ERRA Workshop
Renewable Collection Self-Consumption
A U.S. Perspective via Community Solar

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Contents

What Is Community Solar?

The U.S. Department of Energy (DOE) defines community solar as:

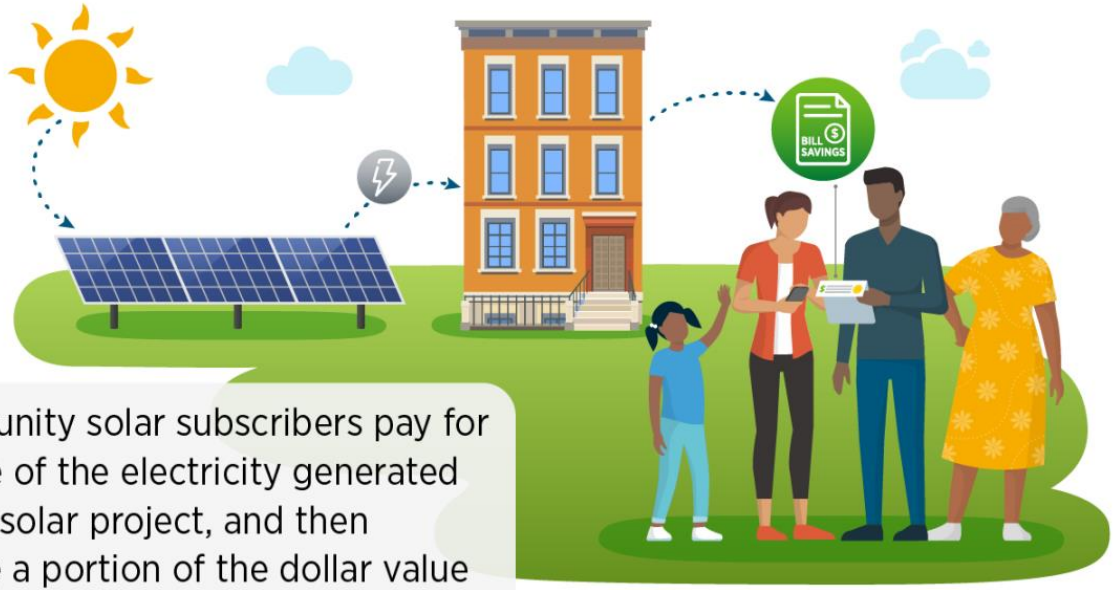
Any solar project or purchasing program, within a geographic area, in which the benefits flow to multiple customers, such as individuals, businesses, nonprofits, and other groups. In most cases, customers benefit from energy generated by solar panels at an off-site array.

Source: DOE, Community Solar Basics.

What Is Community Solar?

How does it work?

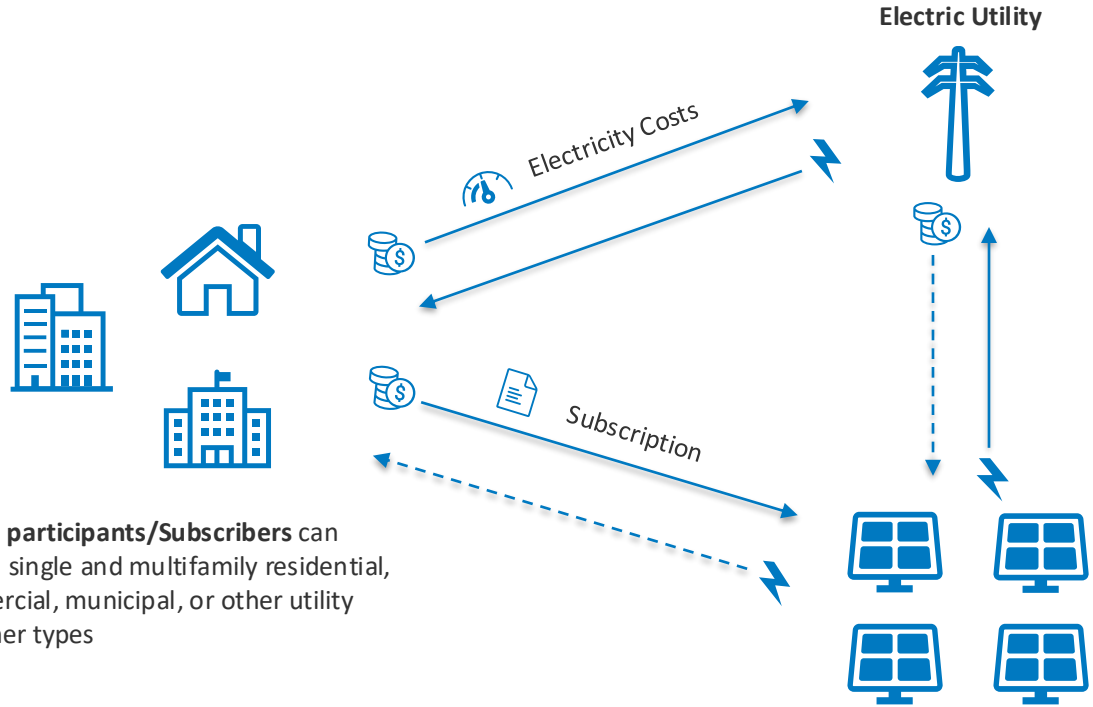
Community solar projects generate electricity from sunlight and the electricity flows to the electricity grid. Project owners can sell this power to their local utility.



Community solar subscribers pay for a share of the electricity generated by the solar project, and then receive a portion of the dollar value generated by the project as a credit.

Source: DOE, Community Solar Basics.

What Is Community Solar?



