



RE: Docket EERE-2017-OT-0056
Costs and Benefits of Net Energy Metering
October 30, 2017

Per the Department of Energy [request for information](#), the [Electric Markets Research Foundation](#) welcomes the opportunity to participate in Docket No. EERE-2017-OT-0056 responsive to the RFI by the Office of Energy Policy and Systems Analysis.

EMRF submits (see links below) economic studies prepared for EMRF and relevant to the DOE RFI. These studies, listed below, provide a detailed and rigorous analysis of the costs and benefits of net metering to utilities, rate payers and the electric grid. Also included is a white paper that addresses the advantages and growth of utility-scale solar.

[*Customer Cost Shifts Caused by Rooftop Solar and Net Energy Metering Policies*](#), February 8, 2017, Meridian Energy Policy

[*The Sustainability of Net Metering: Preliminary Results*](#), November 2016, Meridian Energy Policy

[*Changing Uses of the Electric Grid: Reliability Challenges and Concerns*](#), July 2015, Steve Mitnick, Build Energy America

[*2017 Forecast: Bright, Sun-Shiny Days for Utility Solar*](#), February 17, 2017, Ray Gifford, Wilkinson Barker Knauer

Our studies address the proper components that should be included in DOE's cost benefit study of net energy metering. Each study examined issues critical to the economics and equity of energy net metering. These studies found the costs of energy net metering generally exceed the benefits for utilities, consumers and the electric grid.

Background

Solar energy plays an important and growing role in the nation's energy mix. The U.S. solar industry is expected to triple cumulative capacity over the next five years, [according](#) to the Solar Energy Industry Association. Solar energy comes from residential, commercial and utility sources.

Residential solar relies on rooftop solar panels for electricity. To encourage rooftop solar, states introduced net metering to compensate homeowners with solar arrays. Approximately 40 states and the District of Columbia have adopted net metering policies. Yet even with net metering residential solar is growing slowly, with sales in Q2 2017 down 11 percent from Q2b 2016.

Utility-scale solar dominates the solar market. In 2016, utility-scale solar grew [145 percent](#), including 80 percent of the solar capacity installed in last year's third quarter. In the second quarter 2017, utility-scale solar [represented 58 percent](#) of the installed capacity. Q2 2017 was also the seventh straight quarter that the United States added more than a gigawatt of utility-scale solar. The data show net metering is not needed to create sustainable growth for solar. Utility scale solar is competitive with natural gas and [less costly](#) and more efficient than residential solar with net metering. An important incentive when solar energy needed traction, the rationale for net metering has diminished.

Summary

Net metering is a double whammy for utilities. First, net metering provides an incentive for customers to leave the grid, thereby reducing their share of a utility's fixed costs. Second, customers deploying net meters add to utility costs because these customers avoid paying their share of the cost of wires, poles and meters required to sell power to their utility and to remain connected to the grid.

The cost of net metering exceeds the benefits for most consumers, as the grid's fixed costs are shifted to the remaining customers, who are often low-income renters without access to rooftop solar. Under energy net metering, these customers are being asked to pay an increasing share of grid costs despite receiving no benefits.

The disparity between costs and benefits of net energy metering model threatens the grid. Either consumers without net metering will be forced to pay too much for grid services or the overall drop in utility revenues will threaten grid reliability. Utilities may be unable to maintain grid upkeep at necessary levels.

Fair Share

Net metering benefits some electricity consumers at the expense of others. First, the customer with net metering pays only the variable costs for the kilowatts of electricity received from a utility. Yet when it generates excess power for the grid, the net metering customer receives a credit that includes grid fixed costs. With this generous incentive, a customer could avoid paying anything for the grid for several months or longer. It is a peculiarity that allows many net metering customers to avoid paying their fair share.

The avoidance of responsibility for grid upkeep arising from net metering goes further than just the sidestepping – by a minority of customers – of payment for the grid's fixed costs. Homeowners who can and do install energy net metering avoid contributing to other costs everyone else pays for, such as programs to improve customers' energy efficiency and to assist low-income customers pay their electric bills. Consumers without net metering must pick up the slack through higher electric rates and bills.

Cost-Causation

The net metering incentive violates the longstanding well-settled legal and regulatory principle of cost causation. Cost causation is fundamental in utility regulation. Cost causation is both fair and is the only method of cost allocation that ensures economic efficiency.

Under utility law and regulation, customers who cause costs to be incurred by utilities must pay for those costs. For example, utility investments in residential energy efficiency programs are charged only to the residential class of customers. Or costs to underground distribution lines in a sub-division are paid for by the developer and not by customers in other sub-divisions.

Customers who purchase or lease rooftop solar should pay their fair share of the costs for electricity they take from the grid. And they should pay their fair share of the costs for the 24/7 capacity the grid must always have ready when the rooftop solar customer needs it (perhaps through backup and standby rates). Any other path requires subsidies from customers without rooftop solar to those with such installations.

It is also important that customers with rooftop solar who sell their excess electricity to the grid should be paid at a fair rate. Fairness dictates that the sell-back rate should be equivalent to what the utility saves by receiving this excess electricity and thereby not having to generate the electricity on its own.

Cost-Shifting

The greater the penetration of solar net metering, the more the disparity increases and electricity prices increase for those without rooftop solar, in part, because these costs are spread over fewer retail electricity sales. [At 20 percent rooftop solar penetration](#), cross subsidies are expected to increase the retail price of electricity of those without rooftop solar by as much as 17 percent in some regions.

Under net metering, middle-class renters subsidize the wealthy homeowners with solar net metering. A recent [study](#) by GTM Research found only 13 percent of households with annual income under \$45,000 had rooftop solar.

Given that the risk and severity of cross subsidies increase with penetration, rooftop solar net metering reforms are likely warranted where participation rates are expected to be high.

Conclusion

EMRF studies are consistent with other analyses of energy net metering. The value of solar net metering depends on its location and market penetration. The greater the participation in energy net metering, the more electricity costs shift from homeowners with rooftop solar to customers without solar. Utilities suffer because rooftop solar generators are paid the fixed, full retail rate for the electricity they produce instead of at a rate that reflects the costs that a utility avoids by buying electricity from the rooftop solar facility. As a result, customers with net metering are not contributing their fair share to the fixed costs of maintaining the grid or supporting its reliability. Clearly, the cost of net metering exceeds the benefits provided consumers, utilities and the grid.

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