MEMO: Learnings and Recommendations from the "Solar Deep Dive," an exercise exploring barriers, solutions to accelerating solar deployment in Maryland

October 25, 2023

The "Solar Deep Dive" effort was formed to help environmental advocacy organizations and industry explore the barriers and challenges to solar and potential solutions, and to facilitate alignment around potential prioritization of how to address the issues. This effort, conducted between May and October of 2023, brought together over 20 solar developers, renewable energy trade associations, and clean energy advocates to explore barriers and solutions to solar deployment in Maryland. After identifying and agreeing on the above aspects, surveys and discussions were used to facilitate agreement on the most important and impactful issues to tackle.

The findings and recommendations in this memo are endorsed by the following organizations and businesses (updated October 25, 2023): Chesapeake Climate Action Network * Chesapeake Physicians for Social Responsibility * Chesapeake Solar and Storage Association (CHESSA) * Coalition for Community Solar Access * Earthjustice * Goodleap * Maryland Sierra Club * Maryland League of Conservation Voters * Maryland Rooftop Solar Coalition (MRSC) * Open Road Renewables * Poolesville Green * Solar Energy Industries Association * Solar United Neighbors * Sunrun * Trinity Solar

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I. Introduction

Maryland has established a public policy goal to rapidly expand solar energy as a source of electricity. It has set a statutory target of achieving 14.5 % of the state's electricity consumption from solar generation by 2030, and the state is exploring even more ambitious targets in light of the state's greenhouse gas reduction goals and Governor Moore's commitment to achieve 100% clean energy by 2035.

However, despite this target and several supporting policies, for the past several years Maryland has rarely reached half of its annual target. Even with target adjustments made in the face of the COVID pandemic, we are still far from the trajectory needed to meet our 14.5% target (graph below). Solar faces a variety of financial challenges as well as permitting and regulatory delays and barriers from local and state governments. Addressing these challenges requires clear identification of the challenges, viable solutions, and coordination amongst advocates and state government to make the necessary adjustments.

Despite this, industry groups and advocates are optimistic about the potential growth of solar. In the last decade, solar has experienced an average annual growth rate of 24% (SEIA/Wood Mackenzie Power & Renewables U.S. Solar Market Insight, 2023). Thanks to strong federal policies like the solar Investment Tax Credit, rapidly declining costs, and increasing demand across the private and public sectors for clean electricity, there are now more than 155 gigawatts (GW) of solar capacity installed nationwide, enough to power 27 million homes. Many of these solar systems also include energy storage capacity that provides dispatchable power to the grid or end-user when it is needed most. Solar systems can be grouped into three main sectors: utility-scale, distributed generation (also called "rooftop" and "residential/commercial" solar), and community solar.

There are several efforts underway in Maryland to understand and address the challenges to solar and other renewables, including the Task Force to Study Solar Incentives, the Public Service Commission (PSC)'s Distribution System Planning Work Group, and others.

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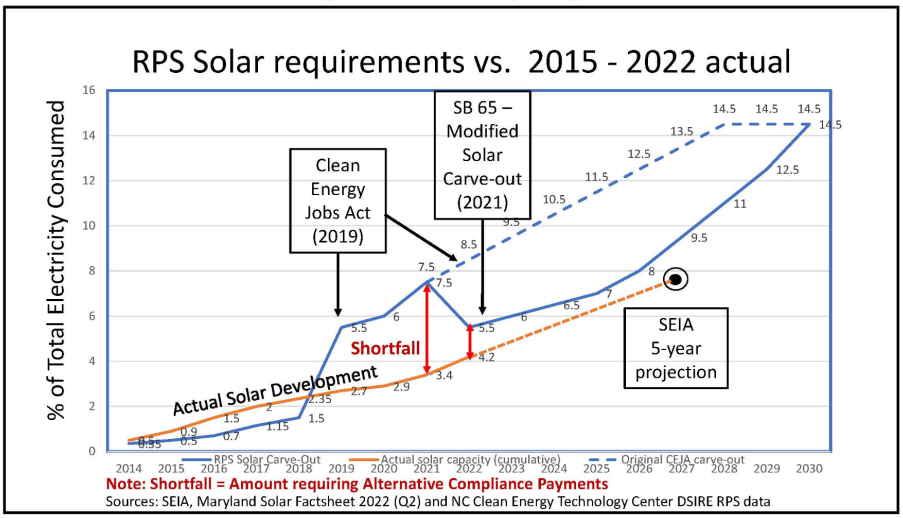
The report is organized around types of solar (residential/commercial, community solar, utility solar), with a discussion of specific barriers or challenges, as well as various opportunities for potential solutions. Some challenges and opportunities span multiple types of solar.

Maryland solar progress



Types of Solar Energy

A utility-scale solar power plant can utilize several solar technologies – primarily photovoltaics (PV) or concentrating solar power (CSP). Regardless of the technology, utility-scale solar systems sell the electricity they generate to wholesale utility buyers, not end-use consumers. Utility-scale solar plants provide the benefit of fixed-priced electricity during peak demand periods when electricity from fossil fuels is the most expensive. Utility-scale solar has been generating reliable, clean electricity with a stable fuel price for decades. Developing utility-scale solar power is one of the fastest ways to reduce carbon emissions and put the United States on a path to a clean energy future.

Electricity produced at or near the business or residence where it is used is called distributed generation (DG). Rooftop solar is the most common and well known type of distributed solar energy project, but DG solar systems can also be ground-mounted. Regardless, the electricity generated from DG solar is typically connected to the local utility distribution grid, where it can provide electricity to the grid during times when the system is producing more electricity than the customer is using. Net energy metering, which is a policy mechanism that allows residential and commercial customers to be financially compensated for the electricity they provide back to the grid, is a key benefit of installing DG solar systems.

