New York's Electricity Marketplace: Efficient, Regulated, Free Enterprise

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Overview

While New York faces serious challenges in the near future to ensure it has ample sources of clean, reliable, and affordable power, the state's dynamic electricity marketplace has played a central, positive role. This issue brief reviews how that marketplace works and some of its near-term challenges.

Competitive Markets

A wholesale market provides New York State's electricity to customers constantly on a 24x7 basis. Such a market exists when competing generators offer their electricity to utilities and other parties. A bidding process sets the price of electricity which fluctuates depending on how much electricity is available, how much electricity is needed, and the availability of transmission lines between generating plants and consuming areas.

Buyers and sellers come together in some cases by long-term contracts. Often, short-term agreements that sell a given amount of power for a short time (even less than an hour) characterize the market. Importantly, generators are required to offer power into the system each day, except when they are closed for planned maintenance or for other operational impediments.

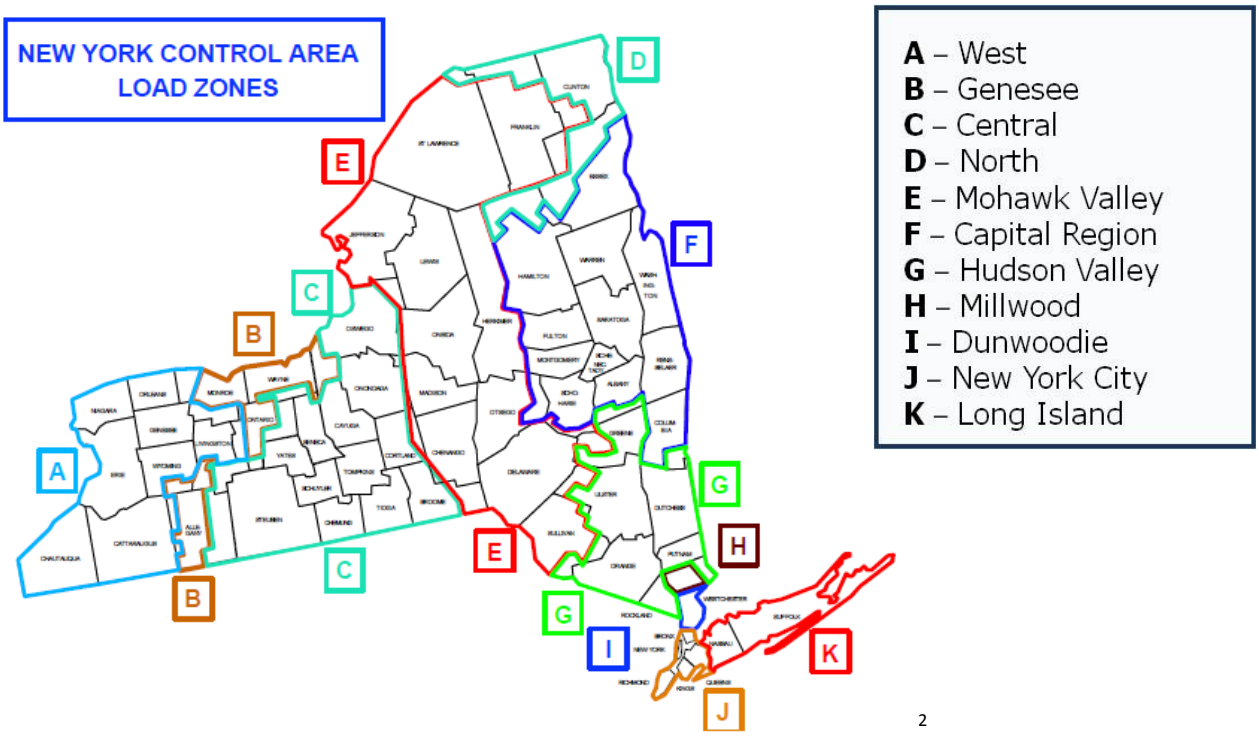
Because electricity is an essential product that cannot be stored, it is imperative to have constant, reliable generation and a 24/7 marketplace.

Role of NYISO

The New York Independent System Operator (NYISO) manages New York's wholesale market, making sure electricity flows over almost 11,000 miles of high-voltage transmission lines throughout the state, and ensuring that sufficient power is continuously available.

NYISO also administers and monitors New York's wholesale electricity market, which has more than $10 billion in annual transactions, over 400 market participants, and daily and hourly auctions that match producers and consumers of power.[1]

[1] http://www.nyiso.com/public/about_nyiso/nyisoataglance/purpose/index.jsp



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An Overview of the Marketplace

New York's wholesale market is divided into 11 load zones or regions. Areas with the greatest populations and electricity demands have the highest loads.

Generators use two methods to sell electricity to utilities, large businesses, cities and villages. The first is through power purchase agreements, by which a set amount of electricity is sold for a certain period of time, typically months or even years. There is a set price or a bandwidth of prices that can be adjusted based on market conditions.

Power purchase agreements or physical contracts provide advantages for buyers and sellers. Buyers are assured of getting a set amount of power at a set price. This is particularly helpful for planning and budgeting. Similarly, sellers (i.e., generators) have sales certainty and assurance of cash flow.

Second, power can be offered and sold into the market daily or even hourly. These real-time or near real-time transactions particularly require NYISO's management and expertise. Because generators are required to offer power, the system ensures demands are met, particularly when there is great pricing volatility.

