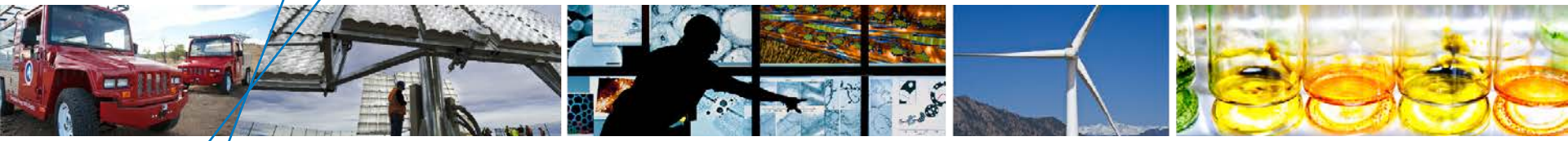
Shared Solar Continues to Trend: Market Update and Implementation Questions



Presenters:

Jenny Heeter, NREL

David Feldman, NREL

Adam Capage, 3Degrees

June 18, 2015

Housekeeping

- Participants are joined in listen-only mode.
- Use the Q&A panel to ask questions during the webinar. We will hold all questions until after all speakers have presented.
- This webinar is being recorded. The slides will be posted to: http://apps3.eere.energy.gov/greenpower/events/archive.shtml.

About Presenters

Jenny Heeter, *Senior Energy Analyst, NREL*

Jenny Heeter is a renewable energy analyst at the National Renewable Energy Laboratory (NREL) in Golden, Colorado. She focuses her research on the voluntary green power market, renewable energy certificate markets, renewable portfolio standards, net metering policies and utility regulatory issues. Prior to joining NREL, she worked for the Indiana Office of Utility Consumer Counselor, representing ratepayer interests in renewable energy and energy efficiency cases brought by utilities before the Indiana Utility Regulatory Commission. She holds an M.P.A. in environmental policy from Indiana University-Bloomington's School of Public and Environmental Affairs and a BA in political science and environmental studies from Macalester College.

David Feldman, *Senior Financial Analyst, NREL*

David Feldman is a senior financial analyst for the National Renewable Energy Laboratory (NREL), helping the organization plan and carry out a wide range of analytical activities related to financial, policy and market developments in the solar industry. His primary areas of expertise include project finance of renewable energy assets, public capital in the renewable energy sector, and solar market development. David came to NREL from Soltage, a commercial-scale solar development company, where he worked in their project finance department. David graduated with an MBA from the Yale School of Management, with a focus in finance, and Amherst College with a BA in philosophy.

Adam Capage, Vice President, Utility Partnerships

Adam leads the 3Degrees Utility Partnership Services group, overseeing all of the firm's utility green power partnerships. Adam was a member of the 3Degrees founding team in 2007. Under his leadership, 3Degrees' utility partnership business has grown substantially and 3Degrees' utility partners' programs have received the USA Department of Energy's Green Power Program of the Year award four separate times. Adam has a B.A. in Political Science from the University of CO at Boulder and a M.A. in Public Administration from the University of CO at Denver.

