

Solar Industry Perspective

Task Force on Renewable Energy Development and Siting

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Maryland's Solar Positioned for Action

- US has deployed over 69 GW.
 - 2 million plus homes
 - 24+ GW of utility scale

Today Maryland is ranked 14th, 1,170 MW in-service

- Today Maryland has over 64,000 homes with solar
- Growing capacity for over 15,000 community solar subscribers
- At 6,500 MW represents \$16+ billion investment
- Over 4,500 currently employed in the MD market
- Over 20,000 new jobs projected for CEJA

- *Ratepayer Impact reinvested through grid, societal and economic benefits at 1:4 ratio, per PSC's [Value of Solar](#) study*

Solar Workers are not only on Rooftops!

- Electricians
- Material Handlers
- Heavy Equipment Operators
- Lawyers and paralegals
- Finance professionals and lenders
- Office administrators
- Marketing specialists
- Web and social media managers
- Project managers
- Delivery and freight logistics
- Environmental specialists
- Landowners
- Land surveyors
- Personnel managers
- Education professionals
- Policy specialists
- Supply chain specialist
- Operations technicians
- Operations managers
- Manufacturer's representatives
- Conference planners
- Construction safety specialists
- System designers
- Project engineers
- Electrical engineers
- Structural engineers,
- Civil engineers
- Environmental engineers



- County inspectors
- County planners
- County permit reviewers
- MDPSC staff
- PJM staff
- Public utility interconnection reviewers
- Public utility line technicians
- County inspectors

Messages for the Maryland Clean Energy Center Summit, October 24th 2019

“The cost of doing nothing is huge...Central banks are recognizing the cost of doing nothing ...Doing nothing is not an option - however the opportunity of doing something is where we have to be. We are doing it in Md.”

•Senator Chris Van Hollen

“Leverage the opportunity around you...It’s an awesome time to be in the energy sector”.

•Maryland

PSC Chairman Jason Stanek

Future is now in Dorchester County

“With its hundreds of thousands of acres of land, Dorchester ranks fourth largest among Maryland’s 23 counties; but it will shrink to 14th by 2100 as nearly half the county turns to open water.”

Tom Horton, Marylander, writer, teacher 2018 Yale Environment360 film
[On the Chesapeake, A Precarious Future of Rising Seas and High Tides](#)



Part 1: Developing & Siting Residential Solar

Residential solar power creates the greatest number of permanent, local jobs on a per MW basis.

Excellent for home generation- offset & backup

- Works well with net metering
- Pathways for net zero
- Ideal for EV charging offset loads
- Paired with storage for added value

Some Siting Challenges

- Roof conditions
- Split Incentives
- Historic preservation concerns
- Shading issues –trees or neighboring structures



Part 2: Developing & Siting Commercial and Community Solar

Community Solar

1. Unlocks solar access to ineligible customers
2. Projects are never more than 20 acres in size (2 MW)
3. Counties are struggling with understanding the value of solar and simply zoning out solar or placing moratoriums on community solar projects

Commercial Solar

1. Commercial rate design makes ROI for solar challenging
2. Access to ANEM can accelerate commercial use of solar
3. Ballasted systems, such as rooftops and parking canopies are common
4. Brownfield sites require considerable local balanced contracting

Part 3: Development & Siting Utility-Scale Solar

*Common **Misconceptions** Around Utility-Scale Solar*

1. Solar can be treated like other land uses. By creating “solar zones” we can reach our energy deployment goals while ensuring few residents live close to solar facilities.
2. Once a county permits a large project, developers will flock to the county to build more projects, ie “solar sprawl.”
3. Most of the utility-scale projects can be placed on Maryland’s brownfields and parking canopies
4. Solar is at odds with the agricultural economy

The subsequent slides dispel each of these myths

Common Concepts/Misconceptions Driving Solar Siting Concerns

1. We can/should treat solar like other land uses and create “solar zones” where we want solar to go
Fact: Unlike other land uses, solar siting is driven by technical constraints that cannot be mapped.
2. We can/should just put solar on brownfields/landfills/car ports.
Fact: There is negligible capacity for solar on Maryland’s contaminated lands. With supportive policies, the capacity is limited to between 200 to 400 MW statewide.
3. “Solar Sprawl” - Where there is 1 solar farm today, will there be 10 tomorrow?
Fact: The nature of scarce transmission capacity means that each solar farm that is developed is likely to make it more difficult/costly to fit another solar farm in the same area of the transmission grid.
4. Solar farms will destroy the agricultural economy/way of life.
Fact: Maryland can meet its RPS obligations through 2030 with less than 1% of the state’s ag land devoted to solar farms with permitting conditions that ensure a net positive impact to local communities

What Constrains Solar Siting?

