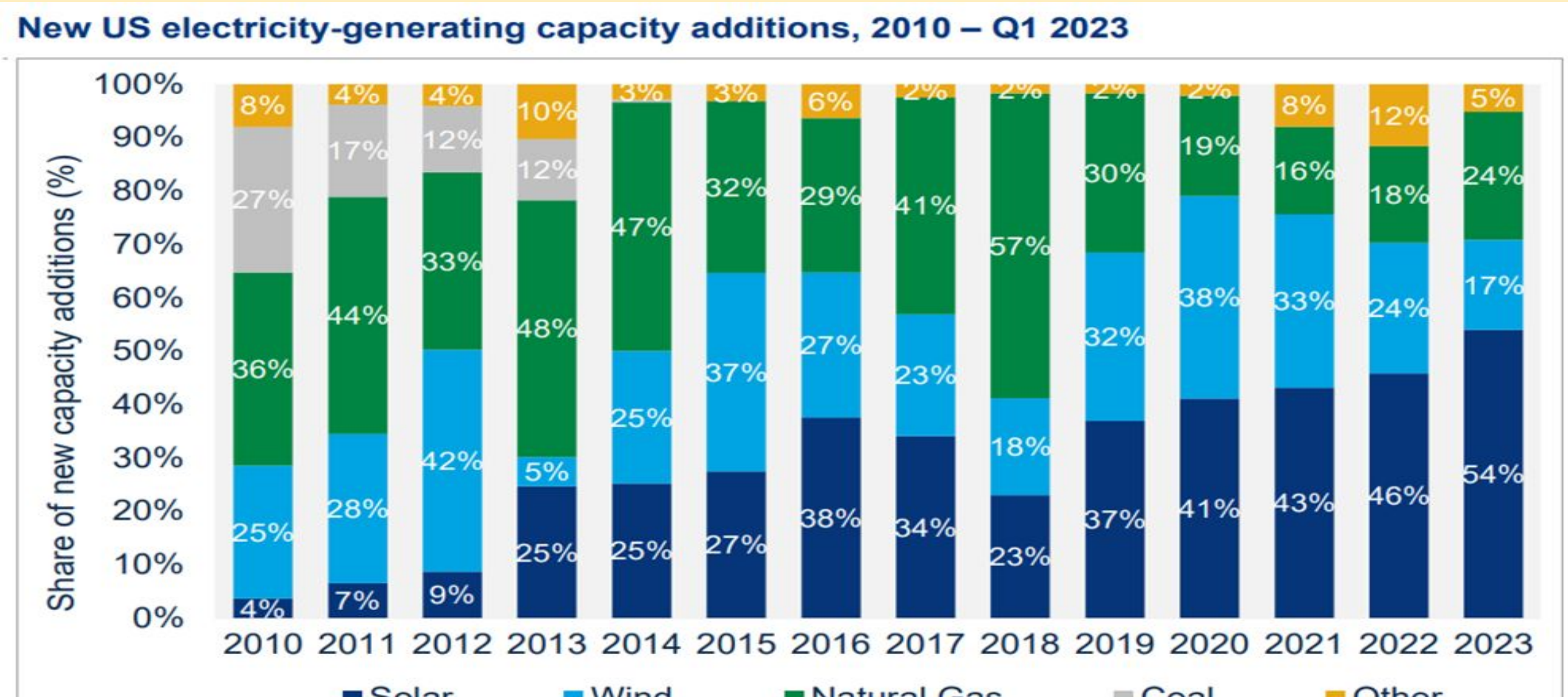
- PJM – Interconnection Queue
- Public Service Commission – CPCN
- Local Permits: Include County/Municipality permits and Local Utility Interconnection
- State permits - MDE