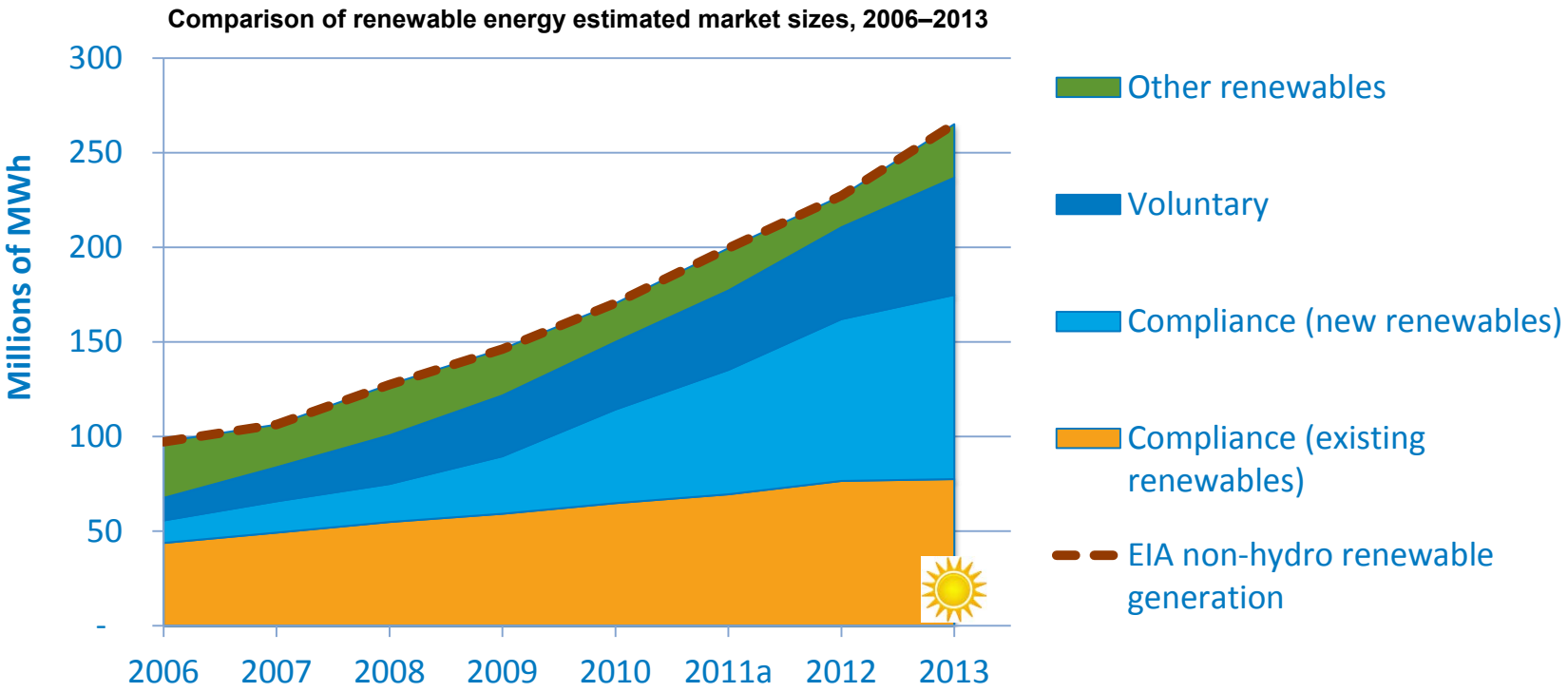
What is Community Shared Solar?

- Shared solar projects allow customers that do not have sufficient solar resource, that rent their homes, or that are otherwise unable or unwilling to install solar on their residences or commercial buildings, to buy or lease a portion of a shared solar system.
- The subscriber's share of the electricity generated by the project is credited to their electricity bill, as if the solar system were located at the home or business.

Shared Solar Projects Serve Both Voluntary and Compliance Markets

- Voluntary Market: Subscriber keeps the Renewable Energy Certificates (RECs) or the RECs are retired by the utility on the subscribers behalf. Subscriber can say "My business is solar powered"
- Compliance/RPS Market: Utility keeps the RECs, for use in meeting Renewable Portfolio Standards (RPSs) or other internal goals. Subscriber can say "I am getting lower cost electricity and helping the utility meet its renewable obligation."
  - Some state shared solar policies proscribe REC treatment.