- Limited carrying **capacity** in Maryland's transmission infrastructure is the dominant constraint for siting a solar farm, and it is both **dynamic** and **unmappable**.
- Any efforts to map the desired locations for solar farms **will not reflect the locations** that will actually have room for solar power on the grid.
- Average time of PJM transmission study process from initial application to project energization is >5 years.
- PJM interconnection queue shows locations of projects in queue. Due to scarcity of transmission capacity & long PJM process, this effectively reflects the location of most utility-scale solar farms through 2030.
- **Take-away**: Siting policy targeting transmission-level solar needs to be flexible to allow for development where there is transmission capacity.

Transmission Capacity Dictates the Solar Industry

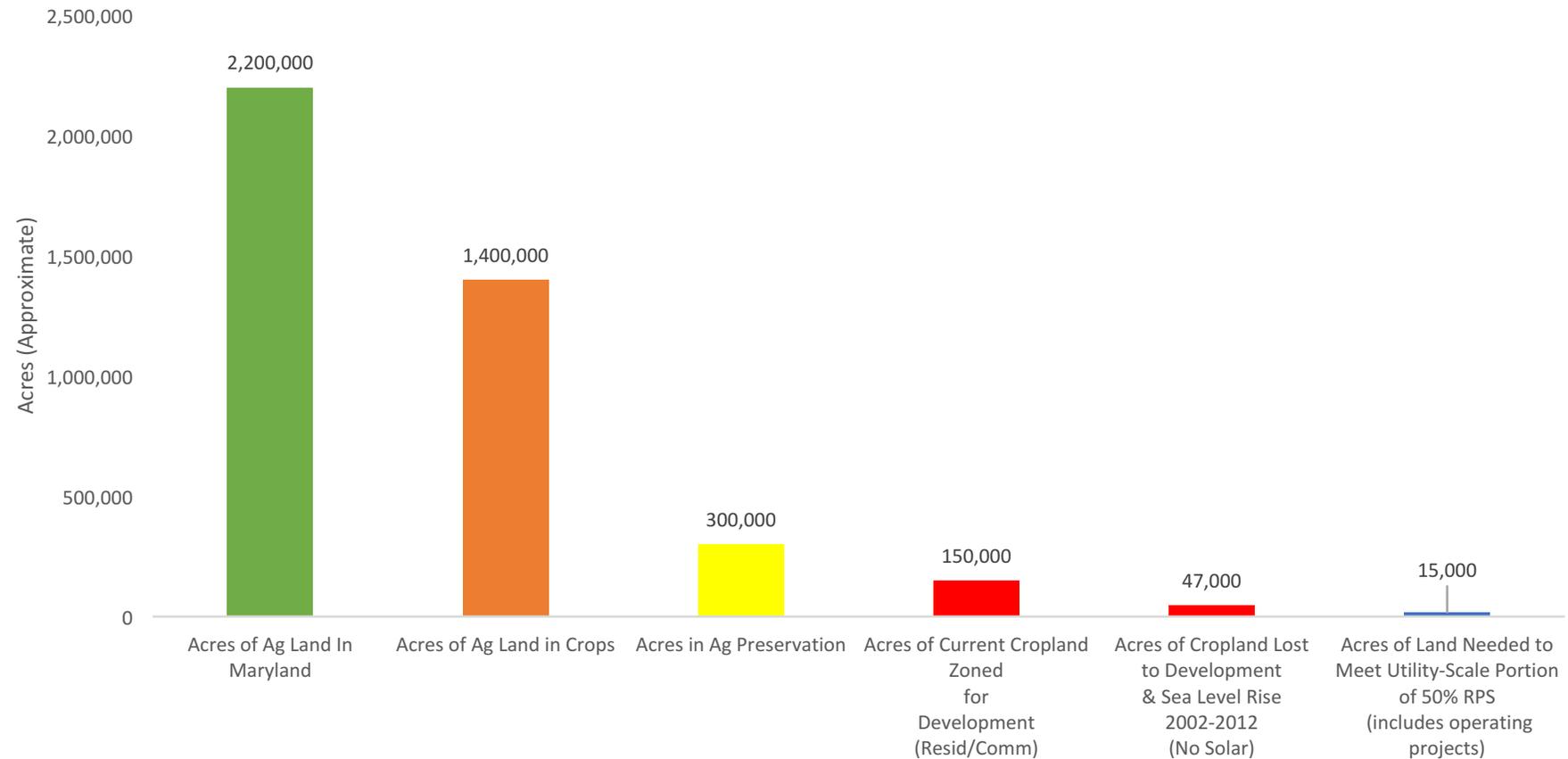
- Proximity to high voltage transmission lines is not sufficient to make a project viable, because room on the transmission lines is scarce and unmappable.
- “Reverse Sprawl:” Solar developers compete over space on the transmission grid, one project can displace another if it is built first!
- Factors external to the industry - such as an industrial facility closing - affect transmission capacity, hence why it takes **years** for the utility to study

