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Shared Solar: Current Landscape, Market Potential, and the Impact of Federal Securities Regulation

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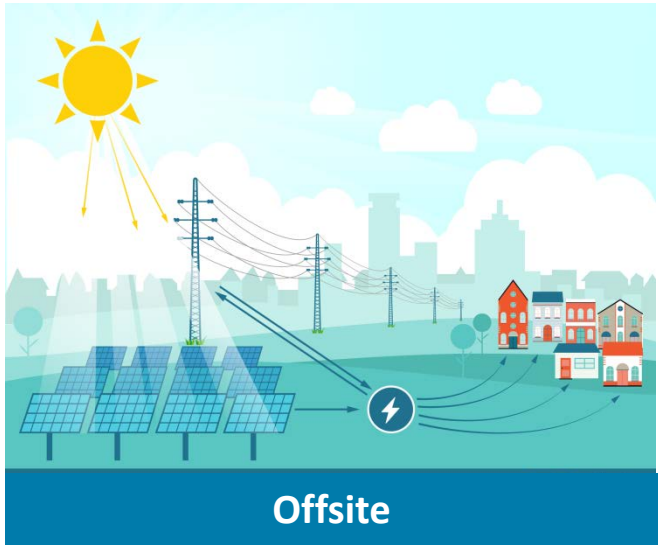
Different Community Solar Business Models

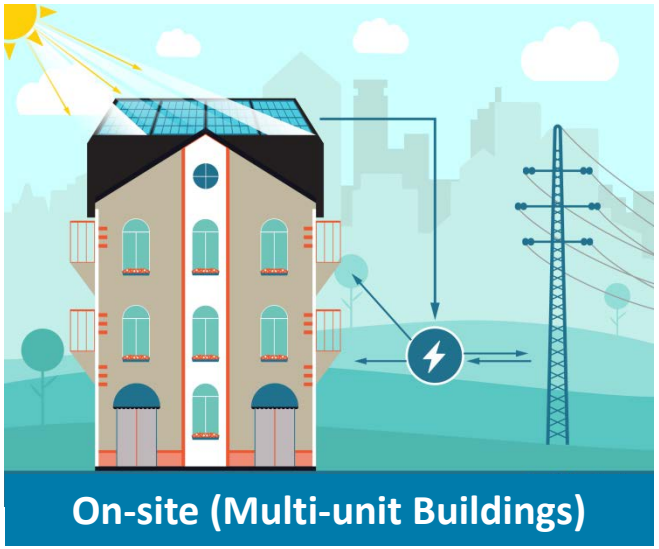
Community Solar
Community members work together to enable solar in their community


Group Purchasing

Financial (Invest or Donate)

Shared Solar
Participants own or lease panels, buy kWh blocks of generation, or own an interest in a shared system.


Offsite


On-site (Multi-unit Buildings)

Many Potential Benefits of Shared Solar

Market Expansion

- **Access to solar for the other 50%**
  - Individuals without good roofs or land for solar can participate
- **Lower barriers to entry (financial and technical)**
  - Minimum buy-ins can be smaller than those for on-site systems
  - Group effort may be easier and more engaging
  - Enable participation by new market segments
- **Easy, engaging, potentially transferable**
  - Option to sell if moving or take share with them.

