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Your Eyes and Ears on the Organized Electric Markets
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How Long a Bridge for Gas?

New Analysis Says Renewables & Storage Will Soon Supplant Peakers

By Rich Heidorn Jr.

About 12,000 people attended the World Gas Conference in D.C. last month, where speakers were bullish on the fuel's future. | © *RTO Insider*

WASHINGTON — The 12,000 attendees at the World Gas Conference last month seemed unaware that the ground is shifting under their feet. Yet that is what's happening, the Rocky Mountain Institute contends in a new analysis.

The clean energy think tank says that utilities, investors and regulators should be skeptical of any new investments in natural gas-fired generation because the combination of renewables and storage is already cheaper than combustion turbine peakers in some regions and will fall below the cost of combined cycle plants within a decade.

RMI's analysis is the latest to sound warnings for gas. In March, IHS Markit published an analysis that found that

Continued on page 18

Opening of Mexico's Market at Risk from New President

By Tom Kleckner

MEXICO CITY — Mexican President-elect Andres Manuel Lopez Obrador has been called a populist, a nationalist, a socialist and, because of his anti-establishment reputation, a mirror image of Donald Trump. That could be bad news for Mexico's fledgling competitive electric market.

Lopez Obrador has said he wants to evaluate the energy liberalization of 2013-14, which opened the state-run petroleum and electric industries to foreign investment. Although the president-elect's focus has been on the country's oil resources, that doesn't make those involved in the electric reforms feel much better.

The front page of *El Heraldo de Mexico* the day after the election. | © *RTO Insider*

"It's super uncertain," said Jose Maria Lujambio Irazabal, a legal counsel deeply involved in the energy reforms, now engaged in private practice in Texas. Offering a more optimistic note, he added, "There's no immediate interest in changing anything. It's not politically attractive."

"Everybody has said they want money to come to Mexico," said Duncan Wood, director of the Wilson Center's Mexico Institute during a Gulf Coast Power Association breakfast last week. "It's not a nationalist idea to say foreign money is bad, except in the energy sector, and oil and gas in particular."

David Shields, who runs a Spanish-language website devoted to analysis and opinions on energy issues, said the opposition to foreign investment stems from U.S.

Continued on page 17

NEPOOL Votes for Press Ban, Discusses Fuel Security

By Michael Kuser

Fuel security was at the top of the agenda during the annual summer meeting of the New England Power Pool Participants Committee, which also featured presentations by ISO-NE's external and internal Market Monitors.

Members attending the June 26-28 committee meeting at the Water's Edge Resort and Spa in Westbrook, Conn., also voted to change NEPOOL rules to formalize the policy of banning the press from their meetings. NEPOOL is the only RTO/ISO stakeholder body in the country that bars the public and press from meetings.

The vote, which approved changes to committee bylaws and the Second Restated NEPOOL Agreement, passed with 79% in favor in a sector-weighted vote, according to a notice of action taken at the three-day

Continued on page 6

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In this week's issue

ERCOT NEWS

Market Monitor: ISO Missing out on Millions in Market Benefits

ERCOT is leaving significant amounts of money on the table by not using real-time co-optimization (RTC) of energy and ancillary services in its market operations, a study by the ISO's Independent Market Monitor has concluded.

In its study filed last month with the Public Utility Commission of Texas, the Monitor found ERCOT last year could have realized savings of $257 million in congestion costs, $155 million in ancillary services costs, about $4/MWh in energy costs and $10 million to $12 million in production cost savings (Docket No. 47199).

The Monitor recommended ERCOT and the PUC implement RTC "as expeditiously as possible." Noting that ERCOT has said it will cost about $40 million and take four or five years to begin using the process, the Monitor said the annual production cost savings and its analysis "provides quantitative evidence of [RTC's] benefits and improved market efficiencies … [that] more than justify the implementation costs."

"It's the key missing link in our market," IMM Director Beth Garza said last month in Houston. "Our market is dependent on pricing during significant scarcity intervals. My fear is that as we get to the point where we see tighter reserve margins, the likelihood of scarcity pricing increases. And high prices are an indication of the ineffective allocation of reserves."

The Monitor has consistently recommended the use of RTC since the nodal market went online in 2010, calling it "foundational" to efficient pricing. (See "Monitor Says Wholesale Market 'Performed Competitively' in 2017," *ERCOT Briefs*.)

The Monitor used historical offers and commitment status of resources from 2017 to simulate the effect RTC would have had on dispatch, prices, costs and system conditions, assuming that market participant behavior would remain unchanged.

It found that "jointly optimizing all products in each interval allows [ancillary services] responsibilities to be continually adjusted in response to changing market conditions." It also said that RTC improves the accuracy of shortage pricing, pointing out that even using data from a year with high installed reserves, it found there were many intervals where average load prices implied scarcity.

"With RTC, however, the number of those intervals decreased significantly," the Monitor said. "In an energy-only market that depends on scarcity pricing signals to provide incentive for proper levels of investment, it is important the scarcity pricing reflects actual scarcity rather than the inefficient assignment of reserve capacity."

The analysis also revealed a "significant improvement" in system reliability because of reduced overloading on network constraints and a reduced use of regulation-up service.

As part of the PUC docket, ERCOT staff also filed a report on co-optimization's operational benefits and its expected effect on reliability unit commitment (RUC) and supplemental ancillary services markets (SASMs). Staff filed a separate report addressing the benefits of incorporating marginal losses into security-constrained economic dispatch.

ERCOT's analysis anticipates significant operational benefits from RTC's implementation, including the timelier procurement of additional ancillary services, more effective congestion management, less manual actions by operators and "an improved management of resource-specific capabilities in assigning and deploying" ancillary services.

Staff said ERCOT has executed 391 SASMs covering more than 2,200 operating hours at average clearing prices of $100/MWh more than the corresponding day-ahead price since the nodal market began. When priced at the $100/MWh premium, they said, the megawatts procured in the SASMs

Continued on page 4

ERCOT NEWS

Continued from page 3

resulted in an $11 million difference.

The ISO's scarcity pricing study indicated it will likely realize production cost savings and reduced consumer costs by incorporating marginal losses in system dispatch decisions. The analysis also projected increases in unit make-whole payments and start-up costs, "which could indicate possible additional costs if marginal losses are implemented."

The PUC last year directed ERCOT and the Monitor to produce the studies as part of its efforts to improve market performance. The Monitor has made the simulation program code, data and use instructions available on ERCOT's website.

July Begins with Another Monthly Demand Record

ERCOT wasted no time setting a new monthly demand record for the third straight month when the system recorded demand of 69.6 GW on July 3 during the 4-5 p.m. hour. July's previous high was set last year at 69.5 GW.

System demand also topped the old record during the 5-6 p.m. hour.

The ISO has now recorded four new monthly highs this year. Staff has forecasted demand will exceed 70 GW in July and August, with a new summer peak of 72.97 GW expected next month.

Real-time prices topped out at $71.85/MWh during the interval ending at 2:30 p.m. on July 3.

The grid operator has yet to issue a conservation appeal this summer. It says it has 78.2 GW of capacity available, with a planning reserve margin of 11%. (See *ERCOT Gains Additional Capacity to Meet Summer Demand*.)

Garland Generating Units Return to Mothballs

ERCOT has approved two separate requests by the city of Garland to return 572 MW of generating capacity to mothball status this fall.

The ISO on Friday approved a notification of suspension of operations (NSO) for two units at Garland's Spencer plant, effective Oct. 3. The two gas-fired units have a total capacity of 118 MW.

ERCOT earlier had approved an NSO for the city's 454-MW, coal-fired Gibbons Creek facility, effective Oct. 1.

The grid operator determined the generation resources were not necessary to support transmission system reliability during their unavailability.

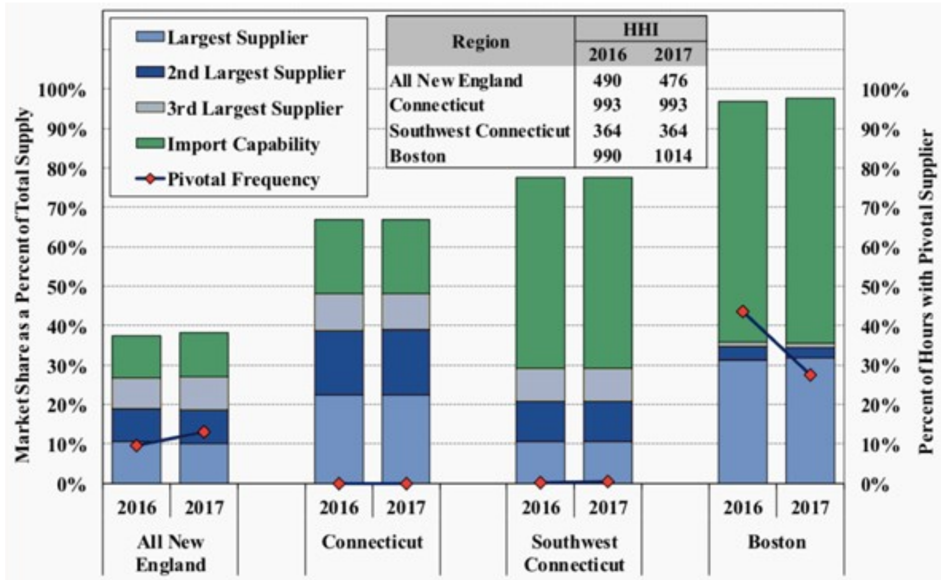
Both units were returned to seasonal status this spring.

