

LYNX ELECTRIC CURRENTS

February 2016

Editor's Notes:

Written by Bert Spaeth

Last month we talked about major changes coming in 2016. An unexpected major change from the US Supreme Court just upset the administration's plans for carbon reduction. In a major move, the Supreme Court issued a "STAY" in the implementation of the EPA's CPP (Clean Power Plan). This STAY order give states a 2 year reprieve in implementing the EPA's CPP. It will impact the 2017 budget with over \$300 billion slated for CPP and related carbon reduction efforts. The EPA's CPP measure will impact all aspects of the US economy, including:

- Power generation
- Closing fossil fuel plants
- Energy efficiency standards for appliances
- New transportation standards
- New fracking and drilling standards
- Generation fuel mix for power plants

The list of impacts goes on and the total economic impact is yet to be determined. The STAY issued by the Supreme Court differs from previous EPA court challenges. Previously EPA started implementing new regulations simultaneously while the court challenges were being addressed. This time the Supreme Court ruled that implementation is on hold for two years allowing the new administration time to review and make adjustments and perform a thorough cost/benefit analysis.

Despite the STAY President Obama's 2017 Budget calls for spending \$4.1 trillion, while expected government revenue for 2017 is around \$3.6 trillion. The president's budget places heavy emphasis on carbon reduction programs and increase spending for solar and wind from \$122 billion to \$345 billion along with funding for global climate change programs in underdeveloped countries. The budget does have cuts of \$14 billion in areas such as: Transportation, Department of Interior, water testing and some federal housing projects. It is up to Congress to determine what will be funded and how Supreme Court action will influence the programs that Congress will actually fund.

The request for the STAY called a "Writ of Certiorari" was requested by North Dakota, Texas and West Virginia. This action results when a ruling by a US Court of Appeals challenge and it goes to the US Supreme Court. If the Supreme Court takes no action, the lower court decision stands. That was not the case with the EPA Clean Power Act. The initial ruling came from the US Court of Appeals for the District of Columbia. With the Supreme Court order for a STAY, both sides have the opportunity to do a complete cost benefit analysis. Proponents of CPP claim environmental, public health and new jobs as benefits. Opponents point out the billions of dollars in cost to consumers, the destruction of established industries, and the resultant economic devastation of fossil fuels economies, with negligible improvements in the health benefits.



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US Energy

As our nation pushes forward with renewable energy mandates and new EPA compliance regulations, transmission projects are playing a key role in providing power. Typical wind and large solar arrays are located in remote areas. Transmission lines are needed to move power from remote renewable energy resources to urban high demand areas. The new emerging power mix is calling for significant carbon reduction by as much as 40% and having a renewable energy percentage of 50% by 2030. Significant new transmission lines and upgrades will be required to move all of that renewable power, be it wind solar, hydro biomass or geothermal. The closure or retirement of old coal plants will also require new transmission lines to move power from compliant or more economically viable plants into areas in which older plants have been closed. For example the Cleveland Ohio region had PJM build 35 separate transmission upgrades and projects at a cost of \$184.5 million for new infrastructure. Another example is private developer Clean Line Energy, waiting for federal approval for a new 4,000 MW transmission line bringing wind power from Oklahoma to Memphis Tennessee. Projects such as the given examples are ongoing across the nation and in some cases between Canada, Mexico and the US. Some utilities are pushing back by requesting the government to review detailed cost analysis submitted by transmission contractors to cost justify new projects. Local DG and DR projects must also be factored in before new transmission lines can be built especially if they reduce local demand. NYC and the lower Hudson River valley region highlight the conflicts between FERC, state regulators, NYISO and stakeholders including utilities. Pending closures of old inefficient plants, flat demand growth and environmental obstacles along with the need to comply, supply reliable power, meet emission standards, and comply with new energy laws, all make solutions challenging.

NYISO Updates

New York wind power continues to play an ever increasing role in the NY power mix. NYISO's latest news release indicated wind power set a new output record in January producing 1,571 MW delivered into the grid. That record represents 9% of the state's energy capacity that day. It also set a new milestone of available production of 90% of the 1,746 MW of rated installed windmill capacity.