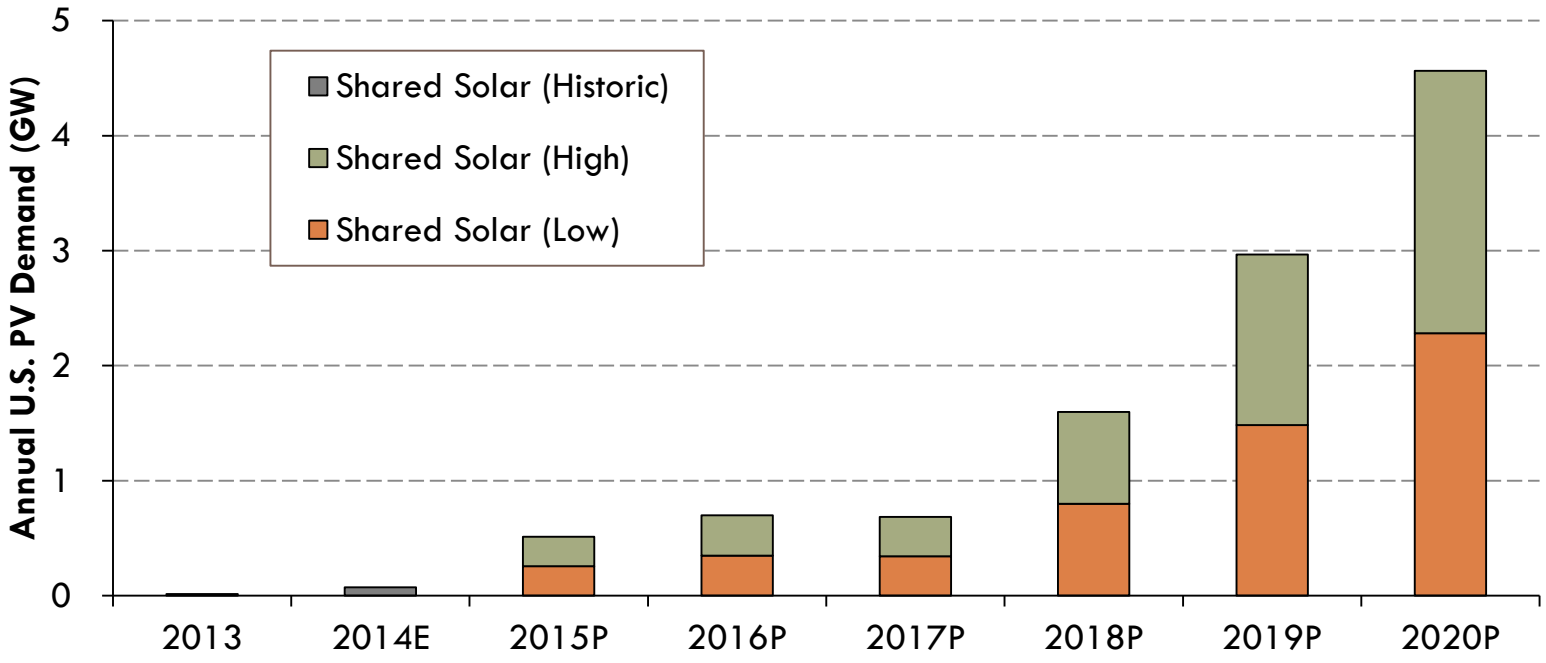
Economies of Scale

- **Lower soft costs**
  - Costs are spread over larger projects
- **Siting flexibility**
  - Optimal grid integration
  - Local econ development: Community-scale projects can use **space close to load centers** unsuitable for small- or utility-scale solar
- **Increased grid visibility and focused interconnection efforts**
  - Utilities can monitor operation of several larger arrays instead of many small systems.

Opportunities for Innovation

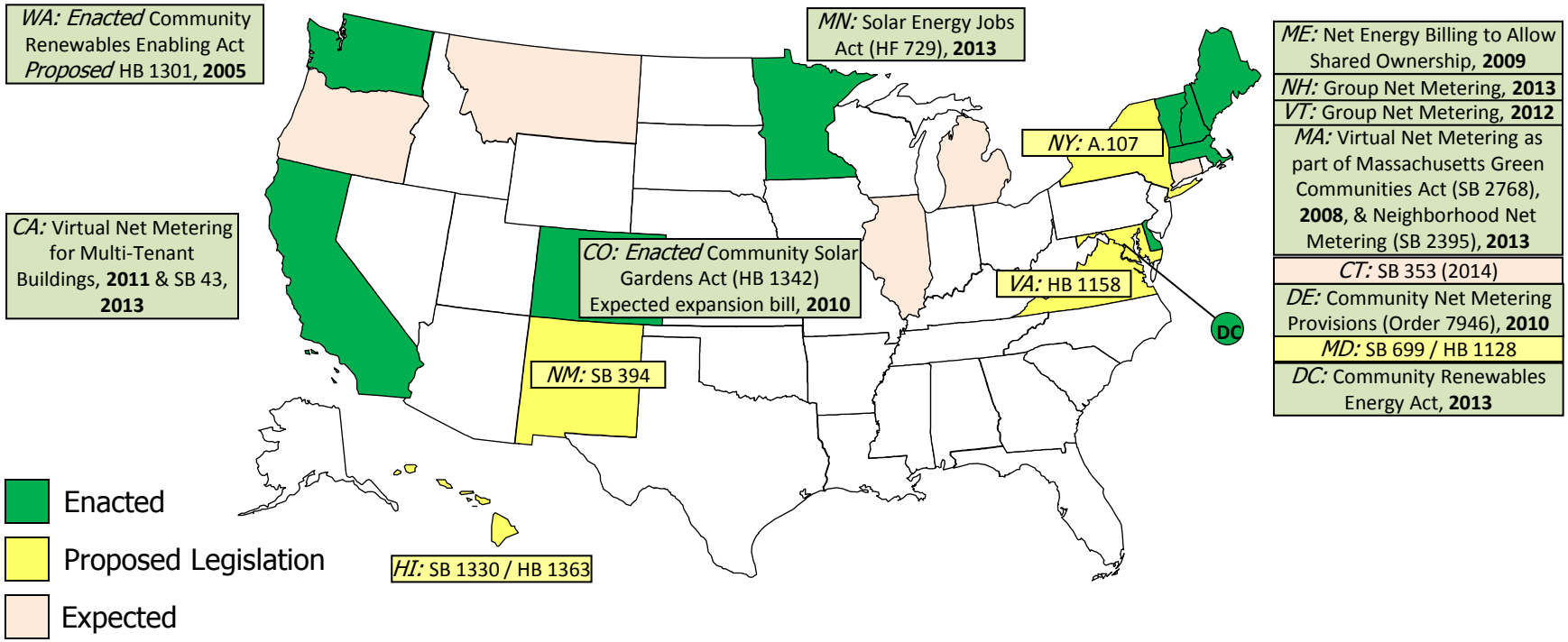
- **Entrepreneurship opportunities**
  - Wide range of possible business models
- **Sector interfaces**
  - Opportunities for residential/commercial/municipal collaboration
- **Community support**
  - Engaging a variety of stakeholders can help program administrators and hosts give back to their community.

Potential Impact of Shared Solar 2015-2020



- Shared solar has the potential to double the U.S. distributed PV market by offering it to the other half of households and businesses that—owing to shading, roof suitability and size, or ownership—cannot host a PV system
- Combining the residential and non-residential sectors, we estimate that, from 2015–2020, cumulative shared solar installations could constitute 5.5–11.0 GW of PV for residential and non-residential customers
  - This could represent an additional $8.2–$16.3 billion of cumulative investment.

