

EXECUTIVE SUMMARY: RETHINKING STANDBY & FIXED COST CHARGES
REGULATORY & RATE DESIGN PATHWAYS TO DEEPER SOLAR PV COST REDUCTIONS

Recent Action on Solar PV-Specific Standby & Fixed Cost Charges

As of August 2014

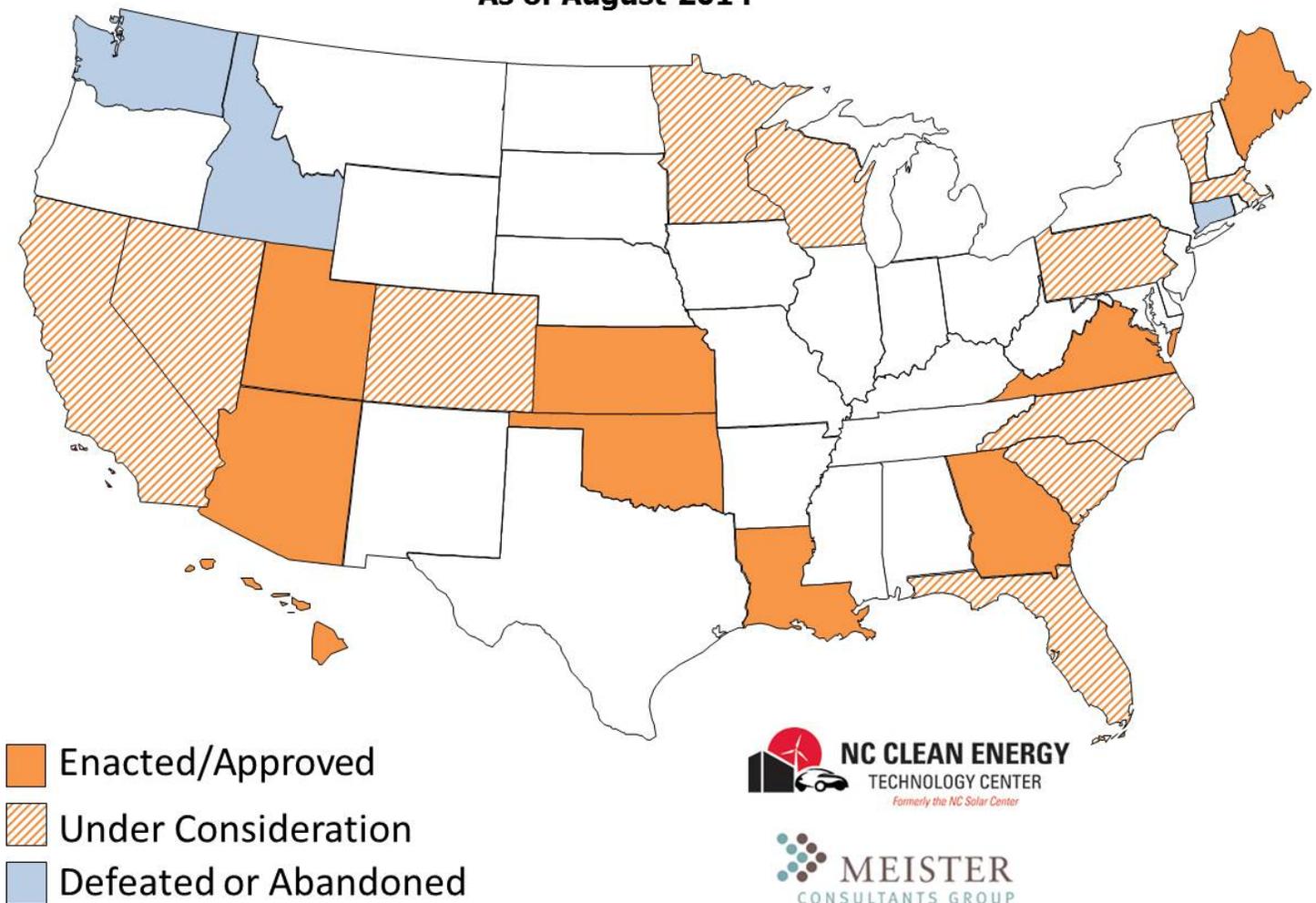


Figure ES-1: States With Legislative or Regulatory Action on New Standby and Fixed Cost Charges

