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Your Eyes and Ears on the Organized Electric Markets
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No Fireworks for FERC Nominees at Senate Hearing

By Rich Heidorn Jr. and Michael Brooks

WASHINGTON — Pennsylvania regulator Robert Powelson and Neil Chatterjee, senior energy policy adviser to Senate Majority Leader Mitch McConnell (R-Ky.), received a mostly friendly reception Thursday at their Senate confirmation hearings to fill two Republican vacancies on FERC.

Aside from several interruptions by anti-pipeline activists, the two-hour hearing before the Senate Energy and Natural Resources Committee was largely uneventful with no obvious stumbles by the nomi-

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From left to right: Dan Brouillette, Neil Chatterjee and Robert Powelson. | *© RTO Insider*

PURPA Critics Call for Reforms

By Robert Mullin

Smutny-Jones

ANCHORAGE, Alaska — A nearly 40-year-old federal law enacted to spur competition in the power industry is badly outdated and in need of reforms to reflect the current markets, critics of the law said during a panel at the annual Western Conference of Public Service Commissioners last week.

"I kind of feel like I was invited to lunch only to find out that I am the lunch," joked Jan Smutny-Jones, CEO of the Independ-

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- CPP's Fate Leaves States, Markets to Drive Grid Decarbonization (p.4)

Capacity Prices down in Most of PJM in 1st Year of 100% CP

By Rory D. Sweeney and Rich Heidorn Jr.

PJM's first capacity auction requiring year-round availability saw prices drop by one-quarter in most of the RTO, with only the EMAAC and Duke Ohio-Kentucky regions recording increases.

Base Residual Auction prices fell to $76.53/MW-day in most of the RTO, down from $100 last year. ComEd dropped to $188.12 from $202.77, and MAAC, which cleared with the RTO at $100 last year, dropped to $86.04. EMAAC, which cleared at less than $120 last year, jumped to $187.87, while the Duke region, which did not price separately from the RTO last year, cleared this year at $130.

This was the first year in which all generation must be Capacity Performance, meaning it's expected to be available throughout the delivery year and faces stiff penalties for

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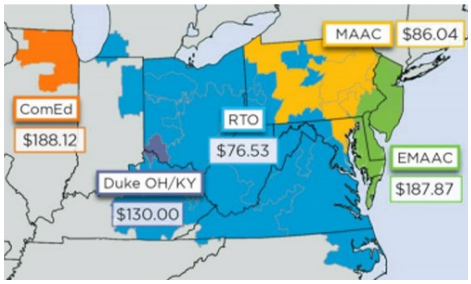

DY 2020/21 capacity clearing prices | *© RTO Insider*

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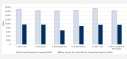

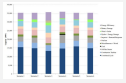

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Western Conference of Public Service Commissioners

Organized Market Officials Tout Benefits, Encourage Regulator Scrutiny

By Robert Mullin

ANCHORAGE, Alaska — Organized electricity markets could provide significant benefits for the West, but state regulators should approach their development with a critical eye, market leaders said last week.

"There is value in markets, and as a result, I'd encourage you to get educated about the benefits of them, and seeing also how it may get to change how you regulate utilities," SPP General Counsel **Paul Suskie** said during a panel discussion entitled "Energy Imbalance Market or the Wild West Interconnect" at the annual meeting of the Western Conference of Public Service Commissioners.

'Healthy Skepticism'

"Have a healthy skepticism. That's what I used to be required to do," the former Arkansas Public Service Commission chairman added.

EIM Governing Body member **Carl Linvill**, formerly a Nevada commissioner, recounted how his career path has imbued him with a dose of skepticism about markets. A former economics professor, Linvill moved to Nevada two decades ago to help build a market monitoring framework for the state's proposed retail deregulation. In the wake of the Western Energy Crisis of 2000-01, the governor handed him the responsibility for unwinding the experiment in restructuring.

"My interest in coming out to Nevada for the job was [that] I was little bit concerned about over-optimism in the markets," Linvill said. "I like markets, I think markets can be very beneficial, but I think that you have to have the right … legal structure [and] context for markets to work well."

Linvill noted that each of the Governing Body's five members is an outsider to CAISO, which operates the market. Members value the expertise of the ISO, as well as its state-of-the art operations, he said.

"But, also, having been outsiders and knowing that we need to be critical, we also take it as part of our job to question and challenge [ISO] staff and to try to push them to understand the perspective [from] our former roles," Linvill said.

Linvill described to the audience of mostly commissioners and their staff how the Governing Body maintains independence from the ISO and exercises oversight over the market.

After originally being selected by a stakeholder nominating committee and approved by the CAISO Board of Governors, the body now approves its own members. The body — not the board — exercises "primary authority" over any ISO initiatives that wouldn't have arisen without the existence of the EIM, meaning it can vote to recommend an EIM-related proposal.

"The Board of Governors can accept or reject, but they cannot amend or alter the proposal," Linvill said.

Quantitative Benefits

Suskie touted the benefits of SPP's own energy imbalance market — the precursor to the RTO's current market — which saved members $1.1 billion between 2008 and 2013, far exceeding projections of $600 million.

"The higher the gas prices, the better the benefits of trading," Suskie said, pointing out that the greatest savings occurred during the market's early years when natural gas prices exceeded $7/MMBtu.

SPP's incorporation of the day-ahead market in 2014 yielded another $1 billion in benefits, Suskie said.

While comparatively modest, the Western EIM's benefits have grown consistently with the addition of new participants. The market now encompasses more than 50% of the region's load, according to **Stacey Crowley**, vice president of regional and federal affairs at CAISO.

Crowley said the EIM has saved nearly $174 million since its inception in November 2014, including $31 million in the last quarter — an all-time high. (See *CAISO EIM Exports Rise with Spring, Report Shows*.)

> ***"I asked them, 'How important were the non-quantified benefits...?' And they said, 'Those were the driving benefits.'"***
>
> **Stacey Crowley, CAISO**

Other benefits include the reduced curtailment of renewable generation, which can be offloaded into neighboring balancing authority areas, and sharing, which has reduced the need for EIM participants to carry flexible ramping reserves.

"The benefits continue to accrue," Crowley said. "It really comes down to more efficient dispatch. It's both interregional and intraregional. So we optimize within the balancing authority and between balancing authorities to really take best advantage of the resources that the Western utilities have."

Qualitative Benefits

Linvill highlighted the importance of the qualitative benefits issuing from the EIM's approach to dispatch.

"I think that a side benefit of this is that there's much greater visibility within the utilities and within the [EIM] footprint region on what's actually going on and what resources are available, what their capabilities are, [and] what the transmission system capabilities are. I think there's much better information about that now then there was" before the market, he said.

Those qualitative benefits were enough to swing Arizona's Salt River Project to join the market after determining that membership would be a financial "wash" for the publicly owned utility, Linvill said.

"I asked them, 'How important were the non-quantified benefits, these other benefits?' And they said, 'Those were the driving benefits. We see this as an essential step to modernize our operations now so we can keep up as things evolve,'" he said.

Linvill said he has respect for markets that work well but recognizes that they can go awry.

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Western Conference of Public Service Commissioners

CPP's Fate Leaves States, Markets to Drive Grid Decarbonization

By Robert Mullin

ANCHORAGE, Alaska — State policies, market forces and technological advancements will continue the decarbonization of the electric industry regardless of the fate of EPA's Clean Power Plan, current and former utility regulators said last week.

"I think the Clean Power Plan is pretty much dying," Doug Little of the Arizona Corporation Commission said during a panel discussion on environmental policy in the "aftermath" of the CPP at the annual meeting of the Western Conference of Public Service Commissioners last week.

"It's only a question of how it's going to die. Right now it's on life support. The question in my mind is, over the next several months, will the EPA pull the plug on the life support and see if it lives in any form, or will they drive a stake through its heart?"

Arizona on Path to Compliance

Little said what happens to the CPP under the Trump administration will make little difference to his state, which opposes implementation of the policy.

The final rule from EPA was "actually something that was achievable" and the state's utilities "did a tremendous job" of incorporating the emissions targets in their integrated resource plans, Little said.

"And, they're not, in my view, going to essentially take that whole planning process that they spent the last two years working on and just throw it away," he said. "The direction that they're going to continue to take is the direction that they've been planning to take over the last couple years."

Little | © RTO Insider

Tim Echols of the Georgia Public Service Commission echoed Little's take.

"To continue with Doug's analogy about the hospital, I really think the Clean Power Plan is going to die — [but] not from the stake. I think it's going to die from a lack of payment on the hospital bill. And they're going to have to unplug it because in the regulatory hospital, not everybody gets service regardless of the situation in the emergency room," Echols said.

The "non-payment" is the Trump administration's proposed 31% cut to the EPA budget, Echols said.

"I don't know how they do corporal punishment in Alaska or Hawaii, but I think President Trump is taking the EPA out behind the woodshed, putting them in timeout, whatever you want to call it," Echols said. "And you know what? That's not unusual for a president to make those kind of decisions. Think about what President Obama did to the [Nuclear Regulatory Commission] and to Yucca Mountain when he got elected."

Political, Practical Concerns in Georgia

Already speaking of the CPP in the past tense, Echols said that he had two problems with the plan, one political and the other practical.

The political issue: that the CPP would have turned the appointed head of Georgia's Environmental Protection Division (EPD) into an "energy czar."

"Now I'm not appointed by the governor, nor are my four colleagues, and this was going to put the EPD administrator essentially in charge of the energy plan for the state," Echols said. He noted that Georgia's rural electric cooperatives are nonprofits "that don't take their orders from the EPD," leaving the burden for compliance on the state's major investor-owned utility, Georgia Power.

Echols' practical concern: "How it picked winners and losers. The big winner, of course — natural gas."

To comply with the rule, states would be forced to close coal-fired plants. That — along with the trend of nuclear plant closures — would leave the power sector exposed to increase gas prices in the future, Echols contended.

"Personally, I'm glad the EPA's in timeout. I'm not saying I don't like clean air. I'm not saying I don't value clean water. But this agency went way too far, and the president is sending a message, and frankly I think it's

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"So, job one is to protect these benefits that have been created, to take this step-by-step, to add entities to the footprint, to potentially add services at some point. But we're not rushing to that or even discussing that at this point," he said. "Really, we want to make sure that we establish a market that has stability and robustness and continues to produce these benefits."

Patrick Lyons of the New Mexico Public Regulation Commission questioned Crowley about whether EIM participants face exit fees.

"There is no exit fee. Entities can choose not to participate by just not bidding in resources or they can leave altogether, so that's a nice benefit as well," Crowley responded.

"So if a company wants to get out, and you're counting on them being in there, how does that work? It doesn't seem very stable," Lyons said.

"I think that the benefit is that we're not counting on them," Crowley said. "This is above-and-beyond optimization that we do normally every day, so we're going to continue to balance the load and resources based on what resources are available to the market."

CPP's Fate Leaves States, Markets to Drive Grid Decarbonization

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the right message."

Two-State Perspective

Robert Kenney, vice president of state regulatory relations at Pacific Gas and Electric, California's largest utility, said he could grasp both sides of the CPP debate.

"California has been very explicitly, vocally and unabashedly supportive of the Clean Power Plan. PG&E in particular has been vocally supportive of the Clean Power Plan. And I think that's probably not surprising when you think about California's position relative to taking steps to combat climate change," said Kenney, a former Missouri regulator.

PG&E is ahead of schedule in meeting California's 33% by 2020 renewable portfolio standard. Including hydroelectric and nuclear, the company's portfolio is already 70% greenhouse gas free, so "the Clean Power Plan wasn't viewed as a barrier," Kenney said.

"Now contrast that to my experience in Missouri, where 80% of our generation was coal-fired, and the Clean Power Plan presented significant challenges," Kenney said. "Many of the utilities that I regulated were vocally opposed to the Clean Power Plan on a variety of different legal grounds and on practical economic grounds."

Those utilities were faced with possibly having to strand coal-fired assets in which they had invested billions to comply with EPA's Mercury and Air Toxics Standards. That, said Kenney, was "difficult to get your brain around" as a regulator.

"I think what you will see in the aftermath of the Clean Power Plan is that states will continue to individually determine how [they] are going to deal with climate change depending on the particular state," Kenney said.

Low gas prices in Missouri are already leading to the retirement of some of those coal-fired plants, regardless of the CPP, a development Kenney expects to continue.

Hawaii: Exempt but Vocal

Lorraine Akiba of the Hawaii Public Utilities Commission noted that although her island state is exempted from the CPP, the state's attorney general has weighed in to support the plan against court challenges. Hawaii has enacted the most ambitious RPS in the country — 100% by 2045.

Kenney | © RTO Insider

Akiba | © RTO Insider

She predicted there will be "big fights" in Congress over the CPP and the EPA budget.

"This is what democracy is about. You know, last time I looked, we're not an oligarchy and not a dictatorship. That's the beauty of democracy. You see four different commissioners up here, with four similar but different viewpoints," Akiba said.

Market Forces

With or without the CPP, the panelists agreed, market forces will continue the drive away from coal and toward gas and renewables.

"What really is affecting the direction towards renewables — and the direction away from some of the fossil fuels like coal — is sub-$3 gas," said Little, who also touted the fact that his state enjoys more than 300 days of sunshine a year, making it fertile ground for the continued expansion of utility-scale solar.

Still, Little said that he's "very concerned" about what FERC and the wholesale markets will do to "more properly value" baseload resources such as coal and nuclear to ensure grid reliability.

"I'm going to be interested to see what happens after my friend Rob Powelson and Neil Chatterjee get onto FERC and see how they're going to address this with some of the changes in the market," Little said. (See related story, *No Fireworks for FERC Nominees at Senate Hearing*, p.1.)

Kenney said technological advances are key drivers of both the market forces and environmental policy leading to decarbonization. Included among those advances: the improvement in natural gas fracking techniques and advances in PV solar cell production that has dramatically reduced costs.

"We've got technological advances that are giving us the tools to" execute low-carbon policies, Kenney said.

Akiba said she agreed that market forces will help determine the future. "I disagree with some of my colleagues that coal is coming back. Coal's never coming back. Coal's not economically viable for this country," she said.

The fight against climate change will continue outside D.C., Akiba argued.

"States are the leaders in this. Cities are the leaders. And I shout out to Atlanta, Ga.," Akiba said, referring to Echols' home state. "The City Council and mayor there just adopted a 100% renewable portfolio standard for their city."

Akiba also encouraged the conference to consider the economic benefits of reducing GHG emissions, saying "the rest of the world is going to decarbonize regardless of the rhetoric coming out of Washington, D.C."

"There are opportunities for economic growth in renewable energy technology, new developments in electrification of transportation [and] alternative transportation. If we let that opportunity go, China is right there."

PURPA Critics Call for Reforms

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ent Energy Producers Association, and the lone defender of the Public Utility Regulatory Policies Act on the panel.

The discussion was moderated by Idaho regulator **Kristine Raper**, whose commission has been an outspoken opponent of PURPA because of its impact on Idaho Power, which has faced mandatory purchase obligations equal to half its load. (See *FERC Conference Debates PURPA Costs, Purchase Obligations*.)

Before setting out his case against PURPA, **Jonathan Weisgall**, vice president of government relations at Berkshire Hathaway Energy, provided a brief history of the act.

Congress passed PURPA in 1978 in response to the mid-70s energy crisis, Weisgall pointed out. The law was designed to promote energy conservation and increased use of domestic energy resources, including cogeneration and renewables. It mandated that all electric utilities — including municipals and cooperatives — purchase electricity from "qualifying facilities" at the utility's "avoided cost." QFs were defined as cogenerating plants and small power producers — under 80 MW.

The Case Against PURPA

But the energy sector has "changed completely" in the 40 years since PURPA's passage, according to Weisgall, and the law — including FERC's regulations implementing it — have not kept up.

He recounted a litany of complaints over the law: Utilities are required to buy power that is neither necessary nor cheap, and they have no control over where QF projects are integrated into the system. PURPA contracts can be lengthy and are not subject to the same resource planning and cost scrutiny as other utility decisions, undermining state integrated resource planning and processes. QFs are not subject to the same curtailment procedures as other generators, yielding an unfair advantage.

"And, lastly, since QFs are not subject to resource planning … significant additions of unplanned renewable QFs can cause reliability issues if they don't provide planned-for ancillary services," Weisgall said. "So PURPA is simply outdated."

Former FERC Commissioner **Philip Moeller**, now a senior vice president with Edison Electric Institute, concurred with Weisgall, calling PURPA "a relic of another era" and saying the country's generation fleet has achieved the diversity envisioned by the act.

In 1978, Moeller pointed out, the U.S. produced more than 16% of its electricity from oil. "Now it's down to 1%. The resource mix has changed dramatically."

1992 Energy Policy Act

Both Moeller and Weisgall pointed to the 1992 Energy Policy Act as being the driver in transforming the market for generation in recent decades.

"FERC's requirement of open access to transmission and standardized interconnection rules and procedures for smaller facilities have removed structural barriers to entry and opened up opportunities for new entrants, including QFs, to supply wholesale energy to distant markets whether a utility is a member of an RTO or not," Weisgall contended.

"We now have better markets. We didn't have RTOs then, or an EIM," Moeller said, referring to the CAISO-run Western Energy Imbalance Market.

