

Community Solar | 2024

Navigating the Current Ecosystem
and Market Insights

STANDARD
SOLAR
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A Flourishing Solar Model That Transforms Communities

Shepherds Mill,
Union Bridge, MD



Community solar projects are transforming the energy landscape with their far-reaching impacts. These photovoltaic (PV) solar arrays, developed by utilities, municipalities or third-party owners on public or private property, offer significant economic and environmental benefits. The systems provide clean energy savings to both residential and commercial subscribers who might not otherwise have access. Community solar initiatives play a crucial role in advancing sustainable energy solutions by lowering carbon footprints and aiding states in meeting renewable energy goals.

Over the past five years, community solar has grown from a lesser-known clean energy model to a giant in the solar energy space.

In 2019, 42 states had community solar projects totaling 1.2 gigawatts (GW) of operational capacity. 1.148 GW were installed in 2023, a 3% increase over 2022, and made up 40% of total U.S. non-residential solar. As of 2022, the community solar industry alone supported 16,785 jobs.

The U.S. community solar market is expected to add more than 6 GW in the next five years and break 14 GW by 2028. The National Renewable Energy Laboratory suggests that the sector could serve 53.2 million households and 311,750 businesses that could not otherwise access solar, reduce subscriber electricity costs by \$110 million —\$330 million a year, and support 7,000 more permanent jobs. ○

“ By being a subscriber to a community solar project, we are hoping to be one of many, many more people who buy into solar as part of the solution that is available to them. As more people are interested and sign up, it will expand the market and the development of solar around the country. This is good for the consumer, the communities and the environment.

KAI HAGEN
Community solar subscriber
and former Frederick County
Commissioner and council member

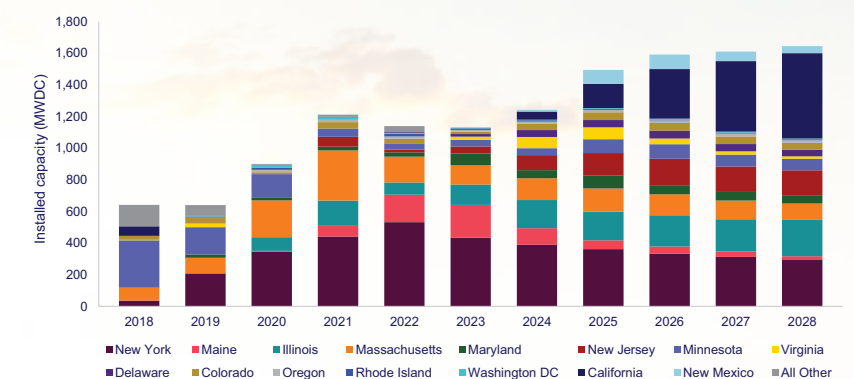
Installer Market Share

Top Asset Owners	2024 Market Share
1 Standard Solar	4.7%
2 CS Energy	3.5%
3 NextEra Energy	2.5%
4 ForeFront Power	2.1%
5 ENGIE	1.7%
6 US Light Energy	1.6%
7 Nexamp	1.5%

Source: Wood Mackenzie

Top States

Historical And Forecasted Installation Capacity By State For Existing Markets



Source: Wood Mackenzie



Subscription and Ownership

Skyward, Boring, OR

Community solar enables subscribers such as homeowners, businesses, organizations and municipalities to enjoy credit on their electric bills for the power produced from their portion of the array. ‘Anchor’ tenants are larger entities like educational institutions, large corporations and community organizations that provide a significant number of reliable subscribers, thus reducing project risks.

These projects demonstrate environmental leadership, resident participation in clean energy and a desire to advance state Renewable Portfolio Standard (RPS) goals.

The model has a range of objectives, such as advancing energy equity, creating local, low-cost energy and cost savings and offering backup power. These projects demonstrate environmental leadership, resident participation in clean energy and a desire to advance state Renewable Portfolio Standard (RPS) goals.

Systems vary in size from less than 5 megawatts (MW) to 10 MW and more and fall under three common ownership structures:

- Utility-administered and owned system.
- Third-party ownership (utility partners with a solar company responsible for constructing, owning and operating the plant).
- Direct ownership (subscribers buy system components, and the utility or third-party developer builds and operates the system). ○



The Catholic University of America, Washington, D.C.

In partnership with Standard Solar, the Catholic University of America in Washington, D.C., developed a 7.5 MW community solar project that will generate approximately 10,000 MWh of solar energy annually. This project is expected to reduce greenhouse gas emissions by 7,115 metric tons each year, equivalent to removing 1,547 cars from the roads.

