Climate Action through Community Solar

Inside Minnesota's Community Solar Program

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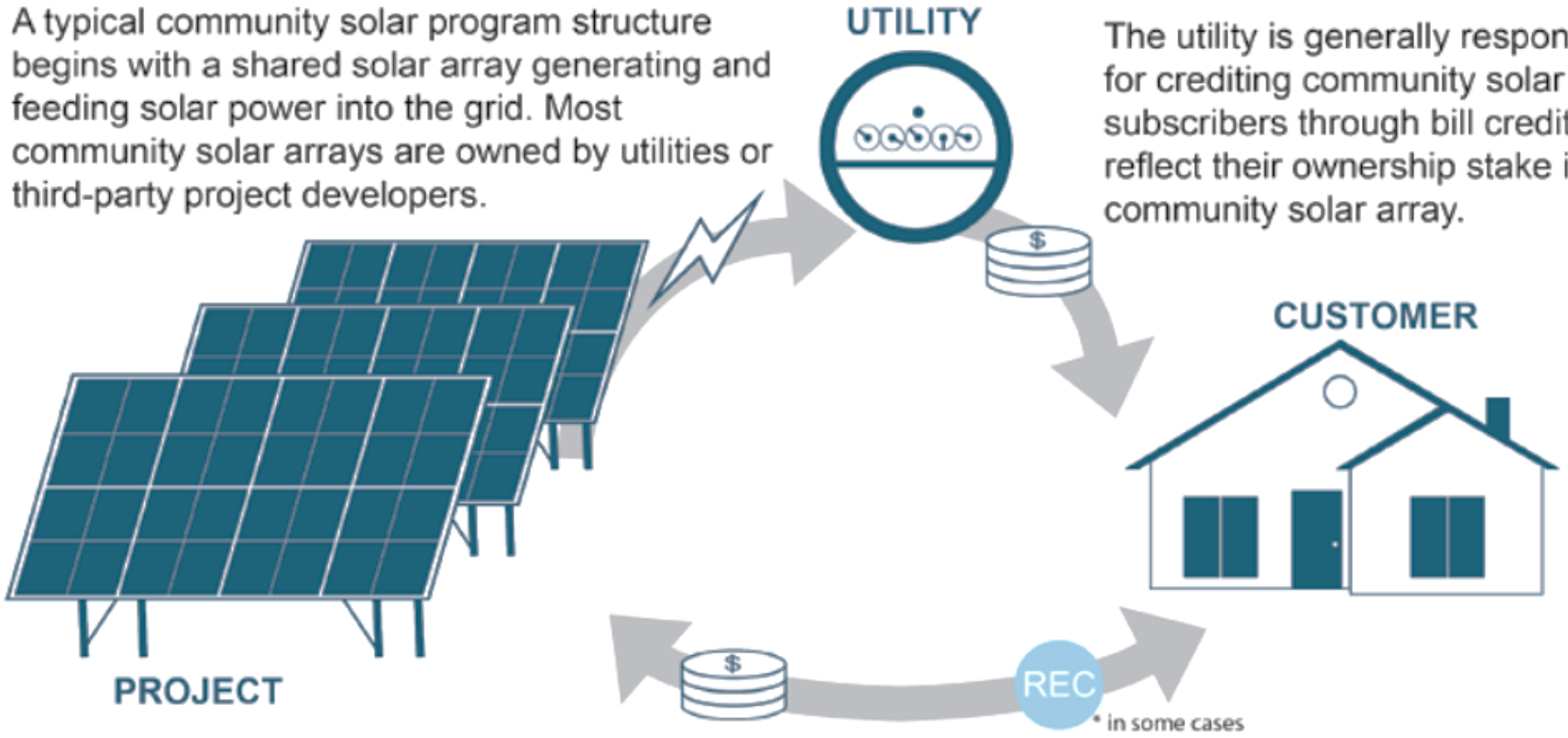
What is Community Solar?

A typical community solar program structure begins with a shared solar array generating and feeding solar power into the grid. Most community solar arrays are owned by utilities or third-party project developers.

The utility is generally responsible for crediting community solar subscribers through bill credits that reflect their ownership stake in the community solar array.



Community solar subscribers generally pay for their subscription through up-front purchases of capacity (kW) or output (kWh). In return, the subscribers receive bill credits. This figure represents a community solar green power program where RECs are conveyed to the subscriber. However subscribers do not commonly receive the RECs, in which case their subscription is not a green power purchase.

