

Determining the Value of Solar

(article written March 19, 2014)

Last June (2013), at the TenneSEIA Stakeholder meeting, Karl Rabago presented on the "value of solar" and its unique benefits to a utility and the grid system, separate from and in addition to more qualitative societal benefits. Until recently, few utilities or policy makers had attempted to recognize or quantify solar's value beyond basic energy and (maybe) generating capacity benefits. Times are changing: Minnesota recently became the first state in the country to establish a value of solar methodology; and TVA, as with many utilities and states, is now pursuing a value of solar analysis.

Solar generation has unique value characteristics - some of which are not typically captured in traditional avoided cost methodologies. While methods for determining solar's value are well documented, the recognition that solar brings greater value than previously thought remains at the center of numerous debates on the equitableness of net metering rules and solar programs across the country. When solar valuation analyses have been conducted in a transparent process using the best available information, the value of solar (particularly distributed) is often above the retail rate.

Minnesota Regulators Approve Value Solar Methodology

On March 13, the Minnesota Public Utilities Commission approved the first state-mandated value of solar methodology in the country. This means that investor-owned utilities in that state now have the option to either continue offering net metering (which credits customers for excess generation at the retail rate), or can instead offer a dual metering option where they pay distributed solar customers a value of solar tariff (using approved methodology) under a 20-year contract.

There are many lessons to be learned and best practices to be gained from the Minnesota process in determining a value of solar methodology. For one, it was efficient. The MN Department of Commerce (DOC) was tasked with developing the draft methodology over a scheduled process that took about six months. Second, it was transparent and open to stakeholder input. There were numerous opportunities for the public (as well as utilities) to provide comments and feedback on iterations of the method as it developed. Third, it was guided by an independent expert. The DOC contracted with Clean Power Research (CPR), arguably the most prominent and credible technical expert in understanding the value of solar generation to utilities and is very upfront with being an independent organization interested in producing quality work and accurate results (rather than being on a utility or, conversely, environmental, agenda).

The below table highlights the "values" components identified for solar in the DOC's methodology, as well as one cost, "Integration Cost," which is more of a placeholder for future assessments when solar penetration levels become higher. The actual rates included are initial draft estimates by Xcel Energy (Minnesota's largest investor-owned utility).

While many of these value components may seem fairly standard, it's the deeper

assumptions and methodologies behind calculating each component that reveal solar's great value. For example, the values are estimated based on solar providing benefits over a 25 year period. Included in that projection are not only avoided direct fuel investments, but also avoided risks (and therefore costs) associated with relying on volatile gas prices.

As demonstrated in the table, Xcel Energy came up with markedly different rates when using the state-mandated methodology (denoted as DOC), versus using Xcel's preferred internal avoided cost methods. The result is decisive: 14.5 cents/kWh for the method approved by the state, versus 7.4 cents/kWh using Xcel's method.

	DOC Methodology Distributed PV Value (\$/kWh)	Company Avoided Cost Distributed PV Value (\$/kWh)	Difference
Avoided Fuel Cost	\$0.056	\$0.045	\$0.011
Avoided Plan O&M - Fixed	\$0.002	\$0.001	\$0.001
Avoided Plan O&M - Variable	\$0.001	\$0.001	\$0.000
Avoided Gen Capacity Cost	\$0.034	\$0.012	\$0.022
Avoided Reserve Capacity Cost	\$0.003	\$0.000	\$0.003
Avoided Trans Capacity Cost	\$0.014	\$0.000	\$0.014
Avoided Distribution Capacity Cost	\$0.004	\$0.001	\$0.003
Avoided Environmental Cost	\$0.030	\$0.013	\$0.017
Avoided Voltage Control Cost			
Solar Integration Cost			
TOTAL	\$0.145	\$0.074	\$0.071

What's TVA's Value of Solar?

As discussed briefly in the IRP Working Group summary (see next article in this Newsletter), TVA has initiated a value of solar analysis to identify what rates should be offered to solar customers. This analysis has the potential to feed into, or take the place of, existing programs such as Green Power Providers, Solar Solutions Initiative, and the Renewable Standard Offer.

A sub-group of the current TVA IRP working group will be created and tasked with representing public stakeholders in this value of solar analysis. TVA has selected the Solar Electric Power Administration (SEPA) to lead the process, with support from the Electric Power Research Institute. The fact that TVA will engage public stakeholders and has identified credible groups to provide leadership and expertise during the process is a positive start. TenneSEIA will be engaged in this process along with SACE and others and will work hard to ensure the best information is utilized. For example, it would be ideal to include the expertise of Clean Power Research, seeing that they have so many capabilities in this area and could allow TVA to avoid re-creating the wheel or delaying

the process, which, as it stands, will likely carry through 2015 (compared to Minnesota's ~6 month process).