Finally, community solar refers to local solar facilities shared by multiple community subscribers who receive credit on their electricity bills for their share of the power that facility produces. This is a comparatively new model of solar and is being rapidly adopted nationwide, including in Maryland, where recent legislation made the state's community solar pilot program permanent. Community solar provides homeowners, renters, and businesses equal access to the economic and environmental benefits of solar energy generation, regardless of the physical attributes or ownership of their home or business.

II. Residential Solar

Since 2016, the Maryland residential solar industry has experienced substantial decline and stagnation, all while Maryland continues to fall short of its clean energy goals. In contrast, the national residential solar market is experiencing historic growth and contributing meaningfully to climate, economic development and environmental justice goals. Further, as of 2021, only 8% of installations in Maryland (286) were for customers with household incomes below $50k, while nationally households in this income bracket comprised 15% of installations. In 2016, Maryland households with incomes below $50k made up 10% of new installations (2,027).[1]

[1] https://emp.lbl.gov/solar-demographics-tool

Currently, the residential market in Maryland deploys approximately 5,000 systems each year, a nearly 80% drop from 2016 levels despite residential solar generating 43% of the state's solar energy.[2] The Maryland Energy Administration (MEA) estimates, as presented in the Solar Task Force meeting on July 18, 2023, that Maryland needs at least 130,000 additional homes with solar by 2035 to meet its current Renewable Portfolio Standard (RPS), which is equivalent to installing around 11,000 systems annually.[3] This MEA estimation equates to approximately 90MW per year of residential installations; with appropriate policy structures, we believe this segment can contribute substantially to meeting Maryland's clean energy goals. In other climate-leading states, the residential industry in each state installs about 100MW to 150MW of new solar each year.[4]

The residential solar industry segment is akin to the home improvement industry, and its potential for year-over-year deployment of solar plays a pivotal role in generating local, family-sustaining, and stable local jobs and fostering economic development. Residential solar projects create about 27 jobs per megawatt installed, which is more than any other type of solar project.[5] Put into context, in 2022, 55% of installation and project management solar jobs came from the residential segment.[6] Expanding this segment will directly expand local jobs.

The rooftop industry holds significant potential to make meaningful contributions towards achieving climate goals. This industry operates using existing infrastructure that doesn't place additional pressure on open lands, a crucial consideration in urban and densely populated areas. Rooftop systems reduce stress on the grid as electrification increases, particularly when they are paired with storage and other energy management technologies.

Additionally, rooftop solar empowers residents to take control of their energy future by allowing them to invest their own capital in sustainable solutions, thus making strides in addressing climate change on a local and individual level.

Residential Solar Summary of Learnings and Recommendations

Through the solar deep dive survey and conversations, a consensus emerged that the most urgent barrier to expanding rooftop solar was the overall cost and the related payback period for a homeowner to recoup expenses. Near-term solutions include the use of alternative compliance payments for grants and tax credits. Increasing and better targeting Solar Renewable Energy Certificate (SREC) values would have a significant impact on the cost of residential solar.

Broader RPS reform was seen as perhaps most impactful in the long term, but requiring more significant study and stakeholder conversations before specific suggestions could be made. However, the group did feel that there may be narrow but impactful steps that can be taken to increase SREC values (via increasing the alternative compliance payment (ACP)) and/or targeting values to specific types of solar. We identified joint solar and storage as providing an additional growth market as well as grid benefits, but requiring additional targeted incentives.

Many participants identified that maximizing federal funding has a potentially transformative impact, but it was difficult to assess the likelihood of success or scale of potential impacts.

Improving and standardizing local permitting was identified as another key barrier that causes delays and confusion for developers and homeowners. Adoption of new systems would take a year or more for local jurisdictions, so we encourage the state to explore legislation or regulation an online standardized solar permitting tool.

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[2] PJM GATS

[3] https://energy.maryland.gov/SiteAssets/Pages/SolarTaskForce/Solar%20Incentives%20Task%20Force%202023.07.18.pdf

[4] ttps://nj.gov/bpu/pdf/boardorders/2022/20220518/8C%20ORDER%20MW%20Reset%20Cost%20Cap.pdf).

[5] https://www.freeingenergy.com/facts/jobs-solar-installation-residential-utility-g207/

[6] https://irecusa.org/census-solar-job-trends/

We identified that in the next few years, Maryland would be approaching the current net-metering cap. The conversation about increasing the cap should start now, but action will not be required for a few years. Similarly, we identified that despite multiple forces that will accelerate demand for upgrades, Maryland lacks an overarching strategy for upgrading electric panels, which could lead to a bottleneck or barrier as demand increases.

There are some issues that are impeding solar development, but for which we were not able to identify viable solutions within Maryland's authority, which we've captured for the record. For example, several participants shared that the minimum setbacks on roofs (set via fire safety standards) led to a significant loss of value of each project, but the scope of the solution made progress on this unlikely.

1. Financial Barrier and Optimal Price Point

Issue

Fundamentally, Maryland homeowners' economic calculations dictate whether to install a solar system -- currently there is a payback ("return on investment") period of 11 years or more; in states with a robust residential market, the payback period is closer to 7 years. The root of this issue, in turn, lies in the structure of Maryland's main solar incentive programs, the most significant of which is the Solar Carve-Out in Maryland's RPS and the associated value of anSREC, whose value is set by a combination of policy and market forces. Currently, the RPS policy, and thus the value of anSREC in the SREC market, does not take into account the different economics of different market segments. Additionally, the current residential solar grant offered by MEA is too small ($1k does not drive a homeowner to decide to install solar), is underfunded (runs out early every year), and does not allow for all business models to participate (third party ownership is excluded).

