

RTO Insider

Your Eyes and Ears on the Organized Electric Markets
CAISO ■ ERCOT ■ ISO-NE ■ MISO ■ NYISO ■ PJM ■ SPP

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OSW Group Seeks Changes on Tx Planning, Cost Allocation

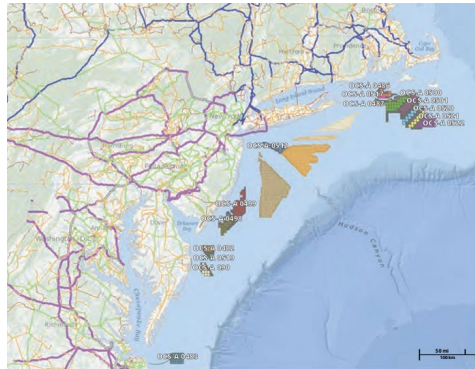
By Rich Heidorn Jr.

Offshore wind advocates are calling for changes to RTO transmission planning and cost allocation rules to reduce costs and development risks for connecting an estimated 30 GW of generation on the East Coast through 2035.

In a *white paper* released Monday, the *Business Network for Offshore Wind* lays out its view of the policy options facing FERC, RTOs and states and the changes it says could ensure the most cost-effective transmission buildout. Grid Strategies' Michael Goggin, who contributed to the paper, will be among 25 witnesses scheduled to appear today at a FERC *technical conference* on offshore transmission.

Brandon Burke, policy and outreach director for the Business Network and the primary author of the paper, said current RTO processes fail to capture all the benefits of offshore transmission, particularly that of an interregional network that could improve resilience in PJM, NYISO and ISO-NE.

It also says OSW development could be



East Coast wind lease areas and major onshore transmission | *Business Network for Offshore Wind*

hamstrung by the "free rider" problem: that transmission upgrades paid for by an individual generator can benefit those who did not contribute.

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Port System Big Challenge for Calif. Offshore Wind. (p9)

DR Firm Challenges FERC, MISO on State Opt-out

By Rich Heidorn Jr.

Demand response aggregator *Voltus* filed a complaint with FERC on Oct. 20 challenging the state "opt-out" provision in Order 719, saying it is undermining MISO's reliability and increasing ratepayers' costs (*EL21-12*).

The complaint, filed on the company's behalf by Earthjustice, asks the commission to revoke the opt-out provision of the 2008 order along with MISO Tariff provisions authorizing states to bar third-party DR providers from participating in the RTO's markets.

Voltus said virtually all the states in MISO have used the opt-out provision, which it says insulates their utilities from DR competition and results in rates that are not just and reasonable. The company also said the provisions are unduly discriminatory because utility-run DR programs are permitted to participate in MISO's markets and because FERC and the

courts have rejected blanket opt-outs for energy efficiency, distributed energy resources and energy storage.

Voltus provides DR services to commercial and industrial customers in PJM, NYISO, ERCOT, CAISO and ISO-NE in the U.S., as well as Ontario's Independent Electricity System Operator and the Alberta Electric System Operator. But in MISO, the company says, it can only operate as an aggregator of retail customers (ARC) in Illinois, Michigan (serving the 10% of load that is allowed to buy electricity from competitive suppliers), Texas, and a few municipal and cooperative utilities that have allowed the company to operate.

It said it could be delivering more than 9,000 MW of DR in MISO, which it said could save ratepayers \$130 million and generate nearly \$500 million in revenue for Voltus annually.

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MISO MARKET SYMPOSIUM



Richard Doying, MISO executive vice president for market and grid strategy (left) and FERC Commissioner Richard Glick | MISO

MISO Seeks Rx for Increased Uncertainty (p.18)

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Avangrid to Acquire PNM Resources for \$4.3B (p.39)

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FERC/Federal News



OSW Group Seeks Changes on Tx Planning, Cost Allocation

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OSW Targets, Projections

Connecticut, Maryland, Massachusetts, New Jersey, New York and Virginia have set targets to procure 29.1 GW of OSW by 2035, with almost 6.3 GW of procurements awarded, [according](#) to the American Wind Energy Association. The departments of Energy and the Interior say the U.S. could [deploy](#) up to 86 GW of OSW, including on the West Coast and in the Great Lakes by 2050. “Aggressive decarbonization” could result in more than 100 GW on the East Coast alone, according to the white paper.

Although OSW resources on the East Coast are relatively close to load centers, they are generally distant from optimal points of interconnection to onshore transmission networks. “In many areas, only lower-voltage transmission and distribution lines extend to the coast, though at certain points high-capacity transmission lines do extend to existing or retired coastal power plants,” the Business Network said. “When the capacity of the existing onshore electricity grid is reached, and low-cost points of interconnection have been utilized, these grid/interconnection constraints could arrest the future growth of the U.S. OSW project pipeline.”

