



Sharing the Sun: Community Solar Deployment, Subscriptions and Energy Burden Reduction

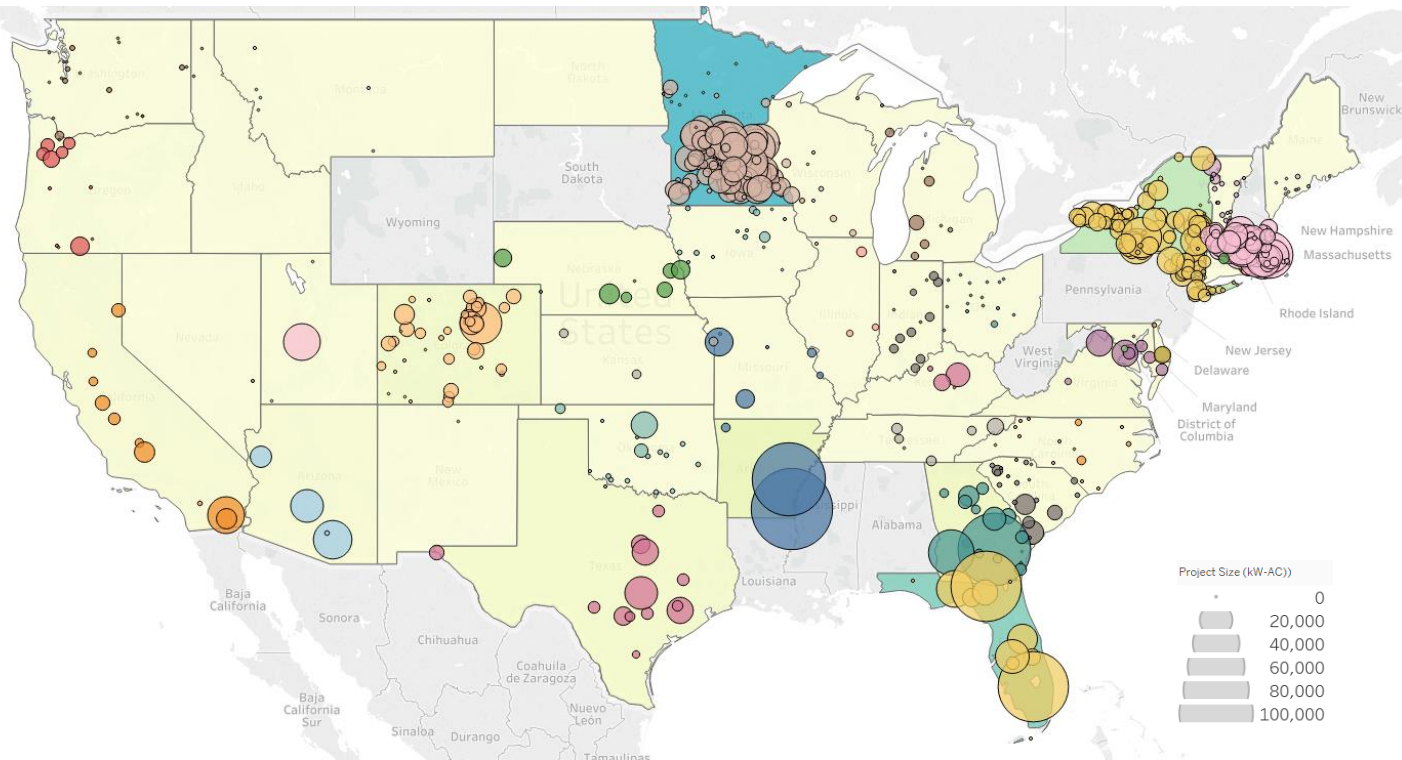
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Community Solar Capacity by State



By the end of 2020, we estimate that there were at least 3,254 MW-AC of community solar capacity distributed across ~1,600 projects in 39 states and Washington, D.C.