Enacted, Proposed, and Expected Shared Solar Legislation

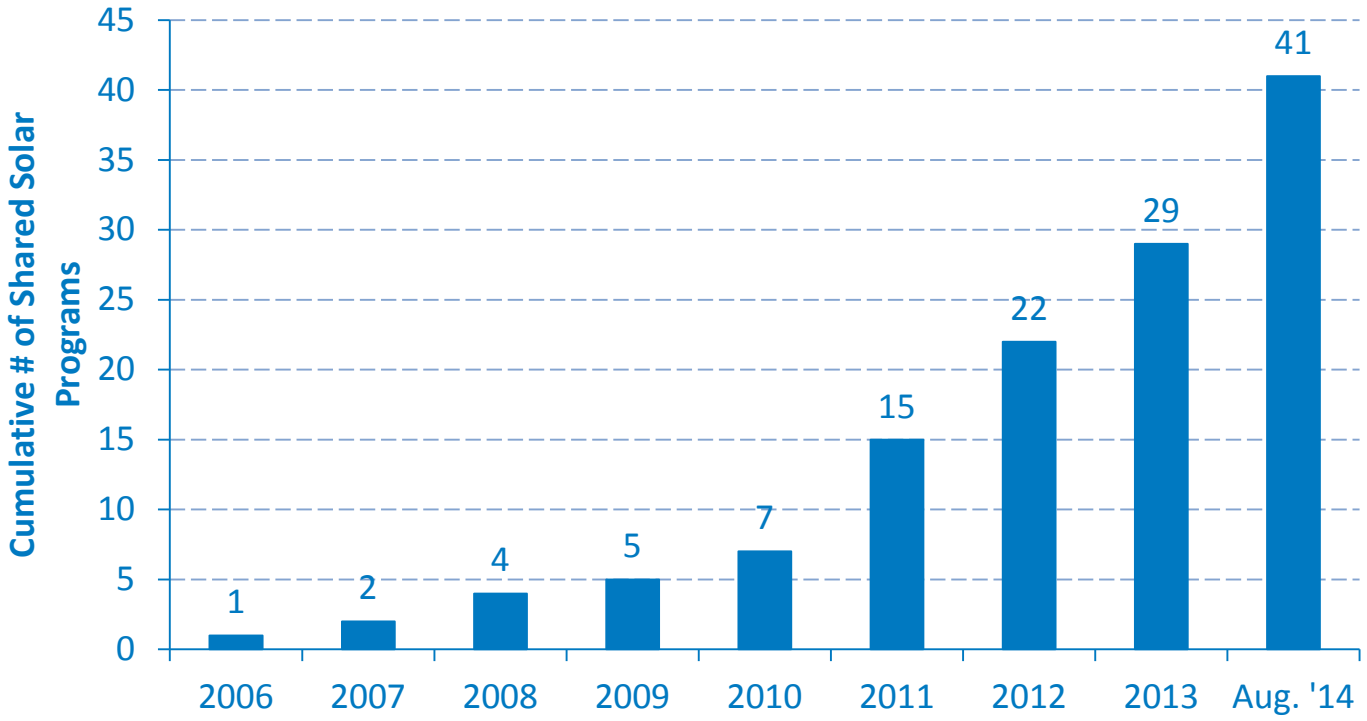


As of February 2015, there were 9 states with shared solar legislation. State policies related to shared solar programs typically come in three forms:

- **Group or virtual net metering** ,which enables the allocation of benefits from an electricity-generating source that is not directly connected to a customer's meter
- A **statewide shared energy program** which establishes a comprehensive shared renewable energy program in the state (including VNM or value-of-solar provisions)
- **Incentives** which provide additional financial incentives for shared renewable energy programs.

Source: Vote Solar. (2015). "States with Shared Renewable Policy." Accessed Feb. 23, 2015: http://www.sharedrenewables.org/.

Cumulative Number of U.S. Shared Solar Programs



- Although legislation that sets statewide rules is helpful, it is not always necessary
- According to SEPA and IREC, 23 of the 41 utility-offered shared solar programs are located in states that have community solar legislation.

Sources: Campbell, B.; Chung, D.; Venegas, R. (2014). *Expanding Solar Access Through Utility-led Community Solar: Participation and Design Trends from Leading U.S. Programs*. Washington, DC: Solar Electric Power Association. Campbell, B.; Passera, L. (2014). *SEPA/IREC Resource: SEPA/IREC Community Solar Program Catalog*. Washington, DC: Solar Electric Power Association.

Challenges to Shared Solar

Customer Adoption	Rate Design	Program Structure	Added Challenges

• **Lack of uniformity and standardization of customer contracts**
  • Costs to developing contracts
• **Marketing costs**
  • The newness of the shared solar market means more education and customer-acquisition costs.
	• **Billing credit mechanisms not available in every jurisdiction**
	• **Unquantified benefits**
	• **Clarity on the distribution and transmission benefits and costs of shared solar system.**
		• **Uncertainty for shared solar market participants about the applicability of federal SEC requirements for registration and disclosure for shared solar projects**
		• **Uncertain tax credit applicability for 25D.**
			• **More infrastructure may be necessary for off-site systems**
			• **Harder for customers to manage supply and demand**
			• **Structuring group program more complex than single offtaker**
			• **Site costs may be higher for off-site systems.**

DOE Engagement in Shared Solar

- SunShot Initiative hosted a full-day stakeholder workshop entitled *Shared and Community Solar: Getting to Scale* in October 2013 to identify paths forward for shared solar
- Attendees identified several important issues
  - Stakeholder engagement important for optimal program design
  - Education and outreach are needed to convey market opportunity
  - **Uncertainty about the applicability of Securities and Exchange Commission (SEC) requirements for registration and disclosure of shared solar projects**
- DOE pursued conversation with SEC staff to help industry better assess security regulation considerations
  - A stakeholder meeting was held in June 2014, wherein SEC staff summarized key clarifications and answered stakeholder questions
    - Primarily focus of discussions on no-action letter request made to the SEC by CommunitySun, LLC.

