

Back to the Future: LSEs in the Drivers Seat Again

Of all the issues confronting FERC in its efforts to reform the US power market, perhaps none is as difficult as a policy on reserve margins and capacity markets. With the suspension of investment in new generation, one can see capacity issues looming, especially in urban areas that missed out on the generation boom. Transmission expansion is a critical part of the solution to this problem. But there has been little investment in transmission, and given the general investor distrust of the power sector as a whole, it will take an effective effort on the part of regulators, developers, and load-serving entities (LSEs) to bring new transmission projects to life.

The upshot of the pages that follow is that, wherever a capacity crunch is likely to surface in the next five years, there are no volunteers that will step up and make the commitments needed to get generation or economically-oriented (as distinct from reliability oriented) transmission projects built. The big national marketers are no longer willing or able to provide the long-term commitments that got plants built during the construction boom. There are a few significant regional players with capital, but most of them are in the market for existing plants (which are being sold at discounted prices by distressed owners).

It is not clear who will make the commitments that will enable the areas that missed out on the boom to continue to meet their reserve requirements. The distressed areas include whole states like California, and load pockets in otherwise well-functioning markets like New York and New England. In the absence of any new money, the burden is likely to fall on the existing LSEs. FERC's Standard Market Design (SMD) places the resource adequacy burden squarely on the LSE's. The problem is, there are a lot of reluctant and "default" LSEs today who want no part of that burden.

Fundamentals of Capacity Markets

To outsiders, it seems odd at first that the federal or state governments have to deal with whether or not there is enough electricity generation capacity. After all, there is no particular requirement for capacity in petroleum refining or even natural gas supply. Deregulation in these industries essentially trusted that market forces would sort out the amount of capacity that would be required. When the capacity has been inadequate, business has found ways either to expand capacity in the market area, or bring in supplies from more distant areas.

As those in the power business know, however, two factors mitigate against such a *laissez-faire* approach in electricity. First, modern society relies on electricity for provision of basic services that cannot be replaced by other services, at least in the short run. A disruption in electricity services, therefore, has consequences far beyond the loss of revenues to the immediate power buyer and seller. Second, all electric assets in the three primary US electric "interties" are

essentially parts of a single, enormous machine. The integrity and reliability of that machine cannot be put into jeopardy. Part of these machines' requirement is a reserve margin to ensure that periodic failures of its component parts (generators, groups of generators, and transmission facilities) do not bring the entire machine to a halt.

If the reasons for requiring reserve margins are obvious, how to best ensure that these margins are maintained is not. Early in the deregulation process, the notion that one could employ the "market" paradigm to this particular requirement was widely held. Nepoch, PJM, and New York ISOs all experimented with capacity markets. Five years later, these markets are widely believed to be ineffective.

FERC's SMD proposal stipulates that LSEs will be responsible for ensuring that there is enough capacity to meet their projected peak loads plus the designated reserve margin. This makes the LSEs the locomotive of electric asset development. There will be stiff penalties imposed on LSEs that do not meet their obligations.

In today's functioning ISOs, LSEs can meet this capacity requirement either by buying or building the capacity themselves, contracting for it in bilateral transactions, or by purchasing the capacity in the ISO-administered capacity markets. The capacity markets are typically organized to offer capacity in various time-frames – multi-month, monthly, weekly, or daily. These capacity markets were never designed to handle all of the capacity transactions. To the contrary, they were contemplated as classic "spot" marketplaces, complementing larger and longer-term bilateral transactions between principals.

FERC's DoD Paradigm

The capacity parts of FERC's SMD proposal envision that the RTO/ISO/ITPs¹ would continuously study their respective power markets, forecasting both load and new generation and transmission projects, identify areas where transmission investment is needed, encourage the placement of that investment, and if the investment is not forthcoming, identify a "backstop" process whereby the needed investment would be made anyway, but presumably be financed by the ITP using ratepayer (as opposed to investor) money.