"Talking about EIM as a competitive alternative — QFs don't participate in that market," Smutny-Jones countered. "The reality is that I seriously doubt that there's any utility in the West that would come to [a utility commission] and say, 'Don't worry about it, I'm going to cover the cost of my power plant in the EIM market.' This isn't going to happen."

Smutny-Jones, whose organization represents independent power marketers and generators in California, agreed that "PURPA has been with us for a while." Like other energy rules, it could be "fine-tuned from time to time."

"But I think it has usefulness, I think it will continue to have usefulness to push where we don't have some competitive pressure on vertically integrated utilities," he said.

Moeller pointed to another reason to roll back PURPA's purchase obligations: the success of energy efficiency measures.

"We have flat to declining load growth in electricity, something that was unfathomable for decades and decades and decades," he said. "Modern reality comes down to ... in many cases, utilities are required to buy power they just don't need in a flat or declining demand situation."

On top of that, Moeller argued, utilities are often paying above-market prices.

"When you add to the cost of power and customers have to pick that up, it has a reverse impact [on efficiency]. Take a look at the Northwest: The No. 1 resource for the Northwest Power Pool for 25 years has been efficiency. That is their first choice," he said.

Smutny-Jones questioned the premise that declining load should be cited as a reason to roll back PURPA.

"If I heard my colleagues correctly, you should all be seeing [integrated resource plans] coming before you that show no new builds ever in the West. I don't think that's true," he said. "I don't pretend to have read the IRPs in 13 western states, but I guess that there will be a significant amount of build-out of different kinds of generation over the next 10 years or so, and that should be subject to pressure from PURPA."

'More Tools, not More Constraints'

Weisgall laid out a series of recommended changes.

Among them: Congress should modify the purchase obligation to clarify that states that utilize IRPs have the authority to decide whether their utilities are obligated to purchase from QFs. In addition, Congress should reduce the size of QFs to "well below" 80 MW and modify FERC's "1-mile rule" in order to prevent suppliers from dis-

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PURPA Critics Call for Reforms

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aggregating their projects "to essentially game the system."

The 80-MW threshold applies to all generating facilities at the "same site" — which FERC has defined as all facilities within 1 mile of the facility seeking QF status. Weisgall said Congress should redefine "comparable markets" to relieve utilities participating in voluntary auction-based and energy imbalance markets from the mandatory purchase obligation.

Weisgall also thinks state commissions should exercise more discretion on the length of PURPA contracts and avoided-cost calculations to ensure those costs are no higher than competitive wholesale market prices — citing LMPs and auctions as potential proxies.

"States need more tools, not more constraints," he said.

Smutny-Jones acknowledged that his state of California made some mistakes early on in its adoption of PURPA when it set avoided costs based on oil at about $100 a barrel.

"We learned from that," he said, adding that in the early 1990s California created a system in which utilities put out a hypothetical generating resource that suppliers could bid against.

"And it was hugely successful," Smutny-Jones said. "The prices were significantly lower than what the utilities had suggested they would be."

"There's a lot of power in the states to try to modify PURPA in ways that can work for you," he said, addressing regulators in the audience.

Smutny-Jones noted that the avoided-cost formulation falls to state regulators.

"So you can either count on the market to give you that number and have people compete against each other, or you can try to come up with a complicated formula," he said. "I would have to caution you about that latter [option] because you'll get it wrong," he said.

Why 'Avoided' Costs?

Weisgall said Smutny-Jones had raised "an interesting point of history."

"Why did PURPA use the term 'avoided costs?' Because there were no market prices. There were no markets as such, so that was the formula, and today of course there are market prices, but we have still have to worry about what avoided cost means, which has kept generations of lawyers employed."

Weisgall posed a question about states that allow third-party suppliers "complete access" to the transmission system.

"Why do they need PURPA if you've got a solar farm and it's a great one and its [cost is] below what the utility could build? We're already seeing with our NV Energy utility in Nevada that we are losing some major customers — casinos — where they are finding third-party providers. Well why do we need PURPA under those circumstances?"

Smutny-Jones acknowledged that PURPA is no longer an issue in California because the state's aggressive renewable portfolio standard has created a strong market for third-party generation. "My phone hasn't rung off the hook about PURPA for a very, very long time because people have other places to go with their resources," he said.

Moeller wrapped up the discussion with a call to arms directed at his former agency rather than the state commissioners in attendance.

"I don't think I'm overstating a full-blown crisis when a utility in Idaho that's guaranteed [to be] long power until at least 2035 is being required to buy at the cost of … $3.1 billion over the next the next 20 years … for power they don't need.

"That's pretty serious. So I think a newly rebooted FERC will have to address this."

ERCOT News

Technical Advisory Committee Briefs

Far West Texas Project Gets TAC's OK

AUSTIN, Texas — ERCOT stakeholders last week unanimously endorsed Oncor and American Electric Power's 345-kV Far West Texas Project that addresses continued load growth southwest of Odessa, Texas.

Since 2010, the area has seen annual load growth of about 8%, driven by increases in the region's oil and natural gas production. While demand growth projections have tapered off recently — only 2.4% through 2020 — Oncor predicts annual load growths as high as 11% within portions of the area over the next five years. More than 1,600 MW of solar resources are expected to come online during that time frame.

Oncor and AEP's original request to ERCOT's Regional Planning Group last April estimated the project's price tag at $423 million.

However, a staff review of 40 different alternatives lowered the cost to $336 million after settling on the most cost-effective of four options: two separate double-circuit 345-kV lines — each with one circuit in place — substation expansions and other transmission elements. One 85-mile line would run between the Riverton and Moss switching stations, with a second circuit added to the existing 16-mile 345-kV line between Moss and the Odessa line. A second, 68-mile 345-kV line would run from the Solstice switching station to the Bakersfield switch station. ERCOT concluded the upgrades "meet the reliability criteria in the most cost-effective manner and have multiple expansion paths to accommodate future load growth."

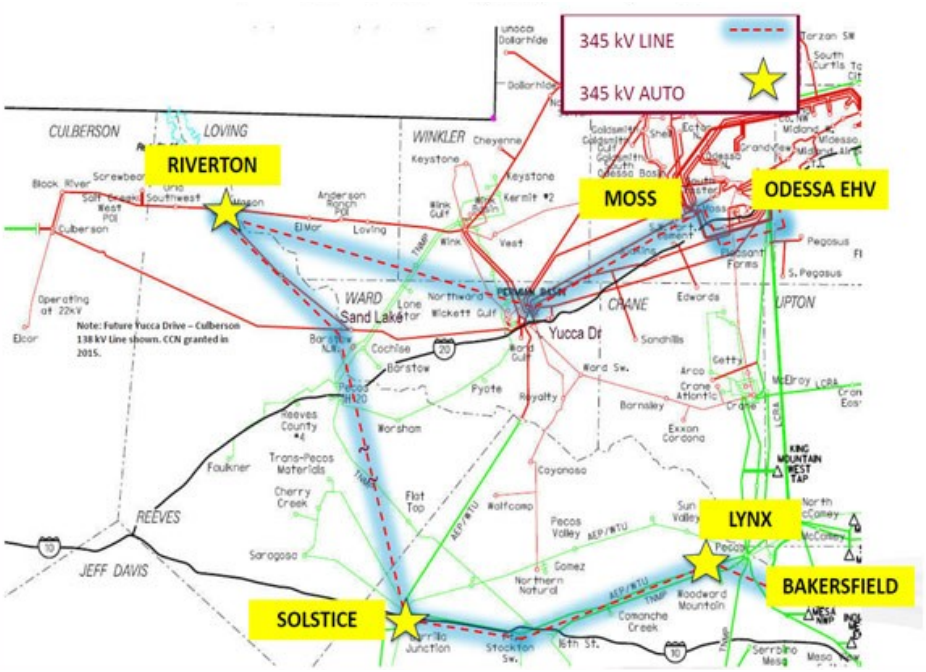
Two of the other options would have closed the 345-kV loop between the two lines, while a third would operate the transmission lines at 138 kV on double-circuit structures. The costs ranged between $446 million and $501 million.

"My only concern is it keeps a tight bandwidth on future growth," Oncor's Collin Martin said during Thursday's Technical Advisory Committee meeting.

Staff admitted the loop could be completed but said its recommended option would provide the best reliability solution while "augment[ing] the load-serving capability … as the outlook for greater load and generation resources in this region becomes more certain."

The project has been proposed to go in service by 2022. Oncor, AEP and the Lower Colorado River Authority would be responsible for the parts of the project within their service territories.

The project still needs approval from the ISO's Board of Directors and a certificate of convenience and necessity from the Public Utility Commission of Texas.



Far West Texas Project area | *ERCOT*

Rayburn Country Integration

Staff also updated the TAC on the potential integration of the 20% of Rayburn Country Electric Cooperative load that sits in the Eastern Interconnection. The East Texas co-op is considering connecting the load — approximately 190 MW — to ERCOT as early as December 2019. The ISO already serves the other 80%.

A study has identified a least-cost option of $38 million, primarily for a new 345-kV substation, a 138-kV switching station and the expansion of several 138-kV lines.

Southern Cross HVDC Project

TAC Chair Adrienne Brandt, of San Antonio's CPS Energy, asked the Reliability and Operations Subcommittee (ROS) to schedule a joint workshop with the Wholesale Market Subcommittee to resolve issues arising from the PUC's final scoping order related to an HVDC transmission project that would transport more than 2 GW of electricity from Texas to Southeast markets.

"This will ensure everyone has transparency between what the other group is talking about and make sure there are no conflicts," Brandt said.

The PUC has directed ERCOT to complete a number of tasks before it allows the city of Garland to energize an approved 38-mile, 345-kV line that would interconnect the Texas grid to the Southern Cross DC tie in Louisiana. The tasks identified in the commission's final order include determining Southern Cross Transmission's "appropriate" market participation classification, necessary transmission upgrades and cost allocations, and resolving price-formation issues (Docket 45624).

TAC Subcommittee to Take up DER Issue

ERCOT's effort to increase visibility into

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ERCOT News

Lubbock Load Could Boost ERCOT Production Costs by $66M

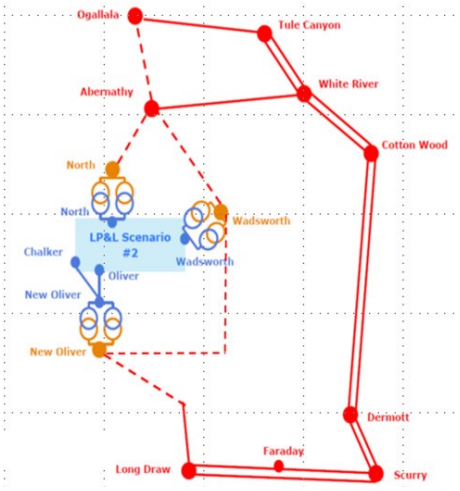
By Tom Kleckner

AUSTIN, Texas — ERCOT staff said its preliminary analysis of Lubbock Power & Light's integration into the Texas grid reveals as much as a $66 million increase in production costs to serve the additional 430 MW of load.

However, those costs will be offset to some degree by unlocking wind generation currently trapped in the Texas Panhandle. Integrating the LP&L system would require 141 miles of new 345-kV transmission lines — at a cost of $364 million — according to a separate ERCOT study completed last June.

Jeff Billo, ERCOT's senior manager of transmission planning, said staff evaluated the years 2020 and 2025 with and without LP&L's load. The analysis indicated an increase of $66 million and $60 million, respectively, in fuel costs to serve the additional load.

Billo said the final report will look at SPP's production costs to determine the overall financial impact to ERCOT. He declined repeated requests from Technical Advisory Committee representatives to discuss SPP's preliminary numbers, saying only that the RTO's production costs would decrease.



ERCOT recommendation for LP&L integration | *ERCOT*

"Their decrease is less than our increase. That kind of makes sense, because we see an increase in the Panhandle's export capability," Billo said, referring to the transmission necessary to connect LP&L to ERCOT.

"We see more Panhandle wind getting to market with the Lubbock system integrated. The full cost of serving the load is somewhat offset by production-cost savings of [the] Panhandle wind," he said.

The integration would require ERCOT to update its systems and documentation to accommodate LP&L's 115-kV facilities. The additional infrastructure will strengthen the Panhandle system and increase transient and voltage stability and reduce congestion. The LP&L load will also contribute to ancillary services' costs.

Left undetermined is whether the load will be in its own transmission zone or absorbed into another, which would affect the congestion revenue rights process.

Final and more detailed information will be available in the report staff presents to the ERCOT board June 13 before a filing with the PUC.

Billo said SPP is working on a parallel timeline with ERCOT and will file its own report separately. SPP did not respond to a request for an update on its progress.

LP&L announced in 2015 it planned to disconnect 430 MW of its load from SPP and join ERCOT in June 2019. The PUC last summer asked the grid operators to conduct coordinated studies on the move, focused on a cost-benefit analysis for ratepayers. (See *PUCT Asks ERCOT, SPP to Coordinate on Lubbock P&L Move*.)

TAC Briefs

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distributed energy resources will begin at the subcommittee level after the TAC declined to get into an in-depth discussion of the growing challenge posed by small generation sources.

Saying she did not want to have the discussion at the TAC "just yet," Brandt proposed starting it at the ROS. She did not receive any pushback.

ERCOT has proposed a collaborative process involving transmission and distribution service providers (TDSPs), "in which the locations of large DERs or large clusters of small DERs are mapped to their appropriate modeled transmission loads."

The ISO has published a white paper, in which it proposes working with TDSPs to develop "a standardized method of providing and collecting appropriate data for mapping current and future registered DER units" to their common information model (CIM) loads. Staff said they will also work

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with stakeholders to develop a process for DSPs in competitive choice regions and non-opt-in entities (NOIE) "to monitor the accumulation of clusters of unregistered (less than 1 MW) DER units connected to specific CIM loads."

Based on annual reports filed at the PUC, staff estimates nearly 900 MW of distributed generation were interconnected as of Dec. 31, 2015, along with more than an estimated 200 MW deployed in NOIE territories. (The reports use the terms DG and DER interchangeably.) Staff has added 20 new registered DER since November, giving ERCOT a total of 99 registered DER as of May 1.

The ISO suggests working with the TDSPs to jointly develop thresholds for "accumulations" of DER, reporting those that exceed the threshold and mapping clusters that exceed the threshold to a CIM load.

ERCOT defines DER as generation, storage technology or a combination of the two that is interconnected at or below 60 kV and operates in parallel with the distribution system. DER does not currently include demand response.

Woody Rickerson, ERCOT's vice president of grid planning and operations, told the TAC the white paper builds on the Distributed Resource Energy Ancillaries Market (DREAM) task force's work, which ended last year. (See "DREAM Task Force's Work Now Ready for Stakeholder Process," *ERCOT Tech Advisory Committee Briefs*.)

He said staff wants to produce annual reports so the grid operator knows how many DER are in its footprint and "what makes sense with aggregation." Staff will insert the resources into the network model as it maps them to their CIM load points, improving the control room's situational awareness.

ERCOT Reports Software Issue, Schedules Meeting on Outages

COO Cheryl Mele alerted the TAC to a market notice reporting on a May 22 incident in which a vendor's issue-tracking system briefly allowed its software clients to view tickets from any other client, including ERCOT. Upon being notified by a non-ERCOT market participant and stakeholder, the ISO asked the vendor to shut down access to the system.

From left to right: TAC Chair Bob Helton, Dynegy; Chair Adrienne Brandt, CPS Energy; and ERCOT COO Cheryl Mele | *© RTO Insider*

In the market notice, the ISO said it has been told a forensics team "has not found any evidence to suggest that information from ERCOT's tracking system has been viewed by other software clients." It is also conducting an internal investigation to evaluate the types of information in the tracking system and to try and determine who accessed or could have accessed the ISO's information.

Mele also told the committee the Texas grid operator will host a June 15 WebEx on extended 345-kV outages in Northwest Texas this summer. Electric Transmission Texas (ETT) notified ERCOT on May 19 it would be inspecting a number of transmission lines ETT built as part of the Competitive Renewable Energy Zone and, if necessary, replacing components as a part of a warranty claim.

The outages are expected to last through November 2018.

"That's a good representation of why you don't buy transmission parts on Craigslist," cracked one TAC member.

Revision Requests Pass Easily

Confronted with 19 revision requests, the TAC separated onto a consent agenda those requests that had reached the committee unopposed or had impact assessments of more than $10,000.

The only nodal protocol revision request (NPRR) to receive an opposing vote was NPRR831, which also received one abstention, relating to private-use networks — networks connected to the ERCOT grid that contain load that is typically netted with internal generation and not directly metered by ERCOT. The change updates market systems to calculate a net load value for each private-use network that will be included in the load zone price for all markets, when the load is a net consumer from the ERCOT grid.

The NPRR was given urgent status to address instances in which LMPs do not reflect congestion. Kenan Ögelman, ERCOT's vice president of commercial operations, said from a system perspective, "This is the quickest way to do this accurately."

The committee passed NPRR827, which bars the ISO from awarding point-to-point (PTP) obligations in the day-ahead market when the corresponding clearing price is greater than the bid price by 25 cents/MWh or more, passed with one abstention.

ERCOT's Carrie Bivens, manager of forward markets, said there is a market-design problem in the way PTP obligations are currently cleared in the day-ahead market. "We're contemplating a different design choice for a long-term solution," she said.