Of note, it is impossible to designate where specific electrons from a generator go. The distribution of electricity is analogous to a reservoir that is filled by many sources. Someone drawing water from the reservoir can be assured of an ample amount of a quality product, but the source of that product cannot be pinpointed. NYISO's job, as the "electricity reservoir manager" is to ensure ample electricity for those who need it.

[2] www.NYISO.com

How Power Moves

Once electricity is generated, according to the laws of physics, it will move to where the load on the lines is less. In New York State, the flow of electricity almost always is from west to east and north to south, where demand is greatest. This corresponds to a population map of New York, and where one would predict the need for electricity to be higher.

As electricity flows over the wires, it loses some energy in movement, especially over long distances.

Having generation near where it is needed is vital and much more cost efficient. Less is lost in the movement and more is carried to the consumer. Additionally, congestion in transmission wires further impairs the flow and can even lead to lost electricity through load shedding, an expensive and wasteful occurrence.

Because of demographic and geographic restraints of New York City and Westchester County, the power plants that feed this load are vital. If a power plant unexpectedly shuts down, one can expect prices and electric rates to increase, if not spike, for the entire region

Of particular importance to the region is the Indian Point power plant, located in the northern Westchester village of Buchanan. Indian Point generates about 2,000 megawatts consistently, enough to serve approximately two million homes. NYISO has found that Indian Point provides approximately 30 percent of the electricity used in New York City, a point also emphasized by Con Edison.[3]

In 2010, the plant produced 16,321 gigawatt hours (GWH) of electricity for load zones G,H, I and J (encompassing several Hudson Valley counties, all of Westchester and the five boroughs). These load zones combined had a load of 74,731 GWH. The portion provided by Indian Point in 2010 was 22 percent.[4]

Indian Point is also very important for the transmission grid. Its location in Northern Westchester assists downstate residents by providing voltage support which is the ability to produce or absorb reactive power in order to maintain a specific voltage level for the electricity generated by plants further upstate. In essence, Indian Point functions as an "electricity pump." The output of a large amount of power from Indian Point helps power to flow more efficiently over the transmission system to NYC.

Powering New York City

Mayor Bloomberg's updated PlaNYC report, a central planning document for the City to meet its infrastructure needs by 2030, also spoke candidly about the importance of Indian Point for meeting the City's energy challenges.

> "New Yorkers receive up to 30% of their total electricity from Indian Point, a nuclear facility in the Lower Hudson Valley which emits virtually no greenhouse gases or air pollution. Indian Point's low operating costs help displace generation at more expensive

[3] Presentation by Joseph Oates, Vice President, Energy Management for Con Edison, to the New York Association for Energy Economics, July 1, 2010, which references the 2010 NYISO Gold Book and 2009 New York State Energy Plan

[4] NYISO 2011 Load & Capacity Data Report

> and pollution power plants located inside the city and throughout the state. We also depend heavily on Indian Point for reliability, as congested transmission lines limit our ability to import power from more distant locations …
>
> Retiring Indian Point without replacing at least a portion of its capacity could lead to power system instability. Replacement costs would exceed $2 billion, New Yorkers would also pay at least $1.5 billion in higher energy costs over the next decade ...[5]

A rule that ensures reliability is that in-city generation capacity must meet 80 percent of the City's needs on the year's highest demand day for electricity. Some of the capacity comes from old peaker plants, smaller, diesel generated facilities designed for temporary use that are typically located in lower income areas of the city and cause a great deal of pollution.

Indian Point's contract mix, whereby it provides electricity to the City and surrounding region, changes periodically. And, to be sure, with its heavy demand and high energy appetite, the City is an attractive market for generators to serve.

According to Con Edison's 2010 annual report, Indian Point would have physical contracts to sell 360 megawatts to Con Ed, beginning May 2011. Previously, 850 megawatts was under physical contracts to Con Ed.

On August 1, 2011, Entergy and Con Ed signed a contract extension for 500 megawatts of power from Entergy out of Indian Point units 2 and 3. While the terms of this power purchase agreement are not public, the date of the contract is contingent on license renewal for and goes for a 5-year term through 2017. It contains market-based pricing mechanisms within a predetermined range, committing low-cost energy to Westchester and New York City while allowing Entergy to meet its goals in hedging energy volumes.[6]

In addition, the New York Power Authority (which serves government entities including the Metropolitan Transportation Authority or MTA, operator of Metro North and the City's subways) said in its 2010 annual report that it has contractual obligations to purchase 200 megawatts from Indian Point. While the mix of physical contract and short-term market sales of Indian Point's electricity has changed, what has not is that more than 2,000 megawatts is continuously provided to the New York system. Today, Indian Point is a "price taker" accepting the hourly market price for more than 1,400 megawatts injected into the grid each hour, thereby displacing higher cost power plants on the supply curve.

Looking Ahead

While New York has a well-run electricity grid and a dynamic marketplace, it faces challenges. Economic recovery will lead to greater demands for electricity. The absence of new sources of electricity in the generation pipeline, especially downstate, is very troubling.

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[5] A Greener, Greater New York, updated PlaNYC report from the City of New York, issued April 21, 2011. See page 117 at: http://nytelecom.vo.llnwd.net/o15/agencies/planyc2030/pdf/planyc_2011_planyc_full_report.pdf

[6] Wayne Leonard, Entergy Chief Executive Officer, August 2, 2011, presentation to financial analysts: http://seekingalpha.com/article/283973-entergy-s-ceo-discusses-q2-2011-results-earnings-call-transcript

It remains critically important for New York to keep and expand the sources of power that it has, and to accelerate new generation wherever possible.

About the Authors

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