



COMMUNITY SOLAR IN MARYLAND

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During the time period of this report “Solar United Neighbors” was known as “Community Power Network” and its Maryland program “Solar United Neighbors of Maryland” was know as “MD SUN”. Some sources, including Public Service Commission filings will reference “MD SUN” and “Maryland Solar United Neighborhoods”.

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INTRODUCTION

The sun shines everywhere in Maryland. But too few Marylanders could take advantage of solar energy until the advent of a statewide community solar program. Community, or shared, solar makes it possible for anyone with an electric bill to access solar energy, even if they can't put it where they live. Shared solar means photovoltaic (PV) systems can be somewhere else in the community (in a field, on a building, over a parking lot, and elsewhere) but provide the benefits of solar electricity to participating subscribers. Community solar also represents a significant opportunity to expand direct access to Maryland's renewable energy economy to everyone in the state. A successful program that delivers energy savings to a wide variety of participants and builds a diverse portfolio of shared renewable projects will broaden and deepen the state's constituency for renewable, clean, distributed energy. It will also make the case for a permanent and expanded program.

HISTORY

Community shared solar has spread across the country. It began when city of Ellensburg created the first community solar facility in the country¹ in 2006. Programs that permitted a third party to develop projects began with laws in Delaware in 2010 and Vermont and Colorado in 2011. Currently fourteen states and the District of Columbia² have laws that allow non-utilities to provide shared renewables. Before the Maryland legislature passed statewide community solar legislation in 2015, local efforts like the University Park Solar LLC³, and the Greenbelt Community Solar, LLC⁴ tried to make community solar a reality for their communities by allowing individuals to invest in and benefit from a shared solar array at another location. Solar United Neighbors of Maryland worked closely with the University Park project founders to develop a model that would work. These innovative, private efforts were successful but proved difficult to set up and scale. They also didn't provide credits that show up directly on your electric bill. In response, Solar United Neighbors of Maryland, Sierra Club, and other solar activists, like University Park Solar LLC founder David Brosch, spent time educating legislators on the need and benefits of a statewide program. This built an understanding and interest in bringing community solar to the state.

Starting in 2012, Maryland legislators made several attempts to pass community solar legislation. In 2015, with a bill introduced by Delegate Luke Clippinger and the support of MDV-SEIA, Earthjustice, Chesapeake Climate Action Network, Sierra Club, Solar United Neighbors of Maryland and others, they succeeded. In May 2015, Governor Hogan signed House Bill 1087⁵ into law. The Public Service Commission convened its Net Metering Working Group in mid-summer of 2015 under the leadership of the Commission's Electricity Division Director, Phil Vanderheyden. This began the process of drafting regulations to implement the new legislation.



Source: University Park LLC.

The Net Metering Working Group is an ongoing, open stakeholder group comprised of representatives from the utilities, the Office of People's Counsel, solar industry, ratepayer advocates, and other groups. It provides a means by which Commission staff can solicit stakeholder input and collaborate on the formulation of new and updating of existing regulations. It also allows for informal public discourse and for staff to identify consensus and non-consensus positions when preparing draft regulations for consideration by the Public Service Commissioners.

The Net Metering Working Group met regularly with Commission staff from the summer through November 2015. Commission staff filed draft regulations for consideration by the Commissioners on November 10, 2015. Two days later, the Commission opened Rule Making 56 (RM 56) to formally consider the proposed draft regulations and public comments⁶ submitted the following month. Solar United Neighbors of Maryland, the local energy industry association (MDV-SEIA), Fuel Fund of Maryland, GRID Alternatives, Sierra Club, the Interstate Renewable Energy Council (IREC), Vote Solar, and others saw the need to demonstrate support

through submitted comments and in person testimony. This was due to the strong opposition to a full retail credit utilities demonstrated in working group sessions. We submitted formal comments and 71 letters from individuals expressing support for crediting the full value of the community solar energy on a participant's bill and for ensuring equitable program access for low- and moderate-income (LMI) residents.

The Commission heard testimony about the proposed regulations in mid-December 2015. By February 2016, Commission staff submitted revised draft regulations. Through our coordination, 160 Maryland residents submitted letters to the Commission. These submissions again voiced strong support for a full retail credit and equitable program access for low- and moderate-income residents. The Commission heard public comments in February of 2016. The state of Maryland published program regulations⁷ in the Maryland Register in April of that year. The Commission formally adopted the regulations, including a full retail electricity credit, on June 14, 2016. The regulations became final one month later.

With regulations final, each utility submitted proposed tariffs for implementing the program

in their territories. Baltimore Gas and Electric (BGE), Potomac Edison, and Pepco Holdings International (PHI) (owner of Pepco & Delmarva Power) filed their tariffs in Fall 2016. In January of, 2017 the Public Service Commission reviewed submitted tariffs and heard public comments. In February the Public Service Commission ruled on the tariffs requesting changes be made. On March 29, 2017 the Public Service Commission accepted re-submitted tariffs marking the launch of community solar in Maryland.

In late May 2017, the Public Service Commission processed and released an initial batch of Subscriber Organization approvals. Subscriber Organizations are the entities that will own and operate the shared solar arrays and offer energy subscriptions to customers. These organizations began to apply for interconnection with the local utility in June. Utility companies began informing organizations of conditional interconnection approval in July. With conditional approval in hand, subscriber organizations began to request space in the program for each of their projects. By August, utility companies began notifying applicants about whether they received space for the program's first year.



PROGRAM STRUCTURE AND CURRENT STATUS

Program Structure

Commission's regulations have several key provisions that make it consistent with community solar best practices⁸. This includes a full retail credit rate for all electricity subscribed to by customers of a shared solar array and specific provisions in the allocation of program capacity to encourage projects with low- and moderate-income customer participation.

A full retail credit for all electricity subscribed to by customers means that on a kilowatt-hour basis, the value of subscribed energy is equivalent to on-site net-metered solar. The regulations allow for utilities to choose to apply a kWh credit or the dollar equivalent. If a dollar credit is chosen, "the electric company shall apply a credit no less than the value to the subscriber of the credit had it been applied to the subscriber's bill as a reduction in metered kilowatt hours." (COMAR 20.62.02.04(D)) As a result, subscribers to community solar, including participants who have no option to install their own solar arrays, will have the same experience as someone who had solar on their property. Broadly, the existence of community solar enables equity of access to renewable energy in the state. The existence of a full retail credit goes one step further and enables equitable access to the economic benefits of solar.