As the largest urban community solar array in the United States, this system highlights the critical role of community solar in advancing clean energy for America’s urban institutions. Open to D.C. Pepco account holders across all eight Wards, the project already has about 1,200 subscribers.





Tri-County Energy,
New York

The Community Solar Policy Landscape

Pro-community solar policy has experienced significant growth across the states over the past few years as lawmakers, utilities and customers become more familiar with the model. Existing programs are expanding from small pilot initiatives to fully realized, uncapped programs with low- and middle-income (LMI) carve-outs. Currently, 24 states and D.C. have established community solar programs.

Florida, Minnesota, New York and Massachusetts are the four states with the most community solar capacity. New York has a particularly effective — and exemplary — community solar program partly because it allows large housing authorities to qualify for the program and be permitted to push savings benefits to customers directly.

In the wake of the IRA, more than 155 GW of solar manufacturing and 65 GWh of standalone storage were announced in 2023.

Several states, such as Michigan, Ohio, Washington and Wisconsin, have not yet enacted legislation but have introduced bills to open markets. A bill in Pennsylvania is advancing in the legislature for the first time. In contrast, community solar is experiencing challenges in some states, and, as in the case of Maine, the market has cooled because there are not enough subscribers for additional growth. In Minnesota, the state Public Utility Commission cut the reimbursement rates for solar compensation, which will erode project savings and cause bill increases for some subscribers. California's

struggling community solar market is experiencing several legislative setbacks that have diminished the program considerably.

The impact of the Inflation Reduction Act (IRA) on solar deployment, including community solar, is profound at the federal level. Over the next 10 years, project development is projected to experience an additional 160 GW of solar and \$565 billion of investment, while job growth is anticipated to reach 478,000. In the wake of the IRA, more than 155 GW of solar manufacturing and 65 GWh of standalone storage were announced in 2023. ○

York, NY



“The IRA has also brought a significant degree of business certainty to the industry. It established grant funding and a stable ITC and PTC over the next 10 years. This is in sharp contrast with past years, when the ITC percentages and eligibility criteria were amended several times. Businesses and investors had to closely follow legislative developments to understand available tax incentives, resulting in a lack of market consistency and predictability. With stable tax incentives for the longer term, solar companies are able to price projects and more easily attract investors.

TREVOR LAUGHLIN
Senior Analyst, Policy and Regulatory Affairs, Standard Solar



Jill Cliburn of Cliburn and Associates is the leader of the Solar Value Project, which is focused on improving utility-based community solar and solar-plus strategies through technical innovations and program design.

Expert Interview

What form does community solar tend to take in rural communities?

While investor-owned utilities serve a substantial part of rural America, the primary providers are consumer-owned rural electric cooperatives and municipal or public power utilities. Community solar has been increasingly adopted across this sector. However, many municipal utilities and cooperatives are in states that don't have a community solar policy or are exempt from the mandates, so they are doing it voluntarily. There are 42 states plus Washington D.C. with community solar projects, even though only 22 states and D.C. have community solar programs.

Advantages for rural utilities of partnering with a developer.

The IRA legislation offers "direct pay" incentives for non-taxable co-ops and public power, supporting local ownership. However, partnering with a private-sector developer can benefit from their expertise in solar design and financing methods. Rural utilities often lack the staff time to access available incentives. Collaborating with a development partner through a Power Purchase Agreement simplifies and accelerates the process, ensuring the benefits are realized efficiently.

Describe the role of the community solar subscriber model for these communities.

In recent years, community solar has shifted from utilities using structures like on-bill financing for what we might call the "buy a panel" program model to an updated subscription model. With subscriptions, customers sign up for the generation from a block of community solar capacity or to "green" a percentage of their bills. Sometimes local utilities have even newer, creative ways of involving customers in community solar. It behooves developers to be open to customized program structures, allowing more opportunities for working with small utilities.

Until recently, extending program benefits to low-income households was difficult because consumer-owned utilities typically want to ensure costs are never shifted from participating customers to non-participants. With today's low cost of solar, it is possible to structure a project so it is a good investment, including participants and non-participants alike. Beyond that, the subscriber model makes participating in community solar voluntary. That makes it possible to set up pricing for subscribers within the program with more flexibility.

How has recent federal policy impacted renewables deployment in rural communities?

