Net Metering and Aggregate Net Metering

Description:

Prior to net energy metering (NEM) policies, utility customers who installed a solar or other renewable energy system had two options for dealing with excess generation. First, they could certify the system as a qualifying facility under the Public Utility Regulatory Act (PURPA) of 1978 and sell energy at the utility's avoided-cost rate. Alternatively, consumers could install batteries to store the energy produced by their systems to deliver the power when they needed it. With the advent of NEM, the economic incentives for installing distributed energy systems improved, making NEM one of the most important policy tools for supporting distributed generation.

Discussion of the Policy:

For generation systems installed on the customer side of the meter, NEM is a policy that allows unused power to be delivered to the grid. Customers are billed only for the "net" power consumed over their generation, while they are credited for excess electricity delivered to the grid. Net metering arrangements not only allow the grid to operate like a battery for the customer, but they also contribute clean generation to the energy mix.

A key provision of net metering programs is that the customer is not "paid" for power, but "credited" against their energy use. This is important for tax reasons, as revenue to a customer is taxable, while crediting for power is not. Therefore, NEM removes financial disincentives for distributed energy system customers. NEM also saves customers money and helps drive growth in the renewable energy industry by expanding the customer base and simplifying the interconnection process.

Traditionally, net metered systems only allow for crediting of generation and use against one meter. However, several states have adopted aggregate net metering, allowing power generated by an on-site renewable system to offset energy demand located across multiple meters, usually owned by a single customer. With some systems – most notably agricultural systems – large energy usage may occur at one meter, while the generation system is installed on the customer side of another meter. Aggregation allows for total demand and total generation across meters owned by the same entity to be netted out, making sites or properties adjacent to a renewable system eligible for net metering credits.

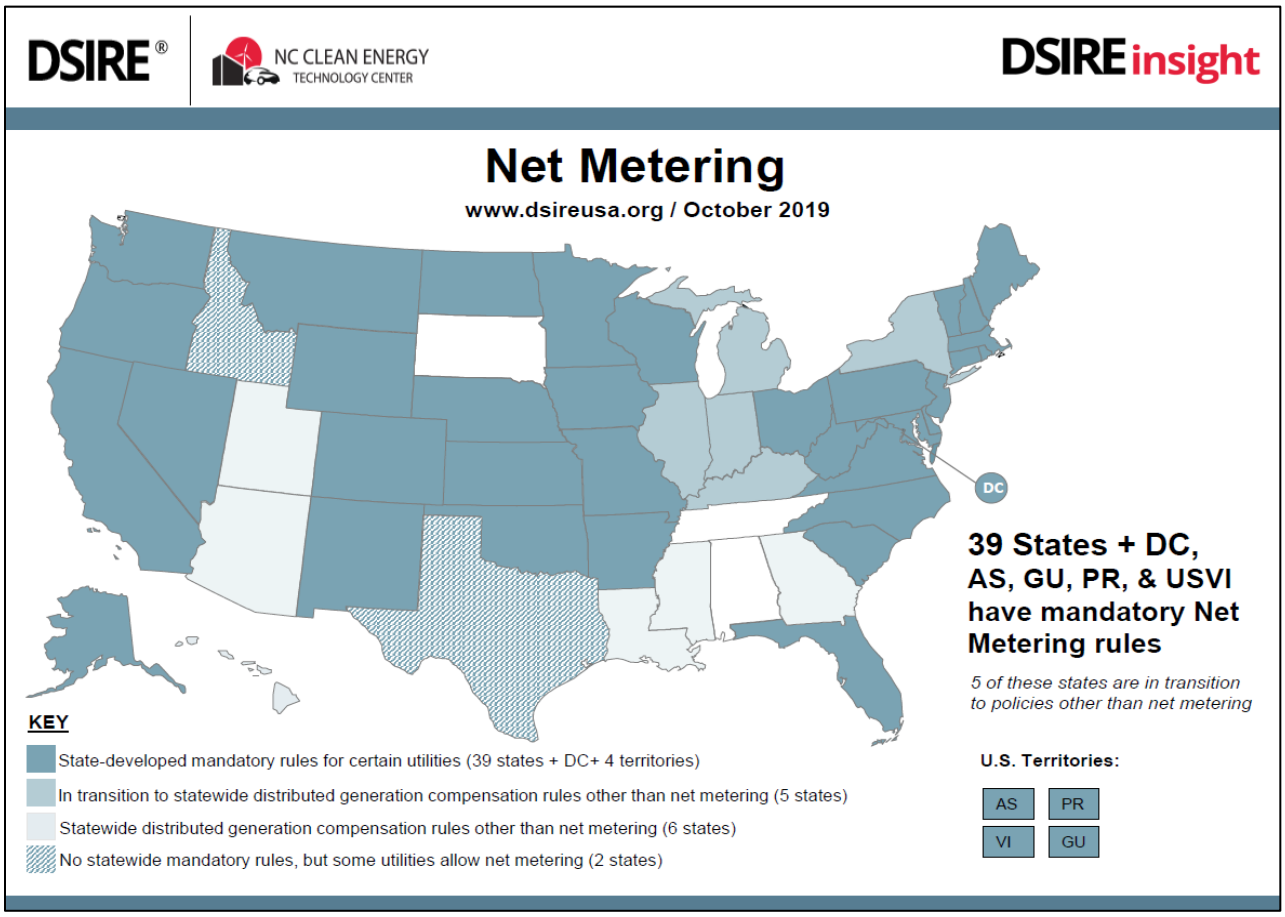
Utilities have pushed back against NEM policies because they can reduce revenues. Utilities argue that non-NEM customers bear more than their fair share of the costs of paying for grid infrastructure because net-metered customers, who are compensated for power generation, contribute a smaller portion to the costs of infrastructure repayment. However, utilities would need to reach substantial levels of photovoltaic (PV) solar penetration before there would be any noticeable effect on costs to customers, and even substantially higher levels of penetration would not significantly increase electricity prices. Furthermore, the issue surrounding NEM is a symptom of a much larger problem: utilities operate within an outdated revenue model. See New Utility Business Model Proceeding.