Voluntary and Compliance Markets are Growing

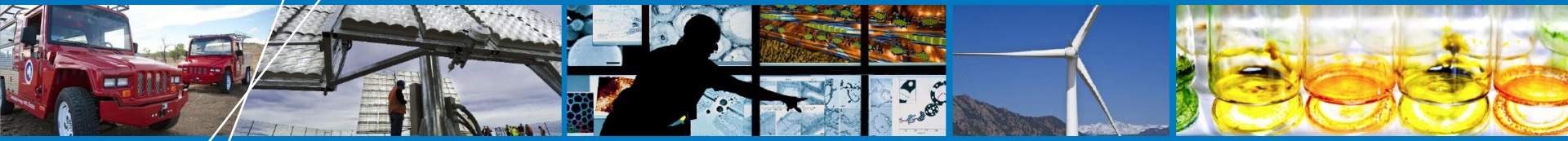


Shared solar is growing fast, but is still a small portion of the total renewable energy in the United States.

Notes: The figure estimates market sizes by showing the total non-hydropower renewable generation in the U.S. (EIA), split into voluntary, compliance, and "other renewables"; "Other renewables" include renewable energy procured on a least-cost basis or by utilities that are not subject to an RPS and are not using the RECs to supply a voluntary program. This figure is only an estimate as some hydropower is used in compliance and voluntary markets.

NREL
NATIONAL RENEWABLE ENERGY LABORATORY

Community Shared Solar: Risk, Pricing, Marketing and Sector Market Potential



David Feldman
National Renewable Energy Laboratory

June 18, 2015

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.