America's 830 local electric, generating and transmission cooperatives serve more than 90% of the country's poorest counties. They push for economic development to provide a pathway out of poverty and, with opportunities provided under the IRA and the Infrastructure Act, strive to upgrade electric systems to facilitate these communities' participation in the clean energy transition.

Rural communities are excited because they finally have access to the funding and technical support needed to make these changes. Some cooperatives are looking to use community solar to offer customers a new choice, pair with a beneficial electrification program, or pair with storage for system-side savings or weather-emergency services.

How is the deployment of community solar in rural communities instructive?

The sky's the limit when designing community solar programs that meet the specific needs of rural communities. Consumer-owned utilities don't have to respond to strict guidelines from statewide energy programs, so they can try more creative and innovative solutions like linking their community solar programs with energy efficiency, load management or energy storage initiatives. They employ strategies that can be adopted by big cities following their example. ○



Bethel, ME

Challenges to Community Solar Growth

Logistical Complexity

Implementing the community solar model can be an intricate process. Projects may have from 20 to 100 or more residential, commercial and government subscribers. Utilities have their own rules and regulations, making billing a complicated procedure. Ongoing communication founded in a solid partnership among the financier, developer or asset owner, and any third-party billing companies, is essential for successfully navigating these complexities.

Capacity limits set by local or state policies can restrict project size and user connections. Projects with a diverse customer mix often secure better financing. Subscription parameters and contract terms affect subscribership and development. Strategic planning and management of subscription criteria are essential for project success, regulatory compliance and securing favorable financing.

Interconnection

The renewable energy sector faces significant deployment bottlenecks due to regulatory and interconnection hurdles, leaving many completed projects stalled without permission

to operate. According to an analysis by the Lawrence Berkeley National Laboratory, more than 2,000 GW of generating capacity are **waiting on interconnection to the grid**. Utilities attribute this problem to high costs and time-consuming grid upgrades.

The interconnection queue is critical. There is a clear sense of urgency around getting more solar online, given factors like coal plants being retired and increasing electricity consumption. The Federal Energy Regulatory Commission (FERC) **is attempting to expedite the process**, and the IRA has incentives for expanding and updating the grid. But all this will take time.

Solar companies like Standard Solar are focused on siting projects where systems can be brought online faster and opting for smaller systems that can more readily fit into the existing grid capacity.

Community Opposition

Siting is one of the most significant barriers to community solar growth. Opposition often arises from residents concerned about disrupted views, excessive farmland use, perceived outsider benefits or increased electricity bills.

Some communities and states are actively resisting renewable energy development. In Ohio, a law was passed allowing county officials to prohibit new renewable energy projects. Similarly, towns in Texas are attempting to block such developments. In one Indiana town, over 70 residents filed a lawsuit to halt a solar project.

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PROJECT PROFILE



Swan Holt, Carver, MA

Standard Solar partnered with a Massachusetts farmer to build a 2,827 kW dual-use array over cranberry bogs, designing it in consultation with the farmer to ensure it would accommodate the existing bogs. This includes pilings taller than a traditional ground-mounted system and rows of bifacial panels spaced out in clusters to allow sunshine to reach the crops and enable farmers to grow and harvest beneath.

This dual-use project grants the farmer an additional source of revenue and, as a community solar system, brings solar energy savings to hundreds of area subscribers who might not otherwise have access to it.





The Power of Positive Community Relationships

Fortunately, support for community solar projects often surpasses opposition because many communities are witnessing the tangible benefits. Additionally, renewable energy companies are making significant efforts to engage with communities and develop projects responsibly.

Building trust in communities is paramount. Responsible solar businesses are transparent about costs, pricing schedules and commitment timelines and strive to develop in ways that align with residents' needs. They also establish partnerships with local leaders and community organizations, especially with groups with environmental stewardship missions.

These companies also understand the importance of addressing the needs of adjacent property holders, local governments and individual home and business owners. Community outreach helps clarify misconceptions and demonstrate the benefits of community solar. Companies often provide information that speaks to the concerns of their audience.

Smaller arrays can address local concerns about the impact of large-scale installations in small communities.

Additional Strategies for Overcoming Opposition

Developers aim to design projects that promote habitat growth and biodiversity while minimizing environmental impacts. They prefer deploying on brownfields or landfills whenever feasible, a strategy successfully implemented by Standard Solar. Additionally, smaller arrays can address local concerns about the impact of large-scale installations in small communities.

Capitalizing on helpful legislation helps as well. Recently, incentives were passed in Standard Solar's home state of Maryland to promote community solar models other than conventional ground mount arrays such as carports and large rooftops.

