Maryland SREC Alternatives

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1 Executive Summary

Maryland is striving to become a clean energy leader. In 2019, Maryland has adopted an ambitious goal of achieving 14.5% solar electricity generation by 2030. Earlier this year, in 2023, Governor Wes Moore committed Maryland to achieving 100% clean renewable generation by 2035. However, Maryland is already facing some significant challenges it will need to overcome to achieve these ambitious goals.

Maryland has formed a "Task Force of Solar Incentives" to study how to accelerate solar deployment. The Solar Task Force provides a critical opportunity to update Maryland's solar policy to incentivize a more rapid adoption of this critical renewable resource, which can set the state on track to meet its goal of 100% clean energy generation by 2035. There are a variety of factors that can influence solar deployment, from economics to land use policy to grid regulations. This study focuses primarily on the structure of the Solar Renewable Energy Certificate (SREC) market.

Sierra Club asked Sustainable Energy Advantage (SEA) to review and recommend strategies to accelerate overall solar deployment in a cost-effective manner; to provide differentiated incentives to different project types (*i.e.*, projects sited on brownfields or in low-income communities); and to create a model that is resilient and protective of ratepayers. The problem that SEA was tasked with addressing is that solar deployment in Maryland has been proceeding too slowly to meet policy goals. Currently, Maryland has a system of variable, market-based SREC pricing, a model that multiple states also began with, but have since moved away from.

Based on an analysis of Maryland's solar markets and an evaluation of financial incentives to promote solar in other states, we provide two potential policy approaches. The first is a "firm fixed price" model, which involves empowering a government entity to create fixed prices (on an annual or regular basis) for new solar generation, which would create more predictability and effective incentive targeting. The second recommendation involves several changes to the current model, including a soft floor for SREC prices, a multiplier to increase incentives for more desirable forms of solar—for example, solar that is sited on rooftops, on brownfields, or in underserved communities—potentially coupled with an increase to the alternative compliance payments (ACP) rates, which are effectively a price ceiling in the SREC market. It is important to note that the first and second recommendations are mutually exclusive, so while we encourage Maryland to carefully consider both recommendations, Maryland should not—and logically speaking, could not—*adopt* both recommendations.

I. <u>Recommendation #1: Firm Fixed Prices for SRECs, with Differentiated Incentives for Different Types of Solar</u>

We recommend that Maryland follow the lead of a number of other states in the region by having a state entity—likely the Maryland Public Service Commission (PSC) or Maryland Energy Administration

(MEA)—develop fixed SREC prices on an annual basis that, once applied to a solar project, would apply for a sufficient number of years (*e.g.*, 10 to 20 years) to have spurred the development of the project. This firm fixed price would be most economically efficient if it varies for different types of solar projects, such as residential solar versus community solar versus utility-scale solar. Imposing a firm fixed price for SRECs would reduce the costs of solar installations because facing less volatile SREC prices reduces the financial uncertainty for financiers of solar projects—especially for large, utility-scale solar projects—thereby reducing developers' cost of borrowing money to finance those projects. Additionally, by decreasing solar developers' borrowing costs, a firm fixed SREC pricing policy is expected to decrease overall costs for ratepayers, who ultimately bear the costs of incentivizing solar developments through the SREC program.

In undertaking a firm fixed pricing policy, Maryland would be following the lead of New Jersey, Massachusetts, Illinois, Maine, and New York, all of which provide firm fixed financial incentives for the construction of new solar projects. Currently, SREC prices in Maryland are variable, as they are set by constantly changing market forces. These other states essentially "firm up" different portions of the revenue stream from solar development by setting fixed prices for either the megawatt-hours (MWh) produced by a solar array (*i.e.*, "generation value") or the environmental benefits provided by a solar array, including its avoidance of greenhouse gas emissions (*i.e.*, "environmental value"). Several policies also firm up prices based on the combination of both generation and environmental value.

Maryland should look to New Jersey in particular as an example of a state with strong fixed solar pricing policies that, if adopted in Maryland, would benefit Maryland's solar developers and ratepayers alike. As an illustration of incentives based on generation value, New Jersey offers firm fixed "strike prices," on a competitive basis, for its larger solar projects. The term "strike prices" means that large solar generators are, generally speaking, guaranteed to receive the difference between the price that is bid by a supplier of the energy, and the value that 1 MWh of solar receives in the wholesale market (*e.g.*, the PJM locational marginal price). Fixing the strike price provides additional financial certainty in terms of the revenue that a given solar generator will receive. As an example of incentives based on environmental value, in New Jersey, smaller solar projects receive a firm fixed "SREC 2" price that differs based on environmental and equity policy preferences, with larger incentives accruing to solar installed on brownfields and canopies, and to community solar projects benefitting low- and moderate-income (LMI) communities. Maryland should also look closely at Illinois's policy for incentivizing solar installation, which is similar to New Jersey's, as well as the various state policies described in the body of this report.

Firm fixed pricing policies are often cited as effective policies in other states to accelerate solar installation. In Massachusetts, the Solar Energy Industries Association (SEA) attributed a recent 1,600 MW increase in solar capacity to Massachusetts' firm fixed pricing program, called a "SMART" program.[1] In Illinois, another state that adopted a firm fixed pricing policy, solar installations have recently taken off, dramatically increasing above their pre-2019 levels.[2] New York also saw a dramatic increase in large-scale

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[1] Solar Energy Industries Association, *Massachusetts Solar*, https://www.seia.org/state-solar-policy/massachusetts-solar.
[2] Solar Energy Industries Association, *Illinois Solar*, https://www.seia.org/state-solar-policy/illinois-solar.

solar development after increasing financial certainty for developers by extending the duration of renewable energy contracts—which embody a firm fixed price—from 10 to 20 years.[3]

In Maryland, the optimal entity to set the firm fixed SREC price would be the Public Service Commission, likely subject to statutory authorization from the General Assembly. The Maryland Energy Administration could feasibly play this price-setting role as well. In order to assess the optimal firm fixed price, Maryland should analyze what incentive level would be needed to support its policy goals at minimum cost.[4] Even with a firm fixed price for solar, Maryland can alter this price over time, as market conditions change. While the price would not change for individual projects, which would be locked into the prevailing fixed price at the time of their installation, Maryland should revisit the appropriate incentive levels that apply to future projects on a regular basis (e.g., annually).

II. Recommendation #2: SREC Floor and SREC Factors (with SREC Factors Providing Differentiated Incentives for Different Types of Solar)

If Maryland does not decide to impose a firm fixed price for SRECs, Maryland should modify its current SREC program to incorporate both a floor price and "SREC factors." A floor price differs from a firm fixed price in that, when there is a price floor, the value of an SREC can float within a range of prices depending upon the market supply and demand for SRECs at a given time, but the SREC price is restricted from falling below a certain lower bound—the "floor." As discussed below, SREC factors are multipliers that change the number of SRECs a project receives by project type. The use of SREC factors will similarly change the value of a project's SREC revenue based on the type of solar projects that Maryland might like to incentivize to different degrees.

The Maryland SREC market does not currently have a floor, so SREC prices could drop significantly if the supply of solar were to increase dramatically, which could cause instability and uncertainty in the SREC market. As explained below, at a recent Solar Task Force meeting, someone mentioned that there are currently 855 megawatts (MW) of large solar projects in the pipeline. If all of these projects were built, they would push up the supply of SRECs and drive down their price. Imposing a floor that the SREC price cannot fall below would mitigate that price risk and provide solar developers with more financial certainty, lowering financing costs.

In tandem with adopting an SREC price floor, we also recommend that Maryland develop SREC factors, which are multipliers that can increase or decrease the quantity of SRECs that accrue to a given MWh of solar generation. Currently, for 1 MWh of solar generation, a project generates 1 SREC, but under a policy of SREC factors, a solar project would produce more or less than 1 SRECs for every 1 MWh of solar

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[3] New York contracted for a single large-scale solar project in solicitations between 2011 and 2016, and after changing the contract term, New York solicited 96 solar projects from 2017 to 2021. *See* NYSERDA, Past Main Tier Solicitations Under the RPS, https://www.nyserda.ny.gov/All-Programs/Clean-Energy-Standard/Important-Orders-Reports-and-Filings/Renewable-Portfolio-Standard/Past-Main-Tier-Solicitations; NYSERDA, Solicitations for Large-Scale Renewables, https://www.nyserda.ny.gov/All-Programs/Large-Scale-Renewables/RES-Tier-One-Eligibility/Solicitations-for-Long-term-Contracts.

[4] This is also called a "missing money" calculation, which is an administratively determined calculation solving for the additional ("missing") revenue required to make a project type financially viable to develop.

generation. The SREC factor would vary based on a project's type and size, pursuant to the state's policy goals. For example, under an SREC factor policy, Maryland could provide 1 MWh of solar generated on a greenfield with 1 SREC, whereas 1 MWh of solar generated on a brownfield or in an LMI community could earn 2 SRECs. Similarly, SREC factors can provide higher incentives for types of solar that are currently under-incentivized. For instance, Maryland could provide 2.5 SRECs for 1 MWh of power generated from a solar project by a residential customer, whereas utility-scale solar generators in Maryland may continue to receive 1 SREC for 1 MWh of solar generated. It is economically efficient to institute SREC factors, which incentivize the installation of a larger quantity of preferred types of solar (*i.e.*, solar on brownfields rather than greenfields) at a lower overall cost to ratepayers.