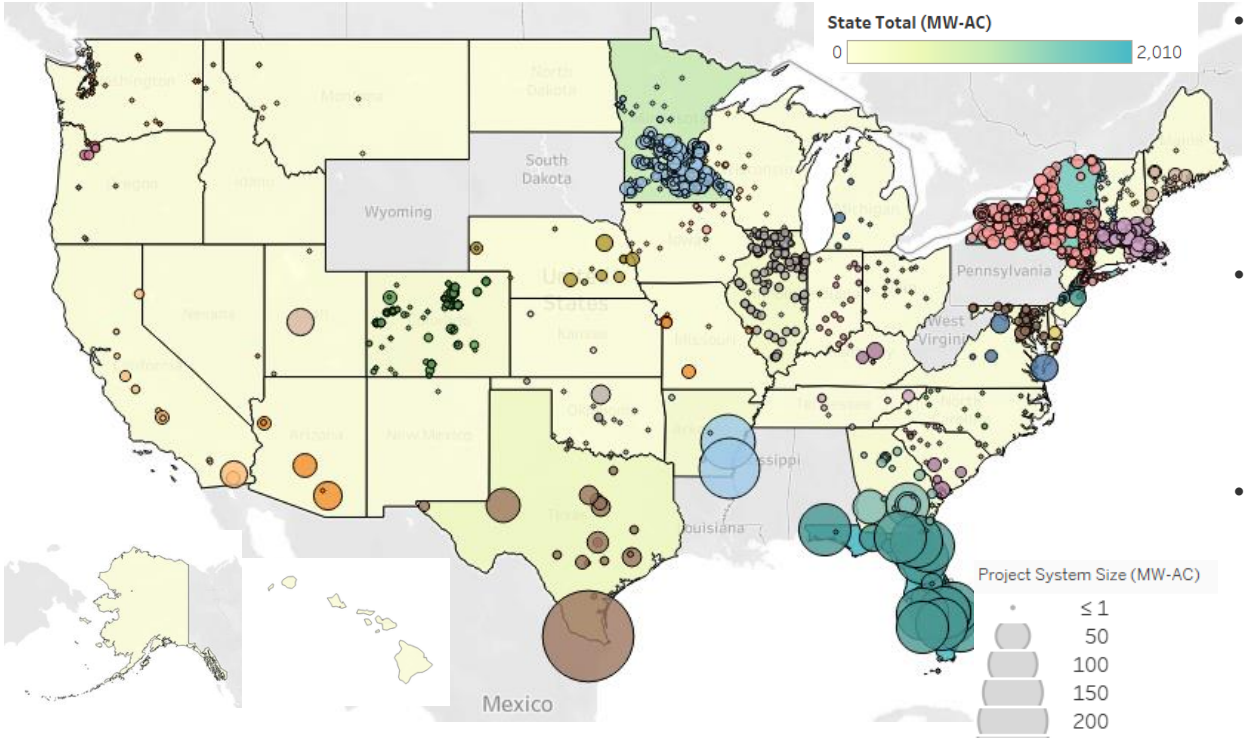
Project participants/Subscribers can include single and multifamily residential, commercial, municipal, or other utility customer types

Community Solar Project may be owned and operated by the utility, 3rd party, or a project participant and may be located anywhere within the utility service area

Market Status

A summary of data on community solar deployment over time, by state, and by project characteristics

Community Solar Capacity by State

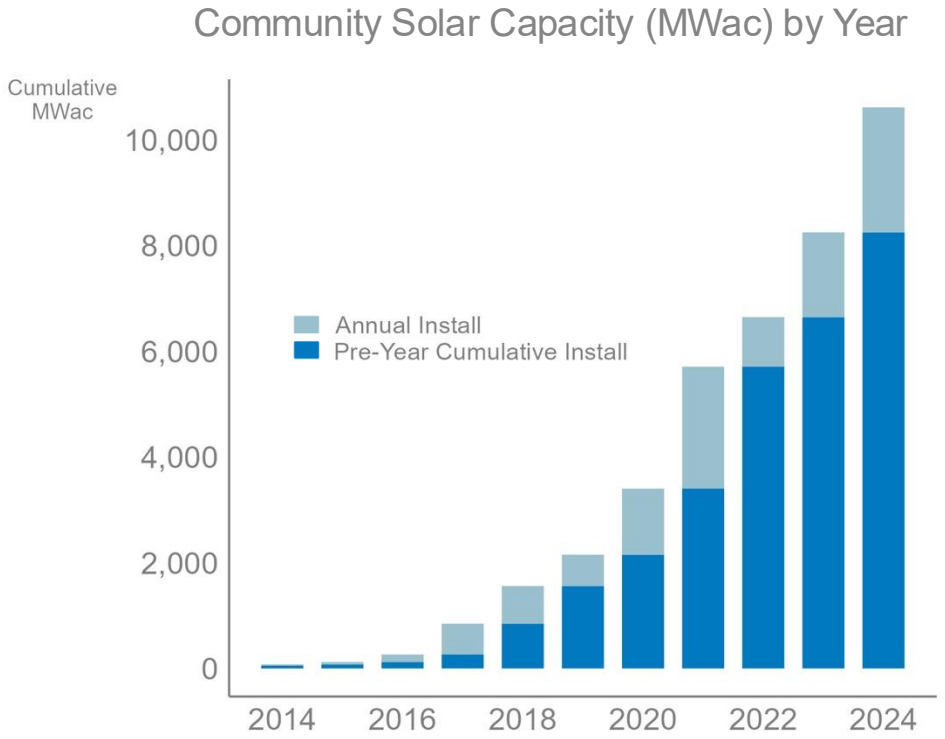


- **Total Community Solar Capacity:** As of December 2024, we estimate a total community solar capacity of 10,615 megawatts-alternating current (MW_{ac}) across over 3,764 projects in 44 states and localities, including the District of Columbia.
- **State Variability:** The distribution of community solar capacity among states ranges from 0 to 3,873 MW_{ac}. Notably, Florida claims the top position in terms of community solar deployment capacity.
- **Visual Representation:** The bubbles on the chart represent individual project sizes, ranging from less than 1 MW_{ac} up to 200 MW_{ac}. In Texas and Arkansas, projects over 100 MW_{ac} have partial capacity dedicated to community solar. The bubbles for each state are the same color, allowing for differentiation between states.