The committee unanimously approved NPRR830, which has an impact assessment of $120,000 to $160,000 and revises the basis of ERCOT's calculation of the four-coincident peak calculation (4-CP) to be consistent with NERC's net-energy-for-load methodology. The proposed methodology uses metered net DC-tie flows.

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ERCOT News

Issues, Schedule Set for Texas ROFR Case

By Tom Kleckner

The Texas Public Utility Commission on May 18 consented to a staff briefing order that lays out the issues to be considered in SPP and Southwestern Public Service's joint request (Docket 46901) to determine whether Texas law includes a right of first refusal (ROFR) that overrides FERC Order 1000.

SPP and SPS filed a petition in February asking the PUC to consider whether the RTO can designate entities other than the incumbent utility to construct and own regionally funded transmission facilities in Texas outside the ERCOT service area. (See *SPS, SPP Ask Texas to Rule on Transmission Competition*.)

At its May 18 meeting, the commission said the parties must address:

- Whether an electric utility or other entity can construct transmission facilities in Texas without first obtaining a certificate of convenience and necessity from the PUC;
- Whether the commission has authority under state law to grant a CCN to a utility that will provide only transmission ser-

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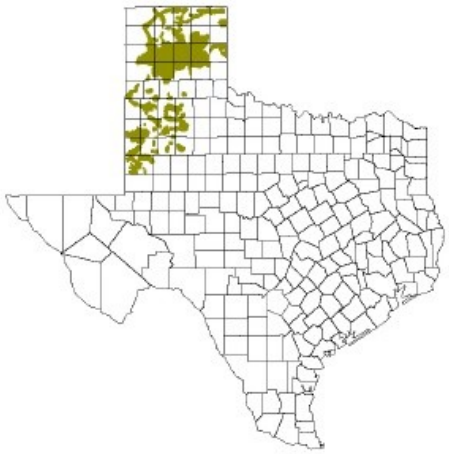

SPS service territory in Texas | *Xcel Energy*

TAC Briefs

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Members approved editing the business case to say the NPRR will "avoid rebilling costs resulting from the assignment of the 4-CP to an incorrect interval" and that it is consistent with direction from the PUC.

A pair of revisions to the Planning Guide (PGRRs) sailed through individual votes without opposition, but PGRR058, which clarifies specific generation to be included in the guide, was sent back to the Protocol Revision Subcommittee.

- PGRR056: Accounts for potential subsynchronous resonance (SSR) vulnerability in the transmission planning process, providing references and citations to the appropriate protocol sections related to SSR and removing its definition from the guides. SSR is a potentially harmful phenomenon involving coincident oscillation between two or more transmission elements or generation resources at frequencies lower than the ERCOT system's normal operating frequency (60 Hz). The change aligns the Planning Guide with ERCOT comments to NPRR562, which was also approved. NPRR562 clarifies responsibilities for affected entities and creates new requirements for the identification, study, mitigation of and protection against SSR. The ERCOT system has become more vulnerable to SSR because of the introduction of series capacitors for voltage support. Without proper mitigation, SSR can quickly destroy resonating elements and/or resources and lead to cascading outages. The NPRR was first introduced four years ago.
- PGRR057: Aligns the Planning Guides with NERC Standard TPL-007-1 (Transmission System Planned Performance for Geomagnetic Disturbance Events) by identifying responsibilities for performing geomagnetic disturbance vulnerability assessments.

The consent agenda included three additional NPRRs, three changes to the Retail Market Guide (RMGRR), a change to the Verifiable Cost Manual (VCMRR), and revisions to the Commercial Operations Market Guide, Load Profiling Guide, Nodal Operating Guide and the Resource Registration Glossary. The guide and glossary changes expand the list of revision requests requiring ERCOT board approval and would first consider those revisions at the voting subcommittee level.

- NPRR796: Specifies that character set validations are available within each Texas standard electronic transaction (TX SET) implementation guide, which recognizes all characters within the basic character set.
- NPRR820: Aligns the definition of an aggregate generation resource (AGR) with the Protocols, which allow a resource entity to register several generators as an AGR. Intermittent resources are not included.
- NPRR824: Aligns Protocol language with NERC reliability standards for energy emergency alerts (EEA) and real power balancing control performance.
- RMGRR145: Provides the format for transmission or distribution service providers, municipally owned utilities and cooperatives to use a mass customer list to inform market participants of all customers in its service territories when entering competition or expanding its service territory.
- RMGRR146: Expands the list of RMGRRs requiring board approval and provides additional clarifications to the RMGRR process.
- RMGRR147: Updates protocol language by providing the option of generating a standalone invoice for meter tampering charges when there is no change in usage consumption.
- VCMRR018: Aligns the manual's revision process with the Protocols and market guides by changing the length of the comment period for newly submitted VCMRRs from seven to 14 days; requires review of all VCMRR impact analyses by the Wholesale Market Subcommittee; aligns the process for submission and review of urgent VCMRRs with other revision-request types; expands the list of VCMRRs requiring board approval; and provides additional revisions to mirror the Protocols and market guides.

— Tom Kleckner

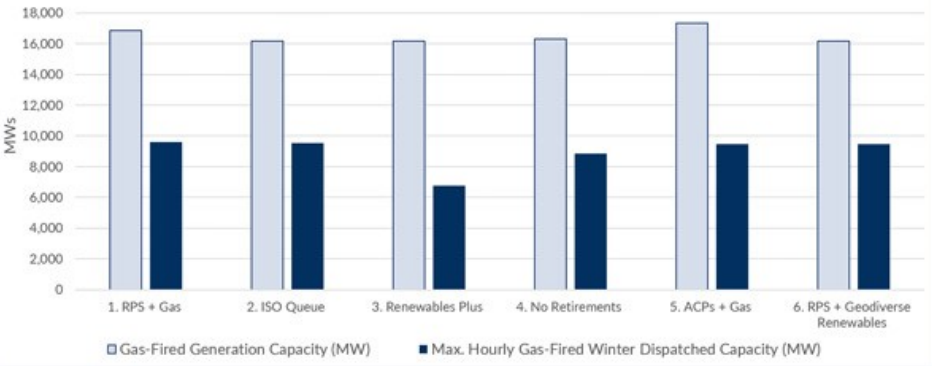
ISO-NE News

NEPOOL: Lack of Fuel Could Idle Half of Gas Plants in Winter

By Michael Kuser

WESTBOROUGH, Mass. — New England will have only enough natural gas capacity to supply about half of its gas-fired generation in winters 2025 and 2030 in most scenarios, according to a New England Power Pool analysis presented to the ISO-NE Planning Advisory Committee on Thursday.

Mark Babula, ISO-NE system planning manager for resource adequacy, said the study showed the region will have sufficient pipeline and LNG capacity to supply all the gas generation with capacity obligations during the summer. But in the winter — when generators must defer to firm gas heating customers — the region won't have sufficient capacity under most circumstances to run all the gas generation that could be economically dispatched.



Projected gas generation capacity vs. maximum gas dispatch capacity (2025) | *NEPOOL*

"When we're talking about dispatch, what we're looking at from the natural gas system perspective is meeting the contractual re-

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Study: New Resources Could 'Crowd Out' Old in ISO-NE

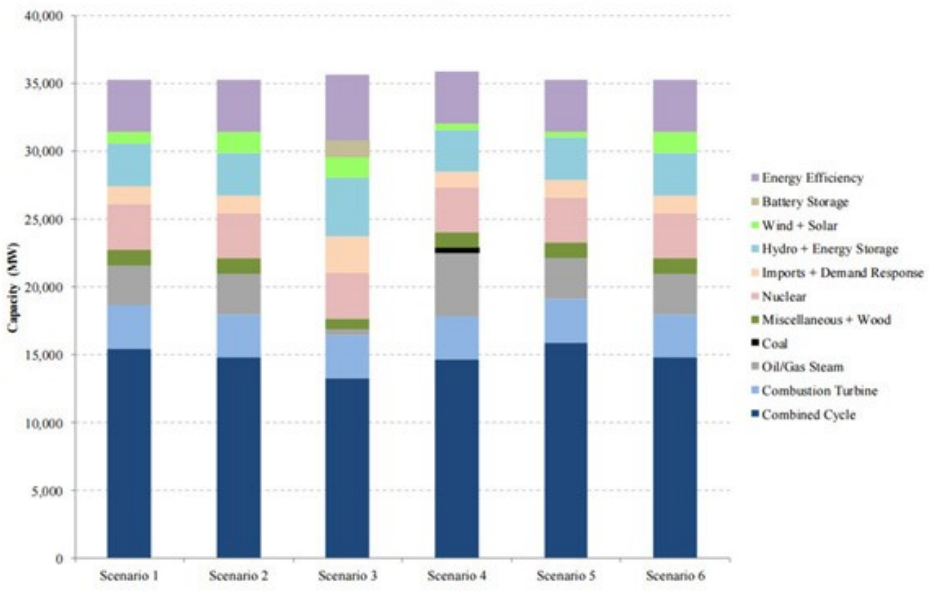
By Michael Kuser

WESTBOROUGH, Mass. — A substantial increase in new clean resources would lower Forward Capacity Auction prices, "crowding out" many existing resources — but their ability to do so will depend on the level of offer mitigation, according to an analysis commissioned by ISO-NE.

ISO-NE last year asked Analysis Group to assess outcomes in the Forward Capacity Market under six resource expansion scenarios evaluated in the second part of the 2016 Economic Study. (See sidebar, next page.)

Todd Schatzki of Analysis Group briefed the Planning Advisory Committee on Thursday on the study, which assumes all current market rules. The study assumes retirements of 2,457 MW by 2025 and 4,668 MW by 2030. Absent retirements, Schatzki said, there's limited need for new resources.

"Given low load growth, given what's going on behind the meter and given that there is not necessarily a lot in the queue that is coming in, absent some market price signal, you're not going to get new resources coming in," said Schatzki, who prepared the report with colleague Christopher Llop. "You're not going to get prices raising back up towards the cost of new entry unless some new resources get in the system."



Cleared capacity by technology and fuel type, 2025 | *Analysis Group*

Capacity and Energy Market Implications

Total Forward Capacity Market payments in 2025 are projected to range between $2.1 billion in Scenario 3 ("Renewables Plus") to $3.8 billion in Scenarios 2 ("ISO Queue") and 6 ("RPS + Geodiverse Renewables"), with energy market revenues projected between $7.7 billion and $8.8 billion.

Scenarios with renewable additions would require additional revenue streams from outside the ISO-NE markets because they have a higher cost of new entry, the study

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NEPOOL: Lack of Fuel Could Idle Half of Gas Plants in Winter

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quirements to the [local distribution companies]," said Michael Henderson, ISO-NE director of regional planning and coordination. "That then gives you some extra gas available that can potentially serve natural gas-fired generation. It's just different looks at how much natural gas-fired generation can be brought on."

The NEPOOL study considered six natural gas system topologies and six "resource expansion" scenarios (see sidebar) to determine whether there is sufficient "spare" gas for electric generation after meeting all firm customers' needs:

- Installed Capacity: All gas-fired generation with capacity supply obligations — a summer focus that represents the upper band of gas consumption by the electric sector. Even under the minimum gas infrastructure case, there is enough spare gas to fuel all gas-fired generation in the summers of 2025 and 2030, but there is only enough spare gas in the winters to serve about half of the gas-fired installed capacity.
- Dispatched Capacity: Gas-fired dispatched capacity requirements on the winter peak gas day, when only a portion of installed gas capacity is needed to serve electric demand.
- Energy Generation: Whether there is enough gas to satisfy the maximum hourly electric energy production by gas-fired generation on the summer and winter peak gas-days. The analysis found sufficient gas for all summer generation needs. For winter 2025, however, there would be sufficient gas for only 6.8 to 9.6 GW of generation, representing 42 to 59% of the projected installed capacity. By winter 2030, the gas could run between 5.3 and 10.1 GW — as little as one-third of the installed capacity.

Only one of six resource expansion scenarios ("Renewables Plus") meets the dispatched capacity and energy generation requirements for winters 2025 and 2030, even assuming the "maximum gas infrastructure" — reflecting pipeline expansions, increased peak shaving by LDC, and LNG from offshore and ENGIE's Distrigas terminal in Everett, Mass.

"In the summertime, we're good. There's actually leftover gas: We could actually run another 12,000 to 15,000 MW, there's so much excess pipe available," Babula said. "When you get into those polar vortex sort of days, we often hear from generators that have just been called by the gas pipe to get back on their ratable take and shut off the valve."

Babula pointed out that the NEPOOL analysis studied only winter and summer peak days. ISO-NE is also conducting a Fuel Security Analysis that will quantify the operational risks of insufficient fuel for the entire 90-day winter period. ISO-NE on May 22 published a summary of the analysis, which is expected to be completed this fall.

While NEPOOL's analysis looks at the system's maximum, short-term capability, the ISO-NE study will determine how often the system likely to be stressed during the winter under different scenarios.

LNG's Role

LNG from Distrigas, the Canaport terminal in Saint John, New Brunswick, and offshore floating storage regasification units are critical for meeting the peak gas-day requirements of the electric sector, according to the study. Without these gas supply sources, approximately 1.5 Bcfd (214,300 MWh/d) would be taken out the market.

Management consultant Richard Levitan asked whether the floating storage wouldn't better be classified as a commodity, considering how inflexible the arrival of LNG carriers can be. Babula said that in the past couple years there have been "ships at the buoy" on most peak gas days, so they included them in the study.

2017 Economic Study Tweaks Scenarios from 2016

WESTBOROUGH, Mass. — Both the New England Power Pool and Analysis Group studies used six "resource expansion" scenarios as the basis for their predictions. The scenarios, listed below, were developed as part of ISO-NE's 2016 Economic Analysis. (See *ISO-NE Projects Impact of $64/ton Carbon Price*.)

ISO-NE's 2017 Economic Study will reflect the same basic assumptions and use the same profiles as those in the 2016 study, while representing some incremental changes to the former study's third scenario. Marianne Perben, manager of resource adequacy and technical studies, outlined the 2017 study's scope of work to the Planning Advisory Committee on Thursday, saying it will produce metrics similar to those in the 2016 report being completed now.

The 2017 study will include analysis that the Conservation Law Foundation requested at the April PAC meeting. The CLF wants the grid operator to determine whether there are viable system topologies other than those analyzed in Scenario 3 of the 2016 study with similar total system emissions but a lower relative annual resource cost.

The 2016 resource expansion scenarios were:

- S1 = RPS + Gas: Physically meet renewable portfolio standards and replace generator retirements with natural gas combined cycle units.
- S2 = ISO Queue: Physically meet RPS and replace generator retirements with new renewables and clean energy.
- S3 = Renewables Plus: The region retires older generating units, physically meets all state RPS and adds renewables/clean energy, energy efficiency, solar PV, plug-in electric vehicles and storage.
- S4 = No Retirements (beyond FCA 10): Meet RPS with new resources under development and use alternative compliance payments (ACPs) for shortfalls. Add natural gas units.
- S5 = ACPs + Gas: Meet RPS with new resources under development and use ACPs. Replace all retirements with natural gas units.
- S6 = RPS + Geodiverse Renewables: Scenario 2 with a more geographically balanced mix of on/offshore wind and solar PV.

ISO-NE News

PAC Briefs

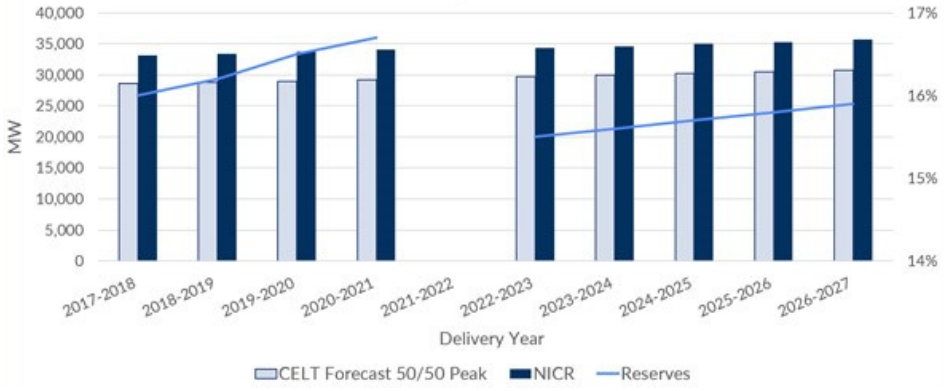
Strong Mass. Economy Nudges up 2017 CELT Load Forecast

WESTBOROUGH, Mass. —The 2017 Capacity, Energy, Loads and Transmission Report shows a reduced RTO load forecast from 2016 but predicts an increase in load for the Southeast New England area because the Massachusetts economy is growing faster than those in other New England states.

ISO-NE system planner Manasa Kotha on Wednesday presented a report on future capacity requirements to the Planning Advisory Committee . It credited some of the increase to changes in the operating company distribution of the load to the buses, and some to the Massachusetts economy, which is expected to grow at a compound annual growth rate of 2.1% through the forecast horizon.

The report covers net installed capacity requirements (ICR) for capacity commitment periods 2022/23 through 2026/27, ranging from 34,300 MW in the first cycle covered to 35,700 MW in the last.