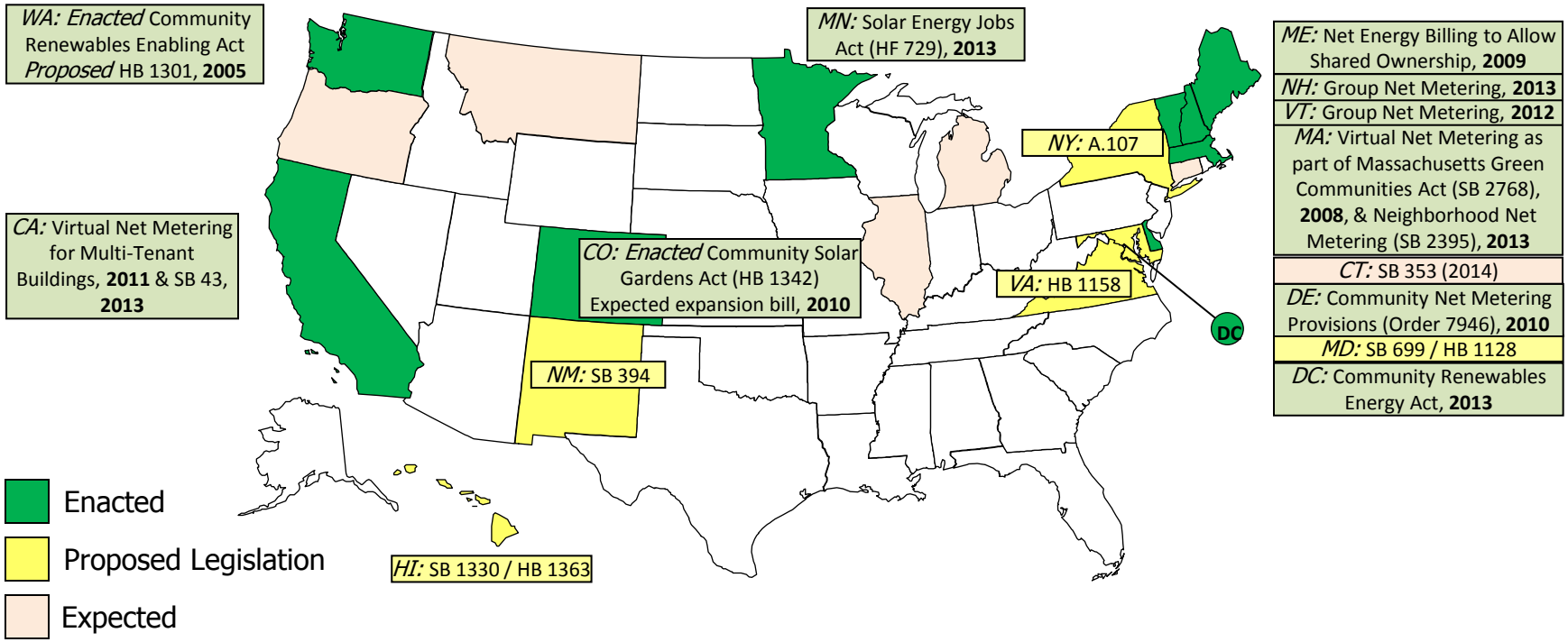
Economies of Scale

- **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.

Enacted, Proposed, and Expected Shared Solar Legislation

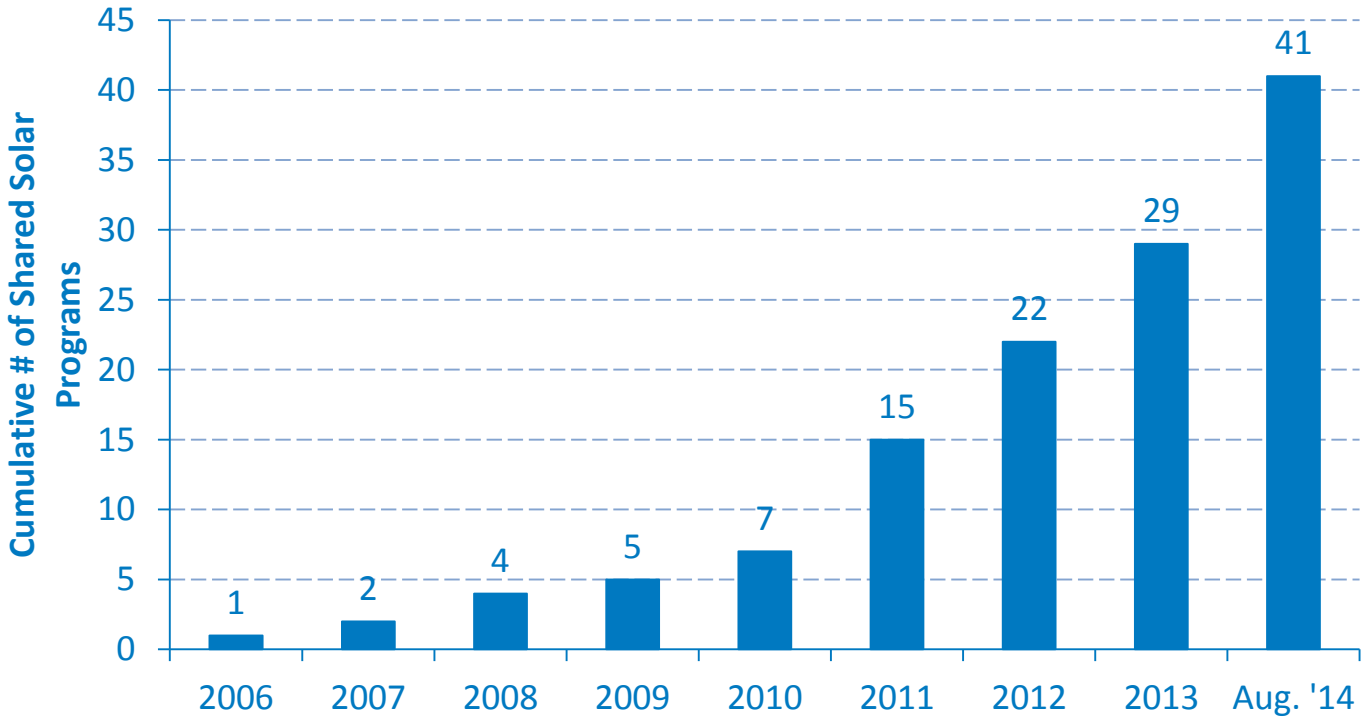


As of February 2015, there were 9 states with shared solar legislation. State policies related to shared solar programs typically come in three forms:

- **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/.