Data Source: NREL, Sharing the Sun, Dec 2024 Dataset

The Growth of Community Solar

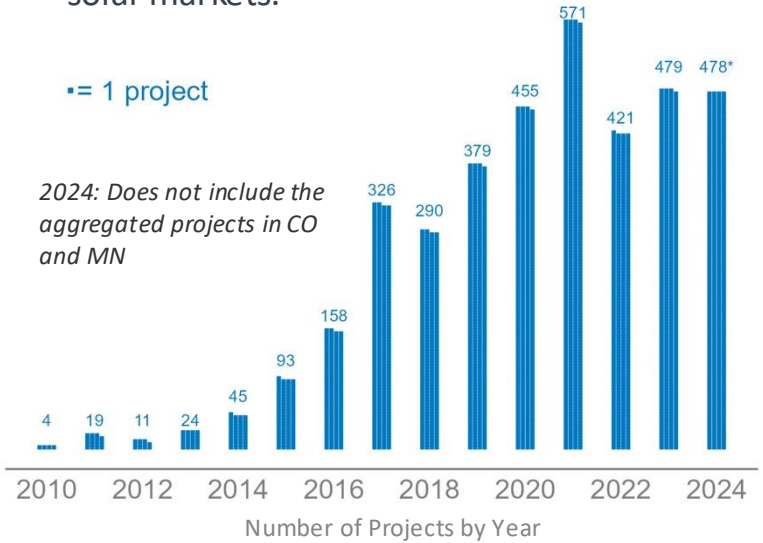
- Community solar capacity has grown since 2016. On average, 1.17 gigawatt-alternating current (GW_{ac}) of capacity has been installed annually since 2016.
- In 2024, more than 2,364 MW_{ac} of community solar was installed, the largest annual installation to date.
- Prior to 2024, 2021 was the year with the single largest installation growth at 2,307 MW_{ac}

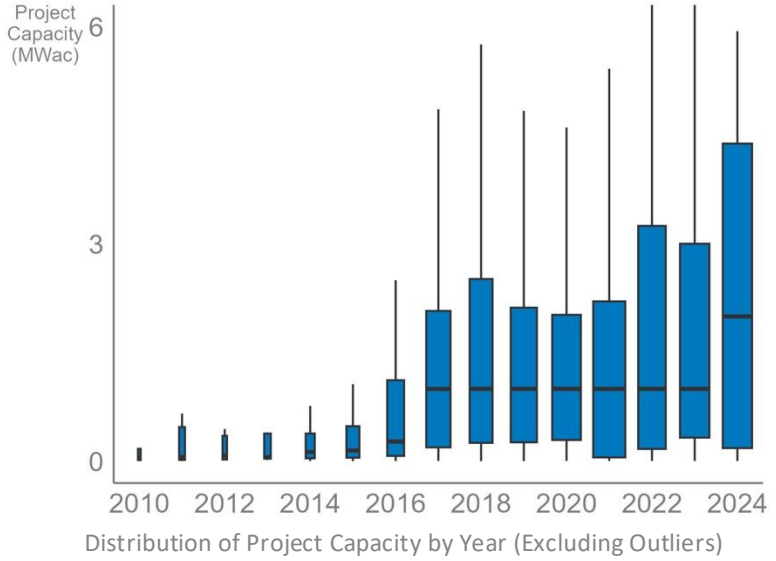


Data Source: NREL, Sharing the Sun, Dec 2024 Dataset

Trends in Community Solar Projects

- The number of community solar projects installed annually increased from 300 in 2017 to more than 570 in 2021.
- Until 2016, the average installed project sizes increased each year. In 2017, the average project size jumped up to around 1 $MW_{ac.}$
- In 2024, the average size increased to 2.8 MW_{ac}. This increase is mainly driven by the larger project capacities deployed in Florida; This also aligns with the increasing project size limits in many community solar markets.



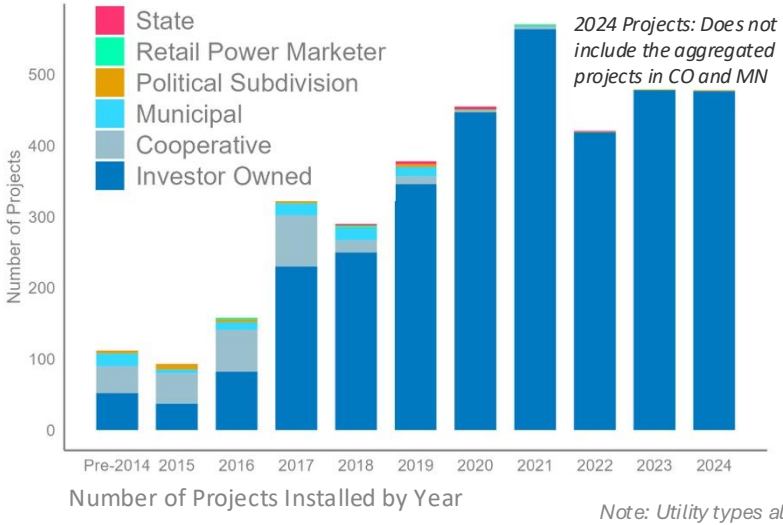


Data Source: NREL, Sharing the Sun, Dec 2024 Dataset

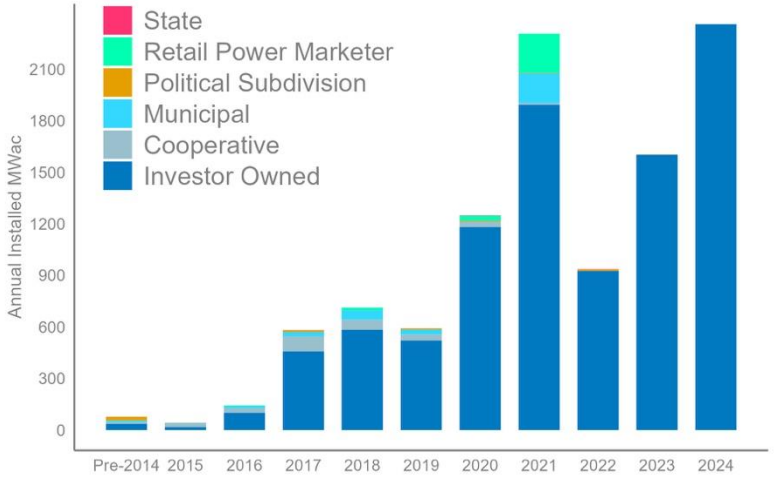
Community Solar in Investor-Owned Utility (IOU) Service Areas

Community solar projects are operated in the service areas of different utility types.