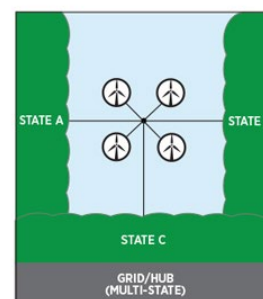
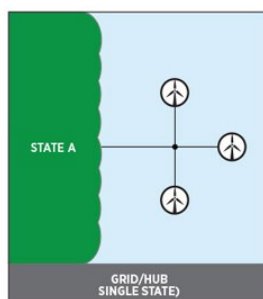
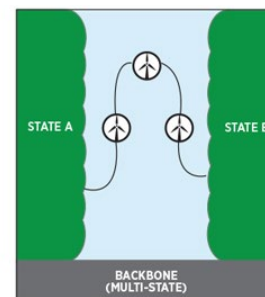
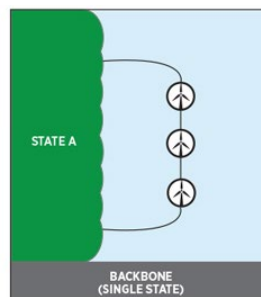
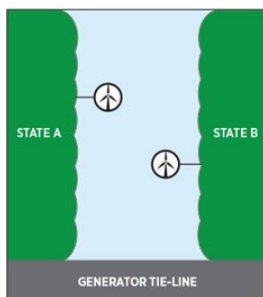
The report identifies eight models for offshore transmission and its cost allocation, including private generator lead lines — the approach being used for the first group of U.S. OSW projects — and one employing partial federal funding.

Planned vs. Project-by-project Approach

“The optimal outcome will almost certainly involve a mix of both generator tie-line and network elements,” the group said. “While there is debate about the optimal configuration of offshore transmission and the onshore grid upgrades necessary to integrate it, a planned transmission strategy is almost always ultimately more efficient than an unplanned, project-by-project approach.”

An offshore transmission network that connects multiple OSW projects would optimize onshore upgrades and make more efficient use of the limited number of optimal onshore interconnection points. It also could benefit from economies of scale by using higher-capacity transmission lines and converter stations, the Business Network says.

Networked offshore transmission also would



Potential offshore wind transmission topologies | *Business Network for Offshore Wind*

allow for rerouting power during interruptions on a single tie line and increase the utilization factor of individual network lines “because geographic diversity causes wind plants to have different output patterns, allowing sharing of network capacity.”

Brattle Group analyses of New England and New York have found that a planned approach could minimize environmental disruptions by reducing the total length of installed cable by about half versus a project-by-project approach.

Costs, Curtailments

The paper says putting 30 GW of OSW in service would require about \$100 billion in capital spending, up to \$20 billion of it for offshore transmission; onshore upgrades would be “comparably large.”

It cited a Brattle [study](#) that a planned offshore network in New England would cost \$500 million less in capital spending with savings of \$55 million annually from reduced power losses. It could also produce another \$300 million in yearly savings by delivering power to higher-priced locations on the grid.

After the first 6.7 GW of OSW is installed, Brattle said, using generator tie-lines to interconnect the remaining 8 GW of capacity in the New England OSW lease areas would result in 13% curtailment, compared with 4% under a

planned approach.

Risks of Network Model

But the paper acknowledged “considerable debate regarding whether a planned offshore transmission network connecting multiple OSW facilities to shore versus an incremental approach driven by generator tie lines serving individual OSW installations will better facilitate the steady expansion and long-term success of the U.S. OSW industry.”

An offshore network entails more regulatory, political and other risks than generator tie lines for individual projects, which it said can undermine the ability to attract investors.

“As the scale of the proposed transmission solution increases, from an individual offshore wind facility tie line, to a line serving multiple OSW projects, to a network line with multiple onshore points of interconnection, and finally to an interregional offshore network, there are increases in both the potential benefits and the policy and political challenges that must be overcome. ...

“The permitting process [for shared offshore transmission] is at best unclear,” the Business Network said, noting FERC’s ruling in July that PJM can deny injection rights to merchant offshore transmission networks unless the project also connects to another grid operator. (See [FERC Rules Against Anbaric in OSW Tx Order.](#)) Anbaric appealed the ruling to the D.C. Circuit

FERC/Federal News



Court of Appeals on Oct. 16.

Role for Government

The paper said “the most fundamental problem” with RTOs’ transmission planning is the reliance on the generator interconnection queue process to determine what transmission should be built. “The lens of generator interconnection is just one of many benefits of those transmission upgrades.”

Because of the “free rider” phenomenon, the white paper says “there is an essential role for government policy in ensuring that adequate transmission is built to realize ... societal benefits, similar to the role governments play for highways, sewer systems and rail networks.”

In many regions, the cost of large upgrades to the grid are assigned to interconnecting generators even though the upgrades benefit the entire region, the group said. “An analogy to that policy would be requiring the last vehicle entering a congested highway to pay the full cost of adding another lane to the highway.”

The group said the risks of network models can be reduced by policy changes clarifying “how transmission will be planned, paid for and permitted.”

The white paper also sees a potential role for DOE in optimizing transmission development, noting that three RTOs and their 20 states and D.C. will have roles in determining transmission planning and cost allocation for OSW on the East Coast.

“Currently, there is no single entity responsible for planning offshore transmission across the East Coast, convening stakeholders and working with the industry and states on transmission options,” it said, suggesting DOE could provide technical research and support for stakeholder engagement. “Potential studies in-

clude analyzing the benefits of different scales and configurations of transmission expansion, quantifying how expanded transmission can reduce capacity and energy costs by capturing interregional diversity in electricity supply and demand, and finding solutions that minimize the total cost of onshore and offshore transmission.”

Beyond Order 1000

It called on FERC to build on Order 1000 by requiring RTOs to incorporate public policy requirements — such as states’ renewable portfolio standards and OSW procurements — into transmission planning. Order 1000 “only required regions to ‘consider’ public policy requirements. State OSW mandates and procurements need to be integrated into transmission planning, as they are law and the procured offshore projects are being built,” it said.