— Tom Kleckner

ISO-NE NEWS

Patton Cites High Uplift, Capacity Concerns in ISO-NE

By Michael Kuser and Rich Heidorn Jr.



A graph of structural market power indicators shows that market concentration has changed very little from 2016 to 2017 in each of the four New England regions. | *ISO-NE*

High uplift costs, market power and the capacity market highlighted the External Market Monitor's concerns in the 2017 State of the Market report for ISO-NE.

Monitor David Patton of Potomac Economics briefed stakeholders on the report at the annual summer meeting of the New England Power Pool Participants Committee last week.

The Monitor said the energy and capacity markets were competitive, with little evidence of withholding, and that market mitigation was infrequent and effective. However, the pivotal supplier analysis found market power under high-load conditions and in the Boston area — the latter of which will diminish with the completion of the Greater Boston Reliability Project and the addition of the Footprint Power combined cycle plant.

The only mitigation measures that have not been fully effective are those on resources frequently committed for local reliability. "Although the mitigation thresholds are tight, the suppliers have the incentive to operate in a higher-cost mode and receive higher NCPC [net commitment-period compensation] payments," the report said.

The NCPC payments contributed to high uplift charges of 42 cents/MWh last year, the Monitor said, more than double that for NYISO ($0.24/MWh) and MISO ($0.16/MWh).

The issue prompted two of the Monitor's eight recommendations, most of which were repeated from its 2016 review. It said the RTO should change the allocation of "economic" NCPC charges consistent with "cost causation" principles and use the lowest-cost fuel — or lowest-cost configuration for multi-unit generators — when making commitments for local reliability.

Reserve Markets

The Monitor also made two related recommendations to reduce uplift, saying the RTO should eliminate its forward reserve market and create a day-ahead operating reserve market co-optimized with the day-ahead energy market.

It said more than three-quarters of day-ahead NCPC charges result from local second contingency protection and system-level 10-minute spinning reserve requirements. Because there is no day-ahead operating reserve market, the Monitor said, the costs are not reflected efficiently in day-ahead prices, resulting in excess reserve commitments and depressed reserve prices.

Creating a day-ahead reserve market would allow the elimination of the forward reserve market, which the Monitor said has "resulted in inefficient economic signals and market costs."

Capacity Market Concerns

Capacity market issues prompted three recommendations, including a call for market changes to complement the Pay-for-Performance program that began June 1 to ensure fuel security under severe winter conditions.

The Monitor said that although PFP will provide incentives for generators to procure fuel for severe winter conditions, "it will not provide the planning and coordination that may be necessary to ensure that ISO-NE's seasonal reliability criteria are satisfied. Thus, the ISO should evaluate whether it has seasonal planning needs for the winter that must be met to satisfy its overall reliability criteria."

It also said it should replace its descending clock auction with a sealed bid procurement and reduce the availability of information about qualified supply before the auction. The current structure provides suppliers with information they can use to recognize when they can benefit by raising capacity prices, it said.

The Monitor recommended several changes to the RTO's minimum offer price rule (MOPR): eliminating performance payment eligibility for units subject to the rule; capping the minimum price at the net cost of new entry; and exempting resources resulting from unsubsidized private investment.

Under PFP, the Monitor said, most of the value of capacity will come from performance payments. But because resources that skip the capacity auction can still earn the payments by producing energy during shortages, "the MOPR will not likely be an effective deterrent under the PFP framework. In addition, an uneconomic entrant will be able to depress capacity prices without selling capacity because it will lower

Continued on page 6

ISO-NE NEWS

Patton Cites High Uplift, Capacity Concerns in ISO-NE

Continued from page 5

the expected number of shortage hours."

The report notes that unlike other RTOs, ISO-NE's MOPR lacks a competitive entry exemption, which could interfere with private investment in new resources.

And it said the MOPR could raise prices substantially above net CONE (currently about $8/kW-month) because it sets the offer floor at the new resource's actual entry cost. That could prevent state-sponsored resources from clearing in the Forward Capacity Auction, with the RTO instead clearing a conventional resource.

		ISO-NE			NYISO	MISO
		2015	2016	2017	2017	2017
Real-Time Uplift						
Total	Local Reliability ($M)	$25	$1	$ 1	$5	$ 3
	Market-Wide ($M)	$58	$27	$23	$9	$61
Per MWh of Load	Local Reliability ($/MWh)	$0.19	$0.01	$0.01	$0.03	$ 0.01
	Market-Wide ($/MWh)	$0.45	$0.22	$0.19	$0.06	$0.09
Day-Ahead Uplift						
Total	Local Reliability ($M)	$24	$31	$15	$21	$25
	Market-Wide ($M)	$12	$13	$13	$3	$15
Per MWh of Load	Local Reliability ($/MWh)	$0.18	$0.25	$0.12	$0.13	$0.04
	Market-Wide ($/MWh)	$0.10	$0.10	$0.11	$0.02	$0.02
Total Uplift						
Total	Local Reliability ($M)	$48	$33	$16	$26	$28
	Market-Wide ($M)	$70	$40	$36	$12	$76
Per MWh of Load	Local Reliability ($/MWh)	$0.38	$0.26	$0.13	$0.17	$0.04
	Market-Wide ($/MWh)	$0.55	$0.32	$0.29	$0.08	$0.12
	All Uplift ($/MWh)	$0.92	$0.58	$0.42	$0.24	$ 0.16

Summary of uplift by RTO | *Potomac Economics*

Under the recently approved Competitive Auctions with Subsidized Policy Resources (CASPR) program, "clearing unneeded conventional resources will compel the sponsored resources to pay lower-cost existing resources to retire," the Monitor said.

In addition to its formal recommendations, the Monitor also noted that several new resources that obtained capacity supply obligations (CSOs) have been delayed in recent years, with some failing to deliver their capacity during the capacity commitment period (CCP).

Consistent delays in delivery of resources have significant implications for market outcomes and efficiency and affect other participants, the Monitor said. "Delayed new projects lower the prices in the FCA(s) in which they cleared, and as a result, FCA prices do not reflect the actual realized supply and demand and the reliability of the system. In addition, other resources that obtained a CSO in the FCA with delayed resources would face additional performance-related risks under the PFP framework," it said.

The Monitor said it supports the RTO's efforts to develop tougher penalties for delayed resources but also encouraged it to consider switching to a prompt market, with the auction conducted immediately before the commitment period.

Coordinated Transaction Scheduling

The report recommended the RTO find ways to improve its price forecasting under its coordinated transaction scheduling (CTS) with NYISO, finding that real-time transactions between the two regions went in the wrong direction in 44% of intervals in 2017.

Although CTS' performance improved last year, the savings were reduced by a small number of intervals with errors of more than $20/MWh.

The Monitor said errors in load forecasting and wind forecasting were the biggest problem, responsible for 23% of price forecast errors. Differences in timing and ramp profiles was the second largest contributor, causing 22% of pricing errors.

NEPOOL Votes for Press Ban, Discusses Fuel Security

Continued from page 1

meeting. The changes add a definition of "press" and bar anyone working for the news media from becoming a NEPOOL member or alternate for a participant.

Three members of the Members Subcommittee disagreed with the Participants Committee's recommendation on the changes and made a dissenting proposal that would have made the press eligible for a non-voting membership for a $5,000 application and an annual fee. It failed with only 27% in support, with only the end-user sector strongly in support.

RTO Insider prompted the vote by having a reporter who lives in Vermont apply for committee membership as an end-user customer in March. NEPOOL has not acted on the application.

"As you know, your application raised some interesting issues for the Participants," Day Pitney attorney Pat Gerity, who serves as legal counsel to the Membership Subcommittee, wrote in an email last week. "They continue to work through those. Thus, the status of your application is that it is still pending."

The changes have been submitted to the entire membership for a mail ballot ending this week. Assuming approval, they will be submitted to FERC.