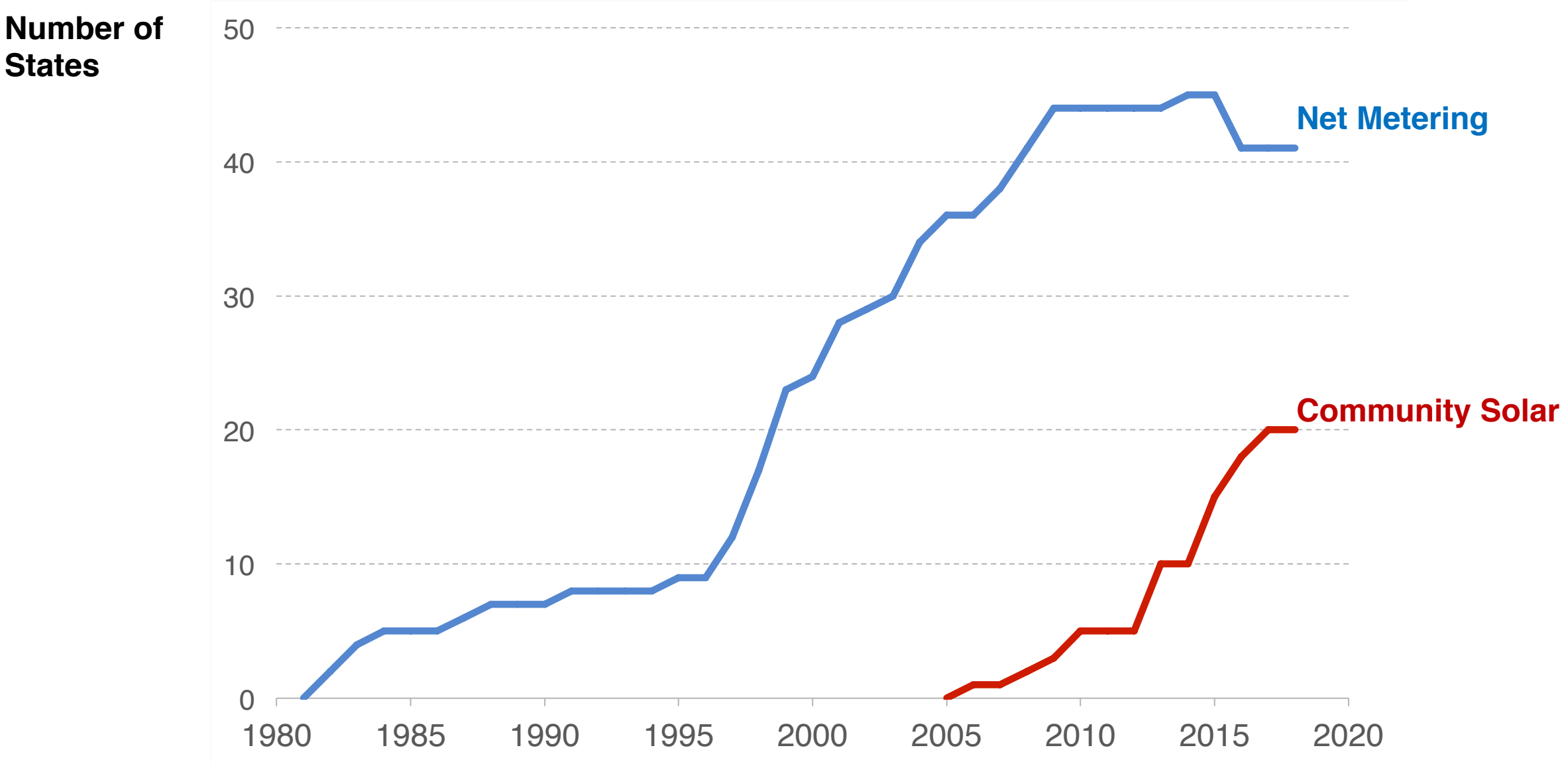
Source: NREL, 2018

Why Community Solar?

- **Access and Equity**
  - Physical constraints (~75% of customers cannot install rooftop solar)
  - Financial constraints (capital and credit constraints can be relaxed)
- **Jobs** (4,000 jobs in MN community solar)
- **Siting, landowner revenue** (~$1,000 per acre in MN), **tax revenue**
- **Local control, customer choice, competition**
- **Environmental benefits, climate change mitigation**
- **Technical benefits** (grid benefits and economies of scale)

Source: ILSR, MnSEIA, Vote Solar (2019)

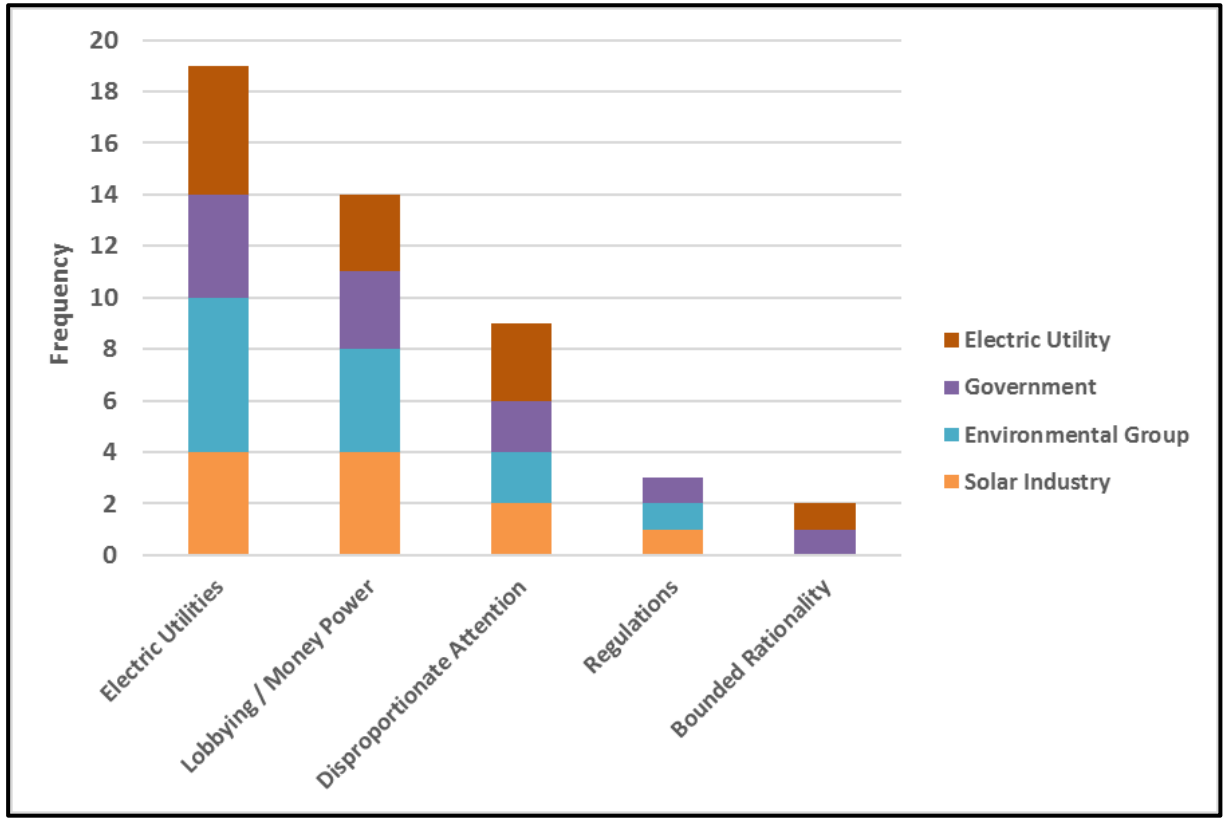
Policy Adoption of Net Metering and Community Solar