Tip of the Month!

Registration for the summer strip for participants in the NYISO DR (Demand Response) program which pays customers that can shed load during critical peak demand periods is open now. The summer strip starts May 1 and runs through October 31. NYC participants can enroll in the Con Ed program as well as the NYISO. Our staff will work with you to get registered and help you determine how much load your facility can shed. Participants will need an interval meter tied to a communication system. If you or your customers have the ability to shed load the incentives make these programs worthwhile in lowering your energy costs and providing some outside capital for your facility. Enrollment forms should be submitted in our office by March 16. Call our office if you have questions or need application forms.

"Peaking Units" can be turbines, reciprocating engines, natural gas, diesel, oil or some dual fuel combination. The key is rapid start up and availability as needed to maintain sufficient capacity during periods of high demand. Typical installations cost in the range of \$1,000 to \$2,000 per kW. DG/CHP units which utilize waste engine thermals for heating or cooling are in the \$3,000 per kW range. Demand Response providers enrolled in SCR (Special Case Resources) typically require some type of air emission permitting. Variables that impact permitting include: type of fuel such as natural gas, diesel, oil or dual fuel, also type of engine whether turbine, combined cycle, or reciprocating engine. The horsepower or kW size will also impact air emissions. Pollution control systems like catalytic converters and the zone location of the power plants can also factor into air permits. Another factor is how the generator is used, which determines the annual run hours. Will the generator be a stand-by, a peak shaving unit, a baseload generator or a generator used for SCR demand response purposes? Check with your local municipal governments, and the state DEC to determine what will be needed for air permits before you install the generators. That will help you decide what type of engine and fuel source you use.

New York State Updates

New York State has released their state energy plan calling for an energy mix of 50% renewable and a 40% reduction in carbon by 2050 using 1990 as a baseline. A larger overriding goal is an 80% carbon reduction by 2050. To meet those goals, governor Cuomo has scheduled multiple PSC hearings for 2016 to address the following goals:

- Increase renewable electric supply to have a 50% renewable energy mix by 2030.
- Supporting construction of renewable energy in NY, resulting in sufficient supply for a bulk renewable market, using DR and dynamic load management.
- Prevent premature closing of upstate nuclear plants to take advantage of their zero carbon emission attributes.
- Promote the progress of REV market objectives

CES (Clean Energy Standards) as stated by the NYS-PSC Include:

- Manage energy costs
- Protect Consumers and ensure no consumer class is left behind
- Promote Capital and operating efficiencies
- Drive business models and service innovation
- Assure timely and appropriate investment in infrastructures and grid modernization
- Achieve greenhouse gas reduction

PJM Updates

PJM is supporting member states in an effort to comply with the EPA's CPP (Clean Power Plan). Between Feb 2016 and the target date of 2030, EPA expects a 36% reduction in carbon emissions using 2005 as a base. With heavy reliance on transmission lines to balance distribution of clean power and maintain reliability. Each state is required to present their plan for compliance with the CPP order from the EPA by September 2016. Previous EPA regulations for mercury and MATS have already resulted in the closure of older noncompliant coal power plants. Must run orders are being issued by state regulators with FERC support to keep economically inefficient nuclear generating plants operational to meet the carbon emission reduction goals.

Meanwhile large MW wind farms in the Midwest are being constructed. Transmission lines will be required to move clean renewable power from the Midwest to the PJM grid. Geography plays a major role in the location of clean energy generation sites for example: the Midwest or Eastern offshore for wind energy, locations near rivers or regions with access to abundant biomass resources. New clean power with offshore power will require distribution to bring the wind generated power onshore to tie into the grid and dense population centers in the eastern seaboard. PJM will review the state plans to comply with the EPA CPP this fall to finalize distribution plans. That information will allow PJM to make sure their transmission system can maintain reliability and move clean power from the generation source to areas of high demand.

