

FUEL CELLS MERIT WIDER DEPLOYMENT

By R. Daniel Brdar



IN BUSINESS, THERE'S a natural tendency to seek the answer that solves The Big Problem and carries no downside.

Many utility executives face such a challenge today as they meet booming demand for electricity, maintain reliability, manage skyrocketing fuel costs and limit environmental impact — while dealing with rate-setting, siting decisions and public opposition to new transmission lines.

No realistic way exists for utilities to meet all these needs at once. Crude oil tops \$75 a barrel, triggering price gyrations in all energy markets. Coal is plentiful, but dirty. Average Americans, in the words of publications such as *Newsweek*, are “going green,” stimulating heightened attention to renewable energy sources such as wind and solar. These forms of generation, of course, have limitations. Wind power is terrific — when the wind is blowing. With a typical capacity factor of 33 percent, 100 megawatts of installed wind power delivers only 33 megawatts of energy. It's also central generation, requiring new transmission and distribution expenses. Likewise, solar can work very well in some locales, particularly for meeting peak power demand, and represents distributed generation. But it, too, is intermittent. On average, it has an even lower capacity factor of just 20 percent.

Those figures contrast starkly with fuel cells, which approach a 95 percent capacity factor. So why, when clean energy alternatives are discussed, do fuel cells so frequently get overlooked?

Fuel cells are highly efficient and ultra-clean. Compared with an average fossil fuel plant, 100 megawatts of electricity produced by fuel cells reduce NOx emissions by 1,240 tons per year, SO₂ by 3,250 tons and CO₂ by 387,000 tons. Fuel cell power plants can run on a variety of fuels — including natural gas and renewable biofuels like ethanol or anaerobic digester gas. They are quiet and safe, capable of being sited right where a need exists — eliminating or delaying a utility's T&D upgrade costs.

In the past, to be sure, utilities questioned siting stationary fuel cells at commercial sites because they represented threats to revenue. As regulated businesses, utilities' avenues for growth were limited. But as more utilities are allowed to own or operate generation assets, they gain tremendous new revenue opportunities. Fuel cells qualify for investment tax credits — about

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\$1,000 per kilowatt — and are eligible for accelerated depreciation. For a utility with a \$50 million federal tax liability, 10 megawatts of fuel cells generate tax savings in excess of \$10 million. More than simply dropping cash to the bottom line, fuel cell operations also enable utilities to capture incremental revenue with assets they own and that deliver ongoing value.

The public is demanding clean, low-impact energy, and has a significant voice in siting decisions. Currently, project developers often select locations based on their access to a particular property, rather than a given area's need for additional generation. Utilities can address multiple issues with fuel cells, providing power to manage regional load growth or grid constraints. As utilities conduct their strategic planning, fuel cells could be deployed in blocks of 20-50 megawatts, forestalling the need for expensive investment and publicly charged debates over expanding the existing T&D infrastructure. Later, with further load growth, these assets can be moved to other marginal locations.

It seems clear that wind and solar will proliferate in the energy mix of the nation's utilities. As this occurs, the requirement for base load power will increase dramatically. Fuel cells are the perfect complement, providing ultra-clean, firm power to complement these intermittent forms of generation. This fact is starkly demonstrated today in Japan. Sharp Corp. installed a fuel cell power plant at its “Super Green” LCD manufacturing plant in Japan. The world's largest maker of photovoltaics counts on a fuel cell to handle baseload — and work in concert with the solar array that provides the factory's peaking power.

Fuel cells represent a new solution for utilities — one that may not solve every aspect of “The Big Problem.” But they are a viable alternative that goes a long way toward meeting many needs in the right circumstances. Wind and solar, rightfully, are two of the renewable choices utilities should consider when looking to address their challenges. But fuel cells — with the variety of fuels on which they run, ultra-clean emissions profile, 24/7 operation and revenue potential — are an equally attractive option that should be seriously considered.

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NEW ZEALAND WAVES

Researchers are considering planting 7,000 turbines off the New Zealand coast 40 meters below the ocean surface. The tides could meet all of the country's electricity needs, proponents say, according to the *Dominion Post*.

The installation could be completed by 2008. The cost is still being determined. One source estimated the cost of the power would be cheaper than new hydroelectric or nuclear power but more expensive than conventionally generated power.