Under Recommendation #2, once Maryland incorporates the protections of both a price floor and SREC factors and creates a market for SRECs with floating prices above a certain price floor, Maryland would be in a good position to increase the ACP if solar development is falling short of policy goals. Currently, the solar market has an effective "price ceiling" in the form of the ACP that load-serving entities (*i.e.*, companies that supply electric generation to retail utility customers) owe when they do not "retire" the minimum required quantity of solar.[5] ACP prices form a ceiling price in the SREC market because energy suppliers in the PJM market would elect to pay whichever of those two prices is lower. All things being equal, a market with a higher ACP will have higher SREC prices.

If Maryland's General Assembly were to authorize the PSC or MEA to increase the ACP value without having an SREC price floor in place, this could create an unstable situation in which Maryland incentivizes the buildout of so much additional solar supply that SREC prices would crash, as an increase in supply would drive down SREC prices. While we recommend imposing an SREC price floor, as well as SREC factor that incentivizes more construction of preferable solar projects, before raising Maryland's ACP, an SREC floor and SREC factor do not necessarily have to be accompanied by a change in the ACP. However, increasing the ACP price too high carries some risks. It can be inefficient—that is, economically more costly—to raise the ACP if the PSC or MEA determines that supply is increasing sufficiently already. After all, increasing the ceiling that an ACP creates unnecessarily high, is not free of costs; with an ACP set at an unnecessarily high level, for example, SREC prices could be allowed to float too high, such that Maryland ratepayers could simply be paying more than they have to for each MWh of solar generation.

The specific monetary values of fixed SREC prices, or an SREC price floor, or ACP values, should ultimately be set by an administrative agency, such as the PSC, following an economic study. Accordingly, we are not providing concrete recommendations for what those values should be.

III. Policy Recommendation Number Three: Maryland Should Incorporate Environmental Values in Its SREC Market

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[5] In order to avoid paying ACPs, energy suppliers in the PJM market must obtain the sufficient quantity of SRECs and "retire" them in the PJM system, such that no other generator can use them. *See* PJM, *About GATS*, https://www.pjm-eis.com/getting-started/about-GATS.aspx.

As discussed in greater detail below, Maryland can structure its SREC market to compensate for—to pay for—not just the power generation value of a project (the price per MWh), but also other environmental values, such as whether a project is built on a brownfield, or in an LMI community, or as a canopy of parking lots. Maryland could do so by creating "multipliers" of SRECs that compensate a given solar project at a higher or lower price per MWh depending upon what types of projects Maryland would most like to incentivize.

For example, because Sierra Club would prefer to see development of solar projects on brownfields and other previously industrialized lands, on rooftops, and over parking lots, rather than on green fields, it would recommend that Maryland provide the structure for higher SREC revenue (via differentiated firm fixed prices for different project types as part of Recommendation #1 or differentiated SREC Factors as part of Recommendation #2) for the energy generated from such projects. Similarly, because Sierra Club strongly supports reinvestment in economically depressed communities and the return of equity to those communities, Sierra Club would recommend that Maryland create a structure for higher SREC revenue for solar projects that are built by, or owned by members of LMI communities, overburdened communities, or minority owned businesses. Finally, because Sierra Club values family supporting jobs in local communities, Sierra Club would recommend that Maryland create the structure for higher SREC revenue for projects using prevailing wages with local labor training apprenticeships.

The following sections provide background material that informs the above recommendations.

2 Foundational Assumptions & Analysis

SRECs (and RECs) are imbued with the environmental value of a project's electricity production (*i.e.*, the environmental benefits provided by a solar array, including its avoidance of greenhouse gas emissions), and that value can be economically compensated for—sold—separately from a project's power generation value (*e.g.*, the value of its energy, capacity, and PJM ancillary services). Currently, a single MD SREC, Tier 1 REC, and Tier 2 REC are minted commensurate with 1 MWh of generation from their respective project types, meaning that in Maryland SREC *markets* are structured only to compensate a project for its environmental benefits and attributes and not for its power generation value.

In Maryland, SREC revenue reflecting a project's generation value for a given MWh is a primary incentive used to incent the development of solar projects in Maryland. While Maryland uses an array of other incentives to support solar development that vary by the size of facility, location, offtaker type (*e.g.*, additional incentives go toward projects that serve community solar for LMI subscribers), a primary incentive is the use of SRECs for a project's power generation value, which provides a significant amount of ongoing value associated with a solar project's electricity production.

The sale of MD SRECs for power generation provides project revenue to project owners in addition to other revenue sources. Examples of other primary revenue sources for Maryland solar projects include:

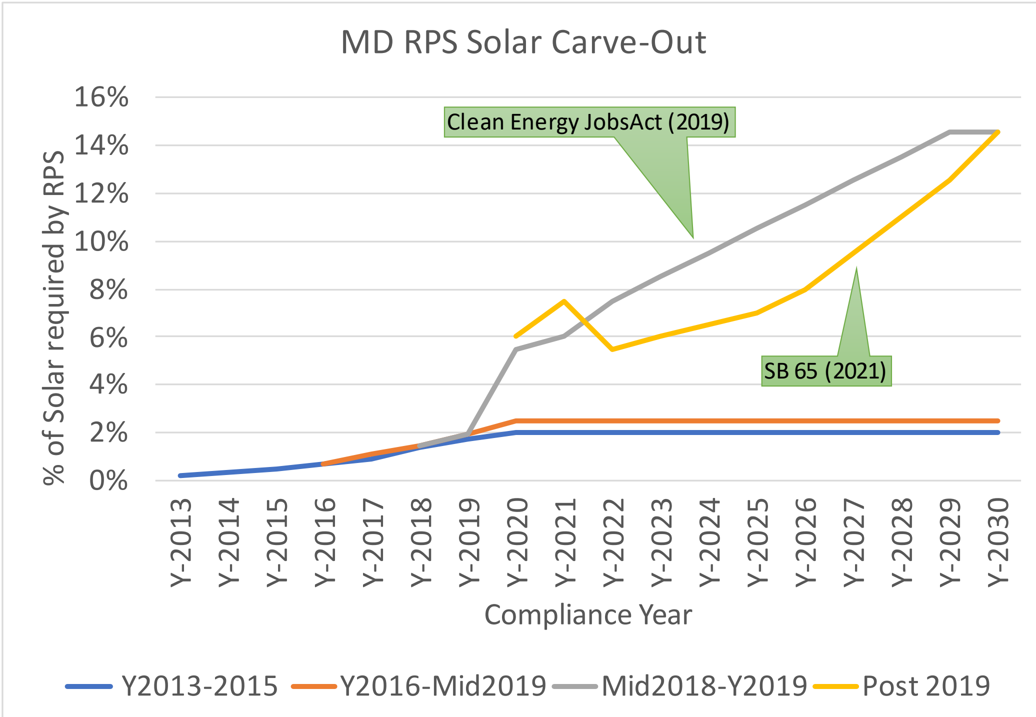
- The sale of energy and capacity by large-scale solar projects (>20 MW) that participate in the PJM wholesale markets; or
- For smaller projects (e.g., </= 2MW), the reaping of net metering or community solar electric generation credits for projects that participate in electric distribution companies (EDCs)' renewable energy incentive programs.

Maryland SREC prices are set by the market as a function of SREC supply, by SREC demand (which is primarily determined by the Maryland solar carve-out percentage, which is legislatively established), and by the SREC ACP rate (which is legislatively established and operates as a ceiling on the SREC price). The current Maryland SREC market is based on a "Basic" Demand Obligation (Basic DO) model, which provides a market-based incentive through which the SREC prices are a function of:

- SREC supply, which is based on the quantity of solar projects that have been developed and additional factors including solar performance, solar irradiance, and the maintenance needs of solar projects;
- SREC demand, which is in part administratively induced by Maryland's statutory requirement that a minimum percent of SRECs (*i.e.*, a minimum solar carve-out[6]—of delivered energy must be retired by load serving entities (LSEs) or the LSEs are required to pay the SREC ACP rate for each SREC that is short of each LSE's minimum requirement;
- SREC ACP rate, which is administratively determined by Maryland's statutory requirement that LSEs must pay ACPs when LSEs retire fewer SRECs than their respective minimum requirements;[7] and
- Other administrative rules, such as SREC banking rules (SRECs can be used in the year of their generation or during the subsequent two compliance years) and eligibility rules (MD SRECs can only be minted from certified solar generation interconnected within Maryland).

[6] *See* Figure 1 for the history of Maryland's Minimum Renewable Portfolio Standard (RPS) solar carve-out percentages of obligated load.
[7] *See* Figure 2 for the history of the Maryland SREC ACP rate.