When looking at revising NEM policies, one important factor to consider is whether the retail value of electricity is substantially higher than the cost of solar on a per-kilowatt hour (kWh) basis. The purpose of net metering is to credit a customer for their substantial investment in generation at a rate that would allow them to recover the cost of their system. If a customer loses money, solar adoption will lag. For example, if a customer purchases a 5-kilowatt (kW) system for $10,000 after incentives and finances that system over 10 years at 5% interest, they will be paying $106/month for their system. If the system produces energy at a 20% capacity factor, their solar power will cost them 15¢/kWh. Solar adoption will be slower if the retail rate at which customers are credited is below 15¢, and faster if the compensation rate is above 15¢. In a state like Hawaii, for example, the residential retail rate of electricity is approximately 31¢/kWh – so the compensation for a solar customer could be reduced below the retail rate while still making the economics of the investment

viable. In Nevada, the retail rate of electricity in 2016 was 8.5¢/kWh. When the Public Utilities Commission of Nevada reduced the NEM value in 2016, solar companies fled the state, damaging Nevada's solar industry.

Example State Programs:

To date, 40 states and the District of Columbia have adopted mandatory NEM rules.



Source: DSIRE

- California Net Energy Metering: http://www.cpuc.ca.gov/General.aspx?id=3800
- Colorado Net Energy Metering: https://programs.dsireusa.org/system/program/detail/271
- New Jersey Net Energy Metering: https://programs.dsireusa.org/system/program/detail/38
- Hawaiian Electric's Net Energy Metering Plus: https://www.hawaiianelectric.com/products-and-services/customer-renewable-programs/net-energy-metering-plus

Key Components:

The American Council for an Energy Efficient Economy (ACEEE) has developed the following list of best practices for state net metering policies:

- All distributed generation technologies, including combined heat and power (CHP), should be eligible;
- Allow all customer classes to participate;
- Allow third-party ownership and meter aggregation;
- System size limits should exceed 2 megawatts (MW);
- Policies should not limit aggregate capacity of net-metered systems as a percentage of utility peak demand;
- Provide for indefinite net excess generation carryover at the utility's retail rate; and,
- Prohibit special fees for net metering.

Policies to allow aggregation can address the following:

- Parameters around allowable aggregation of meters located on single or contiguous properties – one owner, specific to agriculture, public buildings, etc.
- Integration of aggregate NEM with other policies such as shared renewables / community solar.
- Technologies eligible for aggregation.
- Whether all rate classes (residential, commercial, and industrial) are eligible for aggregation.
- In addition to customers of investor-owned utilities, policies can address whether aggregation should be available for the customers of municipal and cooperative utilities.

While most states already have NEM policies, utilities are looking to change these policies through a variety of means, including:

- Assessing a fixed fee on solar owners to make up for infrastructure costs.
- Assessing a per kW monthly fee on solar owners.
- Shifting from "net metering" which is a kWh for kWh credit to "net billing" which pays solar customers a reduced rate for the power they contribute to the grid.
- Reducing the compensation rate from a full retail rate to the wholesale electricity rate or the utility's avoided-cost rate.
- Replacing NEM programs with a successor tariff that accounts for the multiple values solar energy provides to the grid. See the discussion of Value of Solar Tariffs (VOSTs) in the Renewable Standard Offer policy brief.

States can determine the best approach based on their policy goals. If a state wants to increase economic activity in the solar sector, expand customer options for financing solar installations, and increase renewable distributed power on the grid, this can be supported through a strong NEM policy combined with policies to promote advanced rate design, grid modernization, and new utility business models.

If, instead, a state wants to focus on the costs of the portions of the grid infrastructure an owner/generator is using that are not collected through rates assessed throughout the system, they could identify a per-kWh fee for power that is delivered to the grid – the power that is using the grid and not paying the portion of the rate that goes to grid infrastructure. This is different from the power generated by the distributed system, as some of that power is going directly to meet demand at the location it is generated and does not flow on to the grid.

A difficulty with the second approach is that it only looks at one side of the cost/benefit equation: the cost of the infrastructure, and not the benefits provided by renewable generation. Many states have studied the benefits of certain distributed generation technologies (primarily solar) and found that the benefits far outweigh the costs. (See Value of Energy Tariffs in CNEE's Clean Energy Policy Guide for State Legislators.)

More Information:

- Interstate Renewable Energy Council's (IREC) Model Net Metering Rules 2009: http://www.irecusa.org/irec-model-net-metering-rules-2009/
- IREC's Connecting to the Grid Guide 6th Edition: http://www.irecusa.org/connecting-to-the-grid-guide-6th-edition/
- Solar Energy Industries Association: Net Metering: http://www.seia.org/policy/distributed-solar/net-metering