The program also leverages the scarce resource of the capacity categories to encourage a diversity of projects. A fixed amount of space is available to allocate in the program and this space is divided into categories by utility



Source: Sebastian Smoot

territory, by year, and by project type. The LMI category encourages low-to-moderate income focused projects that have at least 30% of their energy output subscribed to by income-qualified subscribers. The LMI category could motivate developers to offer subscriptions to low- and moderate-income customers because the program has an attractive retail credit rate for subscribers and space is limited. This could especially be the case once they are unable to access the program in the Open category, which is the category available to any project type up to the maximum allowed system size of 2 MW (AC). It remains to be seen whether the structure of the program proves sufficient in accomplishing this goal and whether or not low-income residential customers will experience savings from community solar subscriptions. If these happen, the pilot program will have met one of the legislation's key motivations.

KEY PROGRAM PROVISIONS

- Length of program: Three years (began in March 2017)
- Participating utilities: All Investor-Owned Utilities (IOUs) are required to participate (BGE, Delmarva Power, Pepco, and Potomac Edison). Municipal and cooperative utilities may optionally participate.
- Program size: 1.5% of Maryland's 2015 peak demand (~196 MW) allocated over the course of the three year pilot period and divided up by utility territory.
- All projects participating in the program contribute to the state's 1,500 MW net metering cap.
- The Subscriber Organization owns and has title to all Solar Renewable Energy Credits (SRECs) produced by the project.
- Utilities must provide a regularly updated list of projects applying to participate in the program and their current status.
- Projects brought online during pilot period shall continue under the same regulations for 25 years.
- Maximum project size: 2 MW (AC)
- Minimum subscription size: 2 kW average subscription size per project
- Minimum participants per project: 2
- Maximum participants per project: 350
- Project subscription limits: Subscriptions larger than 200 kW must not make up more than 60% of a facility's subscriptions.
- Program space allocations:
 - 40% to Open Category: Any project up to max size for the program
 - 30% to Small, Brownfield, Other category: Projects up to 500 kW, or on rooftops, parking lots, roadways, or parking structures, or on brownfields, or serving more than 51% of their output to LMI customers
 - 30% to LMI Category: Projects serving more than 30% of their output to LMI customers, of which at least 10% must go to low-income.
- Low-to-moderate defined as:
 - Low-income = up to 175% of the Federal Poverty Line
 - Moderate-income = up to 80% of the Area Median Income
 - An operator of a low-income multifamily dwelling unit may apply to the Commission to qualify as a low-income subscriber for the purposes of the pilot program.
- Customers can be any rate class (residential, commercial, municipal, etc.).
- Customers must be in the same utility territory as the shared array.
- Customers receive full retail rate for all electricity to which they subscribe from the shared array.
- Unsubscribed energy from the shared array will be purchased from the Subscriber Organization by the utility at the generation rate as defined in each company's tariff.

Application Process

The application process established for accessing the program intends to screen out those projects that are not yet mature. This design is, in part, a response to the “gold rush” experience in Minnesota’s program that saw a high number of project applications received in a rush at the start of the program. This glut of applications, many of which were barely developed, created logjam for program administrators and utilities reviewing these applications. Multiple steps and requirements are included to avoid this.

First, the program requires organizations to apply with the PSC to be registered subscriber organizations. Then, developers must seek approval for interconnection and must submit remaining evidence of project maturity. This includes proof of site control and proof of having applied for applicable permits. Developers have twelve months to complete their project once they gain access to the program. Projects that fail to meet this deadline must pay a penalty to extend their time limit an additional six months.

These requirements have succeeded in preventing early-stage projects from occupying

program capacity. However, because of pent up interest and developer effort in preparation for the program, the PSC chose to open the interconnection application window at a specific time for each utility. This was the best option identified by the Net Metering Working group that ensured fair access without resorting to assigning system capacity in a more random fashion such as a lottery. As a result, the interconnection queue application became a primary limiting factor for successful entry into the program in year one. This resulted in some projects not gaining access to the program merely because they submitted their interconnection queue applications seconds after their competitors.

At the time of this report, more than 20 different solar developers have applied for space in the program across the four participating utility territories. This wide participation is a good initial indicator that, while the application process is multi-staged and involved, it has still drawn a wide array of developers willing to risk their time and capital to participate in the program.

Current Status (September 2017)

With the program officially open and developers actively working on projects and seeking admission to the program, a picture is starting to develop as to the type, scale, and distribution of these projects throughout the state. Initial signs are for the most part encouraging. At least some activity is happening in all participating utilities territory. Activity is not only occurring in the Open category, but also the Small/Brownfield/Other (SBO) category and the low-to-moderate (LMI) category as well. A quick glance at projects admitted so far for Delmarva⁹, Pepco¹⁰, BG&E¹¹, and Potomac Edison¹² shows this to be true. These projects will likely come online from Q2 to

Q4 in 2018 with subscriber organizations looking for customers in the coming months, leading up to those facilities beginning operation.

The application and allocation process for year two of the pilot program is expected to begin in April 2018. In order to provide a level playing field for late entrants to the community solar market, projects that did not get access to the program in year one will not be able to preserve their spot for year two. These projects must re-apply in year two. After year two, the Commission may re-evaluate whether to maintain a queue for year three projects.

APPLICATION & DEVELOPMENT PROCESS:

Organizations wishing to build and operate a community solar project must do the following to gain access:

STEP 1:

Apply to the Public Service Commission to be a Subscriber Organization and receive approval and a Subscriber Organization ID from the Commission; Application requirements* include:

- Basic company information.
- Posting a Subscriber Organization bond.
- Information on projects to be developed.

STEP 2:

Approved Subscriber Organizations can then apply to the utility company for conditional interconnection approval for each project.

STEP 3:

Upon receiving conditional interconnection approval from the utility, apply to the utility for space in the program by:

- Filling out the required form.
- Declaring which program category they are applying to.
- Providing conditional interconnection approval.
- Providing proof of site control for the array location.
- Providing proof of having applied for applicable permits in the jurisdiction where the array is located.
- Additionally for brown-field projects, applicants must provide evidence of brownfield status.

