Rate Design for Distributed Solar

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Equity & Access Track

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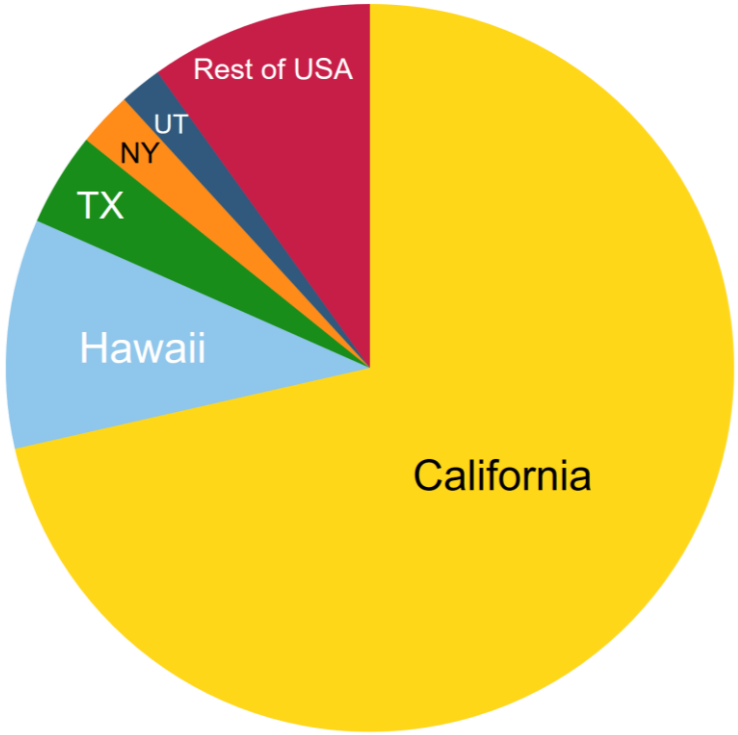
Topics I will cover in this presentation.

- The “sub-title” for my presentation today is “Ensuring Equity and Inclusion in Both Rooftop and SolarNet Metering.”
- Within this important topic there are two areas I’d like to focus on here today:
  - Alternatives to net metering programs for distributed solar customers.
  - Community-owned community solar programs.

Background: Drivers of Distributed Solar Adoption



Share of U.S. Deployment of Distributed Solar by State
Source: U.S. EIA Form 861, 2022 Preliminary Data

- Deployment of distributed solar is growing exponentially (from a tiny base)
- Deployment is highly concentrated in states with:
  - High solar PV adoption
  - Favorable policies
  - More population
- As of 2022, California leads with 71.5% of power capacity, followed by:
  2. Hawaii
  3. Texas
  4. New York
  5. Utah
  6. Vermont

What does Distributed Solar have to do with Equity?

- Many U.S. households still lack access to affordable solar electricity (renters, homeowners who can't access affordable financing, and those without suitable roof conditions or adequate sun exposure).
- Energy burden: (the percentage of household income spent on energy costs), such as low-income households where the average energy burden is 3X higher than for non-low-income households.
- Many programs intended to promote adoption of distributed solar do not inherently promote equity.
- Affluent individuals or utility monopolies continue to disproportionately reap benefits of solar.

Increasing equitable access to solar means ensuring solar energy is available and affordable for all U.S. consumers.

Defining Energy Equity.

A disparity that needs to be addressed:

- Marginalized (aka disadvantaged, aka low-income) communities remain virtually unrepresented in the energy planning and decision-making processes that drive energy production, distribution, and regulation.
  - For example, commission proceedings that determine what utility investments are allowed in the utility's rate base and how those costs are recovered from different classes of customers.

- At the same time, these communities bear an inequitable proportion of the negative impacts of disparities in racial and economic energy burden and environmental injustices related to fossil fuel-based energy production and climate change.

Defining energy equity.

- EE means that levels of energy required by individuals and families is equally available to all, regardless of race, geography, social standing, or economic position.
  - ✓ Further, EE includes those policies intended to:
    1. Ensure that underserved communities receive the benefits resulting from grid modernization efforts across the electric system, and
    2. Ensure that underserved communities do not disproportionately incur costs, both monetary and non-monetary, to maintain parts of the system that do not result in direct benefits for their communities.
- Put another way: Energy equity refers to the fair distribution of the benefits and burdens of energy production and consumption.

The two regulatory policies associated with distributed solar create Equity concerns.