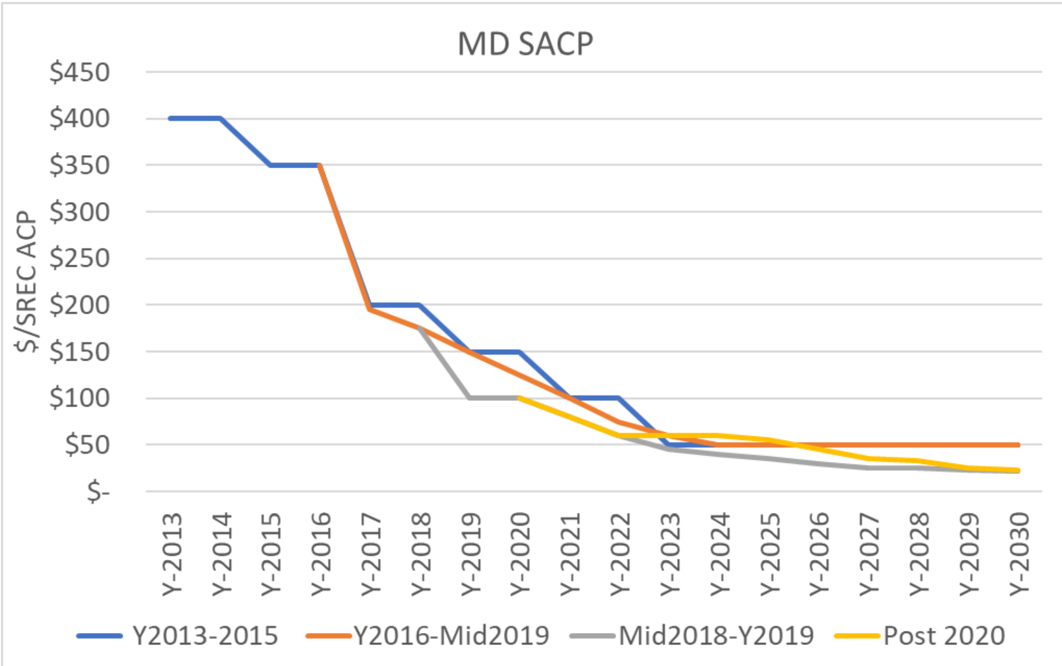
Figure 1 – MD Statutory Annual Minimum Solar Carve-out



As is evident in the graph, the required solar carve-out increased substantially in 2019 with the passage of the Clean Energy Jobs Act, and it was adjusted by additional legislation in 2021.[8]

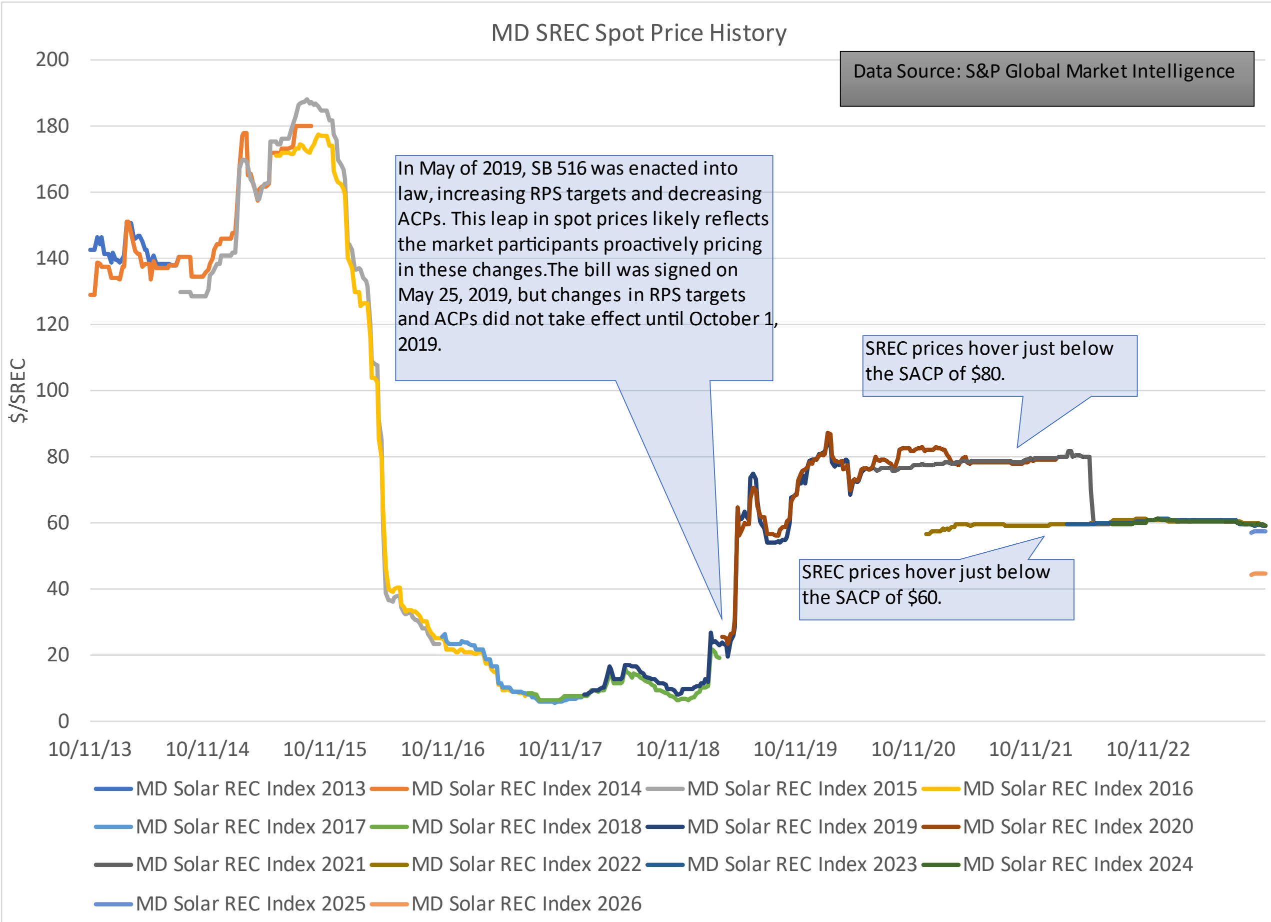
[8] Md. S.B. 65 (2021).

Figure 2 – MD SREC ACP



In Maryland's SREC markets (and REC markets in general), price volatility is a common feature because SREC prices are based on market supply / demand dynamics. Maryland is not an exception to historic SREC market price volatility. See Figure 3.

Figure 3 – MD SREC Spot Prices



The reason why the graph contains overlapping lines is because SRECs are posted for sale before they are minted, and are available for sale for two compliance years after they are minted due to the two-year banking period.

Solar project development is capital intensive and thus the financing costs and overall investment costs of capital are key considerations affecting solar project development.

The greater the perceived / expected solar project revenue volatility, the costlier it is to finance a solar project. That is, all things being equal, a financier will require greater financial returns (*e.g.*, require higher interest rates on loans) for a project with volatile revenue streams as compared to another project with fixed firm revenue streams, even with the same expected revenue. Basically, the higher risk of volatile revenue streams (*e.g.*, those based on SRECs with volatile pricing than those revenue streams based on a firm fixed rate) requires higher financial returns. Conversely, all other things being equal, a project will require more revenue from volatile revenue streams (*e.g.*, MD SREC revenue) to provide the same level of financing as it would from non-volatile revenue streams (*e.g.*, firm, fixed rates for SRECs).

Development costs vary by project type. Some types of solar projects are more expensive to develop and/or operate per MWh of output (*e.g.*, brownfield, solar canopy, community solar, and smaller residential projects) because of a lack of economies of scale. In contrast, larger solar projects (*e.g.*, large greenfield solar projects selling their output to one offtaker) tend to have greater economies of scale.

The current MD SREC market does not create differentiated revenue streams reflecting a project's potential imbued environmental values, only its power generation value. SRECs and RECs in tradeable markets (*e.g.*, MD SRECs) have a single average spot market clearing price at any one time (*e.g.*, $59.31/SREC for September 8, 2023). That is, it does not matter whether the MD SRECs are produced by a 0.5 MW solar canopy (which is more expensive to build and operate and therefore needs relatively more revenue to get financed) than a greenfield large-scale (50 MW) solar farm (which is less expensive to build and operate and therefore needs relatively less revenue to get financed). Despite their differing costs of construction, all types of solar essentially receive the same $/SREC revenue per MWh of production. Put differently, there is a general lack of SREC price differentiation within the Maryland SREC market based on imbued environmental values.[9] All other things being equal, the lack of SREC price discrimination within the Maryland SREC market incents development of the least expensive project types (*e.g.*, it incentivizes large greenfield solar farms at the expense of development of brownfield or solar canopy projects). Whether this is an optimal result depends on Maryland's policy preferences, but nonetheless, the lack of SREC price differentiation is a policy choice.

Recently solar development in Maryland has not kept pace with Maryland's solar development policy goals. Recently, there has not been sufficient MD SREC supply to meet the MD SREC demand (*i.e.*, the MD SREC market is "short" of sufficient supply, or the MD SREC market is "short"). This can be seen most explicitly and recently in Table 6 of the Public Service Commission of Maryland Renewable Energy Portfolio Standard Report with data for Calendar Year 2021,[10] which displays a shortfall of over 900,000 SRECs for retirement out of a total compliance obligation of over 2,900,000 (at a 7.5% solar carve-out). This is shown implicitly for the 2022 and 2023 compliance years; the fact that MD SREC prices hover just under the SREC ACP rate (*i.e.*, the penalty price –see Figure 1) strongly implies that the MD SREC market is significantly undersupplied.