STEP 4:

Upon receiving confirmation of admission to the program from the utility, they are ready to continue developing their projects and have 12 months to begin operating their project before being removed from the program. If they fail to do so within that time period they can pay \$50 per kilowatt (kW) to extend their time limit for an additional six months. Projects applying in the LMI category are exempt from this additional payment requirement.

* <http://www.psc.state.md.us/electricity/community-solar-pilot-program>



PROJECT EXAMPLES

Commission staff and the Net Metering Working Group were keen to honor the intent of the legislation in drafting the regulations for the program. They worked to create a program that encouraged project variety by type, location, and subscriber make-up. As a result of the regulations, as well as outreach from Solar United Neighbors of Maryland and other organizations, a number of communities and businesses have stepped forward to investigate how they can participate in creating shared renewable projects. What follows is a sample of community efforts to participate in the program. We were particularly interested in projects that put the “community” into community solar. These examples are the result of our direct work in the community and are not meant to represent all the development activity happening as part of the pilot program.

1. George Jarrard - Carroll County Landholder

Solar United Neighbors of Maryland met with George in October 2016, after being connected to him by other community solar activists. George had open land, screened by trees from his neighbors, that was big enough for up to 300 kW of solar. He was interested in creating a community solar array because of its potential for community wealth building and job creation. He was interested in splitting the energy output with his neighbors and perhaps interested in dedicating some of the output to low-and-moderate income subscribers in Baltimore city. After researching zoning for his property and speaking with a community solar developer, George determined that the current zoning laws in the county did not permit him to install a shared array. Ground-based solar arrays on residential properties are only permitted in the county for accessory use not to exceed the maximum square footage of all roof space on the property. Furthermore, a shared solar array would be classified as a commercial solar installation that is only permitted in areas zoned commercial and industrial.

Due to the unlikelihood of receiving zoning approval under current regulations, George has decided not to pursue a community solar installation for his property. Instead he is pursuing a smaller ground-based array to offset his own home's electricity usage.

2. Rob Campbell – Cecil County Landholder

Rob Campbell's family has a history with energy projects in his community. In the early 1980's his grandfather worked with Cecil Community College and the county to restore a hydroelectric site to provide power to the college and to the local community. Rob was inspired by his grandfather's legacy. He envisioned developing community solar on his property in Cecil County for the benefit of his neighbors, particularly those of low- and moderate incomes.

Rob's vision included providing workforce development opportunities to nearby Delaware Tech, which has a renewable energy training program. He contacted Solar United Neighbors of Maryland in December of 2016 looking for assistance. After a few months of discussions and planning, Rob began working with Abundant Solar, a community solar developer based in Ontario, Canada looking to develop projects in New York and Maryland. Abundant designed and developed the project, submitted for Interconnection with Delmarva Power & Light in June 2016, and subsequently applied for space in the program.

Due to the heavy volume of applications for the Delmarva territory Rob's project has been waitlisted in the LMI category. A smaller program allocation (6 MW total) in Delmarva combined with lower cost and abundant land in that area (which includes the Eastern Shore), meant stiff competition for all categories with numerous projects waitlisted like Rob's. Unless projects in front of his drop out in front of him in year one, Rob and Abundant must re-apply for the program in Year Two (April 2018).

3. Fuel Fund of Maryland – Reducing Electricity Costs for Their Clients

Fuel Fund works with low-income individuals throughout central Maryland, helping them to afford their energy bills. They do this through providing energy assistance payments, help toward energy bill arrearages, and energy affordability interventions like conservation education, connecting clients to energy efficiency, and lower-cost energy programs. The Fuel Fund has been involved in the development of community solar regulations since 2015, particularly on the programs low-to-moderate income provisions. They are also very interested in engaging in the community solar program directly as a way to permanently lower the cost of electricity for their clients. They've explored various models to do this from financing and building their own array to aggregating low-income demand to negotiate a lower price

with third party community solar developers. Building their own community solar project would allow them to control more of the project and potentially maximize the savings delivered to their clients but also involves significantly more effort and risk. Aggregating demand and negotiating with third party developers has less risk but could yield less savings for clients.

Fuel Fund is currently negotiating partnerships to launch multiple projects in the community solar pilot. Fuel Fund has secured a loan-loss reserve, and will leverage their existing behavior-change program, Watt Watchers, to accelerate low-income client acquisition and pipeline maintenance.

4. John Mariani – Splitting It With the Family

John Mariani owns a small apartment building with a good roof for solar in the Fell's Point neighborhood of Baltimore. He also owns a home in the same neighborhood that is not a good fit for rooftop solar. He contacted Solar United Neighbors of Maryland in October of 2016 with an interest in using the new community solar program to split solar electricity generation between his rental property, his own home, and his sister's home in Timonium. John's LLC, which owns the rental property, will be the Subscriber Organization, take the federal tax credit, and operate the system for 25 years. We helped him navigate how to apply for his LLC to be a Subscriber Organization. In summer 2017, the Public Service Commission approved his application. This project is a good example of how a program like community solar, when flexible and with sufficient program capacity and/or space could allow solar adoption to expand in urban areas like Baltimore.

John is still finalizing plans with his installer and preparing for them to submit an interconnection request. With space still open in the small/brownfield/other category in BGE territory, there's a good chance that his project will gain access to the program, and may become the smallest community solar array in the state.

5. North Chevy Chase/ Kensington – Community-Based Negotiation

The community of North Chevy Chase, just outside of Washington, D.C. is heavily shaded. As a result, many dreams of rooftop solar power go unfulfilled. When Dr. Al Bartlett contacted Solar United Neighbors of Maryland about his neighborhood's interest in community solar, it seemed like the perfect fit for his community. After meeting with a core of interested homeowners it was clear that two distinct paths were developing.

Option one was to organize enough residents interested in community solar to negotiate on a better deal on behalf of the community. The residents would band together and identify developers with subscription space available, a core group of individuals would negotiate a deal with one of the developers, and the group would sign up en masse to purchase energy from the array. The second option was more complicated but held the promise of keeping even more value in the community. Option two involved gathering a group of residents interested in financing and operating a shared solar array for 25 years as both energy subscribers and investors.