Net Metering

- 38 states have NEM, but the programs are being consistently challenged or dismantled.
- Compensation typically based on the current retail rate.
- ***EQUITY ISSUE:*** As more customers take advantage of net metering, fewer fixed costs are paid into the system, resulting in higher rates for non-net metering customers.

Community Solar Programs

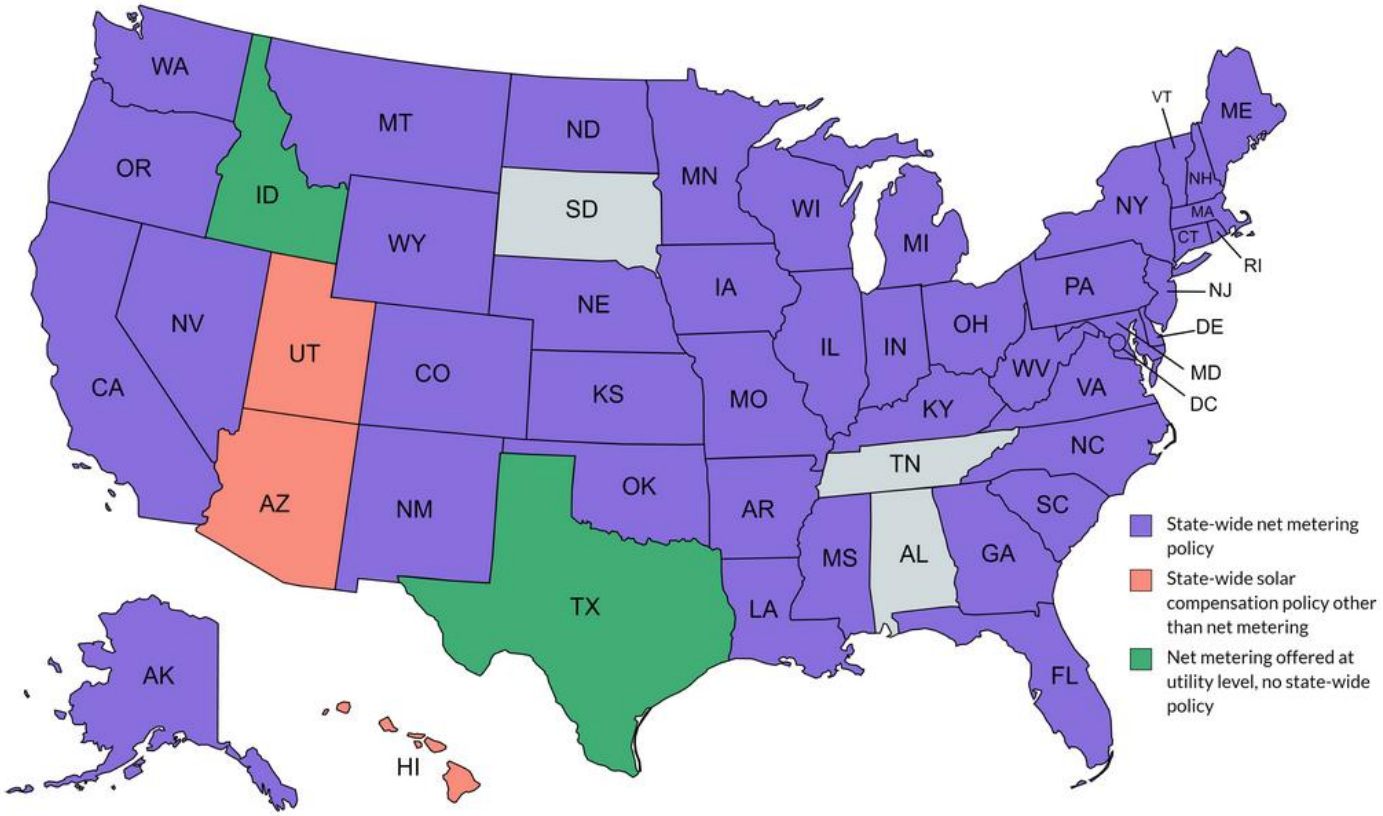
- 22 states have community solar programs created through legislation.
- Community solar projects are typically owned by a utility or third-party LLC.
- Community solar is just 3.6% of all installed solar in the U.S.
- ***EQUITY ISSUE:*** Less than half of U.S. community solar projects have any participation from low-income households due to inability to meet project requirements (e.g., no or low credit score, steep enrollment fees).

What is Net Metering?