Background on Federal Securities Regulations

- SEC was established through laws passed in 1933 and 1934 in order to "increase information disclosure surrounding the issuance and trading of securities"[1]
- These laws regulate the offer and sale of securities and require initial security offerings to register with SEC that disclose important information to investors
  - Cannot sell a security without registering, which can be costly and take time, unless the security qualifies for an exemption
- The Securities Act of 1933 lists different types of securities, including stocks, notes, and "investment contracts"
  - If an instrument is determined to fit into one of these categories, it is a security.

[1]**Source**: Bailey, K. (2012). "Insecurity for Community Solar." *Journal on Telecommunications & High Technology Law* (10:1).

What Constitutes a Security

- Courts are ultimate arbiter of what violates securities laws
- Two U.S. Supreme Court cases help better define what constitutes a security
- In *Securities and Exchange Commission v. W.J. Howey Co.* (1946), court established the "Howey Test," which states that an "investment contract" has the following criteria:
  - An investment of money
  - In a common enterprise
  - Based solely on the efforts of a promoter or a third party
  - For which there is an expectation of profits
- *United Housing Foundation, Inc. v. Forman* involved investors buying an apartment in a housing cooperative (condo)
  - Using the Howey Test, the court determined that **there was not an expectation of profit**—investors were living in the units, and their purchase was motivated instead by personal consumption and use.

SEC “No-Action Letter"

- Important to determine whether offering constitutes a security
- Companies can seek a “no-action letter” from SEC’s Division of Corporate Finance
  - Entities provide info to SEC on the product, service, or action and ask SEC whether not registering would violate federal securities laws
  - If SEC staff thinks no law would be violated, and the Commission not take enforcement action against requester, they may issue a no-action letter
  - SEC may also issue a staff legal bulletin which applies to topic more broadly than individual entity.

CommunitySun No-Action Letter Request

- CommunitySun, LLC is an RE developer that sells interests in shared solar installations via a "SolarCondo*" framework
  - PV system is collectively owned
  - Customers receive virtual net metering (VNM) credits on their individual electric-utility bills

Howey Test Application for CommunitySun

Criteria	CommunitySun Program
An investment of money	Yes. Customers purchase condominium interests.
In a common enterprise	Yes. Multiple customers are expected to purchase an interest in a single PV asset.
Based solely on the efforts of a promoter or a third party	Yes. The program is to be developed, and the project is to be built and operated by CommunitySun or other businesses they hire.
For which there is an expectation of profits	***Not necessarily***. SolarCondo owners may have many motivations for purchasing a condominium interest.

- Because it is not readily apparent whether SolarCondo owners seek profits, the expectations of the owners and sellers must be determined
- Using the *Forman* case precedent, CommunitySun successfully argued that ***ownership in a SolarCondo was for personal consumption and use, not profit.***

*"SolarCondo" is a registered trademark of CommunitySun, LLC.

The Motivation of Buyer and Seller

- Shared solar programs and regulatory environments can be structured in ways to better argue that shared solar programs are not for profit, but for personal consumption and use
- **Billing Mechanism**
  - The same electrons generated by an on-site or off-site customer's PV array may not be used by a particular customer
  - As long as a PV system produces less than customer draws over a certain period of time, programs see this as offsetting consumption
  - Different ways of crediting customer for generation from PV (e.g., one-to-one energy credit, value of solar tariff)
  - The further a net metered arrangement departs from the PV asset primarily being used to offset the customer's consumption, the harder it becomes to argue that the energy is solely designed for personal use and not profit
    - Ex: PV system consistently produces a lot more than customer demand
- **Structuring Shared Solar Program**
  - Shared solar program developers can market material and structure programs in various ways
  - If a shared solar program is marketed as a profit-generating program, it is more likely to come under scrutiny with SEC.

Federal Exemptions

- Shared solar programs whose offerings are classified as a security may still avoid federal securities regulations by qualifying for an exemption
- Regulation D, Rule 506(b) (most widely used exemption): Can raise unlimited amount of capital from accredited investors (and up to 35 non-accredited investors). No advertising allowed
- Rule 506 (c): Can solicit and advertise but only to accredited investors
- Rule 504: Issuer can raise up to $1MM per year. General solicitations and advertisements usually not permitted
- Intrastate Offering Exemption: 80% of the proceeds of the offering, gross revenues, and assets must come from in-state activity; other in-state restriction also apply as well as state securities laws
- Exemptions Related to Non-profits: Non-profit developers may also be exempt as they, by definition, do not make any profit

- Even without an exemption, shared solar offerings classified as a security can still be offered and sold, so long as they are registered with the SEC.

Additional Securities Considerations

- Some developers approaching Howey Test differently
  - Have attempted to avoid "common enterprise" by selling individual panels, not share of system
  - Organized program via co-op so the efforts are not based on third party
- In addition to federal securities laws, **state securities laws apply as well**
  - State securities laws may also limit the scope of certain federal exemptions
  - In addition to Howey Test, 16 states (and Guam) apply "risk capital test" established by the CA Supreme Court
    - Securities laws don't just apply to offerings with expectation of benefit, but also in cases where investors capital is at risk
- **Beyond securities laws, shared solar programs are also subject to other federal, state, and local laws, as well as regulations administered by public utility commissions.**

Market Potential of Shared Solar

- Estimated shared solar market potential by determining additional deployment levels that can be achieved through expanding the available PV system customer base