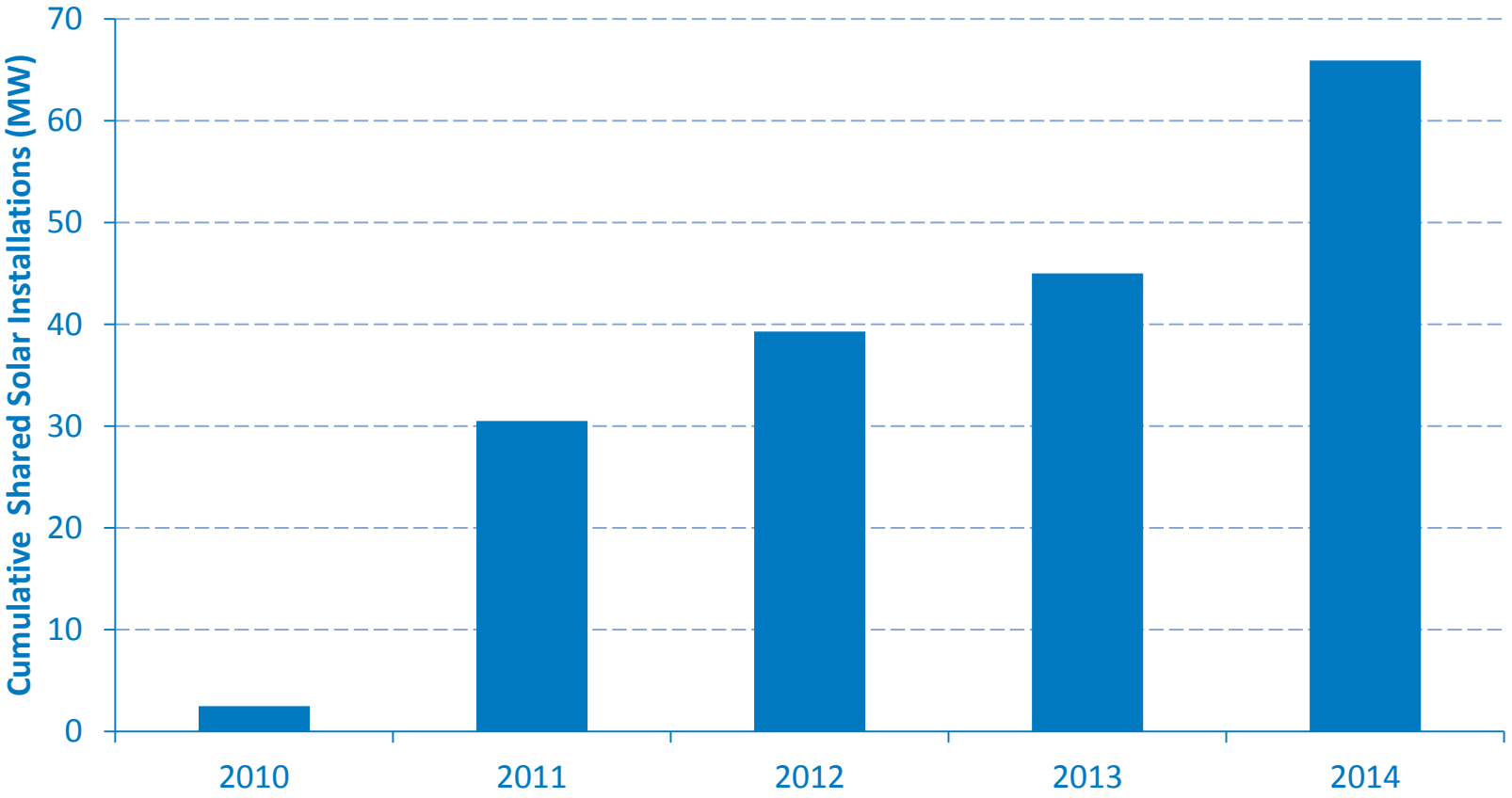
Cumulative Number of U.S. Shared Solar Programs



- 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.