Community solar projects in the Contiguous United States

Data Source: [Sharing the Sun Project List 2020](#)

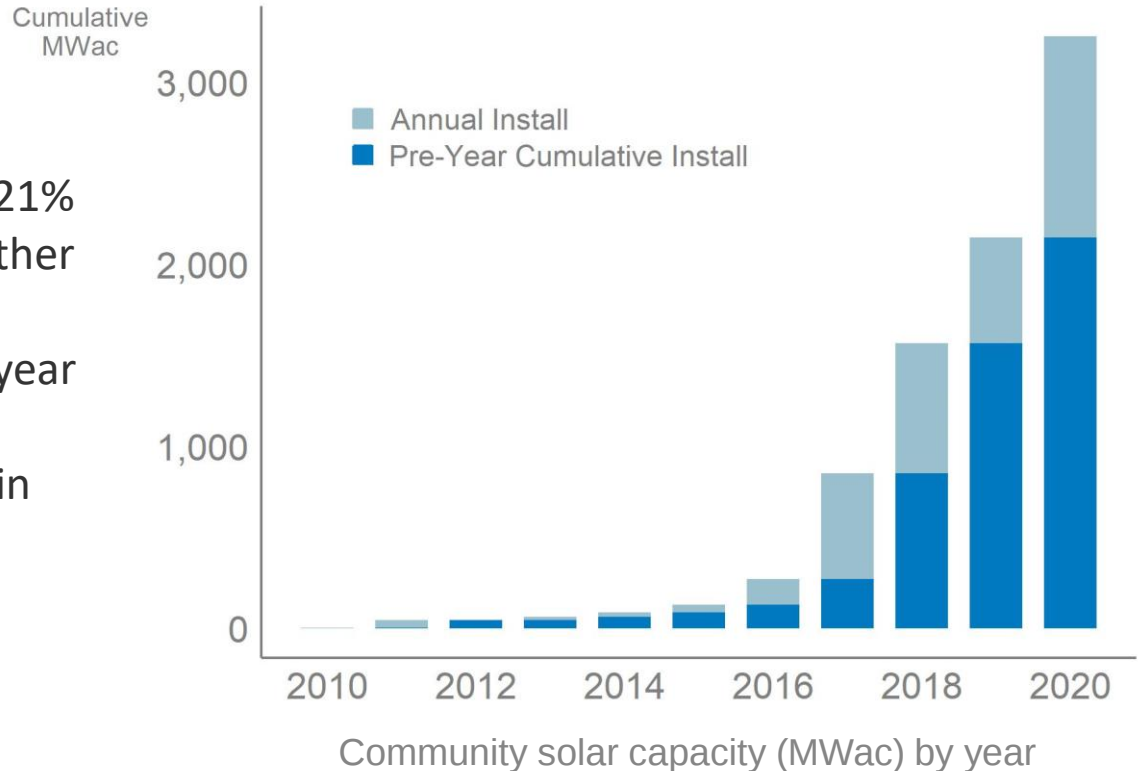
Michigan Context

- As of December 2020, there were 11 community solar projects located in Michigan, installed between 2013 and 2019.
- These projects total about 7.2 MW-AC of solar capacity.
- Projects are located across different utility service territories.

Project Name	City	Utility Name	System Size (kW-AC)	Year of Interconnection
Escanaba Solar Project	Escanaba	City of Escanaba	891	2019
Burcham Solar Park	East Lansing	City of Lansing - (MI)	265	2019
L'Anse Community Solar Array	L'Anse	Village of L'Anse - (MI)	110	2019
SpartanSolar-MEC	Cassopolis	Midwest Energy and Communications	668	2018
Marquette Board of Light and Power Solar	Marquette	City of Marquette - (MI)	116	2017
Spartan Solar	Cadillac	Wolverine Power Supply Coop	1121	2016
Grand Valley State University Community Solar	Allendale	Consumers Energy Co	3000	2016
Grand Valley State University Community Solar	Kalamazoo	Consumers Energy Co	1000	2016
Homeworks Community Solar Garden	Portland	Tri-County Electric Coop	16	2014
Solar Up North Alliance	Grawn	Cherryland Electric Cooperative	40	2013