The group also says current interregional transmission planning processes have failed to identify large projects that would benefit multiple regions because “although Order 1000 requires neighboring transmission planning regions to coordinate planning, it does not require a joint process or evaluation of interregional solutions and their benefits.”

PJM’s response to Order 1000 — the “state agreement” approach — “provides an opening for eastern PJM states with OSW targets to partner [and] pay for transmission” but fails to address the free rider problem, the Business Network said. “If a state will benefit from another state’s transmission investment whether they pay for it or not, they have little incentive to pay for it. However, if each state refuses to pay for transmission upgrades that benefit the entire region, nothing gets built and the entire region suffers.”

all those who will benefit from additional transmission capacity. “Moving transmission planning and cost allocation to the regional transmission planning process is the only solution for that problem,” it said.

The current interconnection process also leaves generation developers at risk that initial upgrade estimates will escalate if others in the transmission queue drop out.

Counting all Benefits

The Business Network also says RTOs are “leaving economic, reliability, resilience, hedging and other benefits on the table” because they are difficult to quantify. “In cases in which precise quantification is not possible, using an estimate will result in a more optimal level of transmission investment than arbitrarily assigning zero value to a benefit that is widely acknowledged to be large. If benefits are not quantified, they should be at least qualitatively taken into account in the planning process.”

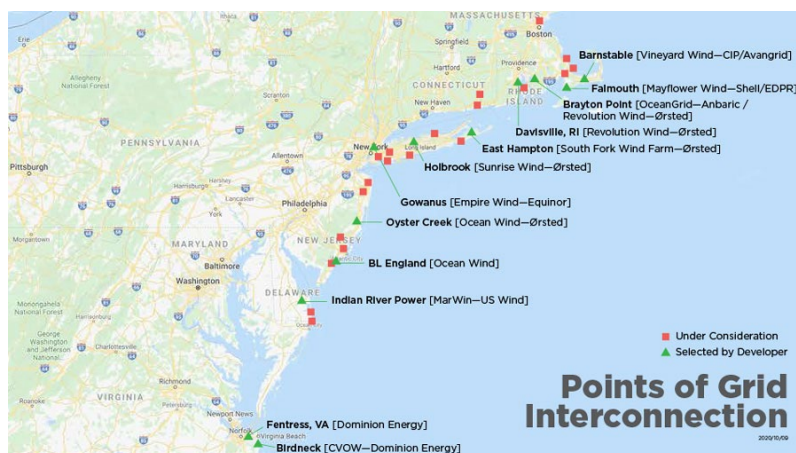
It said transmission planners should use at least a 15-year time horizon for OSW transmission cost-benefit analyses and use advanced modeling to co-optimize transmission and generation planning.

RTO planners “have chosen short time horizons, often 10 years, to calculate the benefits of transmission because of future uncertainty around generation and load. With renewable resources, however, future generation additions will occur in the locations with optimal resources. Those locations are known today and are unlikely to significantly change over time,” the Business Network said. “Transmission assets typically have a useful life of 40 years or more, and that lifetime can often be indefinitely extended by replacing key pieces of equipment.”

Success Stories of Proactive Tx Development

As examples of the “proactive” approach to transmission planning that facilitates renewables, the Business Network cited Texas’ Competitive Renewable Energy Zones, California’s Tehachapi Wind Resource Area near Los Angeles and MISO’s Multi-Value Projects.

“MISO’s approach considers the value of transmission for meeting economics, reliability and public policy (renewable interconnection to meet state RPS requirements) needs. MISO made sure to spread planned transmission projects across the entire MISO footprint to ensure that all zones received projects and had a strong benefit-to-cost ratio, ensuring their support for the overall portfolio.” ■



Potential landing spots for offshore wind generators | *Business Network for Offshore Wind*

It said the interconnection queue cluster process, in which a large number of interconnection applications are evaluated simultaneously and share upgrade costs, could achieve some economies of scale but also fails to allocate the costs to

FERC/Federal News



Glick: FERC Should Help RTOs Work with States

By Michael Kuser

The growth of renewable energy resources stemming from technological developments and the resulting cost reductions has caused more than a few skirmishes, FERC Commissioner Richard Glick said on Wednesday.

“We’re seeing growth on renewable energy, and we’re seeing conflict as well: friction between the states’ efforts to promote renewable energy ... and FERC’s regulation of wholesale electric markets,” Glick said in opening the first day of Renewable Energy Vermont’s annual conference. This year, the group is holding the conference online and over the course of three months.

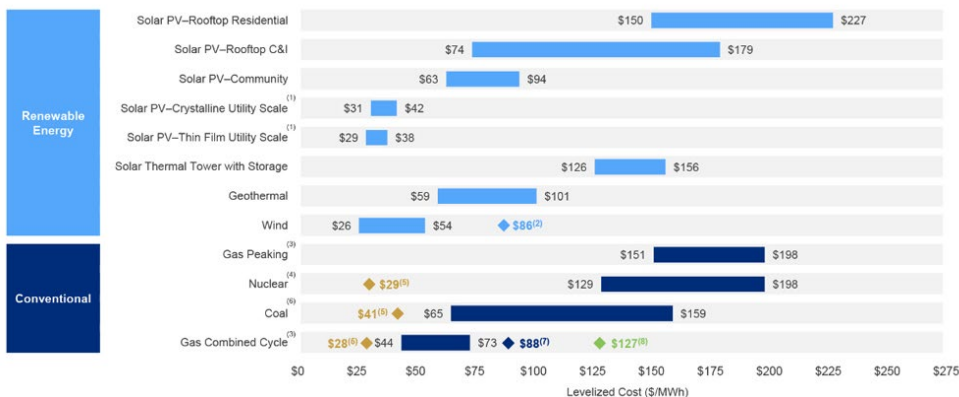
“I don’t think there’s necessarily a natural competition or divergence there, but we’ve seen for a variety of reasons traditional electric generators, primarily natural gas and coal, fighting it out in regional electricity markets,” particularly in the Eastern RTOs, Glick said.