Both options are possible within the community solar pilot program but sit on opposite ends of the complexity spectrum. The first option has very little risk for participants with correspondingly less reward. The second option has more risk and more questions – such as whether the Federal Tax Credit can be shared among a group of individuals – but it comes with more economic reward and more control over project decisions.

Coincidentally, another group in nearby Kensington, contacted us with similar interests around the same time. We connected the two groups together and met to discuss potential ways to partner. Because of this union, the groups have joined forces and are working collaboratively to procure a group-negotiated subscription offering for their communities.

This collaboration of two communities and their exploration of different models is an important example of the potential community solar holds to expand a constituency for clean, renewable energy in the state. Conversations and compromise between group stakeholders, public education, collective decision making, and ultimately, should they be successful, mass participation in a local shared solar project could demonstrate one scalable, community-driven path to mass solar adoption statewide.

Taken one step further, imagine a neighborhood association collectively investing part of their reserve fund in a project. The organization could secure a potentially attractive rate of return on their investment over 20 years and be in a position to ensure the array's energy output was fully subscribed at all times by marketing subscriptions to association members. This is just one of many models with the potential to keep more of a project's economic value in the community. They are made possible when third parties can participate in community-shared renewables like they can in Maryland.

Because of the complexity of option two, the North Chevy Chase/Kensington group has decided to focus on option one for the time being and follow option two on a slower track. So far, they have held two information sessions on the topic, led by Solar United Neighbors of Maryland, set up an online presence and email distribution list, and gathered more than 50 names of individuals interested in community solar.

Thus far, the group has put together a request for information (RFI) to circulate to developers and has started outreach. Immediately they identified one major challenge: locating contact information for community solar developers. They have made contacts through us and through online searches, but finding accurate contact information for relevant companies remains very difficult.

Developers who proposed projects for Pepco's year one program have been notified of their status, but at the time of this report have not

yet begun to offer subscriptions. Initial contacts by the North Chevy Chase/Kensington group resulted in developers asking them to get back in touch in a couple of months.

6. Project SolShine – Helping Housing Authorities

In the summer of 2017, the U.S. Department of Energy (DOE) chose Solar United Neighbors, the parent organization of Solar United Neighbors of Maryland, to be among a group of community solar consultants available to projects competing in DOE's Solar In Your Community (SIYC) Challenge. Project teams received grant awards to develop their projects along with a voucher for consultant services. One project, led by Clean Energy Solutions, Inc. (CESI)¹³ chose Solar United Neighbors to provide services in support of their efforts.

CESI's project, SolShine, focuses on bringing the benefits of community solar to public housing authorities (PHAs) in Maryland. The community solar pilot program's special capacity allocations for projects with low-to-moderate income participation make public housing authorities great partners. The CESI team is combining its public housing expertise and connections to find PHA partners, and is leveraging our knowledge of the pilot program and developer relationships to attract developers and financing. A successful result will see yield one or more community solar projects that benefit the residents of public housing authority properties.

The CESI team is in the process of pre-qualifying several developers and has identified significant interest from PHAs across the state. Due to the timing of the SIYC Challenge, they are planning to apply for access to the pilot program starting in year two for one or more projects.



SUCCESS AND CHALLENGES

The legislature passed community solar in Maryland as a pilot with the intention to provide a meaningful opportunity to study its impact across the state. There is much we still do not know about how community solar will turn out because projects participating in the program are not yet offering subscriptions to potential customers. However, after several years of work to write regulations, implement tariffs, and develop projects there are some key successes and challenges to highlight.

The program in place is more complicated than one might expect from a pilot with its various utility area and project type buckets, as well as detailed consumer protection provisions. But, the scope of the pilot (~196 MW over three years) and the full retail credit afforded subscribers to the program, have made it attractive to community solar developers. This is true even despite depressed SREC prices in Maryland. Below are highlights of some key successes and challenges to the program thus far.

SUCCESSSES

Legislative

It took legislators several tries to pass community solar. In the end, they made it a pilot program rather than a permanent one, added a focus on low-income inclusion, and left the value of the credit rate for subscriptions to be determined by the Public Service Commission. These actions allowed Maryland to join the growing number of states offering community solar broadly to residents.

Low-Income Inclusion

With a specific provision in the legislation¹⁴ to “encourage developers to promote participation by renters and low-income and moderate-income retail electric customers”, the legislature made its intent clear. The regulations attempt to comply with this intent by allocating 30% of the program’s system size allocations (~196 MW over three years) to projects that provide at least 30% of the kilowatt hour output to low-and-moderate income (LMI) subscribers with at least 10% of that 30% dedicated to low-income qualified households. In effect, the program has created a scarce and desirable resource (space in the program) and then sections off part of that resource for LMI projects. Early indications are that the LMI category is less active than the other categories that are filling up. It remains to be seen whether other categories filling up will in fact push developers into developing LMI-focused projects.

Geographic Diversity

Similarly to LMI provisions in the legislation, lawmakers also expressed an interest in studying “a variety of appropriate geographical areas in the State for locating community

solar energy generating systems”. As a result, the regulation’s system size allocations are broken up by utility territory as a percentage of that utility’s peak 2015 demand. Again, the regulations allocate a scarce resource in such a way as to encourage project diversity. This particular part of the program also had the effect of softening utility opposition to the size of the pilot program, especially utilities based in more rural areas of the state with more open space and cheaper land. Initial program applications by territory indicate that this part of the regulations was likely well founded. For example, in Delmarva territory 17 projects have applied for space¹⁵ in the program to date. The first three were permitted, taking up all the space in all three categories. The remaining projects are currently waiting and will likely need to re-apply next year. By comparison, 13 projects have applied¹⁶ in the much larger (by electricity demand) Pepco service territory with eight receiving space so far.

Regulatory

The development of regulations and tariffs took almost two years. The process included heavy involvement from utilities, solar developers, solar activists, low-income advocates, and state agencies. The result reflects the varied and sometimes conflicting views and input of these stakeholders.