This process will rely heavily on the planning acumen of the ITPs. This is likely to have both good and bad effects. On the good side, organizations like PJM – running as they do real-time power markets with tremendous computational complexity -- develop unrivaled perspectives on the strengths and weaknesses of their systems. They release enormous amounts of data on the state of the market, ranging from real-time prices in thousands of buses to (6 months after the fact) bidding data from market participants.

In addition, the planning process of the ITPs will probably hew to well-established protocols, yielding information "cases" that the analytical community will evaluate in the various widely used power flow models and the associated economic and financial assessment tools. In that process, ITPs are obliged to include in their cases all of the actively pursued generation and transmission projects.² It is up to the prospective investor to cull these projects to get a more accurate representation of the most likely future state of affairs.

1. Independent Transmission Providers.

2. There are differences in interpretation from ITP to ITP as to what entails "active pursuit." There are many idle projects in the queues.

This may be loosely compared to a Defense Department procurement program in which the DoD assesses the threat and issues RFPs to which its contractors respond. It is not the free-wheeling, wide open investment climate of real markets, and it will have many of the well-documented drawbacks of centralized planning. Nevertheless, this is the direction the power market is going. The free marketers have had their chance at turning electricity into a truly free market, and they botched it.

Life in Load Pockets: No Good Deed Goes Unpunished

FERC's SMD document notes that ITPs in some areas may want to take special measures to deal with load pockets. Indeed, this is where the action will be in the next five years.

Since FERC's initial moves to deregulate the power market, there has been a boom in generation development but not in transmission development. Generators typically picked the sites for their plants with an eye towards siting convenience and access to input fuels. Thus, there are many new power plants in rural areas, very few new plants in urban areas. Generators may have believed that, if they built the plant, someone else (the ITP, the LSE) would build transmission to take the power to the markets that need it the most.

As a result of the disparity in *generation endowment*, there are load pockets of varying degrees of depth all over the country. Some are severely isolated, and require enormous investments in transmission to join the market areas.

To illustrate, we can take a quick look at New York and PJM. Both pools require that every LSE have adequate electric capacity, either owned or under contract, to serve its load and to meet a reserve requirement. In both pools, the generator that sells capacity in the capacity or bilateral markets must bid its energy into the day-ahead market every day.

In New York more than in PJM, the existence of load pockets has been recognized as a special problem requiring some adjustments in market rules. The needs of the load pockets have been addressed, in part, by a requirement that a minimum percentage of the constrained area's load be met by local generation. For example, 80 percent of the New York City peak load is supposed to be served by generating capacity located within the City load pocket. In Long Island, there is a requirement that 93 percent of the Island's peak load be served by generating capacity located on the Island.

Transmission investments can reduce these local requirements. Thus, the new 330 MW DC transmission line into from Connecticut to Long Island market will reduce the locational requirement in that market from 93 to 87 percent. Very few such transmission investments have been made, but there are reasons to believe that they will be the focus of attention during the next ten years.

The Reluctant LSE

Transmission solutions to the capacity problem have to compete effectively with generation solutions. But can they?

The first step in answering that problem is addressing who will take responsibility in the load pocket. In most urban load pockets, it is increasingly clear that meaningful retail competition is not developing. This illustrates one of the key concerns with FERC's emphasis on LSEs

to ensure adequate resource capacity. The country is full of reluctant LSEs, entities who are trying to figure out their future given the regulatory uncertainty, and who are therefore extremely reluctant to sign the 20-year power purchase agreements necessary to finance new power projects. This is, to be sure, a transition problem but the transition in this case may take ten years.

During this awkward interim period, the “default” LSEs will be living under what is called the “no good deed goes unpunished” syndrome. If they make capacity commitments for 20 years that look ill-advised a few years later, they may not get approval to pass those costs on to their customers. In this worst-case scenario, the continuing regulations on retail rates will cap the returns on the capital committed to the resource, but the potential losses to shareholders will not be capped if, one day, the Public Service Commission deems the commitment to have been imprudent.