PJM's Transition to New Interconnection Process Began July 10

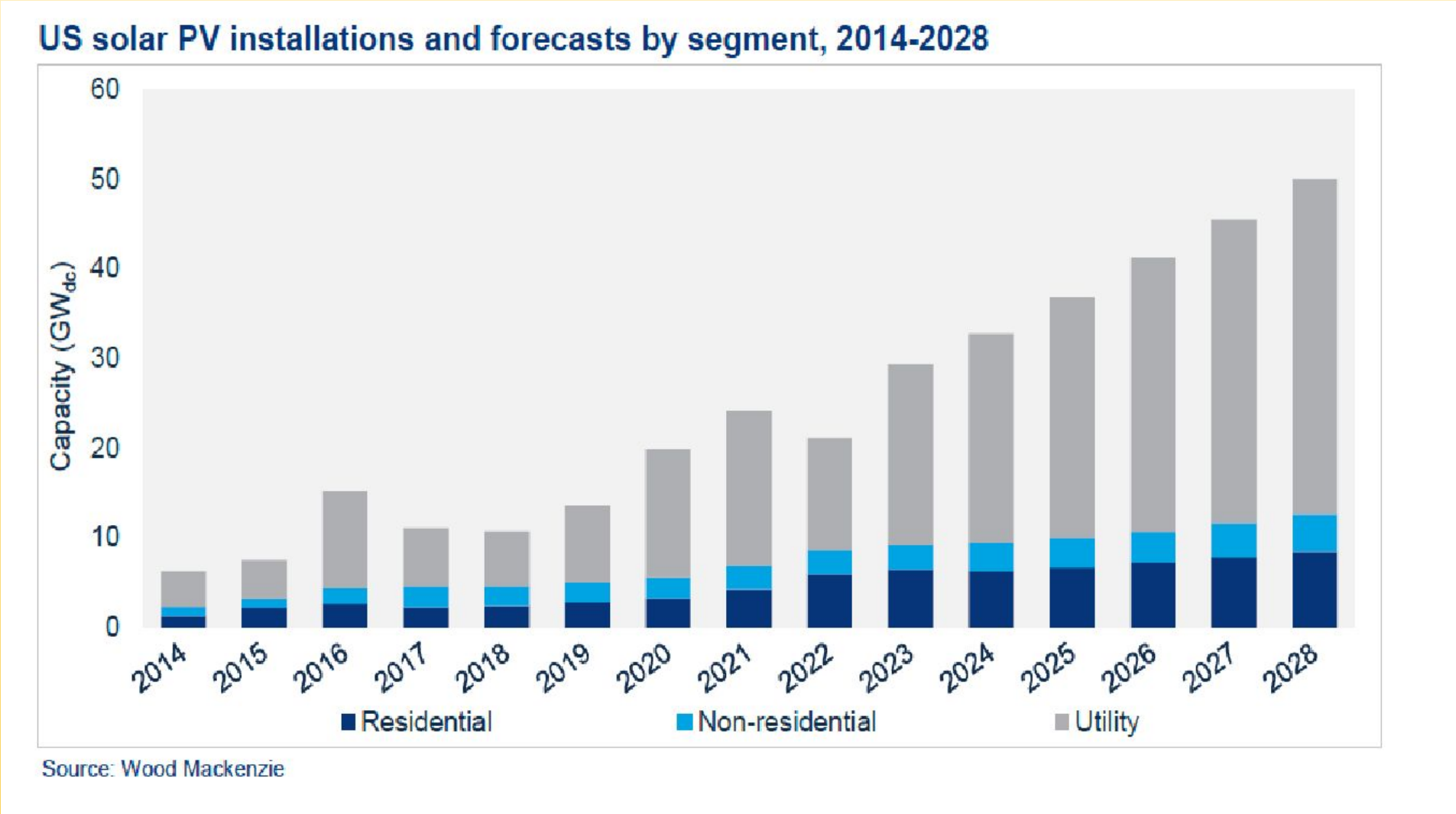
- Anticipates 260,000 MW of generation capacity to be studied over the next three years (95% renewable projects).
- Priority is given to those Projects "shovel ready".
- But... Delays will continue until the backlog is reduced.
- <u>New Interconnection requests will not be reviewed until 2026.</u>

Wood Mackenzie Solar Energy Industries Association (SEIA)