The Current Terrain

In recent years, electric utilities have experienced persistent cost pressures due to sluggish economic conditions, offshoring of manufacturing, new investments in their energy delivery infrastructure and, to an increasing degree, customer-initiated actions to save energy and money. Some industry observers have noted that, these factors, if they persist, could undermine the basic structure of the regulated utility business model, especially if utility fixed costs continue to be recovered through variable, volume-based charges per kilowatt-hour (kWh). At the same time, however, some

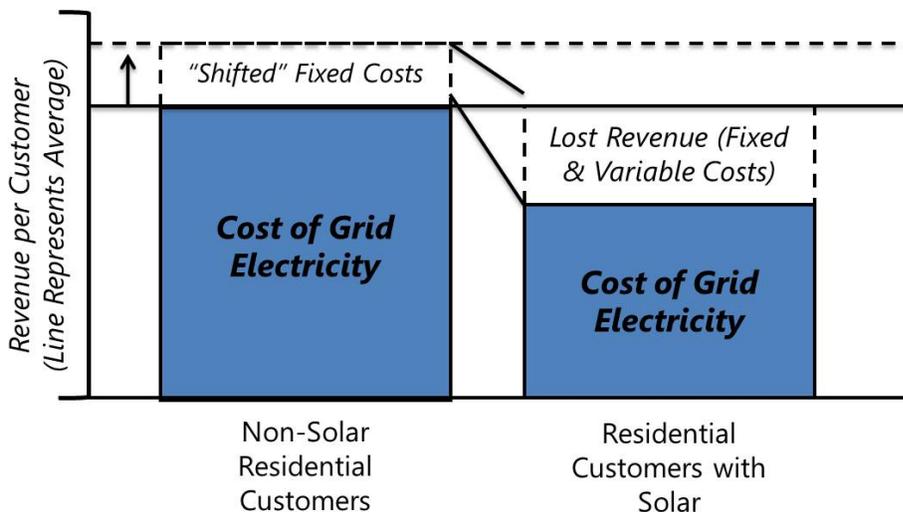
energy industry stakeholders and observers have, superficially, linked the discussion of future utility business models almost exclusively to the rapid growth of distributed solar PV.

This focus has led to a proliferation of “value of solar” studies that strictly compare the costs and benefits of solar PV, to the complete exclusion of other, more dominant long-term drivers of reduced sales and several long-standing, cost-shifting distortions built into the rates of all customers. Predictably, supporters claim that solar PV always results in a net benefit, while the utility industry claims it always results in a net cost to them and their customers. Thus, contentious battles ensue when utilities attempt to impose standby and/or fixed cost charges..

Risks of Current Rate Design Approaches

However, both of these perspectives, which by definition view solar PV in isolation, are an inappropriate frame for the multi-layered, multi-faceted fixed cost recovery challenge most utilities face. While narrowly tailored cost-benefit analyses are often critically important to judging the value of a technology or government policy or for comparing multiple technologies and policies to one another, focusing exclusively on customer-sited solar PV and net energy metering (NEM) as the main driver of declining utility revenues fundamentally mischaracterizes the real, more important reasons why some utilities could be collecting insufficient revenue and consistently falling short of their authorized returns on investment. Simply put, rate structures that target solar PV to the exclusion of the many other causes of utility revenue erosion and cost shifts from some customers to others constitute undue price discrimination against solar PV. Perhaps most damaging for solar PV technology, however, PV-specific charges will negatively impact the solar PV cost reduction goals of the U.S. Department of Energy’s SunShot Initiative, which has begun efforts to systematically target and reduce the non-hardware “soft” costs of solar PV. Narrowly designed and applied standby and fixed cost charges threaten to derail beneficial soft cost reductions, particularly for financing and customer acquisition, and thereby lead to lengthy delays in the date by which rooftop PV technology requires no financial incentives.