A robust general market is a fundamental component that plays a crucial role in supporting disadvantaged communities effectively. It allows companies to become more efficient and profitable, making it possible for them to provide affordable options to all. A strong market also fosters sustainability, attracts investment, and promotes development, benefiting both mainstream and underserved areas. *In essence, a healthy general market is a cornerstone for addressing the needs of Low to Moderate Income, Overburdened and Underserved (LMIOU) households.*

However, a robust general market is necessary but not sufficient to meet Maryland's goals of reaching households in low to moderate income and underserved areas. By definition, these customers face more challenging household economics than the average homeowner. Therefore, a higher incentive, combined with targeted funds for roof replacement and panel upgrades, is also needed to fully address this market. Residential solar customers in Baltimore save as much as $900 during their first year of solar ownership. On average, residential solar increases the value of a home by about $15,000, which can help LMIOU households accumulate wealth.[7] [8]

Solutions

Other climate-leading states such as New Jersey, New York, Illinois and Massachusetts all have differentiated incentive structures that allow for a robust residential market. We believe an intermediary solution is needed to bridge the gap while policymakers develop more comprehensive RPS reform. These "bridge" solutions could be instituted in the short term, and limited to three years, to facilitate the growth of the residential rooftop industry while negotiations for a broader RPS reform package continue.

The group discussed short term actions and longer term, more expansive solutions. Short term actions focused on strategies utilizing administrative authority, including MEA's use of revenue from the Regional Greenhouse

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[7] https://nccleantech.ncsu.edu/wp-content/uploads/2019/05/Going-Solar-in-America-Ranking-Solars-Value-to-Customers_FINAL.pdf

[8] https://www.energy.gov/energysaver/benefits-residential-solar-electricity

Gas Initiative (RGGI) and ACPs. We recommend that these funds can be most impactful through a strategy of expanding direct grants for residential systems.

From 2023-2025, MEA expects to receive over $200M in SACP revenues – up from just over $50,000 in 2022. HB 550 (2023) clarified that the portion of these funds used to promote renewable energy would focus on low to moderate income census tracts and overburdened and underserved communities. We recommend a significant portion of these funds be dedicated to expanding the Residential Solar Grant program, to serve customers within the Low Income and Overburdened and Underserved (LMIOU) census tracts. The Residential Solar Grant Program's grants should be increased to reduce the customer payback period to closer to 7 years and should be expanded to allow participation of all business models. MEA should establish a higher grant level for customers who identify as low income, and MEA should explore low-barrier identification methods, including self-identification, to streamline the process. Under the same grant program, MEA should use RGGI funds to provide a similarly expanded grant to customers living outside of LMIOU census tracts.

We recognize there will likely be analysis required to identify the ideal price points for grants, but we offer these recommendations to seed the conversation: For homes within LMIOU census tracts, up to $5k could be provided per system, and households that are verified as low and moderate income within LMIOU census tracts could receive up to $7k - $7.5k. Up to $3k-$4k could be offered to customers living outside of LMIOU census tracts (likely sourced from RGGI). We recommend exploring the utility of refundable tax credits.

Additionally, we urge that all possible incentives for low income homes be braided together into a single program. Many low to moderate income homes may require electric panel upgrades and roof repairs. Funds could come from existing state funds (such as the ACP budget) or future federal funds (e.g. Solar for All, HOMES and HEEHRA grant programs under the federal Inflation Reduction Act).

While the most direct way to affect the financial equation for residential solar is to increase the value and stability of the SRECs that these systems receive, the SREC market is intertwined in a larger RPS reform conversation. Maryland is the only state that is leading on climate and does not differentiate its incentive programs for each of the different market segments (rooftop, community solar, and utility-scale solar). The RPS reform conversation, while needed, is not likely to be concluded for several years; hence there is a need for a bridge solution in the interim. Participants were generally open to differentiated SREC values for residential, community, and utility-scale solar, in recognition of the different economics of each sector, but felt that this must be paired with other steps (discussed later on) to remove non-financial barriers to the deployment of community and utility-scale solar.

2. Lack of Policies to Encourage Deployment of Residential Solar and Storage and Lack of Compensation for Helping to Meet Grid Flexibility Needs

Issue

Currently, only a small percentage of solar customers have adopted onsite battery storage. The only rationale that customers have under the existing policy structure is to install battery storage as a back-up measure. The relatively low number of outages in Maryland means an investment for resilience purposes is often not attractive or attainable for the average consumer, much less for low-to-moderate income consumers. Utility customers with solar+storage need a way to monetize the various values that they can provide to the grid, as those additional value streams will help make solar+storage more attractive to the average consumer and more accessible to low-to-moderate income consumers.

While solar provides numerous benefits to the grid, solar paired with battery storage adds a level of flexibility and additional technical capability to provide grid support. As the grid undergoes a transformation to accommodate widespread electrification, the need for flexible resources at the grid edge will be at a premium. Additionally, the ability of a solar+storage customer to meet the demand for flexibility with clean, onsite energy

reduces grid congestion, can lower system and local peak demand, and reduces line losses associated with grid-delivered power.