He referred to the New England States Committee on Electricity (NESCOE) having earlier this month called on ISO-NE to increase its transparency and the role of states in its decision-making. The NESCOE manifesto followed a letter from the governors of Connecticut, Maine, Massachusetts, Rhode Island and Vermont, who said the RTO is frustrating their clean energy efforts. (See *States Demand ‘Central Role’ in ISO-NE Market Design.*)

“States want their decisions to be heard in these regional markets,” Glick said. “From my



FERC Commissioner Richard Glick | Renewable Energy Vermont



FERC Commissioner Richard Glick cited a recent Lazard study that shows that when U.S. government subsidies are included, the cost of onshore wind and utility-scale solar is competitive with the marginal cost of coal, nuclear and combined cycle gas generation. | Lazard

perspective, FERC’s responsibility is to figure out a way to help these RTOs design their markets and oversee [these] design changes to ensure that state policies are accommodated, not blocked. If we don’t do that, I think we’re headed towards a bad situation in which some states are going to drop out of RTOs, and certainly states aren’t going to do anything further that would give FERC additional authority over resource decision-making.”

REV Chair Josh Bagnato asked what FERC is doing that impacts Vermonters who are pushing for the clean energy transition.

“The commission has quite a bit of jurisdiction over the New England electricity market through our oversight of ISO-NE, so almost all wholesale transactions throughout the region are subject to FERC regulation and oversight. So, the decisions we make have a great deal of impact on the resource mix, prices and on reliability,” Glick said.

“I don’t think the people at ISO New England ... get up in the morning and say, ‘How can we frustrate or block state programs?’ I don’t think they do that at all, but they are looking at the markets from a different perspective. They want to make sure that the lights stay on and that they provide power at a relatively reasonable price.”

The federal government right now “is relatively AWOL on greenhouse gas emissions, [so] it’s really up to the states at this point to address those issues, and I don’t think the commission blocking state policies, whether it be intentional or inadvertent, is the way to go at this point,” Glick said.

He cited a recent Lazard analysis that said wind

and solar are now the most cost-competitive energy technologies, not only in the U.S., but around the world.

“That’s certainly been a pretty dramatic change,” Glick said. Though federal and state policies have helped somewhat, he said, far and away the biggest driver has been consumer demand, and that will certainly continue in the future.

Individual consumers as well as corporate America have concerns about climate change and would like to see a much greener mix in their utilities’ resource portfolio.

At first it was just Big Tech companies, “but now we’re seeing it all over the place, with Proctor and Gamble, Anheuser-Busch, Walmart — companies that you wouldn’t normally think of in terms of the energy space,” Glick said. “They’re saying, ‘We want to be 100% green and have a 100% net-zero emissions portfolio as quickly as possible.’ And they’re demanding that of utilities, which are going out and substantially changing the resource mix.”

Bagnato asked what three magic buttons Glick would push to help the transition to renewable energy.

“The first is more of an esoteric one, which is follow the science,” Glick said. “The U.S. is the only country in the world having this debate. ... Two, massively build out the transmission grid to be able to accommodate offshore wind and ... onshore wind and solar. Third, we have to have a federal policy. States have been doing a great job, but whether on carbon pricing or whatever, cooperation on a regional basis doesn’t work without a federal overlay.” ■

FERC/Federal News



New Data Offer Way to Value Carbon Abatement

By Michael Kuser

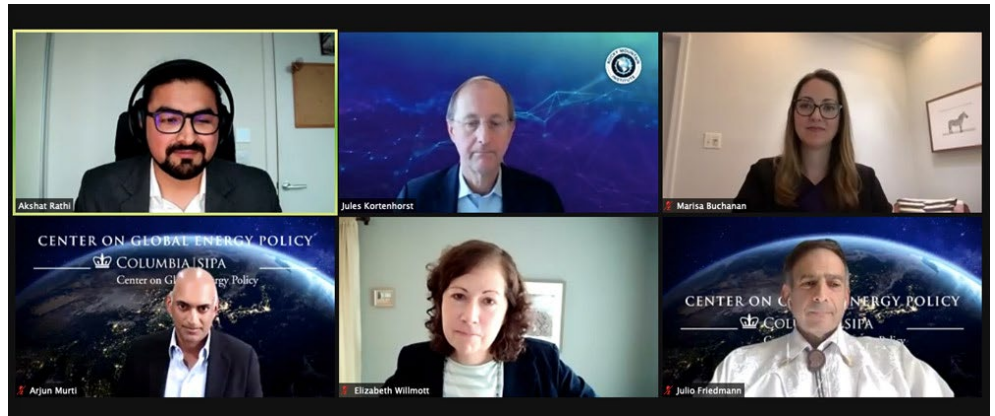
A new study from Columbia University puts forward a leveled cost of carbon abatement (LCCA) as a good way for investors and companies to compare technologies and policies that reduce emissions.