Full Retail Credit Rate for Subscriptions

This was the most contentious issue discussed during the development of regulations. Utilities argued that the remote nature of the shared facilities, away from the subscribers electricity demand meant that the value of the electricity should be set to less than the full retail value for a consumer. The full retail rate includes generation, transmission, and distribution costs. Solar United Neighbors of Maryland, MDV-SEIA, and numerous others made the counter argument that until there is



a clear and open assessment of all the costs and benefits of solar to the electricity grid that the value should remain equal to that of a rooftop solar owner. Additionally, keeping this value equal maintains equity of value between those who are able to install solar on their properties and those that can't. Ultimately, the Commission agreed with this point of view by setting the retail credit from community solar subscribed energy to be equivalent to all volumetric (kWh) charges on a customer's utility bill.

Small and Non-Traditional Project Inclusion

Community solar is often assumed to mean large-scale, multi-megawatt installations with shares divided amongst a large number of people. The concept however, also has the potential for smaller-scale and community-focused projects to flourish if the program allows them the space to do so. These smaller projects, while not as cost effective on a per-watt basis as a larger installation, by their smaller scale hold the potential for community members to take a more active role in developing them and for keeping more of the economic value in the community. During the development of regulations Solar United Neighbors of Maryland and others advocated for protections for these kinds of projects. Three key provisions came as a result:

1. Capacity allocation categories specifically set aside space for projects up to 500 kW, or on rooftops, parking lots, etc.
2. Customer protection provisions regarding the use of agents were waived for community-based efforts. This is particularly important, for example, if a church were partnering on a project

and its church members were doing outreach on the benefits to other church members.

3. Subscriber organization registration requirements identify separate categories¹⁷ (Types B and C) for collective groups of subscribers and non-profits. For these types the application fee is reduced from \$400 to \$50 and for which a Subscriber Organization Bond is not required unless the project size is over 1 MW. The waiving of this bond requirement significantly reduces the cost and complexity in developing smaller community-based project.

Consumer Protections

Based on previous experiences with aggressive sales tactics used by some providers in the retail electricity supply industry, the Office of People's Counsel successfully pushed for detailed consumer protection regulations¹⁸. These regulations include requirements for agents selling subscriptions, anti-discrimination requirements, provisions for transferring subscriptions, and requirements for contract disclosures such as price, term, renewal fees, dispute resolution procedures, and system maintenance plans. While these regulations are extremely detailed and represent additional cost for developers, they also reflect lessons learned from previous experiences in the state. The fact that these provisions already exist rather than going through a lengthy writing of them in the future may allow developers to continue to serve the Maryland market smoothly should the pilot be made permanent.

CHALLENGES

Legislative

It's a pilot

Unlike other states such as Colorado, Minnesota, Massachusetts, and New York, Maryland chose to create a pilot program. The program is a reasonable size at roughly 196 MW over three years but its status as a pilot does create uncertainty for future development beyond the three-year pilot period. Fortunately, existing projects admitted to the pilot program will be subject to the pilot regulations for 25 years, giving project developers the certainty they needed to secure financing.

As part of the pilot the legislature mandated that a study be completed by July 1, 2019 to inform them on the results and recommendations regarding the pilot. How the study will be framed and carried out will potentially affect the outcome. Proper program evaluation would require adequate study design, definition of variables to be tracked, and methodology for their tracking be built in from the beginning of a project, not later. To date, the Commission has not finalized the study design. It has instead focused efforts on getting the program operational. It remains unclear how final design and implementation of the study will happen.

With year three of the pilot program likely to run from Spring 2019 through Spring 2020, the timing of the report could allow for lawmakers to make the program permanent in the 2020 Maryland legislative session.

Regulatory

Bond requirements

As part of the subscriber organization application process, the Commission requires applicants to post a \$10,000 bond plus an additional \$25,000 for each megawatt in excess of 1 MW. This bond is intended as a safety measure for the Commission and subscribers should a subscriber organization not fulfill their regulatory requirements. While it is likely a prudent step on behalf of the Commission, several developers reported that the lack of detail on the potential use of the bond by the Commission was making it difficult to secure one from bonding providers. This appeared to be a potential barrier to market entry for developers. However, based on the subsequent successful application of numerous developers to be subscriber organizations by mid-2017, it looks like those concerns have subsided. What remains unclear is whether new, and perhaps smaller scale entrants into the market will encounter similar difficulties and be at a disadvantage to developers already operating in Maryland.

Interconnection queue

The order in which applications are received is a critical factor in determining which projects will gain access to the program and which will not. This is due to the program's limited size. Extended discussions took place during the development of the regulations and tariffs to establish the best solution for fairly determining the order of receipt. Because the critical first step in gaining access to the program is receiving a conditional approval for interconnection, the interconnection application process has become a gating factor. Utilities opened their interconnection queue for community solar project applications at a specified time at the direction of the Commission. Using the timestamp of emailed interconnection applications became the method for establishing the order in which those projects would be evaluated by the utility engineering team. This solution was the most reasonable available given the limited space

in the program. But, it also means that project developers applying just a few seconds later than their competitors are now on a waiting list. Because the Commission decided that it will clear out the application queue before the start of year two, it is very likely that these developers will need to apply again.

Rooftop permitting upfront costs

In order to apply for space in the program, subscriber organizations must show proof that they have applied for applicable permits. For ground-based arrays this likely means a zoning permit. Zoning permits typically do not require a full engineering design be done of the system. For rooftop-based systems however, the initial application for a permit may require zoning, structural, and electrical information be provided. Additional design may be needed to meet this requirement. Correspondingly, it may mean more upfront costs to the solar developers who, at the time of application for these permits, doesn't even know if they will be given space in the program. At least one developer reported this as an added cost and risk for them during the application process. It remains unclear how wide of an impact this challenge will have on the adoption of smaller rooftop community solar arrays.

