

# Principles for the Evolution of Net Energy Metering and Rate Design



This document provides a consensus view of solar advocates for regulators and stakeholders considering rate design and compensation for distributed solar generation, including potential alternatives to net energy metering. Traditional net energy metering (NEM) is fundamentally a bill credit that represents the full retail value of distributed electricity delivered to the distribution system, and has been a critical policy for valuing and enabling distributed generation. As penetration of solar and other distributed energy resources increases, states and utilities have begun to examine, and in some cases implement, alternative rate and compensation mechanisms.

The principles below are intended to be consistent with the imperative of public utility commissions and energy service providers to maintain reliable, cost-effective service to all customers while protecting the rights of customers to generate their own energy in a manner that provides both system and public benefits, including environmental protection and economic development.

They provide high level criteria for the conditions under which states may wish to consider alternatives to NEM, and high level principles for what distributed solar compensation mechanisms should look like where alternatives to NEM are appropriately considered.

Specifically the paper is organized into four sections:

- ❖ Basic principles, foundational to considerations for considering rate design and compensation for distributed solar generation.
- ❖ Criteria and Conditions for the Consideration of Alternatives to Net Energy Metering
- ❖ Guiding Principles for Solar Rate Design, and
- ❖ Guiding principles for Alternative Compensation

## Basic Principles<sup>1</sup>

- ❖ Customers have a right to reduce their consumption of grid-supplied electricity with energy efficiency, demand response, storage, or clean distributed generation. Thus, a customer should always receive the full retail price value for behind the meter

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<sup>1</sup> The Criteria and Principles herein do not distinguish between regulated and restructured states. However, rate designs, cost allocation methods, avoided costs and cost/benefit analyses must recognize whether the utility is distribution-only or vertically integrated.

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choices that reduce grid-supplied energy consumption, whether installing energy efficiency measures, or consuming on-site generation.

- ❖ Solar rate design and compensation mechanisms should support customer economics to invest in solar that are sustainable, consistent with the full stream of values provided by the system, and fair to all stakeholders.
- ❖ Net energy metering is a proven mechanism for driving solar deployment, liked and understood by customers, and is preferred in most circumstances.
- ❖ Most studies have shown that the benefits of distributed solar generation equal or exceed costs to the utility or other customers where penetration is low. Assertions that current or future solar customers have shifted or will shift costs to others, and/or create new costs, must be demonstrated with valid, transparent data that reflects the values, avoided utility costs, and results of deploying solar at the distribution level, as well as the utility cost of providing service.
  - A cost of service study that fails to consider the benefits of distributed solar generation (DSG) cannot establish a cost-shift.
  - Regulators should require an independent cost-benefit analysis before considering substantial rate design or compensation changes based on cost-shift assertions.
  - The benefits of existing distributed solar should be recognized when considering any asserted cost shift.
  - The time frame for review of costs and benefits must be on par with the life of the particular type of Distributed Energy Resources (DER) assets, e.g. 20-30 years, and be forward looking, not a snapshot of one year of sunk costs as is typical in a general rate case (GRC).
  - Regulators should seek to ensure in GRC, Integrated Resource Plans (IRP) and other relevant proceedings that future avoided costs found in cost/benefit studies related to DSG and other DER are *actually* avoided (e.g. the canceled PG&E transmission projects saving \$200 million and the Brooklyn-Queens Demand Management project avoiding costly upgrades).
  - Since some level of quantifiable cross-subsidization is inherent in all rate design, particularly for large diverse classes, an independent finding of a *material* cost shift should be required before regulators authorize substantial changes to rates or rate design.
- ❖ Net metering can be accomplished through simple energy netting, or in combination with monetary compensation depending on the rate design:
  - For non-time differentiated residential and small commercial rates, i.e. rates based on energy consumed at any time, energy netting on a kWh basis over the billing period is good policy particularly at low to moderate penetration levels, and pending demonstration of a material impact.

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- For time-differentiated rates, monetary compensation is an accepted feature of some current NEM structures and may be necessary to preserve the full value of excess energy.
- ❖ Opportunities for retail customers and third party DSG and other DER developers to provide additional services (e.g. voltage & frequency regulation, VAR support) should be encouraged, especially in States moving towards a service oriented utility/regulatory model, though access to markets, and appropriate compensation mechanisms.
- ❖ Consideration of creating separate rate classes for customers that choose to utilize DER technologies must be based upon a factual demonstration of significantly different load and cost characteristics using publicly available actual data, and should generally be discouraged as potentially discriminatory.