Consent Agenda

The Participants Committee unanimously

Continued on page 7

ISO-NE NEWS

NEPOOL Votes for Press Ban, Discusses Fuel Security

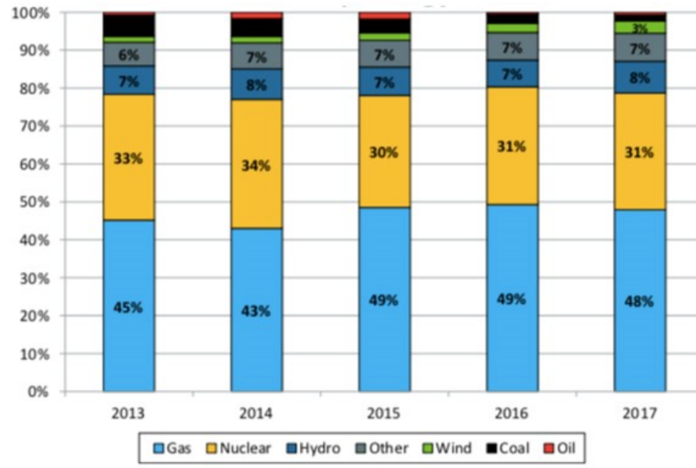
Continued from page 6

approved two items on its consent agenda:

- Revisions to the Tariff and Market Rule 1 to modify the allocation of costs of the Forward Capacity Auction and annual reconfiguration auction to improve the alignment with the auction clearing methodology under the marginal reliability impact demand curves. The changes include a new definition for "estimated capacity load obligation" and replace the use of the net regional clearing price and residual capacity transfer rights in the Forward Capacity Market settlement. The RTO will request an effective date of June 1, 2021, for the 12th Capacity Commitment Period. (Separately, the committee approved related changes to the RTO's Financial Assurance Policy.)
- Retirement of Appendix C (Demand Response Holidays) of Operating Procedure 14 (Technical Requirements for Generation, Demand Resources and Asset Related Demands) to reflect the removal of demand response holidays because of the implementation of price-responsive demand, which had been recommended by the Reliability Committee on June 12.

No to New Winter Reliability Program

A proposal to re-establish a winter reliability program for future winter periods failed to pass, garnering only a 50% vote in favor. Energy New England (ENE), a Massachusetts cooperative owned by the municipalities Braintree, Taunton, Concord, Hingham and Wellesley, proposed the measure.



New England's fuel mix in 2017 was similar to that since 2015, with natural gas claiming a 48% share of energy generation and 39% of capacity. | *ISO-NE*

ENE proposed continuing the same program rules as were used for winters 2015/16 and 2017/18. It said the Pay-for-Performance program, which took effect June 1 to replace the winter program, provides "little incentive to materially increase stored fuels" because rates are too low and there is excess cleared capacity for winter 2018/19. The PFP program increased financial incentives for resource owners to make investments to ensure their resources' reliability during periods of scarcity.

ENE said the winter reliability program should remain in effect

Continued on page 8

ISO-NE NEWS

NEPOOL Votes for Press Ban, Discusses Fuel Security

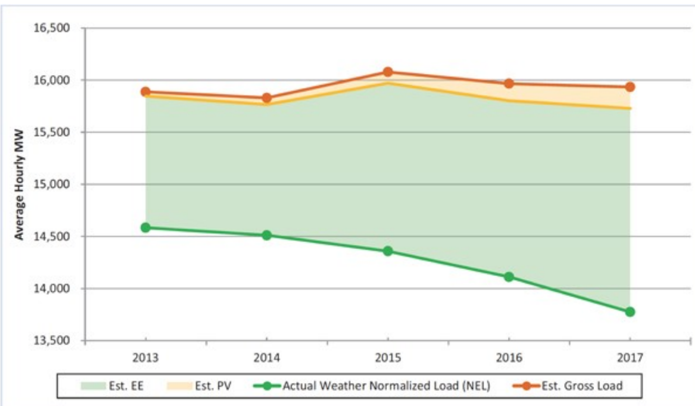
Continued from page 7

until implementation of a "market-based solution."

The proposal previously failed to gain endorsement by the Markets Committee, winning less than 30% support.

Fuel Security

Fuel security occupied most of the agenda for the second day of the meeting, with Paul J. Hibbard of Analysis Group moderating presentations by Professor Anji Seth of the University of Connecticut Institute for Resilience & Climate Adaptation and Phyllis Yoshida, Sasakawa Peace Foundation USA's senior fellow for energy and technology and former Department of Energy deputy assistant secretary for Asia, Europe and the Americas.



Continuing a long-term trend, New England saw the lowest electric demand in at least 18 years in 2017, driven by an increase in energy efficiency and, to a lesser extent, behind-the-meter solar. | *Potomac Economics*

Seth's report addressed climate change, concluding that many currently rare extreme events will become more commonplace over the next few decades as the climate adjusts to greenhouse gases already emitted, while natural variability could amplify or suppress the warming signal regionally.

Yoshida looked at the impact of the Fukushima nuclear accident on Japan's energy systems and extrapolated lessons for New England on how a region with insufficient domestic resources can provide a resilient energy supply in the face of unexpected events. She recommended that policymakers ensure that electricity and natural gas market deregulation is transparent, increases competition and creates opportunities for new actors and new technologies and practices.

External Monitor's Fuel Security Assessment

ISO-NE's External Market Monitor David Patton of Potomac Economics gave a presentation on his firm's 2017 State of the Market report, which included a fuel security assessment for a two-week period of severe winter weather.

The EMM's baseline scenario found that more than two-thirds of all potential LNG and oil storage capability will be needed if the

Continued on page 9

ISO-NE NEWS

NEPOOL Votes for Press Ban, Discusses Fuel Security

Continued from page 8

Everett Marine (Distrigas) LNG terminal retires. Under a "severe pipeline contingency," the market will be slightly short with Distrigas in 2023/24 and short by the equivalent of 2,500 MW for two weeks without the facility, Potomac Economics said.

"Although the oil storage capacity and LNG import capability are high enough to satisfy the demand for these fuels during a severe winter event, it would require very high utilization rates — above those observed in the past," the EMM said.

The system is projected to require a very high percentage of this capability if the Distrigas terminal is retired, the report said. "Additionally, even if this terminal does not retire, the demand for oil and gas will exceed the available supply under a severe pipeline contingency in the 2023/24 cold snap scenario. This suggests that under these conditions, ISO-NE would lose its ability to serve the load for an extended time frame."

The EMM said "market design changes may be needed to ensure that generators have incentives to conserve limited fuel supplies and allow market prices to efficiently reflect these fuel limitations."

(See related story, *Patton Cites High Uplift, Capacity Concerns in ISO-NE*, p.5.)

2017 Wholesale and Capacity Market Costs Rise Sharply

Jeff McDonald, the RTO's vice president for market monitoring, presented the Internal Market Monitor report on 2017 market performance, which found that "energy, capacity and ancillary service markets performed well, exhibiting competitive outcomes."

Wholesale electricity prices reflected changes in underlying primary fuel prices and electricity demand, with costs last year totaling $9.1 billion, up 20% from the previous year, the report said. Capacity market costs were up 93% to $2.2 billion because of higher prices in FCA 8 in 2014, which covered the 2017/18 CCP.

The IMM reported 2017 energy market costs totaled $4.5 billion, up 9% from the previous year, while natural gas price averaged $3.72/MMBtu, up 19%. Electricity demand declined 2% for the year, and in Q3 dropped 8%, which helped offset the impact of higher natural gas prices.

New England's fuel mix in 2017 was largely unchanged since 2015, with natural gas claiming a 48% share of energy generation and 39% of capacity.

Continuing a long-term trend, New England saw the lowest electric demand in at least 18 years in 2017, driven by an increase in energy efficiency and, to a lesser extent, behind-the-meter solar, the report said.

PJM NEWS

Factors in New PJM VRR Curve Still in Question

By Rory D. Sweeney

VALLEY FORGE, Pa. — PJM has altered one of its recommended revisions to its capacity auction demand curve in response to stakeholder pressure, and a coalition of generators is pushing for other changes.

Staff have agreed with stakeholder requests to recommend moving the curve 1% left, negating a 1% shift to the right when the curve was last analyzed in 2014 and reducing excess capacity. The recommendations are part of PJM's quadrennial review of the variable resource requirement (VRR) curve in its Reliability Pricing Model capacity market construct.

The announcement came at a Friday meeting of stakeholders interested in revisions to the curve. Tanya Bodell of Energyzt also provided an analysis funded by the PJM Power Providers Group (P3) that argued for retaining the current model of combustion turbine as the curve's reference resource. A reference resource is representative of a peaking unit in the energy market that derives a significant portion of its revenues from the capacity market.

