Paying the price for more power

by Edward L. Flippen

US energy policy must turn to time-sensitive pricing in order to help balance electricity demand and supply.

The Northeast power outage on 13 August 2003 – the worst blackout in US history – is prompting demands to modernize the country's electricity grid. This is not surprising in view of the fact that fifty million people in cities from New York to Detroit and from Toronto to Ottawa were left without power as 100 power plants shut down and 62,000 megawatts of electricity were lost.

According to the National Electricity Reliability Council, the transmission system has grown less than 1% a year over the past 10 years, which is inadequate to handle the predicted 38% increase in demand. By some estimates, upgrading the 157,000-mile-long electric transmission network will cost $60-100 billion. According to the Report of the National Energy Policy Development Group, the US also needs to build an additional 1,300 to 1,900 new power plants in the next 17 years to meet demand.

But the problem with simply building power plants and transmission lines (besides the "not in my backyard" syndrome) is that additional plants and lines, by themselves, are not a cost effective answer to electricity shortages. Whether in a state that continues with traditional rate regulation, or in a state such as California that has deregulated power plants, the consequence of adding power plants and transmission lines without addressing electricity pricing will be the same: inefficiencies.

The real cost of power changes continuously throughout the day. Yet, with only a few exceptions, customers see a flat price per kilowatt on their bills. They therefore have no incentive to reduce their consumption at peak periods and increase consumption in off-peak. Under this traditional pricing method, building additional power plants and transmission lines will not necessarily ensure the availability of adequate electric supplies. The added costs of those facilities will simply be rolled into the existing cost structures of power suppliers, and the costs will be passed on to consumers in their monthly bills. Consumers will continue to demand greater amounts of electricity at peak periods, and more plants and lines will be built to meet those demands instead of ensuring better utilization from existing plants and lines.

In the absence of a motive to adjust time of day use, electricity grids hit huge usage peaks in the late afternoon and early evening, with usage levels tapering off to a small fraction of peak usage levels in the late evening and early morning hours. The large, low cost generators that can most efficiently provide electricity cannot be used to satisfy this peaking demand, since they cannot practically be turned down or off in low use hours. Providing price incentives for consumers to run clothes-dryers and dishwashers as they sleep would allow the industry to get considerably more mileage out of existing plants and lines, and would also allow for efficient expansion.

People respond to increased prices for gasoline, groceries, clothing, and housing. For example, studies show that "short-run" demand for gasoline is relatively price inelastic compared to long-run demand. In the short-run, people are stuck with their vehicles, but with rising gasoline prices, people eventually replace their cars, trucks, and SUVs with more fuel-efficient vehicles. In the long-run, a 20% in gasoline prices could produce a 14 % decrease in fuel purchases.

A 14% reduction in peak-period electricity consumption would eliminate the need for the construction of nearly 400 peaking plants (250 megawatts each) and save approximately 95 billion to 475 billion cubic feet of gas per year or 90,000 to 450,000 barrels of oil per year (depending on whether the peaking units are gas or oil). Any savings – even such relatively small savings – are important. By 2020, the US will need 50% more natural gas and one-third more oil to meet demand. To the extent that customer responses reduce peak demand, the existing plant capacity and transmission lines that are made available to serve new customers is far cheaper than the price tag of adding new plants and lines, albeit the aging US electromechanical transmission grid is clearly in need of upgrading given its service as the backbone of a digital economy.

There is no "quick fix" to adding 1,300 to 1,900 power plants and modernizing a 157,000-mile-long electric transmission network, but efficient electricity pricing will help. Surely, now is the time to get serious about making time-sensitive pricing a component of US energy policy.

Edward L Flippen

Partner, McGuire Woods LLP, Richmond, Virginia

Mr. Flippen is an attorney and an adjunct professor of law at The Marshall-Wythe School of Law at the College of William and Mary. He is an academic visitor at the London School of Economics and Political Science for the Michaelmas Term 2003.