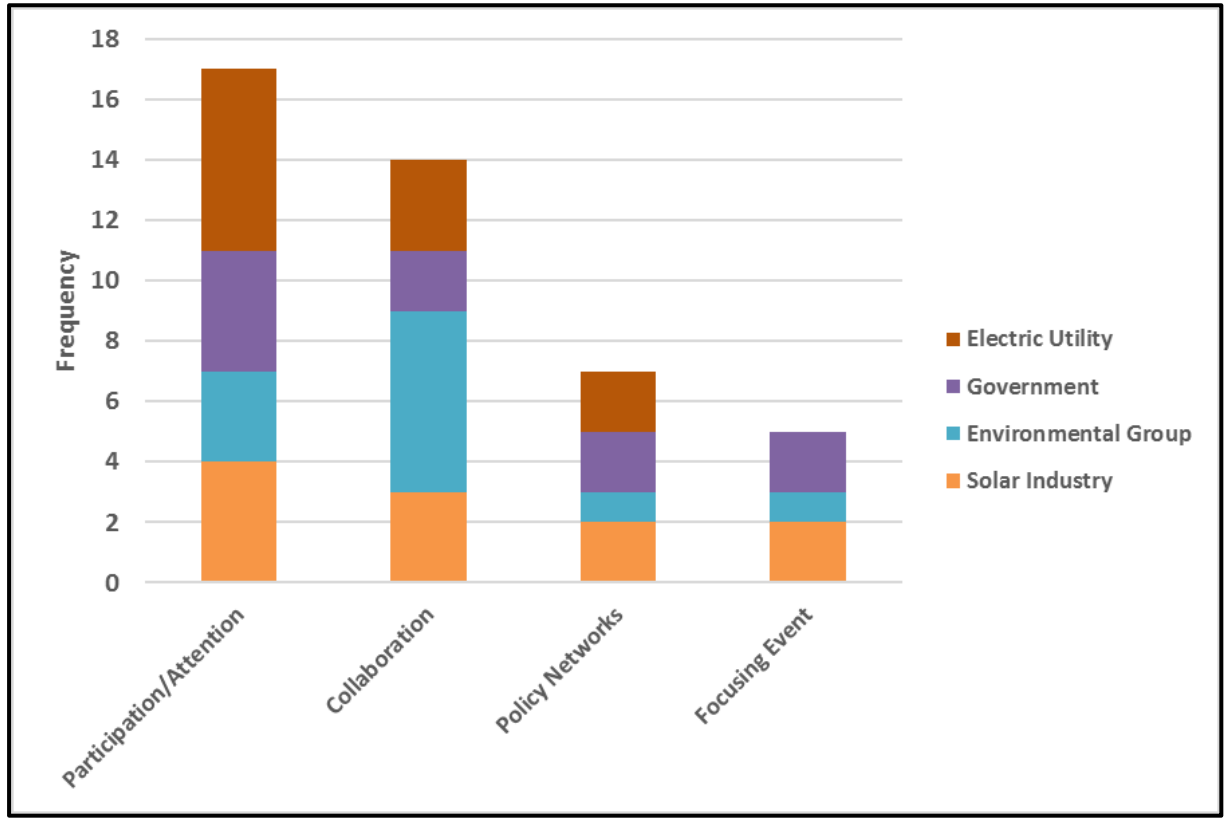
Note: Data compiled by author from DSIRE (2019), NREL (2018), & Shared Renewables HQ (2019).

Community Solar Policy Barriers & Opportunities

BARRIERS



OPPORTUNITES

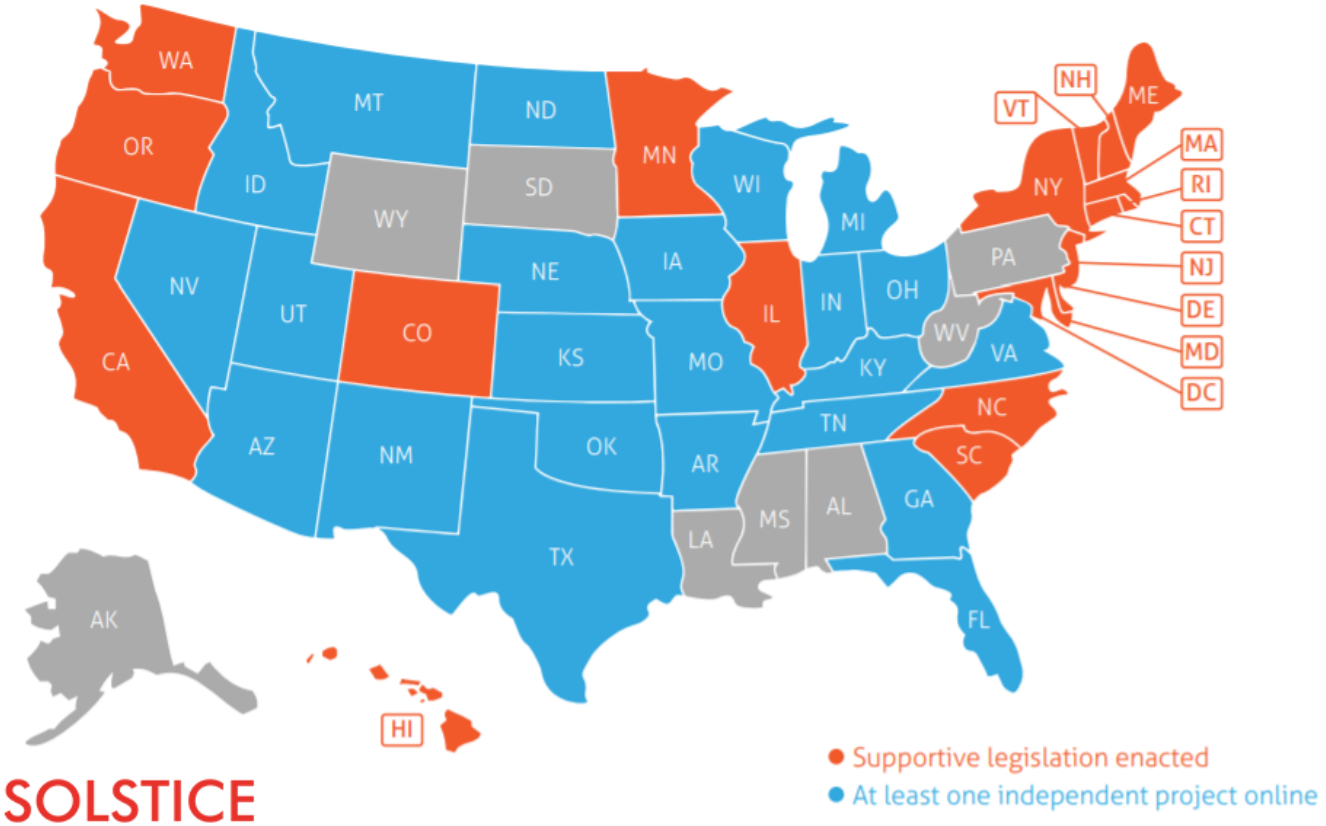


- **Opposition** from electric utilities via lobbying/money power
- Opportunities to **increase attention, participation, and collaboration** and **increase transparency of benefits**
- Advocacy coalitions and collaboration among many actors

Source: Michaud (2016)