“Policymakers should recognize that one size doesn’t fit all,” Julio Friedmann, lead author of the *paper* from Columbia’s Center on Global Energy Policy, said in a webinar Oct. 19. “One technology may not be the best bet, or one action may not be the best pathway. You may need to do different things in different states to get the maximum CO₂ reduction at the lowest cost.”

Two bankers, a global energy expert and a corporate carbon strategist joined a panel to discuss the merits of LCCA as a tool to measure how much CO₂ can be reduced by a specific capital investment or policy, calculating costs on the basis of dollars per tons of emissions reduced.

Previous marginal or leveled cost methodologies often failed to consider the specific contexts that determine the real, all-in costs of a policy and the real, all-in impacts on emissions, according to the authors.

“One example we ran is the investment tax credit [ITC], which is having a big impact on getting solar panels built, and that’s terrific,” Friedmann said. “It turns out that the value of the ITC was pretty different in different places. In California, \$70/ton was the value; in New Jersey, it cost \$105/ton; in Texas it was \$31/



Clockwise from top left: Akshat Rathi, Bloomberg News; Jules Kortenhorst, Rocky Mountain Institute; Marisa Buchanan, JPMorgan Chase; Julio Friedmann, CGEP; Elizabeth Willmott, Microsoft; and Arjun Murti, Warburg Pincus. | CGEP

ton — so a bargain in Texas, but not so much in New Jersey and Massachusetts.”

This approach also lets policymakers figure out who pays, he said. The ITC is generally viewed as a reduction in cost to the ratepayer, which is true. It also represents an increase in cost to the tax code, because it’s money coming out of the U.S. Treasury.

“The most important thing to think through is what is being displaced; that’s the hardest thing to get your brain around,” Friedmann said. “When anyone does this analysis, including us, we rarely end up with a point result; we usually end up for one issue with a table in order to explain how these things actually interact.” For example, if a clean energy source in India displaces a nuclear plant, that’s not as appealing compared to displacing the burning

of biomass, he said.

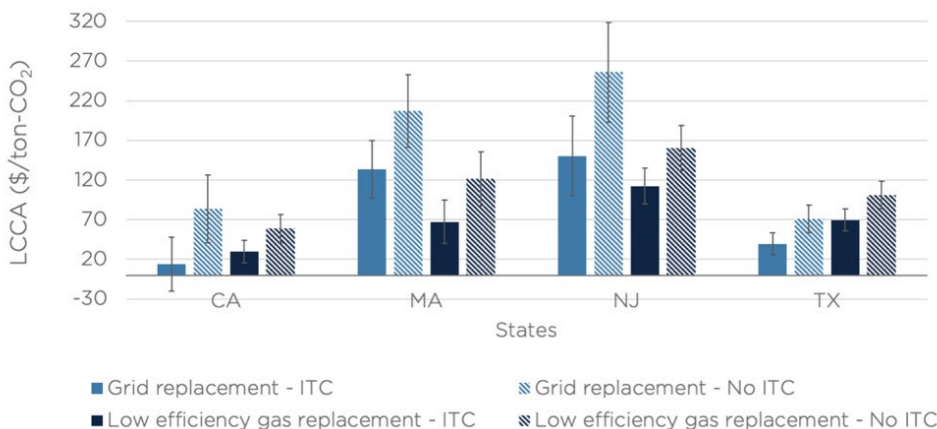
Policy Signals

The Climate Leadership and Community Protection Act signed by Gov. Andrew Cuomo last year requires the Department of Environmental Conservation to establish a value of carbon, based on either abatement or damage cost estimates, for use by state agencies. New York’s policy sways the national debate because not only does the state have some of the most ambitious clean energy goals in the country — net zero by 2040 — but is arguably farther along the policy road to implementing a price on carbon emissions.

“We set ourselves a goal of being net zero by 2050, then things that might not have seemed possible on the outset suddenly become feasible,” said Jules Kortenhorst, CEO of the Rocky Mountain Institute.

“Integration happens; venture capital funding for new technologies gets rolled out; entrepreneurs roll up their sleeves and do things that were deemed impossible; and I think even in this exciting methodology, that is still an area that we haven’t captured yet,” he said. “What is the value of breakthrough innovation when we set ourselves a very ambitious goal and thereby start driving to net zero by the middle of the century?”

Moderator Akshat Rathi of Bloomberg News said that regulations can make what seems to be economically sensible actually happen. He asked how they can help a large bank, for example, align its investment portfolio with the goals of the 2015 Paris Agreement on climate change.



Note: The difference represents the value/cost of the ITC in each market for a 10 kW rooftop array.

LCCA representation of electric power costs with and without the ITC | Goldman Sachs

FERC/Federal News



"We know that we need better data," said Marisa Buchanan, managing director and head of sustainability at JPMorgan Chase, which earlier this month announced it would align its financing to meet the Paris goal of net-zero greenhouse gas emissions by 2050. "We know that we need to increase the comprehensiveness of that data, and we need it to come from a broader swath of companies out there."

JPMorgan works with a lot of big companies, she said, but also wants to extend the emissions reporting effort to medium-sized companies.

"We need long-term policy signals that are really focused on pricing carbon, in many cases, but also looking for other opportunities to reduce emissions," Buchanan said. "We know that a price on carbon is really critical, but it's also only one tool in the toolbox. ... It's important to think about the types of policy signals that are most effective, depending upon the sector or industry you are targeting."