Compared to most other states with prolific solar development in PJM and the northeast (Illinois, New Jersey, New York, Massachusetts, and Maine), the revenue streams for Maryland projects are more volatile and riskier to finance because they do not include any firm, fixed price revenue streams.

For example, Table 1 provides a summary comparison of how states currently incent their community solar projects. All the states with programs characterized in Table 1, except for Maryland, have evolved their

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[9] The lack of price discrimination between different types of solar energy stands in contrast to the broader presence of price discrimination between the solar carve-out and non-solar Tier 1 RECs, as well as Tier 2 RECs. Each of those categories is subject to different REC prices.
[10] Maryland Public Service Commission, *Renewable Energy Portfolio Standard Report* (2021), CY21-RPS-Annual-Report_Final.pdf (state.md.us).

distributed energy resource (DER) solar incentive programs from a structure with only volatile revenue streams to a structure that obtains some or all its revenue streams for Community Solar projects based on firm fixed rates. These states made this policy change in part because they analyzed and understood that volatile revenue streams for DER projects are expensive and inefficient to finance, and in the end, volatile SREC pricing costs ratepayers more for the same amount of solar installed.

Similarly, states are providing firm fixed revenue for at least a portion of their large-scale solar projects for a similar financing reason, including:

- New Jersey via its Competitive Solar Incentive (CSI) Program, which provides competitively set incentives for grid supply projects and net metered non-residential projects greater than 5 MW_{DC}.[11]
- New York via its Index REC Contract Structure, which provides, as summarized on a Sustainable Energy Advantage blog post: "Under the Index REC pricing structure, the Monthly REC price is determined as the Index REC Strike Price less the Reference Energy Price and the $/MWh equivalent Reference Capacity Price (RCP). The Reference Energy Price and RCP are intended to approximate the market revenues generators realize in the energy and capacity markets, respectively. Under this mechanism, the REC revenues would increase if the energy and capacity market revenues decline, thus providing renewable developers a financial hedge against market price volatility."[12]
- Massachusetts via its Offshore Wind Solicitation, which provides an opportunity to bid for long-term fixed firm price contracts for energy only, RECs only, or the combination of energy and RECs. In addition, the solicitation provides the opportunity to submit an Indexed Bid Price for the combination of energy and RECs via an Indexing Adjustment, which "will be applied to increase or decrease the Indexed Price Bid price by up to 15% based on the change in a set of macroeconomic and/or commodity indices (the 'Composite Set of Indices'), which will be determined by the RFP Drafting Parties (the Indexing Adjustment Mechanism)."[13]

Table 1 – Characterization of Revenue Streams of Current Community Solar Programs by State

State	Program Name	Nickname	Volatile Revenue Streams	Firm Fixed Revenue Streams	Comment
MD	Community Solar[14]	MD-CSEGS	• Community Solar Credits	n/a	CSEGS is equivalent to net metering rates

[11] New Jersey Board of Public Utilities, Competitive Solar Incentive (CSI) Program, https://njcleanenergy.com/renewable-energy/programs/susi-program/csi-program.
[12] SEA Blog, "NYSERDA's Proposed Modification of Index REC Price Formula due to Capacity Accreditation Reforms" (July 27, 2022), https://www.seadvantage.com/blog-post/capacity-accreditation-reforms-lsrrfi22-1/.
[13] *See* Massachusetts Department of Energy Resources, *RFP for Long-term Contracts for Offshore Wind Energy Projects* at 17 (Aug. 8, 2023); *see also* Massachusetts Government, "Healey-Driscoll Administration Issues Region's Largest Offshore Wind Solicitation" (Aug. 30, 2023), https://www.mass.gov/news/healey-driscoll-administration-issues-regions-largest-offshore-wind-solicitation.
[14] Md. H.B. 908.

State	Program Name	Nickname	Volatile Revenue Streams	Firm Fixed Revenue Streams	Comment
			• SRECs		
NJ	Solar Successor Incentive Program – Administratively Determined Incentive[15]	NJ-SuSI-ADI	• Net metering credits	• SREC 2	SREC2 value based on "missing money"[16] calculation.
MA	Solar Massachusetts Renewable Target Program for FTM[17] projects[18]	MA-SMART-FTM	n/a	• Entire revenue stream via a strike price construct	Strike Price is based on the difference of the total incentives and the value of energy. Minimum Strike Price is $0/kWh (never negative)[19]
IL	Adjustable Block Program[20]	IL-ABP	• Community Solar Credits	• RECs	REC value based on "missing money" calculation.
ME	Net Energy Billing[21]	ME-NEBv2	• Class I RECs	• Net Energy Billing credits	Net Energy Billing is in practice equivalent to net metering
NY	Value of Distributed Energy Resources[22]	NY-VDER	• Energy • Capacity	• Environmental Value • Demand Reduction Value	NY also provides a significant upfront $/kW installed incentive based on "missing

[15] NJ Board of Public Utilities, *Administratively Determined Incentive (ADI) Program*, https://njcleanenergy.com/renewable-energy/programs/susi-program/adi-program.
[16] *See* Footnote 1.
[17] FTM is front-of-the meter (called "standalone projects" in MA-SMART program parlance, which are the vast majority of non-residential MWs installed).
[18] Massachusetts Government, *Solar Massachusetts Renewable Target (SMART) Program*, https://www.mass.gov/info-details/solar-massachusetts-renewable-target-smart-program.
[19] The Strike Price construct for MA-SMART is only available to front-of-the meter (also called FTM or standalone projects). For example, a greenfield community solar project is defined as a standalone project for the program.
[20] *See* Illinois Shines, *Welcome to Illinois Shines: Building our Solar Future*, https://illinoisshines.com/; *see also* Illinois Shines, *Traditional Community Solar*, https://illinoisshines.com/traditional-community-solar/.
[21] See Me. Code § 65-407-313 R. 3 ("For eligible facilities that do not satisfy the requirements of Section 3(k)(4)(a)(b)(c) and (d), the tariff rate for credits received in 2022 shall be the applicable tariff rate that was established by the Commission for NEB credits received during calendar year 2020. Beginning on January 1, 2023 and for each subsequent year, the tariff rate shall be that rate increased by 2.25% each year.").
[22] N.Y. State, *The Value Stack*, https://www.nyserda.ny.gov/All-Programs/NY-Sun/Contractors/Value-of-Distributed-Energy-Resources.

State	Program Name	Nickname	Volatile Revenue Streams	Firm Fixed Revenue Streams	Comment
				• Locational System Relief Value	money" calculations.

Many states with prolific solar development in PJM and the northeast provide differing incentives by project type. Examples include:

- Community Solar for LMI subscribers: MD, NY, MA, and NJ. (The MD incentives are in the form of additional tax breaks, and not additional revenue, for LMI subscribers).
- Solar incentives for specific "land use" (e.g., brownfield, landfill, agrivoltaics, or project type (e.g., rooftop, solar parking canopy)": MA, NJ, and NY.
- Solar incentives that vary by project size: MA, IL, NY, and NJ.

Providing such incentives (and disincentives for greenfield development for the MA-SMART program) gives policymakers explicit levers to induce projects preferred by their constituents.

3 Current MD SREC Market Model: Additional Issues and Opportunities

To reiterate, **MD SREC price volatility is a feature of the MD SREC market structure**.

The recent lack of MD SREC price volatility is only a function of insufficient supply to meet demand. When there is a significant undersupply of SRECs to meet the annual RPS demand obligation in the MD SREC market, the market prices hover near the ACP level for the compliance year. The MD SREC market has been undersupplied since mid-2020.

The recent spurt of applications for MD SREC qualified projects may well increase the MD SREC supply to exceed the MD SREC demand obligation if the projects are ultimately developed and interconnected. On a recent Solar Incentives Task Force Meeting, it was noted that there were 855 MW of large-scale solar that have been provided a Certificate of Public Convenience and Necessity (CPCN). This potential supply, combined with the growth of Community Solar projects and solar projects in other sectors, could well have SREC supply doubling to ~4,000,000 SRECs per year. If this occurs, MD SREC supply will substantially exceed MD SREC demand in a couple of years.

If MD SREC demand exceeds supply, SREC prices will soften and may well crash. In this scenario, while the availability to bank SRECs (for two years beyond the production year) should soften any drop in MD SREC prices for moderate oversupply cases, at some point, with additional oversupply, prices could drop substantially (e.g., to ~50% or less of the SACP rate), as has occurred previously in the MD SREC market in cases of significant oversupply. Within the current SREC market structure, there is no easy way to rectify the supply / demand imbalance short of legislative intervention once again modifying the solar carve-out RPS percent obligation (and perhaps once again modifying the SACP).

Once again, Maryland's volatility in SREC prices leads to higher financing costs for solar projects. As a result, the cost to develop solar in Maryland is higher than in another state with less volatile revenue streams, all else being equal. This results in higher costs to Maryland's ratepayers for a given MW of solar installation or MWh of solar generation, again, all else being equal. It is therefore comparatively uneconomic for Maryland to allow such volatility.