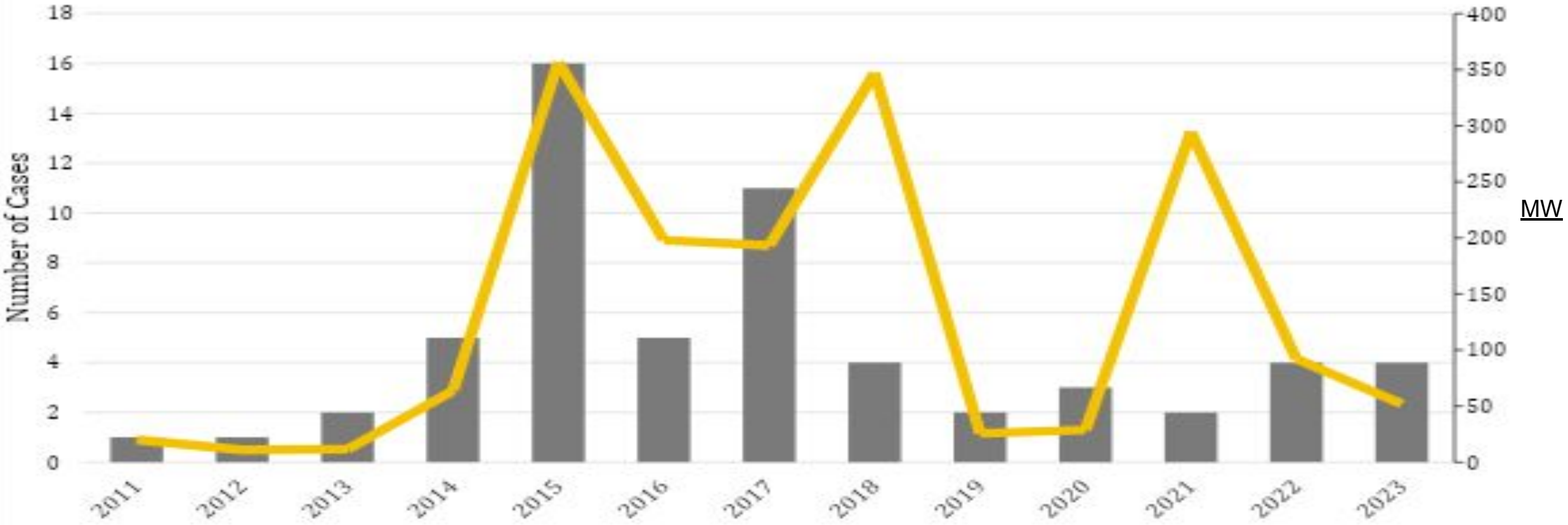
US Solar Market Insight® June 2023



US Solar Growth Projections by Wood Mackenzie and the Solar Energy Industries Association (SEIA)®