Solutions

States in the Northeast have begun developing programs to compensate battery storage devices for performing grid services, primarily system peak reductions, through “ConnectedSolutions” programs. The Commission needs guidance and direction from the legislature to develop programs on a large enough scale to support tens of thousands of Marylanders in adopting solar+storage in the next five years to help increase flexibility at the grid edge. The ConnectedSolutions model provides an upfront cash rebate to help offset the capital cost of installing the battery storage device and then provides a stream of compensation to the battery for performing valuable grid services on a pay-for-performance basis.

The ConnectedSolutions programs are hosted within energy efficiency programs in Massachusetts and pass cost-effectiveness screening. Maryland should lean in to launching its own form of ConnectedSolutions that aims to meet as many of the state’s policy goals as it can, including expanding access to onsite clean energy systems to low-to-moderate income households through a higher upfront incentive to those households. Customer-sited solar+storage will be an important component of making the energy transition happen in a cost effective manner, but absent some intervention and policy directive, the market has not materialized to date. A program that compensates solar+storage for flexible grid support and encourages further deployment through cost-effective ratepayer-funded rebates will provide a significant hedge to the potential cost of electrification on the grid.

3. Inconsistent and Slow Local Permitting for Rooftop/Residential

Issue

Local jurisdictions are responsible for setting zoning and design parameters for solar and creating a permitting process. Permitting rules and application processes differ from jurisdiction to jurisdiction. Further, elements are often ambiguous, leading to uncertainty and process delays. These delays and ambiguities lead to additional costs for companies installing rooftop solar. Secondly, there are cases where jurisdictions have created custom electrical guidance for solar, which is unnecessary and cumbersome.

Solutions

AHJs (Authorities Having Jurisdiction over solar zoning/permitting) should adopt an online standardized permitting system. The most common is a tool called “SolarApp+,” which allows a jurisdiction to enter its permitting parameters into the system. Developers enter the application information into the portal and once a reviewer verifies the application content, the SolarApp+ program automatically generates the result.

MEA is receiving $3.8M from DOE to provide grants to support AHJs. However, there was concern from participants that incentives alone might not be sufficient to move a majority of jurisdictions quickly to new systems.

To facilitate rapid adoption, one model is California’s Solar Access Act (SB379, Wiener), which requires most cities and counties to adopt some type of online standardized permit process, which includes, but is not limited to, SolarAPP+.

The Solar Deep Dive assessed this as an impactful action, and one in which there was sufficient information to support 2024 action, but ranked this as less of a priority than addressing the financial actions.

4. Net Metering Capacity Cap

Issue

Maryland's existing Net Metering capacity cap is an aggregate limit on eligible renewable generation capacity that can participate in net metering or community solar. As of the 2022 report from the Public Service Commission, "the current level of installed capacity, approximately 1,033 megawatts ("MW"),1 is 34.4 percent of the eligible." In 2021 the cap was increased from 1500MW to 3000MW. Based on likely growth from community and residential solar, the cap will need to be increased again before 2031. Arbitrary caps that are frequently exceeded frustrate market development. Caps can create "start-stop" conditions that create price volatility and inhibit the development of efficient supply and value chains.

Solutions

Legislative action to address the existing 3000 MW net metering cap would be required as the cap is approached. Efficient growth of residential, community, and ANEM solar beyond 3000 MW will be constrained if the cap isn't raised.

Alternatively, completing a "value of solar" analysis or applying the Uniform Benefit Cost Analysis currently under development at the PSC will set the appropriate point for program review -- when the net costs exceed the net benefits. In other words, this system will replace the cap with a better system of cost-effectiveness analysis.

5. Increased Demand (and lack of overarching strategy) for electrical panel upgrades

Issue

Electrical panel upgrades will increasingly become an issue as battery deployment and electrification increase. As a result, consumers who require a panel upgrade will face additional costs and possibly additional delays at the time of attempting to procure solar and storage, creating a delay and disincentive for solar, storage, building electrification and installation of electric vehicle charging. Given the multiple policy goals that require panel upgrades, we recommend the development of a more holistic strategy for upgrades.

Solution

First, Maryland building codes should require solar and electric vehicle (EV)-ready electrical wiring and panels for all new construction and major renovations.

Second, we recommend the PSC study the issue and recommend strategies to incentivize and streamline solutions for panel upgrades. The status of electric panels should be flagged as part of any audit and the state should identify strategic opportunities to incentivize upgrades, similar to how rooftop solar is often more economical at the time of a roof replacement.

On the regulatory side, through ia interconnection rules, the PSC should allow for the use of meter collar adaptors. The PSC interconnection working group has submitted a draft rule to the PSC that includes a provision requiring utilities to allow meter collars and to establish a process for testing and certifying specific devices. The hearing for these proposed changes is set for December 5, 2023. Collar adaptors can be installed between a home's meter and the meter socket, allowing for a single access point for solar, storage or electric vehicle needs that can avoid the need for a more expensive main electrical panel upgrade to facilitate those new loads. Meter Collar Adapters are a relatively low-cost alternative that can dramatically reduce the amount of time for installation of a home battery or an EV charger.

6. Restrictive setbacks on roof

Issue

Prohibitive setback requirements from a roof edge reduce available usable space by 22%. Excessive setbacks also often prohibit system expansions and upgrades (systems installed before setbacks were instituted are not grandfathered).

Solutions

Work with fire-code officials; generate recommended state standard fire safety requirements for solar (example - R.I.). Watch future building codes to ensure that any setbacks, if proposed, are appropriate and necessary for Maryland specifically.

III. Community Solar Specific Issues

Maryland has a mature community solar market, originally enabled through legislation that passed in 2015, which established a pilot program. The pilot has held annual capacity allocations since 2017 – with set amounts distributed by each investor-owned utility and further separated into various “capacity buckets” differentiated by project size and location as well as the type of customers served. There is currently about 120 MW of community solar capacity operating in Maryland, and nearly 400 MW that is either reserved (under development) or waitlisted in the pilot program due to the pilot’s capacity limits.

