Energy Technologies Area Lawrence Berkeley National Laboratory

Net metering and rate reforms for distributed solar

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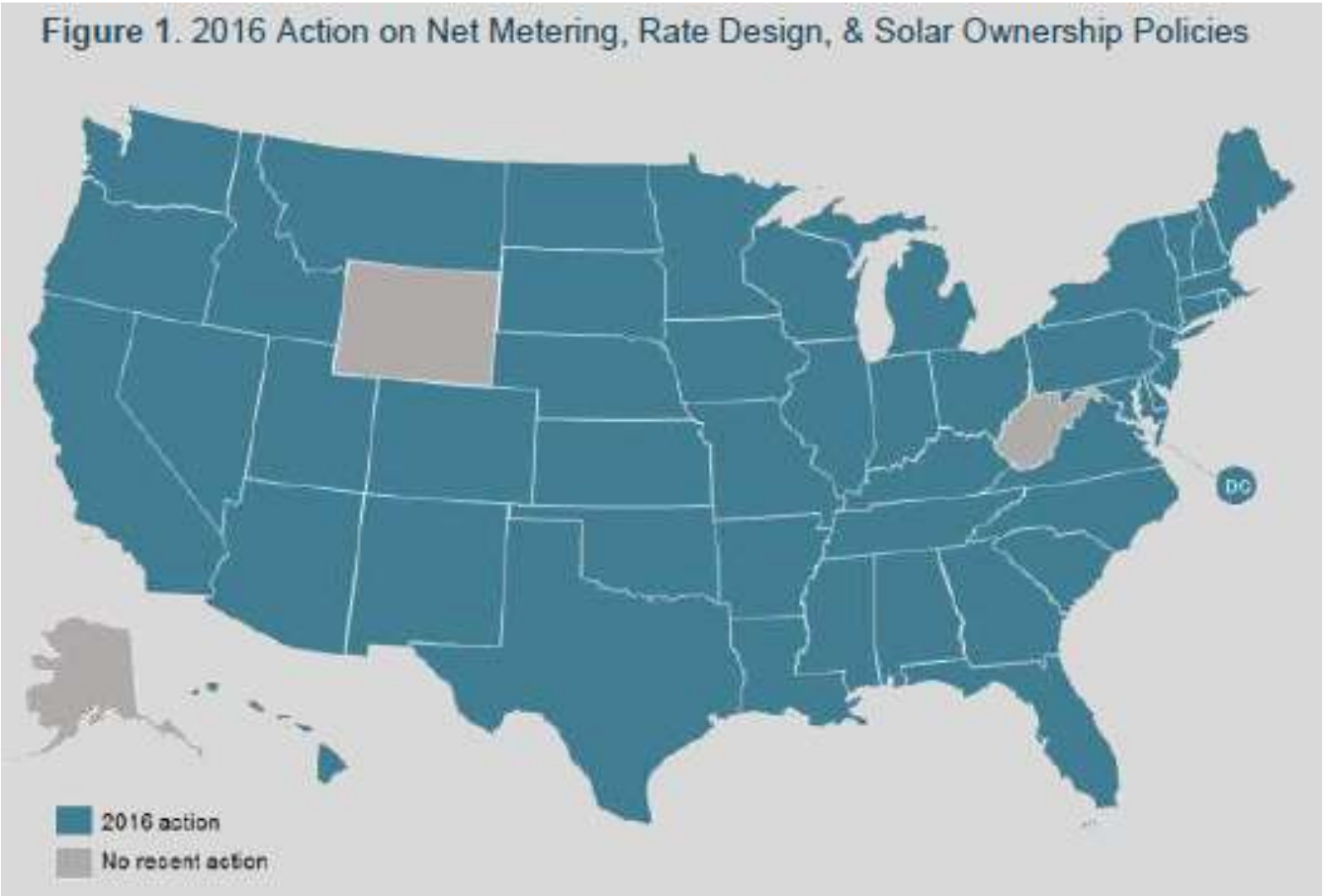
In this presentation