PJM is recommending switching from the Frame F to the Frame H of a General Electric turbine based on an analysis it commissioned from the Brattle Group, but Bodell said Frame F allows for flexibility and modularity, which is currently favored over unit size by market participants. Characteristics of the Frame H units are "so 2000s," she said, because they're designed and being used for "large, baseload combined cycle applications." She noted that no Frame H units are being installed as CTs in PJM's territory, and there is no evidence they will be, while Frame F units are. The mismatch would result in an inappropriate demand curve, she said.

Tanya Bodell | © RTO Insider

"Going solely for the least-costly estimated technology can really squeeze out a lot of innovation and a lot of long-term gains that you can get from new technologies that are coming in," Bodell said.

Erik Heinle of the D.C. Office of the People's Counsel thanked Bodell for the presentation and said it's "worth considering" proposals for the F and the H frames as either CTs or CCs.

PJM is targeting Oct. 12 to make its filing for FERC approval, and seeking endorsement votes by the Markets and Reliability Committee on Aug. 23 and the Members Committee during a Aug. 31 teleconference.

PJM had a special meeting of the Market Implementation Committee on July 6. | © RTO Insider

PJM NEWS

PJM Market Efficiency Project Rules Could Slip Deadline

By Rory D. Sweeney

VALLEY FORGE, Pa. — With the opening of PJM's next long-term transmission proposal window looming less than four months away, it remains unclear whether the RTO will have new rules in place for evaluating and selecting market efficiency projects.

That would mean that any rule changes discussed by the Market Efficiency Process Enhancement Task Force since February that aren't in place by the window's Nov. 1 start will have to wait another two years for the Regional Transmission Expansion Plan's next window.

After a three-hour meeting on Thursday, stakeholders remain at odds about how to move forward. A nonbinding poll showed stakeholders were unable to find at least 50% consensus on any of six solution proposals to address how PJM evaluates and chooses the discretionary transmission projects, which aren't necessary for reliability but are meant to reduce congestion costs.

The Package A proposal received 49% approval, but stakeholders remained at odds over whether to exclude facility study agreements from the base case unless needed for reliability; whether to use a $10 million versus $20 million threshold on project re-evaluation criteria; and how to calculate energy benefits.

Given the intractability, PJM's Brian Chmielewski, who oversees the task force, said the group should not forward all six proposals for consideration at the July 12 Planning Committee meeting, but instead attempt to sort through the polling results to assemble three new proposal packages. Stakeholders allowed Chmielewski to create the composite proposals but then balked at sending just those three to the committee.

LS Power's Sharon Segner said the changes were significant enough for the task force to take another poll, which was supported by representatives from transmission owners Public Service Electric and Gas and American Electric Power. Chmielewski expressed concern about the further delay.

"If we do another poll, we lose the Nov. 1 effective date," he explained, because there won't be enough time to get it through the stakeholder endorsement process and receive FERC approval. "Slowing down a month means you miss another two years of new rules. … I think we should go to that [PC] meeting with the intent of having a first read" and take the committee's input, he said.

Segner suggested adding the new rules to the upcoming window after it opens if FERC would approve such a move, but GT Power Group's Dave Pratzon expressed concern that such late changes could disadvantage bidders.

Pauline Foley, PJM's counsel, said she wasn't "comfortable" with making a determination on whether PJM would be willing to ask FERC for a waiver to grant the approval in less than 60 days. PJM's Asanga Perera added that other stakeholders might complain about the bidding rules potentially being changed halfway through the process. The window runs through February.

"I don't think it's just PJM's call," Perera said.

On Friday afternoon, RTO staff opened a poll on the three new proposals and gave stakeholders until noon on Wednesday to respond, giving staff enough time to compile and report the results at the PC.

PJM NEWS

FERC OKs PJM RTEP Allocations, Sets TMEP 206 Proceeding

By Rory D. Sweeney

FERC on Monday approved part of PJM's cost responsibility assignments for its updated Regional Transmission Expansion Plan but rejected allocations for four cross-border projects, instituting a Section 206 proceeding to revise the RTO's Tariff language to address the reasons for its rejection (EL18-173, ER18-614, *et al.*).

The commission approved 41 projects but rejected the allocations for the targeted market efficiency projects (TMEPs) b2971, b2973, b2974 and b2975. PJM transmission owners had argued that the RTO erred in not allocating project costs to Hudson Transmission Partners and Linden VFT, which operate merchant lines into New York City and had recently converted their firm transmission withdrawal rights to non-firm rights. Those lines would benefit from the TMEPs, other TOs contended.

FERC rejected PJM's argument that the Hudson and Linden facilities should be exempt, noting that the RTO's Tariff says, "Transmission congestion charges are incurred in the zones and merchant transmission facilities in which market buyers experienced net transmission congestion charges, regardless of whether the merchant transmission facility has firm or non-firm transmission withdrawal rights."

PJM also recognized its requirement to assign TMEP costs in zones and merchant facilities "shown to have experienced net positive congestion over a two-year historical period as determined by PJM and MISO" but didn't allocate any costs to Linden or Hudson nor provide any explanation, the commission said.

It also said Schedule 12 in PJM's Tariff, which outlines cost allocations, is ambiguous about whether merchant facilities should be exempt from allocations, which the RTO argued they should be.

"We therefore find that the most reasonable interpretation of the PJM Tariff is to allocate within PJM its share of the costs of TMEPs to those zones and merchant transmission facilities in PJM that are shown to have experienced net positive congestion over the two historical years, as determined by a TMEP study conducted by MISO and PJM," the commission said.

FERC denied PJM's use of two commission opinions and its decision to grant the requests from Linden and Hudson to convert their firm withdrawal rights to non-firm transmission withdrawal rights, saying they provide no guidance because they focus on different issues.

The commission ordered PJM to file new cost assignments that "must reflect Hudson's and Linden's *pro rata* share of the sum of the net transmission congestion charges paid by market buyers of the zones and merchant transmission facilities in which market buyers experienced net transmission congestion charges, as identified through the TMEP study." PJM has 30 days to clarify the Schedule 12 language or show cause why it shouldn't be revised.

FERC set the 206 proceeding to adjust Schedule 12 to conform with its interpretation in the order. Parties interested in being involved have 21 days to register. FERC set the refund date for when the proceeding is published in the *Federal Register*.

The commission also rejected protests from the Public Power Authority of New Jersey, the New Jersey Board of Public Utilities and Dominion Energy, saying PJM adequately addressed them.

FERC Closes Book on Va. Tx Undergrounding Dispute

FERC last week ended a seven-year-old dispute over cost allocation for three Virginia Electric Power Co. transmission undergrounding projects when it accepted a compliance filing and denied related rehearing requests (ER18-318, EL10-49, *et al.*).

At issue was whether Old Dominion Electric Cooperative and North Carolina Electric Membership Corp. (NCEMC) should be required to pay the additional costs of undergrounding VEPCO's Pleasant View, DuPont Fabros and Garrisonville projects.

VEPCO's filing revised its tariff to remove, extending back to March 17, 2010, the incremental costs of undergrounding the projects, and instead charged those costs to wholesale transmission customers in Virginia, which had mandated the undergrounding. In response to a conditional protest by NCEMC, the tariff was amended to exclude NCEMC and all other North Carolina wholesale customers from the undergrounding costs in light of another FERC decision on the issue last October affirming that North Carolina customers would bear no additional costs. (See *FERC Upholds Cost Allocation on Va. Tx Undergrounding*.)

The commission last week denied rehearing requests from VEPCO, which had argued against excluding several costs from the allocation. FERC said it was reasonable to exclude any costs that had not been shown to be directly related to constructing the projects underground.

The commission also denied rehearing requests from ODEC, Northern Virginia Electric Cooperative and Virginia Municipal Electric Association No. 1. FERC said it had already determined it appropriate to allocate incremental undergrounding costs to all Virginia customers in the Dominion zone, and that the only issue set for hearing was the appropriate amount of the costs to be allocated among those customers on a load-ratio share basis.

— Rory D. Sweeney

Company Briefs

South Carolina Regulators Order SCE&G Rate Cut

The South Carolina Public Service Commission on July 2 ordered South Carolina Electric & Gas to temporarily cut its rates by 15%.

The rate cut was mandated by a bill meant to reduce the amount SCE&G customers pay to cover the cost of the failed attempt by SCANA, the utility's parent, and state-owned utility Santee Cooper to expand the V.C. Summer nuclear power station. SCE&G has filed a lawsuit in federal court arguing the law is unconstitutional.

More: *The Post and Courier*

EDP Secures PPAs for Two Midwest Wind Farms

EDP Renewables North America has secured four 15-year power purchase agreements to sell the energy from two wind farms with a total capacity of 405 MW to three commercial and industrial entities.