When making its Paris commitment, the bank targeted its activities in oil and gas, automotive manufacturing and electric power, but the business community cannot address climate challenge on its own, she said.

"We really need support and leadership from our policymakers, here in the U.S. as well as globally." The new study "is going to be critical to informing that policy conversation," Buchanan said.

Abatement Strategies

Elizabeth Willmott, carbon lead at Microsoft,

referred to the "tapestry" of different strategies that optimize carbon removal and agreed on the importance of the new study.

Microsoft executives' commitment to reduce and remove carbon emissions is supported by an internal carbon fee, in practice since 2012 and expanded to include all of the company's value chain, Willmott said.

"What's really important for us, being a data science and computer science company, is being able to have this crucial data to compare and contrast strategies, so that when we're making these decisions, we're not simply throwing money at the next bright, shiny thing," Willmott said. "That's why I think the leveled cost of carbon abatement is really a fantastic example of a way to drive good behavioral change and smart economics as a result of any company or government commitment to making swift reductions."

Rathi asked how Microsoft would spur innovation in carbon removal.

"We see a clear need for a swift and profound abatement in greenhouse gas emissions, and we see policies that are effective on the surface that have little real impact, and so we need to take a holistic view on pricing carbon," Willmott said. "From Microsoft's perspective, when we even breathe a word of higher carbon removal costs internally, our internal business stakeholders interpret that as a carbon fee increase on the horizon two to five years out."

Using carbon removal for its own sake and as a price incentive creates a virtuous cycle, she said.

Asked what Microsoft's internal carbon fee is per ton, Willmott said that when the company first established it in 2012, it was based on the budget needed to invest in renewable energy, as well as on carbon offsets at the time.

"But that wasn't driving change, so we increased it two years ago to \$15/ton, which was the point at which we knew our internal colleagues would be able to pay for their own renewable energy," Willmott said.

The firm established that price as an incentive for its Scope 1 and 2 emissions, and it has driven the change desired, she said.

Scientists classify carbon emissions in three categories, or "scopes," with Scope 1 emissions being direct emissions; Scope 2 meaning indirect emissions from power or heat production; and Scope 3 referring to indirect emissions from all other activities.

"Now with our Scope 3 carbon fee, which was instituted just this last January, we're starting lower because the data quality is poor ... [and] we're starting to do the hard work of figuring out what the cost will be and is for this different Scope 3 category so we can then set the fee to be more of an appropriate incentive in just the way the LCAA talks about," Willmott said. "I'm not sure this is public, but you'll all be the first to know our exciting Microsoft internal workings here: It's about \$5/ton."

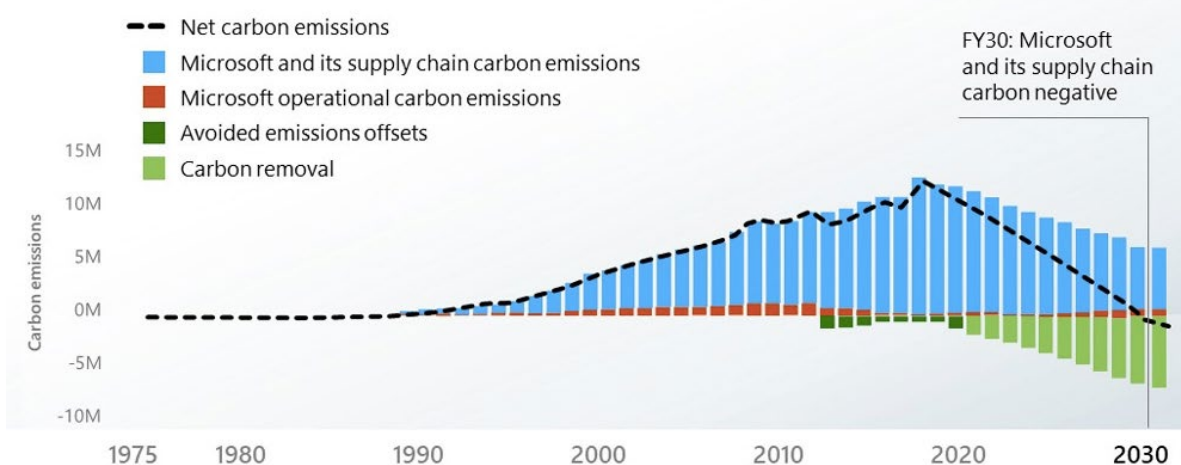
Arjun Murti, senior adviser at Warburg Pincus, said investors are trying to assess where a particular project lies on the cost curve and what is the market for it.

The crucial value of the new study is in its ability to help investors and policymakers understand the public policy implications of a given project.

"Is it going to have support over the long run? Does it actually enhance the societal goals, something that investors are now incorporating more explicitly in their analysis," Murti said.

The private sector needs to act, and the investment bankers need to send price signals, RMI's Kortenhorst said: "Capital is flowing away from the old companies who don't see the writing on the wall." ■

Annual carbon emissions



Microsoft will be carbon negative by 2030, and it plans by 2050 to remove from the environment all the carbon the company has emitted since it was founded in 1975. | *Microsoft*

CAISO/West News

CPUC Tries to Fix PSPS Funding Foul-up

Grants for Well Pumps Overwhelmed Program to Help Vulnerable Residents

By Hudson Sangree

The California Public Utilities Commission acted to correct a “serious omission” Thursday that it said had resulted in huge sums of money going to owners of rural homes, regardless of income, to provide battery backup for electric well pumps.