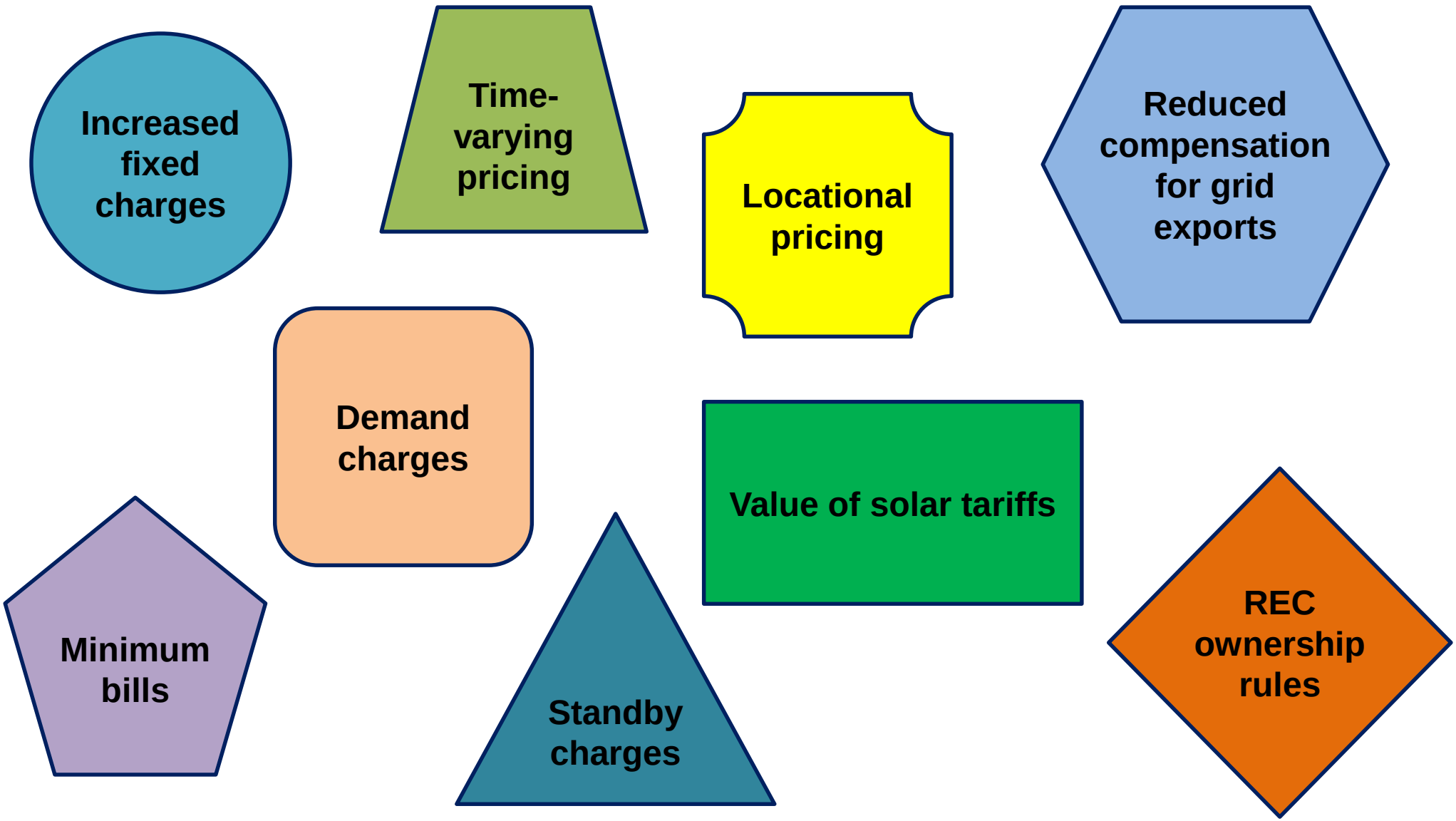
- General landscape of net energy metering (NEM) and rate reforms for distributed solar
- Assessing the “cost shift” argument
- Potential impacts of rate reforms on solar adoption
- Outlining a broader set of strategies for addressing concerns about the financial impacts of distributed solar on utilities and their customers

NEM and rate reforms have proliferated



Source: NC Clean Energy Technology Center and Meister Consultants, 2017. "The 50 States of Solar: 2016 Policy Review and Q4 Quarterly Report"