SMECO's FERC filing and program tariff

In August of 2016, Southern Maryland Electric Cooperative, Inc. (SMECO) and Choptank Electric Cooperative, Inc. filed a petition for declaratory order at the Federal Energy Regulatory Commission (FERC) asking FERC to review Maryland's community solar regulations and rule that those regulations do not comply with federal law. Numerous organizations, including

Solar United Neighbors of Maryland with the assistance of Earthjustice, filed comments asking FERC to dismiss the petition and they did in November of 2016¹⁹. The Commission did so in part because SMECO's participation in the program was voluntary. Since the dismissal of their FERC petition SMECO has applied to join the community solar program by submitting a tariff for consideration by the Maryland Commission. In doing so, SMECO asked the Commission to waive the provision²⁰ of the regulations that require full retail electricity value to be applied as credits carried over for a twelve-month period at that value. Instead of on a yearly basis, the SMECO tariff sought to pay out excess generation on a monthly basis at a lower rate. We opposed this tariff on the grounds that it is unfair and confusing to community solar subscribers in SMECO territory to be treated differently than those in other parts of the state. The Commission rejected SMECO's tariff request²¹ in September of this year. In October, SMECO chose to re-file with FERC asking for a re-hearing based on that rejection. At the time of this report FERC has not ruled on whether to grant SMECO's request. Should FERC grant a re-hearing, this would potentially create uncertainty for the program until resolved.

Brownfields mixed with small projects

The "small, brownfield, other" (SBO) category was intended in part to allocate space to projects which may be slower to develop so that they did not miss out on program allocation space and, to encourage a wider variety of projects. Based on some initial data on program allocations, Solar United Neighbors of Maryland does have concern that including rooftop projects of any size and brownfields in the category as systems under 500 kW may result in less space

In the case of Montgomery County, there is interest in changing the zoning code to accommodate community solar. Montgomery County resident Sebastian Smoot contacted us in late 2016. He is the president of the Good Hope Estates Civic Association. Sebastian was interested in pursuing the development of a community solar array for his neighborhood. Solar United Neighbors of Maryland worked with Sebastian to explain the program and potential project models. After some legwork, Sebastian located a nearby church with sufficient land and interest to host an array. Subsequent investigations on zoning uncovered an issue limiting ground-based solar in the county to accessory use. Undeterred, the Sebastian reached out to his local county councilmember who is considering introducing legislation to change the zoning code to accommodate community solar.

available for those smaller projects. In Delmarva territory for example, the entire SBO category was used up by what looks to be a single 2 MW brownfield project²². In Pepco territory, five of the six megawatts²³ of year one space in the SBO category are now reserved by some combination of large-scale rooftop and brownfield projects. However, with the exception of Delmarva, there is still space in every other utility territory in the SBO category so it remains to be seen whether any additional provisions will be needed to ensure smaller projects are not crowded out by bigger ones in subsequent years.

Zoning

A complete analysis of the various zoning restrictions is beyond the scope of this paper but several examples are helpful to show the different types of challenges happening in this area:

1. Caroline County - Implemented a six month moratorium²⁴ in May 2017.
2. Baltimore County – Reviewed their solar zoning ordinances after considering a complete moratorium²⁵ at the end of 2016 and passed a regulation that allows a limited number of projects of a size no larger than 2 MW which is the limit of community solar arrays.
3. Montgomery County – Current regulations limit ground-based solar²⁶ to accessory use, effectively blocking commercial, ground-based solar.

Development

Beyond the state and local regulations, solar developers will face other hurdles to successfully creating a community solar project in Maryland. From large-scale issues like the viability of the SREC market and the impacts of energy assistance on low-income subscriptions to more project-specific concerns like unexpected interconnection upgrade costs, project development is a bumpy ride. What follows are some examples of the potential obstacles.

Depressed SREC values

The value of Solar Renewable Energy Credits (SRECs) has dropped from over \$100 to under \$10 since early 2016. This steep decline in price has significant impact for project economics, especially for smaller systems. Because of a recent decline in equipment prices and the overall downward trend in installation costs, the drop in SRECs does not appear to have prevented project developers from moving forward. Solar United Neighbors of Maryland does expect however, that the lower SREC incomes may translate into developers offering to subscribers reduced savings under what they would expect to pay for utility sourced energy.

Utility upgrades

When utilities conduct their interconnection engineering studies they sometimes determine that a proposed project may require equipment upgrades to local distribution equipment. The project causing this upgrade is the one that is required to pay for the upgrades. These upgrades can add significant cost. When in this situation, the developer has a choice to make. The developer can pay for the upgrade if their project economics support it. They can cancel their project. They may also be able to downgrade the size of their project to negate the need for an upgrade. In this case, the next developer to connect a project in that area will likely be face those equipment upgrade costs. The first developer has essentially passed the buck to the next one. Because the last project in an area causes this situation to happen they are forced to pay the price for all the earlier projects already installed. This situation is not specific to community solar but represents real risk for solar developers of any larger size project. A more systematic approach to managing these upgrades would be more appropriate and effective, ideally as part of a statewide-integrated resource planning process. Further discussion on this topic is outside the scope of this paper but it should be noted that the interest around community solar is likely to exacerbate this situation and will remain a project development risk for solar developers.

Communication with developers

Now that many projects are officially in the program and actively being developed, subscriber organizations will likely begin to look for customers soon. Solar United Neighbors of Maryland is working with communities who are interested in subscribing to community solar. Unfortunately, right now contacting developers is proving to be a challenge. The program allocation lists maintained by utilities shows the name of the project and the subscriber organization but does not provide any contact information. The Public Service Commission has contact information but that information is for a regulatory contact and not necessarily for customer contact. Even that information has not been made public. As a result, communities (like North Chevy Chase/Kensington described above) who may be able to bring larger groups of subscribers are struggling to get in touch with developers. We expect this to improve over time but for now, this may be barrier to speedy consumer adoption. In response, we are consolidating a list of subscriber organizations and projects with the help of community volunteers and through our own knowledge of developers working in Maryland.

Impact of energy assistance

Income-qualified Marylanders are eligible to receive energy assistance payments from the Maryland Office of Home Energy Programs (OHEP) through its Electric Universal Service Program (EUSP) and through the Maryland Energy Assistance Program (MEAP). In the case of electricity assistance, credits from these programs are applied to a customer's utility electricity bill in monthly installments. For recipients of these energy assistance payments, subscribing to community solar could cause them to pay more for electricity than they would otherwise pay over the course of a year due to those energy assistance payments creating an artificial overage in community solar subscription credits.