- Since 2019, community solar in the service area of investor-owned utilities have led the market.
- As of the 2024, projects in the service area of investor-owned utilities total 91% of installed community solar capacity cumulatively.



Number of Projects Installed by Year



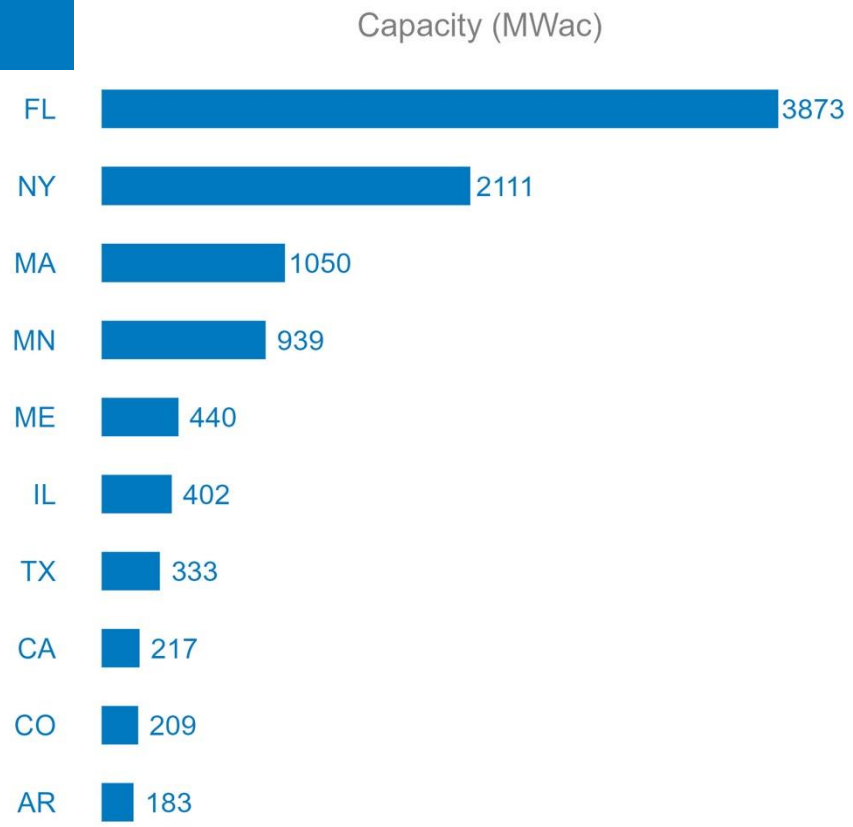
Capacity Installed (MW_{ac}) by Year

Note: Utility types align with those reported on EIA Form 861

Data Source: NREL, Sharing the Sun, Dec 2024 Dataset

A Few Key States Lead the Community Solar Market

- About 92% of cumulative community solar capacity is located in 10 states.
- About 75% of cumulative capacity is located in just four states: Florida, New York, Massachusetts, and Minnesota.
- Twenty-six states have more than 10 MW_{ac} of installed capacity.

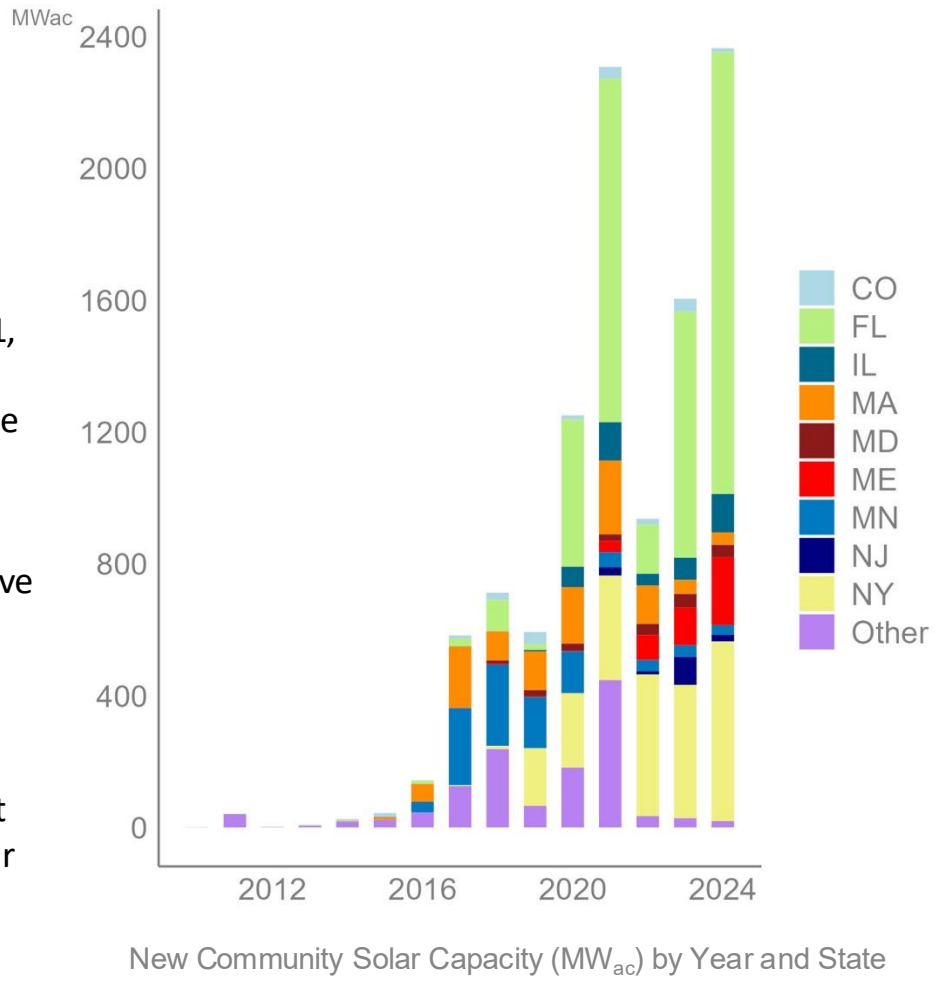


Cumulative Community Solar Capacity (MW_{ac}) by State

Data Source: NREL, Sharing the Sun, Dec 2024 Dataset

Community Solar Capacity Has Been Installed in Waves in Key Markets

- **Massachusetts' and Minnesota's Growth (2016–2021):** Massachusetts and Minnesota witnessed community solar capacity expansions during the years 2016 to 2021, adding about 840 MW_{ac} each. Cumulative capacity installed in Massachusetts reached the 1 GW_{ac} milestone in 2023.
- **Florida's Capacity (2020–2024):** Florida experienced an increase in capacity from 2020 to 2024, with a cumulative 3.87 GW_{ac} of capacity coming online.
- **New York's Emerging Market (2019–2024):** New York added 2.10 GW_{ac} of capacity during the past 6 years.
- **New Jersey and Maine:** New Jersey and Maine has built more than 141 MW_{ac} and 431 MW_{ac} of community solar projects since 2021.