Cumulative MW of Shared Solar Installations



- Cumulative shared solar installations has grown over 25 times since 2010

Sources: GTM & SEIA. U.S. Solar Market Insight Report: Q1 2015. June 2015.

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.**

Securities Regulations Affecting Shared Solar

- Securities and Exchange Commission (SEC) functions to "increase information disclosure surrounding the issuance and trading of securities"
- Registering as a security has the potential to add complexity and cost
- But what is a security? Courts ultimately decide these questions
  - Supreme court said in the *Howey* case that a 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
  - Several shared solar programs have attempted to avoid classification by avoiding one of these criteria
    - CommunitySun successfully argued that ***ownership in a SolarCondo was for personal consumption and use, not profit***
      - Offsetting electricity not making money

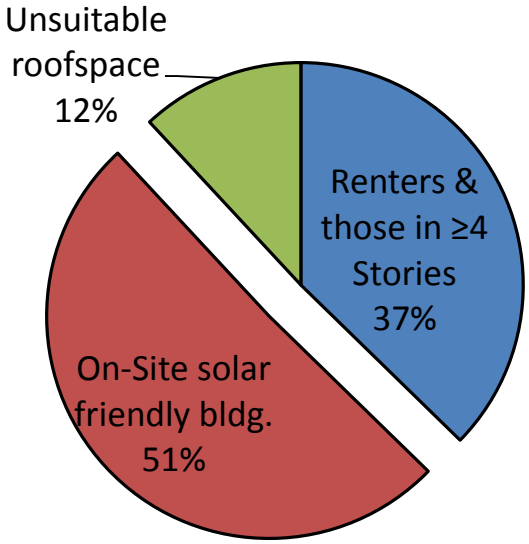
Shared solar programs whose offerings are classified as a security may still avoid federal securities regulations by qualifying for an exemption (though they may still be subject to state securities laws)

- 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.

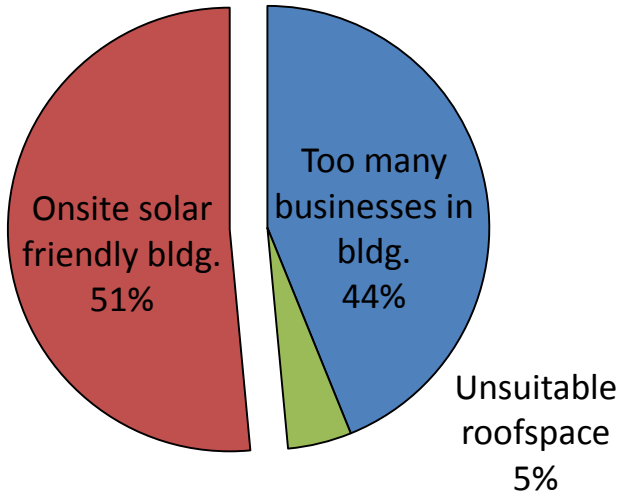
Market Potential of Shared Solar

- Estimated shared solar market potential by determining additional deployment levels that can be achieved through expanding the available PV system customer base
- In the residential and non-residential marketplace estimates were made for:
  - % of customers unable to host an on-site PV system
  - Renters, those without access to roofspace (malls, multitenant buildings, high-rises), and/or those living in buildings with insufficient roofspace with good solar exposure (using analyzed LiDAR data)
- 49% of U.S. households and businesses are currently unable to host a PV system
- Market Constraints
  - Development process/time necessary for shared solar business model
  - State-level constraints (e.g., net metering caps, state RPS levels).