Common Utility Perception Of Net Energy Metering Rate Impact



Common Solar Industry/Advocate View Of Net Energy Metering Rate Impact

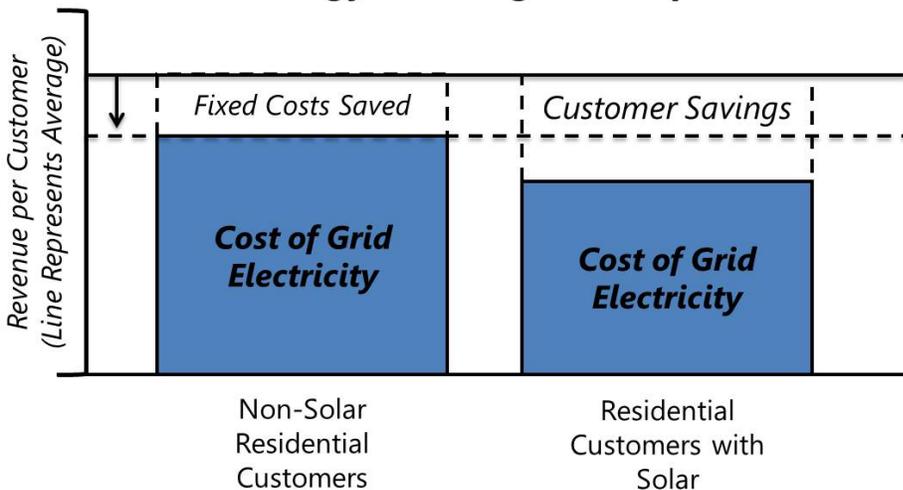
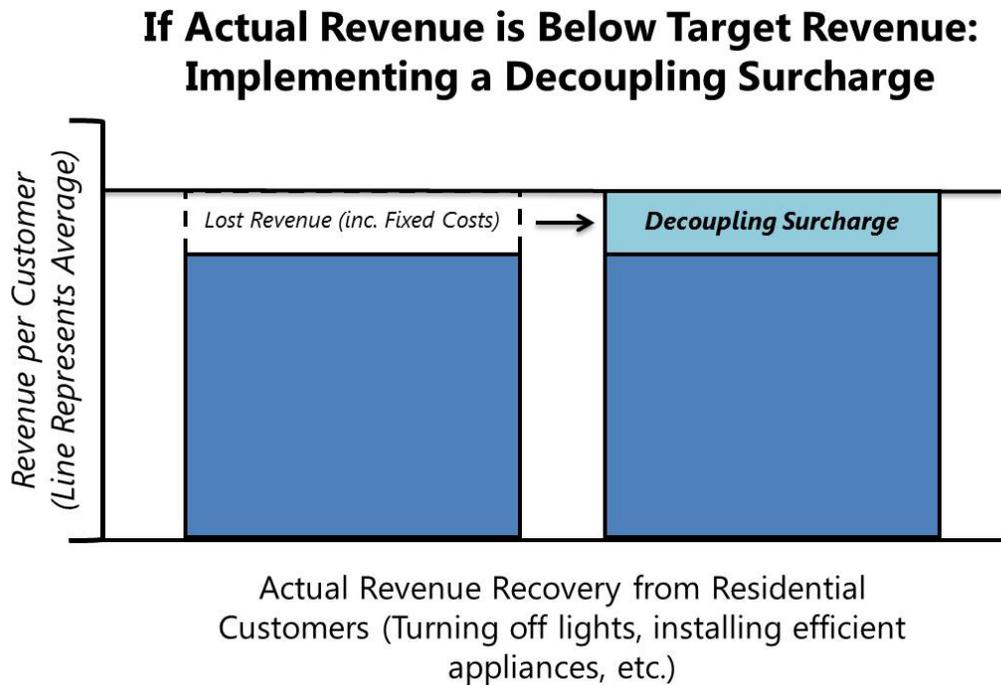


Figure ES-2: Differing Perceptions of NEM Rate Impact

Towards a Softer Ratemaking Path and a Simplified Three-Component Cost Recovery System

Thus, it is important for utilities and regulators to carefully consider a broader, softer, more holistic strategy for recovering their fixed costs. The report proposed a three-part strategy, including 1) revenue decoupling, 2) a minimum monthly contribution all customers must pay, and 3) time-differentiated rates. Implementing all of these components provides utilities with sufficient tools to recover their costs in an era of more distributed generation, and can serve as an equitable substitute for standby and fixed cost charges on solar PV.