The company said the wind farms are in Illinois and Indiana, and it expects them to start operations in 2019 and 2020, respectively.

The agreements give EDP 2.1 GW of PPAs in the U.S., surpassing its goal of 1.8 GW for projects to be installed in 2016-2020.

More: *EDP Renovaveis*

ATC Sues Company Allegedly Responsible for Tx Spill

American Transmission Co. on July 2 filed a lawsuit in U.S. District Court for Michigan's Western District against VanEnkevort Tug and Barge, which allegedly is responsible for the April 1 anchor strike that severed two out-of-service ATC power cables in the Straits of Mackinac.

ATC alleges in the lawsuit that the anchor was dragged across the Straits floor because of a malfunction, negligence, inexperience or lack of supervision.

An end of one of the severed American Transmission Co. cables April 26, 2018. | *ATC*

The company is seeking to recoup the costs of repairing and replacing the cables, as well as responding to and remediating the spill of 600 gallons of dielectric fluid from the cables after the anchor struck them.

More: *MLive*

FERC Orders Settlement Hearing Over PG&E-San Francisco Dispute

FERC established a settlement hearing between Pacific Gas and Electric and the city of San Francisco regarding cost estimates the utility used in relation to interconnection and service agreements.

San Francisco had requested FERC set a hearing over the issue after PG&E proposed to revise the agreements to reflect work performed for existing delivery points in the first quarter of 2018. San Francisco challenged some cost estimates and raised concerns of over-collection for the work.

More: *ER18-1482*

Xcel Buys Project as Part of Wind Energy Plan

Xcel Energy said July 3 it has bought the 478-MW Hale Wind Project in Hale County, Texas, from NextEra Energy Resources.

Xcel said Wanzek Construction will begin constructing the wind farm later this month. Xcel expects construction will cost about $735 million, a little less than a previous estimate of $769 million. (See *Texas PUC Issues Final Order for SPS Wind Farm*.)

The wind farm is part of Xcel's 1.23-GW wind energy expansion initiative to serve customers in New Mexico and Texas.

More: *Lubbock Avalanche-Journal*

Innergex Buys Texas Solar Project from Longroad

Quebec-based Innergex Renewable Energy said July 2 it has bought a 250-MW AC/315-MW DC photovoltaic solar project in Winkler County, Texas, from Longroad Energy Partners for an undisclosed sum.

Innergex said it received full notice to proceed with construction of the Phoebe solar facility on July 2 and expects it to be operating in the third quarter of next year.

The company said the solar facility will sell its output to ERCOT and receive a fixed price on 89% of the energy it produces under a 12-year power purchase agreement with Shell Energy North America.

More: *Innergex*

ABB Completes GE Industrial Solutions Business Acquisition

ABB said July 2 it completed its $2.6 billion acquisition of GE Industrial Solutions, General Electric's electrification solutions business.

Stephanie Mains, who was GE Industrial Solutions' president and CEO, will remain the head of the unit as its managing director. As part of the acquisition, ABB received the long-term right to use the GE brand.

More: *ABB*

FEDERAL BRIEFS

Pruitt Resigns as EPA Administrator

Acting EPA Administrator Andrew Wheeler (far right) participated in this meeting between DOE officials and Murray Energy as a lobbyist for Murray. | *Photo obtained by In These Times*

EPA Administrator Scott Pruitt resigned, effective July 6, President Trump announced via Twitter.

The president said Deputy Administrator Andrew Wheeler would become acting administrator on July 9. He will retain the role until a new administrator is nominated by Trump and confirmed by the Senate. Confirmed as deputy in April, Wheeler is a former lobbyist for the coal industry, including Murray Energy, and a former aide to Sen. James Inhofe (R-Okla.), a prominent denier of climate science.

In his resignation letter, Pruitt cited "the unrelenting attacks on me personally [and] my family." He is the subject of at least 13 federal investigations relating to actions he took as administrator.

More: *The New York Times*

Study Estimates Deaths from Supporting Coal Plants

The Trump administration's plan to keep struggling coal-fired and nuclear power plants open for two years would result in 353 to 815 premature deaths in 2019 and 2020 from additional sulfur dioxide and nitrogen oxides emissions, according to a study released July 5 by Resources for the Future, a nonprofit research organization.

The study projects that the plan would delay the retirement of an average of 7,800 MW of coal-fired capacity and 1,100 MW of nuclear capacity. It also finds that the plan would support 790 coal mine jobs, meaning it would cause one death for each two to four-and-a-half coal mine jobs it supports.

More: *Axios*; *Resources for the Future*

CPP Replacement Draft Nearing Completion

EPA has drafted a replacement for the Clean Power Plan that is much less stringent, *The New York Times* reported July 5, citing industry sources who have worked closely with the agency to shape the document.

The Trump administration's proposal, according to industry attorneys familiar with it, recommends regulating the emissions of individual coal plants, which would require them to make modest upgrades, such as improving efficiency or substituting fuel.

The CPP was more ambitious, encouraging utilities to make broader systemic changes, such as switching from coal to natural gas or renewable energy, to cut emissions.

More: *The New York Times*

NRC Commissioner Declines Nevada Recusal Request on Yucca

Nuclear Regulatory Commissioner David Wright on July 2 declined Nevada's request that he recuse himself from the Yucca Mountain licensing proceeding.

The state asked for his recusal last month because of his public comments critical of local opposition to the project and his advocacy for storing waste at the site while he belonged to the Yucca Mountain Task Force from 2005 to 2010.

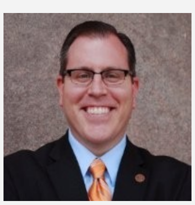
More: *Las Vegas Review-Journal*

STATE BRIEFS

ARIZONA

Corporation Commission Executive Director Resigns

Corporation Commission Executive Director Ted Vogt resigned July 5 after four elected commissioners raised questions about his wife's work with Arizona Public Service.



Vogt

Vogt's wife, Annie, works for Veridus, a lobbying firm hired by APS' parent company, Pinnacle West Capital, to fight a ballot initiative that, if approved by voters, would require APS and other regulated electric utilities to get half their power from renewable sources by 2030.

Vogt was hired in January 2017. He disclosed his wife's role with Veridus on July 2 and Commission Chairman Tom Forese sent him a letter the next day asking him to resign.

More: *The Arizona Republic; Phoenix Business Journal*

RPS Ballot Initiative Supporters File 480k+ Signatures

Supporters of an initiative that would require electric utilities to get at least half their power from renewable sources by 2030 filed more than 480,000 signatures with the secretary of state's office on July 5 to get the initiative on the November ballot.

The supporters only need 225,963 of the signatures to be valid to get the initiative on the ballot.

A spokesman for a group called Arizonans for Affordable Energy, which is financed largely by Arizona Public Service's parent, Pinnacle West Capital, has claimed that many of the people gathering signatures are convicted felons who, unless their civil rights were restored, are ineligible to do that.

More: *Arizona Daily Star*

CALIFORNIA

State Officials Discussing Financial Responsibility for Wildfires

Gov. Jerry Brown and state legislators said July 2 they were forming a special committee to discuss financial responsibility for wildfires, fire prevention and requiring utilities to develop more expansive wildfire preparation plans.

The announcement of the committee suggests the governor and the lawmakers

Continued on page 15

STATE BRIEFS

Continued from page 14

are considering scaling back the principle of inverse condemnation, which requires utilities to pay for damage their equipment causes even if there's no finding they were negligent in maintaining and operating it.

Any changes to the law resulting from the committee would apply only to future fires. But the committee's formation comes as Pacific Gas and Electric faces potentially billions of dollars in costs from the fires that swept across the state's wine country last year.

More: *The Associated Press*

Assembly Committee Passes 100% Zero Carbon Bill

The State Assembly and Utilities Committee on July 3 approved by a 10-5 vote legislation carried over from last year requiring retail energy sellers to provide 100% zero-emission power by the end of 2045.

Politically popular SB100, introduced by State Sen. Kevin De Leon, accelerates the timetable for no-emission power, requiring retail energy sellers to procure 50 to 60% zero-carbon electricity by 2030 before meeting the 2045 requirement.

Amendments passed June 27 allow publicly owned utilities with more than 50% hydropower to establish a "soft" renewable portfolio target in consultation with the Energy Commission. The bill will now move to floor votes in both chambers of the State Legislature.

MASSACHUSETTS

Deadline for Vineyard Wind Negotiations Pushed Back

The three electric distribution companies seeking to reach an agreement with Vineyard Wind on buying power from its proposed 800-MW wind farm have extended the deadline for reaching the agreement to July 31, according to a filing they made with the Department of Public Utilities on July 2.

