Utilities Solve for Solar: Practical Analytics for Local Community Solar Planning

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**Overview**
Whether utilities or third parties are the main drivers of local community solar, the challenge of reaching market potential will only be met if parties can agree that program pricing is both fair and competitive. In particular, critiques of utility-led community solar programs often center on the high net premium charged to participating customers. In most cases, this is largely due to limitations of the standard solar levelized cost of energy (LCOE) calculation, which is the basis for setting the cost of the power purchase agreement (PPA) and in turn, program-participant pricing. Often a non-bypassable wires charge or customer charge adds even more to the premium cost for community solar. The debate over value of solar policies is ongoing in the policy arena, examining these and many other issues. Yet a concurrent challenge is how to scale up community solar and establish the strategic value of community-scale distributed PV (DPV) without delay. Here, the authors describe a ready process to achieve cost-based pricing solutions and grow larger, high-value community solar programs today.

This cost-based pricing solution (summarized in Figure 1) was developed in working with more than a dozen utilities on the Community Solar Value Project (CSVP), a 2-year effort, funded by the U.S. Department of Energy SunShot Solar Market Pathways Program. This solution includes a process model and analytic approach to achieve the following:

- It addresses market-ready strategic design; solar.
- It conservatively calculates a small number of monetizable benefits, to derive a new LCOE that specifically closes the gap between the standard LCOE and a program-target price.
- It identifies the contentious process of developing an extensive and precisely calculated list of solar benefits, among related to developing a well-supported narrative.
- It relates directly to pricing options that are familiar to utility ratepayers departments today.

**Methodology**
LCOE is defined as the net present value (NPV) of project costs divided by the NPV of generation (kWh), evaluated over the life of the project. When nearly all generation resources were centralized on the transmission grid, this metric was simply applied to various resource acquisitions. But increasingly, distributed energy resources are providing strategic value as well as kWh generation, and utilities must also consider the incremental levelized benefits of strategic distributed PV (DPV), as well as the levelized costs. The generic equations for this net LCOE are:

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\text{LCOE}_{\text{PPA}} = \frac{\text{NPV}_{\text{Project Costs}}}{\text{NPV}_{\text{Generation (kWh)}}}
\]

Many benefits may be included in the project narrative, but only monetizable project-specific benefits are included in the LCOE. Thus, the net LCOE represents an adjusted PPA. It may be a solar array project, a local project with grid benefits vs. a larger, remote project, or a half-dozen smaller, strategic projects. A project narrative case, Figure 2 shows how a small number of benefits can impact the net LCOE and help to meet a target price.

Elements of this approach are familiar and hardly innovative—accepting in how they are applied to enhance specific project net value and meet a program pricing target. Here planners engage in an iterative process that emphasizes reaching agreement quickly. Typically, utility staff are asked to provide ranges for each value, and to apply caveats to small number of benefits can impact the net LCOE and help to meet a target price. The authors have found, through work on the Community Solar Value Project, that utilities find it difficult to justify truly cost-competitive pricing for local (DPV) community solar. Following a standard for cost-based pricing, utilities would typically "pass through" the resource cost, expressed as the gross levelized cost of energy (LCOE), and add wire costs. That approach misses monetizable utility benefits. However, a standard level of solar analysis can be long and contentious, even among internal utility staff. In contrast, the process discussed here is simply focused on meeting a pricing target. Further, it supports a broader narrative case, which can include both monetizable values and qualitative benefits. This builds a narrative that can be compelling to utility decision-makers.

**Discussion**
This process grew out of discussions with utility decision-makers who needed to build a solid case for community-scale solar, to win over company executives and to move a program forward without getting caught up in the regulatory process. Any solution would have to use rigorous analytics, but simply and in a pointed way.

The "benefit-adjusted PPA" approach is rational and direct. A net LCOE that includes levelized benefits is a suitable metric for DPV. If, by convention, the utility recovers the PPAs cost through community solar subscription pricing, it would be far simpler to use a benefit-adjusted PPA. The non-bypassable wires charge can remain untouched for now. The approach adapts to the "buy or lease a panel" model. In that case, the utility could reduce the net price per share, to recover the adjusted PPA cost. One caveat here: the utility would have to finance the value of benefits that accumulate over time. For either the subscription or panel model, benefits could alternatively be reflected simply as a tick credit.

When presented to peer reviewers, the response to this process was that it is sound, if deceptively simple. In application, it is a bit like a regulatory stipulation process, but internal to the utility. It assumes reasonable fairness and maintains a commitment to cost-based pricing. The process also reveals high-value project design strategies, including deferral-related value and long-term deferral valuation. The process also reveals high-value project design strategies, including deferral-related value and long-term deferral valuation. The process also reveals high-value project design strategies, including deferral-related value and long-term deferral valuation. The process also reveals high-value project design strategies, including deferral-related value and long-term deferral valuation.