Component 1: Revenue Decoupling Unlike solar PV-specific rates and charges, decoupling mechanisms assess all utility customers an added charge fixed or volumetric charge if the utility does not recover its fixed costs during the year, or a refund with interest if it exceeds that revenue requirement.

Given that most customers are using less, decoupling honors the ratemaking principles of fairness in lost fixed cost recovery, while also reducing a utility's incentive to increase sales. By implementing it, a utility

Figure ES-3: How Revenue Decoupling Allows for Recovering Lost Revenue from All Customers

recognizes that innovative, behind-the-meter energy saving approaches like solar PV (or, simply, run-of-the-mill energy conservation approaches) are becoming evenly spread across its customers and are facilitating considerable utility avoided cost benefits that all customers benefit from.

Component 2: Establishing "Bare Minimum" Fixed Cost Contributions Lowest-Usage Customers However, adopting a decoupling approach makes it absolutely crucial for a utility to adjust what are known as minimum fixed cost contribution, but only for customers that use low or no net energy, given that these customers frequently do not even pay the bare minimum fixed cost contribution per month. Most solar customers, in fact, already pay these costs, and thus a minimum fixed cost contribution would not affect them. A minimum monthly contribution, which was adopted in California (Assembly Bill 327), is assessed on all customers, but functionally only impacts zero net energy customers. This approach makes a great deal of sense as a way to ensure that the decoupling surcharge has sufficient teeth when dealing with customers with low (or no) electricity usage, especially since many revenue decoupling bill adjustments are assessed on a per kWh basis.

Component 3: Time-Differentiated Rates for All Customers Another approach that can limit potentially unfair and discriminatory charges for solar PV customers is a gradually phased-in time-of-use pricing strategy. While average hourly rates result in cost shifting from customers who use less to those who use more during peak usage hours, well-designed

time-differentiated rates more accurately reflect the true marginal costs of supplying customers. Indeed, time-differentiated rates would ensure that customers with solar PV that have unexpected grid energy needs in high-cost periods would pay an appropriate price for that energy, thus substituting for standby or fixed cost charges. The California Public Utility Commission’s Energy Division has recommended that a switch to time-differentiated rates be accounted for in valuing the costs and benefits of NEM for California’s investor-owned utilities, and the Sacramento Municipal Utility district plans to fully phase in TOU rates by 2018.

Why “Bare Minimum” Fixed Cost Contributions Are Key to Effective Decoupling Implementation for Low/No Usage Solar Customers