"At this time, the distribution companies are in the final state of negotiations with Vineyard Wind based on the prices, terms and conditions contained in its selected bid," according to the filing by attorneys for the utilities.

More: *Cape Cod Times*

MINNESOTA

ALJ: Deny Minnesota Power Gas Plant Approvals

Public Utilities Commission Administrative Law Judge Jeanne Cochran on July 2 recommended that the commission deny Minnesota Power the three approvals it needs to build the 535-MW, gas-fired Nemadji Trail Energy Center with Dairyland Power Cooperative.

Cochran said the power plant is neither needed nor in the public interest.

A Minnesota Power spokeswoman said the plant would help the company reach its goal of having 44% of its power come from renewable sources by 2025, of which environmental groups are skeptical.

More: *Duluth News Tribune*

MISSOURI

PSC Reduces Ameren's Revenue 6% to Reflect Lower Tax Rate

The Public Service Commission on June 5 approved an agreement reducing Ameren Missouri's annual revenue by $166.5 million (6%), effective Aug. 1.

The agreement is in a case that the PSC opened on June 6 under a state law that gives the commission one-time authority to order an adjustment to the rates of certain electric utilities in light of the Tax Cuts and Jobs Act.

More: *Public Service Commission*

Continued on page 16

STATE BRIEFS

Continued from page 15

NEW HAMPSHIRE

3rd Biomass Power Company Halts Operations After Veto

A third biomass power company is temporarily winding down its operations in response to a governor's veto of a bill requiring utilities to buy electricity from biomass power plants at 80% of the market rate, an official with the company said July 3.

Bridgewater Power Plant joins Pinetree Bethlehem and Pinetree Tamworth in halting its purchase of wood chips from local suppliers and intending to burn through its stockpiled wood chips in the coming weeks, according to Michael O'Leary, the plant's asset manager.

O'Leary said he's confident the plant could remain running year-round if the legislature were to override the governor's veto.

More: Concord Monitor

NORTH DAKOTA

PSC Approves 1st Wind Farm Decommissioning Plans

The Public Service Commission said July 3 that it has approved the first set of wind farm decommissioning plans since it changed the rules governing wind farm decommissioning last year.

The PSC approved decommissioning plans for 14 wind farms. The new rules require wind farm developers to file decommissioning plans, including cost estimates, and have them approved by the commission before they open the facilities. They also require owners of existing wind farms to have submitted decommissioning plans by July 1. Additionally, the rules require the plans to include financial assurance for decommissioning.

More: Public Service Commission

OHIO

PSB Staff Recommend Wind Farm Approval

Power Siting Board staff recommended July 3 that Lake Erie Energy Development Co. (LEEDCo) be allowed to build the first freshwater wind farm in the U.S. on Lake Erie, if the company develops a plan for monitoring birds and bats so the facility can operate at night.

Beth Nagursky, LEEDCo's director of sustainable development, said she is confident the company can develop a monitoring plan for the $126 million Icebreaker wind farm that meets the staff's demands.

A public hearing on the project is scheduled for July 19.

More: The Plain Dealer

OREGON

Clean Energy Fund Backers Claim Enough Signatures for Ballot

Backers of an initiative to fund clean energy programs in Portland with a new business tax said July 5 they have gathered more than 60,000 signatures from people who want the initiative on the November ballot, well above the 35,000 needed.

The Portland Clean Energy Fund would pay for programs such as home weatherization, energy efficiency upgrades, and job training in the renewable energy and energy efficiency fields. Many of the programs would be earmarked for people with low incomes and communities of color.

Supporters of the initiative say it would raise an estimated $30 million a year from a 1% tax on businesses with half a million dollars or more of sales in Portland, excluding sales of groceries or medicine. A political action committee called Keep Portland Affordable is representing business interests that are against the initiative.

More: Oregon Public Broadcasting

Continued on page 17

STATE BRIEFS

Continued from page 16

TEXAS

Xcel Files Settlement Keeping Rates Unchanged

Xcel Energy said July 2 it has filed a settlement agreement with the Public Utility Commission that, if approved, would keep its base rates unchanged this year.

"When we filed for new rates in 2017, we anticipated the need for $55 million in additional revenue to recover the costs of new power grid investments," said David Hudson, president of Xcel Energy-Texas. "The significant reduction in federal corporate tax expense, coupled with lower costs on our long-term debt, will enable us to absorb the cost of new infrastructure without raising base electric rates."

More: *Lubbock Avalanche-Journal*

VIRGINIA

Court Upholds Law Allowing Pipeline Surveying w/o Permission

The state Supreme Court by a 6-1 vote on July 5 upheld for the third time a controversial law that allows natural gas companies to enter private property without permission to survey possible routes for new pipelines.

The majority opinion written by Justice Cleo E. Powell said the General Assembly clearly intended "to grant natural gas companies access to private property for the purpose of conducting certain activities related to the possible construction of a natural gas pipeline."

In a 23-page dissent, Justice Arthur Kelsey said the law "subordinates the ancient common-law rights of private property owners to the commercial interests of a pipeline company that is under no legal requirement to enter onto another's land."

More: *Richmond Times-Dispatch*

WASHINGTON

Carbon Fee Referendum Gets Enough Signatures for Ballot

Supporters of a carbon fee referendum delivered 375,000 signatures from people who want the referendum on the November ballot to the secretary of state's office on July 2.

The coalition of tribes, community, labor and environmental groups only needed 260,000 valid voters' signatures to get the referendum on the ballot. Voters rejected a carbon tax two years ago.

More: *The Associated Press*

Opening of Mexico's Market at Risk from New President

Continued from page 1

companies' expropriation of natural resources south of the border during the early 1900s. "Current leftist thought is that foreigners shouldn't have [the oil]," Shields said.

Lopez Obrador, more popularly known as AMLO, campaigned on promises to reduce economic inequality, combat corruption and reduce narco violence. Wood said his message was consistent with his previous two runs for the presidency in 2006 and 2012. But this time, AMLO's message resonated with Mexicans resentful of the elites and tired of the status quo.

He won almost 54% of the vote in a field with four other contenders.

"You have to go to an Andres Manuel rally just to experience it," said Wood, who was among the 80,000 that filled the Zocalo, Mexico City's main square, for the president-elect's victory speech July 1. "They're emotionally exhausting. You get there, and everyone is screaming, '*Presidente*! *Presidente*!'"

AMLO's National Regeneration Movement party (MORENA) formally created only four years ago, also won majorities in both houses of the national legislature and took five of the nine governorships that were up for grabs. With the party near a supermajority, which it could gain in the 2021 midterms, locals are already talking about constitutional changes that could lead to a second term for Lopez Obrador and the possible extinction of the PRI and PAN parties that have ruled Mexico for 89 years.

"Andres Manuel studies history," Wood said. "He wants to be a great *presidente*. He wants a legacy. He wants to go down in history and be remembered by the history books as someone who improved the country."

Taking on Pemex

Wood said AMLO's objective is to have MORENA become a "truly hegemonic" party that dominates Mexican politics for years to come. That means taking on a pair of institutions that have come to symbolize Mexican corruption, the government and Pemex, the national petroleum monopoly.

AMLO's administration, which won't take office until Dec. 1, has said it wants to review each of the 107 energy-related contracts the government has signed with ExxonMobil, Chevron and more than 70 other foreign companies to seek out corruption. Suspicious of the private-equity interests backing some of the contracts, the incoming government also wants to suspend new oil and power auctions during the transition, an action Wood says President Enrique Pena Nieto is likely to agree to as a sign of goodwill.

"It's not the contract; it's how [the companies] got the contract," Wood said. "In that way, [the government] could choose one company and make them the scapegoat. Then [it] can tell the public, 'We fixed it.'

"Will that freak out investors? Yes, but it won't be a disaster," he said. "Those 107 contracts are already starting to pay off. The rig count has gone up for the first time in years. Andres Manuel will start receiving the benefits of energy reform. Revenues are coming into the coffers. He doesn't have any interest in canceling those contracts. When they say there won't be any more bidding, that might be the truth."

Power Contracts More Transparent

While most of the contracts are oil and gas exploration and production deals, they also

Continued on page 18

Opening of Mexico's Market at Risk from New President

Continued from page 17

include clean-energy certificates and energy and capacity contracts. Power industry insiders say their contracts are more transparent than those in the oil and gas sector, and they remain confident they will remain a lower priority for AMLO. They note that the subsidized electric industry provides cheap power, while Pemex is seen as extracting value from the nation's resources.

"In our view, the electric industry is in a less vulnerable position than the oil and gas industry, but we'll be monitoring it very closely," said Laurie Fitzmaurice, vice president of development for EDF Energy's Mexico business.

