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Solar Energy Compensation Arguments Intensify as Utilities Aim to Recover Fixed Costs

As Residential Solar PV Installation Levels Increase, Utilities Are Pushing For New Rate Structures to Cover System Costs

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Policy Brief

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Key Takeaways:

- Net energy metering can shift utilities' fixed cost recovery to non-generating customers
- The majority of U.S. states utilize retail energy rate-based compensation of net energy metering for residential solar customers
- Value of Solar Tariff aims to more-accurately address costs and benefits of distributed solar generation

Entities Mentioned:

- Arizona Corporation Commission
- Arizona Public Service Company
- Austin Energy
- California Public Utilities Commission
- Colorado Public Utilities Commission
- Hawaii Public Utilities Commission
- Minnesota Department of Commerce
- Minnesota Public Utilities Commission
- Solar Energy Industries Association

Related Research

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Value of Solar Emerges as Alternative to Net Energy Metering

The distributed solar photovoltaic (PV) energy industry is growing rapidly and disrupting the traditional one-way power flow utility model. To account for this, states and utilities are working together to reconsider distributed generation compensation and tariff policies. Net energy metering (NEM) is the long-standing rate structure that allows solar PV owners to feed produced electricity back to the grid, and receive compensation for doing so. When a solar PV customer's generation is higher than consumption in a given month, the customer is often given either – depending on the state – a volumetric (energy use) bill credit, a cash credit at the full retail rate, or a cash credit at a lower "avoided cost" rate.

The Status Quo: Net Energy Metering

Currently, 43 states and Washington D.C. use NEM to compensate utility customers for their on-site energy generation. With NEM, the customer's produced energy is subtracted from consumed energy every month, and the customer pays for the net amount. When production exceeds consumption, customers are paid at the same retail rate, or a lower "avoided cost" rate via cash or bill credits, depending on the state. However, when solar PV system owners do not pay an electricity bill, utilities say they fail to recover fixed costs from that customer to maintain the grid and ensure reliability; these costs are then shifted to non-generating customers through higher rates. Solar NEM advocates claim that the retail-rate compensation already covers these costs and the utility avoids environmental, fuel, generation, and transmission and distribution loss costs.

Utilities say solar PV customers shift costs to non-solar customers

First Statewide "Value of Solar" Tariff

The Minnesota Department of Commerce was directed to design the VOST methodology in 2013 under MN Law 2013, Chapter 85 HF 729, Article 9, Section 10. On April 1, 2014, the Minnesota Public Utilities Commission (PUC) approved the Department of Commerce's finalized Value of Solar Tariff (VOST) Methodology (Docket No. E-999/M-14-65), making Minnesota the first state to implement this new solar energy compensation methodology.

Minnesota approved the first state-wide VOST methodology on April 1, 2014

The VOST methodology is based on initial work by Austin, Texas municipal utility Austin Energy and Clean Power Research in 2006, and was first implemented in October 2012 at $0.128 per kilowatt-hour (kWh). The VOST rate was recently reduced to $0.107 per kWh, primarily due to depressed natural gas prices. The Minnesota VOST determines how much solar power is worth to the utility, its ratepayers, society, and the environment. Under the VOST, customers with solar PV are billed for full energy use at their retail rate, and given bill credits for produced energy at a fixed VOST rate.

Minnesota's investor-owned utilities still have the option to choose NEM or the new VOST. To determine which option is most economical, utilities must calculate the value of distributed PV and various associated avoided system

costs (Figure 1). Avoided fuel and generation costs are of highest value. Avoided fuel costs are based on long-term, risk-free fuel supply contracts; and avoided generation costs are based on installed capital cost of peaking combustion and combined cycle gas turbines, and their heat rates relative to solar PV. For avoided environmental costs, the PUC settled on a combination of Minnesota PUC-established externality costs for non-CO_2 emission and the federal (Environmental Protection Agency) social cost of carbon of approximately $0.03 per kWh. To-date, no Minnesota utilities have filed for a VOST rate.