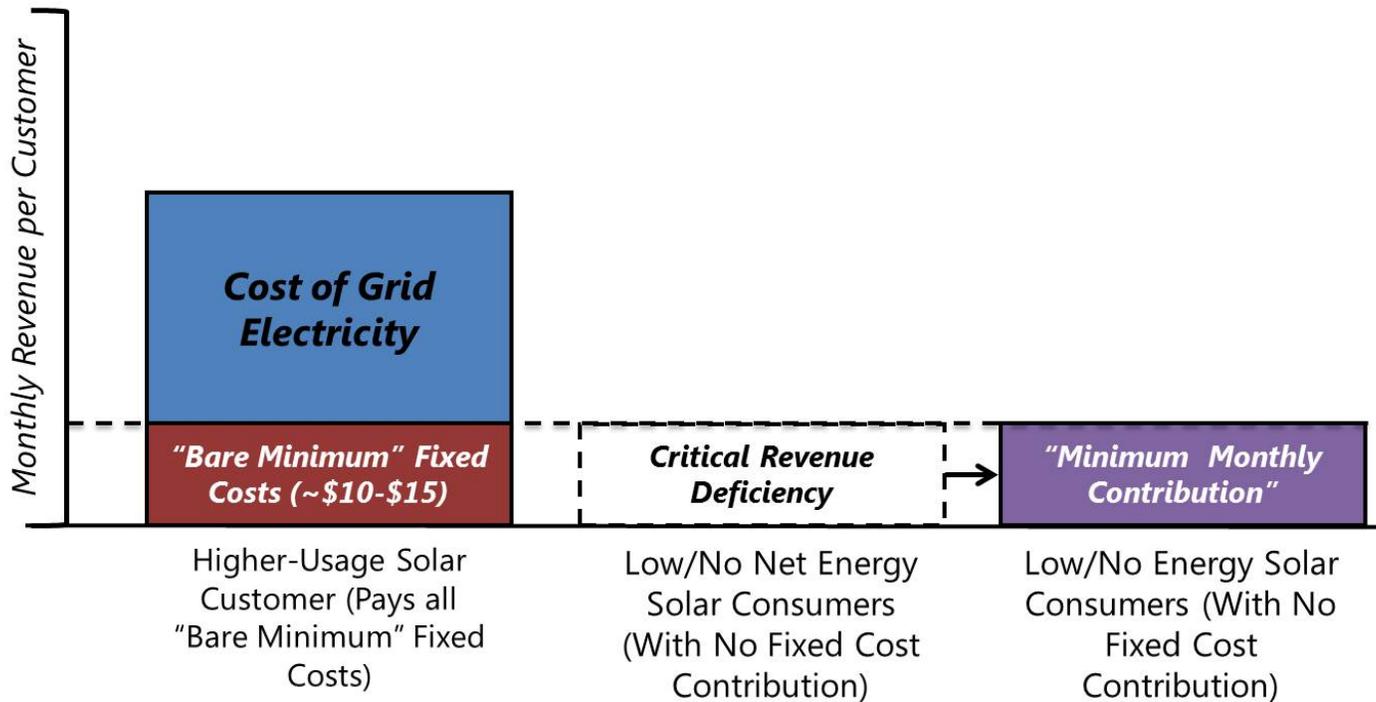


Figure ES-4: How a Fixed Cost Contribution Can Aid in Decoupling Implementation

Other Emerging Approaches for Encouraging PV Development & Limiting Lost Fixed Costs There are several other paths to encouraging distributed solar cost reductions without undermining utilities. Four other fixed-cost friendly pathways for utilities include 1) feed-in or value of solar tariffs for customers selling all energy back to their utility, 2) virtual net metering for community shared solar projects, and 3) targeting and crediting higher-value solar PV installations in key areas.

Solar PV Soft Cost Reduction Benefits of a Softer Ratemaking Path

In all, the main soft cost benefits of this “softer path” would be that the cost of financing and customer acquisition, the two soft costs most likely to increase if NEM were to be severely curtailed, would continue on a downward trajectory. This would be likely to occur, as PV would remain a solid investment that provides customers with the ability to hedge rising utility rates, even as both solar and non-solar customers may be required to pay a minimum monthly grid cost that most customers (even customers with solar) already pay in full.

Thus, PV and PV companies would remain attractive to larger investors, thus maintaining a clear financing cost reduction pathway. In addition, other more innovative approaches, such as virtual net metering to enable community shared solar, could extend the benefits of solar to more customers, thereby reducing customer acquisition costs. Thus, the cumulative effect would be that rooftop PV could become cost-effective without added incentives far more quickly.

Transitioning to a Softer Ratemaking Path: Addressing Common Questions and Concerns

Q: Wouldn't a more transparent "value of solar" approach make more sense than decoupling with a minimum bill and time-differentiated rates?

A: No. Retail utility rates are rife with cost shifts that functionally serve as inter-class and intra-class cross-subsidies. Thus, regulators should resist the temptation to apply PV-specific fees and charges to NEM that run the risk of being unduly discriminatory, unless it is doing so in the context of correcting all major avoidable rate distortions and cost shifts currently built into customer rates.