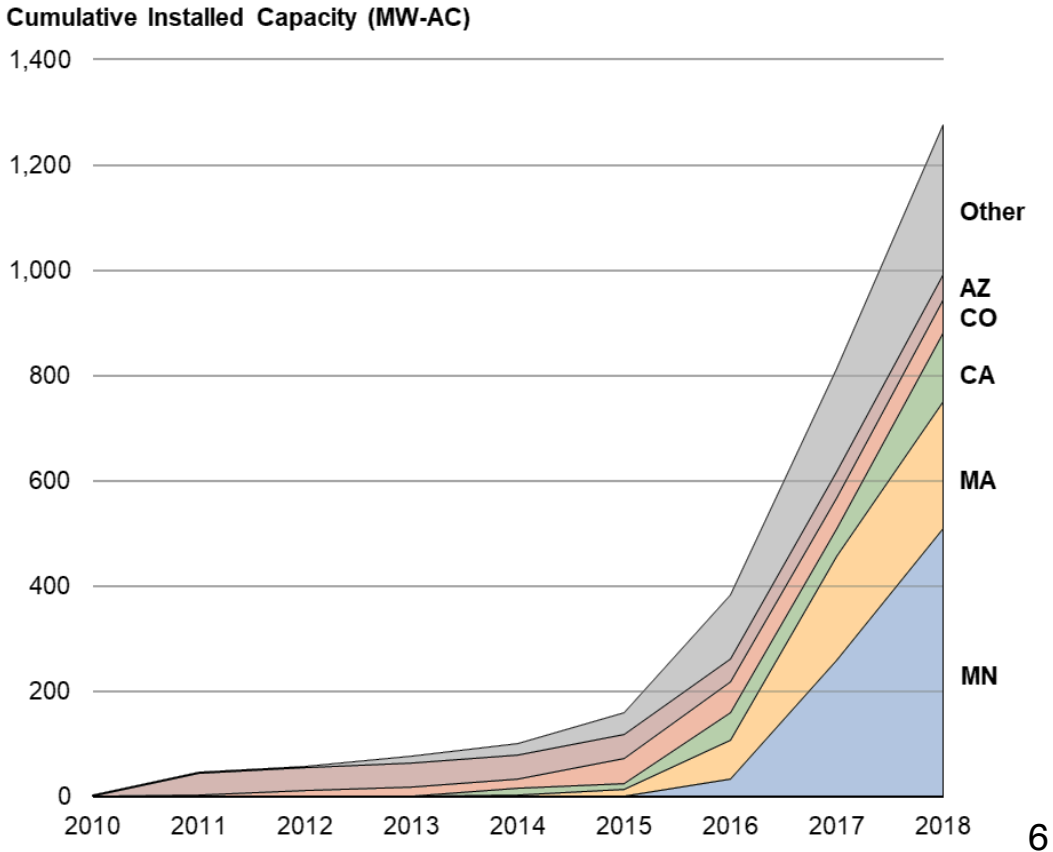
Community Solar in Action

- **19 states + D.C.** have enacted formal community solar policy
- **>200 munis and co-ops** have programs in 40+ states
- **>5%** of installed solar capacity in 2018 (total ~1.3 GW)



SOLSTICE
Solar for every American

Source: Solstice (2018)



Data Source: NREL (2019)

Community Solar in Minnesota

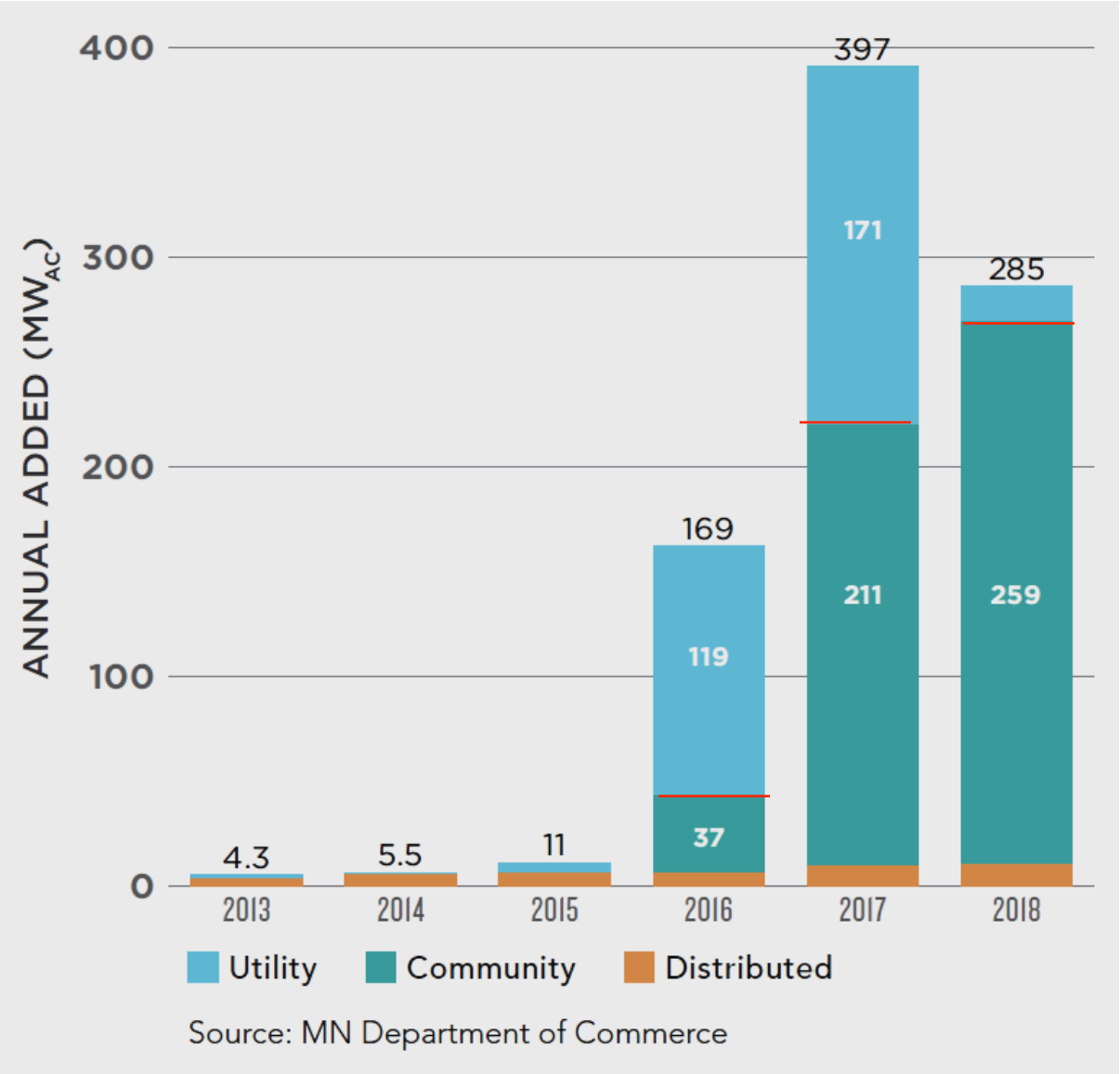
Solar in Minnesota

Solar standard for IOUs:

- 1.5% solar by 2020
- 10% of solar from <20kW systems

Statewide goal: 10% solar by 2030

~60% of installations (2016-2018) from community solar



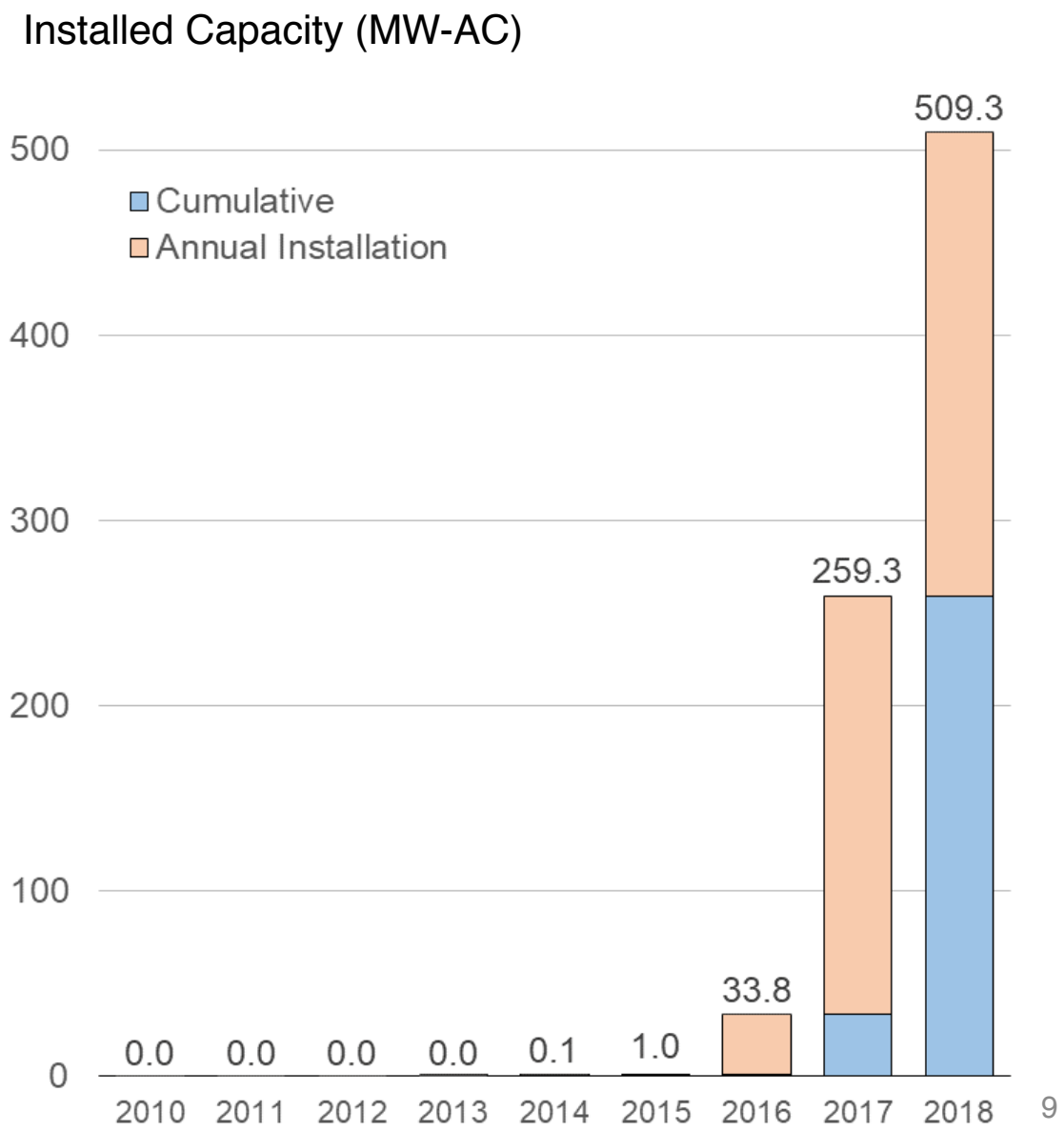
Community Solar in Minnesota

Enabling legislation in 2013

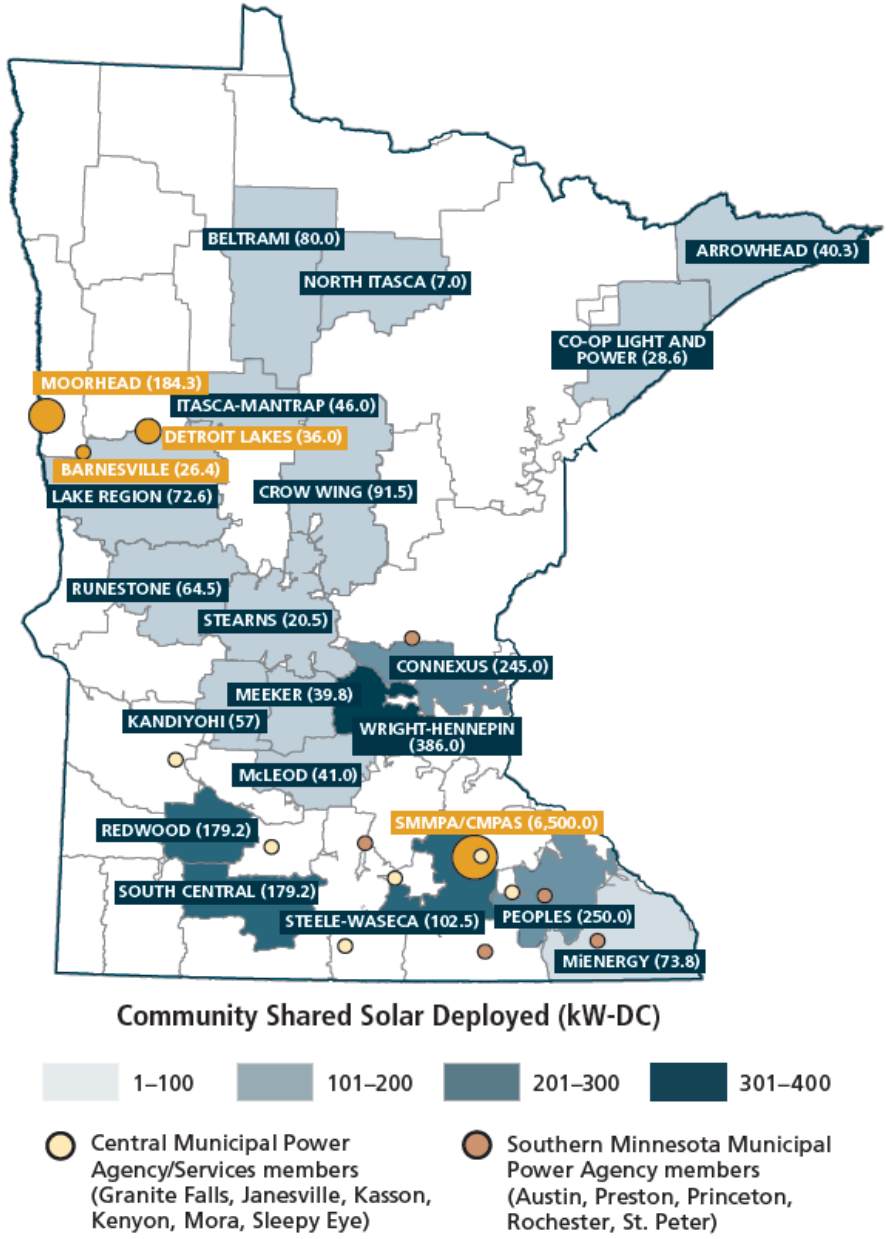
- No program size cap
- 1 MW project size cap (*co-location)
- Subs. in same or adjacent county
- Min 5 subs., max 40% of garden
- No LMI provisions
- Bill credits: retail rate+, then VOS