The load forecast is net of behind-the-meter solar PV resources. Energy efficiency is treated separately — modeled as a supply-side capacity resource in the ICR calculations.



Net installed capacity requirements. Delivery years prior to 2022 are actual values; years after 2022 are representative values. DY 2021/22 is under development. | *ISO-NE*

For additional background, Kotha referred participants to a Reliability Committee presentation on the ICR Values for CCP 2020/21 covered by Forward Capacity Auction 11.

Locational Reserves Good in Key Load Centers

Generation and transmission additions expected to be completed by 2019 will ensure sufficient operating reserves in Greater Boston, Greater Connecticut and Greater Southwest Connecticut through 2021, according to a report on reserve needs for major import areas.

Forward reserve requirements for the Northeast Massachusetts/Boston zone have ranged from 300 to 500 MW for the last three summers, and 0 MW for the winters. The report calls for 279 MW this summer and 200 to 650 MW for 2018, dropping to 0 to 50 MW after the addition of the 674-MW Footprint Power quick-start combined cycle plant at Salem Harbor, which is expected online by the end of the year.

ISO-NE resource adequacy planner Fei Zeng, who presented the report to the PAC on Wednesday, said that fast-start resources near those major load centers provide flexibility to the grid.

— Michael Kuser

Study: New Resources Could 'Crowd Out' Old in ISO-NE

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says. Substantial expansion of clean resources as in Scenario 3 "would lower FCA prices, crowding out existing resources."

"As the quantity of new clean resources added to the system increases, the cost (per MWh or MW) of supporting clean resources increases. The gap in revenue requirement (for new entry) needs to be filled by other sources because of decreases in revenues from both the FCM and energy markets."

These impacts would depend on what portion of new renewables participate in the capacity auction and the extent of offer mitigation under the minimum offer price rule. The study assumes continuation of the current 200 MW/year renewable exemption, evaluating mitigation levels through sensitivity analyses.

Under four of the scenarios (1, 2, 5 and 6), the combination of energy, ancillary services and capacity revenue is sufficient to support the entry of new gas-fired combustion turbines. But market revenues are insufficient to incent the development of all other new resources assumed to enter the market in each scenario and none of the scenarios provides sufficient revenues for new combined cycle plants.

"Clean" resources — including offshore wind, hydro imports, battery storage and behind-the-meter solar, — would require other revenues, such as state renewable portfolio standards. "Needed revenues increase with the expansion of clean resources, as these resources reduce prices in both the energy and capacity markets," the study says.

Total payments in the ISO-NE markets range from $9.7 billion to $15.6 billion, excluding ancillary service payments. The total payments do not include the costs associated with state policies.

ISO-NE completed Phase I of the Economic Study earlier this year and in June will issue the final part.

Robert Ethier, vice president of market operations, outlined the scope of work and for background information referred participants to a study on FCA results published in December 2016.

ISO-NE News

ISO-NE to Offer Clustered Interconnection Requests in Maine

By Michael Kuser

WESTBOROUGH, Mass. — ISO-NE is working to adopt clustering methodology, already used by every other ISO/RTO in the country, to speed the development of new transmission capacity, particularly to help free wind power trapped in Maine.

Transmission bottlenecks that prevent Maine's wind generation from reaching load centers in Massachusetts and Connecticut could be relieved by allowing large and small generators to pool their interconnection requests, Al McBride, director of system planning, told the Planning Advisory Committee on Wednesday.

McBride presented a Maine Resource Integration Study that showed how generators in the western and northern parts of the state could combine their interconnection applications and thus share costs on required upgrades. The grid operator could also analyze the combined interconnection requests in the same system impact study (SIS).

Interconnection Queue Backlog

ISO-NE has experienced a persistent backlog of interconnection requests in Northern and Western Maine, where several thousand megawatts of proposed resources have requested interconnection. In March, the RTO said it would not issue a competitive solicitation for the proposed Keene Road market efficiency transmission upgrade because the cost would be greater than the production savings. (See *ISO-NE Nixes Keene Road Tx Upgrade*.)

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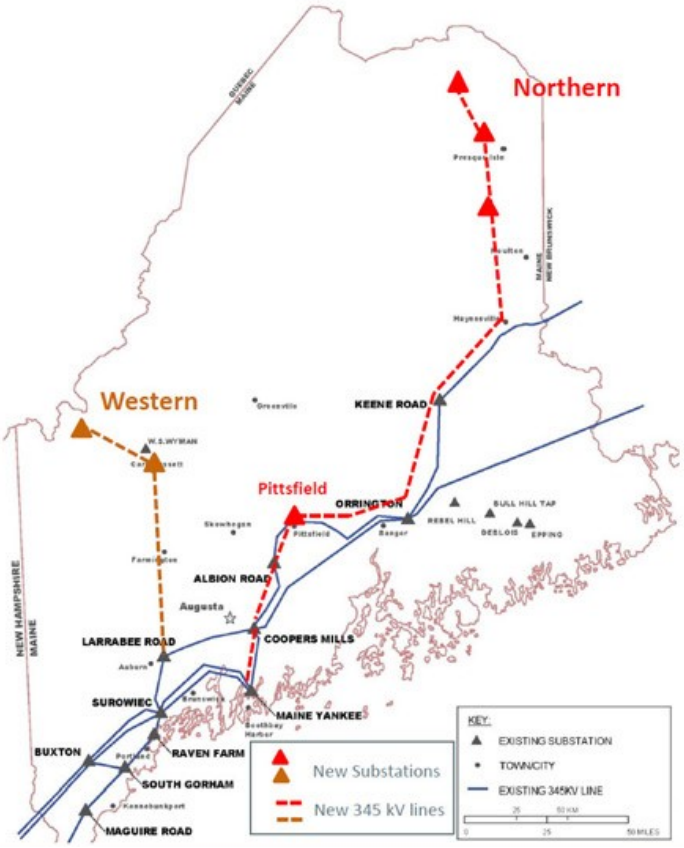

Transmission upgrade concepts | *ISO-NE*

ISO-NE News

ISO-NE to Offer Clustered Interconnection Requests in Maine

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The proposed clustering methodology comprises two phases. In the first phase, the RTO will identify the initial designs of cluster-enabling transmission upgrades (CETU) in the regional system planning process. In the second phase, the RTO will conduct the cluster SIS to study the interconnection of the individual projects, together with the identified CETU.

New England is going to be looking at applying the clustering methodology to both AC and HVDC solutions. One speaker expressed concern that having two options would mean neither would reach critical mass, saying, "Sounds like you could have two undersubscribed" solutions.

Driven by the Wind

Wind resources looking to be included in such a cluster will have to join the transmission interconnection queue by about August. The study proposes that transmission owners prepare cost estimates by the PAC meeting in June, after which ISO-NE will calculate cost allocations and issue a draft report for comment.

As is currently the case, none of the shared or individual interconnection transmission upgrade and facility costs will be incorporated into regional transmission rates.

Mars Hill Wind Farm in Northern Maine

In June 2015, the American Wind Energy Association petitioned FERC to initiate a rulemaking process to address "complex, time-consuming technical disputes" in the interconnection queue process that "undermine the ability of new generators to compete."

In response, FERC last December issued a Notice of Proposed Rulemaking that would change the *pro forma* large generator interconnection rules to increase certainty and transparency for new resources (RM17-8). (See *FERC Proposes Changes to Interconnection Rules*.)

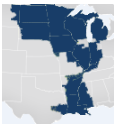
New Circuits

The Maine Resource Integration Study assesses new 345-kV AC transmission circuits that could connect to the areas with the largest number of interconnection requests. Evaluations include interconnecting with, or bypassing, existing lines and substations.

The New England Power Pool Participants Committee in February supported Tariff changes for the proposed interconnection clustering methodology. Two or more interconnection requests requiring common new transmission infrastructure would trigger the clustering methodology.

Participants in a cluster would be allocated a percentage of costs for shared upgrades and assume sole responsibility for facilities needed solely for their project.

MISO NEWS



MISO Steering Committee OKs IMM Proposals for Market Roadmap

By Amanda Durish Cook

MISO's Steering Committee recommended that all but one of a handful of the Independent Market Monitor's oft-repeated recommendations be included on the 2018 Market Roadmap as potential market rule changes.

Most of the recommendations have already been brought up in Market Subcommittee meetings or are part of past State of the Market reports.

MISO's 2016 stakeholder redesign process dictates that for issues to be discussed in stakeholder meetings or added to the Market Roadmap list, they must first be submitted to the Steering Committee for a committee assignment. The Market Roadmap is a prioritized and tracked list of market revision goals that stakeholders and the RTO agree to pursue in stakeholder meetings.

The Steering Committee made the decision to move the following recommendations forward during a May 24 conference call:

- Improving shortage pricing by revising the operating reserve demand curve to reflect a higher value of lost load. (See "Patton Seeks Increase in VoLL," *MISO, IMM Differ over Scarcity Pricing Changes*.)
- Establishing regional reserve requirements and cost allocation through expansion of a 30-minute reserve product. MISO stakeholder relations staff member Justin Stewart said the issue might be too similar to a project already on the Roadmap that will create short-term capacity reserves, so the Steering Committee added the Monitor's recommendation to the existing project candidate.
- Changing the day-ahead margin assurance payment and real-time offer revenue sufficiency guarantee (RSG) payment rules and performance incentives to reduce gaming. The Monitor last year suggested some wind generators were deliberately over-forecasting to collect more RSG payments; the issue is expected to surface in this year's State of the Market report. (See *IMM Report Highlights Outages, Wind Over-Forecasting*.) Stewart said the issue was similar to an existing Roadmap project to tighten thresholds on uninstructed deviations from dispatch orders, which is currently in the software development phase. Steering Committee members nevertheless assigned the Monitor's suggestion new candidate status.
- Creating a method for validating wind suppliers' forecasts and using the results to alter dispatch instructions if needed, and improving forecasting incentives by modifying deviation thresholds and settlement rules. The two wind recommendations were added to an existing Roadmap candidate covering dispatchable intermittent resource modifications.

The one recommendation not added to the Roadmap was that MISO consider the economic cost of congestion, not just reliability, before granting planned outages. We Energies' Tony Jankowski said the issue has existed "for over 10 years."

"You're venturing down a road here of what's acceptable congestion or excessive congestion. … I don't see this as being a simple Roadmap item," he said.

Other stakeholders agreed to table the issue, with some predicting the topic will be raised again in the next State of the Market report. Last month, MISO stakeholders took up a separate outage issue, debating whether resources on extended outages should be barred from participating in future Planning Resource Auctions. (See *MISO May Bar Units on Extended Outage from Capacity Auctions*.)

The deadline for submitting candidates for consideration in the 2017 Market Roadmap project selection was May 11. Market improvements submitted after the deadline will be considered for prioritization in the 2018 Market Roadmap process.

Weather, Gas Prices Cause MISO Energy Price Spike in April

Turbulent spring weather in MISO South and more expensive natural gas contributed to MISO's highest energy prices since December.

Real-time energy prices averaged $30.03/MWh during April while day-ahead prices averaged $30.77/MWh, the first time prices have exceeded $30/MWh since December. The higher prices were due in part to about $3/MMBtu natural gas, and congestion from forced outages and high load in MISO South, which experienced severe weather and temperatures more akin to expected May levels. Systemwide load averaged 66.9 GW, a slight decrease from April 2016, and peaked at 79.6 GW.

"Operating challenges were few in the Midwest, but for the South, the opposite was true," MISO Executive Director of Strategy Shawn McFarlane said at a May 23 Informational Forum.

McFarlane | © *RTO Insider*

McFarlane said MISO activated emergency procedures a number of times during the month in response to the weather and used its emergency pricing structure on three occasions in the month, one culminating in a maximum generation event on April 4. (See "Several Factors in Spring MISO South Maximum Generation Event," *MISO Market Subcommittee Briefs*.)

McFarlane said MISO "successfully balanced supply and demand" during all emergency alerts.

"Fortunately, the actions of our neighbors and members and our own actions in the control room allowed us to navigate successfully through challenging events," McFarlane said.

— Amanda Durish Cook

MISO NEWS

Federal Official Warns MISO of Growing Cyber Threats

By Amanda Durish Cook

CARMEL, Ind. — A senior Homeland Security official last week told MISO employees and stakeholders that cyberattacks will escalate in the future and the RTO and its members will be among the prime targets.

Hershfield

Neil Hershfield, deputy director of the U.S. Department of Homeland Security's Control Systems Security Program, said of the 290 cyberattacks committed by nation-state terrorists that the department investigated in 2016, the energy industry accounted for 59, ranking third in targeted American industries behind critical manufacturing (63) and communications (62).

"Hackers are very interested in what you do," Hershfield told MISO employees and stakeholders at a May 23 Informational Forum.

The department estimates that by 2020, 50 billion internet-ready devices will be in people's hands worldwide. "All this adds up to a much-larger attack surface. It's a long-term threat," Hershfield said.

The number of sophisticated attacks will climb in the future, he said. "Frankly we anticipate more attacks, as hackers figure out how to monetize them like ransomware attacks," referencing the international WannaCry ransomware attack, which held encrypted data in exchange for Bitcoin payments. Hershfield also said he believes that the 2015 attacks on power utilities in Ukraine were simply testing grounds for a larger attack. He said trojan malware — like Havex and Black Energy, which was used in the Ukrainian cyberattack — were used in most sophisticated industrial control systems attacks in 2014 and 2015.

"You might have to operate in a contested environment someday," he warned.

The department categorizes cyber threats into three types: small groups or individuals who act out of notoriety or curiosity; criminals and activists that act on revenge or blackmail; and terrorist organizations and nation states with political motives. The government has identified hackers in Russia, China, Iran and North Korea, Hershfield said.

He said companies may have to operate in manual mode while they work to regain computer operations following a cyberattack. But that is not always possible.

"Many of the processes controlled by computerized control systems have advanced to the point that they can no longer be operated without the control system," Hershfield said. Many of the employees who know how to operate in manual mode have retired, he added. "That's something to think about."

Hershfield also said the average company spends 2 to 3% of its information technology budget on cybersecurity, and best-in-class companies spend 8%.

Spear-phishing emails were the most common means of entry identified in the 290 attacks investigated by Homeland Security in 2016.

He said LinkedIn is hackers' preferred starting point to gain access to work email accounts. "The main reason someone would go after you is access or placement in your organization," said Hershfield, who advised employees with security access to be on guard, especially when opening emails. "Who here clicks on emails from their bank? I never click on emails from my bank. If I want to do something, I go to the bank's website myself." He also admitted that he recently earned low marks because of his Facebook account in a personal cybersecurity assessment. "I had my profile opened to everyone, not just friends," he said.

Two-Password Authentication

Hershfield urges companies to limit remote access and isolate critical operating systems, recommending that all remote access be routed through a business network that doesn't hold critical information. He also advised that MISO use a two-password authentication to access a critical control network, meaning one log-in and password for the business network and one for the critical control network.

"Is it less convenient? Yes. Is it more secure? Yes," Hershfield said.

He also said companies should immediately terminate security access for employees that leave the company, pointing to a former Georgia-Pacific employee in Baton Rouge who remotely accessed computer systems and interrupted operations in February, causing $1.1 million in damage to the paper maker in retaliation for being fired. FBI agents arrived at his home to find a still-active virtual private network connection, Hershfield said. He said MISO and member companies should report control system cyber incidents and vulnerabilities to Industrial Control System Cyber Emergency Response Team by emailing ICS-CERT@hq.dhs.gov or calling (877) 776-7585.

Neil Hershfield speaks at the May 23 Informational Forum. | © *RTO Insider*

MISO NEWS

MISO, PJM Weighing 8 Interregional Tx Proposals

By Amanda Durish Cook

MISO and PJM are evaluating eight proposed interregional market efficiency projects, but a supplemental project by American Electric Power could undermine most of the proposals.

The RTOs received three upgrade and five greenfield proposals for three congested flowgates ranging from $1 million to $198 million.

Proposals were due at the end of February on interregional projects for constraints the RTOs previously identified. (See "2017 MEP Identification Underway," *FERC Signals Bulk of NIPSCO Order Work Complete*.)

The RTOs will evaluate the proposals' benefits based on the first 15 years of service, benefit-cost ratios and the cost split between RTOs, Eric Thoms, MISO manager of planning coordination, said at a May 23 Joint and Common Market meeting. AEP-Exelon, NextEra, Northern Indiana Public Service Co., AEP-NIPSCO, WPPI Energy and Northeast Transmission Development submitted proposals, most offering 138-kV projects and a few submitting 345-kV solutions.

Thoms | © *RTO Insider*

All but two of the project proposals focus on the Olive–Bosserman constraint near the western Indiana-Michigan border. Transource Energy also submitted an interregional proposal to correct congestion along the southern Indiana-Ohio border with a new 138/345-kV substation and lines, and NIPSCO presented a new 138-kV line proposal to relieve congestion along the northern Illinois-Indiana border.

Complicating matters, AEP also announced plans for a supplemental project — a project type funded wholly by the transmission owner and therefore not requiring PJM approval — that diminishes the severity of the Olive–Bosserman constraint.

AEP would increase voltage and reroute

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MISO, PJM to Try Again on FERC Pseudo-Tie Filings

By Amanda Durish Cook

CARMEL, Ind. — Both MISO and PJM will attempt second drafts of their respective pseudo-tie requirements after receiving deficiency letters from FERC in response to their initial filings, officials said last week.