What About Solar on Brownfields & Landfills?

- Maryland's solar industry screened two databases totaling over 400 contaminated sites across Maryland (full report at www.mdsolarcoalition.com)
- The opportunity to develop solar on contaminated sites in Maryland is negligible, limited to a range of between ~200 to ~400 MW across the state, assuming enabling legislation.
- Policies designed to incentivize solar development on these sites must address numerous challenges with their commercial viability.
- ***Uncertainty around transmission injection capacity and landowner interest at these sites remains an obstacle even with enabling legislation.***

MD Farmland Development Pressures In Context

Maryland Solar Siting on Farmland in Context



- ~Half of Maryland's solar mandate will be met by ~2000 MW of utility-scale solar by 2030. If ~90% of that is developed on farmland, that translates to around 15,000 acres of Maryland farmland used to host solar through 2030.
- In context, Maryland's counties & municipalities have zoned ~150,000 acres of the state's ~1.4m acres of current cropland for residential/ commercial development.

Recommendations for Siting Task Force

1. Provide best practices to towns and counties for education, economic, environmental and technical issues. The VA DMME and University of Virginia now have experts in-house to provide support to counties with this expertise
1. Address barriers and accelerate community and commercial solar deployment through expanding current MEA grant programs, opening ANEM to commercial entities and community solar program changes to incentivize commercial engagement.
1. Adjust NEM program cap to facilitate distributed generation sector growth, increase community solar system size cap to 5 MW
1. Support expansion of residential solar by addressing restrictive covenants, streamline permitting process to reduce soft costs of distributed generation, develop tools to expand solar access to LMI communities
1. Confirm value of solar as a soils restoration tool at degraded soil (ag) sites
1. PPRP to issue pollinator friendly standards for projects

