Utility Solar Business Models: Developing Value in Solar Markets

INTRODUCTION

Utilities are critical players in emerging U.S. solar electricity markets.[1] In the last two years alone, utilities have announced almost 800 megawatts of utility-owned solar projects in various stages of development worth over $2.5 billion dollars.[2] However, utility influence on solar markets goes beyond ownership alone and is true regardless of where solar generation systems are sited; or who develops, owns or operates them; or whether they supply onsite customer needs, community-level developments, or the utility's own grid.

Utilities, regulators, and solar companies have been thinking creatively about new *Utility Solar Business Models* (USBM) that better align utility interests with policies favoring solar development. USBMs are distinct in that they offer present or future value to utilities, as well as to utility customers and society, to support utility actions that advance larger renewables and carbon reduction goals. Traditional renewable incentives consist of government policies designed to achieve long-term societal benefits, and utilities seek to minimize costs to ratepayers within this framework. As used here, USBMs are innovative approaches that serve utility business interests as well, so that utilities are naturally motivated to advance societal goals.

SEPA has been working with electric utilities on USBM development and understanding since 2007 through working groups, reports, workshops, presentations and case summaries. SEPA's May 2008 report classified emerging utility approaches into three broad categories – *utility ownership* of solar generation assets, *utility financing* of solar installations, and *utility purchases* of solar output through power purchase agreements. The report also noted that in reality, utility business approaches aren't always so neatly separated, and they often combine several of these elements.

This Executive Summary, and the accompanying report, represents the second phase of this project where variants of USBMs include:

- Pursuing both utility ownership and PPAs, linking their prices, and comparing outcomes
- Standardizing bidding and PPAs, to minimize transaction costs and regulatory review
- Aggregating, integrating and controlling systems to reduce host and developer costs
- Compensating host customers with lease payments or long-term fixed energy rates
- Targeting underutilized properties, multiple-site owners, and public rights-of-way
- Targeting local capacity constraints using tracking systems
- Integrating distributed solar with local smart grid initiatives

This expansion of business model development further into the utility market represents a significant potential for solar market growth. To help in the development of USBM strategies, SEPA has also developed a decision mapping tool that can be used as a complement to this report, or as a stand-alone thought exercise. Its intent is to highlight important business, legal, and (for IOUs) regulatory drivers, raise critical questions, and stimulate creative thinking for those considering expanding beyond conventional utility operations. Members may download the decision tool from SEPA's website (click here).

[1] In this report, 'solar electricity' includes photovoltaics and concentrating solar thermal electric technologies.
[2] http://www.solarelectricpower.org/solar-tools/solar-data-and-mapping-tool.aspx?view=usbm

KEY REGULATORY AND BUSINESS ISSUES

Utility participation in emerging solar markets presents numerous and novel challenges for utilities and regulators alike. In analyzing business models, four major regulatory and business challenge areas emerged in the analysis:

1. Solar Ownership: Who owns the solar assets?

Utilities often have good reasons for owning the generating facilities that supply their grids. For all utilities, ownership can provide more control over planning, siting, operating, and maintaining facilities needed to serve their customers. For IOUs operating under traditional regulation, ownership of generating assets also affords the opportunity to earn a return on utility investment, unlike power purchased from non-utility owned facilities, which is treated as an expense and simply reimbursed by customers. However, since electric industry restructuring, some states have prohibited utilities from owning or acquiring generation assets, including solar. And in states that do permit utility-owned generation, utility ownership of distributed generation presents important questions about the roles utilities should play in markets. While it is generally true that investor-owned utilities would be more likely to consider ownership, due to the state regulatory cost-recovery and federal tax credit structures, it is not a hard and fast rule. All utilities will overlay a complex set of considerations in assessing utility ownership, including utility type, regulatory or decision-maker treatment, utility tax structures and issues, applicable incentives, associated risks of ownership and other factors.

2. Solar Value: How can the utility add value in solar markets that others can't?

Creating economic value for the utilities' customers, their communities, and (for IOUs) their shareholders is the foundation of any successful business model. For utilities choosing to engage in solar markets, this means offering products and/or services that other market participants do not, or offering better or cheaper alternatives than others do. For those utilities, the question is how to add value that others don't or can't.