EDF has a sizeable presence in Mexico, with 391 MW of wind generation operating, 90 MW of solar under construction and more than 1 GW of wind and solar in development. Fitzmaurice said EDF has been in Mexico for more than 15 years and intends to remain "for the long term."

"Signals sent by the incoming administration and the support of industrials and the local business sector have been positive," she said, noting that the industry is in the middle of another power auction, with economic bids due in November and contracts to be awarded in February.

Peter Nance, managing director of Que Advisors, is among those taking a wait-and-see attitude. He expects the oil-and-gas sector to undergo the new administration's initial scrutiny. "The [power] auctions have been successful in attracting capital," he said.

"Our job for the next six years is to explain the importance of the power reforms," said Ruth Guevara, a founding partner with Zumma, an energy consulting firm.

Nance and others point out that foreign investment will be important if AMLO wants to balance the budget and provide subsidies and other income support for low-income farm workers.

GCPA's July breakfast in Mexico City | © *RTO Insider*

"They will need the money for the federal budget," Lujambio Irazabal said. "The key is low [electric] prices for the end users. We've always had subsidies, and we'll always have subsidies."

"Electricity is less controversial in the public eye than oil contracts," Wood said. "There has to be some kind of gift to the Mexican electorate, and that will be continuation of subsidies for small Mexican consumers."

The government has long subsidized electric rates for its smallest consumers on the backs of large users, and Wood said AMLO has had a long history of fighting for lower prices. In the mid-90s, AMLO organized protests against excessive fees being charged to consumers in his home state of Tabasco, protests that continue today.

"You will see that powerful, centralized government is going to be crucial to managing the energy sector," Wood said.

He said whomever is chosen for energy secretary will be secondary to the president-elect. However, AMLO's early choice for the position, Pemex veteran Norma Rocio Nahle Garcia, is not the open-market economist Wood was hoping for. "Her vision is definitely of the old style of Mexican politics," he said.

And change may not be what Mexico's economy, the world's 13th largest, necessarily needs at this point, Wood said.

"Cheap power is fundamental to Mexico's economic competitiveness," Wood said. "Andres Manuel knows he needs one thing. He has political dominance, but he needs economic stability. He's not going to change very much."

How Long a Bridge for Gas?

Continued from page 1

batteries with access to cheap renewable power can be cheaper than CTs.

Greentech Media Research says storage will be competitive with gas peakers within four years and cheaper within 10 years. "I can't see a reason why we should ever build a gas peaker again in the U.S. after, say, 2025," Shayle Kann, a senior adviser to GTM Research and Wood Mackenzie, told GTM's Energy Storage Summit last December. "If you think about how energy storage starts to take over the world, peaking is kind of your first big market."

However, Bloomberg New Energy Finance does not see gas' role as the "bridge" fuel between coal and renewables ending any time soon, instead forecasting an increased role for gas peakers for the next three decades.

At the World Gas Conference at the Walter E. Washington Convention Center, speakers on a panel on the role for gas in power generation also were more bullish.

Shankari Srinivasan | © *RTO Insider*

With global power consumption expected to double by 2050, gas has a "great opportunity" to grow, said Shankari Srinivasan, vice

Continued on page 19

New Analysis Says Renewables & Storage Will Soon Supplant Peakers

Continued from page 18

president and managing director of global gas and EMEA power for IHS.

She acknowledged the growing competition from renewables and batteries and the impact energy efficiency can have on power demand growth. But in constructing future scenarios, IHS "found it very difficult to construct a case … where [global] gas-fired generation declines," she said. "Renewables on their own are unlikely to be able to support this level of growth. In the U.S., I think we will continue to see gas taking a large share of power generation and remaining a fundamental part of the power generation mix."

In contrast, Srinivasan said Europe may be seeing "the beginning of the end" of combined cycle gas turbine construction.

"I am, I think, being a little provocative. But it is possible to envisage new generation capacity as a mix of renewables and maybe only open cycle gas turbines," she said.

The price of gas will be paramount in China and the rest of Asia, which will each account for one-third of global power demand growth through 2050.

"In Asia, development and growth of gas will depend on how competitive it is with coal … and the strength of clean air policies. … Gas as a bridge to a zero-carbon future may be skipped entirely — replaced by a gray-green world of coal and renewables in certain parts of the world."

Moderator Tom Kuhn, president of the Edison Electric Institute (left), and De la Rey Venter, Royal Dutch Shell, at a World Gas Conference panel on gas' future in power generation. | *© RTO Insider*

Another panelist, De la Rey Venter, Royal Dutch Shell's executive vice president for integrated gas ventures, insisted that gas will remain essential to balancing the variability of renewables for at least a decade.

"There are those who say that ultimately batteries will eat gas for breakfast. We don't quite subscribe to that logic," he said. "There are many things that need to happen before batteries can play a meaningful role beyond short-term balancing of fluctuations in the system."

In addition to reducing their cost and improving their performance, Venter said batteries need frequent access to low- or no-cost power for charging to be competitive.

Venter said the gas industry needs to "fight this notion that …. there's this existential competition between gas and renewables."

"Gas is the ultimate enabler of renewables," he said. "If you really want to see a … widespread penetration of renewables, you need to have gas for the next decade or two."

Continued on page 20

Proposed new natural gas-fired power plants in the U.S.

New Analysis Says Renewables & Storage Will Soon Supplant Peakers

Continued from page 19

"The current rush to gas in the U.S. electricity system could lock in $1 trillion of costs through 2030."

Rocky Mountain Institute

Stakes: Replacing Half of Thermal Capacity by 2030

Although there is disagreement over when gas will lose its appeal for power generation, there's no doubt that the stakes are huge, both for the industry and consumers.

RMI notes that more than half of U.S. thermal generating capacity is more than 30 years old and expected to reach retirement age by 2030. It estimates that it would cost more than $500 billion to replace all retiring power plants with new natural gas-fired capacity (including $110 billion in investments already announced by utilities and independent power plant developers).

"This will lock in another $480 billion in fuel costs and 5 billion tons of CO_2 emissions through 2030, and up to 16 billion tons through 2050," RMI says. "The current rush to gas in the U.S. electricity system could lock in $1 trillion of costs through 2030."

RMI sees a $350 billion (net present value) market opportunity through 2030 for renewables and distributed energy resources supplanting gas projects where cost effective. That would eliminate $370 billion of gas capital costs and operating expenses, a net savings of more than 2%, it said.

"This investment trajectory would unlock a market for renewables and DERs many times larger than today's," RMI said. It would also reduce carbon emissions and save consumers money — even excluding DERs' value to the distribution system beyond peak load reduction or avoided fuel price risk or any emission costs.

Cheaper than Peakers, Nearing Parity with Combined Cycle

RMI's analysis found that the clean energy portfolio — wind, solar and DERs, including batteries — was cheaper than two CT plants planned for serving peaks, beating one in the Mid-Atlantic by 60% and one in ERCOT by 47%.

In a comparison with CCGT power plants with higher capacity factors, RMI said the clean portfolio was 8% cheaper than a CCGT in California but 6% more costly than such a project in Florida, RMI said.

"Factoring in expected further cost reductions in distributed solar and/or a $7.50/ton price on CO_2 emissions, all four cases show that an optimized clean energy portfolio is more cost-effective and lower in risk than the proposed gas plant," the report said.

In addition to competing with proposed gas generation, clean energy portfolios will also undermine the profitability of existing plants within eight years, RMI says. In some areas, clean energy portfolios' combined construction and operating costs — levelized cost of electricity — will be lower than CCGTs' operating costs by 2026, assuming $5/MMBtu gas (translating to operating cost of $36/MWh). Assuming gas prices remain about $3/MMBtu ($23/MWh), the alternatives won't be cheaper until about 2040 — still within the operating lives of plants being proposed now, RMI says.

$144 Billion Stranded?

"In other words, the same technological innovations and price declines in renewable energy that have already contributed to early coal plant retirement are now threatening to strand investments in natural gas," the report says. "Thus, the $112 billion of gas-fired power plants currently proposed or under construction, along with $32 billion of proposed gas pipelines to serve these power plants, are already at risk of becoming stranded assets."

With about 83% of announced gas projects proposed for restructured markets,

Continued on page 21

Alternatives to new thermal power plant investment under consideration | *Rocky Mountain Institute*

New Analysis Says Renewables & Storage Will Soon Supplant Peakers

Continued from page 20

independent power producers would bear most of the risk of competition from DERs and renewables.

The trends are also beginning to pinch IPPs' suppliers. Bloomberg reported in June that Siemens is considering selling its gas turbine business. The company's CFO told investors in March that the market for large gas turbines will fall to 100 units in 2018, 10% below the company's previous projections.