SREC price volatility could be moderated by the implementation of a floor price into the current SREC market model. To make SRECs less risky, and thus more valuable to financiers on a risk-adjusted basis, Maryland could provide a floor price (above $0/SREC), which developers and their financiers could count on at the time of development and which SREC prices would not (generally) fall under. Price floors come in two major variants: hard floors and soft floors.

Hard floors require a creditworthy counterparty (*i.e.,* a buyer of last resort). While providing a hard floor is theoretically possible, it has not been accomplished in reality, except in couple of small New Jersey programs.[23] The largest barrier is recruiting a counterparty to take on the financial risk, so it probably is impracticable to implement a hard floor on a large-scale basis.

Soft floors were implemented in the Massachusetts SREC I and SREC II programs by implementing an auction mechanism, called a Solar Credit Clearinghouse Auction (SCCA), which is intended to establish a price "floor" for SREC I and SREC II certificates.[24] The SCCAs are configured as a volume-based auction with a known price. Thus, if the SCCA-offered certificates are sold, the seller of the SRECs gets the known price, and if they are not sold, the seller gets additional years of certificate eligibility to sell those certificates when it is likely the market will not be over-supplied. The reason the market likely will not be over-supplied in future years is because one mechanism of the SCCA is to raise the compliance obligation in succeeding years if all the offered SRECs are not sold in the SCCA. While adding a soft floor price mechanism to the current MD SREC structure would be an improvement, it is important to note that Massachusetts is phasing out the SCCAs. The SREC I program is finished, and the SREC II program is set to expire in 2027. Massachusetts now offers the SMART program to incentivize DER solar development, which as described above, provides a firm fixed price for solar generation.

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[23] *See* NERA Economic Consulting, *SREC-Based Financing Program* (July 18, 2011), https://www.njedcsolar.com/assets/files/NJEDCSolar_Program_Guide_7-18-2011.pdf; PSE&G, *Solar Loan Program*, https://nj.pseg.com/-/media/pseg/global/gathercontentdocuments/7-4-7howtoapply/solarloan_commercial_brochure.ashx.

[24] *See* Massachusetts Government, *Solar Carve-out and Solar Carve-out II Clearinghouse Auction*, https://www.mass.gov/info-details/solar-carve-out-and-solar-carve-out-ii-clearinghouse-auction.

4 Maryland Should Follow Other States' Lead In Structuring Its SREC Market To Reflect Certain Imbued Environmental Values

As is discussed in greater detail in this section, a number of states have developed SREC multipliers that reflect certain environmental attributes or values, as well as other incentives for the development of more equitable and more environmentally friendly types of solar energy. Sierra Club recommends that Maryland create higher SREC multipliers for the energy generated from solar projects that:

- Are built on brownfields and other previously industrialized lands, on rooftops, and over parking lots, rather than on green fields.
- Are located in, built by, or owned by members of low and LMI communities, overburdened communities, or minority-owned businesses.
- Follow prevailing wages with local labor training apprenticeships.

4.1 Energy Equity

4.1.1 Existing Approaches in Other Regions

Other states have begun to design their distributed solar programs with provisions specifically targeted toward encouraging project development and ownership in ways that increase energy equity. By creating rules that require projects to meet minimum equity thresholds to participate in programs or including optional, incremental incentives for projects that voluntarily meet equity-focused criteria, states have structured their solar programs to prioritize reaching particular communities.

When looking at states with robust distributed solar programs, many have specifications that provide additional benefits to LMI customers or households and disadvantaged communities, increasing energy equity and access to solar. In our research, it was not found that any programs had specific policies or rules related to minority-owned business enterprises (MBEs). Additionally, save a few short mentions, there is little information available on labor provisions in any of the programs that we researched.

4.1.1.1 New York

Under the NY-Sun[25] program, a set amount of capacity for the Inclusive Community Solar Adder (ICSA)[26] is offered, which provides incentives for community distributed generation (CDG) projects focused on increasing access for LMI households and disadvantaged communities. For a project to be eligible for these incentives, called "adders," it must dedicate at least 50% of the ICSA capacity to "eligible residential subscribers," or in other words, LMI subscribers, those living in affordable housing, or residents of disadvantaged communities. The adders range from \$50 -\$200 per kW_{DC}, depending on their location.[27]

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[25] New York State, *NY-Sun*, https://www.nyserda.ny.gov/All-Programs/NY-Sun.

[26] New York State, *Inclusive Community Solar Adder*, https://www.nyserda.ny.gov/All-Programs/NY-Sun/Contractors/Dashboards-and-incentives/Inclusive-Community-Solar-Adder.

[27] NY-Sun: *Con Edison Program Manual* (Oct. 20223), https://www.nyserda.ny.gov/-/media/Project/Nyserda/Files/Programs/NY-Sun/Contractor-Resources/coned-program-manual.pdf.

Additionally, NY-Sun's Community Benefit Program offers higher adders, ranging from $150-$300 per kW, in exchange for showing an increased commitment to low-income subscribers in the community. A project can earn these higher adders if it can provide a 20% bill discount to eligible subscribers and meets three out of five of the below criteria, or if it provides a 15% bill discount and meets all five criteria.

The Community Benefit Program's adder criteria are as follows:

- Demonstrated close partnerships with community organizations and stakeholders from the disadvantaged community local to the project site throughout the project development process, including siting, construction, and customer outreach.
- Workforce training and hiring commitments of Priority Populations or members of the surrounding disadvantaged community.
- Community based or participant ownership models.
- Dedicated strategy to target individuals in disadvantaged communities with Limited English Proficiency.
- Sited within a disadvantaged community and serving eligible subscribers in the surrounding community.

4.1.1.2 Massachusetts

The Solar Massachusetts Renewable Target (SMART) Program[28] is run by the Department of Energy Resources (DOER) and utilizes a 3,200 MW declining block program providing incentives for solar development in Massachusetts. Each Block provides a 5% capacity carve-out for low-income generation units. The SMART program provides three different low-income incentives, depending on the type of solar unit, as illustrated below.[29] Adders and Base Compensation Rate Factors cannot be combined.

Low Income Community Shared Solar Tariff Generation Unit: A Community Shared Solar Tariff Generation Unit with at least 50% of its energy output allocated to low-income customers in the form of electricity or bill credits.

Low Income Community Shared Solar Tariff Generation Unit	0.06 $/kWh

Low Income Property Solar Tariff Generation Unit: A Solar Tariff Generation Unit with a rated capacity greater than 25 kW that provides all of its generation output in the form of electricity or bill credits to LMI housing.

Low Income Property Solar Tariff Generation Unit	0.03 $/kWh

[28] Massachusetts, *Solar Massachusetts Renewable Target (SMART) Program*, https://www.mass.gov/info-details/solar-massachusetts-renewable-target-smart-program.
[29] Ma. 225 CMR 20 at 17, https://www.mass.gov/doc/225-cmr-2000-solar-massachusetts-renewable-target-smart-program/download.

Low Income Solar Tariff Generation Unit: A Solar Tariff Generation Unit with an AC-rated capacity of less than or equal to 25 kW that serves low-income customers.

Low Income Solar Tariff Generation Units less than or equal to 25 kW AC	230% Base compensation rate factor

4.1.1.3 New Jersey

New Jersey employs the Successor Solar Incentive (SuSI) program,[30] which is comprised of two sub-programs, the Administratively Determined Incentive (ADI) Program[31] and the Competitive Solar Incentive (CSI) Program.[32] The ADI program carves out a 225 MW block for Community Solar projects, under which all projects will be subject to an SREC II price of $90/MWh. In the New Jersey Board of Public Utilities (BPU)'s recent Order[33] finalizing the Community Solar Program, the BPU required that all community solar projects must supply at least 51% of their project capacity to LMI subscribers. This eliminated the need for separate SREC II prices for LMI and non-LMI community solar, as all projects will effectively be providing a majority of their capacity to LMI subscribers.

4.1.2 Additional Program Design Options

In addition to the energy equity policies in the above-discussed programs, we have found a few other possible options for program design that would increase energy equity in communities. These include:

- Mandate delivering a certain percentage of benefits or procurement capacity to low-income or disadvantaged communities and homeowners. This can involve establishing household income thresholds to qualify as low-income participants, potentially based on the number of persons in the household.
- Assign higher-value credits to projects serving low-income customers, making serving low-income communities a more financially viable and appealing market for nonprofits and solar developers.
- Assign higher value credits for Minority Business Enterprise (MBE) entities wishing to participate in distributed solar.
- Include local hiring provisions, which require that certain percentages of the workforce for a project come from the surrounding community.
- Develop an Engagement Plan: Identify historically underserved communities and invite community members, community representatives, and community-based organizations to the conversation.

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[30] New Jersey BPU, *Successor Solar Incentive Program (SUSI)*, https://www.njcleanenergy.com/renewable-energy/programs/susi-program.
[31] New Jersey BPU, *Administratively Determined Incentive (ADI) Program*, https://njcleanenergy.com/renewable-energy/programs/susi-program/adi-program.
[32] New Jersey BPU, *Competitive Solar Incentive (CSI) Program*, https://njcleanenergy.com/renewable-energy/programs/susi-program/csi-program.
[33] Order filed 10/11/2023.