### **Criteria and Conditions for the Consideration of Alternatives to Net Energy Metering**

- ❖ Penetration level should be the leading threshold criteria for consideration of alternatives to NEM.
- ❖ Customers who installed solar under net metering should be grandfathered for a reasonable period of time. Customers have a reasonable expectation that rate structures (as opposed to rates themselves) will not change dramatically. Gradualism is an important rate design principle, and a gradual phase-in to any new compensation methodology should be provided at the end of the grandfathering period.
- ❖ Process: Early, i.e. pre-litigation, data collection and analysis under the guidance of the State Commission can provide opportunities for collaboration toward the development of a factual basis for future changes to rate designs, compensation, and other mechanisms.
- ❖ Simplicity, Gradualism, and Predictability: The simplicity of the NEM compensation mechanism facilitates customer adoption of distributed solar. Any future design should consider customer needs for simplicity and any changes should be applied gradually and predictably.
- ❖ Shadow billing and voluntary pilot programs to analyze opportunities to increase the benefits that net metered systems provide to the grid, and to assess the actual impacts of proposed changes (for example, time-of-use (TOU) pilot programs) should be considered before making substantial mandatory changes to compensation or rate design.
- ❖ Hold harmless policies should be in place for low-to-moderate income (LMI) customers.
- ❖ NEM imports & exports are generally netted monthly in most states, and trued up annually. More granular netting generally reduces solar customer economics, but may be worthy of consideration when penetration levels increase, or in conjunction with deployment of other DERs such as storage.

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## Guiding Principles for Solar Rate Design

- ❖ Rate design should seek to send clear price signals to customers that encourage sustainable, cost-effective investments in solar and complementary technologies.
- ❖ Rate designs should not create barriers to the deployment of distributed solar generation or DER technologies other than solar.
- ❖ Rate designs that provide greater incentives for DER technology deployment (e.g. more steeply inverted block rates) can be considered to encourage early adoption of efficiency, distributed generation and storage technologies.
- ❖ Rate designs that emphasize temporal cost-causation (time-varying, critical peak pricing and critical peak rebates) are generally consistent with solar deployment, and may be quite beneficial to customer and system alike when solar is integrated with DERs like storage or demand response.
- ❖ Rate designs that emphasize higher fixed (e.g. customer, service and facility or basic service) charges than necessary for recovery of strictly customer-related costs like service drop, billing, and metering, or quasi-fixed (e.g. mandatory residential demand) charges do not reflect cost causation, disproportionately impact low and moderate income customers, and should be discouraged.
- ❖ Regulatory review of rate design alternatives should consider impacts on low-income customers; e.g. utility fixed or quasi-fixed charge proposals usually put solar and efficiency technologies further out of reach of LMI customers.
- ❖ Any consideration of standby, backup or other supplemental charges for solar customers must (1) be consistent with PURPA requirements, (2) be based upon a customer's ability to control self-generation similar to a conventional fossil resource (e.g. diesel or natural gas), and (3) reflect the probability of customer generation unavailability in the development of any rates.

## Guiding principles for Alternative Compensation

- ❖ A fair value of solar (or "stacked benefit") compensation rate can be considered for distributed solar generation exports, at higher penetration levels. Such value should be determined taking into account both short term and long term (life of system) benefits of distributed solar generation.
- ❖ Buy all/Sell all (BA/SA or "VOST") compensation approaches should be at the option of the retail customer, i.e. VOST should not be the only customer option. Critical considerations impacting system economics and the ability to finance include the frequency and effect of future changes to the value proposition. In addition, consideration must be given to the effect on customers of the lack of energy hedging (customer-generated solar energy does not offset the customer's utility-supplied energy).
- ❖ Alternative Compensation methods should take into account the efficacy of integrating solar with other forms of DER (e.g. storage) in the grid of the future, assuring that barriers to new technologies are not created.

## **Principles for the Evolution of Net Energy Metering and Rate Design**

- ❖ Solar specific surcharges such as installed capacity fees are discriminatory, generally unsupported by facts, and impede distributed solar generation system economics.