These reforms come in many shapes and sizes



The motivations for these reforms vary

- Cost-shifting/rate impacts
- Utility shareholder impacts
- Economic efficiency

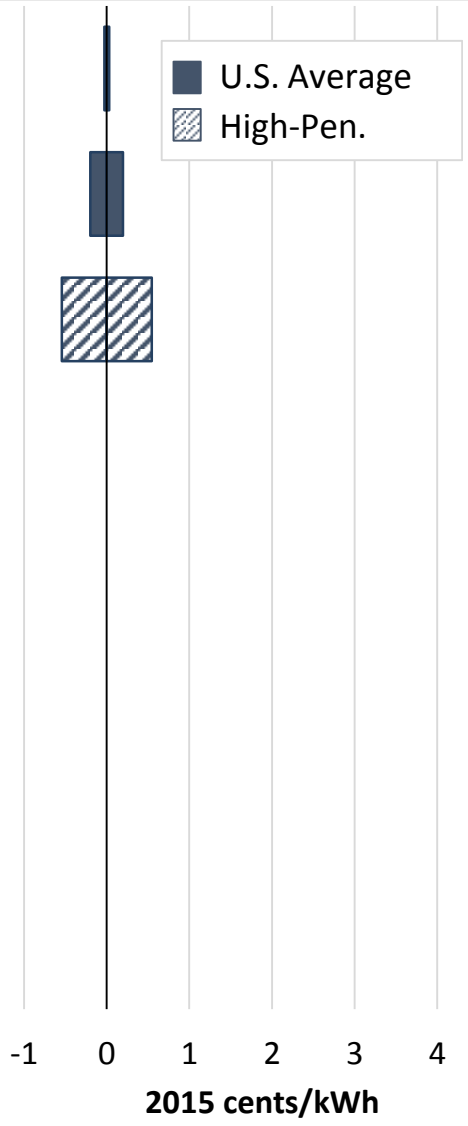
Net energy metering represents one potential source of pressure on retail electricity prices…

NEM rate impacts at three penetration levels

Net-Metered PV: Impact at **current penetration levels**, across a range of VoS assumptions, with purely volumetric rates

Net-Metered PV: Impact at **projected 2030 pen. level**, across a range of VoS assumptions, with purely volumetric rates

Net-Metered PV: Impact at **10% penetration**, across a range of VoS assumptions, with purely volumetric rates



…though other factors may ultimately be bigger drivers for future rate increases

Net-Metered PV: Impact at current penetration levels, across a range of VoS assumptions, with purely volumetric rates

Net-Metered PV: Impact at projected 2030 pen. level, across a range of VoS assumptions, with purely volumetric rates

Net-Metered PV: Impact at 10% penetration, across a range of VoS assumptions, with purely volumetric rates

Other issues that also impact rates

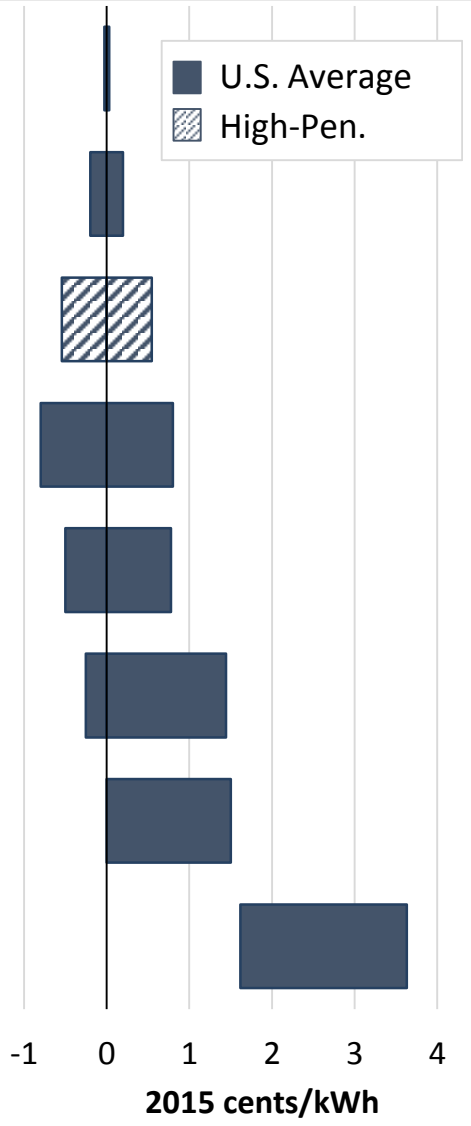
Energy Efficiency: Impact of projected 2015-2030 EE savings, if avoided costs are valued at the same rate as solar