2018 Installed Capacity: 509 MW

- ~3.7 MW in co-ops/munis
- 1 MW in MN Power
- >500 MW in Xcel
  - ~12% residential subscriptions
  - >38% public sector subscriptions

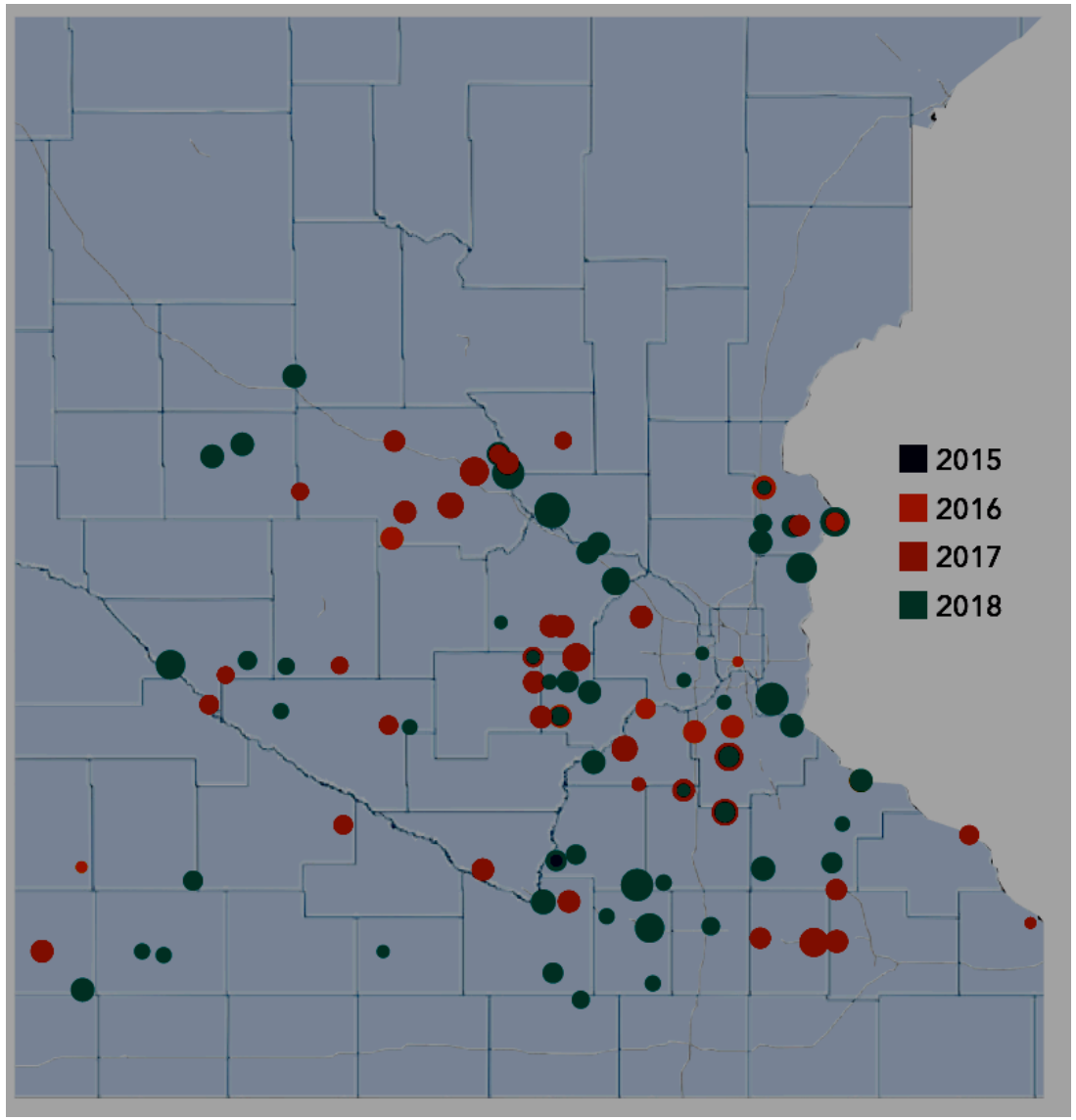


Projects in Co-ops and Munis



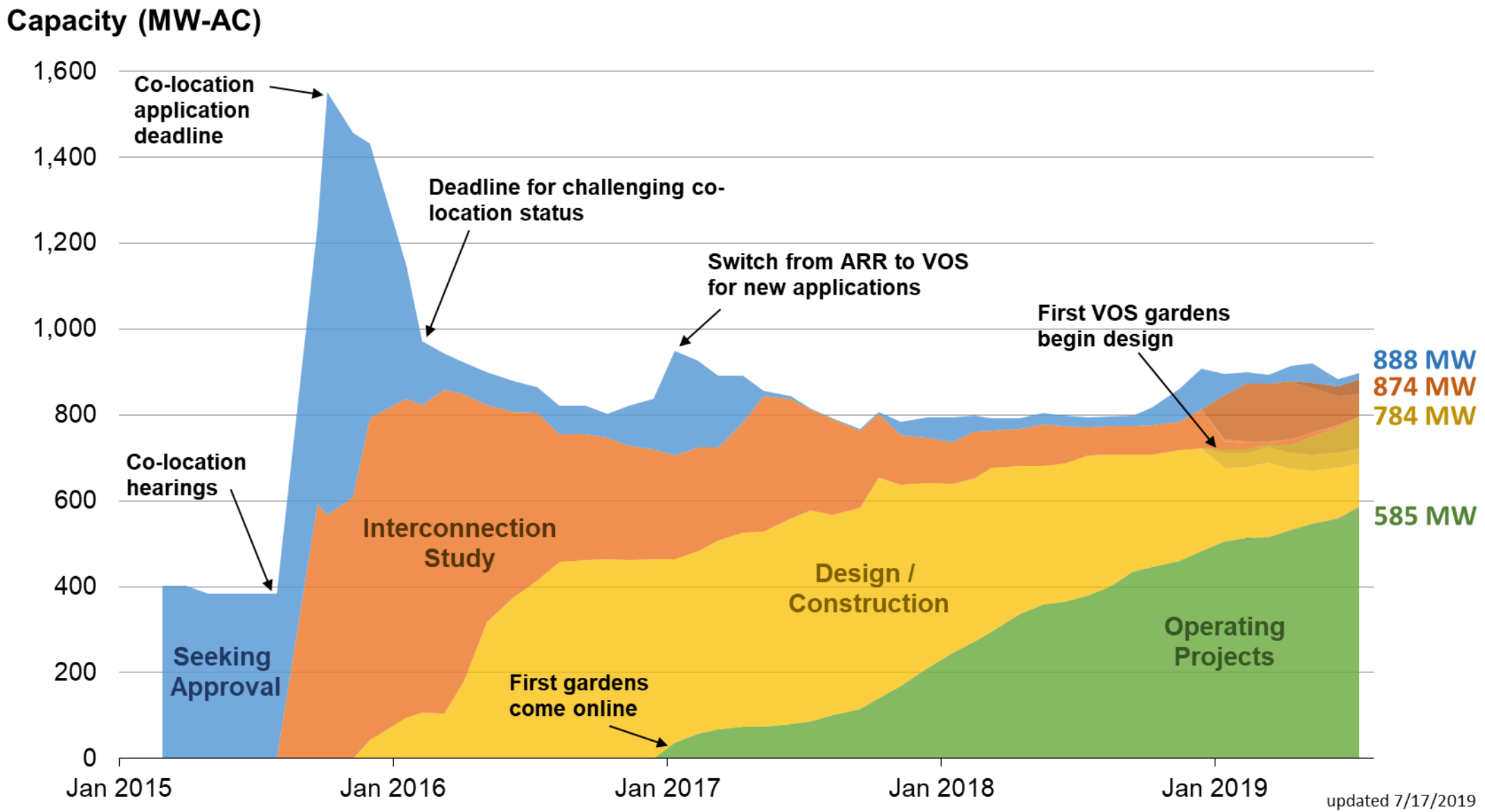
Source: Chan, et al (2019)

Projects in Xcel Energy's Territory



Source: ILSR, MnSEIA, Vote Solar (2019)

Community Solar Serving Xcel Energy Customers



updated 7/17/2019
based on MN PUC 13-867

Value of Solar

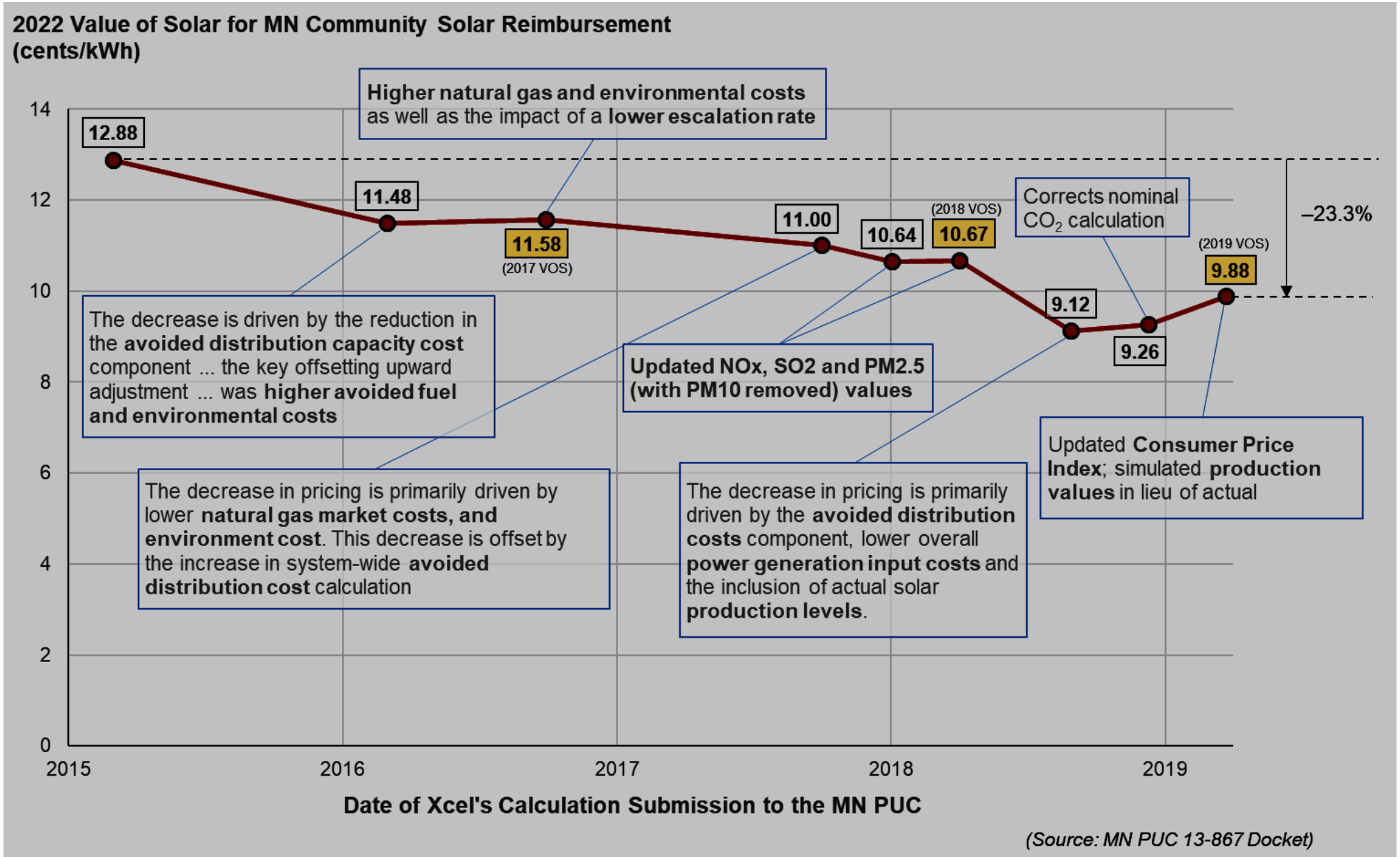
- 2013 enabling legislation set up transition to a Value of Solar (VOS) Tariff for subscriber reimbursement for new projects in 2017
    - Conceptual agreement on VOS as “distributed solar ‘done right’”

- The VOS is designed to represent all benefits (avoided costs) of distributed solar generation
    - 8 distinct avoided cost calculations
    - Many assumptions
    - Sensitive to natural gas prices

- VOS was first calculated in 2015, but has declined 23% since

- Residential adder pilot created for 2019 VOS (1.5¢/kWh, declining)