Households

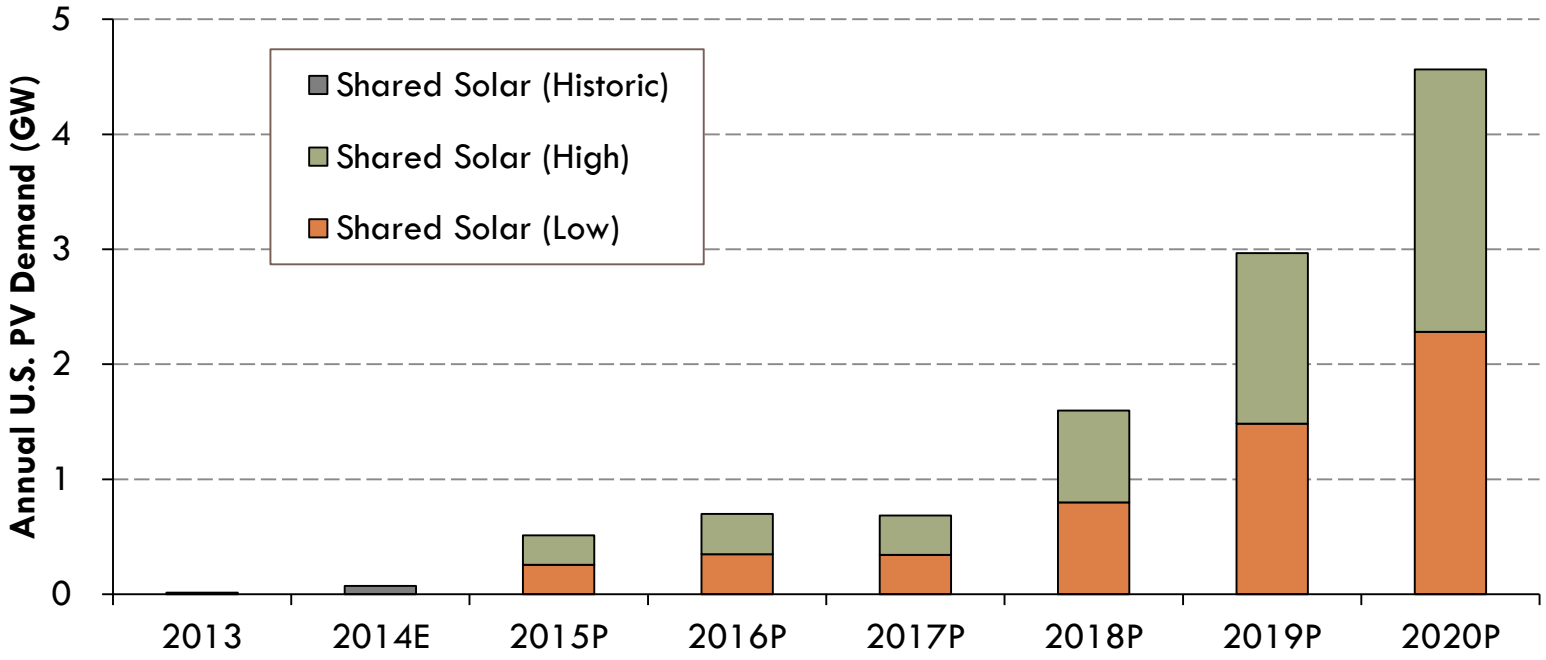


Businesses



Source: Feldman et al. ***Shared Solar: Current Landscape, Market Potential, and the Impact of Federal Securities Regulation*. NREL. April 2015.**

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.

Source: Feldman et al. ***Shared Solar: Current Landscape, Market Potential, and the Impact of Federal Securities Regulation*. NREL. April 2015.**

Conclusion

- 49% of U.S. households and 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.

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KEY CONSIDERATIONS FOR COMMUNITY SHARED SOLAR

Webinar with

ADAM CAPAGE

Vice President of Utility Partnerships - 3Degrees, Inc.

06/18/15

3Degrees' mission is to connect people with renewable energy on a massive scale.