Natural Gas: Range in retail electricity price across 10th/90th percentile gas price confidence intervals for 2030

RPS: Impact in 2030 across low and high cost scenario assumptions

Carbon: Impact of CPP in 2030 across multiple studies, each considering multiple implementation scenarios

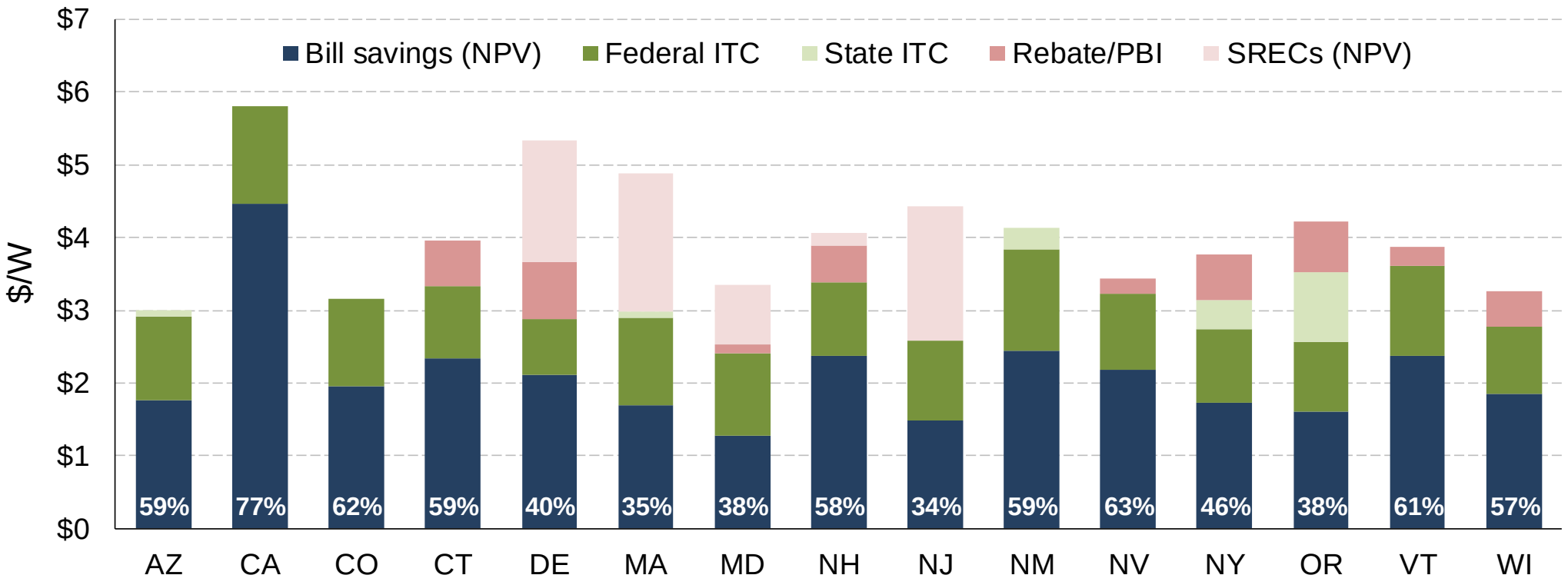
CapEx: Gross impact of electric-industry CapEx through 2030, across range of CapEx trajectories and WACC



Rate reforms can have significant impacts on the customer-economics of solar

Present Value of Benefits for Host-Owned Residential PV (2015)