- Create an up-front rebate program for solar panel installation with specific carve-outs for low-income participation, reducing upfront costs for customers who could not afford it otherwise.

4.2 Efficient Use of Land

4.2.1 Existing Mechanisms in Other Regions

In this section, we explore the various land-use incentives or disincentives of five existing solar programs. Established solar incentive programs have leveraged two main strategies to incentivize and/or disincentivize the siting of solar on different land types: (1) REC multipliers and (2) rate adders. Both types of incentives can be provided as either an up-front incentive (a fixed value determined by a project's land-use type and capacity) or a performance-based incentive (based on a project's actual electricity production).

In both Massachusetts and New Jersey, policy makers first deployed REC multipliers—called "SREC factors"—in their SREC II (MA) and Transition Incentive Programs (NJ). As explained in the executive summary above, SREC factors determine the amount of solar generation that is required to produce one certificate (either an SREC II or a TREC). In both programs, SREC factors were determined in part by the siting type/location of a solar generating facility. For example, in the SREC II program, projects with parking canopy-mounted panels were assigned an SREC Factor of 1 regardless of the project's size, while projects with traditional ground- and roof-mounted panels were assigned an SREC factor between 0.7 and 0.9.[34] An SREC factor of less than one means that a project had to generator more than 1 MWh of electricity in order to receive a certificate; for example, if a project had an SREC factor of 0.8, it would need to generate 1.2 MWh (1,200 kWh) of electricity to receive 1 certificate. In both the SREC II and TREC programs, SREC factors ranged from around 0.5 to 1, and were used to promote canopy, building-mounted, brownfield, and landfill-sited solar in the SREC II program, and rooftop, brownfield, and landfill-sited solar in NJ's TREC program.

In both Massachusetts and New Jersey (as well as New York), the latest solar programs (the successors to the SREC II and TREC programs in MA and NJ) forgo SREC factors and replace them with either $/kWh adders (or subtractors) in Massachusetts or fixed SREC incentive amounts in New Jersey, respectively. New York's NY-Sun program uses an upfront incentive based on nameplate capacity instead of production.

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[34] In the SREC II program, SREC Factors decreased over time based on a project's commercial operation date; we report here the initial SREC Factors values. Temporal SREC Factor values can be accessed here: https://files.masscec.com/innovate-clean-energy/prod-track-system/RPSSolarCarve-OutIIProgramOverview.pdf.

In Table 2 below, we present the incentives that each program previously provided or currently provides to various types of solar installations:

Table 2 – Solar Program Incentives by Land Use Category

Land Use Category	MA SREC II [35]	MA SMART[36]	NJ TREC	NJ SuSI	NY-Sun
Rooftop/Building Mounted	SREC factor of 0.9	$0.2/kWh incentive-rate adder	SREC Factor of 0.6-1.0 [37]	<1 MW: $100/SREC-II 1-5 MW: $90/SREC-II	
Parking Canopy/Carport	SREC factor of 1	$0.06/kWh incentive-rate adder		<1 MW: $100/SREC-II 1-5 MW: $90/SREC-II	
Brownfield	SREC factor of 0.8	$0.03/kWh incentive-rate adder	SREC Factor of 1		$150/kW adder
Greenfield		Up to $0.0025/kWh incentive-rate **subtractor** + ban on development that is "Priority Habitat, Core Habitat, and/or Critical Natural Landscape"			
Landfill	SREC factor of 0.8	$0.04/kWh incentive-rate adder	SREC Factor of 1		$150/kW adder
Agrivoltaics		$0.06/kWh incentive-rate adder			
Floating		$0.03/kWh incentive-rate adder		<1 MW: $100/SREC-II 1-5 MW: $90/SREC-II	$150/kW adder

[35] SREC Factors varied based on in-service date; Original SREC Factors are reported here: https://files.masscec.com/innovate-clean-energy/prod-track-system/RPSSolarCarve-OutIIProgramOverview.pdf.

[36] SMART incentives were originally proposed as declining block incentives (they would decrease as blocks of capacity were filled by a pre-ordained percent). The starting (i.e., Block 1 incentives are provided here: https://www.mass.gov/doc/capacity-block-base-compensation-rate-and-compensation-rate-adder-guideline-2/download.

[37] SREC Factor varies based on if customer is residential or not. *See* New Jersey BPU, *Solar Transition Frequently Asked Questions (FAQs)*, https://njcleanenergy.com/renewable-energy/program-updates-and-background-information/solar-transition-frequently-asked-questions#TREC.

Interestingly, in Massachusetts, DOER added new incentives for agrivoltaics between its SREC II and SMART programs, while maintaining incentives for build mounted/rooftop, canopy, brownfield, and landfill projects. DOER also added a subtractor to disincentive installations on greenfields (locations that have never experienced commercial development). Meanwhile, between the TREC and Successor Solar Incentive (SuSI) program, New Jersey's Board of Public Utilities (BPU) added incentives for canopy and floating solar projects, while eliminating incentives for brownfield- and landfill-sited solar projects.

Maine's Net Energy Billing (NEB) program does not include any up-front or performance-based incentives based on a solar facility's land use.[38] However, a Statute enabling a now-discontinued DG procurement program required that the Maine Public Utility Commission (PUC) "evaluate a qualified bid for a project that is located on previously developed or impacted land at 90% of the offered rate."[39] Maine's Distributed Energy Stakeholder Group gave focus to land use issues when discussing the design of an NEB program successor (now enabled via statute),[40] but program criteria related to land use have yet to be implemented. Moreover, in Rhode Island, to promote agrivoltaic projects, the Rhode Island Office of Energy Resources (OER) manages the Agricultural Energy Grant Program, which provides grants of up to $20,000 for eligible energy efficiency and renewable energy projects located on farms throughout Rhode Island.[41] Rhode Island also piloted a performance-based incentive adder applicable to solar canopy projects in the state's Renewable Energy Growth (REG) program during program years 2020-2021 (at a rate of 6 ₵/kWh in 2020 and 5 ₵/kWh in 2021). The adder was discontinued due to concerns regarding the program's expected costs in relation to benefits, given cost increases forecasted for program year 2022 (as assessed by SEA in a 2021 analysis of the program, following a prior assessment of the 2020 program year).[42] For program years 2024-2026, Rhode Island's Office of Energy Resources (OER) is considering the development of performance-based adders for projects sited on land requiring remediation (as enabled by a recent statute).[43] SEA, acting as a consultant to OER, has calculated draft adder values in the range of 3-4 ₵/kWh.[44]

4.2.2 Analysis of Land-Use Incentives in Other Regions

In the previous section, we surveyed and catalogued land-use incentives/disincentives deployed in other regions. In this section, we will examine the ramifications that those incentives/disincentives have had on solar development as it pertains to land usage. In Table 3, we compare and contrast the effects of land-use incentives in Massachusetts' SREC II and SMART programs:

Table 3 – Solar Program Incentives by Land Use Category

	MA SREC II[45]		MA SMART[46]	
Land Use Category	Capacity (MW)	Percentage of Total Program Capacity	Capacity (MW)	Percentage of Total Program Capacity
Rooftop/Building Mounted	280.8	16.0%	293.4	11.8%

[38] Maine Public Utilities Commission, *Net Energy Tariff Rates*, https://www.maine.gov/mpuc/regulated-utilities/electricity/neb.
[39] Me. S.P. 565 - L.D. 1711.
[40] Me. S.P. 815 - L.D. 1986.
[41] Rhode Island OER, *Energy Efficiency And Renewable Energy Programs For Farms*, https://energy.ri.gov/energy-efficiency/farmers.
[42] SEA, *RI Renewable Energy Growth Program: Discussion of Carport Adder and Benefit-Cost Analysis* (Sept. 23, 2021), https://ripuc.ri.gov/sites/g/files/xkgbur841/files/eventsactions/docket/JG-Schedule-1---RI_REG_MTG_re_Carport_Adder_Final_09232021.pdf.
[43] R.I. 2023 -- H 5853 SUBSTITUTE A, https://webserver.rilegislature.gov/billtext23/housetext23/h5853a.htm.
[44] SEA, *Rhode Island Renewable Energy Growth Program: Research, Analysis, & Discussion in Support of Second Draft 2024 Program Year Ceiling Price and IncentiveRate Adder Recommendations* (Oct. 24, 2023), https://energy.ri.gov/sites/g/files/xkgbur741/files/2023-10/RI_REG_2024_MTG_3_FINAL.pdf.
[45] Massachusetts, *RPS Solar Carve-out II Renewable Generation Units* (Oct. 24, 2023), https://www.mass.gov/doc/rps-solar-carve-out-ii-renewable-generation-units.
[46] Massachusetts, *SMART Solar Tariff Generation Units*, https://www.mass.gov/doc/smart-solar-tariff-generation-units.