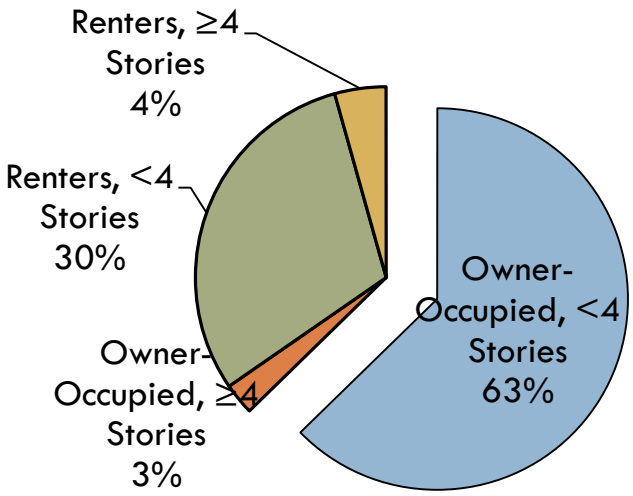
$$\textbf{Shared Solar Market} = (\textit{Onsite Solar Deployment} \times \%\ \boldsymbol{\textit{Increase in Customer Base}} - \textit{Onsite Solar Deployment}) \times \textit{Market Constraints}$$

$$\textbf{Increase in Customer Base} = \frac{1}{1/\%\ \textit{of Customers Unable to Host Onsite PV}}$$

- In the residential and non-residential marketplace estimates were made for:
  - % of customers unable to host an on-site PV system
  - Market Constraints
    - Development process/time necessary for shared solar business model
    - State-level constraints (e.g., net metering caps, state RPS levels).

% of Residential Customers Unable to Host a PV System

- We assumed residential customers unable to host a PV system meet one of the following criteria:
  - Renters
  - Customers in buildings with 4 or more stories
  - Those living in a building with insufficient roof space.

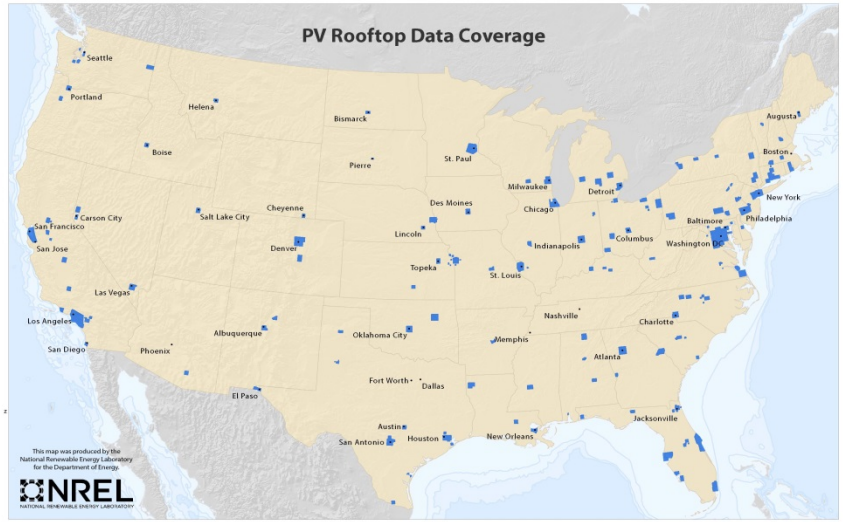


- 37% of U.S. households either rent or live in a building with 4 or more stories
- We then calculated how many of the remaining 63% of households had roofs that could host a PV system.

Using LiDAR Data to Estimate Roof Suitability

- LiDAR data was processed for 167 U.S. regions, with a population of 100 million and a roof area of 7.7 billion square meters
  - Buildings with a footprint of less than 5,000 square meters were assumed to be residential
  - The data were analyzed to determine how many buildings 1) had the proper shade and slope thresholds; 2) had roofs faced a proper direction; and 3) could host enough acceptable, contiguous roof area to host a 1.5 kW PV system
    - While the average residential system is larger than 1.5 kW, 19% of residential PV systems have capacities between 1.5 kW – 3.0 kW

- Based on these thresholds, 81% of residential buildings have enough suitable roof space to host a PV system
- Therefore, when accounting for ownership, number of stories, and availability of suitable roof space, **49% of households cannot host a PV system.**