The Compelling Case of Agrivoltaics

Educating communities about the benefits of dual-use models, such as agrivoltaics, is especially impactful. Agrivoltaics, which combines solar energy with agricultural land, can be utilized on farmland, rangeland and native habitats. This model fosters collaboration among solar developers, landowners and farmers, promoting both environmental and financial sustainability.

Deployment on agricultural land can be a win for farmers because it gives them stable monthly revenue. For example, Vermont dairy farmers experiencing increasingly thin profit margins found that community

“ At Standard Solar, community solar project success starts with strong partnerships. This can be with landowners hosting projects as well as with community leaders and key influencers. It can also be with developers, aggregators that secure and manage subscribers and local permitting offices that help expedite permitting. We're very fortunate to have strong partners that bring us multiple projects year after year, something that can happen when teams execute projects successfully over the long term.

JOHN FINNERTY
Director of Business Development, Standard Solar

solar on less productive land was a way of achieving long-term economic stability without losing the use of any of their land.

At Standard Solar's Shepherds Mill community solar array in Maryland, the project was developed on land that was previously low-yielding for crops. The farmer was happy to use it for solar, given that the plot was not particularly fruitful. Additionally, solar companies like Standard Solar often deploy arrays on only a small percentage of a farmer's land.

Agrivoltaics can also include livestock-powered solar grazing to manage vegetation growth on sites. This low-cost, sustainable O&M strategy allows solar asset owners to build positive relationships with the surrounding communities, and it is employed at Shepherds Mill and arrays across the country. ○

PROJECT PROFILE



Shepherds Mill,
Union Bridge, MD

Located in Maryland's Carroll County, the 2.8 MW Shepherds Mill Community Solar project has an annual production of 4 million kilowatt hours, providing savings and clean power to hundreds of local Maryland subscribers. Shepherds Mill allocates 30% of the output to service low- to moderate-income subscribers with additional savings and plays a key role in Maryland's efforts to reach its renewable energy goals.

The array is a prime example of agrivoltaics. As long-term owner-operator of the system, Standard Solar employs solar grazing with sheep to manage vegetation growth, a practice that reduces the need for herbicides and emission-producing commercial mowing. Shepherds Mill also exemplifies good public policy in action. Maryland's community solar program resulted from collaborating with legislators, utilities, regulators, community groups, landowners, environmentalists and solar industry leaders. In turn, that program was responsible for facilitating the development of Shepherds Mill and securing the needed subscribers.



“Every energy consumer should be able to choose clean, local and affordable community solar. Solar community leaders can make

Brush, CO

Community Solar and Energy Equity

Community solar programs play an integral role in creating energy equity in America by reducing the burden Low and Moderate-Income (LMI) and disadvantaged households experience through lowered electricity costs. Increasingly, the model broadens access to clean energy benefits for economically vulnerable communities, including Indigenous people and people of color. The share of community solar serving LMI subscribers **grew from 2%** in the second half of 2022 to 10% in the second half of 2023, with the cost to subscriber LMI customers declining by 30%. Additionally, community solar offers benefits to multifamily affordable housing providers by increasing financial stability through reduced costs and improved energy services.

...They enjoy portfolio diversification that includes the underserved low-income off-taker market.

Pro-LMI legislation and developers
Legislation and targeted programming are vital. **14 of the 24 states** with community solar programs have a low-income participation

provision or “carve-outs.” Helpful programs include self-attestation qualification processes, a variety of contract models, subscription price subsidization and consolidated billing.

At the federal level, the IRA offers two programs focused on increasing low-income participation: a **low-income bonus credit program** and a **grant program** boosting equitable access to community solar. These can be a boon for solar companies. For example, when there are LMI threshold requirements of 40% in a particular market, developers often seek to achieve that to get closer to the ITC IRA bonus credit available for projects that reach 51% LMI participation.

Encouraging LMI solar access not only reduces economic inequality but it is also a smart business decision. Financiers and developers who have difficulties securing quality off-takers in the corporate space end up spreading their credit

risk across many households in different towns and employment bases. In this way, they enjoy portfolio diversification that includes the underserved low-income off-taker market.

Barriers

Barriers to deploying community solar in these communities include limited access to financing, a lack of effective incentives and utility allowance structures that hinder the assignment of benefits to low-income residents. Developers sometimes also have trouble discerning if a particular project qualifies under the IRA adders for LMI, disadvantaged and community energy communities. Strategies to overcome these barriers include providing education, offering financial incentives and exploring alternative methods of distributing benefits to residents.