	MA SREC II[45]		MA SMART[46]	
Parking Canopy/Carport	52.5	3.0%	141.1	5.6%
Brownfield	49.7	2.8%	49.5	2.0%
Landfill	133.6	7.6%	121.4	4.9%
Agrivoltaics	-	-	64.9	2.6%
Floating	-	-	-	-
Other	1,236	70.5%	1,829.7	73.2%

Comparing the land-use categories of solar facilities between the SREC II and SMART programs, our main observation is that the land-use type of solar facilities in Massachusetts were relatively stable, even as incentives shifted between the SREC II and SMART programs. With that said, the capacity of rooftop, building mounted, and landfill solar projects decreased—albeit slightly—between the two programs as a percentage of program capacity. The most dramatic change of any land use category occurred in the rooftop/building mounted category, where such projects contributed 16% of SREC II program capacity but only 11.8% of SMART program capacity. It would require further analysis that is outside the scope of this endeavor to determine if this 4.2% shift was the direct result of DOER's transition from an SREC factor of 0.9 under SREC II to a $0.2 $/kWh adder under MA SMART. Moreover, the proportional capacities of parking canopy/carport and agrivoltaic solar projects experienced a minor increase between the SREC II and SMART programs, while brownfield and "other" (a category that includes greenfields) solar project capacity (as a percentage of total program capacity) remained roughly consistent between the SREC II and SMART programs. These observations are largely in line with changes—or lack of changes—implemented by DOER between the SREC II and SMART programs. For example, the introduction of an adder for agrivoltaic projects successfully attracted approximately 65 MW of agrivoltaic solar projects (over the 0 MW baseline).

Conducting a similar analysis in New Jersey is a less comprehensive exercise because the BPU's data for the Transition Incentive (TREC) program does not distinguish between rooftop and canopy solar or between brownfield and land field land use categories. Table 4 (below) reports the land use categories of New Jersey's solar incentive programs:

Table 4 – Solar Program Incentives by Land Use Category[47]

	NJ TREC		NJ SuSI	
Land Use Category	Capacity (MW)	Percentage of Total Program Capaciity	Capacity (MW)	Percentage of Total Program Capaciity
Rooftop/Building Mounted/Canopy	688.4	77.5%	321.8	95.7%
Landfills/Areas of Historic Fill	95.5	10.8%	0.5	0.16%
Other	1.38	11.7%	13.83	4.12%

When comparing the land-use categories of solar facilities between the TREC and SuSI programs, it is immediately apparent that rooftop, building-mounted, and canopy solar increased dramatically—as a percent of program capacity—between the two incentive programs, increasing from 77.5% in the TREC program to 95.7% in the SuSI program. As was the case with the solar incentive programs in Massachusetts, it would require further analysis that is outside the scope of this endeavor to determine if this 18.2% shift was the direct result of the BPU's transition from an SREC factor range of 0.6-1.0 under TREC

[47] Massachusetts, *Solar Activity Reports*, https://njcleanenergy.com/renewable-energy/project-activity-reports/project-activity-reports.

to fixed MW adders (of $90-$100/SREC II) under SuSI. It would be easy to attribute the BPU's elimination of an incentive for solar sited on landfills or areas of historic fill to the dramatic shift in the proportion of landfills/areas of historic fill; that is, 10.8% of solar projects were sited on such lands under TREC, and less than 0.2% of projects were sited on such lands under SuSI. Nonetheless, the elimination of incentives for landfills/areas of historic fill may not be the factor driving this change. Alternatively, New Jersey may be running out of landfills/areas of historic fill that are suitable for solar development and/or the development cycle of landfills/areas of historic fill may be much longer than that of other solar developments, and thus there may still be significant development of solar on landfills/areas of historic fill, which will be reported in the above statistics in subsequent project activity reports.

5 Community Benefit Agreements

There are several methods that can ensure that a portion of the financial benefits of a solar PV or other type of renewable energy project is redistributed from the project developer/owner to the population(s) that the project negatively affects (e.g., through environmental degradation, obstructed views, and noise or light pollution). This section provides an overview of one such method: the use of Community Benefit Agreements (CBAs). According to the U.S. Department of Energy (DOE), a CBA is "an agreement signed by community benefit groups and a developer, identifying the community benefits a developer agrees to deliver, *in return for community support of the project*."[48] The DOE defines community benefit groups as "coalitions comprised of … stakeholders [that] represent the interests of residents who will be impacted by" the proposed development(s). The DOE further states that CBAs are "enforceable, legally-binding contracts" and are "the direct result of substantial community input." Of note, while the DOE's definition of the CBA appears to exclude the direct participation of government authorities, current trends in renewable energy policy demonstrate that municipal, state, and federal authorities are increasingly involving themselves in the encouragement and negotiation of CBAs. We will discuss this in more detail later in this section.

While there is no single standard for what benefits a CBA should provide to a local population (and to what extent) in exchange for its support, possible provisions can be categorized as follows:[49]

- Monetary compensation
  - Conventional economic benefits (*e.g.*, using local manufacturers and contractors)
  - Alternative economic benefits (*e.g.*, via donations to local organizations or energy bill reductions)
  - Community ownership (*i.e.*, the community is provided ownership shares in the project)
- Public goods compensation
  - In-kind benefits (*e.g.*, a new recreational facility or community center)
  - Local services (*e.g.*, provision of an educational program)
  - Environmental mitigation or enhancement (*e.g.*, planting flowers or trees)

It may seem obvious that communities would likely benefit from any of the above-listed forms of compensation; however, a survey of the literature reveals that researchers in this space share a common concern regarding how local populations perceive compensation in this context. In one research paper on the role of community benefits in the acceptance of solar farms in the Netherlands, for example, researchers discuss how "public goods compensation is considered as more effective than monetary compensation," as the latter may be considered a "bribe," suggesting that the project developer is not

[48] U.S. Department of Energy, "Guide to Advancing Opportunities for Community Benefits through Energy Project Development" at 4, https://www.energy.gov/diversity/articles/community-benefit-agreement-cba-resource-guide.

[49] Kimo van den Berg and Barbara Tempels, "The role of community benefits in community acceptance of multifunctional solar farms in the Netherlands" at 3, https://www.sciencedirect.com/science/article/pii/S0264837722003714.

"concerned with the public interest.[50] In another paper on community benefit payments for renewable energy development in the United Kingdom, researchers discussed how "the use of simple cost and benefit balances" between the project developer/owner and local population is complicated by "nuanced aspects of symbolism and place attachment, which can be constructed through equally complex matters like historical relations or rural idyllicism."[51] This reasoning casts "NIMBY-ism" (i.e., "Not in My Backyard") as an oversimplification and affirms the need for thoughtful community engagement regardless of a developer's willingness to share the monetary benefits of a project. In another paper on community benefits in wind power development, the researchers note how the importance of perceptions of "trust" and "fairness" clash with the ambiguity inherent in how to achieve them.[52]

5.1 Examples of CBAs

There seem to be few examples (or, at least, few publicly available examples) of CBAs in the renewable energy sector. That said, the Sabin Center for Climate Change Law at Columbia University has compiled a Community Benefits Agreements Database that includes information on CBAs from five offshore wind projects, six onshore wind projects, and four solar projects.[53] The database also includes examples of CBAs from several other industries.

The National Renewable Energy Laboratory (NREL) has also authored a paper titled, "Setting the Baseline: The Current Understanding of Equity in Land-Based Wind Energy Development and Operation" and a Wind Energy Community Benefits Guide, which both discuss the use of CBAs in wind energy development.[54] The paper compiled the results of NREL's Wind Energy Equity Engagement Series (WEEES), which aimed to "better understand equity in wind energy through engagement with experts and communities." According to the Executive Summary, three "key themes" emerged:

- Early Planning and Capacity – The importance of early engagement with the affected communities and the role of government in boosting "local capacities for participation and advocacy;"
- Identity and Agency – The importance of allowing communities to dictate the terms that wind [or solar] energy development affects the community's sense of identity, history, and place and other social/cultural factors; and
- Salient Benefits – The importance that material benefits are "relevant and impactful" for members of the affected communities and that the distribution of benefits should be based on "impact, not land ownership."

In contrast to the paper's theoretical orientation, the Guide details recent examples of CBAs used in land-based and offshore wind development, as well as examples of the processes undertaken to develop such CBAs. Although each example of process was different, the use of external experts (*e.g.*, lawyers, technical experts, and facilitators) stood out as a common practice.

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[50] van den Berg and Tempels, "The role of community benefits in community acceptance of multifunctional solar farms in the Netherlands," 3.
[51] Sandy Kerr, Kate Johnson, and Stephanie Weir, "Understanding community benefit payments from renewable energy development" at 204, https://www.sciencedirect.com/science/article/pii/S030142151730109X.
[52] Mhairi Aitken, "Wind power and community benefits: Challenges and opportunities," 6067, http://energie.promes.cnrs.fr/IMG/pdf/Wind_Power_Community_Benefits.pdf.
[53] Sabin Center, *Community Benefits Agreements Database*, https://climate.law.columbia.edu/content/community-benefits-agreements-database.
[54] Elizabeth Gill, et al., *Setting the Baseline: The Current Understanding of Equity in Land-Based Wind Energy Development and Operation*, NREL, https://www.nrel.gov/docs/fy23osti/85185.pdf; Energy.Gov, *WINDExchange: Wind Energy Community Benefits Guide*, https://windexchange.energy.gov/community-benefits-guide.