MISO Director of Forward Operations Planning Kevin Vannoy confirmed at a May 23 MISO-PJM Joint and Common Market meeting that the two RTOs are working to respond to FERC's requests for more information.

"Both RTOs are making administrative improvements that were intended for this year, but the commission rejected those, so we are continuing with those filings and continuing to work through the congestion overlap issue," Vannoy said.

FERC's May 5 deficiency letter asked PJM to explain how much it worked with MISO on the rules, how its proposed minimum electrical distance impedance was determined and how it will determine whether resources are operationally deliverable (ER17-1138).

That followed FERC's deficiency letter to MISO in April. (See *FERC Seeks More Details on MISO Pseudo-Tie Proposal*; "MISO, PJM in 'General' Agreement over Pseudo-Tie Congestion Remedy," *MISO Market Subcommittee Briefs*.)

MISO Senior Director of Regional Operations David Zwergel said his RTO still agrees that a revised pseudo-tie agreement will allow it to manage pseudo-tie impacts reliably. "It's not infinite; there's only so many pseudo-ties that transmission can handle," Zwergel added.

PJM proposed that pseudo-ties be based on aligned network models from the two RTOs for flowgates and have firm transmission subject to a deliverability analysis similar to one it uses for internal resources. The RTO also proposed that any new flowgate created because of a pseudo-tie must have at least one flexible internal generator with at least a 1.5% impact on the flowgate.

"None of the current pseudo-ties fail this [deliverability] test … so we're okay so far with that," said Tim Horger, PJM director of energy market operations. Horger said PJM will again take up deliverability test specifics once double-counting complaints from MISO and PJM market members are resolved. "Once the dust settles from the FERC filings, we'll work on that. We took a historical look at impacts so far."

Customized Energy Solutions' David Sapper asked if the RTO with the most stringent pseudo-tie rules would essentially determine what requirements new and existing pseudo-ties would follow.

"I guess you could look at it that way, but both requirements are going to have to be met," Horger replied.

Some stakeholders expressed concern that MISO and PJM are still pursuing stricter pseudo-tie rules considering they don't always bind at the same time on constraints.

Sapper also asked for more detailed Tariff filings from the RTOs on the second pseudo-tie requirement attempts, saying that MISO's load-serving entities prefer more details, especially because the filings are "uncharted territory."

Horger also said PJM is still pushing for its first-ever pseudo-tie *pro forma* agreement, which was debated for months this year before it was put on hold. Horger said if the RTOs agree on future rules laid out in their joint operating agreement, MISO would no longer need to be a signatory to the *pro*

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PJM NEWS

MISO, PJM Weighing 8 Interregional Tx Proposals

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nearby PJM circuits dating back to the 1930s, with two new 138/120-kV distribution stations to replace lower-voltage stations. The project is still in conceptual stages, AEP said.

PJM staff said the AEP project would relieve some of the congestion on Olive–Bosserman but that the interregional proposals could still provide benefits. MISO and PJM have yet to study the effects of the supplemental project on the six interregional proposals.

At a May 26 Interregional Planning Stakeholder Advisory Committee conference call, NIPSCO's Miles Taylor asked if the supplemental project would be included in the RTOs' evaluations of the interregional proposals. PJM interregional planning manager Chuck Liebold said PJM will put the project into a base case scenario if AEP decides to pursue the project. Stakeholders reminded RTO staff at the meeting that developers spent a lot of time and money on the interregional proposals, expressing concern that they could be negated by AEP's project.

"This [supplemental] project is happening to get attention now because of its impact on interregional projects. We get many, many supplemental projects all the time," said Liebold, adding that RTO staff has no control over which are built.

The RTOs hope to have preliminary benefit numbers on the interregional projects by the end of June.

Project evaluation will continue for each RTO individually and in the IPSAC through the end of September. Selection of the interregional projects is expected to begin in the fall.

Thoms said that if any projects arise out of the two-year interregional process, they will be sent before the RTOs' boards for approval by December.

Meanwhile, MISO has asked FERC for an 18-month extension to settle on an internal cost allocation approach under the commission's directive last year that the RTO allow interregional market efficiency projects as low as 100 kV (ER16-1969). Stemming from a 2013 NIPSCO complaint, FERC's order also directed MISO to remove its $5 million cost floor for interregional projects with PJM. (See *FERC Signals Bulk of NIPSCO Order Work Complete*.)

MISO, PJM to Try Again on FERC Pseudo-Tie Filings

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forma, and it could be limited to pseudo-tie owners and PJM. Horger said MISO and PJM staff are currently at work on joint operating agreement language.

However, Horger said PJM still isn't in a hurry to finalize a *pro forma*. "We have the whole FERC quorum issue also; I don't think there's a rush to get this filed," he said. The commission has been without a quorum since February, preventing it from taking definitive action on any disputes, including addressing the MISO Independent Market Monitor's challenge to the pseudo-tie concept. (See *Pseudo-Tie Feud Rises as Patton, NYISO Protest PJM Proposal*.)

RTOs Closer to Double-Congestion Rebate Program

MISO and PJM hope to implement rebates by September as a stopgap solution to the double-charging of congestion on pseudo-tied units.

The RTOs agree that day-ahead firm flow entitlement exchanges will improve predictions on the effect of congestion on pricing. The day-ahead exchanges between MISO and PJM began in late January.

Vannoy said in a best-case scenario, MISO and PJM can implement the stopgap rebate solution by the beginning of September and implement a longer-term goal of scheduling pseudo-ties in the day-ahead process by next May.

4 Categories for Freeze Date

Joe Rushing, a senior engineer in PJM's interregional planning division, said the RTOs will continue to pursue a "bucket" approach to revise the current 2004 freeze date for determining eligibility for a share of firm rights on flowgates. The rights would be divvied up based on how long resources have participated in the market. (See "Freeze Date Future in Buckets?" *PJM, MISO Go Quiet on Pseudo-Ties; Reach Interface Pricing Accord*.)

The RTOs are proposing to add a fourth tranche to include market-wide transfers that align with planning processes. The tranche would be the first in line for a megawatt reduction when firm flow entitlements exceed a flowgate's capability. The third tranche — which allows for entitlements to be granted for limited market-based transfers for reliability within the RTO balancing authority — will end after 10 years.

MISO's Kevin Vannoy (left) and Tim Horger (right). | © RTO Insider

The first bucket will continue to be used for active designated network resources predating the current April 1, 2004, freeze date and historic transmission service requests, which will be given first consideration for flowgate needs. A second tranche would be for active designated network resources and transmission service requests after 2004.

Rushing said the RTOs will draft Tariff language for a FERC filing sometime in the third quarter.

PJM NEWS

Analysts See End to New Builds in BRA Results

By Rory D. Sweeney

The rush to build new generation in PJM might be over, if analysts are correctly reading the tea leaves of last week's PJM capacity auction results.

Base Residual Auction prices for Delivery Year 2020/21 fell to $76.53/MW-day in most of the RTO, down from $100 last year. ComEd dropped to $188.12 from $202.77, and MAAC, which cleared with the RTO at $100 last year, dropped to $86.04.

The only areas that saw price increases were EMAAC, which jumped to $187.87 from less than $120 last year, and Duke Ohio-Kentucky, which cleared at $130 this year after pricing with the RTO last year. (See *Capacity Prices down in Most of PJM in 1st Year of 100% CP*.)

"The silver lining here appears to be a meaningful slowdown in new capacity clearing the auction," UBS analyst Julien Dumoulin-Smith wrote in a note published Wednesday. "While it's been years that many generators have been speculating on just when the flow of new units would slow, this appears it."

Less than 3,200 MW of new generation and uprates offered and just 2,824 MW cleared. Both results are down approximately 50% from last year's auction. Clearing prices for 2020/21 ranged from only 26 to 66% of the net cost of new entry.

"To this end, we see the latest capacity prices and challenges in the debt markets as stymying any future efforts despite a clear backlog of future proposed plants," he wrote. "We believe the market for new capacity is largely exhausted."

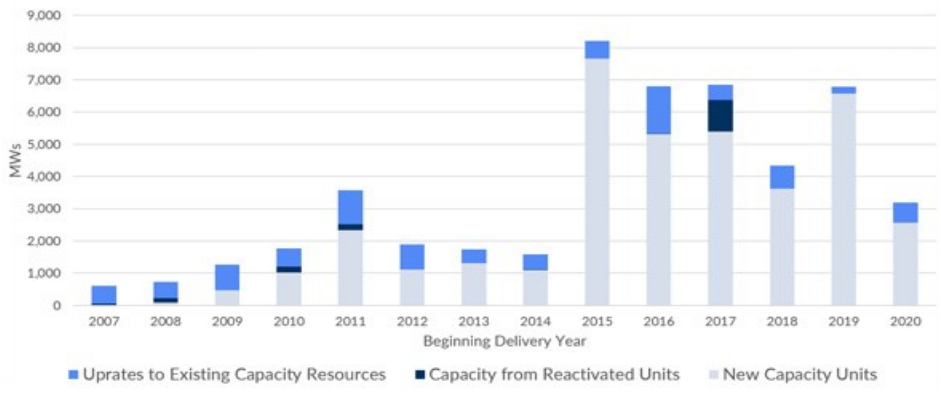
Capitalizing on cheap fuel caused by an abundance of production in the Marcellus and Utica shale plays and pipeline constraints that limited takeaway capacity, developers flooded the market in recent years with new, highly efficient gas units that have depressed capacity and energy market prices. Low fuel prices persist, but the spark spread might not be as attractive anymore.

"I don't see any economic justification for bringing a new power plant online" in these market conditions, ICF's George Katsigiannakis said in an interview. "You start questioning what was driving all those builds: it was economics or it was just irrational expectations?"

Going forward, he said, "the market is going to rationalize and provide better returns," but that will require unit retirements to reduce the excess capacity. With the onset of governmental initiatives to save certain units for socio-economic reasons, such as the zero-emissions credits passed last year in Illinois, and promote construction of others, such as renewable energy credits for solar and wind projects is several states, Katsigiannakis said "one of the most important issues" is how the oversupply will be curtailed.

"The intervention of state policies on the capacity market … how they can do it so they will not break down the market, is a different question," he said.

Dumoulin-Smith agreed that he doesn't "see any obvious easy fixes to improve prices" and that retirements appear to be a waiting game.



New capacity offered by year | *PJM*

"The question is increasingly when will retirements materialize given the lower prices? We think any number of large legacy coal plants could see further pressure in [Pennsylvania and Ohio]," he wrote. "Even fully compliant larger plants could be at very clear risk across any part of the RTO footprint."

He identified Talen Energy's Susquehanna nuclear plant and Exelon's Three Mile Island — which failed to clear the last three auctions — as potential casualties. He said Dynegy's and FirstEnergy Solutions' generation also is at risk.

Alternatively, he saw Public Service Enterprise Group, Calpine and Exelon as potential winners from the BRA, with their units concentrated in the higher-clearing locational deliverability areas.

Katsigiannakis said the "big surprise" was how much demand response was able to hang on despite the increased commitment demands of 100% Capacity Performance. He had expected DR to drop by about half from 10,348 MW to approximately 6,000, as that's how much had year-round capability in last year's auction. Instead, 7,532 MW cleared.

He said he'll need to analyze the situation further to understand why so much additional DR was able to clear.

Exelon to Shut Down TMI in 2 Years

Exelon announced this morning that it will retire TMI in September 2019 "absent needed policy reforms."

"Like New York and Illinois before it, [Pennsylvania] has an opportunity to take a leadership role by implementing a policy solution to preserve its nuclear energy facilities and the clean, reliable energy and good-paying jobs they provide," CEO Chris Crane said in a statement.

Exelon said it will send PJM and the Nuclear Regulatory Commission deactivation notices within 30 days. It is taking a one-time charge of $65 million to $110 million for 2017, and accelerating approximately $1 billion in depreciation and amortization through the shutdown date, terminating capital investment projects and canceling 2019 fuel purchases and outage planning, impacting about 1,500 outage workers.

TMI directly employs 675 workers.

PJM NEWS

Capacity Prices down in Most of PJM in 1st Year of 100% CP

Continued from page 1

nonperformance.

It was also the first year under relaxed seasonal aggregation rules, which resulted in almost 400 MW of capacity pairing winter generation (mostly wind) with summer solar, demand response and energy efficiency.

With seasonal DR no longer allowed — outside of that matched with other resources through aggregation — price-responsive demand (PRD) participated for the first time in this year's auction. PJM members committed to 558 MW of demand reductions under PRD.

The auction also followed Illinois' approval in December of zero-emission credit subsidies for nuclear plants. Exelon said neither its Quad Cities plant in Illinois nor its Three Mile Island nuclear plant in Pennsylvania cleared the auction.

Load Forecast Down

The auction reflected a 2.1% reduction in forecast peak load from last year's level to 153,915 MW. The reliability requirement was reduced by 2,800 MW from DY 2019/20 because of the lower peak forecast and the PRD elections.

"When the reliability requirement goes down for the same amount of [available] capacity, it's going to yield a lower clearing price," said Adam Keech, PJM's executive director of market operations, in a press conference.

PJM acquired 165,109 MW for 2020/21, down about 2,000 MW from last year and providing a 23.3% reserve margin — the highest ever in the 14-year history of the BRA, and well above the required 16.6%.

About 189,918 MW was offered into the BRA, out of about 213,000 MW that was eligible, a decrease of 4,325 MW from last year's offers.

Keech said the auction will cost load a total of about $7 billion in 2020/21, about the same as for 2019/20.

In total, about 3,144 MW (UCAP) of new generation offered into the auction including uprates, down 3,400 MW from last year. About 2,824 MW of the new generation cleared, mostly natural gas combined cycle and combustion turbines.

Almost 4,000 MW of capacity imports cleared, up 121 MW (3%) from last year, most of them from west of PJM. Combined with internal generation of almost 152,000 MW, generation made up 94% of the capacity acquired, with DR (7,820 MW) and EE (1,710 MW) making up the balance.

Price Separation

Prices in ComEd, MAAC and EMAAC separated from the rest of the RTO in response to unit retirements and increased transmission congestion in those regions, requiring the acquisition of local generation, Keech said. The Duke region clearing price increased because "we would need to incentivize locational capacity specifically in that area due to retirement," Keech said.

"We have units that are at financial risk in the area that, if they retire, it could create a reliability issue," he said.

Although Keech said confidentiality requirements restricted him from going into detail about which units were involved, the creation of the Duke Ohio-Kentucky and Dayton, Ohio, locational deliverability areas were apparently driven by the scheduled 2018 retirements of Dayton Power and Light's Killen and Stuart coal-fired plants. At 2,700 MW, the plants represent more than half of the capacity in the Dayton LDA.

The Dayton LDA, however, cleared along with the rest of the RTO.

Seasonal Aggregation

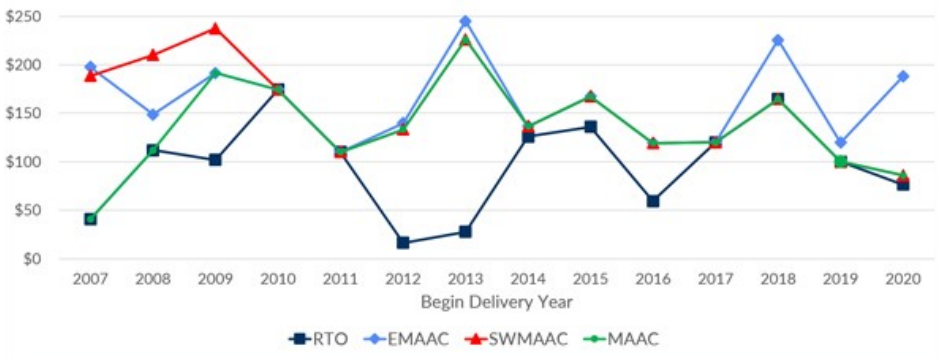
Under relaxed rules that allowed aggregation across LDAs, 398 MW of seasonal capacity cleared. PJM filed plans with FERC in October, without stakeholder consensus, to ease restrictions on how seasonal resources can aggregate and offer into the BRA. With FERC lacking a quorum, staff tentatively approved it in March, and PJM quickly established rules in time for the auction. (See *PJM Outlines Aggregation Rules for Upcoming Capacity Auction*.)

The figure includes intermittent resources that exhibit seasonal performance differences, such as wind, which performs better in winter, and solar, which performs better in summer. It also includes DR resources, many of which are unavailable in the winter.

DR accounted for about 289 MW of the summer seasonal product, while EE accounted for about 103 MW and solar generation the remaining 6 MW. All 398 MW of wind seasonal product was supplied by generation, and Keech said wind accounted for 384 MW of it.

Keech said there were "quite a number" of winter capacity injection rights that didn't get used as part of the seasonal aggregations.

"Certainly, from our perspective, we would have loved to see some more participation in that area," he said. "Given that we have 400 MW that we otherwise wouldn't have ever had, I think that's successful."



BRA clearing prices | *PJM*

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PJM NEWS

Capacity Prices down in Most of PJM in 1st Year of 100% CP

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Renewables as CP

Another 504 MW of wind cleared as CP, for a total of 888 MW of wind (6,828.5 MW nameplate capacity at a 13% capacity factor). That was down about 80 MW from last year's auction.