- A regulatory construct.
  - ✓ Net metering refers to an agreement between a utility and an end-use customer who owns a distributed energy resource (DERs) and sells back power from that resource to the utility.
  - ✓ A regulatory construct meaning the NEM program is approved by a utility commission.
  - ✓ Many variations across states and utilities.
  - ✓ Most typically associated with solar panels installed on a home or commercial business.
  - ✓ Customer can be compensated either with a payment or a bill credit, with specific levels of compensation being one of the most contentious aspects.

Where is Net Metering Available?

As of October 2022….



Source: Solar.com

KEY FACTS:

- 38 states, Washington, D.C., and four territories offer net metering, if defined as including retail rate compensation.
- 7 states—Arizona, Georgia, Hawaii, Indiana, Nevada, Maine and Mississippi—have statewide distributed generation compensation rules other than net metering.
- Although Minnesota offers conventional net metering, the state has also created a value of solar rate, or tariff, as an alternative to net metering.

Potential Solutions—Net Metering Alternatives

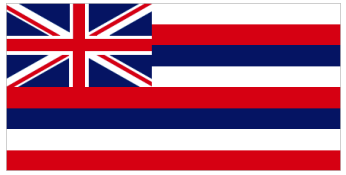
- **Value of Solar:** Associates a quantifiable benefit or cost with each kWh of distributed solar exported to the grid. Presumably, that number would become the kWh rate at which solar DG would be compensated. (Austin Energy in Texas, MN mandate for IOUs).

- **Demand Charges:** Assigns a cost to the customer for the relative strain the customer places on system resources. (e.g., a customer with flatter demand imposes less of a strain on a utility's capacity resources and incurs a smaller demand charge). Typically applied only to C&I customers.

- **Fixed Charges:** Utility elects to add a fixed surcharge to DG customer bills to recoup more of the fixed system costs the utility incurs to serve these customers.

- **Separate Metering:** A buy-sell approach in which in which consumption and generation are treated as completely separate services with different price points and rate designs.

State Policy Examples.



HAWAII

- Leads the nation in leads the nation in the rate of rooftop solar adoption
- Net metering 2001-2015
- Discontinued out of concerns that infrastructure could not handle the increased amount of energy the rooftop solar

Major PUC decision 10/2022:

- New rate structure: first-in-the-nation statewide plan intended to encourage customers to shift their energy use to times that best align with Hawaii's increasingly solar-powered grid.
- Customers simply pay for the costs they impose on the system.

New rate structure with 3 components:

1) A small **fixed charge** covers utility billing and payment-collection expenses, which everyone incurs.
2) A **"grid-access charge"** that's proportional to the capacity a customer pulls from the grid in a given month.
3) But the bulk of monthly bill will be determined by a **TOU rate.**
    a) electricity in the evening peak hours costs three times more than it does in the sunny hours
    b) The middle of the night is cheaper than the peak but more expensive than the sunny hours.

Potential Solutions—Community Solar Alternatives

- Community-owned Community Solar (as opposed to utility- or 3rd-party owned)
  - ✓ Ownership structure is controlled by the community served; democratic governance; distribution of profits.
  - ✓ With enhanced control, communities can advance Equity
- State Policies (Mandates, Financial Incentives, Equity Requirements)
  - ✓ Mandates: An increasing number of states now require that a specific percentage of community solar projects must be dedicated to low- or moderate income communities (e.g., CO, CT, HI, MD, NV, and OR).
  - ✓ Financial Incentives: Providing state funding to community solar projects in disadvantaged communities (e.g., CA, IL, MA, NH, RI and DC)
  - ✓ Equity Requirements: Only those community solar programs that include local stakeholder ownership would be approved; or, requirements that the community owns, manages, and takes the benefits of a community solar project, with the utility or 3rd party having a secondary role.

Community Solar Program Options

	Community originated	Community developed	Community managed	Community owned	Community Benefits
Investor owned	no	no	no	no	very little
Community participation	maybe	no	no	no	some
Community partnership	yes	yes	yes	within 10 years	significant
Community owned	yes	yes	yes	yes	all

Community-owned community solar has the potential to be more equitable than other types of renewable energy.

It provides the opportunity to own renewable energy systems.

Communities can produce electricity rather than purchasing it from large utilities or meeting the requirements for rooftop solar (for example, home ownership, sufficient roof conditions and size, and the ability to pay high upfront costs).

The research included in this presentation has been funded by the Department of Energy, Office of Electricity, under the sponsorship of Dr. Imre Gyuk.

The energy storage policy landscape continues to evolve.

Sandia National Labs monitors and analyzes activity at the federal and state levels and publishes information in the Global Energy Storage Database, available at this link:

https://www.sandia.gov/ess-ssl/global-energy-storage-database/

Thank you!

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