Outside of the renewable energy sector, DOE has reported examples of CBAs that are used for fossil fuel and other infrastructure projects,[55] and in 2011, the Public Law Center at the University of Tulane prepared a Summary and Index of Community Benefit Agreements.[56]

We summarize the various categories of benefits described in the CBAs reported by all the above-mentioned sources in Table 5below. We note that the extent of involvement from community groups and residents is unclear for several of the "CBAs" identified in these sources. In part, this is because some of the agreements (where available) only list the affected municipality as a party to the contract (alongside the project developer). In addition, several of the agreements were termed "Host Community Agreements," "Good Neighbor Agreements," or similar terms, which may vary in practice from a CBA, as previously defined.

Table 5 – Summary of Benefit Categories in Reported-on CBAs

Benefit Category	Count of All CBAs that Include a Benefit in this Category (n = 70)	Count of Renewable Energy CBAs that Include a Benefit in this Category (n = 25)
Local Supplier Requirement(s)	5	1
Local Workforce and/or Living Wage Requirements	32	4
Apprenticeship/Job Training	20	3
Union Support/Neutrality	6	0
Environmental Enhancements/Requirements	16	1
Affordable Housing	14	1
Community Fund and/or Other Donations	50	23
Other	31	6

We note that there were several benefits that are rare or unique among the CBAs, which we categorized as "Other." These benefits include such conditions as:

- An agreement to not lease space to a Wal-Mart.
- A 24-hour community hotline for residents to file complaints.
- A healthcare program for employees.
- New constructions (e.g., a childcare center, public school, and parking lot).

That such benefits are commonplace among CBAs demonstrates the potential (and frequent practice) for CBAs to be tailored to the diverse needs and expectations of different communities.[57]

5.2 Government-Facilitated CBAs

As mentioned, municipal, state, and federal authorities are increasingly involving themselves in the encouragement and negotiation of CBAs. We provide an overview of several such instances below.

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[55] U.S. Department of Energy, "Guide to Advancing Opportunities for Community Benefits through Energy Project Development" at 4.

[56] The Public Law Center, *Summary and Index of Community Benefit Agreements*, summary-and-index-community-benefit-agreements.pdf (tulane.edu).

[57] The data also reveals that CBAs in the renewable energy sector tend to focus on monetary benefits to the exclusion of other possible benefits. It is unclear why this is the case. The difference may have to do with the specific circumstances of renewable energy development relative to other types of infrastructure.

5.2.1 NYSERDA Build-Ready Program

New York's Build-Ready Program, administered by the New York State Energy Research and Development Authority (NYSERDA), is intended to advance large-scale renewable energy projects by identifying sites that are consistent with the State's standards and preparing the sites for private renewable energy developers.[58] The Program was mandated by the Accelerated Renewables Growth and Community Protection Act (passed in April 3, 2020)[59] and approved by a New York Public Service Commission (PSC) Order issued on October 15, 2020.[60] Through the Program, NYSERDA pursues site control and pre-construction development activities prior to auctioning the vetted sites, bundled with contracts for REC payments, to provide a de-risked package for private developers to construct and operate projects at these sites. As of April 2023, NYSERDA had screened over 10,820 sites, with 10 sites under active development. NYSERDA has stated that it "intends on negotiating Host Community Benefit Agreements, when possible, to minimize the risk and variability this factor presents for bidders."[61]

On October 10, 2023, NYSERDA issued its first RFP auctioning a Build-Ready project.[62] The RFP is for the "BR Benson Mines Solar PV Project" (BR Facility) and provides the following information regarding the "Community Benefits Package" that NYSERDA negotiated with the Town of Clifton and St. Lawrence County:

- "NYSERDA engaged with the Town of Clifton and St. Lawrence County throughout the development of the BR Facility to discuss the project, understand the needs of the Town and identify potential benefits the project could provide."
- "Based on the local government and community input, the BR Facility was designed to re-route an active snowmobile trail to allow for continued recreation on the property and to establish a community improvement fund."
- "NYSERDA and the St. Lawrence County Industrial Development Agency (SLCIDA) are establishing the Clifton-Fine Solar Community Improvement Fund, funded with an initial allocation of $200,000 to be paid by the [RFP Awardee] to the SLCIDA to manage and administer. The goal for the Community improvement Fund is to bolster economic growth and inspire a range of entrepreneurial opportunities within the boundaries of the Clifton-Fine School District. The Fund's activities will aim to retain existing businesses, generate new business and employment opportunities, and improve the customer experience for both residents and visitors by:
    - Accelerating business aesthetic improvements
    - Enhancing business infrastructure
    - Supporting business diversity and innovation
    - Leveraging regional tourism
    - Furthering climate equity and justice."

NYSERDA also negotiated a twenty-year Payment-in-Lieu-of-Taxes (PILOT) agreement, which is an agreement to provide monetary compensation to a government for the property tax revenue lost due to tax exempt ownership or use. It does not appear that a written agreement for the Community Benefits Package has been made publicly available at this time.

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[58] NY State, *Build-Ready Program - NYSERDA*, https://www.nyserda.ny.gov/All-Programs/Build-Ready-Program.
[59] N.Y. S.B. 7508.
[60] http://documents.dps.ny.gov/public/Common/ViewDoc.aspx?DocRefId=%7bB0F6CC45-490C-48A7-B0FB-6D3C7924993C%7d.
[61] NYSERDA, "Clean Energy Resource Development and Incentives: The Build-Ready Program Annual Progress Report 2022" at 28, https://documents.dps.ny.gov/public/Common/ViewDoc.aspx?DocRefId=%7b30C83887-0000-C630-9841-03A29C0474AA%7d.
[62] NYSERDA, https://portal.nyserda.ny.gov/servlet/servlet.FileDownload?file=00P8z000003EobLEAS.

5.2.2 New York Host Community Benefit Program

New York's Host Community Benefit Program, administered by the electric utilities, will provide an annual benefit to residential electric utility customers living in a town or city within which a renewable energy project with a capacity exceeding 25 MW_{AC} is located and the project commenced operation after the passage of the Accelerated Renewables Growth and Community Protection Act.[63] The Program was adopted by a PSC Order on February 11, 2021.[64] Solar and wind projects will pay annual fees of $500/MW and $1,000/MW of nameplate capacity, respectively, to the utility serving the host municipality. The utility provider will collect the annual fees for the first ten years of a project's operation and will distribute the collected fee as a credit to customers' bills. The credits will be shared equally between all residential customers in the host municipality, regardless of their proximity to the project. If a project's footprint is in multiple municipalities, those municipalities will share the bill credits equally. The credits to a customer's bill will be applied to the first bill in a calendar year beginning in the year after a facility becomes operational. The fee only applies to generating facilities, and thus does not apply to energy storage facilities. As of June 1, 2023, the Program was still not operational and applicable renewable energy projects are not expected to commence operation until 2025.[65]

5.2.3 U.S. DOE Community Benefit Plans

As part of all funding opportunity announcements (FOAs) and loan applications pursuant to the P.L. 117-169 – Inflation Reduction Act of 2022 (IRA) and P.L. 117-58 – The Infrastructure Investment and Jobs Act (IIJA),[66] DOE requires applicants to submit a Community Benefit Plan (CBP)[67] to be scored during the "merit review/project selection process" (accounting for 20% of the total score alongside other technical components). Note that, according to DOE, a CBA "is one possible outcome of meaningful community engagement that is part of the [CBP]. While the names are similar, the two are not synonymous."[68] Therefore, although applicants are not required to execute a CBA, each applicant must at minimum provide a community engagement plan as part of the CBP. Should the applicant intend to execute a CBA and/or have taken steps toward doing so prior to submitting the application, it is our interpretation that such progress would likely improve the applicant's score. In addition, although DOE "will not be party to the [Project Labor, Community Workforce, or Community Benefits Agreements]," DOE "may incorporate [such an Agreement] into the award terms and pursue action if a recipient fails to comply with the terms."

As explained above, Maryland should look to all of the above policies as guides for its prioritization of equity in developing strong financial incentives for solar adoption. These initiatives to improve equity should be adopted in tandem with the recommended financial incentives outlined in the executive summary above, which are also designed to benefit LMI communities in Maryland by reducing the costs to ratepayers of solar development. Thank you for taking the time to review and consider these recommendations.

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[63] N.Y. S.B. 7508.
[64] NYSERDA, http://documents.dps.ny.gov/public/Common/ViewDoc.aspx?DocRefId=%7bDFD69D2F-A16F-404F-9A7C-283F0C79D1DB%7d.
[65] New York Department of Public Service, "Department of Public Service Staff Report on the Implementation and Effectiveness of the Host Community Benefit Program," http://documents.dps.ny.gov/public/Common/ViewDoc.aspx?DocRefId=%7bDFD69D2F-A16F-404F-9A7C-283F0C79D1DB%7d.
[66] P.L. 117-169; P.L. 117-58.
[67] *See* template at https://www.energy.gov/sites/default/files/2023-05/CommunityBenefitsPlanTemplate.docx.
[68] U.S. Department of Energy, "About Community Benefits Plans," https://www.energy.gov/infrastructure/about-community-benefits-plans.