The Rapid Growth of Community Solar

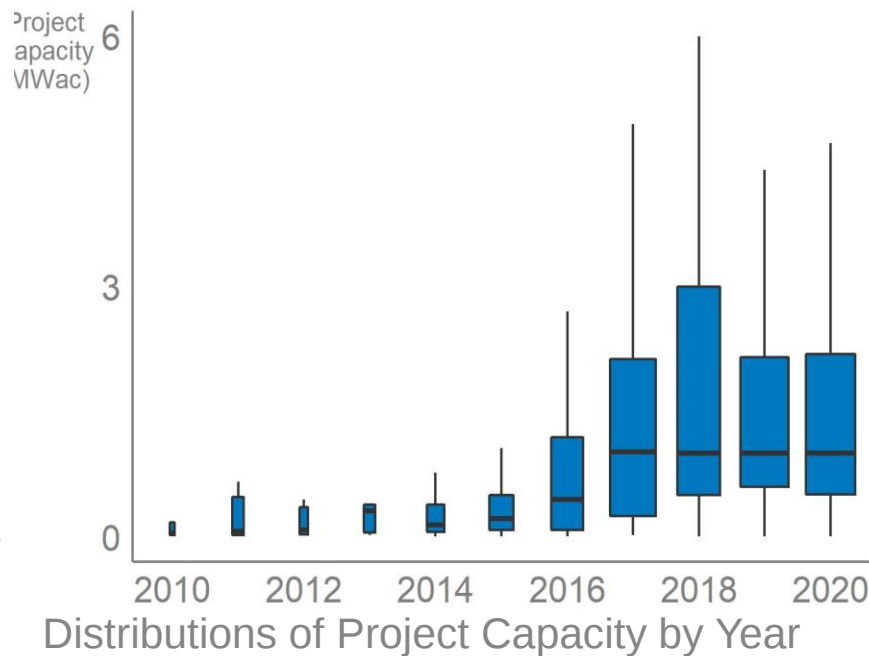
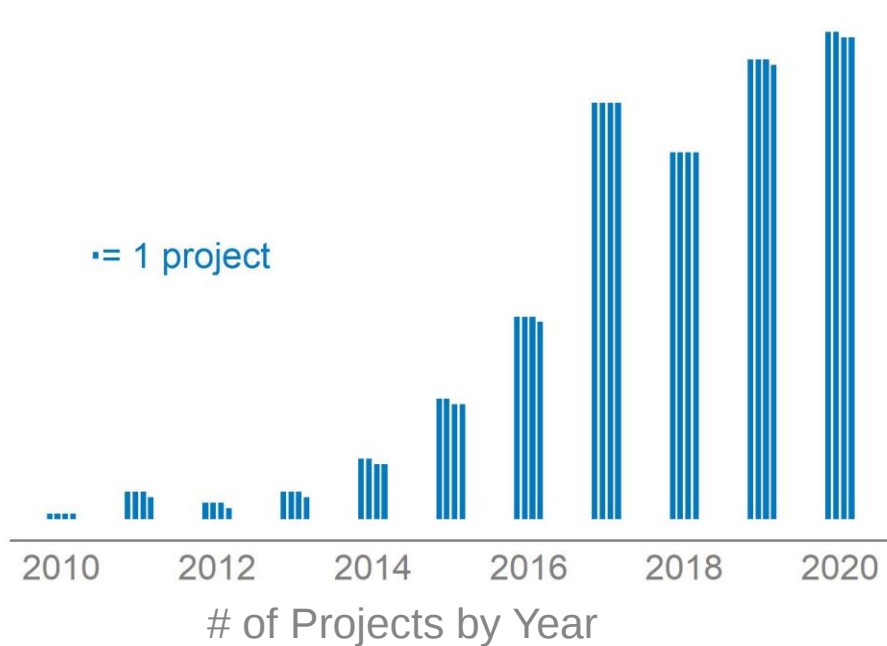
- Cumulative community solar capacity has grown by about 121% year over year since 2010, in other words, capacity has more than doubled on average year over year
- About 1,107 MW came online in 2020 alone.



More and Larger Projects

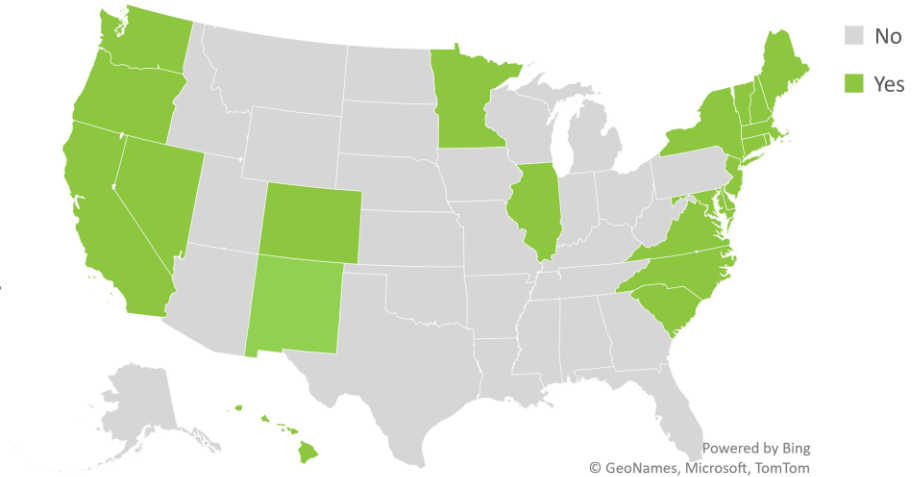
Community solar capacity has increased both because more projects have come online and because projects have generally become larger over time.