Competitor General Electric also sees a "soft" market for gas turbines for several years. Two-thirds of its power capacity additions in 2017 were renewables. But in announcing a corporate restructuring in June, the company told investors, "Gas remains key to long-term energy mix."

California, Arizona Leading the Transition

RMI cites as examples 11 alternatives to new thermal power plant investment now under consideration (see below). Six of them are in California, where the abundance of solar and wind — and the state's environmental goals — have made gas-fired generation an endangered species.

In February, the California Public Utilities Commission issued its first integrated resource plan. Intended to help the state meet its 2030 greenhouse gas reduction goals — a 50% reduction in electric sector GHG emissions from 2015 levels — the plan sees no new gas-fired capacity through 2030. Incremental generation needs are instead satisfied by utility-scale solar (73%), in-state wind (9%), battery storage (16.3%) and geothermal (1.7%).

CAISO has approved battery energy storage (BES) as a capacity resource if it can maintain its rated output for four consecutive hours over three consecutive days.

NRG Energy last October asked the California Energy Commission to suspend its review of the proposed 262-MW Puente plant in Oxnard after commissioners recommended rejecting the application. The turnabout came following criticism that the 2014 analysis that supported the gas addition did not reflect steep price declines since then for non-emitting alternative resources. (See *NRG Signals Pull-out on Proposed Puente Plant*.)

California regulators in January ordered Pacific Gas and Electric to solicit energy storage, renewables and load management options to replace three uneconomic Calpine gas peakers. On June 29, PG&E proposed to fill its need with four storage projects totaling 567 MW.

In March, PG&E solicited proposals to develop up to 45 MW of "clean energy" resources, including at least 10 MW of energy storage, to replace the aging 165-MW Dynegy Oakland jet fuel-fired power plant. It would be the first time PG&E used clean energy resources as an alternative to fossil fuels for transmission reliability. (See *PG&E to Seek Storage, EE to Replace Dynegy Plant*.)

Also in March, the Arizona Corporation Commission rejected Arizona Public Service's plans to double its natural gas fleet over the next 15 years, instead ordering that utilities show that storage is *not* a cost-effective option before seeking approval of new natural gas units.

APS and Xcel Energy Colorado are among the utilities whose solicitations have produced renewable and storage bids at lower energy or capacity costs than thermal generation. Xcel received 87 bids for solar/storage projects at a median price of $36/MWh — compared with the $85/MWh levelized cost of electricity for an advanced CT, according to the Energy Information Administration.

To be sure, battery technologies will have to improve to be a solution in colder climates, where winter peaks can last for more than four hours.

Nevertheless, Xcel Energy CEO Ben Fowke told *The Wall Street Journal* earlier this year, "I could see in 10 to 15 years where you have 30% of what is traditionally a peaker market served by storage."

Mark Dyson, one of the authors of the RMI study, discussed its findings in a webinar last week, citing evidence that investors agree with its conclusions.

Dyson cited the 7% one-day drop in GE's share price in late May after CEO John

Continued on page 22

Comparison of combined cycle operating costs vs. clean energy portfolio levelized costs 2020-2040 | *Rocky Mountain Institute*

New Analysis Says Renewables & Storage Will Soon Supplant Peakers

Continued from page 21

> **"If the savings in systemwide production costs exceed the premium in fixed costs, BES systems would yield net benefits relative to CTs."**
>
> **IHS Markit**

Flannery told investors that the market for the company's large gas turbines will remain weak through 2020. "The narrative was around the bad bet that it made in doubling down on new gas as a growth opportunity," Dyson said.

"We see other investors looking at the PJM capacity market results and seeing how much uncleared gas there was that was in the queue. That's kind of another hint that the market is cooling," he added.

IHS also Bearish on Peakers

The results of RMI's analysis were consistent with those published in March by IHS Associate Director Wade Shafer and senior analyst Sam Huntington.

The two compared a scenario in which California's incremental resource adequacy needs from 2021 to 2030 were met entirely with CTs versus one using four-hour lithium-ion (Li-ion) BES.

They concluded that despite projected cost declines, the levelized fixed cost (capital and fixed operations and maintenance costs) of a four-hour Li-ion BES system will remain more expensive than a typical CT through 2030. But with inexpensive power for charging, they said, batteries would have a lower operational cost. "If the savings in systemwide production costs exceed the premium in fixed costs, BES systems would yield net benefits relative to CTs," they said.

IHS' analysis assumes that by 2030, more than half of California batteries will be linked to otherwise-curtailed solar PV, giving them access to low- and no-cost power.

If California met all its peaking capacity needs from 2021 to 2030 with BES instead of CTs, net present value benefits to the power sector would be about $16 million — essentially break-even given the size of the investments, the study found. "Savings also arise from the higher efficiency of the remaining thermal fleet — batteries smooth the variability in net load, resulting in fewer start-ups by peakers and allowing mid-merit plants to operate at lower heat rates," they wrote.

Their conclusion: "California appears to be on the right track in terms of requiring batteries to cost-effectively manage the excess solar energy created by the [renewable portfolio standard]; however, IHS Markit has not evaluated the optimal year to fully transition from new gas-fired capacity to batteries."

In an interview, Huntington said the RMI analysis appeared sound. He said he was somewhat surprised that RMI found not only peakers but CCGTs at risk. "A lot [of the RMI analysis] relied on energy efficiency and demand response, something we haven't looked at as closely," he said.

Dissenting Voices

In contrast, BNEF contends gas will remain vital through 2050.

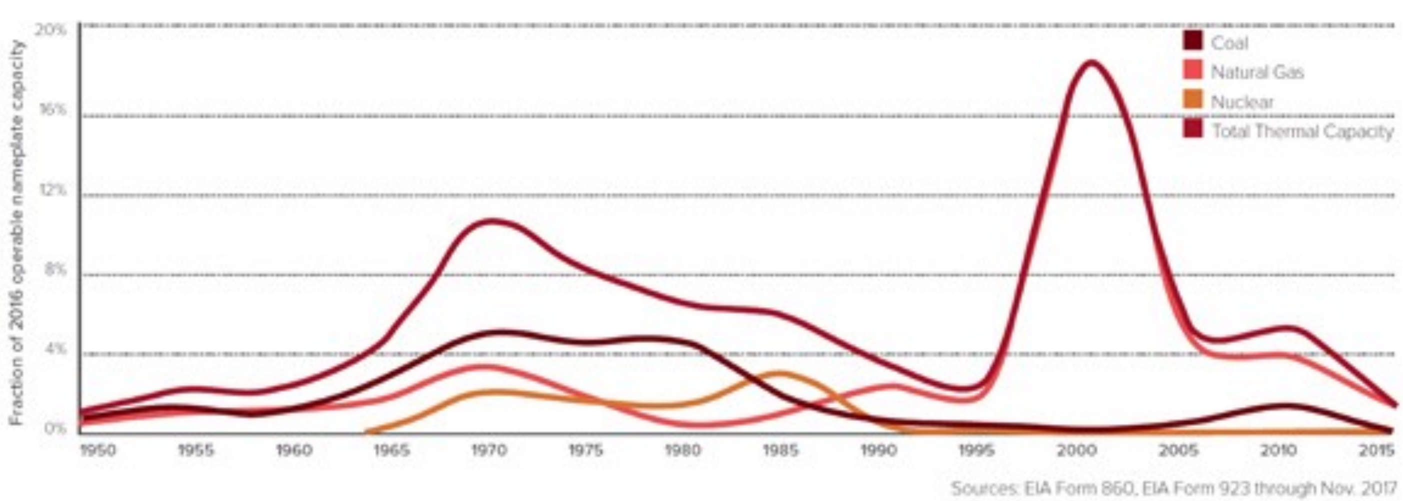
Its 2018 New Energy Outlook report predicts coal and nuclear will "have almost disappeared from the electricity mix" by 2050, while renewables penetration will reach 55%. Supporting renewables, batteries will "grow in significance" beginning in 2030, it said.

BNEF projects PV module prices to continue dropping at the 28.5% "learning rate" of the last 40 years — meaning costs drop 28.5% for each doubling of deployed capacity.

Li-on battery pack prices will fall by almost two-thirds between 2017 and 2030, BNEF says, driven by the learning rate of a 27-fold increase in electric vehicle sales.

But while cheaper renewables and batteries will hurt most thermal power sources, BNEF sees an increased role for gas peakers.

"As thermal plants retire and variable renewables increase the variability on the supply side … peaking gas emerges as a critical technology to back up renewables during the extremes when wind and solar are at a minimum (sometimes this can be up to weeks at a time)," BNEF said. "We expect peaker gas to grow by almost a factor of four by 2050, as a cheaper, more nimble alternative to large-scale CCGT and coal-fired power plants running at low capacity factors."



Distribution of thermal power plant capacity by fuel type and online date