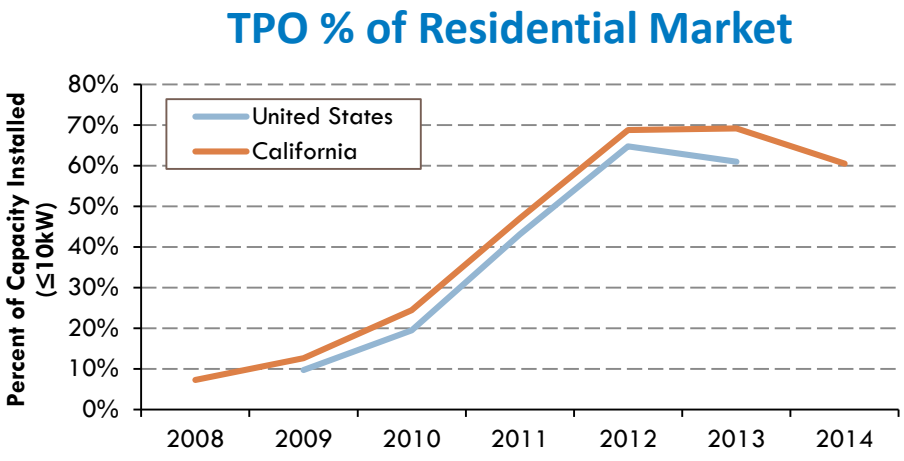
Market Constraints

State Level Constraints

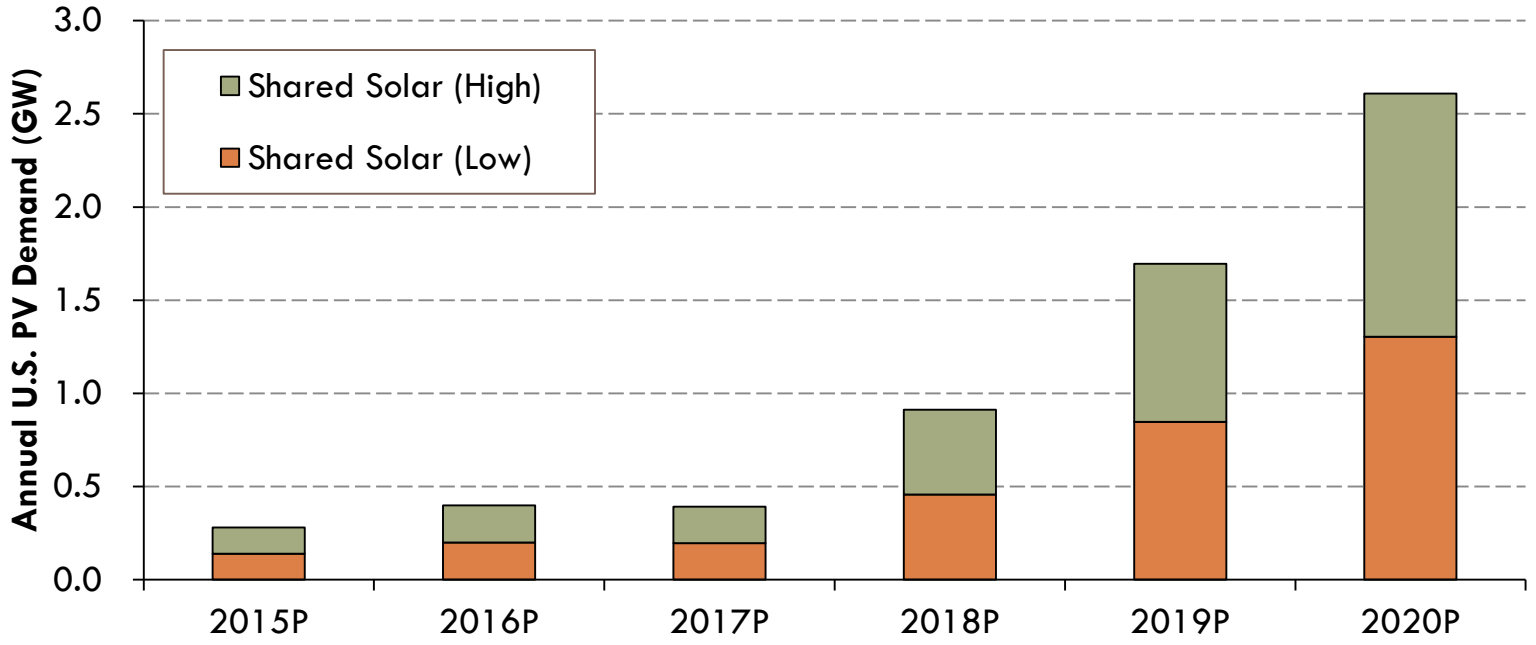
- Net metering caps limit the total amount of net metering generating capacity
  - Over half of the states with net metering policies have caps
- State level RPSs have helped drive PV growth throughout the United States
  - Programs set standard for each year and encourage RE deployment up to a certain level
    - Beyond that level, mechanisms are often in place to limit growth
- For these reasons we model two scenarios: one in which 50% of distributed market is capped by these factors, and one in which future demand is not capped

Market Maturity

- The shared solar marketplace will need to develop in many of the same ways that the TPO market developed
  - Expanding business model nationwide
  - Promoting customer awareness of new product
  - Changing some state/local laws to accommodate new business model
  - Development of legal documents and educating financial institutions
- We assumed shared solar will go through similar growth process and achieve full market maturity in 6 years.