New Community Solar Capacity (MW_{ac}) by Year and State

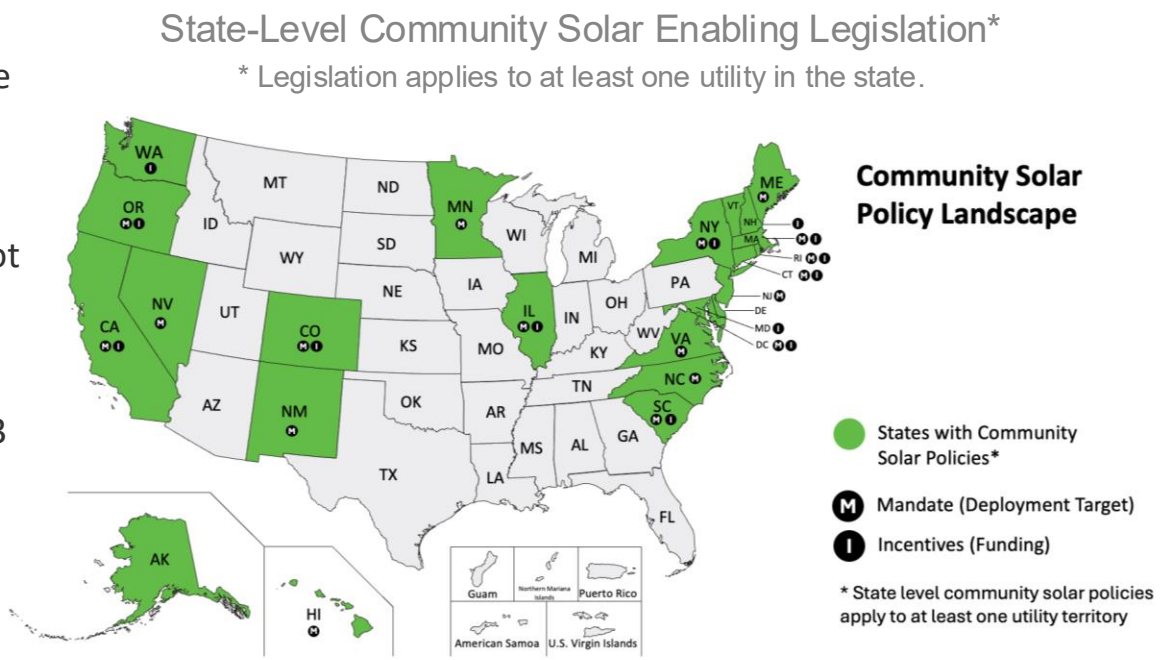
Data Source: NREL, Sharing the Sun, Dec 2024 Dataset

Impact of Policy and Market Drivers

A discussion of various policy and market factors that have shaped community solar deployment

Community Solar State Policies (slide 1 of 2)

- Twenty-four states and localities, including the District of Columbia, have passed some form of legislation enabling community solar, either through state-required programs or by authorizing a limited number of pilot projects.
- States that have enacted new legislation or made changes since 2023 include Alaska, Colorado, Maryland, Minnesota, and New Jersey.
- These programs vary in scope but generally allow for some form of virtual net metering that enables subscribers to benefit from their community solar subscriptions.

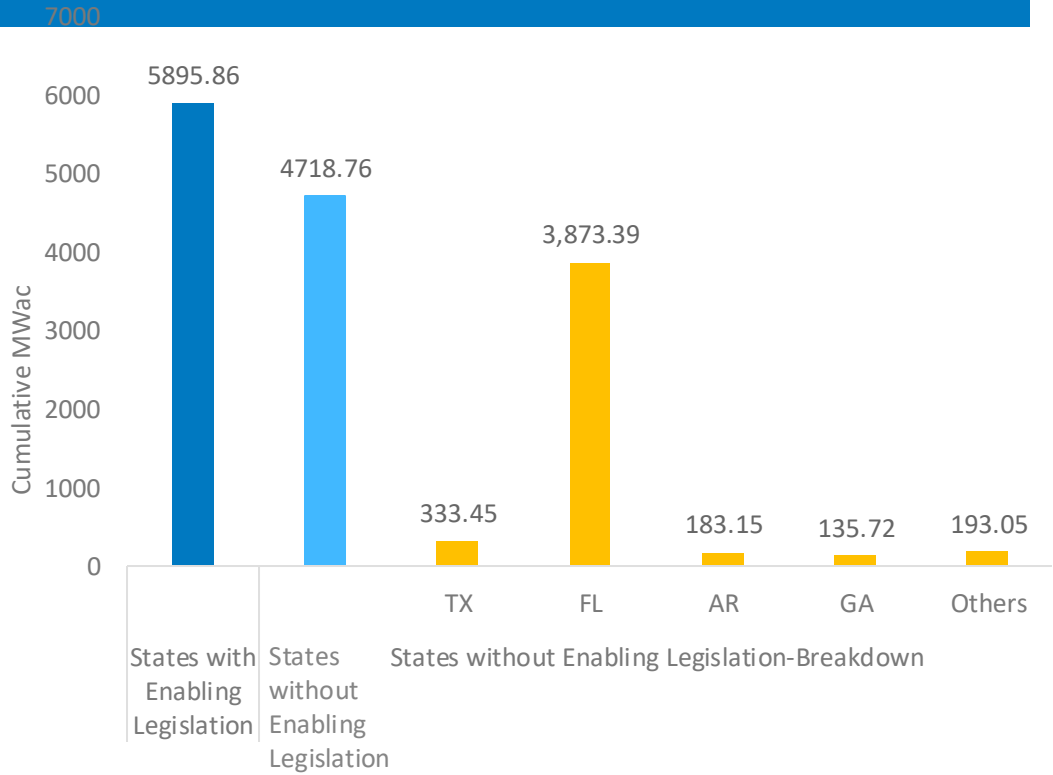


Source: NREL State Policies and Programs for Community Solar.

