Next Generation Solar Framework

Policy for Distributed Solar PV

November 2015

Acadia Center

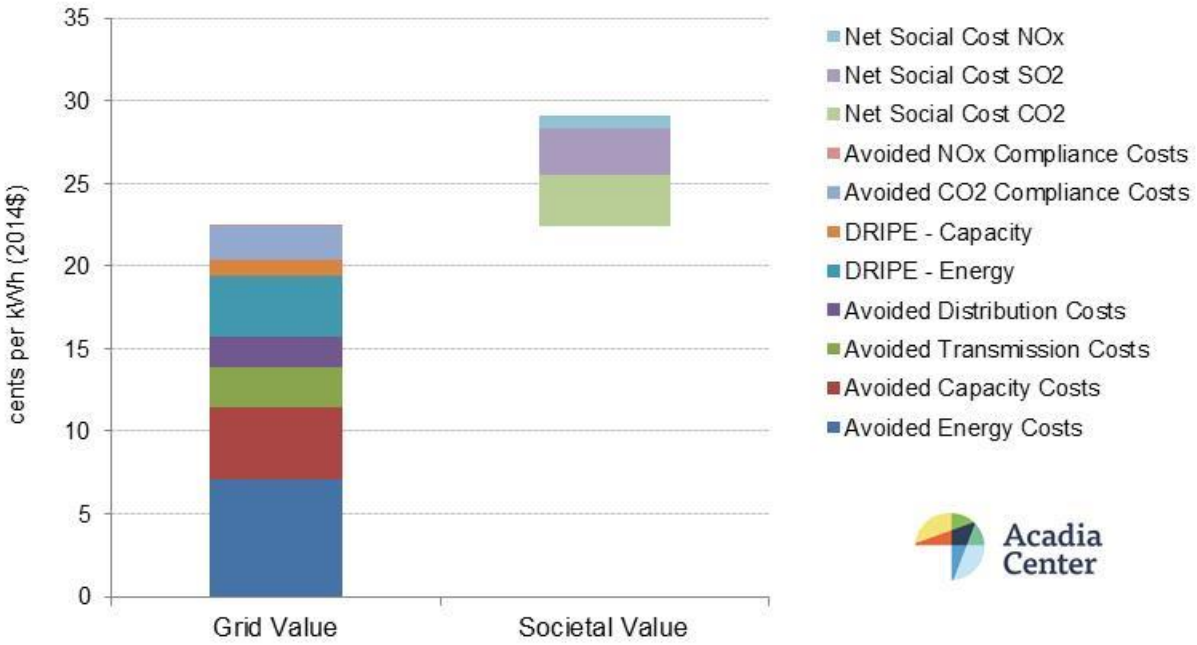
Advancing the Clean Energy Future

Introduction

Across the United States, a debate is underway about proper rate design and compensation models for distributed energy resources generally and distributed solar photovoltaics (PV) specifically. An important first step in setting policy for distributed solar is to understand the value, or benefits, that distributed solar provides. Over the past year, Acadia Center has released Value of Solar studies that estimate the value of distributed solar generation in five states.

These studies estimate the long-term benefits that distributed solar provides, including avoided energy supply costs, savings related to peak demand reductions, reductions in market prices, and emissions benefits. For example, Acadia Center's Value of Solar analysis for Massachusetts examined a range of avoided costs to ratepayers totaling 22.4 cents per kWh as well as several additional societal benefits totaling 6.7 cents per kWh.

Figure 1: Grid and Societal Value of Solar PV in Massachusetts – 25-year Levelized Cost (2014$)



Policy Framework for Distributed Solar PV

Calculating the value of solar can serve as the basis for a "value of solar tariff", a two-way rate design that requires additional metering, but also can be the basis for other reforms. Any changes to solar compensation should be properly integrated with existing structures that support solar, such as net metering and renewable portfolio standards, and should reflect more general rate design principles like simplicity and understandability. In Massachusetts, Acadia Center worked with allies to develop the "Next Generation Solar Policy Framework for Massachusetts" that includes very specific recommendations for reforms, and these concepts can be applied in other jurisdictions.

Compensation through Rates (e.g. Net Metering)

Acadia Center's studies, and many others, indicate that the ratepayer value of distributed solar is greater or equal to the retail rate of electricity. In other words, retail rate net metering is generally a fair policy that provides net benefits to ratepayers and society. However, once solar PV reaches significant penetration, balanced reforms can be undertaken to make rate structures more economically accurate and to ensure equitable payment for the distribution grid. In the long run, customers who provide a range of products and services to the electric system should be charged and credited at rates that reflect the granular costs and benefits. Acadia Center's UtilityVision lays out a full agenda for long-term rate reform.