Shared Solar Market Potential for Residential Customers 2015-2020

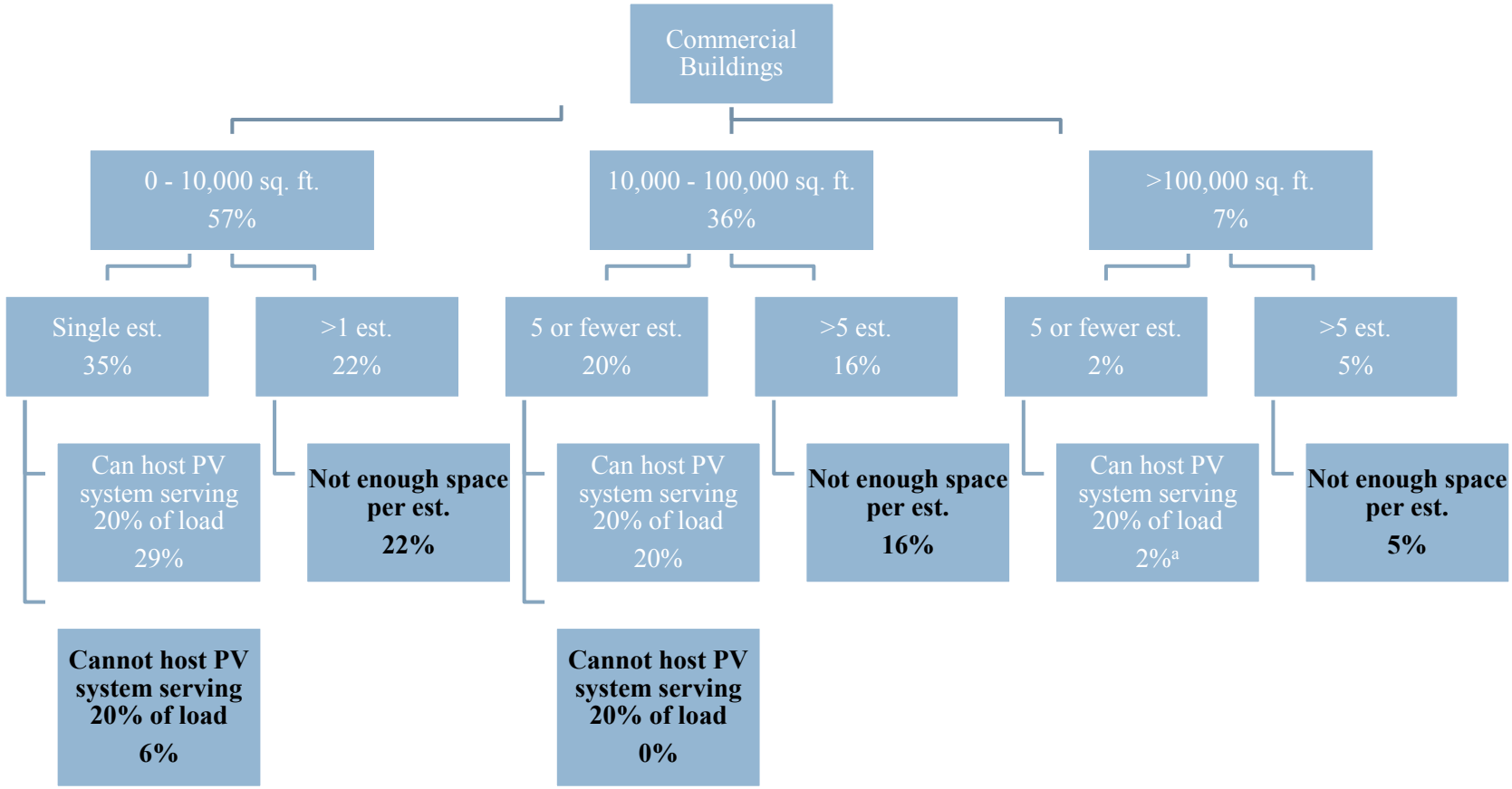


- Based on these assumptions, we estimate that, from 2015–2020, cumulative shared solar installations could constitute 3.1–6.3 GW of PV for residential customers
  - Including 1.3–2.6 GW in 2020 alone
  - This could represent an additional $4.7–$9.3 billion of cumulative investment

% of Non-residential Customers Unable to Host a PV System

- We assumed non-residential customers unable to host a PV system are located in buildings meeting one of the following criteria:
  - Buildings with more than five establishments (e.g., malls)
  - Buildings of less than 10,000 square feet with two to five establishments
  - Single-establishment buildings under 10,000 sq. ft. with insufficient roof space to host a PV system of adequate size
- Unlike the residential market, we do not assume that ownership of space is a requirement for hosting an on-site PV system
  - While this is a barrier, many businesses have already successfully solved owner/tenant issues
- The same LiDAR data was processed using different constraints for the commercial space
  - For this analysis, we assume that a business will not install a system on its roof unless that system can generate at least 20% of its energy demand, or approximately 15% of building roof space.

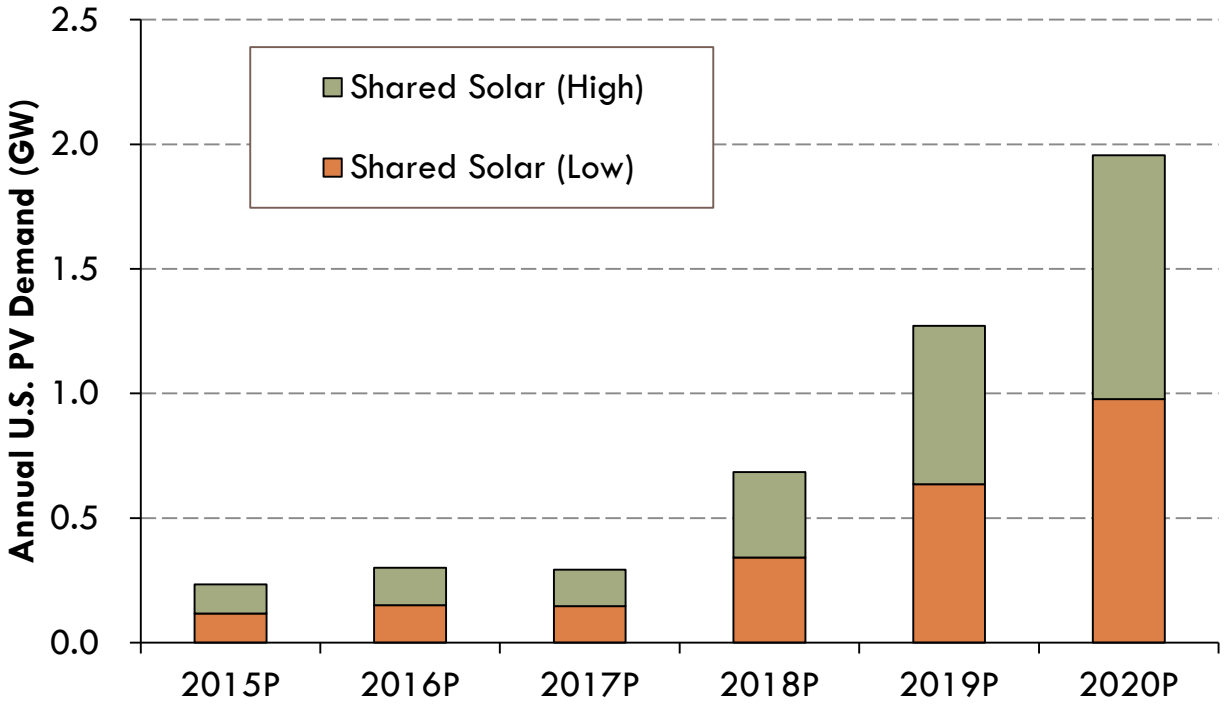
% of Non-residential Customers Unable to Host a PV System



Based on these criteria, 48% of businesses that cannot host a PV system could use shared solar.