Florida and Arizona built large size (over 50 MWac) community solar projects in 2020



Community Solar State Policies (1/2)

- 21 states and Washington, DC have passed some form of legislation enabling community solar, either through state-required programs or the authorization of a limited number of pilot projects.
- These programs vary in scope, but they generally all allow for some form of virtual metering that enables subscribers to benefit from their community solar subscriptions

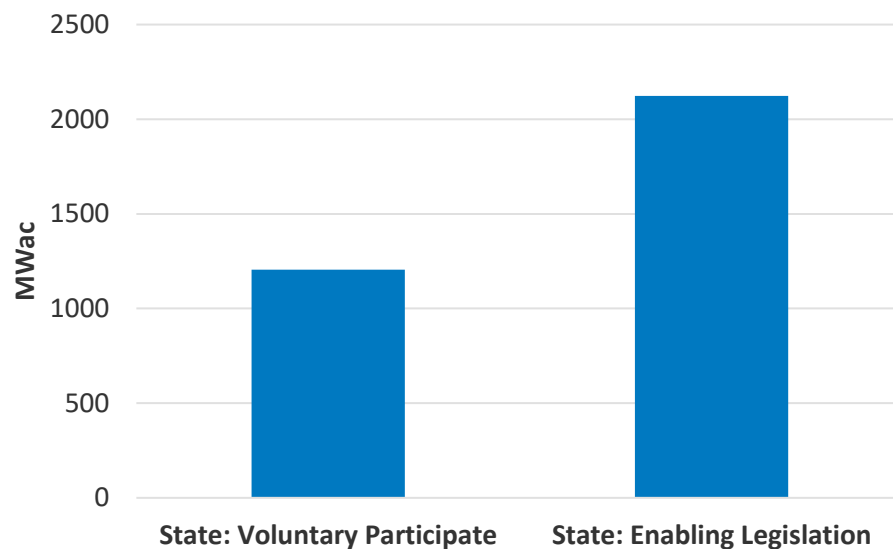


State-level community solar enabling legislation*

* Legislation applies to at least one utility in the state

Community Solar State Policies (2/2)

- Some states currently have limited policy activities regarding community solar.
- FL, AR, GA, and TX voluntarily participates contribute to 80% of Non-enabling legislation state community solar deployment.
- Voluntary community solar market booms in recent years. For example, FL has deployed 560 MWac projects since 2018