Moreover, the misconception that LMI off-takers are a risky investment persists in some areas. However, risk is often addressed through allowance and state program support through loan-loss reserve programs and public funds held in reserve to cover potential losses in case of a customer default. ○

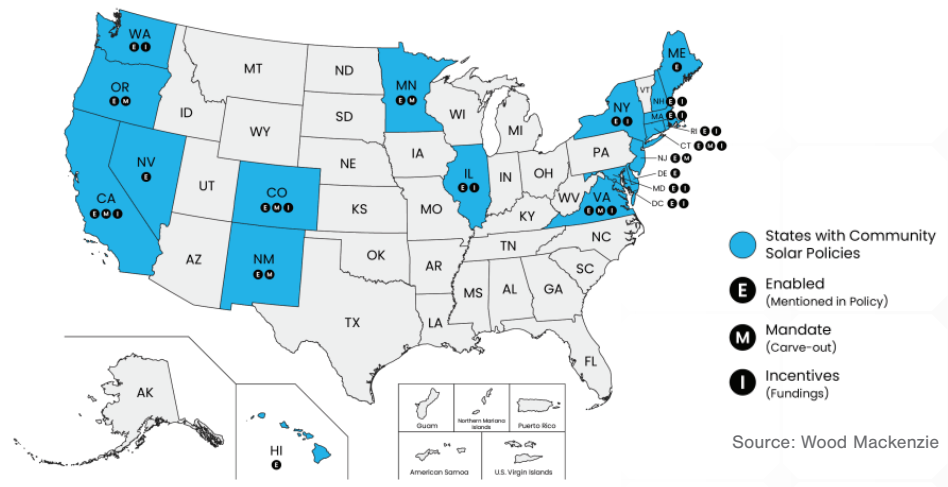
this happen by ensuring these programs are open to participants regardless of income level and by making consumer protection paramount.

Solar companies and decision-makers should work together to design community solar programs with carve-outs for LMI and energy-burdened communities that have higher discount rates and no fees or credit score requirements.

FATIMA GHANI
Go Solar Program Specialist,
Solar United Neighbors (SUN)

SUN is a national nonprofit organization dedicated to representing the needs and interests of solar owners, subscribers and clean energy supporters.

States With LMI Incentives or Carve-outs





Expert Interview

Charlie Coggeshall is the Mid-Atlantic Regional Director for the Coalition for Community Solar Access, an organization committed to increasing access to community solar for Americans and American businesses.

Charlie offers insights about the latest policies, perceptions and innovations related to community solar, nationally and in the Mid-Atlantic region.

What do you see solar developers doing to innovate in community solar to help deploy projects?

From where I sit, although greenfield development remains the most cost-competitive part of the segment, there is an increasing interest in rooftop projects, agrivoltaics/dual-use, brownfields, etc. In some cases this is driven by program requirements and/or incentives, but it's notable that there are more developers that are specifically geared toward these types of project development than in years past.

What are some best practices for making community solar accessible and appealing for communities and key decision-makers — throughout all steps of the development process? Can you illustrate this with an example or two?

Having LMI participation requirements has become the standard for community solar program design in most markets across the country. While having LMI requirements is a best practice in itself, the customer experience and overall benefit are maximized when coupled with other program

design features, such as consolidated billing and the ability for customers to “self-attest” their income status.

The states that I cover in the Mid-Atlantic (MD, NJ and VA) are good examples of these policies being leveraged. Beyond the policy requirements, my sense is that successful developers often have strong relationships with the communities where the projects are located and/or with entities representing the individuals being served.

How has the public’s — and legislators’ — understanding of community solar shifted over the past few years?

Community solar has gone from a relatively unfamiliar segment of the solar industry to being embraced as a distributed generation tool for meeting clean energy and equity goals across roughly twenty states. The recent expansion of programs I cover in the Mid-Atlantic demonstrates this trend, as do policy initiatives that have arisen out of the Biden Administration over the past several years.

Describe the impact of the interconnection backlog on community solar deployment.

Interconnection is critical to the success of any community solar market, and there is a wide range of experiences across markets regarding those that are best equipped versus those that need major updates/improvements.

Interconnection backlogs can create years of delay and drive significant development risks. Improving interconnection regulations and utility practices is essential to establishing a scalable community solar program. ○

Cumulative Installed Community Solar Capacity, 2010-2028



Source: Wood Mackenzie



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