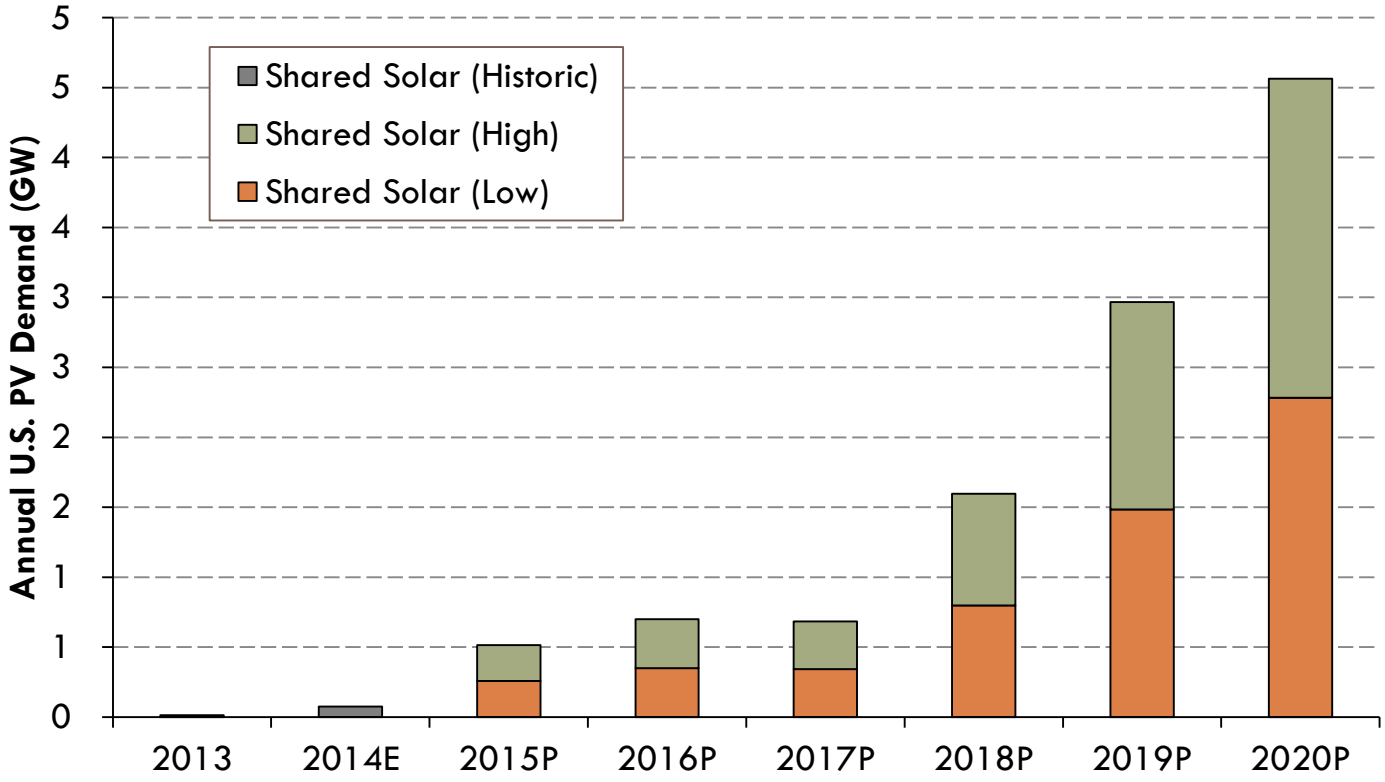
Shared Solar Market Potential for Non-residential Customers, 2015-2020

- The limiting factors from the residential analysis were also used for the non-residential market:
  - State level constraints potentially limiting 50% of market growth
  - 6 years to reach full maturity
- Based on these assumptions, we estimate that, from 2015–2020, cumulative shared solar installations could constitute 2.4–4.7 GW of PV for non-residential customers
  - Including 1.0–2.0 GW in 2020 alone
  - This could represent an additional $3.5–$7.0 billion of cumulative investment.



Shared Solar Market Potential for Distributed Market, 2015-2020

- Combining the residential and non-residential sectors, we estimate that, from 2015–2020, cumulative shared solar installations could constitute 5.5–11.0 GW of PV for non-residential customers
  - This could represent an additional $8.2–$16.3 billion of cumulative investment.



Upside Potential of Shared Solar

- There are several reasons why the market for shared solar could be larger than estimated
  - LiDAR data, used to estimate roof suitability, does not take into account roof age, condition, or building material
  - Many businesses that lease property cannot host a PV system
  - Shared solar may be a more attractive value proposition to consumers
    - More fungible
    - Customers may not want PV on their property
    - Potentially easier transaction for individual participants.

Conclusion

- 49% of U.S. households and 48% of U.S. businesses are currently unable to host a PV system
  - Shared solar could expand cumulative U.S. PV deployment by 5.5-11.0 GW between 2015-2020 and represent $8.2–$16.3 billion of cumulative investment
- There are unquantified factors which could make these numbers higher including:
  - Easier and less restrictive participation, a potentially better value proposition, and the ability to service a much higher share of customer load
- Shared solar offerings marketed and structured to reduce customers' retail electricity bills are less likely to be treated as a security than those marketed and structured primarily as a profit-generating program
- Shared solar programs whose offerings are classified as securities may still avoid federal securities regulations by qualifying for an exemption, though that may still be subject to state securities laws. However, even without an exemption, shared solar offerings classified as securities can still be offered and sold, so long as they are registered with the SEC.

Thank You!

To download a copy of the report, please go to the following link:

http://www.nrel.gov/docs/fy15osti/63892.pdf

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