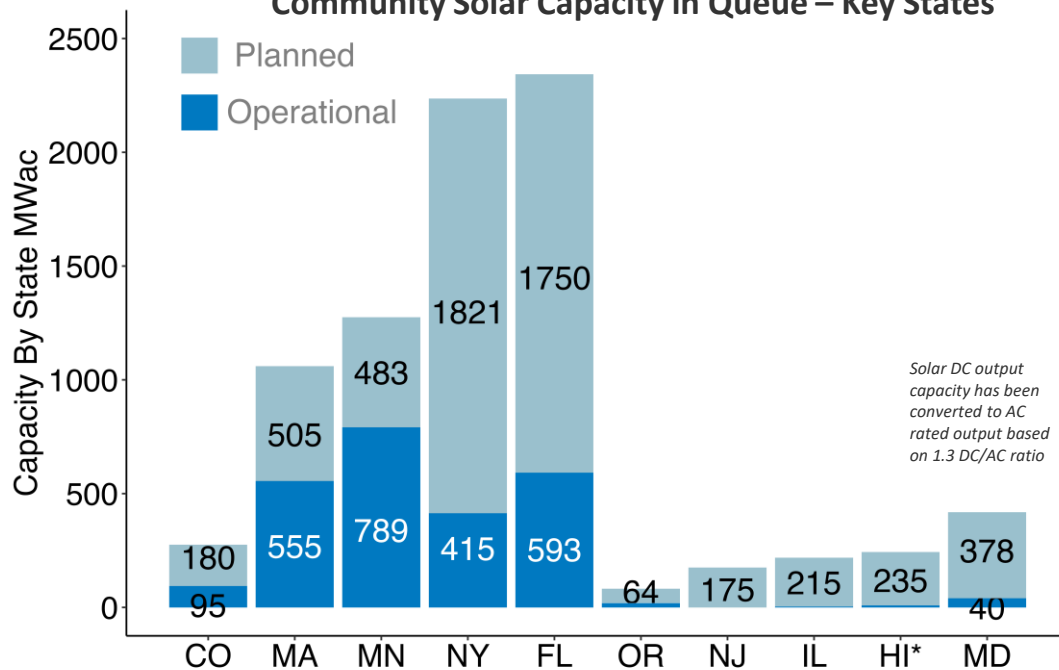


Cumulative Installed Capacity by State with/without Enabling Legislation

* Legislation applies to at least one utility in the state

Community Solar Capacity in Queue Top States

Community Solar Capacity in Queue – Key States



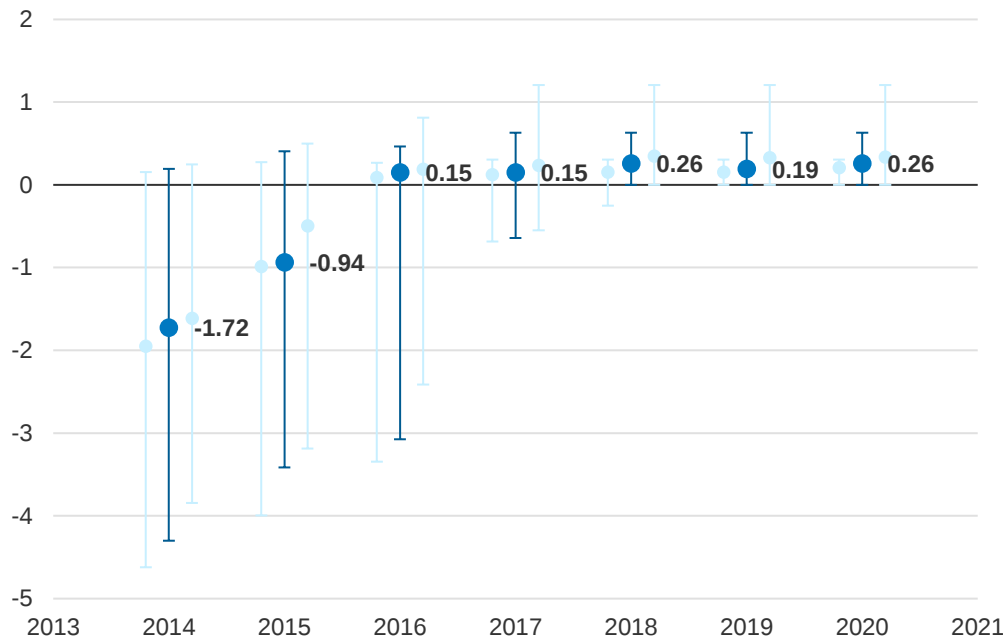
Operational data come from the NREL [Sharing the Sun Project List 2020](#). CO: Planned solar capacities include projects under Xcel program; FL: Planned capacities include FPL and Duke Energy Program; MA: Planned capacities include SREC II (converted to AC) and SMART program; MN: Planned capacities only include projects under Xcel program; NJ: Planned capacities include Phase 1 and Phase 2 Community Solar Pilot Program; IL: Planned capacities include Adjustable Block Program only; HI*: Planned capacities include Hawaiian Electric Community based renewable energy program, assumed AC capacity. MD: Planned capacities include MD Community solar pilot program. OR: Planned capacities include Oregon community solar program. The solid blue represents the cumulative rated AC power output (MW) for community solar in operation by corresponding year in corresponding state. The semi-transparent blue represent capacity planned

- As of 2020, five States (CO, MA, MN FL, and NY) have the most community solar capacity installed + in queue.
 - Over 4,700 MWac in queue
- MD, OR, NH, IL, HI are implementing state-level community solar programs to increase the markets in their states.
 - Over 1,000 MWac in queue
- “Planned” indicates community solar projects in queue and will be installed thereafter

