

# Distributed Generation— The Promise and the Problem

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**The CEO** of a major competitive power company, also a former colleague, said to me a few years ago, "The entire legal and regulatory framework that we've toiled under throughout our careers will be blown up one day by some technological breakthrough that sneaks in our back door. It could be something as simple as an ionized house paint that can generate enough electricity to power the entire household. But whatever it is, the century-old debates about federal vs. state authority, fuel choices, monopoly vs. competition, and the rest will be mooted forever."

My friend's outburst, half wistful prediction and half angry verdict, came back to me as I met for the umpteenth time in the past 25 years with my old friend Scott Sklar, longtime executive director of the Solar Energy Industry Association.

More recently, he is CEO of the Stella Group, a consulting firm that provides advice and services to commercial, industrial, and government customers. The services range from basic energy efficiency retrofits to sophisticated, building-integrated power systems, green backup power generation, and optimized technology blends.

Sklar organized this outing as a field trip—my favorite type of outing—with two stops: a power plant and a distributed generation showcase. But, Sklar being Sklar, the field trip was not what I'd expected.

The first stop was a parking lot in an Arlington, Virginia commercial strip mall, or, more specifically, a tiny, fenced-in sliver of a parking lot on which sat a shipping container with four solar panels of varying makes and designs and a single wind microturbine. A skinny wire looped the output of Sklar's power plant to a Dominion Virginia Power distribution line. The

plant is not a moneymaker. Sklar said that the authorized feed-in tariff isn't high enough, but it satisfies his objectives for the project: small, modular, easily assembled and replicable. Sklar's high school-age daughter and a friend assembled the plant in hours from its component parts, all of which were sent in the shipping container that is the base of the power block.

The second stop was the piece de resistance: a visit to Sklar's combination home and home office, two free-standing structures also in Arlington. Before entering the two buildings, we walked the perimeter. Starting with the office building's electric load (approximately 1.5 kW), Sklar then proceeded to show me energy efficiency, distributed generation, and storage retrofits to both buildings, in each case subtracting load until he reached zero.

The energy efficiency retrofits include double-paned, argon-filled windows, LO/MIT thermal barrier paint in the attic, and high-end insulation throughout the house, together with superefficient appliances and lighting provided by cold-cathode compact fluorescent bulbs and bundled LED lights.

Power for the office buildings comes from a small wind turbine, solar electric roofing shingles and a PEM 5-kW fuel cell for power augmentation. Finally, Sklar has installed sophisticated energy storage capability, including a battery pack with hydrogen fuel cell as backup that could keep the power on up to a month during a power failure, without the inherent vulnerabilities of classic diesel or natural gas backup generators. The Arlington buildings are completely uncoupled from the local utility. There is no backup power and no safety net—utterly self-sufficient.

Distributed generation is one of a growing number of silver bullets that

could magically solve the multivariate equation of electric supply, reliability, and environmental improvement. But Sklar's dazzling expo got me thinking again about unfulfilled promises that have swirled through the on-again, off-again energy policy debate since at least the first big energy crisis of the 1970s: conservation, efficiency, renewable power, cogeneration, self-generation, distributed generation, etc. Forty years later, why does each still occupy only a sliver of the electric portfolio?

Regarding distributed generation, one answer is the time lag between capital investment and payback. Whether an investment's benefit is viewed as a simple calculation of how long it takes the investment to pay for itself (measured as the net present value of the difference between pre- and post-investment electric bills), or as a return on investment, Sklar's gizmos cost a lot of money.

As he did the math to demonstrate why he no longer pays a penny for his electrons, I mentally ran up a tab that was in the high tens of thousands of dollars. Such investment analyses are typical and prudent in the commercial and industrial sectors, but substantially less so for most U.S. homeowners.

It's hard to imagine that Sklar's investment will be replicated quickly or easily by his neighbors or the rest of Arlington or the nation, even with substantial tax credit and grant supports available under federal and state law.

As U.S. policymakers inch toward some major, necessary decisions about the next generation of electricity options, including how to price the environmental ramifications of those decisions, distributed generation should come into its own as an option that adds electric supply, improves the environment, and can deliver direct economic benefits to retail ratepayers. **ELP**

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