To date, no Minnesota utilities have filed for the new VOST rate

Figure 1 – Example Value of Solar Levelized Calculation Chart

25-Year Levelized Value	Economic Value ($/kWh)	Load Match (No Losses) (%)	Distribution Loss Savings (%)	Distributed PV Value ($/kWh)
Avoided Fuel Cost	$ 0.056		8%	$ 0.061
Avoided Plant O&M - Fixed	$ 0.003	40%	9%	$ 0.001
Avoided Plant O&M - Variable	$ 0.001		8%	$ 0.001
Avoided Gen Capacity Cost	$ 0.048	40%	9%	$ 0.021
Avoided Reserve Capacity Cost	$ 0.007	40%	9%	$ 0.003
Avoided Trans. Capacity Cost	$ 0.018	40%	9%	$ 0.008
Avoided Dist. Capacity Cost	$ 0.008	30%	5%	$ 0.003
Avoided Environmental Cost	$ 0.027		8%	$ 0.029
Avoided Voltage Control Cost				
Avoided Solar Integration Cost				
				$ 0.127

Source: Minnesota Department of Commerce

State Utilities Battle Regulators and Solar Industry for New Rate Design

According to the Solar Energy Industries Association (SEIA), since 2010, the average price of a residential PV installation has dropped 41 percent to $3.92 per watt in Q2 2014. This attractive average price and traditional NEM compensation has led to more residential customers producing their own energy than ever before, leaving utilities searching for revenue to cover fixed system costs. This search has come in the form of proposed fixed charges or full restructuring of solar PV customer compensation at the state level.

Residential solar costs have dropped 41 percent since 2010

Arizona NEM Debate Settled, For Now

Arizona Public Service Company (APS) – the state's largest utility – has pushed back on residential solar PV NEM and called for adjusted rates for years, mainly through a fixed bill charge. In November 2013, the Arizona Corporation Commission (ACC) approved a fixed fee of $0.70 per kW for solar rooftop owners effective January 1, 2014. The rate adds up to an average of $5 per month, and is much lower than the APS-proposed options of a fixed monthly charge of approximately $50 per month, or a bill credit for energy generated at the Southwest (Palo Verde) hub wholesale rate. The bill credit was estimated by the ACC Staff – in Docket No. E-01345A-13-0248 – to reduce PV owners' current savings approximately $100 per month. Although rate design will be

discussed at length over the next years, APS will likely have to wait until July 1, 2016 – its next rate case – to amend its net metering design.

Massachusetts to Propose NEM Reforms by March 1, 2015

This summer, Massachusetts considered significant legislation (H.B 4185) to eliminate the state solar net-metering cap, add a minimum monthly bill charge, and modify the state's solar incentive program from renewable energy credits (RECs) to a declining block grant structure. The minimum bill charge is similar to the fixed charge design in AZ, but would only be triggered when the solar customer's net bill is lower than the minimum bill charge. Despite the legislation largely failing, the state did raise the solar net metering cap from 3 to 4 percent of peak load for private installations, and from 3 to 5 percent of peak load for public installations. A new, 17-member net metering task force will recommend NEM reforms by March 1, 2015.

Masschusetts will see NEM reform recommendations by March 1, 2015

New California Rate Design Underway, Current Customers Sheltered

California's mandated "NEM successor tariff" – due by December 31, 2015 – may look similar to Minnesota's VOST. The current California NEM tariff allows state solar PV owners to receive bill credit at the retail rate for net generation. On October 7, 2013, California Governor Jerry Brown signed into law Assembly Bill (AB) 327, which called for the California PUC to develop a NEM successor tariff that (1) ensures customer-sited distributed generation continues to sustainably grow; (2) is based on costs and benefits of the renewable generation facility; and (3) has benefits to all customers and the electrical system, with approximately equal costs. The new tariff will be implemented on either July 1, 2017, or when the state reaches its 5 percent NEM cap.

California's "NEM Successor Tariff" design is due by December 31, 2015

On March 27, 2014, the California Public Utilities Commission (CPUC) established that customers with rooftop solar systems installed prior to the start of the new tariff will be "grandfathered in" and will continue to receive the current NEM credit for 20 years from the date of the system's installation.

The NEM Debate Spreads as Utilities Face Flat Demand Growth

As electricity customers increasingly seek methods to reduce their energy bills, solar PV is now one of the best, most affordable options. States considering NEM reform will have to work with utilities to agree on the value of distributed solar PV and the various avoided costs it provides. This search for energy savings though distributed generation and overall low system demand growth has pushed utilities to consider different methods for earning revenue to support themselves and the electric system.

In addition to the above, Colorado, Hawaii, and more than 15 other states are examining NEM alternatives and have implemented stakeholder review processes to evaluate how to best value distributed PV.

In Colorado, the PUC will hold three stakeholder meetings prior to deciding how to proceed with the Xcel energy-proposed alternatives of an avoided cost rate (about 50 percent of the retail rate), or a credit equal to the lowest cost – utility scale – solar provider. Hawaii is addressing the issue by directing the PUC to develop a wide-scale grid modernization plan, updated interconnection policies, and a new distributed generation tariff structure with House Bill 1943, which was signed into law on June 23 of this year.

Disclosures Section

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Regulatory and Legislative agendas are subject to change.

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