Among other ways documented in the report, utilities have sought to add value by:

- Making lower-cost solar accessible to more customers through community-based systems
- Reducing deployment costs by targeting underused properties, multiple-site owners, and public rights-of-way
- Relieving local capacity constraints using tracking systems
- Improving operations by integrating solar with smart grid initiatives
- Reducing developer and host customer costs by aggregating and integrating systems
- Minimizing transaction costs and regulatory review by standardizing competitive procurements, and
- Rewarding host customers for siting systems that help meet utility renewable portfolio requirements.

If the essence of a promising business model is to create a path from technology development to economic value by offering something better, cheaper, and/or different than others offer, many recent utility initiatives have risen to that challenge.

3. Competitive Issues: What challenges can utility solar programs expect to face from stakeholders?

Bringing distinct value to solar markets is necessary but not always sufficient for a successful utility business model. To survive regulatory and possibly antitrust scrutiny, a utility may have to demonstrate that it is not relying on advantages derived from its monopoly status. However, not every market advantage that a utility enjoys results from this position. Some advantages may flow from a utility's size, its efficiency, the business acumen of its management, or other characteristics equally available to non-monopoly businesses. Courts and commissions generally have recognized that the use of these kinds of competitive strengths are permissible.

The potential danger arises when a utility proposes to take advantage of assets or capabilities that it possesses primarily or exclusively by virtue of its monopoly over conventional electricity supply. Examples might include preferential interconnection of utility-owned systems; the use of confidential system or customer information not

available to nonutility providers to target high-value solar sites; the leveraging of energy efficiency or other ratepayer-funded programs for utility solar development; or the use of ratepayer-funded trucks, equipment, or personnel for competitive solar operations. While these arguably could enable the utility to add value to solar markets, nonutility competitors are likely to view them as unfair and perhaps unlawful competition, and regulators and/or legislators may assess this in this light.

Different forms of utility participation have different impacts on competitive solar markets, and on solar industry players at different points in the value chain. The three basic forms identified in SEPA's original report – *power purchases, financing* of solar installations, and *ownership* of solar assets – illustrate this.

Utility power purchases from competitive solar providers support solar development, and present few anticompetitive issues from the solar suppliers' perspective (unless the utility's non-regulated affiliates are competing for those sales). But while solar power purchases raise few competitive concerns, they have limited appeal as 'win/win/win' utility business models.

Utility financing of solar installations owned by customers or solar developers can also advance solar development. However, financing of customer or third-party systems isn't usually considered integral to the functions of utilities, and it competes with nonutility sources of financing. Still, to encourage customer-sited solar, utilities in some jurisdictions have asked their regulators to treat solar loans as utility investments, comparable to traditional investments in plant and equipment used to serve customers, and entitled to the utility's regulated rate of return – i.e., producing earnings for utility shareholders that aren't available through utility purchases of third-party generated solar power.

Utility ownership of distributed[3] *solar assets* presents the main concerns for competitive solar markets. From an IOU's perspective, investing in and owning physical assets that can earn an authorized rate of return is the traditional means by which utility shareholders are afforded a growth opportunity. But from a market perspective, distributed solar systems don't exhibit the 'natural monopoly' characteristics that have historically been considered as an important part of the justification for monopoly ownership and its associated advantages. The entry of utilities into competitive distributed solar markets presents a critical challenge: how can utility strengths be utilized to advance distributed solar development, while preserving the robust competition that has proved so effective in improving solar technologies, reducing costs, and expanding penetration?

4. Stakeholder Impacts: Who benefits and who pays for utility solar activities, and how significant are these impacts?

Recent utility solar initiatives have also presented issues more familiar to utilities and regulators, including who will benefit from utility solar activities; who should pay for them; how much the benefits and costs are likely to be; and how these should be allocated among different stakeholders and utility customers. These issues are less likely to arise between utilities and solar industry providers, than between utilities and consumer or ratepayer advocates, or between customer groups that perceive different stakes in the outcome of utility solar proposals:

- Concerns that solar-generated electricity will cost more and how to protect ratepayers from additional costs
- How to determine whether proposed solar costs are reasonable, and to what extent they should be recoverable from ratepayers
- Whether value streams – energy, capacity, REC sales, tax benefits, wires deferral, etc. – from utility-owned solar will accrue to utility shareholders, or be credited to utility customers
- Whether the utility can earn a return on all or some part of its solar investments, and whether costs should be rolled into the its general ratebase, or treated as a separate class of investment
- How the utility can make solar benefits available to more customers, while reducing costs and easing customer burdens
- The magnitude of customer bill impacts, initially and over the life of the utility's solar program.

