Distributed Generation: How Green? How Efficient? How Well-Priced?

A close look at the details of state and local programs in support of distributed generation raises some questions about the whether the promotion of green DG actually advances environmental objectives, especially when it takes place in a context of 'net metering' and flat residential electricity rates. It is time to reassess where we are going and to calibrate our pricing and policies to make certain that our efforts are carrying us in the right direction.

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A backwards-spinning electricity meter driven by a rooftop solar panel is a powerfully appealing image for a public increasingly attuned to environmental, reliability, energy efficiency, and self-sufficiency considerations. Thus, the promotion of ''distributed generation'' (DG) has substantial public appeal. Not surprisingly, therefore, throughout the country, various mechanisms such as mandated access, subsidies, net metering programs, solar and other renewable energy credits, feed-in tariffs, and distributed generation requirements embedded within renewable portfolio standards are all being deployed to promote and support DG. DG is generally defined as smaller-scale generation intended primarily for self-consumption at the premises of end users, who are connected directly to the

 1040-6190/$–see front matter http://dx.doi.org/10.1016/j.tej.2013.02.016

distribution system for the sale of any excess energy that is produced. In practice, solar power, particularly rooftop installations, is the predominant form of energy being promoted through DG programs, although the policies are not necessarily limited to it. Utilities in many areas are struggling to keep up with the demand for new interconnections stimulated by these programs.

In theory, distributed generation has the potential for multiple benefits, including reduced congestion on transmission lines, increased reliability, and possible reductions in energy losses through the transmission and distribution system. Above all, it is often assumed (sometimes explicitly and sometimes implicitly) that ''distributed generation'' means renewable, low-carbon energy. For many programs nationwide, the wish to promote green energy is the driving force behind support for distributed generation.

Those theoretical green benefits, however, are neither inherent nor certain. There is some evidence that the anticipated benefits are offset by program costs; potential perverse incentives created with respect to energy conservation, energy efficiency, and technology optimization; and socially regressive cost allocations. Given the importance that green considerations have in driving support for distributed generation, it is worthwhile to examine carefully the environmental implications of distributed generation programs as they are typically implemented.[1] A close look at the details of state and local programs in support of distributed generation raises some questions about whether the promotion of green DG actually advances environmental objectives, especially when it takes place in a context of ''net metering'' and flat residential electricity rates.

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I. Is Support for Distributed Generation Cost-effective as a Way to Promote the Use of Renewable Energy?

To the extent that support for distributed generation is motivated by environmental concerns, there is no clear policy basis for providing more support for green distributed generation than for central renewable generation. But that is exactly what seems to be happening in many cases. Distributed generation programs are often an add-on or carve-out in a larger framework of a statewide RPS or other system of support for renewable energy. The very fact that distributed generation programs need additional support within an RPS framework suggests that central generation of renewables is likely cheaper than renewable DG—and further evidence for this can be found in the fact that many of the programs intended to support distributed generation come with pre-set limits on the amount of generation to be supported. When a government establishes a program but sets a limit on how much it can be used, that constitutes a *de facto* admission that policymakers are very uncertain as to the benefits that are to be gained, so they are ''cutting their losses'' up front. When the context for a distributed generation program is an overall statewide RPS, the result is a zero sum game in which the distributed generation requirement itself does not increase the overall share of renewables in the electricity system—it merely offsets renewable requirements that would otherwise be fulfilled by central renewables.

II. What Effect do Incentives for Distributed Generation Have on Energy Conservation and Energy Efficiency?

This is a complex question, but one that could yield surprising, and, from an environmental perspective, counterproductive results. Certainly, the same