Meanwhile the Supreme Court order for a STAY on the implementation of CPP PJM gives time to make cost effective compliance decisions. PJM will continue to provide their member states with detailed analysis regarding generation fuel mix, emissions standards and additional infrastructure resources including new transmission lines and renewable energy sources. The PJM analysis will evaluate the potential effects of CPP and provide sufficient data for member states planning for the future in light of the STAY order and EPA mandates being litigated.

FERC Updates

A Conference hosted by FERC Feb. 4, 2016, addressed FTR (Financial Transmission Rights), and ARR (Auction Revenue Rights). The Conference participants expressed concern about the ARR base and whether it would be sufficient through 2026. Using a 1.5% growth forecast the panel which included PJM's senior vice president Stu Bresler and PJM's manager for marketing Tim Horger, reviewed the available data. Using a 1.5% growth factor, the panel looked at the need for transmission line upgrades and removing the existing annual netting of both positive and negative FTR's in the FTR portfolio. FERC expects numerous post technical conference questions and comments.

FERC and NERC (North American Reliability Corp.) released a technical report on system restoration and recovery plans developed by regional utilities. Federal agencies stated the plans are thorough, highly detailed, and if implemented, will enhance and improve responses to: cyber-attacks, storm response, and various physical attacks. As reliability standards are mandatory, the review assessed the effectiveness of utility recovery and restoration protocol. Some additional measures were recommended including:

FERC Updates Continued...

- Verification and test modifications
- Feedback from utilities that experienced major catastrophic failures in the past
- Fully understanding the triggers and responses needed to combat cyber attacks
- Obtaining independent technical reviews of all proposed methods, technologies and new protocols
- Scheduling exercises and simulations for various recovery strategies to train staff and evaluate the effectiveness
- Developing robust cybersecurity responses

Green Energy REC's (Renewable Energy Credits)

As state mandates are phased in, suppliers or ESCO's will be required to purchase REC's (Renewable Energy Credits) and show documented proof of purchase. Some states require a percentage of Solar REC's or offshore wind depending on the host states social policies. Each category, whether it is called Tier or Class has different pricing and some states mandate a mix. Suffice it to say, Solar is the most expensive and Tier II or Class II is the least expensive. Failure to purchase green energy or AEPS (Alternative Energy Portfolio Standard) or REC's will result in a default REC. PJM customers would pay Alternative Energy Credits (AEP) at \$500 per credit. Connecticut has a default rate as well. Lynx will assist you in locating cost effective green REC's to meet your needs. In addition, Lynx can handle your reporting and assist you in purchasing REC's. The percentage of renewable energy is expected to increase up to 27% in certain states by 2025. New York is in the process of developing having some type of REC programs. Governor Cuomo wants the energy mix to contain 50% renewable energy by 2030.

Note: To ease the burden of purchasing annually for our ISO-NE and PJM customers, to minimize the large cash expenditure, Lynx is recommending purchasing REC's on a quarterly basis and avoid higher prices at the end of the reporting period.

ISO-NE Updates

A new natural gas peaking power plant has been approved and is scheduled to be operational by 2019. The plant Canal 3, is part of the "Fleet Modernization" for NRG across the US. ISO-NE Forward Capacity Market will pay \$7.03/kW month. Canal Station 3 located in Sandwich Massachusetts will have an output of 333 MW, which is enough to power 264,000 average residential customers. This plant will be considered a "peaker" and operated during periods of high demand, having the ability to be operational within an hour when needed. NRG the plant operator is also planning a 1.5 MW community solar project at their Canal site. NRG VP John Chillemi is proud of the development occurring at the Canal site as part of NRG fleet modernization portfolio.

NYSERDA PON Updates

As we indicated last year major changes have been made to NYSERDA PON's. The list below shows the PON programs that have been revised. The emphasis appears to be in electric energy efficiency upgrades and renewable energy. Utilities such as Con Edison are offering incentives for various energy efficiency upgrades so check with your utility before planning any major energy upgrades. As changes and revisions are made Lynx Currents will continue to keep you updated. If you have a project that requires outside funding such as grants, Lynx staff can assist you. For our Con Ed customers we can provide Cummins Generators for DR programs with performance incentives available from Con Ed and NYISO.