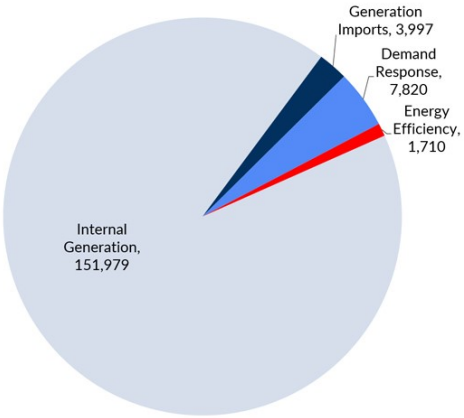
An additional 119 MW of solar cleared as CP beyond the seasonal aggregation. The 125-MW total (about 330 MW nameplate at a 38% capacity factor) was down 210 MW from last year's auction.

Demand Response, EE

The amount of intermittent resources offered as CP dropped by 3,400 MW from last year, while DR offers fell by 2,085 MW compared with total DR offers for 2019/20.

DY 2020/21 will see a 2,816-MW net decrease of DR from 2019/20 to 7,532 MW and a 195-MW increase of EE to 1,710 MW.

The filing to ease the seasonal aggregation rules came after only 6% of DR cleared last year as CP. Stu Bresler, PJM senior vice president of operations and markets, said



Cleared capacity by type (megawatts) | *PJM*

4,700 MW of DR could have qualified as CP but didn't clear economically. This year, 76% of EE and 79% of DR cleared.

Subsidy Impacts

Keech said he couldn't discuss the specific impacts of the Illinois ZECs on clearing prices.

Aside from Quad Cities and TMI, Exelon's nuclear plants in PJM did clear, with the exception of Oyster Creek, which did not participate because it is scheduled to retire in 2019.

The company "remains fully committed" to keeping Quad Cities in operation, "provided that [Illinois'] zero-emissions credit program is implemented as expected and provided that Quad Cities is selected to participate," Joe Dominguez, Exelon's executive vice president of government and regulatory affairs and public policy, said in a statement. The ZEC program, to be implemented by the Illinois Power Agency, has not yet been implemented.

The company used the results to call for an expansion of ZECs to Pennsylvania, noting that it was the third year in a row that TMI left the capacity auction empty-handed. "Exelon has been working with stakeholders on options for the continued operation of TMI, which has not been profitable in five years."

Another generator looking for nuclear subsidies is FirstEnergy, which has been pressing Ohio officials for aid for its 889-MW Davis-Besse nuclear plant near Toledo and the 1,231-MW Perry plant near Cleveland. (See *FirstEnergy Hopeful on State, Federal Support*.)

The company's hopes suffered a blow last week when the chair of the Ohio House Public Utilities Committee suspended hearings on the subsidy without calling for a

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PJM NEWS

Capacity Prices down in Most of PJM in 1st Year of 100% CP

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vote. "I am not sensing a keen desire on the part of the House members to vote on this and doubt that we will have more hearings in the near future unless something cataclysmic should happen," *The Plain Dealer* quoted Chairman William Seitz.

But the auction brought some good news for the company. Asked whether Perry and Besse-Davis cleared the auction, spokesman Doug Colafella responded: "Yes, a portion of all of the units FirstEnergy Solutions bid into the auction cleared."

Also reporting on its fortunes was Dynegy, which said Wednesday that it cleared 10,217 MW, representing $456 million in revenue at a weighted average of $122.19/MW-day. That included 9,772 MW from the company's PJM fleet ($124.27/MW-day) and 444 MW exported from MISO ($76.53/MW-day).

Still Getting Gas

Gas-fired units continue to benefit from ongoing pipeline constraints that have built up a glut of natural gas and depressed prices in the Marcellus and Utica shale regions throughout PJM's footprint. Despite clearing prices of approximately 26 to 66% of the net cost of new entry, the auction attracted 2,350 MW of new gas-fired generation.

"I think it's intuitive that that [gas entry] will slow down given that the prices are below" net CONE, Keech said.

Price Responsive Demand

PJM members committed to 558 MW of demand reductions under PRD, with the BGE (330 MW), PEPCO (170 MW) and EMAAC (58 MW) LDAs participating.

Unlike DR, which is counted on the supply side, PRD is deducted from the reliability requirement, shifting the LDAs' demand curves to the left.

NRDC Critical

Jennifer Chen of the Natural Resources Defense Council was disappointed that wind, solar and DR resources declined compared to last year and that the RTO "is continuing to rely primarily on fossil fuels and nuclear." She blamed the "arbitrary" CP rules for creating a "preference" of gas and nuclear over "clean power" and argued that the new seasonal aggregation rules squeeze out many summer-only resources that can't find winter-only resources to pair with for the auction.

She also criticized PJM for securing too much capacity, saying consumers are paying more than they should pay for reliability.

Predictions

Results largely defied expectations, fueling a recurring complaint among market participants about the market's volatility.

Earlier this month, ICF analysts Rachel Green, Himanshu Pande and George Katsigiannakis predicted prices would exceed $100/MW-day as the 100% CP requirement offset downward pressure from increased supply and lower demand. They predicted the EMAAC, ComEd and Dayton LDAs would see price separation from the rest of the RTO.

Julien Dumoulin-Smith, an analyst with UBS, predicted in March that the ComEd region would break $200/MW-day, and in April that EMAAC would remain "roughly flat." He did, however, note changes to transmission accounting that would cause EMAAC to clear separately from the rest of the RTO and cautioned that demand reductions would likely depress clearing prices.

PJM NEWS

MRC Briefs

Pseudo-Tie Discussion Postponed to Continue Negotiations with MISO

WILMINGTON, Del. — Mike Bryson, PJM's vice president of operations, announced at last week's Markets and Reliability Committee meeting that a scheduled vote on new pseudo-tie provisions would be postponed because of ongoing negotiations with MISO.

Members were expecting to be asked to endorse several items related to creating a *pro forma* pseudo-tie agreement, including the agreement, a pseudo-tie reimbursement agreement and associated Tariff and Operating Agreement revisions. However, Bryson, who substituted as chair of the meeting for CFO Suzanne Daugherty, said discussions continue with MISO to overcome differences between the two grid operators. (See *Pseudo-Tie Feud Rises as Patton, NYISO Protest PJM Proposal*.)

The proposal, developed through the Underperformance Risk Management Senior Task Force, would make deliverability requirements uniform for resources within and outside of PJM's footprint and require feasibility studies for all pseudo-ties. Existing pseudo-ties would have five years to conform to the deliverability standards for internal resources.

Coal Replaced by Gas and Nuclear in 2020/21 BRA

PJM's Jeff Bastian reviewed the Base Residual Auction results from May 23, noting that coal-fired generation cleared about 3,450 MW less than last year while gas and nuclear increased 3,700 MW and 1,500 MW, respectively.

"The sun does shine in the winter. There was a recognition by resource owners that there's more risk involved with offering solar, so that the annual quantity is significantly lower than what those resources were required to offer in the past."

Jeff Bastian, PJM

Wind, solar and hydro all cleared fewer megawatts this year than last. (See related story, *Capacity Prices down in Most of PJM in 1st Year of 100% CP*, p.1.)

"Here we see the reduced offerings of resources that might have a hard time because of their intermittency meeting the CP," Bastian said.

Roy Shanker, an industry consultant, asked about negative megawatts of capacity transfer rights in the MAAC locational deliverability area, which cleared roughly $9.50 higher than the rest of the RTO at $86.04. The negative CTR megawatts mean there's less load paying for the capacity in that region than there is capacity receiving the LDA's price, Bastian said.

"[It's] a function of that area's share of the peak load forecast, which is a disconnect completely from the way the load is represented at the clearing of the auction, so you can have that kind of an outcome," he said.

Exelon's Jason Barker asked PJM to develop a written explanation of how CTRs were calculated to describe how negative megawatts can occur.

Barker

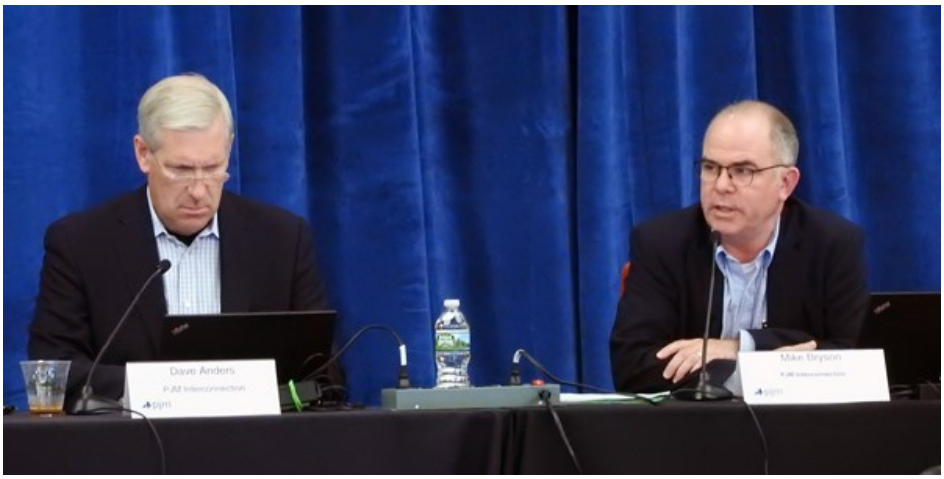
Bastian noted that the Duke Energy Ohio/Kentucky LDA, which cleared about $54 higher than the rest of the RTO at $130, was modeled individually "due to potential for deactivations in that area," which might reduce the amount of power potentially deliverable to the LDA below the amount PJM feels is required for reliability.

"We find it prudent to model them from a reliability perspective," he said, noting that it's been done before in the PPL, BGE and ComEd LDAs. Of the three, only the ComEd LDA has ever separated from the rest of the RTO, he said.

American Electric Power's Dana Horton asked how 119 MW of solar could clear as Capacity Performance, given that the sun usually isn't shining during the morning and evening daily demand peaks in winter, when resources are most likely to be called. This auction was the first year in which all resource offers must comply with CP rules that require year-round availability and impose stricter nonperformance penalties if units fail to be available.

"The sun does shine in the winter," Bastian said. "There was a recognition by the resource owners that there's more risk involved with offering solar, so that the annual quantity is significantly lower than what those resources were required to offer in the past."

Greg Carmean, the executive director of the Organization of PJM States Inc., asked if all nuclear units cleared, but Bastian declined to address the specific unit results. Barker confirmed for attendees that not all nuclear plants cleared, apparently referencing the company's Three Mile Island, which the



PJM's Dave Anders (left) and MRC Chair Mike Bryson. | © *RTO Insider*

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PJM News

PJM Kicks off Transmission Cost Cap Initiative

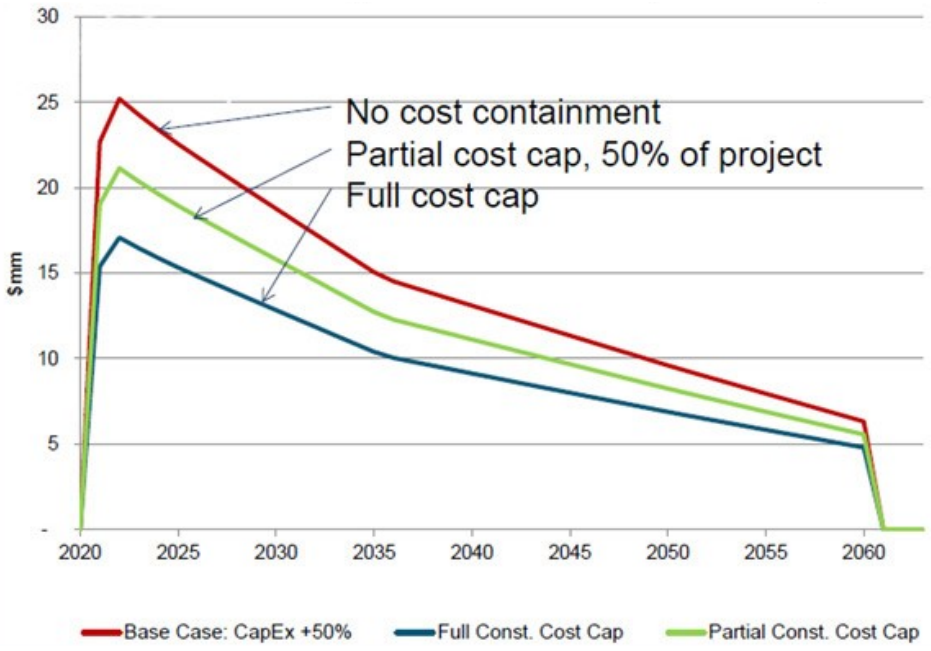
By Rory D. Sweeney

VALLEY FORGE, Pa. — PJM's Planning Committee on Wednesday held its first special session on cost caps and other cost-containment provisions for competitive transmission bids. The RTO expects that any recommended procedure changes that are identified by the sessions will be incorporated in the new Manual 14F: Competitive Planning Process, which received its third "first" reading at the Markets and Reliability Committee meeting last week.

At the initial meeting, PJM provided several examples of cost-recovery and cost-containment mechanisms that have been proposed. Stakeholders indicated an interest in a standardized lexicon for cost-containment descriptions to aid in comparing project proposals.

Ruth Ann Price of the Delaware consumer advocate's office urged keeping the process simple and argued for allowing very few exemptions to cost caps.

Sharon Segner of LS Power suggested that there's a role in the discussion for FERC, whose Order 1000 opened up transmission development to competition.



Annual revenue requirements | © RTO Insider

Following a technical conference in June reviewing the first five years under the order, the commission asked for comments in response to a series of questions on cost-containment provisions (AD16-18). (See *FERC Calls for Post-Conference Comments on Order 1000*.)

FERC asked for information on how transmission providers compare proposals with and without cost-containment provisions; whether it should provide guidance or requirements on the use of such provisions; suggestions for ensuring the transparency of evaluations; and whether there should be standardization of cost-containment provisions or exclusions of certain costs to facilitate comparison of proposals with differing containment provisions. The commission also asked what types of performance-based rates it could accept to reduce "asymmetrical risk."

The next big question for PJM's initiative is to determine if the focus should be on capital costs or annual revenue requirements. Stakeholders noted that PJM's focus has historically been on capital costs.

Through PJM's 13 competitive windows since 2013, about 18% of 650 proposals included cost-containment provisions. Of those, two projects were selected.

Cost caps have been more common in other regions. Of 12 competitive windows including CAISO, SPP and MISO, 54% of the 56 proposed projects and 55% of the selected projects included cost-containment provisions.

The committee's next special session is scheduled for July 18.

MRC Briefs

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company announced earlier had not cleared for the second year in a row.

New Black Start Units Will Have New Annual Revenue Requirements

Stakeholders endorsed by acclimation changes to the annual revenue requirements for black start units. PJM and its Independent Market Monitor had previously come to an agreement on the time periods for member submission of data and review by the Monitor. They also agreed on having the revenue go into a non-interest-bearing account for each unit until its costs have been approved, at which point the RTO will conduct a true-up. (See "PJM to Review Black Start Prior to New RFP," *PJM Market Implementation Committee Briefs*.)

The move comes as PJM prepares for its second request for proposals on black start units, which is scheduled for 2018 for projects to be available in 2020.

PJM Defends Interest in Paying for Frequency Response

Stakeholders endorsed by acclimation a problem statement and issue charge on analyzing generator requirements for primary frequency response, but not before renewing debate over compensation.

FERC issued a Notice of Proposed Rulemaking last November that would require primary frequency response for all new units except for nuclear plants. The NOPR did not address compensation. At previous meet-

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ings, the Delaware Public Service Commission's John Farber has challenged PJM's plan to investigate compensation and requested language be added to the problem statement and issue charge that allowed it only "if appropriate or necessary."

"The intent is to ensure that it's not a given that compensation is required," Farber said on Thursday, responding to an inquiry from Public Service Electric and Gas' Gary Greiner about why the text was added.

PJM staff reiterated the RTO's desire to study whether units should be paid for maintaining primary frequency response capabilities.

"Back at the [Operating Committee meeting] in the fall, PJM made a statement about how we didn't think compensation was necessary," Bryson said. "We're clearly more open-minded about that now, and the wording of the issue charge is intended to imply that."

Stakeholders eventually agreed on discussing potential compensation mechanisms and recommending compensation changes "if appropriate or necessary."

FTRs to Get a Longer Perspective

Members endorsed by acclimation a proposed problem statement and issue charge to consider changes to long-term financial transmission rights modeling.

PJM's Regional Transmission Expansion Plan looks out up to three years into the future in ordering upgrades, but approved projects aren't captured in FTR analyses because they are only able to capture information on a six-month horizon.

Perera

"It is concerning to PJM that today, the current process is not capturing these upgrades. Because what this means to us is that they're not fully transparent to the market participants," PJM's Asanga Perera said.

In the documents, PJM guaranteed that FTR-capability allocations would be made "without violating firm transmission customer priority rights."

Other FTR changes developed in response to the FERC order impacting the annual revenue rights and FTR process also were endorsed during the meeting, though not without some modifications.