Q: Will keeping NEM at the retail rate designing work at higher penetrations of solar PV if there's a cost shift?

A: It is possible that creating a special rate class for solar PV customers could make a significant degree of sense when customer-sited solar PV supplies a sizable plurality (~15%-20%) of a utility's potential peak load. Nevertheless, this question still speculatively assumes that NEM creates a net cost shift over time in all jurisdictions, even without adjusting for other rate distortions, which could also grow with time.

Q: If standby rates are unduly discriminatory, how are utilities supposed to be compensated for backup power to PV customers?

A: Cost-based, time-differentiated rates for all customers that more accurately reflect the time-dependent price of electricity render standby rates based on the putative costs of backup power functionally unnecessary. In addition, time-of-use pricing, unlike standby rates, is a particularly transparent approach that is well-suited for all solar PV customer-generators, since PV systems allow these customers to avoid a large degree of their peak usage, but still pay the costs of their electricity usage on-peak if their PV system cannot generate at certain times.

Q: Won't minimum bills to cover fixed costs limit customer incentives to invest in solar PV?

A: It is true that instituting a minimum bill *without* a decoupling mechanism in place is, indeed, certain to reduce the customer's "energy" rate (or at least the rate at which it increases) that can be reduced when using solar PV. However, if a utility institutes a decoupling mechanism, the "minimum bill" only functionally serves to ensure that the decoupling mechanism collects the bare minimum necessary revenue from zero net energy customers.

Q: Isn't it true that these approaches raise rates, and are unjust to low-income and other vulnerable customers?

A: Decoupling or time-differentiated rates may superficially appear to raise rates, but this represents at best an incomplete picture. When a utility implements revenue decoupling, it is, in essence, more likely to earn a return in line with investor expectations regardless of how much they sell, reducing investor risk, and thus the rate of return, and growth in rates. In the case of time-differentiated rates, customers receive a better price signal about the cost of peak usage, which will cause them to make adjustments to shift usage to lower cost times.

For more information, or to share questions or comments, please contact Jim Kennerly at the NC Clean Energy Technology Center (jdkenne2@ncsu.edu) or Kathryn Wright of Meister Consultants Group (kathryn.wright@mc-group.com).

Acknowledgements

The authors would like to extend a special thanks to Tom Stanton of the National Regulatory Research Institute and Lon Huber of the Arizona Residential Utility Customers' Office, who provided significant time and effort to providing advice and guidance for this effort. Jason Keyes of Keyes, Fox & Wiedman, LLC, Paul Quinlan of ScottMadden, Jack Floyd & Jay Lucas of the Public Staff Electric Division, North Carolina Utilities Commission, Nancy LaPlaca of LaPlaca and Associates, Andrew Belden of Meister Consultants Group, and Philip Haddix of the The Solar Foundation also provided very thoughtful review and comments on previous drafts of the full technical report.

Disclaimer

This material is based upon work supported by the **U.S. Department of Energy under Award Number DE-EE0003525**. The guide was produced by the **NC Clean Energy Technology Center (formerly the NC Solar Center)**, and **Meister Consultants Group, Inc.** with the support of the following organizations as part of the SunShot Solar Outreach Partnership: ICLEI-Local Governments for Sustainability; International City/County Management Association (ICMA); Solar Electric Power Association (SEPA); Interstate Renewable Energy Council, Inc. (IREC); The Solar Foundation (TSF); American Planning Association (APA); and National Association of Regional Councils (NARC).

This guide was prepared as an account of work sponsored by an agency of the United States Government. Neither the United States Government nor any agency thereof, nor any of their employees, makes any warranty, express or implied, or assumes any legal liability or responsibility for the accuracy, completeness, or usefulness of any information, apparatus, product, or process disclosed, or represents that its use would not infringe on privately owned rights. Reference herein to any specific commercial product, process, or service by trade name, trademark, manufacturer, or otherwise does not necessarily constitute or imply its endorsement, recommendation, or favoring by the United States Government or any agency thereof. The views and opinions of authors expressed herein do not necessarily state or reflect those of the United States Government or any agency thereof.