Value of Solar



IPS Solar Presentation

Eric Pasi

IPS SOLAR

Eric Pasi

Chief Development Officer

About IPS Solar

1991

FOUNDED

#1 MINNEAPOLIS/ST. PAUL BUSINESS JOURNAL FAST50

FASTEST GROWING
MPLS/STP BUSINESS

#2 Inc. 500

FASTEST GROWING
INC. MAGAZINE

#12 2019 TOPSOLAR CONTRACTORS

US COMMERCIAL
SOLAR DEVELOPER

125MW

COMPLETED PROJECTS
75 MW UNDER DEVELOPMENT

NABCEP CERTIFIED

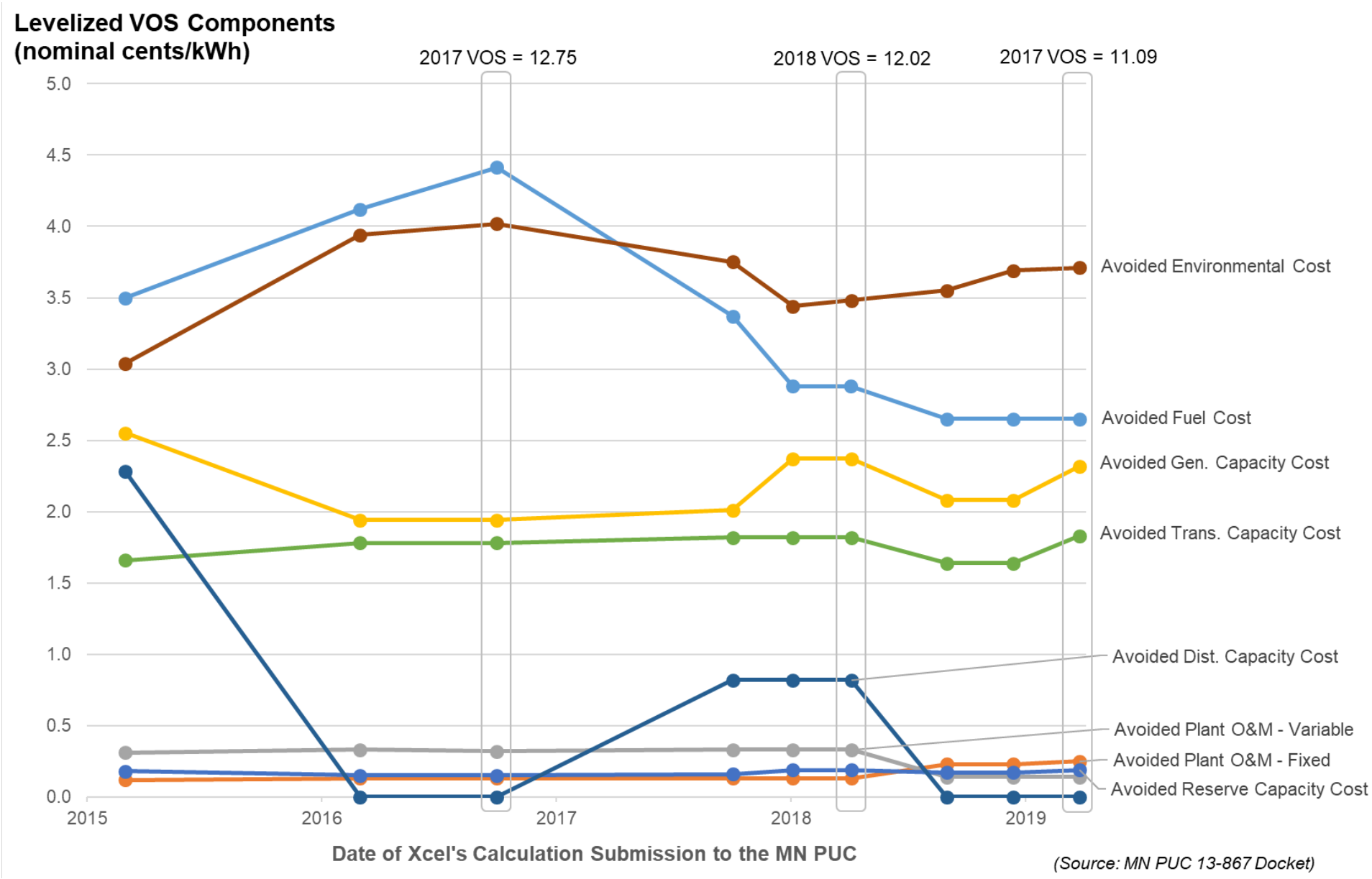
EXPERIENCED &
INDUSTRY CERTIFIED

IPS SOLAR

Building Energy.

Discussion

Backup



(Source: MN PUC 13-867 Docket)

Community Solar Policy is NOT Uniform

State	Program Cap	Project Size Cap	Subscriber Location[a]	Subscriber Eligibility	LMI Stipulations	Subscriber Compensation
California	600 MW	20 MW	Yes	Yes	Yes	Avoided cost of generation
Colorado	Varies by utility	2 MW	Yes	Yes	Yes	Retail rate
Connecticut	6 MW	≤4 MW	No	Yes	Yes	In development
Delaware	Net metering cap applies	2 MW	No	Yes	No	Retail rate
Hawaii	In development	In development	No	In development	No	In development
Illinois	In development	In development	No	In development	Yes	Value-of-solar-energy
Maine	Uncapped	≤660 kW	No	Yes	No	Retail rate
Maryland	200 MW	2 MW	No	Yes	Yes	Retail rate
Massachusetts	1,280 MW[b]	5 MW	Yes	Yes	Yes	Limited retail rate
Minnesota	Uncapped	1 MW	Yes	Yes	No	Value-of-solar-energy
New Hampshire	Net metering cap applies	1 MW	No	No	No	Avoided cost of generation rate (projects >100 kW)
New York	Uncapped	2 MW	No	Yes	No	Value-of-solar-energy
North Carolina	40 MW	5 MW	Yes	Yes	No	Avoided cost of generation
Oregon	Uncapped	3 MW[c]	No	Yes	Yes	Value-of-solar-energy
Rhode Island	30 MW	10 MW	No	Yes	Yes	Retail rate
Vermont	Net metering cap applies	500 kW	No	No	No	Retail rate
Virginia	40 MW	2 MWd	No	No	No	In development
Washington	Incentive cap applies	1 MW	No	No	No	In development

[a] Geographic limits in the table refer to any additional restrictions outside the requirement that a customer be located within the same electric service territory as the project.

[b] This cap applies to the Solar Massachusetts Renewable Target (SMART) Program overall, excluding the minimum carve-out for small <25 kW PV systems of 320 MW. Community solar projects must compete with a variety of other distributed projects under this cap.

[c] Oregon allows colocation of projects up to 3 MW in certain urban areas that are yet to be determined.

[d] For certain utilities, projects can be larger than 2 MW, provided excess capacity is not dedicated to the pilot program.

Source: Cook & Shah, NREL (2018)