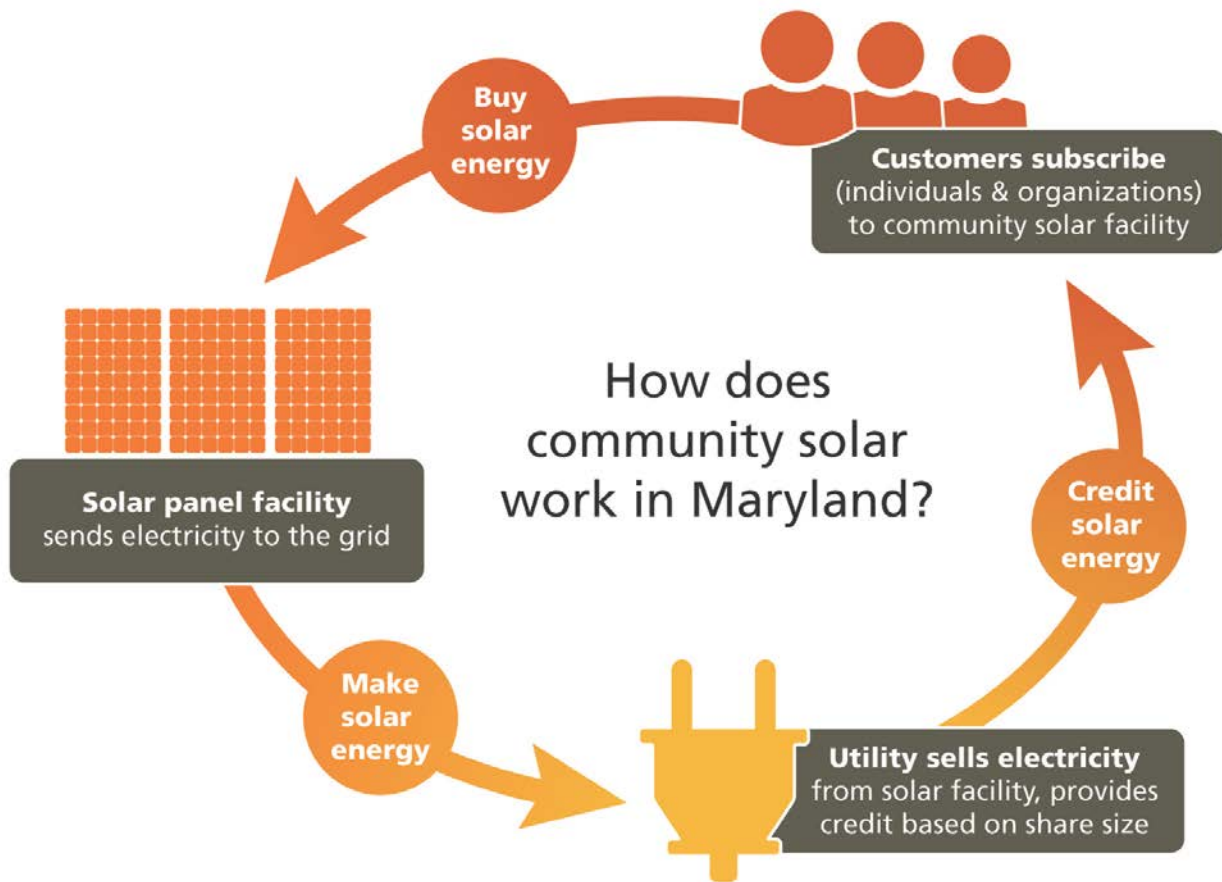
A detailed explanation of the factors leading to this are outside of the scope of this paper but

can be found in the comments filed by the Fuel Fund of Maryland and Solar United Neighbors of Maryland²⁷ with the Commission. At the writing of this report, the Commission has decided not to recommend any changes to the program and instead work with subscriber organizations to ensure that subscriptions for energy assistance recipients subscribing to community solar will be sized to ensure that those subscribers will not be impacted. It remains to be seen whether this solution will be sufficient or whether a more systemic solution is in order, such as enabling consolidated billing of community solar subscriptions on the utility bill or permitting OHEP to direct energy assistance payments to subscriber organizations.

Financing LMI projects

Projects with low- and moderate-income customers have a higher perceived risk for financiers. This is due to concern that these customers will have a greater likelihood of defaulting on subscriptions. Defaults would raise project costs to find new subscribers and cast doubt on the long-term expected revenue stream of energy sales used to pay off project financing. Currently there are no public efforts to address this issue. Maryland does not have any programs to directly support financing for community solar projects with a low-to-moderate income focus.

To fill the void, at least one philanthropic effort is in the works. The Climate Access Fund, launched by Coalition for Green Capital and Lynn Heller "will facilitate and increase access to clean energy in Maryland's low-income communities. Modeled on Green Banks that have emerged around the country since 2011, the CAF will be a nonprofit organization that will seek philanthropic capital to drive more private investment into low-income clean energy deployment. Using creative market development techniques, innovative finance structures, and alternative underwriting criteria, the CAF will bring Green Bank benefits – and energy cost savings – to low-income Marylanders." Their initial product will be a guarantee fund to secure financing for projects targeted at low- and moderate-income participants. (See appendix for more)



EDUCATION AND PUBLIC OUTREACH

Since community solar legislation was passed in 2015, Solar United Neighbors of Maryland and other organizations, such as Civic Works in Baltimore, have provided public education on what community solar is, how it will operate in Maryland, what residents need to know, and how they can take advantage of it. More of this work is needed to stem confusion and suspicion about these offerings as they enter the marketplace. From the beginning of these education efforts, it has been clear it is critical to building confidence in the general public. During public meetings on the subject, residents regularly express confusion about several key aspects of the program.

1. How Does It Work?

Rooftop solar offsets a home's electricity usage by generating electricity from the roof that is either used immediately on site or flows to the electricity grid and generates a bill credit for future use. As rooftop solar becomes more prevalent in Maryland, homeowners are beginning to understand how this process works. Now, enter community solar where the electricity is generated somewhere else and those same credits are virtually applied to a customer's utility bill. This leads some to think that those electrons from the array somehow flow to their home specifically and that they need to be somehow physically connected to the facility to receive the benefits.

2. How Do I Pay For It?

One of the beautiful things about community solar is the wide variety of project models and offerings that are possible. Will the customer pay by the kilowatt-hour (kWh) on a monthly basis? Will they pay for a block of kWh on a yearly basis or perhaps upfront for the life of the system? Will they pay for a specific amount of capacity or kilowatts (kW)? All of these options create confusion for potential customers, many whom are not accustomed to pricing out energy alternatives to their standard service from the utility.