The pilot will become a permanent program at the end of 2024 due to legislation that passed in early 2023. The permanent program has no capacity limits other than the state-wide net metering capacity cap of 3,000 MW, of which about one-third has been met, leaving nearly 2,000 MW available for community solar and other net metered projects. In addition to new community solar project development – which the passage of the 2023 legislation has already begun driving in the state – projects that were stuck in the pilot queue or waitlist can become operational in the permanent program.

The permanent program will accelerate the deployment of community solar in Maryland over the coming years, and it will also ensure that disadvantaged and underserved residents and communities will directly benefit from the projects being deployed. In the permanent program, projects must allocate at least 40% of capacity toward low-or-moderate income customers, and ensure those participating customers receive bill savings. The permanent program also incorporates consolidated billing, which is consumer friendly and allows for greater flexibility for lower-income customers to benefit from community solar, in addition to other benefits from state or federal energy aid programs.

While community solar in Maryland is rapidly growing and evolving into one of the most equitable markets in the country, it is not without its challenges. In several counties in Maryland, the development of ground-mounted solar projects has become prohibitive, due largely to concerns associated with aesthetics or agricultural interests that are perceived as competing. This has in turn created bottlenecks for interconnection due to congestion on the grid in areas where permitting is more reasonable. Counties have permitting jurisdiction over projects up to 2 MW in size, but projects between 2-5 MW fall under the PSC’s jurisdiction, which means they might not be subject to some of the more challenging county-level ordinances.

Summary of Learnings

Siting and zoning emerged as the most impactful barrier to community solar deployment, and will become an increasing challenge as this sector grows. Addressing other potential barriers - such as creating an alternative to the CPCN or updating the community solar application - will prepare the process for the growth that Maryland is building toward.

1. Local Zoning, Permitting and Siting

Issue

Siting is currently the single greatest constraint to community solar deployment in Maryland; however, note that it also represents a challenge for utility scale solar, discussed in the next section.

In Maryland, counties are the primary AHJ, and the zoning and permitting rules and process vary widely from county to county. Community solar projects can be up to 5 MW in size. While a county can influence the state-administered Certificate of Public Convenience and Necessity (CPCN) review process for projects above 2 MW (discussed in both the next community solar subsection as well as in the utility-scale solar section), projects sized up to 2 MW are wholly subject to the county's jurisdiction. Some counties have (or had) reasonable ordinances that enable responsible development of community solar projects. But increasingly, there is a trend to all but prohibit future ground-mounted community solar development. The most challenging ordinance requirements vary by county and range from market-undermining limits on the number, size, or proximity of projects, to more blatant restrictions (specific to solar) on agricultural lands.[9]

This direction by many counties in recent years has resulted in a major disruption to the momentum of the state's community solar market and an inequitable distribution of community solar capacity and landowner development opportunities from county to county. Further, the areas with more reasonable county ordinances have drawn greater developer interest, which has in turn created more bottlenecks on interconnection (discussed further below), resulting in a one-two punch against siting community solar projects in Maryland.

Solutions

County ordinances should follow some level of standardization that relies on national best practices and balances the state's various policy interests. Recent legislation passed in Illinois, HB 4412,[10] provides a useful example of a state-level approach to setting basic siting parameters. The Solar and Storage Study Institute also recently published model legislative language (and an accompanying memo) that demonstrates how a state could create baseline standards and processes required in county permitting for utility-scale renewable energy projects.[11] Another potential tool is to expand the CPCN process to preempt projects that are 2 MW and below in cases where county ordinances are unreasonable.

2. Streamline Permitting Process at Public Service Commission for Smaller-Scale CPCN Projects

Issue

Community solar projects between 2 MW and 5 MW need to secure a CPCN, which is a robust state-level permitting process run by the Public Service Commission (PSC) and the Power Plant Research Program (PPRP). Although there has yet to be a community solar project requiring a CPCN, there are a confluence of factors that are expected to make this a major development area for the market. The ability to interconnect a project above 2 MW was only recently enabled in Maryland through the passage of HB 440[12] in 2022, which raised the limit from 2 MW to 5 MW. This, combined with the passage of HB 908[13] in 2023, has accelerated developer interest in the state, and the combination of local county challenges (described in the prior subsection) and limited interconnection points due to utility technical interconnection requirement constraints

[9] As one example, Carroll County recently voted to remove the entire subsection of its ordinance regarding solar in agriculturally zoned districts.
[10] Illinois (2023) HB 4412 - https://ilga.gov/legislation/publicacts/102/PDF/102-1123.pdf
[11] Solar and Storage Study Institute. Found here: https://www.ssii.org/comprehensive-siting-legislation-page/
[12] Maryland (2022) HB 440 - https://mgaleg.maryland.gov/2022RS/Chapters_noln/CH_581_hb0440t.pdf
[13] Maryland (2023) HB908 - https://mgaleg.maryland.gov/2023RS/Chapters_noln/CH_652_hb0908e.pdf

(described in the next subsection) is sparking a mass focus on projects above 2MW that can leverage the state-level permitting process.

The problem is that the CPCN process was designed for very large transmission-level power plants and the PSC and PPRP were not resourced to handle a flood of smaller-scale distributed generation community solar project applications. Further, the CPCN process is expensive, inefficient, and time-consuming for these smaller projects - taking 12 to18 or more months for approval and involve an adjudicated process that can cost double, if not multiple times more than, a standard permitting process (for a project not exceeding 2 MW) for a community solar applicant.