Framing Today's Conversation //

COMMUNITY SHARED SOLAR FOR INVESTOR OWNED UTILITIES

TYPICAL PROGRAM ATTRIBUTES

+ Facilities of 5-25 MW
+ All above market costs are borne by participating customers
+ Monthly billing, no up front charge
+ Typically not driven by a legislative or regulatory mandate

CLEAR UTILITY AND CUSTOMER APPEAL

+ Utilities want to offer customers choices.
+ Many customers want solar but don't own a roof that works for solar.
+ Existing REC-based programs have proven customer interest in supporting renewables

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Market Realities // QUESTIONS ABOUND

- Who should build and own the supply?
- What is the right combination of participant terms and conditions?
- Can the utility earn a rate of return on any part of the asset?
- What are program goals?
- How should the program be priced?
- What if it doesn't sell out?
- Who is the target market and how should it be marketed?
- How will offering this program impact other utility programs?
- Can the billing system handle program design specifications?
- Will stakeholders support this program?
- Who should own the REC?

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Market Realities //

5 QUESTIONS UTILITY MANAGEMENT WILL EVENTUALLY ASK

Q1 How are we managing risk?

Q2 Will the proposed pricing hold non-participants harmless?

Q3 Can we own the asset?

Q4 Should we keep the REC?

Q5 Can you launch in 3 months?

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Q: How are we managing risk?

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A: Three top options

- Offer a simple and appealing product people want to buy
  - Include appropriate budget to tell prospective customers about it
- Use excess supply to meet other requirements
  - RPS in states with standard and/or voluntary REC-based programs
- Actively manage program demand
  - Plan to build and manage waiting lists, maintain close linkage between marketing and supply

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Case Study // PRICING SURPRISE

Impacts of contracts & termination fees

	Program w/ Fees & Contracts	Attractive & Simple Program (w/o fees and contracts)
DROP RATES	4%	15%
AVERAGE BLOCK PURCHASE	1.5	2.4
PARTICIPANTS REQUIRED TO SELL OUT	5000	3125
ANNUAL ATTRITION	175	470
AVERAGE COST TO ACQUIRE A NEW CUSTOMER	$190.00	$125.00
TOTAL COST TO SELL-OUT SYSTEM & RECOVER ANNUAL ATTRITION OVER 10 YEARS	**$1,330,000**	**$978,000**

Q: Will the proposed pricing hold non-participants harmless?

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A: Yes, if modeled carefully and implemented correctly

Total Cost/Projected Sales = Retail Rate

Inputs

+ Supply cost
+ marketing & administration
+ T&D
+ Projected sales volume in kWh

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Q: Can we own the asset?

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A: Maybe

- Many state utility commissions will be considering this question in coming months and years.
- Few early signals
- Begin thinking about this early in the planning process

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Q: Should we keep the RECs?

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A: Probably not

Do customers believe they are buying solar power?

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Inherent Risk in Utility Retaining the REC

FEDERAL CONSUMER PROTECTION STATUES

Retaining the REC greatly increases the risk of potential liability under federal consumer protection statutes and guidelines.

GREEN-E

The gold-standard in certification for voluntary renewable energy products including annual review of all marketing claims.

FTC GREEN GUIDES

+ updated in 2012, address consumer protection principles and enforcement related to renewable energy claims. 15 U.S.C. 41-58.
+ "…because the Guides are based on consumer understanding of environmental claims, consumer perception research provides the best evidence upon which to formulate guidance."
+ …it has, by selling renewable energy certificates, transferred the right to characterize that electricity as renewable." Section 260.15(d)(ex. 5).

GREEN-E

+ Now beginning to certify Community Solar programs
+ Green-e certification can go along way towards managing relationships with stakeholder organizations and regulators.

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Q: Can we launch in 3 months?

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A: No

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Contact

ADAM CAPAGE

Vice President of Utility Partnerships

ACAPAGE@3DEGREESINC.COM

(503) 295 7781

3Degrees