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Public Policy and the U.S. Solar Industry

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By Louisa Lund, Program Director, Consortium for Energy Policy Research

In a talk that gave a preview of some of the findings in MIT's forthcoming *Future of Solar Energy* report, MIT Energy Initiative Director of Research and Analysis Frank O'Sullivan pointed out significant differences in the markets for utility-scale and residential solar and corresponding differences in how the two parts of the industry benefit from the federal investment tax credit offered to both kinds of projects.

Both forms of solar, O'Sullivan noted, have benefitted from a significant drop in the cost of solar panels—down 80% since 2008, leaving "balance of system" costs (primarily the cost of installation) the chief drivers of solar system costs in the U.S.

Balance of system costs are higher (proportionally) for residential than for utility-scale systems. But this difference is magnified by differences in pricing that seem to reflect a more competitive market for utility-scale than for residential installations.

As O'Sullivan detailed, the price of utility-scale solar can be mapped back to a combined effect of solar PV costs, balance of system costs, and a cost savings associated with the federal government's Investment Tax Credit and provisions for tax benefits associated with accelerated depreciation (the Modified Accelerated Cost-Recovery System, or MACRS). These costs and benefits result in a cost of about $1.80 per installed watt of capacity for utility systems, about what one would expect in a competitive market where solar developers earn a reasonable rate of return.

The residential solar installation market functions differently, indicating an underdeveloped competitive market, O'Sullivan argued. Taking into account higher installation and other balance of system costs for residential solar, along with additional challenges in realizing the Investment Tax Credit, a cost of approximately $3.25 per installed watt might be expected in a competitive residential solar market. Actual prices, however, are closer to $4.25 per watt, reflecting, O'Sullivan argued, a market in which prices are based not on competitive costs, but on homeowner willingness to pay.

This inflated price, O'Sullivan noted, circles back to raise the amount of subsidy available through the federal Investment Tax Credit, which can be claimed based on the total price of the system. The net result is that in terms of federal subsidy dollars one watt of residential solar costs three times as much as one watt of utility-scale solar. (O'Sullivan noted that this calculation does not include additional subsidies available through state RPS and net metering programs.) One finding of the MIT study, O'Sullivan said, was that it does not make sense to subsidize residential solar more than utility-scale solar energy.

O'Sullivan's talk also raised questions about the best use of federal research and development funds, given that the price of solar PV panels themselves may have declined as much as can reasonably be expected. Noting that industry itself is very good at finding ways to trim balance of system costs, O'Sullivan suggested that federal R&D funds might best be spent pursuing new breakthrough solar technologies.

The talk was part of the Kennedy School's Energy Policy Seminar Series, which is jointly sponsored by the Energy Technology Innovation Policy research group of the Belfer Center for Science and International Affairs and by the Consortium for Energy Policy Research of the Mossavar-Rahmani Center on Business and Government.