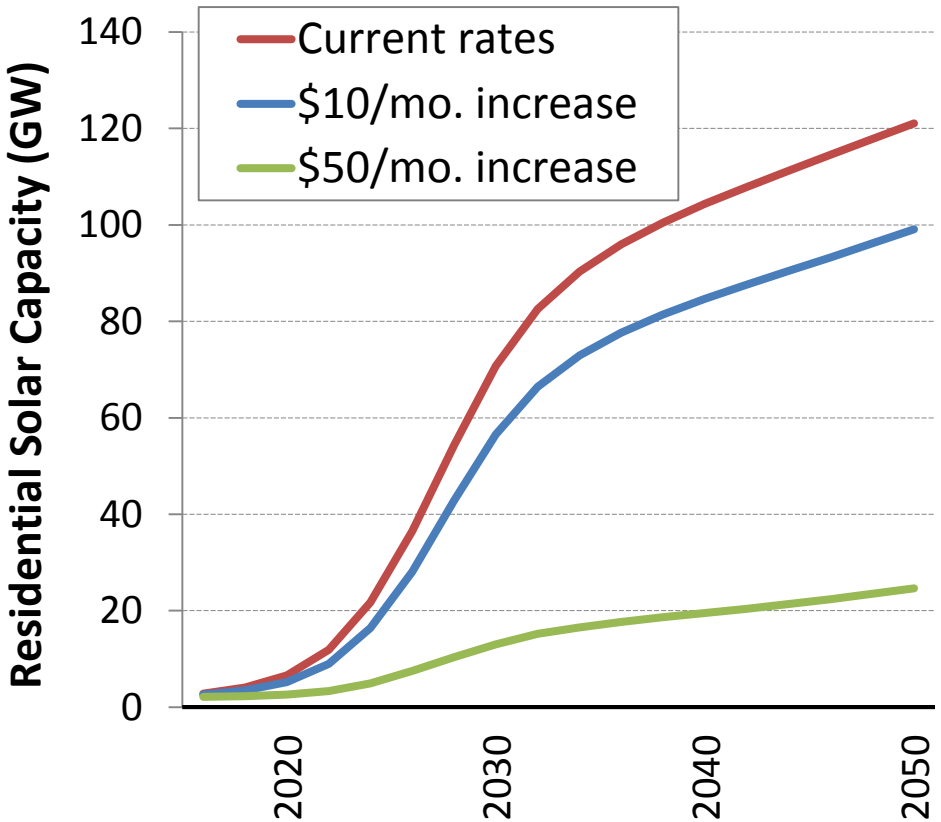
Blue Bars are Bill Savings with Full NEM and Volumetric Rates



Notes: Based on project level data collected for Berkeley Lab's annual "Tracking the Sun" report. Bill savings calculated from EIA data for average retail electricity price by utility, with adjustments for usage tiers. Percentages refer to bill savings as a percent of total economic benefits to the customer.

And those impacts on solar customer-economics could, in turn, significantly throttle solar growth

Projected Cumulative U.S. Residential PV Capacity with Increased Fixed Charges



For example, a $50/month fixed customer charge, would reduce residential solar growth by ~90%

Retail-rate and NEM reforms are not the only tool in the toolkit

- Retail rate and NEM reforms generally seek to address concerns about utility ratepayer/shareholder impacts by *reducing solar customer bill savings*

→ **Tends to be a zero-sum game**

- Other strategies can address some of the same concerns, but potentially in a less contentious manner

Strategies for mitigating the impacts of distributed solar on utility ratepayers & shareholders

Limit solar customer bill savings	• Higher fixed/demand charges • Reduce compensation for grid exports
Facilitate higher value forms of deployment	• Time-varying and locational pricing • Enhanced utility system planning • Community solar • Utility ownership and financing of distributed solar • Distribution network operators
Broaden customer access	• Community solar • LMI initiatives • Utility ownership and financing of distributed solar
Align utility profits and earnings with distributed solar growth	• Decoupling • Utility ownership and financing of distributed solar • Performance-based incentives • Distribution network operators • Services-driven utilities

Concluding thoughts

1. For ***most*** utilities, cost-shift from distributed solar is, and will continue to be, in the noise, simply by virtue of low penetration levels
2. If policy objective is keeping rates low, other issues generally offer much bigger bang for the buck
3. As a general matter, economic efficiency—i.e., prices that reflect long-run marginal social value—provides a more compelling rationale for rate and NEM reforms
4. A broad array of potential solutions exist to addressing concerns about utility/ratepayer impacts from distributed solar—some of which may be less contentious

For Further Information

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