FERC Podcast Transcript
January 11, 2017

Scott Miller: How Regional Organized Power Markets Work

Craig Cano: Welcome to "Open Access," the podcast series of the Federal Energy Regulatory Commission, or FERC. I'm Craig Cano, your host.

Our goal here is to have a conversation about FERC, what it does and how that can affect you. FERC can get very legal and very technical, so we will strive to keep it simple. FERC is an independent regulatory agency that oversees the interstate transmission of electricity, natural gas and oil. FERC's authority also includes review of proposals to build interstate natural gas pipelines and liquefied natural gas terminals, and licensing of nonfederal hydropower projects. FERC protects the reliability of the high-voltage interstate transmission system through mandatory reliability standards and it monitors interstate energy markets to ensure that everyone in those markets is playing by the rules.

Mary O'Driscoll: Hi, I'm Mary O'Driscoll. Today Craig and I are sitting down with Scott Miller, senior market advisor in FERC's Office of Energy Policy and Innovation. We're talking about organized regional electricity markets. Basically, there are seven of these regional markets operating in the United States. What each market does is combine the transmission facilities of several transmission owners into a single transmission system to move energy over long distances at a single lower price than the combined charges of each utility that may be located between the buyer and seller. Their operations provide electricity to two thirds of the population of the United States.

But before we go there, Scott Miller is here to lay down a few important facts:

Scott Miller: Thanks, Mary. First, why don't we talk about what's electric service. Basically, it's the ability to turn on a lamp, start up your computer, or charge your phone. You get that electricity from your local utility or another retail provider. And in much of the US they purchase power and wholesale regional markets that provide a wide variety of services that ensure you can get electricity in every circumstance.

Second, electricity is unlike almost any other good. It is very difficult to economically store, generally it must be produced at the very moment that is consumed. Think of it as a just in time product or service. This is very important because it means that in the short term you need to balance the electric and generation consumption. In the long term, you must build out the system to be able to serve peak load – that means the highest load possible -- which could be the demand of a lot of air conditioning on a really hot day or when people turn up their heating systems to stay warm on a very cold day.

And finally the production and delivery of electricity is astonishingly complex and follows physical laws that defy assumptions baked into standard commercial arrangements. Thus, it flows over transmission lines along the path of least resistance, not in a directed way as an oil or natural gas pipelines.

Mary O'Driscoll: Well, I think a little history is in order here too. Under the traditional industry model that developed in the United States, electric utility companies generated, transmitted and distributed power to end use customers like you, me and the Starbucks on the corner. This is known as a vertically integrated utility. It planned and operated all the components of its individual system and was compensated based on its cost of service.

Scott Miller: That's right, in exchange for the right to provide service on a monopoly basis, a utility agreed to serve any customer in its franchise territory. This so-called regulatory compact work well, until the early 1970s when the push for more diverse and competitive sources of electricity generation took hold.

Over the years utilities in some parts of the US and join together what were known as power pools to coordinate the generation and transmission of electricity over broader geographic regions. But it was not until FERC issued its landmark order 888 in April 1996 that the monopoly hold on transmission lines was broken. In that decision, the Commission ruled that while the utilities could continue to own interstate transmission lines, they must provide open access nondiscriminatory transmission service to any qualified entity seeking it.

Mary O'Driscoll: So, what happened as result of FERC ensuring that all these customers have access to transmission?

Scott Miller: Well, customers have easier access to competing supplies and generally there is more efficient and diverse and lower cost electricity.

Craig Cano: So then, how did regional markets evolve?

Scott Miller: Well, the concept of regional markets found a ready-made platform suitable for first implementation power pools that existed for many years in the eastern part of the United States. From 1997 to 1999, New England, New York and the region known as the Pennsylvania-New Jersey-Maryland interconnection, PJM, formed the first regional markets off their long-standing power pools. California through legislation also formed its own market. Since then, more regional markets were formed in the Midwest and another in the Mid-South portion of the country known as the Southwest Power Pool, SPP, again, using the power pool model as a starting point. A prominent feature of all these systems is that they incorporate a market of bids from generation to manage the system.

All transmission systems are managed on a security constrained dispatch spaces. The objective is to identify the lowest cost set of resources to provide energy while honoring the operational limits of the power generators. Remember what we said earlier: regional electricity markets break the link between generation and transmission and replace that link with markets that parse out what a resource is doing to provide electricity service.