In the shorter term, particularly in jurisdictions without widespread advanced metering infrastructure that enables more granular rate designs, balanced reforms to net metering credit value can be undertaken. These reforms must be based on a credible and publicly scrutinized analysis of the costs and benefits of solar PV, and should represent the full long-term value to ratepayers. A proper value-based policy will address any argument that net metering represents a cross-subsidy. The alignment of net metering credit to ratepayer value should also facilitate expansion of virtual net metering and community shared solar policies by addressing arguments about cross-subsidies. These changes can also be applied to certain categories of projects, such as larger projects where any imbalances are more significant, and existing projects can be grandfathered under current frameworks.

These reforms can occur in a way that changes current net metering credits modestly rather than radically. Currently, in many circumstances, overall net metering credit value is the sum of three components: (1) retail energy supply, (2) transmission, and (3) distribution. In the reform process, the **retail energy supply credit** and **transmission credit** can remain the same, since they are reasonable starting points for avoided costs. However, two new credits that apply to all solar PV should be defined in order to reflect the other attributes of solar: a "**distribution system benefit credit or charge**" and an "**energy system benefit credit**" as elaborated below. In addition, new credits can be created for specific categories of projects, such as **west-facing solar PV** and **solar PV that is located in particularly constrained areas of the distribution grid**. These credits should be paid for by the appropriate set of customers to which the value accrues, for example only the distribution utility should pay for distribution-related credits. It is also worth noting that this same structure can be applied to other generation technologies in addition to solar PV.

Other Compensation Mechanisms (e.g. Renewable Portfolio Standards)

Distributed solar projects also receive financial support from other mechanisms aside from retail rate reductions and net metering. Under this framework, these mechanisms represent broader environmental, economic, and social values, as well as any incremental support needed to build projects and launch an infant solar industry.

These incentives for solar can be benchmarked to the environmental and economic benefits of distributed solar generation, but should be structured to minimize the additional cost necessary to build different types of projects. Such a program can take a variety of forms, but key design features include:

- **Performance-based payments** based on actual generation;
- **Open application processes** that do not start and stop, or leave projects in limbo due to utility interconnection waiting times;
- **Long-term, stable structure** to lower overall costs and enable financing; and
- **Public policy carve-outs** for projects benefiting low-income residents and housing, community shared solar projects, landfill and brownfield projects, and municipal projects.

Over time, these should be integrated into broader frameworks for promoting renewable energy – e.g. Class I renewable portfolio standard policies.

Details on Reformed Net Metering Credit Structure

The following provides additional details on the net metering credit structure introduced on page 2.

Existing credits for all projects

Retail Energy Supply Credit

- Stays the same.

Transmission Credit

- Credit value for solar generators in rate classes with primarily per-kWh transmission rates should stay the same. Projects that are connected to the distribution grid do not use the transmission grid and should receive full offset for transmission.
- Credit value for solar generators in rate classes with demand charges should be switched to a value-based per-kWh credit for transmission.

New credits for all projects

Distribution System Benefit Credit or Charge

- New per-kWh distribution credit or charge should reflect the net value to the distribution system, including avoided distribution infrastructure investments, improved local reliability and reduced vulnerability to failures or disruption, and improved power quality, as well as any solar integration costs.
- This value can be determined separately for different categories of projects.

Energy System Benefit Credit

- New per-kWh credit incorporates energy system benefits above and beyond retail generation credit.
- These benefits include the additional value for energy and capacity from the generation profile of solar, reduction in line losses, wholesale energy and capacity market price suppression, fuel price risk mitigation, and reasonably foreseeable avoided public health and environmental compliance costs.

Credits that apply to select projects

Distribution Locational Credit

- Applicable to distributed generation that provides additional ratepayer value in areas of the grid that are particularly constrained.

West-facing Solar Credit

- Applicable to west-facing solar, which provides proportionally more on-peak generation and generates greater benefits related to peak demand than south facing solar, which maximizes energy production.

Conclusion

Balanced solar policy depends on valuing the unique benefits that distributed generation provides to customers, the grid, and society. The Next Generation Solar Framework lays out a balanced approach to account for system-wide benefits and costs, while optimizing payment structures and advancing complementary public policy objectives.

For more information:

Mark LeBel, Staff Attorney, mlebel@acadiacenter.org, 617.742.0054 ext. 104