Cocco

PJM requested endorsement for Manual 6 revisions, which prompted Mike Cocco of Old Dominion Electric Cooperative to request that the phrase "no longer viable" describing transmission paths be clarified.

Monitor Joe Bowring questioned PJM's planned changes for the FTR forfeiture process.

"I would ask that you give it more thought," he said.

Steve Lieberman of American Municipal Power followed Bowring's comment with a motion to defer a vote on that language until next month. (The Monitor is not a member and could not make the motion on its own behalf.)

Stakeholders worked on the proposal, and PJM's Brian Chmielewski returned later in the meeting to seek endorsement of the revised package. Per Bowring's request, the forfeiture changes were removed, he said, and "no longer active" was substituted for "no longer viable," along with a definition of the phrase that matched the definition in the Tariff.

Stakeholder Approvals

Stakeholders endorsed by acclimation several manual revisions and other operational changes:

> ***"It is concerning to PJM that today, the current process is not capturing these upgrades."***
>
> **Asanga Perera, PJM**

- Manual 3: Transmission Operations. Revisions developed in response to a periodic review.
- Manual 14D: Generator Operational Requirements. Revisions to develop requirements for solar generation facilities, in compliance with FERC Orders 828 (Requirements for Frequency and Voltage Ride Through Capability of Small Generating Facilities), issued July 21, 2016, and Order 764 (Integration of Variable Energy Resources), issued June 22, 2012. (See *FERC Issues Ride-Through Requirement for Small Generators*.)
- Manual 36: System Restoration. Revisions developed in response to a periodic review.
- Manual 13: Emergency Operations. Attachment E updated with 2017/18 load forecast and Mid-Atlantic load shed allocation information; Attachment F updated with 2017/2018 load shed capabilities and allocation percentages. The data in the attachments affects only transmission owners and has been validated by them.
- Governing-document revisions to allow for monthly correction of meters for pseudo-tied units and dynamic schedules. (See "Meter Correction Initiative OK'd," *PJM Market Implementation Committee Briefs*.)
- An updated charter for the Incremental Auction Senior Task Force, which was created in response to a problem statement by Direct Energy that was approved by the MRC in November 2016. The revisions reflect an increase in scope resulting from a problem statement by NRG Energy on replacement capacity that was approved in March 2017. The revisions set a target for completing work and making recommendations to the MRC by January 2018. (See "Stakeholders Approve Variety of Actions," *PJM Markets and Reliability and Members Committees Briefs*.)

Members Committee

The Members Committee held its monthly meeting last week at PJM's Annual Meeting. (See *PJM Annual Meeting Celebrates RTO's First 90 Years*.)

— Rory D. Sweeney

SPP NEWS

Looking Forward Report: The Shale Revolution Continues

By Tom Kleckner

Bates White's Vincent Musco (left) and Craig Roach explain their report to Oklahoma Commissioner Dana Murphy and SPP's board and members. | *© RTO Insider*

The shale gas revolution that has undercut the economics of coal and nuclear plants doesn't appear to be ending anytime soon.

Economists Craig Roach and Vincent Musco say the revolution will continue, despite evidence that "there is a limit to how low natural gas prices can go and for how long low prices can persist."

In producing their seventh annual looking-forward report for SPP's Board of Directors, Bates White Economic Consulting's Roach and Musco say low gas prices will continue "if and only if" technological improvements continue to delay the search for more hard-to-find gas reserves.

Two Risks

Roach said they see two risks to the continued shale gas revolution: underground and aboveground risk.

"The underground risk is whether the technology for shale gas production will continue to improve, so that even as the U.S. turns to more difficult reserves, the price will continue to fall," Roach said in a presentation to the Board of Directors/Members Committee meeting last month. "That is happening. All new wells drilled last year are producing more gas on average than the wells drilled in previous years."

In the report, Roach and Musco note "proven reserves reflect not only the physical abundance of natural gas reserves but also estimates of whether those reserves can be produced at prevailing market prices."

The economists say data indicate a floor of roughly $3/MMBtu, based on a recent 16.6% decline in proven reserves. According to the U.S. Energy Information Administration, Henry Hub spot prices fell 42.4% in 2015, from $4.37/MMBtu to $2.62/MMBtu, and the agency predicted a further 6.1% decline in 2016. April's spot prices were $3.10/MMBtu, up from $2.88/MMBtu the month before.

"The bet is that big-data analytics of the massive amount of data captured on actual gas and oil wells will be what sustains the technologic improvement needed to keep prices moderate," Roach and Musco write.

Six states in SPP's footprint — Arkansas, Kansas, North Dakota, New Mexico, Oklahoma and Texas — account for 46% of the country's total natural gas proved reserves.

Low gas prices have led to an increased investment in combined cycle resources, which, along with subsidized renewable generation and flattened energy demand, has led to low market prices and the early retirement of baseload plants, the report says.

Concerns over Nuclear Generation's Viability

"You have people saying this is the markets working. You also have people saying this isn't the markets working, because prices are artificially low," Musco said. "The markets aren't capturing the full value of nuclear generation. They're not capturing the full reliability value and the zero-emissions value of nuclear generation."

The report notes that reductions in nuclear capacity could increase carbon emissions, citing EIA data that 28% of all U.S. nuclear generation has recently retired or is at risk of retirement by 2030.

Nuclear generation has provided about 20% of the country's energy each year and accounts for 60% of zero-emissions generation in the U.S. "Developers are turning almost exclusively to natural gas-fired combined cycle generation to replace retiring baseload capacity," the report says, noting 100 GW of natural gas-fired combined cycle generation is under development. "However, it may also be argued that these retirements are part of the natural course of generation investments. As plants age, uneconomic plants give way for new, more efficient generation to take their place."

That has already happened within SPP's footprint. Last October, the Omaha Public Power District retired its 500-MW Fort Calhoun nuclear plant, saying it would save up to $994 million over the next 20 years. OPPD's board blamed the retirement on low gas prices and load growth, among

"Developers are turning almost exclusively to natural gas-fired combined cycle generation to replace retiring baseload capacity."

SPP Annual Looking Forward Report, Bates White

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SPP NEWS

Looking Forward Report: The Shale Revolution Continues

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other factors. The plant's operating license was good until 2033.

Fort Calhoun's retirement leaves SPP with only two nuclear plants contributing to its generation mix: Nebraska Public Power District's Cooper Nuclear Station (771.5 MW) and Kansas' Wolf Creek (1,205 MW), which is owned by three separate companies.

Moody's has reported that both plants "could face a 'similar fate'" because they produce power at a cost that is often higher than SPP's north pricing hub.

But Roach and Musco say they believe the plants won't retire early, noting that Cooper and Wolf Creek have lower operations and maintenance costs than the smaller Fort Calhoun, their ownership has less available capacity to offset their loss and NPPD CEO Pat Pope expects a "'capacity-short environment' in SPP," making the nuclear units a "good long-term strategy."

The report notes efforts to address the problem through out-of-market payments in New York and Illinois, FERC's Notice of Proposed Rulemaking on fast-start pricing, small modular reactors and other technological improvements.

It also warns of legal challenges to states considering "special action to 'save'" baseload generation; the "direct impact" to SPP's markets if FERC changes the way wholesale market prices are calculated and the threat posted to baseload generation as existing power purchase agreements expire.

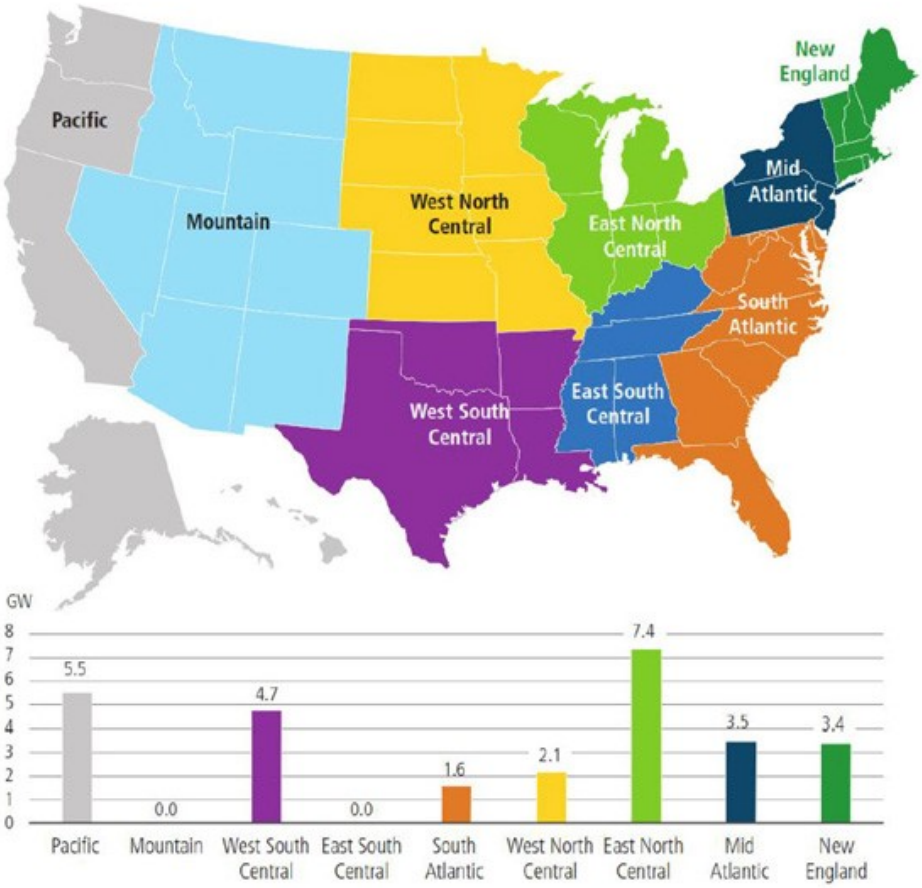
Other Issues to Watch

The report also evaluates five other market and regulatory issues that could affect SPP's markets or require the board's special attention:

- The changing utility model in the face of distributed energy resources and decentralization.
- The U.S. Supreme Court's ruling in cases involving PJM stakeholders and the states of New Jersey and Maryland, which held that the Federal Power Act "'provides FERC with the authority to regulate wholesale market operators' compensation of demand response bids,'" and other jurisdictional issues.
- Lessons from the 2016 Electricity Policy Modernization Act, which died because of unresolved differences between the House and Senate versions but nonetheless raised legislative concerns over the "catastrophic consequences of long-term power outages." Future legislation could include provisions on grid hardening and security and provisions related to markets and distributed energy resources, the report says.
- The outcome of the Trump administration's plan to undo the Obama administration's Clean Power Plan. Because the Supreme Court has already ruled that EPA has the authority under the Clean Air Act to regulate carbon emissions, some observers say Trump can't repeal the CPP without providing a replacement, such as a carbon tax.
- Electric vehicles. Although EVs have not gained significant market share to date, the authors say the SHEAM model — shared, electric, autonomous mobility — can significantly reduce their payback period.

The report says while DER are not an "existential threat" to the grid, they are "likely to challenge generation-owning utilities in the production of electricity and could also emerge as alternatives to traditional grid investments."

While the report was Roach and Musco's seventh for SPP, it's their first for Bates White Economic Consulting. The previous reports were done with Boston Pacific, which joined Bates White's energy practice in November.



Nuclear units at risk or recently retired by region | *Department of Energy, Bates White*

SPP NEWS

Issues, Schedule Set for Texas ROFR Case

Continued from page 11

vice outside ERCOT; and

- Whether SPS has the exclusive right to construct transmission facilities within its certified service area and, if it does, whether it can decline to exercise that right.

The commissioners directed the parties to not take up any issue "relating to the interpretation of a FERC order or tariff," saying such issues are not within the PUC's jurisdiction.

The briefs are due June 21, with reply briefs due July 6.

As an incumbent utility operating outside ERCOT, SPS contends the state's Public Utility Regulatory Act (PURA) gives it a ROFR to build in the service area prescribed by the PUC. That would prevent a potential competitive project under Order 1000.

SPP claims that no such right exists, giving the RTO the ability to solicit and designate transmission-only utilities to construct and operate new transmission facilities within SPS' service area under Order 1000.

The project in question, the 345-kV Potter-Tolk transmission line in the Texas Panhandle, was pulled from SPP's 10-year planning assessment in April. SPP's Board of Directors has directed staff to conduct a congestion study in the area, due within a year. (See *SPP Board Cancels Panhandle Line, Seeks New Congestion Study*.)

The PUC debated during its previous meeting whether to send the case to the State Office of Administrative Hearings (SOAH). The commissioners eventually agreed the docket could be decided based on written briefs. (See *Texas PUC Agrees to Take up SPP, SPS Request on ROFR*.)

SPS Rate-Recovery Request Moves Forward

The PUC also revised a preliminary order in SPS' request to recover the cost of developing two wind farms in West Texas and New Mexico (Docket 46936).

Commissioner Ken Anderson directed staff to include in the order a discussion of the final approval's effect on the city of Lubbock, which has said it wants to transfer load currently served by SPS from SPP into ERCOT. (See *Texas PUC OKs ERCOT, SPP Studies on Lubbock Move*.)

"Does it have the potential to create stranded costs that would have to be recovered?" he asked. "If the answer is yes, then the order should include a question about what should be done to eliminate that risk. It seems to me that because Lubbock has already filed to make that move, it shouldn't be a surprise … that SPS will attempt to argue stranded costs. That issue should be teed up for the commission to consider."

Anderson also asked SPS and its intervenors to address whether there should be a cap on costs — estimated at $1.6 billion, or about 40% of SPS' rate base — as the PUC required of a Southwestern Electric Power Co. plant in western Arkansas.

> ***SPS "cannot afford to wait eight to 10 months … to begin receiving revenue attributable to the facilities."***
>
> ***SPS***

"The truth of the matter is, we don't know what the cost is going to be. It could result in very substantial increase in the rate base," he said.

The company has asked the PUC to approve a "cost-reconciliation mechanism" for the period between the wind farms' commercial operation date and their inclusion in the rate base. SPS has said it "cannot afford to wait eight to 10 months … to begin receiving revenue attributable to the facilities."

SPS told the commission it hopes to have both wind farms in operation by the end of 2020, allowing it to capture the full federal tax credits. The two projects have a combined capacity of 1,000 MW.

The docket has been referred to SOAH. The Texas Industrial Energy Consumers and Golden Spread Electric Cooperative have intervened in the case.

Commissioners Move on Without Nelson

The meeting was the PUC's first without Donna Nelson, who retired from the commission May 15 after almost six years as the three-person panel's chair. (See *Texas PUC Chair Nelson Stepping Down*.)

Her absence was notable from the start. With Nelson at the helm, Anderson would normally offer motions and Marquez would second them. On Thursday, Anderson had to prod Marquez into offering a motion to approve the consent agenda.

Momentarily flustered, Marquez said, "I'm sorry, that was a little out of order. You have that motion."

Anderson seconded, and the hearing was underway.

Texas Gov. Greg Abbott has yet to announce a replacement for Nelson. The Texas Legislature's 85th biennial session ends May 29, which may be delaying the announcement.

FERC News

No Fireworks for FERC Nominees at Senate Hearing

Continued from page 1

nees nor attacks by senators.

The tenor of the hearing suggested Powelson and Chatterjee should have no problem winning confirmation in the Republican-controlled Senate to restore the commission's quorum, which was lost in February with the resignation of former Chairman Norman Bay.

Powelson and Chatterjee, who are seeking terms expiring in 2020 and 2021, respectively, testified along with Dan Brouillette, President Trump's nominee to be deputy secretary of energy.

Each nimbly tap danced in response to questions on senators' pet concerns — favored Department of Energy labs, pipeline and hydro projects, state incentives to save nuclear generation, the fate of the Yucca Mountain nuclear waste depository — promising to consider the issues but not committing themselves to positions.

Chair Lisa Murkowski (R-Alaska) pledged at the end of the hearing to bring the nominees to a committee vote quickly after they answer any written questions from the senators. "My hope is to be able to advance your names quickly, along with that of [nominee for Interior Department deputy secretary, David Bernhardt], so that we can process these nominees for the FERC, for DOE, for DOI and allow the business to proceed."

Mild Tone

The mild tone of the questions was a stark contrast to the grilling Bay — a Democrat and former prosecutor — received at his confirmation hearing in 2014, when Republicans attacked his record as chief of FERC enforcement. (See *LaFleur Cruises, Bay Bruises in Confirmation Hearing*.)

That's not to say the hearing was devoid of partisanship.

Murkowski blamed Bay for resigning and former President Obama for refusing to fill Republican vacancies on the commission last year (by some accounts, a response to the Senate's refusal to consider Supreme Court nominee Merrick Garland). "As a result of those factors, this is the first time in 40 years that FERC has lacked a quorum," she said.

Brouilette, Chatterjee and Powelson | © *RTO Insider*

Sen. Al Franken (D-Minn.), sitting in for ranking member Maria Cantwell (D-Wash.), countered that Bay had informed the Trump transition team he would resign if replaced as chair. He noted it took Trump three months to name nominees.

Franken also took the opportunity to criticize Trump's proposed Energy Department budget cuts and its rollback of the Obama administration's clean energy and climate policies.