3. What's a Good Deal?

In addition to the pricing of subscription options, there are numerous other factors a customer should consider when deciding on community solar. Some agreements may have the cost of the subscription rise over time. Others may include an early termination fee. It is important to consider all the variables, from the length of the contract, to renewal terms, to whether there is a performance guarantee.

LAYING THE FOUNDATION FOR SUCCESS

These kinds of confusion and the overall need for community solar education has led Solar United Neighbors of Maryland to develop a suite of educational materials. We have robust online community solar information, use printable flyers and slideshow presentations at community meetings, and developed a project summary template (See appendix for example) to evaluate projects from a subscriber perspective. These resources, along with public education events with key community partners will be critical for the successful adoption of community solar across the state. This may be especially true in low-to-moderate income communities where the similarity between community solar and retail electricity supply offerings may cause suspicion and mistrust. In the past, retail electricity providers sometimes promised a low rate, failing to alert customers that the rate would escalate dramatically over time.

FUTURE PROSPECTS

for Community Solar in Maryland

It's been a long road to bring community solar to Maryland. After years of experiments, community activism, and unsuccessful legislation, Maryland's recently launched program is on the cusp of making solar accessible to almost everyone in the state. The program contains many features that reflect the best practices for community solar. Chief among them are a full retail credit rate for energy subscriptions and significant capacity reserved for low-to-moderate income inclusion.

Like any new program, it also has challenges ahead of it and questions that remain. With the low SREC prices in today's market, will project developers be able to deliver savings to their customers? Will smaller and community-based projects be able to access the program? Will projects be developed across Maryland or be concentrated in certain areas? Will LMI capacity be underutilized, again leaving low-to-moderate income Marylanders out of the renewable energy economy? Can the program be improved to ensure benefits for LMI participants are maximized?

The answers to these questions and others like them will determine whether the legislature turns the pilot program into a permanent one. Yet, with a program sized to just 1.5% of the state's total electricity demand, the community solar pilot can only do so much in its current form. A permanent program, building on the pilot's successes and learning from its mistakes, will need to grow beyond the size constraints currently in place. If Maryland's clean, renewable, distributed energy movement can make that happen, an expanded program will play a central role in speeding Maryland toward a renewable energy economy that's accessible to and benefits all residents.



CONTRIBUTORS

Sincere thanks to the following for their review and contributions to this report:

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- Ingrid Schwingler, GRID Alternatives
- Tom Figel, GRID Alternatives
- Jessica Ennis, Earthjustice
- Lynn Heller, Climate Access Fund

APPENDIX **Sample community solar project review template**

ABOUT THE PROJECT

THE BASICS

Utility service territory where project is located	
Who can participate?	
Cost	
Is this cheaper than what I pay now?	
How much can I buy?	
How often will I pay?	
How long is the contract?	
Will my cost for this energy go up over time?	
Are there termination fees?	
Are there other fees?	
Will I own the panels?	
Will this energy be cheaper than grid energy in the future?	

THE DETAILS

Are there minimum credit scores required to qualify?	
Can I claim the Federal Tax Credit?	
Can I claim local tax credits?	
Will I get any Solar Renewable Energy Credits (SRECs)?	
Will I get any other incentives?	
How do I sign up?	
Can I stay subscribed and keep the benefits if I move?	
Can I transfer it to someone else if I move?	
How do I cancel?	
Can I buy in small increments?	
Is financing available for me?	
Does the system have a long-term maintenance contract?	
Can I monitor the system?	
What happens if the system stops working?	
Is there a performance guarantee?	
How do I file a complaint if I need to?	

COMMUNITY IMPACTS

Did the community play a role in developing the project?	
Is there community ownership or control?	
Does it provide local job opportunities?	
Are there provisions for low-income participants?	
Are there additional community benefits?	

CLIMATE ACCESS FUND BACKGROUND

The Climate Access Fund: Clean Energy for All

The Climate Access Fund (CAF) is a new finance initiative, launched by the Coalition for Green Capital and Lynn Heller, which will facilitate and increase access to clean energy in Maryland's low-income communities. Modeled on Green Banks that have emerged around the country since 2011, the CAF will be a nonprofit organization that will seek philanthropic capital to drive more private investment into low-income clean energy deployment. Using creative market development techniques, innovative finance structures, and alternative underwriting criteria, the CAF will bring Green Bank benefits – and energy cost savings – to low-income Marylanders.

The CAF will launch with a single product: a guarantee fund for low- and moderate- income (LMI) community solar projects. To date, access to residential solar energy in Maryland has mostly been limited to those who own their own homes and can afford the upfront costs of installing rooftop solar. Maryland's newly launched community solar pilot program has created an opportunity to change that. Through community solar, an LMI household can substantially reduce its monthly electricity bill by subscribing to an off-site solar project, as if the solar system were on its own roof.

The Maryland Public Service Commission has set aside a certain amount of community solar power that must be generated for the benefit of LMI Maryland residents. Yet this minimum capacity is unlikely to be met – much less exceeded – by solar developers without the right project structure and finance. Specifically, unless solar developers have access to risk mitigation capital, they are more likely to pursue market-rate community solar opportunities than LMI opportunities. The CAF's guarantee fund aims to level the playing field, offering capital and project development support for projects targeting LMI households. By demonstrating that community solar can be successfully marketed and deployed in LMI communities, the CAF can help bring the market to scale.

The CAF seeks to raise \$3.6 million in its guarantee fund to benefit 1,800 LMI households in Maryland. The fund's capital will be raised primarily through philanthropic grants and program-related investments and will be used as reserves, sitting behind the project and its financiers to cover a portion of potential financial losses, should they arise. By reducing the project's financial risk, private capital can flow at greater scale and lower cost. CAF will develop the partnerships and financial models necessary to maximize LMI participation in and savings from community solar, minimize risk to financial partners, and demonstrate to commercial banks the creditworthiness of LMI consumers when it comes to solar financing.

By facilitating LMI access to community solar power now, and to other clean energy technologies in the future, CAF intends to ensure that the benefits of the 21st century's clean energy transformation do not leave Maryland's low-income population behind.

For more information, please contact Lynn Heller at lynn@climateaccessfund.org.

END NOTES

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