NPVs are Increasing Over Time

- The median NPV of subscriptions has been positive since 2016, when state-legislated programs began to rapidly expand
- Virtual metering for programs in CO, MN, MA, and NY after 2017 also increase the overall NPVs

Net Present Value (\$/W)

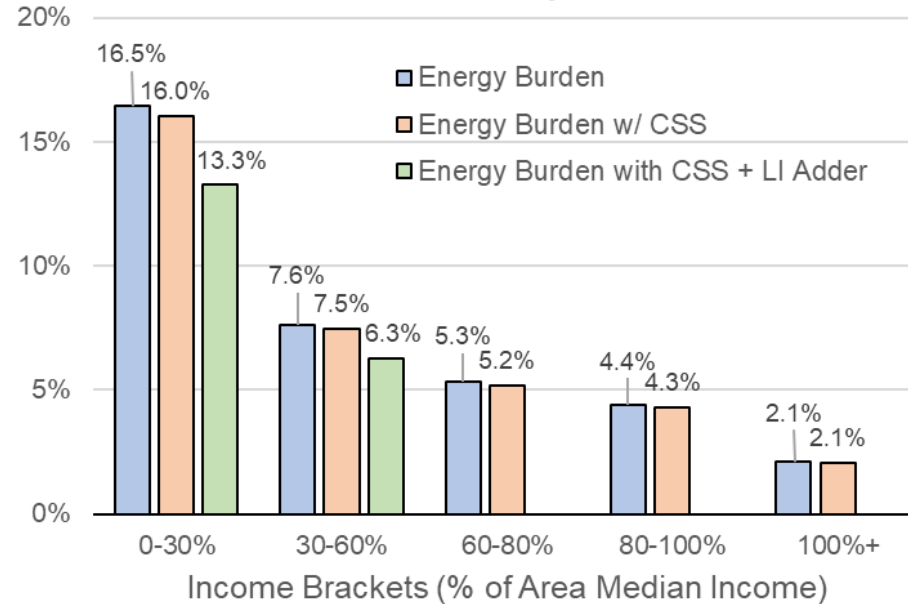


Error bars show p10 and p90. Light blue bars show high and low sensitivities to rate escalation, inflation, and discount rates

Example: Net Present Value of Community Solar in Massachusetts

- The average community shared solar subscription in Massachusetts has a net present value (NPV) of \$0.15/W.
- Translated to an annuity equivalent, the average subscription yields a benefit of ~\$14/kw·yr.
- To cover 100% of average electric load, the average community solar subscription reduced energy burden by ~0.5pp for the lowest income bracket.
- Energy burden is defined as the percentage of gross household income spent on energy costs, inclusive of electricity, natural gas, and delivered fuels and exclusive of transportation
- Including the MA \$0.06/kWh low-income adder to the average subscription, community solar reduces energy burden for the lowest income bracket by ~3.2 pp.

Energy Burden in Massachusetts with and without Community Solar



Additional data sources: DOE LEAD tool, EIA-861. Energy burden is shown for the first-year of a subscription with community solar benefits shown as an annuity equivalent with a 7% discount rate. The [MA low-income adder](#) is available to projects with >50% of offtake to subscribers below 65% state median income.