Solutions

The PSC and PPRP should develop a streamlined permitting process that is appropriate for solar projects of up to 5 MW (or similar size) that leverages best practices and is more cost- and time-effective. This is important both for the administrative role of the PSC/PPRP in reviewing the applications as well as for ensuring the cost and time on the applicant/developer don't prevent applications from occurring in the first place. The state should also expand the personnel at the PPRP to be able to meet the anticipated workload associated with the increased applications.

3. Update and Improve the Utility Technical Interconnection Requirements; Such as Removing Arbitrary Circuit Capacity Limits

Issue

Maryland's utilities are implementing Technical Interconnection Requirements[14] ("TIR") without any outside oversight or justification of reasonableness or necessity. The TIR are artificially constraining the amount of DERs that can be interconnected based on the broad application of crude rules of thumb (e.g., limit of 3 MW on a common 12-13.8kV feeder), and which have no regard for actual grid conditions at a given location. This approach is not consistent with common practice across the country and represents a major barrier to state clean energy goals**.**

Running additional interconnection lines to get beyond these capacity limits leads to significant costs to solar developers - *building direct feeder lines costs roughly $1 million a mile* - making many potential projects non-feasible and thus impeding progress on solar. Many states (like NY) allow for similar voltage circuits to host 8-12 MW of solar, with the circuit capacity set by a technical analysis of the circuit itself, not an arbitrary and excessively low cap.

Solutions

Eliminate the use of aggregate circuit capacity limits, and replace them with a hosting-capacity based screening methodology. More specifically, remove the arbitrary 3 MW circuit capacity limit by instituting analysis of capacity using standardized and transparent screening parameters, as is done in NY. Maryland's PSC's Distribution System Planning Work Group and Interconnection Work Group are exploring this; resolution may require a PSC rulemaking or legislation. With this reform, utilities would be able to increase deployment on circuits by 200%+ without additional ratepayer impact.

Other areas of the TIR should also be evaluated and updated for utilities to be consistent with the country's

[14] See Examples: BGE's TIR can be found here (effective 5/1/2021)) - https://azure-na-assets.contentstack.com/v3/assets/blt71bfe6e8a1c2d265/blt23e3e4c0c4c7eff9/BGE_TIR_Rev_1.pdf?branch=prod_alias; and PEPCO's TIR can be found here (effective 10/18/2023) - https://azure-na-assets.contentstack.com/v3/assets/bltbb7c204688a1a6a8/blt40029df57f5ac340/6531347feaa3de000d05f86b/TIR_Summary_as_of_10-18-23_Rev._4.pdf

best practices based on the markets with the greatest deployment (and experience) with distributed generation.

4. Leverage Best Practices and Ensure Timely Implementation of Consolidated Billing for the Community Solar Program

Issue

HB 908 requires utilities to implement consolidated billing for the permanent community solar program by January 2026. This is a critical element of the permanent program, particularly given HB 908's requirement that every project dedicate at least 40% of its capacity to low and moderate income (LMI) customers. It is not only a consumer protection and enables greater access to benefits and broader eligibility among the LMI community.

Under the pilot community solar program, "dual" billing proved to be a major barrier to participation by LMI households. One reason is that energy assistance (EUSP and LIHEAP) payments on behalf of LMI households are only made to utilities, and the benefits are eliminated or severely reduced to a customer that is already receiving credits generated from a community solar project. Under "dual" billing the utility only registers the full credit value that a customer receives via their subscription and doesn't account for the customer's separate transaction (dual bill) with the subscriber organization. Conversely, consolidated billing allows the customer to leverage both their community solar subscription credits and other energy assistance to lower their overall energy burden. Equally important, many LMI households pay utilities for their electricity in cash, at places like supermarkets and pharmacies; with consolidated billing, this cash payment can be shared with non-utility electricity providers, but not with community solar, because it is billed separately. Because of separate billing, community solar is billed through bank accounts or credit cards, which many LMI households do not have or use for bill paying. Consolidated billing will allow community solar to be paid in cash, just like other non-utility suppliers.

All that said, while consolidated billing has been incorporated in several community solar markets, the implementation of it has not always been seamless. Technical details, ranging from general process requirements to the actual infrastructure, can be overlooked and new issues can evolve. This has played out in other markets, and even here in Maryland, the state's implementation of Supplier Consolidated Billing has not been without its challenges.

Solutions

While consolidated billing is mandated by HB 908, its implementation will stretch over two years and there will be great anticipation and demand by the market to use it as soon as it's ready. The PSC must ensure the successful implementation of consolidated billing, including monitoring the utilities to ensure the timing and infrastructure stay on track. Further, the PSC should direct Maryland's form of consolidated billing toward a "net crediting" design, similar to that first established in New York (followed by New Jersey). Net crediting avoids the need for purchase of receivables as well as other complexities associated with more traditional forms of consolidated billing. That said, the PSC should also leverage the lessons learned from New York as it worked through the kinks of being the first state to implement net crediting.

5. Challenge of Implementation of 40% LMI target

Issue

Bad actors among retail energy suppliers, using high-cost "variable rates" and selling conventional energy with clean energy RECs (rather than actual electricity generated by clean energy sources) for increased prices, has fostered confusion and distrust among potential consumers for community solar. The lack of consolidated billing in the pilot program has added to this confusion and distrust.

Solutions

To address the challenge of implementation of the 40% LMI target, Maryland must increase public education and public awareness (trust building) by working with local government and trusted messengers, to make target communities aware of the actual cost savings and real clean energy benefits of community solar.