Note: Alaska enabled community solar policies in Aug 2024 through Senate Bill 152.

Community Solar State Policies (slide 2 of 2)

- As of December 2024, 55.5% of community solar installations were developed in states with enabling legislation, whereas 44.5% of community solar installations were in states without enabling legislation.
- Florida, Texas, Arkansas, and Georgia were the key drivers of capacity in states without enabling legislation, contributing to 95.9 % of developed capacity among states without enabling legislation.



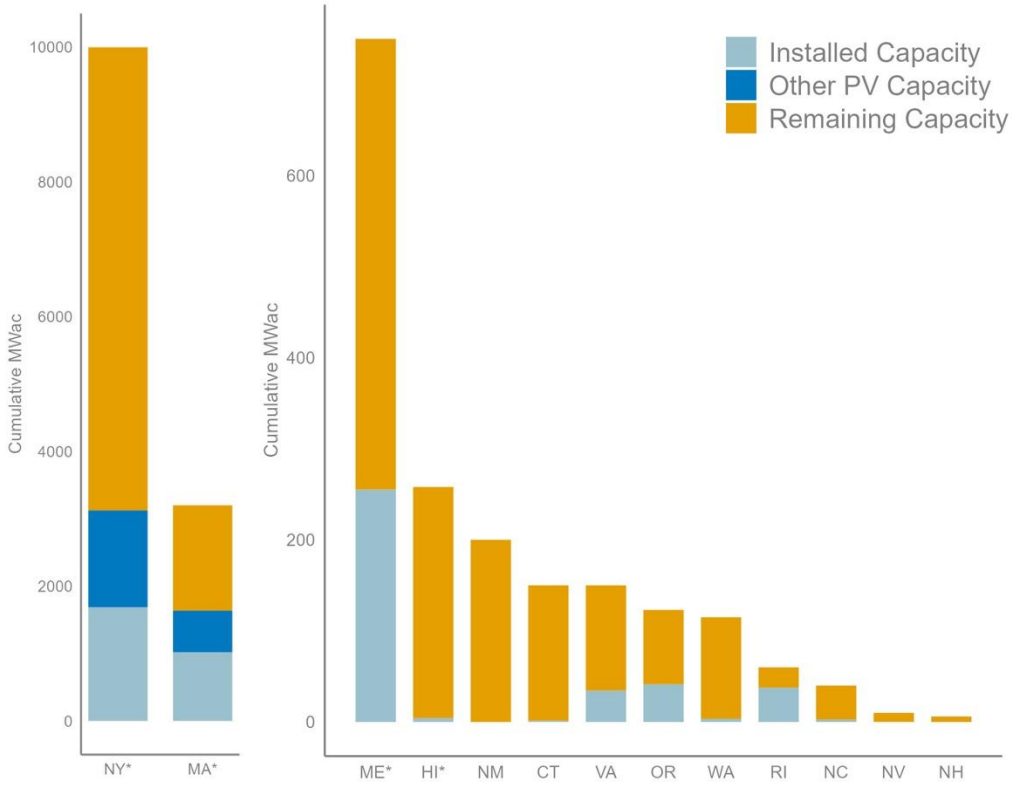
Cumulative Installed Capacity in States With and Without Enabling Legislation

Data Source: NREL, Sharing the Sun, Dec 2024 Dataset & State Policies and Programs for Community Solar.

Most States With Program Caps Have Large Amounts of Remaining Capacity

At least 22 states and localities, including the District of Columbia, have some cap-related requirements on community solar programs.

- Thirteen states have community solar program caps, shown in the graphs at right.
- The District of Columbia does not have a cap but set the target to provide solar access to 100,000 low- and moderate-income households.
- Florida, South Carolina, and Wisconsin have utility-led programs with capacity targets.
- Minnesota, Maryland, and New Jersey have revised their programs and will implement annual procurement targets and caps.



Installed and Remaining Capacity in States With State-Level Program-Size Caps

Source: Updated from NREL, Status of State Community Solar Program Caps (2022), State Policies and Programs for Community Solar). In addition, New Hampshire Electric Assistance Program Low-Moderate Income (EAP LMI) Community Solar Program *is accepting applicants in February 2024*