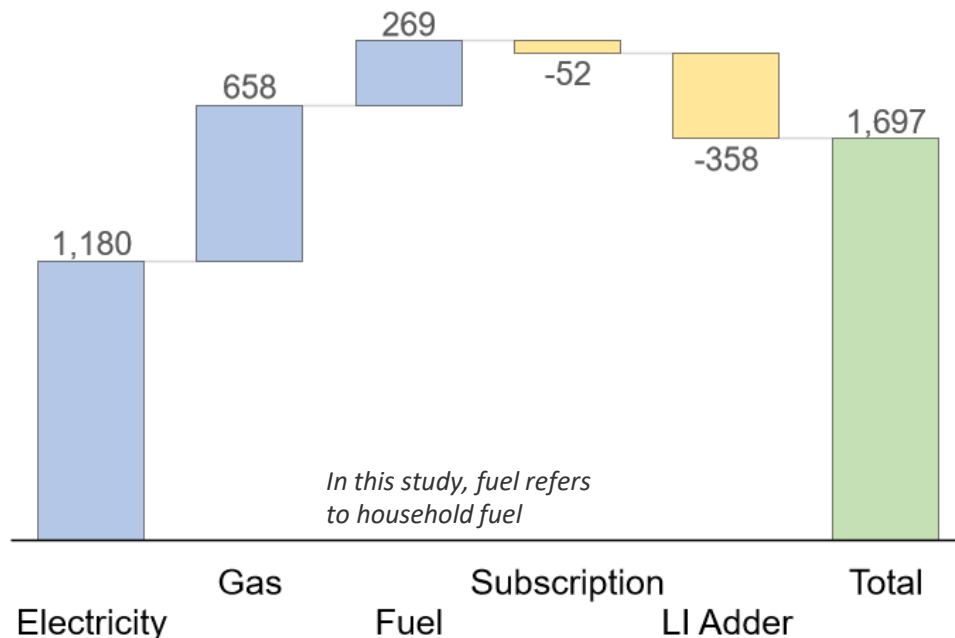
NREL | 10

Pp: percentage point

Example: Impact of Adder on Low-Income Bills in Massachusetts

- MA households below 30% of area median income (AMI) have average annual energy expenditures of \$2,107 (\$1,180 in electricity expenditures).
- The average community solar subscription that covers 100% of electricity usage reduces ~\$52/year for low-income subscribers
- If subscriptions are from a project eligible for the \$0.06/kWh low-income adder, there is an additional average benefit of ~\$358/year
- The average subscription with the LI adder reduces average energy costs for low-income customers to \$1,697 (~19% reduction) and average electricity costs to \$770 (~35% reduction)

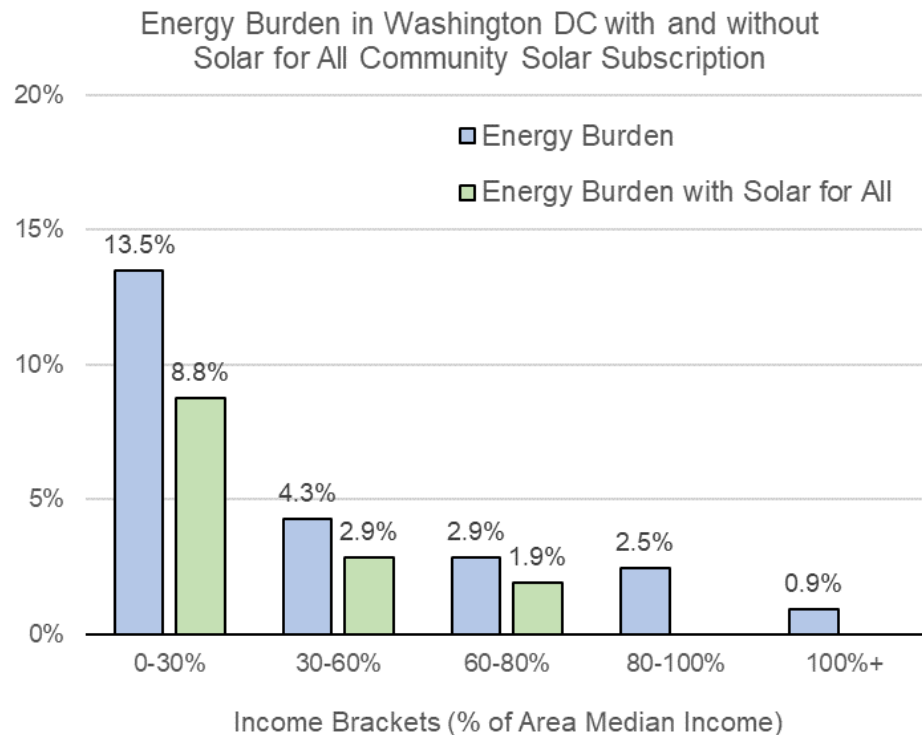
Annual Energy Expenditures: MA Household <30% AMI



Note: Fuel types are determined based on the [LEAD Tool](#). Monthly housing energy costs are based on household monthly expenditures for electricity, gas (utility and bottled), and other fuels (including fuel oil, wood, etc.).

Example: Impact of Solar for All in Washington, D.C.

- Washington, D.C.'s Solar for All Program offers free community solar subscriptions to households below 80% of Area Median Income
- Subscriptions are set to offset approximately 50% of electricity bills
- Solar for All subscriptions reduce energy burden for the lowest income households from 13.5% to 8.8%.



Value of subscriptions assumes subscriptions reduce 50% of annual electricity costs