Current PON's (Program Opportunity Notices), which are available to qualified customers that pay SBC for NYSERDA programs, are listed below.

- PON 1219 Existing Buildings: Provides rebates and performance incentives for existing buildings for electric efficiency upgrades only. Revised 1/7/2016.
- PON 1601 New Construction Financial Incentives: Provides incentives for new and remodeled buildings. Revised 1/7/2016.
- PON 1746 Flex Tech: Provides funding for a variety of feasibility and energy related studies. Revised 12/10/2015. Revised 12/20/2015
- PON 2112 Solar PV Program Financial Incentive, Revised 10/18/2015, up to 25 kW for residential and up to 200 kW for non-residential.

NYSDERDA PON Updates Continued...

- 2456 Industrial and Process Efficiency Program. Revised 12/23/2015: This PON is can pay up to \$4.5 Million per project.
- 2568 CHP Acceleration Program. This PON runs through December 30, 2016, pending availability of funding. These units are pre-engineered CHP systems for NYC area up to 1.3 MW.
- PON 2689 Emerging Technologies and accelerated Commercialization, Revised 8/28/2015: through Dec. 2016
- PON 2701 Combined Heat and Power CHP Performance Program through Dec. 2016. Revised 1/16/2015
- PON 2828 Renewable Portfolio Standard Customer-Sited Tier Anaerobic Digester Gas to Electricity. Has been extended until funds are exhausted.
- PON 3010 NY Biomass Boilers, Revised 8/7/2015: pays for Biomass fueled thermals through 2018
- PON 3082 NY SUN Commercial/Industrial Incentive Program: Through Dec. 2023

US Energy Markets

A look into the future of on-site energy management was showcased at the Energy Conference and Expo in Charlotte North Carolina. A tour of a “repurposed” plant shows how Alevo Batteries are manufactured. These utility scale energy storage batteries will be used to store energy and used to stabilize grid capacity during periods of high demand. The plant is located in Victory Industrial Park, North Carolina. Alevo plans on producing 16 GWh of battery storage annually. Working with Alevo, Duke Energy at their McAlpine substation is demonstrating a working Micro-grid. This application consists of a 50 kW solar array charging 500 kW of battery storage units. The system will have the capability to re-sync with the grid and provide islanding operation during extended or prolonged periods of grid outages. The new combination of technologies demonstrates the new-on-site energy industry products, and a new direction for future energy markets.

Energy Engineer Corner

Our staff encounters numerous questions from both IT and energy customers. We have decided to publish several of the more common questions on a monthly basis. So if you have a technical question regarding IT or energy, send us an e-mail and our staff will respond. We will publish select questions each month that may be of interest to our readers. Send questions to: BASpaeth@LynxTechnologies.net.

Our question for the month:

Besides using generators to shed load, what else can be done to participate in DR programs?

The simplest strategy for DR is to turn off non-essential loads. This requires having knowledgeable staff that can turn off high energy loads such as air conditioning, or processing equipment with high heating loads while still maintaining required ASHRAE standards for occupancy. Non-essential lighting can be turned down or off. Office equipment such as copiers, extra monitors or other non-essential equipment can be turned off during an event. It is staff dependent and requires responsible personnel to be on site. Some large customers have energy management systems which can be programmed to limit peak demand. For example supermarkets can install peak limiting equipment to run cooling compressors and cycle the units based on temperature needs so not all units run at the same time. Large office complexes can be pre-cooled before an event then turn down the air conditioning load during curtailment events. An energy management system can perform the load shedding making sure the facility meets the load shedding goals. Some manufacturing facilities turn off certain production lines during peak load shedding and perform plant maintenance or simply shut off large motors during an event. The list of strategies goes on depending on the type of electric loads in a building. Facility managers need to do the cost analysis to determine if shutting down a production line, versus the revenue from participating in DR is worth the inconvenience of turning down or changing building settings. If you need additional information call our LYNX EMS office at 716-774-1341