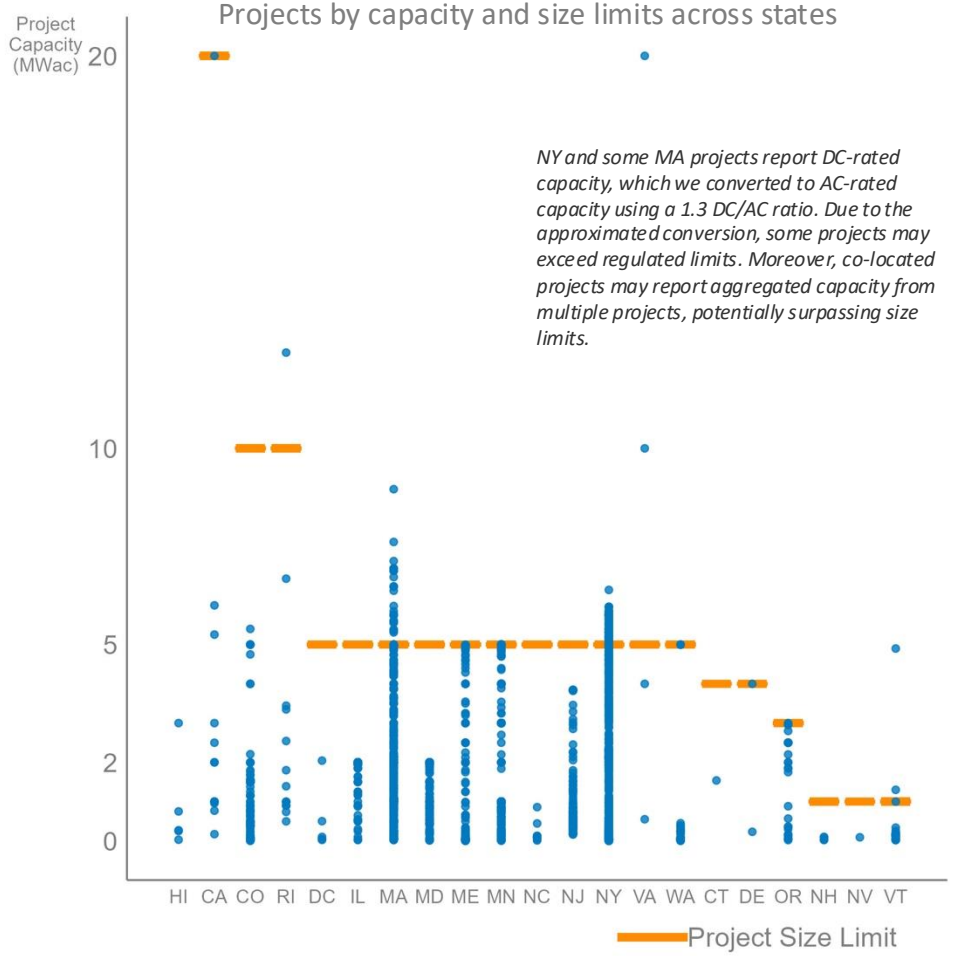
* Program size cap for financial incentives, includes installed capacity of all eligible solar projects.

^ New Jersey made the community solar program to permanent and removed the cap in 2024.

Most States Have Project Size Limits of 5 MW

At least 21 states and localities, including the District of Columbia, have max size limits on community solar projects.

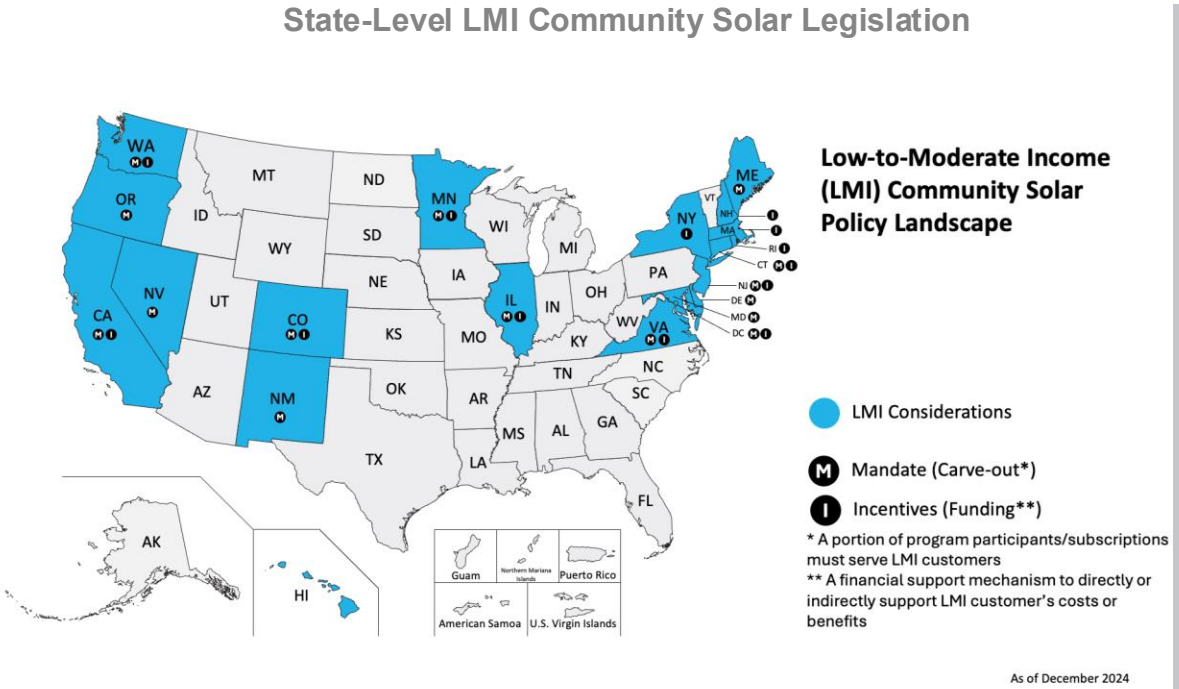
- Eleven states have project size limits of 5 MW_{ac}, including leading markets for community solar, such as Massachusetts, Maryland, Minnesota, and New York.
- Colorado increased the project size cap to 10 MW_{ac} in 2023.
- California operates several distinct programs, each with its own project limitations to facilitate community renewables. The Enhanced Community Renewables program has established a project cap of 20 MW_{ac}.
- In Hawaii, capacity limits for individual projects vary by location. The largest shared renewable project cannot exceed 75 MW.



Data Source: NREL, Sharing the Sun, Dec 2024 Dataset & State Policies and Programs for Community Solar.