[3] 'Distributed' generally refers to solar projects that are located on a distribution feeder, less than a few megawatts in size, and can be rooftop or ground-mounted.

LOOKING FORWARD

Over the course of the last three years, the number of utilities taking an interest in solar programs that add utility value, while at the same time expanding solar markets has increased significantly. The full report catalogs in detail the activities of these utilities and the sometimes altered paths towards approval and adoption. USBM development is primarily still in the early stages of ideas and innovation and utilities should study these existing ventures to predict and model their new proposals more intelligently. As USBMs mature, so will regulators, industry, and consumers understanding, expectations and opinions on proposals.

Just as utilities need to adjust to changing stakeholder assessments, utilities also need to look at the rapidly changing solar markets in the short-term and retail grid parity and/or carbon pricing over the medium-term. Market gaps and opportunities may alter quickly if federal or state policy or solar market prices change. Photovoltaic costs have dropped significantly in the last two years and successful business models will not look at today's conditions but those coming 1-3 years from now.

The combination of a rapidly changing solar market and utilities' abilities to scale the market with new innovation represents an exciting opportunity for utilities, the industry, and ultimately society at large. But as with any new venture, the devil is in the details and the case summaries outlined in the full report provide an educational window for future opportunities to advance with a better strategic vision and understanding.

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SEPA Research Report Summaries

Utility Solar Tax Manual (2009)
In 2008, Congress extended the federal solar investment tax credit for eight years and removed the utility exemption, allowing regulated investor-owned utilities to utilize the credit. This manual provides detailed explanations of the tax provisions related to the bill, as well as exploring other tax issues such as Clean Renewable Energy Bonds, and unique business tax structures and issues.

Decoupling Utility Profits from Sales: Issues for the Photovoltaic Industry (2009)
The reduced sale of electricity creates an inherent problem for electric utilities in maintaining long-term operating revenue, especially as the solar industry expands. Decoupling is a regulatory policy option that can change the way utilities recover revenues to adjust this disincentive. This decoupling white paper introduces the concept into the solar community, explaining what decoupling is, and defining the different types. It includes a case study showing how solar market development in the future might affect utility rates under decoupling.

Distributed Photovoltaic Generation for Regulated Utilities (2009)
This analysis looks at both the regulatory and practical issues surrounding the installation of utility-owned distributed photovoltaics by investor-owned utilities.

Photovoltaic Incentive Programs Survey (2009)
In coordination with SEPA, an electronic survey was developed and distributed by U.S. utility and state PV incentive program managers to consumers who installed PV systems and received a rebate to offset the cost. The survey asked about the participants' satisfaction and experiences with the installation, incentive, interconnection, and ongoing maintenance of their systems. The resulting report analyzed the data across geographies to draw distinctions and parallels across the country

Top Ten Utility Solar Rankings 2009 (2010)
This report is the third of SEPA's annual survey of US utilities' grid connected solar. The results are top ten rankings of the most solar integrated utilities.

International Utility Survey: Utility Procurement Influences & Practices (2010)
Gartner and SEPA conducted a survey of 134 utilities in Europe and the United States to understand their requirements and objectives for implementing photovoltaic (PV) technologies in their energy generation portfolios. This telephone survey was complemented, in the U.S., by an online survey.

PV Technology Characterization Review (2010)
The PV market continues its explosive growth and simultaneously a wide array of commercially available PV technology and application options are emerging. This SEPA report provides a comparative understanding of the PV technologies along with pertinent metrics, from the manufacturing process through deployment in the field across a broad range of upstream and downstream metrics, including manufacturing processes, feedstock and materials availability, module physical and operating characteristics, market applications and environmental characteristics.

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