6. Bottlenecks in PSC Community Solar Application Processing

Issue

Under the Community Solar Pilot Program, the PSC established a process of creating a special entity – a "subscriber organization" – and requiring approval of this entity for a community solar project to be allowed to seek the separate and already complex interconnection and permitting requirements (and the CPCN process for projects >2 MW). This additional administrative process has created an unnecessary burden on PSC staff and substantial delays for program applicants.

Solutions

Remove Subscriber Organization requirement for projects to submit an interconnection application, while maintaining bonding requirements for operating capacity. This would create a speedier project development process, allowing interconnection applications to move ahead without prior PSC approval. The SO ID request can be then made at the same time as the application for capacity under the Community Solar Permanent Program. This would also lessen the number of applications the PSC would need to review, as only SO ID requests for fully developed projects will be submitted. This may be addressed outside of legislation or even regulation, via the PSC staff's administrative protocols. This solution helps more with advancing the timeline to deployment, rather than increasing total deployment.

VI. Utility Scale Only

1. Local Zoning, Permitting and Siting

Issue:

Utility-scale solar also experiences challenges relating to siting and zoning, but it is impacted differently than community solar.

The goal should be to create a siting and zoning approach that:

- Puts Maryland on track to deploy solar at a pace consistent with the state's GHG goals
- Reduce avoidable costs and delays (which either slow pace of progress or add to consumer cost)
- Includes appropriate alignment with state and local land use goals

As noted above, Maryland does not provide rules or even guidance to local governments regarding appropriate or effective local zoning or permitting of solar projects – especially projects large enough to require siting on the ground. In Maryland, counties are the primary AHJ, and the zoning and permitting rules and process vary widely from county to county. Many counties impose conditions – such as a minimum distance between solar projects or a total number per council district – that lack any clear environmental or public policy benefit beyond limiting solar. In many counties, there are sufficient restrictions to create a *de facto* ban on ground-mounted solar.

Most utility-scale and community solar projects are cost-competitive right now. Removing barriers to the

deployment of utility and community solar will allow for accelerated progress towards Maryland's solar goal, independent of the other changes discussed in this memorandum (though many of those changes will certainly help).

For larger projects, while the Public Service Commission does have the authority to preempt local zoning, this only occurs once a developer takes the time and money to develop a CPCN application and move through the cumbersome and costly process. The prospect of an additional lengthy legal battle is enough of a risk to deter developers from pursuing projects in many Maryland counties. Furthermore, when going through the CPCN process, counties typically oppose these projects on the basis of local county zoning bans, which ultimately leads to delays through the CPCN process, as well as puts the PSC in the position of having to overrule local zoning rules.

Solar developers currently view many counties in Maryland as having *de facto* bans. This puts increased pressure on other counties to make up the difference by installing more solar projects, while also removing many potentially economically viable projects from consideration.

Legislation passed in 2023 does streamline aspects of the CPCN process to limit opportunities for disruptive delays. However, after CPCNs are approved, the PSC currently imposes requirements on approved projects that rely on administrative/non-discretionary permitting action by local governments (*i.e.*, site plan review, driveway permits, stormwater permits, etc.). This process can take 4-6 months, or potentially longer if a local government wishes to slow down a process. These steps do not have parameters set by law and can be used to create further delay.

Solutions

These siting and zoning issues require a proactive approach, technical support, and ongoing monitoring to ensure effectiveness.

First, we recommend Maryland develop guardrails to define minimum acceptable siting standards, based on best practices and designs, to achieve solar's contribution to the state's GHG reduction goals. Recent Illinois legislation, HB4412, provides an example of an approach to establishment of a balanced basic set of siting parameters. Maryland will need to engage in stakeholder discussions to identify appropriate state-specific guardrails.

Second, consider creating an ombudsman at MEA, PSC, or even the Maryland Department of Planning, for questions and concerns regarding the implementation of permitting and siting.

Third, Maryland could provide technical staff to the PSC and empower them to perform the non-discretionary review that is currently reserved for local governments. For example, PSC or PPRP technical staff, already familiar through work on the CPCN process, could review final site plans for conformance with the various CPCN licensing conditions imposed on a project by the PSC. This is the model in Ohio and other states.

2. Limited Number of Projects in PJM Queue

Issue

All electricity projects over a certain size are required to submit an application to enter the queue for interconnection to the PJM grid. The application process is not optimized for the pace of new solar and wind projects being proposed, and currently projects face a 5+ year delay. The PJM operators are re-designing the processes, but to facilitate this, PJM imposed a freeze on reviewing any new projects until the new process is established.

This means that the projects currently in the queue are the only viable utility-scale projects that Maryland can deploy in the next four to five years. Projects are proposed at an early concept stage and many do not end up being pursued. In a normal course of operation, this isn't a problem, but with a limited number of projects that can produce utility scale solar, Maryland should take extra steps to support each project.

There are currently around 12 projects in the PJM queue for Maryland.

Solutions

Provide MEA or PSC caseworkers, ideally trained in project management, to connect with project developers and provide support in navigating regulatory or administrative steps, identifying potential barriers, and helping develop solutions when possible.

V. Grid, Transmission, and Interconnection

1. Interconnection - Modernization of the grid

Issue

1. Currently queued PJM solar projects in Maryland – especially those in advanced positions in the PJM queue (*i.e.*, those "Fast Tracked" under PJM queue reform, those in queues AG1 or earlier, etc) – are a finite state resource. If any of these small number of projects fails, they are irreplaceable within the next 8-10 years due to the PJM grid capacity constraints and delayed PJM interconnection approval process.