Note: HI programs do not specify AC/DC in their capacity

States With Legislation That Expands Community Solar Access for LMI Households

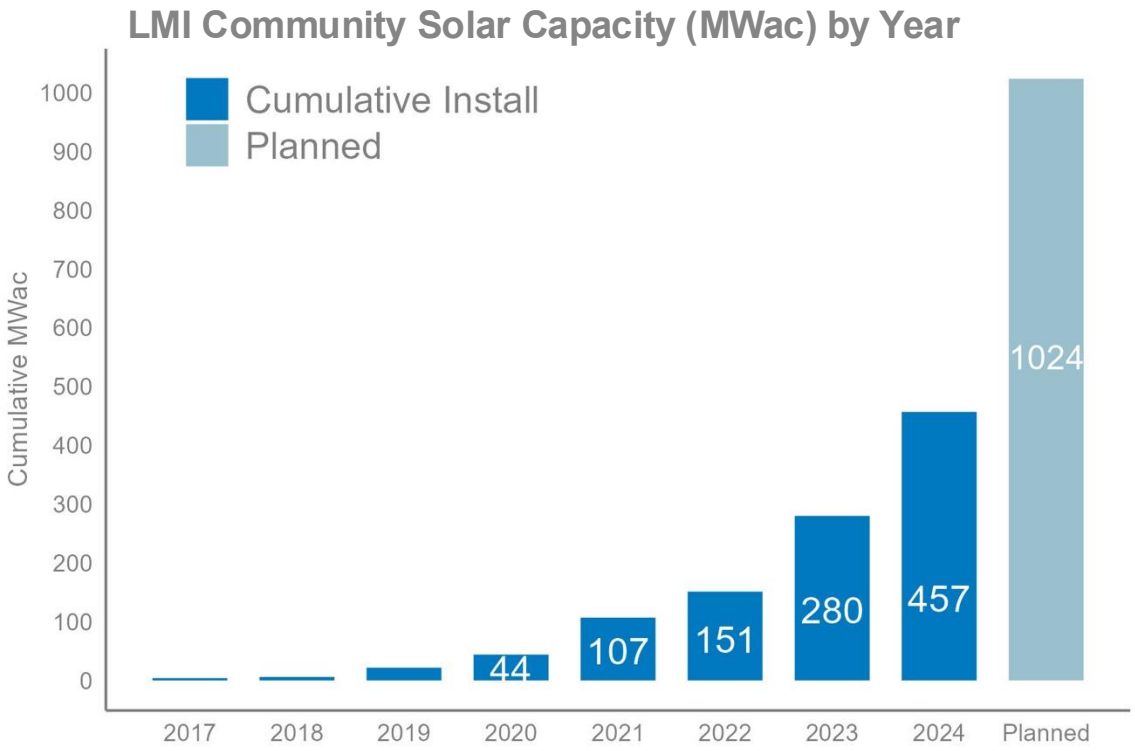


- At least 20 states and localities including the District of Columbia have passed legislation with stipulations that expand community solar access for LMI[1] households.
- There are two main types of enabling policies for LMI community solar:
  - Carve-outs in community solar programs for projects for LMI subscribers. For example, the program can set aside a certain percentage of capacity dedicated to LMI subscribers.
  - Financial incentives and LMI adders. For example, the program will allocate a certain amount of funding, or offer higher incentives as an adder, to ensure expanded solar access.

Source: [State Policies and Programs for Community Solar]

[1] **LMI** = Low-to-moderate income

LMI Community Solar Is Growing Quickly

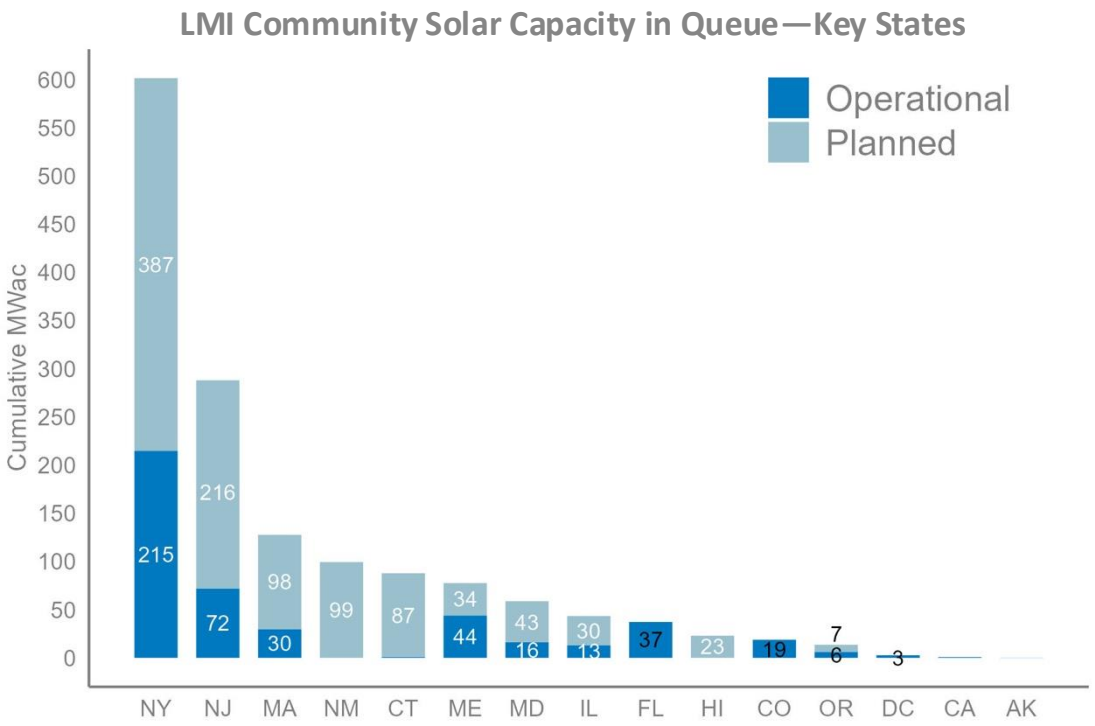


- The LMI[1] community solar market was small until 2019.
- LMI community solar contributes to 4.3% (457 MW/ 10,615 MW) of the whole community solar market as of 2024.
- The figure to the left captures the conservative LMI dedicated capacity based on program carve-outs.
  - For instance, if a 1-MW_{ac} project requires at least 51% to be reserved for LMI customers, the LMI capacity is calculated as 0.51 MW_{ac}.

[1] **LMI** = Low-to-moderate income

Source: *Sharing the Sun, Dec 2024 Dataset*

LMI Community Solar Capacity Planned



- **As of 2024, at least 457 MW_{ac} of community solar capacity are dedicated to LMI[1] customers.**
  - State programs typically require 10% to 51% capacity to be set aside for LMI customers.
  - At least 1,024 MW_{ac} of community solar dedicated to LMI households are planned.

Source: *Sharing the Sun, Dec 2024 Dataset*

[1] **LMI** = Low-to-moderate income

Thank you

www.nrel.gov

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