So, in a market, the market operator procures the resources to provide the energy and any ancillary service requirements for electricity use. It must maintain the security of the transmission system and honor the limitations of the power generators and the transmission system.

Mary O'Driscoll: Okay, so you said security constrained dispatch. That sounds really complicated, can you elaborate on that?

Scott Miller: Well, It's really not complicated once you break it down a little bit. Security constrained dispatch is the way the electric system in a regional market is run to ensure reliability. It means that a calculation of where the demand is and what amount it needs as compared to where generation can be injected into the grid without overloading the transmission system.

When we add the additional factor of doing this on an economic basis, we can look to see what generation can be used to meet demand at the best cost given the capability of the transmission system. If there were no limitations to transmitting electricity, the power operator would simply identify the lowest cost set of resources needed to meet demand. It gets more complicated when there is some limitation to transmitting electricity.

For example, if there is a demand of 1,000 MW in an area, and the most economic generation is in another area far away, the transmission system often will only allow a certain amount of the economic power, say 800 MW, to be transported to the demand. The remainder, 200 MW, will be met with generation that is closer and thus not require overburdening the transmission system, but at a slightly higher cost. This ensures that the regional market delivers the most economic power to customers while maintaining the reliability of the overall system.

Craig Cano: Okay, so what you're saying is, that managing the system in the most efficient manner with multiple buyers and sellers, requires a process to select which generation is dispatched to meet the physical need of the system at the lowest cost. The commission determined that the most efficient way to implement the process, was by allowing buyers and sellers to bid into the market. But there are different kinds of markets. Can you describe them for us and explain why each is essential?

Scott Miller: Well, the basic market is known as the energy market, which is the actual megawatts consumed to power our lives, for reasons of short-term planning is divided into a day ahead market in a real-time market. The latter energy market allows for response to differences in weather or other factors from what was committed in the previous day. Then there are what we call ancillary services markets which are the other uses of electricity necessary to ensure reliability. Generally these can be characterized as reserve products.

Finally, in some regional markets, there is something called capacity markets. These are operated to try and provide compensation and planning so that the energy will be available

in the future. In other commodity markets, this might be provided by simply investing in storage. But as we discussed, electricity is currently difficult economically store.

Mary O'Driscoll: So, are these products bought and sold outside of these organized markets? And with the structure of the wholesale markets in those regions?

Scott Miller: Well, yes, in addition to the organized markets administered by the RTO or ISO, there are short and longer-term bilateral markets that have been facilitated by the requirements of open access. I note that a number of utilities that had not joined regional markets have recently either joined regional market or taken steps towards a regional market.

We have seen MISO, the midcontinent operator, and SPP expand in the last few years, including participation by Entergy, a large, vertically integrated utility, and the Western Area Power Authority, a federal power marketer. In addition, a number of utilities – PacifiCorp, NV Energy in Nevada, Puget Sound, and Arizona Public Service – are participating in real-time imbalance market that is integrated into the California ISO's regional market.

Craig Cano: So, where do we go from here?

Scott Miller: Well, that depends on many factors. It may depend on changes in the market forces affecting the companies we regulate. Currently, many states require their utilities to procure large percentages of their power from renewable resources. This is influencing the relative importance of summer operational characteristics, namely, the ability to flexibly respond to change in supply and demand conditions.

Another complication is that for the first time in the history of the electric industry, demand for electricity is nearly flat in a period of economic expansion. This puts pressure on the traditional utility models for growth, which are often predicated on increasing electric demand, which drives investment in the utility. We will have to wait and see what is needed in the area of FERC jurisdiction, depending on these and other inputs.

Mary O'Driscoll: Well Scott, thank you so much for joining us today. This is a really interesting discussion, thank you very much.

And thank you so much, that was Scott Miller, senior market advisor in FERC's Office of Energy Policy and Innovation, talking about organized regional electric markets.

Craig Cano: Thank you for listening to "Open Access," the podcast series of the Federal Energy Regulatory Commission. Unless otherwise noted, the views expressed on these podcasts are personal views and do not necessarily express the views of individual commissioners or of the Commission as a whole. This podcast is a production of the Federal Energy Regulatory Commission Office of External Affairs, Leonard Tao, director. We will be updating our posts when we've got news, so be sure to check out our website, www.FERC.gov, and follow us on Facebook, Twitter and LinkedIn to find out when our next podcast airs.