"Both the Department of Energy and the Federal Energy Regulatory Commission can play a key role in the clean energy revolution, or they can hold us back while our international competitors reap the rewards," he said. "That is the prism through which I will consider the nominees that we hear from today."

Later, in response to Franken's question about what needs to be done to allow distributed energy technologies to participate in the markets, Chatterjee pledged: "I'm in favor of markets. I'm in favor of competition. And I'm in favor of technology, particularly technologies of interest to consumers."

Climate Change Question

Sen. Tammy Duckworth (D-Ill.) asked the nominees whether they believed in manmade climate change.

"I'm not a climate denier," Powelson responded, adding that "market-based solutions" were adding natural gas and renewables and reducing carbon emissions in Pennsylvania.

Chatterjee — who was central in McConnell's fight against the EPA Clean Power Plan — said he would insist that any policy to cut carbon emissions not undermine the grid. "The first issue at FERC is to oversee reliability. I think that any policy … that seeks to mitigate carbon emissions, we have to ensure that it not have a negative impact on reliability," he said.

"The climate is changing and we're all living here, so it must have some impact," Brouillette said.

Duckworth also asked the FERC nominees for their position on state energy initiatives, such as Illinois' zero-emission credits for nuclear plants.

"I'm a state's rights individual," said Powelson, adding that "nuclear power is part of our energy mix and we're going to need it."

Chatterjee also promised, "I believe in states' rights."

A Plug for Coal

Sen. Joe Manchin (D-W.Va.) made his case for a continued role for coal in the nation's generation portfolio, saying it is an essential part of "baseload power. "All that we're asking for is a proper mix," he said. "I'm being told by the utility companies the proper mix isn't being enforced because of certain conditions and certain requirements that the previous FERC has put on them.

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FERC NEWS

No Fireworks for FERC Nominees at Senate Hearing

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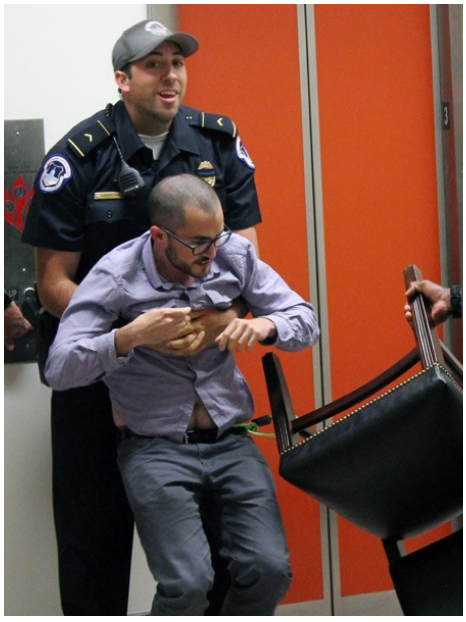
"There's going to be a fuel of the future, I'm sure in 10 to 20, 30 years from now," he continued. "But right now we have to use — in the cleanest fashion we can — what we have that we can depend on."

Responding to Sen. Martin Heinrich's (D-N.M.) question about the commission's role in transmission development, Powelson said if confirmed, he wanted to "immediately sit down with our regional transmission organizations and independent system operators and see where the bottlenecks are, what's working and what's not working."

PURPA

Sen. John Barrasso (R-Wyo.) asked the FERC nominees for their views of the Public Utility Regulatory Policies Act, passed in the aftermath of the 1973 oil crisis.

Powelson called PURPA "a 1978 vintage document. It was addressing a scarcity issue … and the generation mix has changed today." He promised to look at "what's working with PURPA and what's not" if confirmed.



Lee Stewart of Beyond Extreme Energy was carried — along with his chair, to which he had attached himself — out of the room by police after disrupting the hearing. | © RTO Insider

"But I say this respectfully, a Congressional review of PURPA — a PURPA 2.0 doctrine — might be part of a potential energy bill."

Chatterjee echoed Powelson's sentiments. "Any major changes to PURPA would be made by Congress, and while you have my assurance I would work very seriously on this issue should I be confirmed, I think any major changes need to come from this body and not from FERC," he said. (See related story, *PURPA Critics Call for Reforms*, p.1.)

Paths to FERC

Powelson, a member of the Pennsylvania Public Utility Commission, is the current president of the National Association of Regulatory Utility Commissioners. "What I learned from my experience at NARUC is what works in Pennsylvania might not work in other jurisdictions and the proud appreciation we each have for our individual states' rights in supporting our states' energy policies," he said in his opening remarks.

Chatterjee, a former lobbyist for the National Rural Electric Cooperative Association, became McConnell's energy adviser in 2011 after working for two years as a staff aide for the coal state senator. Noting the tradition of bipartisanship and consensus at the commission, he touted his ability to compromise with Democratic senators in pushing through legislation.

"We call Neil 'the Boxer whisperer' in my office — a term of endearment, I assure you," McConnell told the committee in his introduction, referring to Sen. Barbara Boxer (D-Calif.). "His work was key in forging alliances between Sen. Boxer, myself … and others that ultimately resulted in bipartisan agreement."

Franken said Trump should quickly fill the remaining Republican vacancy and nominate a Democrat to replace Commissioner Colette Honorable, who announced she would not seek a new term when hers expires in June.

Numerous reports have identified Kevin McIntyre, co-head of the energy practice at law firm Jones Day, as the third Republican nominee and likely chairman.

Unidentified protester being led away from the hearing room. | © RTO Insider

"It is important that we restore the quorum at this commission. But it is equally important that the president nominate two more members to fill the remaining vacancies — one a Democrat, and one Republican — and maintain the party balance that the law requires," Franken said.

Protest Disruptions

The hearing was interrupted several times by protesters from environmental group Beyond Extreme Energy, who chanted "FERC hurts families" and "Shut FERC down." The group has used the same *modus operandi* to disrupt FERC open meetings.

Police removed and arrested four protesters, including Lee Stewart, who had tied himself to a chair and had to be carried out along with it. One demonstrator left behind a noisemaker that filled the hearing room briefly with a piercing shriek until it was removed. "Until Congress investigates the agency's abuses of power and law, the Senate must not approve new FERC commissioners," the group said in a statement.

At the end of the hearing, Murkowski praised the nominees' young children, who sat with their mothers in the front row. "You've been extraordinarily well behaved," she said in an apparent dig at the protesters. "I think you set a fine example for grownups."

COMPANY BRIEFS

Southern Co. Needs More Time to Assess Vogtle Options

Southern Co.'s CEO hopes to have an evaluation completed in August or "late summer" regarding what to do about the Vogtle nuclear power plant in the wake of Westinghouse Electric's Chapter 11 filing.

Speaking to *The Atlantic Journal-Constitution* following a shareholders meeting Wednesday, Tom Fanning said it is taking longer than expected to get assessments from subcontractors regarding the cost of completing the project.

Company officials had said they hoped to reach a decision by June as to whether to ask Georgia regulators to stick with the project, complete only part of it for now or drop it altogether.

More: *The Atlantic Journal-Constitution*

Consumers Investing $440M in Gas System

Consumers Energy announced it will spend nearly $440 million this year to modernize its natural gas system.

It will spend $75 million to complete 40 improvement projects and replace 67 miles of pipe with plastic and steel, along with an additional $60 million on roadway and civic improvement projects to relocate and replace natural gas infrastructure.

It additionally will invest $120 million to keep up with growth in Michigan, it said.

More: *Consumers Energy*

GE Plans to Invest $3B in 2017, Half for Renewables

General Electric's energy investment subsidiary expects to invest $3 billion this year, with at least half of that supporting renewable energy projects around the world, the unit's CEO said.

David Nason said most of GE Energy Financial Services' 2017 investments will be in North America and will include repowering existing wind farms by replacing aging turbines with new ones.

The unit has committed $15 billion to date to renewable energy, including about $5 billion over the past three years.

More: *Bloomberg Markets*; *Seeking Alpha*

KCP&L Continues Merger Talks with Westar

The Kansas Corporation Commission unanimously refused a request to reconsider its April rejection of Kansas City Power & Light's proposed $12.2 billion acquisition of Westar Energy, which would have created a combined power company with a $14 billion rate base in Kansas and Missouri.

KCP&L spokeswoman Katie McDonald, however, said the company continues to explore the possibility of buying Westar. "We continue to work with Westar in a timely manner to explore the possibility of a revised deal that is materially better than our standalone plan for both shareholders and customers," McDonald said.

More: *The Wichita Eagle*

Westinghouse Strikes Deal for $800M Bankruptcy Loan

Westinghouse Electric told a U.S. bankruptcy judge that it had reached a deal to borrow $800 million, which would enable it to complete its plan to exit bankruptcy by July 27.

The company received court approval in March to borrow $350 million from affiliates of Apollo Global Management. Last week, U.S. Bankruptcy Judge Michael Wiles said he would allow Westinghouse to borrow the remaining $450 million that Apollo agreed to provide, but he wanted to review an agreement that resolved creditors' concerns that the money would be going to non-bankrupt affiliates overseas.

The company said it needs cash to shore up its profitable overseas businesses that add value to its bankrupt business.

More: *Reuters*

Ex-Sunrun Managers: Firm Concealed Cancellations Before IPO

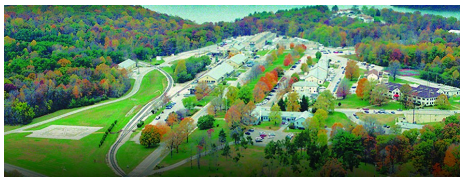
Former Sunrun sales managers told *The Wall Street Journal* that the company instructed them not to report canceled deals prior to its initial public offering in August 2015.

Investors who acquired the solar firm's securities between Sept. 16, 2015, and May 2, 2017, recently filed a class action lawsuit alleging that Sunrun did not adequately report the number of customers who canceled contracts.

The IPO was priced at $14/share. The highest price the stock reached in the past 52 weeks was $7.34/share.

More: *The Wall Street Journal*

Duke Completes 17-MW Solar Farm on Ind. Naval Base



Crane Naval Base | *U.S. Navy*

Duke Energy last week completed a 17-MW solar farm at the Naval Support Activity base in Crane, Ind.

The new farm — which Duke will own, operate and maintain — comprises 76,000 solar panels and sits on 145 acres.

To accommodate the farm and compensate the base for use of its secure land, Duke will upgrade the base's electrical infrastructure and provide a feasibility study to ascertain if a microgrid could enhance base security.

More: *pv magazine*

Duke Sues Environmental Group over NC Plant

Duke Energy

Duke Energy has filed a lawsuit against an environmental group asking a federal judge to rule that its Mayo power plant is not polluting the groundwater in Person County, N.C. — an attempt to counter the Roanoke River Basin Association's allegations that Duke is violating the Clean Water Act in its disposal of the plant's coal ash.

Duke maintains that it is complying with the act and that it disposes pollutants in a wastewater treatment system with the full knowledge and approval of the state of North Carolina. Duke's suit seeks a judgment that the power plant is in compliance with its permit and the CWA, blocking RRBA from pursuing its allegations.

More: *The News & Observer*

FEDERAL BRIEFS

Trump's Proposed TVA Budget Cuts Spending, Employees in 2018

The Trump administration's proposed budget for Tennessee Valley Authority cuts $677 million in capital spending, $263 million in operating expenses and 316 employees compared with the current year.

TVA Chief Financial Officer John Thomas said the federal utility's large capital projects are winding down. Last fall, the utility completed Watts Bar Unit 2. In the spring, it finished construction of a new combined cycle turbine at the Paradise plant.

TVA is exceeding its goal, adopted by its board three years ago, of cutting its total debt by $22 billion by 2023.

More: *Times Free Press*

Clean Coal Money Cut 85% Under Trump's Proposed Budget

Funding for clean coal research will be slashed 85%, from $200 million to $31 million, under the Trump administration's proposed budget.

The budget cuts the Energy Department's funds by $1.7 billion down to $28 billion, with an overhaul in how research and development are funded.

The department would focus on basic research and then free the technologies for private industry to develop.

More: *Bloomberg*

Trump Proposed Budget Seeks to Sell BPA Grid

The Trump administration's fiscal year 2018 budget includes a proposal to sell off the Bonneville Power Administration's transmission assets, which make up about three-quarters of the high-voltage grid in the Northwest.

The administration says selling BPA's grid would save about $4.9 billion over the course of a decade.

The budget also seeks to sell other assets of the power marketing administration for a total savings of $5.5 billion.

More: *Portland Business Journal*

DOE's Nuclear Waste Burial Test Gets Budget Ax

Citing budget priorities, the Energy Department is abandoning the Deep Borehole Field Test, which would assess whether nuclear waste can be stored in approximately 3-mile-deep holes.

In December, energy officials said companies were exploring potential sites in South Dakota, Texas and New Mexico.

More: *The Associated Press*

Trump Announces 3 Nominees for NRC

President Trump announced three Republican nominees for the Nuclear Regulatory Commission, a move that could prevent the commission from losing its quorum in July.


Wright

Trump plans to nominate Annie Caputo, a senior Senate environment panel adviser and nuclear engineer, and David Wright, a former state utility regulator from South Carolina. Trump also plans to reappoint the commission's chairwoman, Kristine Svinicki, whose term expires in June.

The terms of commissioners Stephen Burns and Jeff Baran expire in 2018 and 2019.

More: *The Hill*; *Washington Examiner*

Lower Court Must Reconsider 'Cronyism' Case Against DOE

A federal appeals court last week ordered a lower court to reconsider a lawsuit filed by an electric vehicle battery manufacturer against the Department of Energy over its rejection of a vehicle technology loan.

San Francisco-based Limnia accused the department of "cronyism" and politics in its rejection of its 2009 application. The department said Limnia didn't meet the requirements and didn't pay the proper fee.

The D.C. Circuit Court of Appeals said the district court acted improperly when it remanded the case back to the department without ordering it to reconsider Limnia's 2009 application.

More: *The Hill*

STATE BRIEFS

MICHIGAN

Detroit Names Howrani Heeres as 1st Sustainability Director

Joel Howrani Heeres has been named Detroit's first sustainability director, with responsibilities including sustainability issues relating to energy. He began work on May 22.


Heeres

In recent years, Detroit's energy sustainability efforts have included converting 59,000 streetlights to LEDs and opening a 10-acre solar array at O'Shea Park.

Howrani Heeres previously led initiatives at DTE Energy to use metrics and continuous improvement efforts to better manage the utility's operations.

More: *Michigan Chronicle*

MINNESOTA

Passed Bill Draws Ire of Renewable, Consumer Groups

A jobs and energy omnibus bill passed by the Legislature contains several provisions opposed by renewable energy and consumer groups.

SF 1456 would exempt small rural utilities from participating in the state's Conserva-

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State Briefs

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tion Improvement Program, which allows customers who replace old appliances with energy-efficient ones to receive rebates. Other provisions provide for mediation to resolve disputes between rural cooperative utilities and members, as well as a goal of setting rates evaluated by regulators at 5% less than the national average. Energy efficiency advocates say other factors beyond the per-kilowatt-hour rate should be considered when setting the rates.

Gov. Mark Dayton has not yet indicated whether he will sign the bill.

More: *Minnesota Public Radio*

MISSOURI

House Passes Bill Allowing Manufacturers to Negotiate Rates

Hoping to bring jobs to the southeastern part of the state, the House of Representatives on Wednesday advanced a bill that would allow manufacturing companies that use 50 MW or more of electricity per month to negotiate lower electricity rates than currently permitted.

The bill is meant to entice two companies to set up shop in New Madrid, where the closure of an aluminum smelter last year caused 900 people to lose their jobs. Rep. Don Rone, who sponsored the bill, said the companies could create up to 500 jobs combined, but they can't operate in the state without the ability to negotiate a special rate.

Critics say the bill would increase monthly costs for households and small businesses across the state.

More: *The Associated Press*

NEVADA

Lawmakers Sending Bills on Energy Storage, Wind to Governor

Lawmakers passed several energy bills that are heading to Gov. Brian Sandoval for his signature.

The measures include Senate Bill 145, which provides incentives to customers to install solar energy storage systems; Senate Bill 204, which requires regulators to investigate whether to establish biennial targets for certain electric utilities to procure energy storage systems; Senate Bill 314, which makes it easier for residents to put up windmills; and Assembly Bill 223, which requires electric utilities to create an energy efficiency plan.

"We have to make sure we are moving forward in a progressive and comprehensive way with respect to our energy strategy," said Sen. Pat Spearman (D), who sponsored Senate Bill 145.

More: *Las Vegas Sun*

NEW YORK

16-MW Microgrid Planned For Empire State Plaza

Gov. Andrew Cuomo announced plans to construct a 16-MW microgrid to power the 98-acre Governor Nelson A. Rockefeller Empire State Plaza in Albany.

The grid, which will be housed at a steam plant that was decommissioned in 1994, will use a combined heat and power system to supply 90% of the power, as well as heating and cooling, for the 10 buildings at the seat of the state's government. It is expected to cut the state's energy costs by $2.7 million annually and to remove more than 25,600 tons of greenhouse gases from the atmosphere each year, while helping the state meet its goal of reducing greenhouse gas emissions by 40% by 2030 from 1990 levels.

Design and construction are expected to begin in 2017, with the grid coming online in late 2019.

More: *Cuomo Administration*; *Microgrid Knowledge*

RTO Insider

Your Eyes and Ears on the Organized Electric Markets

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