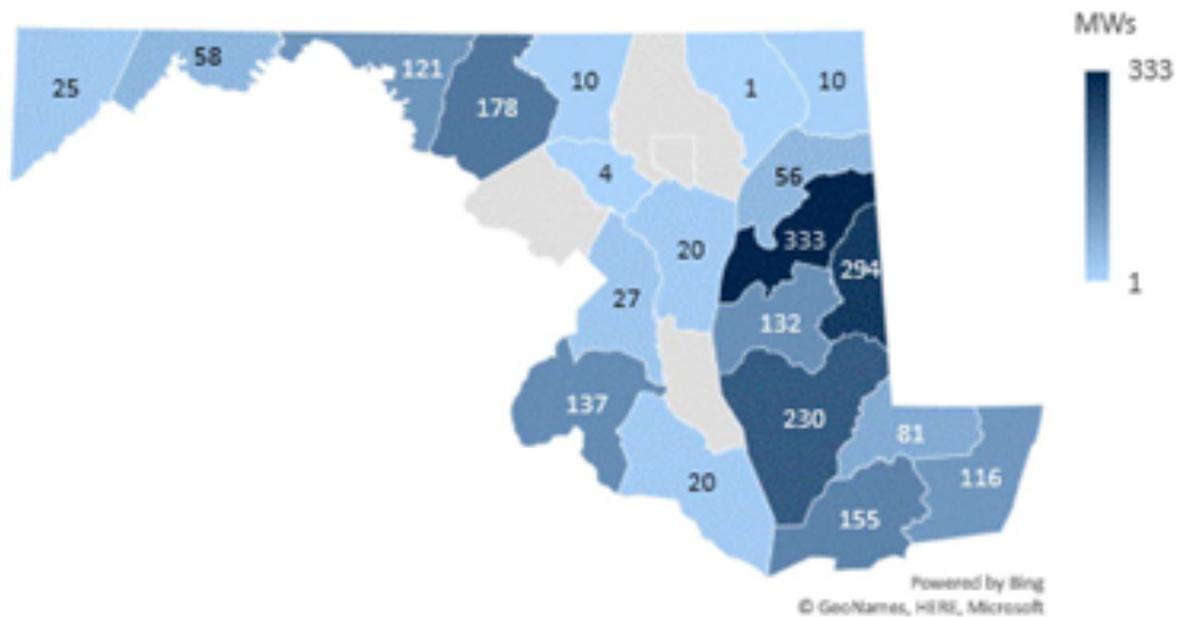
Appendix

1. Where are the large projects in Maryland's queue?
2. How does the CPCN process govern responsible solar siting process?
3. How are local voices heard in the permitting process?
4. How can developers mitigate viewshed concerns?
5. How do I calculate the acreage required based on the size of a project?

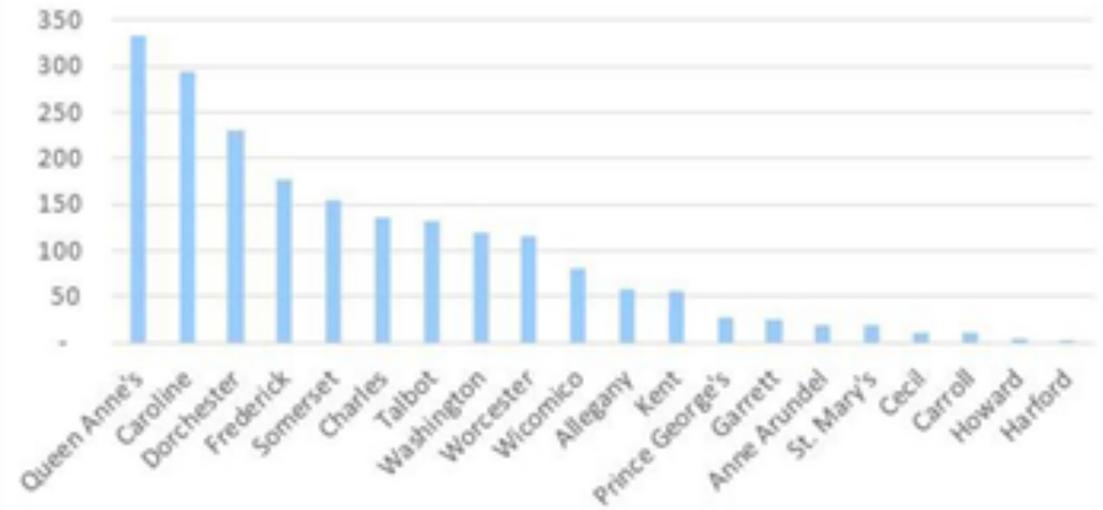
Solar MW in Maryland's PJM Queue

There is a total of 1,912 MW of solar in Maryland's PJM queue, which includes 1,269 MW under study, 33 MW under construction, 266 MW suspended projects, 100 MW in pre-construction, and 245 MW that are currently operating.

MW of Solar in Maryland Transmission Queue by County



MW of Solar in Maryland Transmission Queue by County (operating, under development, & suspended)



Our neighbors share similar issues

“Farmland is valuable, and a finite resource. Even if a solar array produces energy for the next 25 years, eventually, a farmer will be able to plant crops again in that field.

We don't want to lose our productive crop ground for good, but we also want to encourage farmers to make the best economic use of their land. We are hopeful that solar, following proper construction standards, can be a competitive economic use for some Pennsylvania farm ground, while preserving the land for future use.”

Pennsylvania Farm Bureau letter to Sen. David Argall, Chair, Senate Majority Policy Committee. October 22, 2019

State CPCN Process for Permitting Large Solar Projects

- Projects over 2 MWs (~16 acres) are permitted through the state CPCN process. Projects up-to 2 MW are entirely governed by the local permitting process.
- Department of Natural Resources' Power Plant Research Program (PPRP), on behalf of the PSC, is charged with evaluating the water quality, wildlife, soil, stormwater, health, and economic impacts of each project.
- The CPCN process gives significant consideration for local/county land use preferences in the final determination.
- PPRP can impose any conditions necessary to avoid negative impacts and can recommend against a permit if any negative impacts are deemed to outweigh a proposed project's benefits. Standard conditions include setbacks, planting of vegetative screens, decommissioning requirements and bonding.
- A public utility law judge considers evidence and determines approval or denial of permits on behalf of PSC, though PSC can have final say on appeal.

