



NREL Solar Resources of Interest to CESA Members

PUBLICATIONS—Reports and Studies

Status of Net Metering: Assessing the Potential to Reach Program Caps

(September 2014)

Net metering program caps limit the total amount of net metered generating capacity that can be installed in a state or utility service territory. This report examines states with net metering caps—just over half of states with net metering policies today include caps—and forecasts how long net metering would be expected to be available in these various jurisdictions under current policies. The report concludes that based on projections of near-term distributed photovoltaic (PV) capacity additions, a handful of states could reach current cap levels by 2018. Considerations for setting and adjusting net metering cap levels may include interaction with other policies, potential rate and grid impacts, interaction of net metering with state or local policy goals for distributed generation, and potential financial impacts on the utility and ratepayers.

Effectiveness of State-Level Policies on Solar Market Development in Different State Contexts

(February 2014)

In response to public interest in solar PV, state and local policymakers have implemented various policy initiatives with the goal of encouraging private investment in PV and building a robust PV market. This paper builds on past research to determine the most effective policy strategies for different types of states, as determined by their physical, demographic, and macroeconomic context. The study finds that solar-related policy has a quantified effect on installed PV capacity and that having a “solar set-aside” included in a state renewable portfolio standard (RPS) is a factor consistently correlated with increased installed PV capacity.

Benchmarking Non-Hardware Balance-of-System (Soft) Costs for U.S. Photovoltaic Systems, Using a Bottom-Up Approach and Installer Survey - Second Edition

(October 2013)

This report presents results from the second U.S. Department of Energy (DOE) sponsored, bottom-up data collection and analysis of non-hardware balance-of-system costs—“soft” costs—for U.S. residential and commercial PV systems. The study analyzes data gathered from 55 residential PV

installers, representing 4,260 residential installations and approximately 27 MW of residential capacity installed during the first half of 2012. The study finds that soft costs accounted for a significant portion of total installed PV system prices in the first half of 2012: 64% of the total residential system price, 57% of the small (less than 250 kW) commercial system price, and 52% of the large (250 kW or larger) commercial system price. Among the individual soft-cost categories characterized, the study notes that supply chain costs, indirect corporate costs, transaction costs, and installer/developer profit are dominant soft cost contributors, followed by installation labor, sales tax, and customer acquisition.

[Non-Hardware \("Soft"\) Cost-Reduction Roadmap for Residential and Small Commercial Solar Photovoltaics, 2013-2020](#)

(August 2013)

DOE SunShot Initiative's aim is to deliver grid-parity PV by 2020. Soft costs have become a major driver of PV system prices as PV hardware costs have continued to drop. This report provides a roadmap for how to attain the solar soft-cost reductions necessary to achieve the SunShot Initiative's total soft-cost targets by the end of the decade. This report focuses on advances in four soft-cost areas: (1) customer acquisition; (2) permitting, inspection, and interconnection; (3) installation labor; and (4) financing. The analysis outlines aggressive cost-reduction pathways in each of these areas to achieve the SunShot's soft-cost targets. The report's residential PV roadmap shows a particularly challenging path to achieve the SunShot soft-cost targets while the commercial PV roadmap offers a more certain path to the SunShot targets.

[Strategic Sequencing for State Distributed PV Policies: A Quantitative Analysis of Policy Impacts and Interactions](#)

(October 2012)

This study examines the use of state policy as a tool to support the development of a robust private investment market for distributed PV. The hypothesis tested in the study is *if states and localities can stage policies in a particular order, then they can cost-efficiently draw private investors to develop PV markets*. The specific policies selected for evaluation included those addressing interconnection and net metering, and renewable portfolio standards (RPS) and their technology-specific set-asides. The study finds, among other things, that implementing low-cost policies (interconnection and net metering) prior to more expensive policies (RPS, incentives) may bolster the effectiveness of the latter policies.

ONLINE RESOURCES—Models, Tools, and Programs

[Community Solar Scenario Tool](#)

NREL's Community Solar Scenario Tool (CSST) provides a "first cut" analysis of different community or shared solar program options. This tool allows users to see how various inputs, such as system size,

location, and project costs, impact the economics of a community solar project both from the perspective of a potential customer as well as the perspective of the sponsoring utility. This tool offers information on a range of financial scenarios to evaluate if a community solar project makes sense in a particular community.

Open PV Project

NREL's Open PV Project is collaborative effort among government, industry, and the public to compile a comprehensive database of PV installation data for the U.S. The website provides PV system price and installed capacity data at the state level. The data collected is actively maintained by the contributors and are always changing to provide an evolving, up-to-date snapshot of the U.S. PV market.

PVWatts Calculator

NREL's PVWatts[®] Calculator is a web application that estimates the electricity production of a grid-connected roof- or ground-mounted PV system based on a few simple inputs. To use the calculator, simply enter information about the system's location, basic design parameters, and system economics. PVWatts[®] calculates estimated values for the system's annual and monthly electricity production, and for the monetary value of the electricity.

Solar STAT

NREL's Solar Technical Assistance Team (STAT) provides information on solar policies and issues for state and local government decision makers. The technical assistance NREL furnishes is intended to support legislators, regulators, and their staff members develop the market for PV technologies. The STAT program consists of a [quick response](#) component, an [in-depth assistance](#) program, and an online [educational](#) component. The online educational component offers a range of resources and outreach materials, including a [STAT webinar series](#), to aid PV market growth at the state and local levels. Past webinar presentations are available in the areas of [Solar 101](#), [Hot Topics in Solar](#), and [Do-It-Yourself Solar Market Analysis](#). The [Solar STAT Blog](#) discusses the most recent NREL and DOE SunShot Initiative technical assistance offered, which be of interest to other states or communities.

State and Local Energy Data (SLED) Tool

SLED is an online resource that provides data on current electricity prices, policies and incentives, and fuel costs for a particular municipality or zip code. The Renewable Energy tab offers detailed information on important renewable energy policies and regulations, available financial incentives, and renewable resource potential, including PV potential, specific to a given location. When a user searches for information on a particular city, town, or zip code, the response automatically also provides data for the state as a whole, including state energy consumption trends, state retail electricity price trends, and fuel sources used to supply electricity.