February 2016

Sun	Mon	Tue	Wed	Thu	Fri	Sat
	1	2	3	4	5 NYISO ICAP Monthly Auction	6
7	8 NYISO ICAP Monthly Auction	9	10 NYISO ICAP Results	11	12	13
14	15	16	17	18	19 Certification	20
21	22	23 NYISO ICAP Spot Auction	24 NYISO ICAP Spot Auction	25	26 NYISO ICAP Spot Results	27
28	29					

Future Dates

February:

10 & 811 NYISO ICAP Monthly Auction
 15 Monthly Auction Results
 23 Certification
 25-28 NYISO ICAP Spot Auction
 30 Spot Auction Results

LynxEMS

Address:

2680 Grand Island Blvd., Suite 2
 Grand Island, NY 14072

Phone: 716-774-1341

Fax: 866-316-8599

Website: www.LynxEMS.com

Contacts:

Kevin Schoener: KHSchoener@LynxEMS.com
 Bert Spaeth: BASpaeth@LynxEMS.com
 Scott McCarthy: STMCarthy@LynxEMS.com
 Dennis O'Leary: DJOLEary@LynxEMS.com

Commodity Pricing

Historical - Flat DAM

	Sep-15	Oct-15	Nov-15	Dec-15	Jan-16	Feb-16
NYISO-A	26.56	26.18	22.92	18.61	21.19	17.72
NYISO-F	26.78	26.27	23.37	21.93	37.10	32.17
NYISO-J	32.45	27.68	23.34	20.24	35.04	31.28
NYISO-K	35.58	35.20	28.83	23.87	40.86	34.97
PJM-PSEG	28.60	25.41	21.99	19.44	28.99	26.37
PJM-JCPL	26.75	25.14	21.57	18.79	27.55	24.52
PJM-APS	29.69	30.58	27.39	24.94	30.31	28.15
PJM-PECO	26.76	24.62	21.01	18.65	26.85	24.11
PJM-PPL	25.95	24.95	21.30	18.88	27.32	24.45
PJM-DLCO	28.80	29.51	26.26	23.84	27.57	25.72
PJM-PENELE C	29.13	28.53	24.23	22.10	27.92	26.23
PJM-METED	25.95	25.06	21.32	18.53	27.12	24.27
PJM-BGE	36.58	38.81	35.26	33.97	40.37	37.86
ISONE-CT	30.79	35.78	27.81	22.26	38.35	31.53

Current Projections

	Mar-16	Apr-16	May-16	Mar-16 to Feb-17		
	Flat	Flat	Flat	Flat	Peak	Off Peak
	22.91	24.74	26.64	30.56	41.17	21.31
	32.84	26.86	26.06	35.18	41.81	29.41
	31.20	27.53	27.83	36.33	44.18	29.48
	50.72	38.89	45.97	48.63	57.42	40.96
	26.47	25.73	25.75	30.96	37.49	25.28
	25.45	25.04	24.93	29.87	35.97	24.56
	29.37	30.13	30.17	33.68	39.81	28.33
	24.72	24.40	24.51	29.09	35.04	23.90
	24.73	24.28	24.41	28.89	34.86	23.68
	28.27	28.47	29.22	31.24	36.50	26.65
	28.30	28.54	28.65	32.42	38.71	26.93
	24.93	24.43	24.56	28.98	34.96	23.78
	39.06	39.07	39.24	43.57	51.83	36.37
	31.71	31.53	28.90	37.71	44.53	31.75

Glossary of Acronyms

<p>ABACCUS - Annual Baseline Assessment of Choice in Canada and the US</p> <p>AEC - Alternative Energy Credits</p> <p>AEPS - Alternative Energy Portfolio Standard</p>	<p>CRP - Comprehensive Reliability Plan</p> <p>DEFG - Distributed Energy Financial group</p> <p>DER - Distributed Energy Resources</p>	<p>DG - Distributed generation</p> <p>DR - Demand Response</p> <p>LNG - Liquid Natural Gas</p> <p>NEPOOL New England Power POOL</p>	<p>REC - Renewable Energy Credits</p> <p>REV - Reforming Energy Vision</p>
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