2. Distribution system planning and modernization – beyond expansion of the 3 MW interconnection capacity, additional planning is absolutely required to transition Maryland's electricity sector from the present unidirectional system, which distributes power from a small number of large generators, to the bidirectional grid that is needed to expand and incorporate distributed energy sources (such as solar, storage, and EVs) that can also put power onto the grid. The distribution grid also needs modernization to increase reliability, manage expected load increases, manage variability in generation and demand, incorporate "non-wire solutions," and increase participation and protection of vulnerable communities.

3. The state also has major transmission system capacity and planning deficiencies:
   a. Bulk power transmission capacity onto (and off of) the Eastern Shore is already limited, resulting in Eastern Shore ratepayers paying additional "congestion costs" for power. This limitation also means that renewable energy generated on the Eastern Shore cannot be readily transmitted to the rest of the state.
   b. As a result, the transmission system infrastructure requirements identified in the POWER Act are also essential for the planned investments in Offshore Wind to be capable of serving the whole state (the Eastern Shore itself is estimated to be able to absorb the first 3 GW of OSW power – after that, the power cannot be sent statewide without additional transmission infrastructure development).
   c. Western Maryland also has limited transmission infrastructure, which will limit the potential development of large-scale renewable energy resources there.
   d. The lack of planning and development of adequate clean renewable energy resources to replace coal-fired generation plants is already leading to proposals by utilities to build expensive transmission infrastructure to support demand; this infrastructure would not be needed if Maryland had coherent strategic planning for its electricity sector, and if built (at substantial cost to ratepayers), would either ultimately become stranded assets or could shape the development of renewable energy generation in ways that are otherwise non-strategic.

Solution

1. Fast track implementation of the utility-scale solar projects that will be first out of the PJM queue.
2. Effective PSC completion and utility implementation of reformed distribution system planning as ordered under Public Utilities Article, § 7-801 *et seq*. The PSC's 2022-2023 effort at developing effective distribution system planning was a failure, with the output rejected by MEA, OPC, and the PSC itself. A second effort is underway, with new leadership, but the process needs to be effectively structured – and monitored by the PSC and the Administration – to ensure that it is not dominated by the utilities' interests in limiting renewable energy expansion and maximizing their own capital development revenue, which (as OPC has noted) is not the same as the state's own needs and interests.
3. State level transmission planning – At present, there is no agreed-upon overall plan to address present deficiencies and future requirements for transmission system strengthening. This will require not just PJM's involvement, but participation by MDE, MEA , PSC, other agencies, the utilities, energy developers, and stakeholders as well. The unfortunate $800 million utility proposal for new transmission capacity to patch the loss of the Brandon Shores coal-fired plant must stimulate immediate implementation of this coherent medium- and long-term transmission capacity and needs analysis.
4. Maryland's PSC should actively participate in PJM's stakeholder workshops around Long-Term Regional Transmission Planning (LTRTP) to proactively identify least-regrets transmission needs, address interconnection issues, and contribute to the development of policies, guidelines, procedures, processes, and regulations that can positively impact Maryland consumers.

2. Absence of an agreed-upon methodology to determine "value of distributed energy resources"

Issue

Maryland does not have a uniform answer to the question, "How do we value the development and function of distributed energy resources (DERs) within our electricity system"? The absence of such an agreed-upon method of assigning value has a major negative impact on the rate of development of distributed energy and its potential positive impacts. Specific issues stemming from this failure include:

1. "Benefit-cost analyses" (BCAs) are a final decision-making criterion for utilities' capital investments in grid and energy infrastructure; however, Maryland utilities do not assign any benefit to the development of DERs. Because the return on investment calculation is a major determinant of utilities' planning decisions, this lack of inclusion of a value for DERs weighs heavily against pro-DER investment by the utilities, which are "investor-owned" and driven substantially by achieving returns on investment.
2. The lack of any agreed-upon value of solar (as a subset of the value of DERs calculation) has repeatedly been used by opponents of pro-solar policies and incentives, such as net metering (opponents cite the "cost" to utilities, in the form of lost charges for distribution costs, without considering any benefits of having distributed energy on the system).
3. While the possibility of strategic development of DERs (including solar, storage, and EVs) to realize "locational value" is given conceptual support, there is no agreed-upon way to calculate that value, leaving the possibility widely unrealized.
4. Lack of a systematic approach to valuation affects the policy and financial support for individuals or organizations to participate in the energy market through aggregation of the output of their DERs (*i.e.*, solar, storage, EVs, and even energy efficiency) and sales into the energy market, which is authorized under FERC Order No. 2222 and should be a key economic support for DER development (and one that does not require public sector incentives.
5. At the highest level, lack of a systematic approach to valuation of the different forms of DER (and the conditions under which they are implemented) fundamentally limits the consideration and management of DERs as the full elements of the electricity system that they need to become.

Solution

Over a year ago, the PSC proposed, but did not implement, a Work Group process to develop a "Unified Benefit-Cost Analysis (UBCA) of Distributed Energy Resources," using the established National Standards

Practice Manual methodology (Case 9674). Within the past several weeks, the PSC has finally activated this process through a Work Group led by an external facilitator.

Given the history of such Work Group activities, the following two conditions should be monitored and assured by the PSC itself, the state Administration, and relevant stakeholders –

- Assure that the process is carried out in a transparent, balanced, and technically sound way, and that the final product represents a balanced and effective approach to policy, planning, regulatory, and financial considerations of DER development (considering the 5 “problem” points above).
- Equally (or more) important, once the UBCA methodology is established, assure its consistent and complete application in policy, planning, regulatory, and financial decision-making.