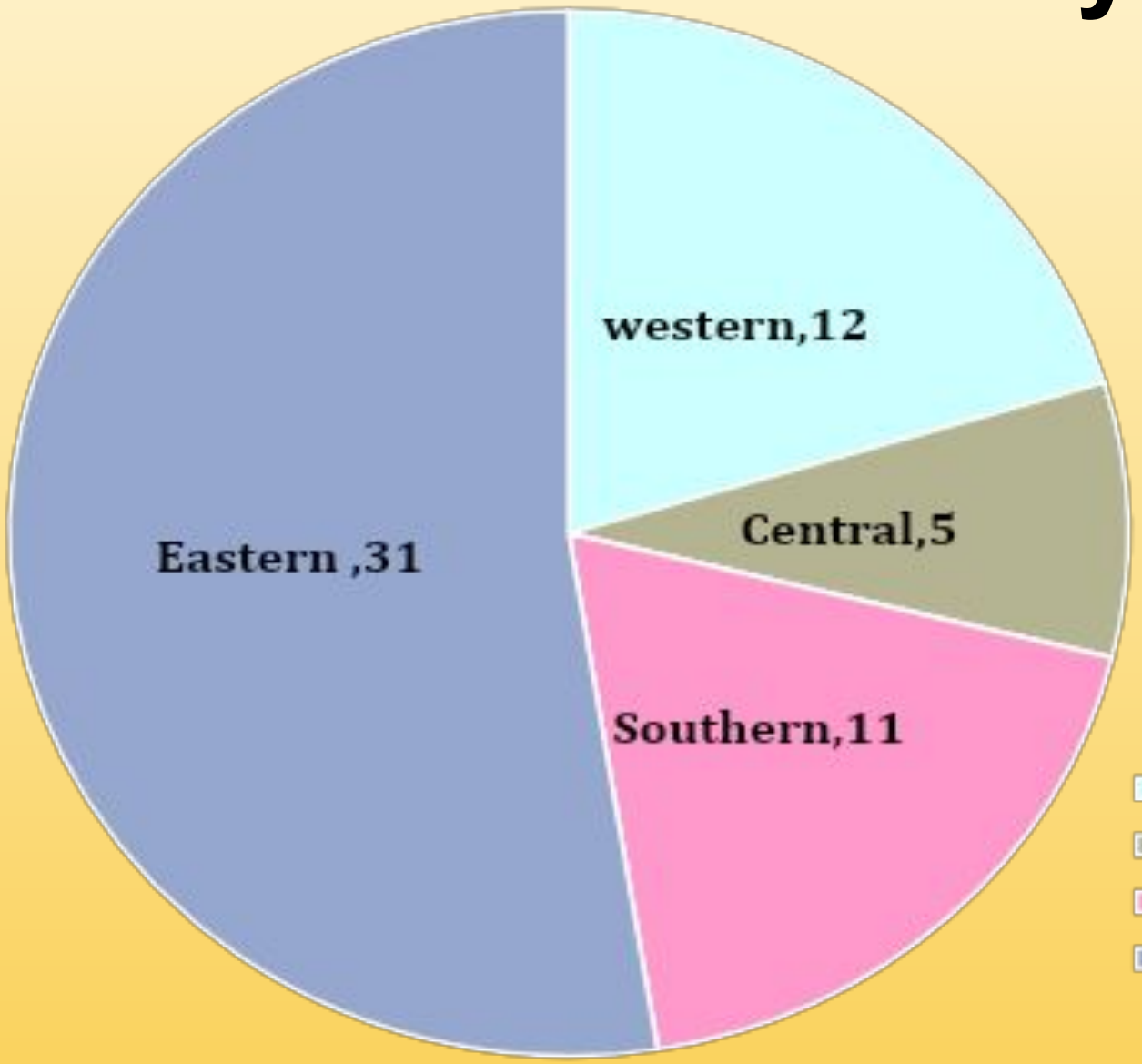


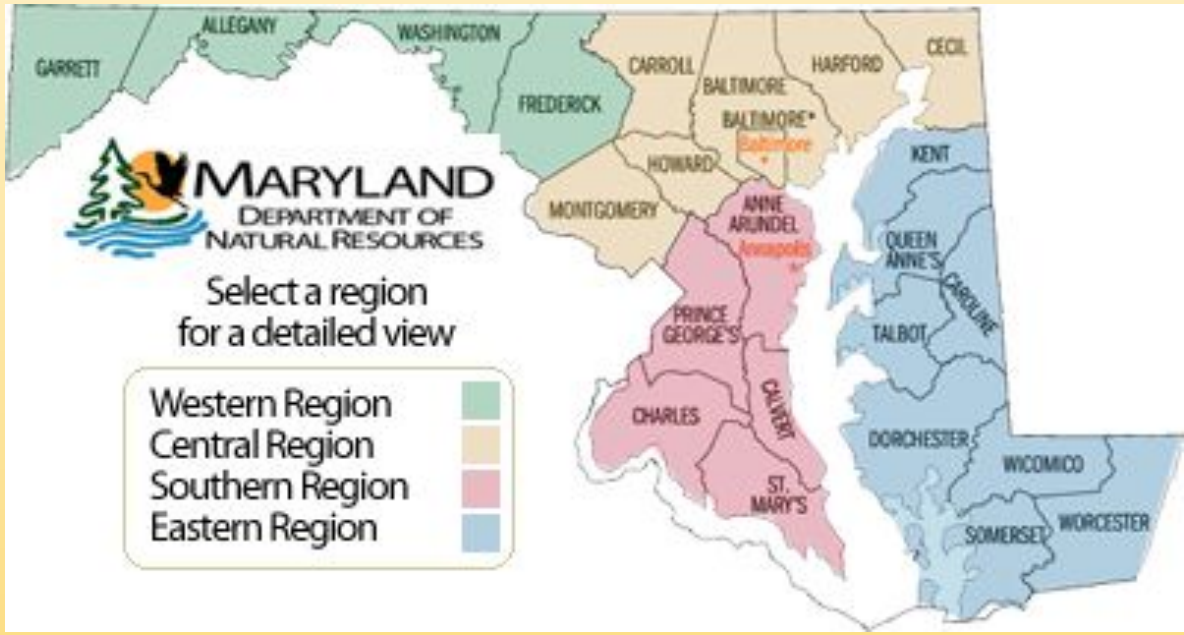
Maryland Utility-Scale Solar CPCN Cases by Year and Associated total MWs



Individual Utility-Scale Solar Projects Ranged from 5-202 MW.

Number of Utility-Scale Solar Cases by Region





PSC's Solar CPCN Cases from 2011 to November 2020.

60 Solar Cases Filed to Date:

4 - In review

1 - Currently with suspended schedules

4 - Applicant withdrew CPCN applications

1 - PSC denied (Mills Branch, Kent County)

1 - Relinquished their CPCN

49 - Granted CPCN

1/49 are on Brownfield sites

Current Status Of Solar Projects who have Received a CPCN

- By Dec. 2023 MWs Maryland will 398.8 MWs Operational Utility Scale Solar Projects
- By Dec. 2026 – Additional 851 MWs expected to be operational

Summary:

- By 2026, an additional 17 CPCN approved Utility-Scale Solar Projects will become operational, equaling 1249.8 MWs.
- 34/49 Utility Scale Solar Projects have firm operational dates

In Maryland, Utility-Scale Solar CPCN Cases by Year and Associated Total MWs Projected for 2024-2026.

Individual Utility-Scale Solar Projects Ranged from 5-202 MW.

Current PPRP Study

PPRP is currently conducting a study to investigate the reasons for post-CPCN Utility-Scale operation delays

PPRP goal is to complete that study in the coming weeks

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