The commission voted 4-1 to limit its Self-Generation Incentive Program’s (SGIP) “equity resiliency” grants to those with 80% of an area’s median income. The changes will take effect retroactively to Aug. 17, when Commissioner Clifford Rechtschaffen issued a scoping memorandum indicating the CPUC was considering altering program criteria. (See *PSPS Relief Funds Not Spent as Intended, CPUC Says*.)

The SGIP funds were meant to help low-income and medically vulnerable residents of areas affected by public safety power shutoffs (PSPS), the intentional blackouts that utilities use to prevent their equipment from starting wildfires.

Other components of the equity resiliency budget had income restrictions but not the well pump grants. The result was that purveyors of battery storage targeted wealthier homeowners, including those with vacation homes.

Rechtschaffen said the CPUC quickly added the equity resiliency component to SGIP last year to help those facing hardships from multiple power shutoffs, including residents who rely on well water. But the program has been overwhelmed, he said.

Nearly \$400 million of the \$612 million meant to last through 2024 was spent in less than a year, the commission said. PG&E received 10,000 applications for the program’s subsidies this year, more than it received in the first 18 years of the SGIP program, and committed all of its \$270 million share of the equity resiliency proceeds, Rechtschaffen said.

The program is funded by \$166 million per year in ratepayer charges.

“In hindsight, given this surge of applications by well customers, it would have been better to limit the program to low-income customers from the outset,” Rechtschaffen said. “We are making that adjustment now.”

Half the equity resiliency grant recipients are well customers, he said.



Home battery storage systems are at the heart of the controversy over well backups in the CPUC’s Self Generation Incentive Program. | Southern California Edison

Rechtschaffen laid part of the blame on companies that sell energy storage systems.

“I think it’s somewhat unfortunate that the developers have focused so much of their attention on signing up well customers ... as opposed to focusing on medical baseline or low-income residential customers,” Rechtschaffen said. “Those customers face the greatest need. They suffer the most from power shutoffs.”

The CPUC approved \$830 million for the SGIP in January, with \$612 million dedicated to “equity” and “equity resiliency” subsidies to aid residents who face repeated PSPS. Thousands of the program’s targeted customers rely on electrically powered medical equipment to keep themselves alive. (See *California PUC Devoting \$1.2B to Self-generation*.)

Commissioner Martha Guzman Aceves cast the lone “no” vote in Thursday’s voting meeting, saying the remaining funds in the program should be given first to customers who rely on electrically powered medical devices.

Rechtschaffen said he sympathized but didn’t think he had the votes among the five commissioners to make that change.

Customers who filed grant applications but

had not yet received funding will have to meet the new criteria.

Commissioner Liane Randolph repeated her misgivings about applying new rules to pending applications but voted for the changes.

“I was very concerned about ... modifying the rules in the middle of the process,” Randolph said. “I still have that concern, but I recognize there are countervailing issues with regard to the large amount of funds that would otherwise not be available for other aspects of the program.”

In a meeting Oct. 12, Commissioner Genevieve Shiroma called the situation a “serious omission” but one she thought shouldn’t be fixed by changing the rules midstream. Shiroma voted for the changes Thursday.

CPUC President Marybel Batjer, who also voted “yes,” thanked Rechtschaffen and staff members for “making this difficult situation as right as can be.”

She said she was frustrated by the lack of data showing “this was an abused situation by people who ... are using the program for a second home.” The CPUC asked for the data from utilities but had not received it yet, she said. ■

CAISO/West News

Port System Big Challenge for Calif. Offshore Wind

By Robert Mullin

California's port infrastructure will pose a key — but not insurmountable — obstacle to the development of floating offshore wind (FOSW) projects along the state's coastline, industry experts said Thursday.

The subject arose during a scoping workshop the California Energy Commission convened to seek public input on its "draft research concept" regarding the development and testing of FOSW technology.

While West Coast offshore wind development lags that of the East Coast, 14 developers responded to the U.S. Bureau of Ocean Energy Management's 2018 call for information and nominations to develop wind facilities off the coast of California. Development is more of challenge along the West Coast compared

with the East because of the very narrow continental shelf and steep drop-off close to shore, necessitating the construction of floating — rather than fixed-bottom — turbines. (See *Differences Aside, West Coast OSW Can Learn from East.*)

During Thursday's virtual workshop, the CEC laid out a tentative objective that state-funded research projects support "the development and pilot demonstration of innovative floating offshore wind component(s) and installation processes that advance the readiness, reliability and cost-competitiveness of floating offshore wind in California." It also seeks to increase understanding of how FOSW will affect sensitive wildlife species and habitats in the region.

The final research concept will guide the CEC's investment plan for dispensing grants through California's ratepayer-funded Electric Program

Investment Charge (EPIC) program, which currently invests about \$130 million annually across all energy research and pilot programs.

During the workshop, Alla Weinstein, CEO of Castle Wind, said she thinks a key issue was omitted from the CEC's stated objective. She noted that a still unreleased report by the National Renewable Energy Laboratory, discussed publicly during a recent California Public Utilities Commission meeting, found that the "distance to port" for projects in federal lease areas will be the "main driver" of the cost of energy for California FOSW.

BOEM's call for nominations designated three sites for development, including the Humboldt Call Area off California's remote North Coast and the Morro Bay and Diablo Canyon call areas off the sparsely populated Central Coast.