State Permitting with Significant Local Input

- In 2017, the Maryland solar industry worked with MACo to **strengthen the local voice** in the state's CPCN process, and to date numerous permitting decisions for solar projects that have been permitted or have been rejected for a permit through the CPCN process have mentioned the added weight given to local input and zoning.
- Numerous counties have developed **ordinances** that are **routinely considered** & referenced as part of CPCN permit decisions **by public utility law judges**.
- Maryland counties have taken **varying approaches to participation in the CPCN process**, including:
 - Some counties rely entirely on the state CPCN process vs. a local process
 - Some counties have passed solar ordinances as their expression of input into the CPCN process but have merged the local process into the CPCN process
 - Some counties require projects to go through the local process which then informs their input into the CPCN process
- Open question (especially since key 2019 Maryland court ruling affirming state preemption of local zoning) as to **whether it's appropriate to submit local applications for CUPs** vs. local governments participating in CPCN process as interested parties or intervenors.

CPCN Process In Practice

- Forest Conservation Act (FCA) - Solar projects subject to the CPCN process **must comply with the FCA** with the exception of a narrow exemption in statute that allows CPCN solar projects that are not removing forests and that comply with the local Forest Conservation Ordinance to be exempt from mitigation requirements. All other solar projects subject to CPCN must comply with FCA requirements.
- Decommissioning – As a standard condition on all CPCN projects, **PPRP requires that projects be decommissioned and the land restored at the end of a project’s life**. The required decommissioning plan must include a financial mechanism (ex. bond) to ensure that decommissioning occurs.
- Vegetative Screening – A common condition across all CPCN solar projects **requires that trees, shrubs, and other vegetation be planted around solar projects** in order to obscure their view from the public. Such conditions often include financial assurances to guarantee screening efficacy.
- Stormwater – Maryland Department of the Environment has guidelines that govern stormwater management for solar farms. Solar projects also typically require National Pollutant Discharge Elimination System (NPDES) stormwater permit coverage and other state regulatory approvals including conformance with stormwater management, sediment and erosion control, and consistency with Critical Areas.

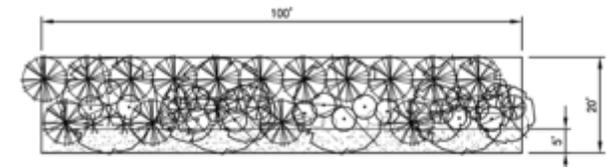
Utility Scale Solar Best Practices - Screening

- Screening may be appropriate in some cases, such as mitigating impacts to historic structures or other visually-sensitive receptors
- Consists of a “row” of hedges, short trees or naturalized, native plantings to create “green wall”
- Cost can be significant so usually not applied as blanket approach to entire project perimeter
- PPRP generally requires screening as indicated by local authorities and across from all sensitive receptors/scenic bi-ways



LANDSCAPE BUFFER PLANT SCHEDULE					
SYMBOL	PLANT	ROW	ROW WIDTH	ROW SPACING	ROW HEIGHT
☐	11	✓	✓	✓	✓
	12	✓	✓	✓	✓
	13	✓	✓	✓	✓
	14	✓	✓	✓	✓
☐	15	✓	✓	✓	✓
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	37	✓	✓	✓	✓
	38	✓	✓	✓	✓

LANDSCAPE BUFFER POLLINATOR MIX		
PLANT	ROW WIDTH	ROW SPACING
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**FULL SCREENING
TYPICAL LANDSCAPE BUFFER (100' x 20')**
NOT TO SCALE



How To Calculate Acres of Solar on Farmland

- Acres of Utility Scale Solar on Ag Land By 2030 =

- [(Eligible Retail Power Sales in 2030 x 14.5%) ÷
- Solar Net Capacity Factor ÷ 8760 (no. of hrs. in a year)] x
- % of Supply Met by USS on Ag Land x
- Acres of Solar per MWac

FORMULA NOTES:

MWh solar needed by 2030

Converts MWh to MW

Limits to solar on ag land

Converts MW to Acres

- Acres of Utility Scale Solar on Ag Land By 2030 =

- [(61,760,000 x 14.5%) ÷ 25% ÷ 8760)] x 45% x 8 = **14,718 acres**

- 14,718 acres translates to just over 1,800 MW of solar, which is consistent with what we know about the current PJM transmission queue and process₂₃