Yet, without a significant commitment from an LSE, it is doubtful any significant new merchant transmission or generation investment will be made. The days when a Williams or Mirant or Duke would build a power plant (or sign a long-term tolling agreement) “on spec” or sign a 20-year transmission deal are over. Many of these companies have paid huge penalties for their daring and will now become models of conservative behavior.

The effects of this restrictive financing environment will be most significant in solving the capacity problem in areas that missed out on the generation construction boom of the 1990s and early 2000s. For these areas, the LSEs will have to *cause* generation and or transmission facilities to be built by making long-term financial commitments that the developers can take into a skeptical and selective financing market.

Competition via DC Connections

What should LSE’s do to remain in compliance with reserve requirements when outsiders can no longer be counted on to do it for them?³ Responding to the completion of the very first DC merchant transmission project – the Cross Sound Cable between Long Island and Connecticut -- the NY-ISO has held that the *locational* reserve capacity requirements in New York may be satisfied via the specialized capabilities of DC transmission lines. So, LSEs now have a choice: they can satisfy their hard-to-get locational capacity requirement via capacity contracts with generators in areas connected by the controllable DC line. This could be a new paradigm for how load pockets meet their capacity requirements.

The economics of the transmission solution depend on the comparative capital cost of new gas-fired urban power plants, on the interconnection costs, and on the enduring spread between the source and sink markets. In most heavily urban settings, a major CCGT project is likely to cost in excess of \$1000/kw. In addition to that, many urban markets have what one might call eccentric AC systems that require significant investment to be able to accommodate a new baseline plant. As a result, a CCGT project outside the urban area with a long AC generator lead into the city may be more economical than an in-city generator in terms of capital cost, but will still cause someone (either the power plant developer or the LSE) to pay a very large interconnection cost.

3. What if an LSE in a load pocket fails to take the necessary steps to comply with capacity requirements? Existing RTO rules impose heavy fines. In New York, for example, the deficiency charge for 2002-03 has been pegged by NYISO at \$17.20/MWh for Long Island. The SMD has other formulations to deal with this problem.

A DC project will typically not aggravate short-circuit problems in an AC system, and can essentially move the LSE's purchasing point farther from the city than can be done with an AC cable. In principle, the DC line should be extended to a source market that is well-endowed with a variety of generation sources. In that case, the LSE also gains a "portfolio" advantage insofar as the generation resources are less tied to natural gas.

There will be different winners in different situations. The point is that urban areas will call out for the most creative solutions to the reserve adequacy issue because they have the toughest problem.

LSEs in the Drivers Seat for Now, Whether They Like it or Not

In spite of all the turmoil, increases in power generation are having the effects that the proponents of electric market reform envisioned. Many generating facilities have been built, capacity in many areas is abundant, and the long-term price outlook there is in the \$30/MWh range. The exception is the load pockets in which capacity has not been expanded by voluntary, private investment. The withdrawal of investor interest in financing power plants creates a gap in their power future.

It will take real effort to fill that gap. The general malaise in the financing community and uncertainty over when and how FERC's SMD initiative is implemented will cripple private investment in generation for years, to the detriment of maintaining adequate reserve margins, especially in load pockets. Private generation investment, in short, will not solve the load pocket capacity issue.

This puts LSEs – and those who regulate them -- back in the drivers seat, whether they want to be there or not. Moreover, it puts them in a position to pick winners and losers: DC transmission, wind power, local CCGTs, demand management. This is unquestionably a retreat from the world that might have been had the vision of the Enrons, Williams, and Dukes come to fruition. But it has not.

In summary, to live in this half-way regulated, half-way unregulated world safely and reliably, some LSEs – mostly those in load pockets -- need to make some long-term commitments. As they do so (and many will have no choice but to do so), they will implicitly and automatically build a bridge between the regulated world and a future, more market-oriented world that we all realize now will take a decade to develop.