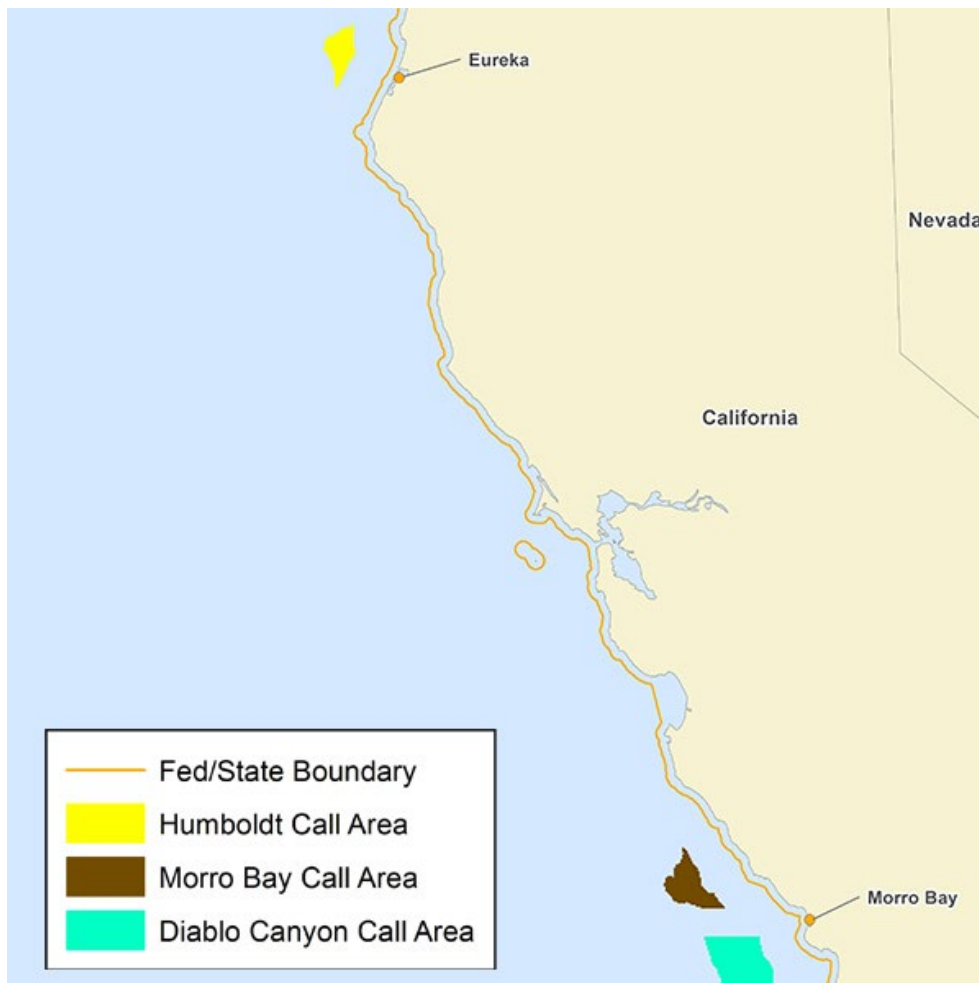
"The distance to port is one element, but also the port infrastructure and limitations that are visible right now are going to be the biggest challenges the industry is going to face," Weinstein said.

The CEC failed to include the issue as one of its main focus areas despite the fact that "it is the single most important [factor] for the levelized cost of energy [LCOE], and it should be included as one of the top priorities," Weinstein said. The CEC's Silvia Palma-Rojas earlier told workshop participants that the commission is targeting an LCOE of \$75/MWh or lower for California FOSW.

Sam Kanner, offshore wind lead for the independent Otherlab, noted that many California ports "are inaccessible to floating wind designs because of transit draft and air draft considerations from bridges or whatnot."

"In California, there are only a few ports that could handle floating offshore wind, maybe six or so, and the largest ones are quite far away from the current lease areas," said Markus Wernli, assistant vice president at civil engineering firm WSP USA. "That compares to the East Coast, where you could draw a circle of 50 miles and get 27 ports out of it."

Wernli advised the CEC to focus on those ports that can most feasibly handle FOSW development. He said the commission should "help people in those communities around those ports understand what it means to have a facility that does work in offshore wind." He recommended the state develop environmental and economic studies for those areas and assess supply-chain logistics.



BOEM's three call areas off the California coast are located in remote areas far from the state's major ports. | BOEM

CAISO/West News

Jason Cotrell, CEO of RCAM Technologies, which specializes in 3D concrete printing of renewable energy structure components, emphasized the importance of the state's role in studying its ports. He recounted how the New York State Energy Research and Development Authority (NYSERDA) performed a 2018 study of that state's port infrastructure for suitability for OSW development.

That study "identified 11 relatively small ports, many of them behind bridges, many of them underutilized, as potential candidates," Cotrell said. "Too small for a staging of an offshore wind plant, but certainly potentially valuable."

Cotrell's company determined it could have used a small Brooklyn port identified in the report to annually produce "something like \$50 million" in offshore wind components using its 3D printing technology. He said wind developer Equinor later chose the site as an operations-and-maintenance base for its offshore facilities.

Studies such as the one performed by NYSERDA are "very important to small companies like ours that have limited means and resources to perform these studies ourselves," Cotrell said, adding that new technologies could unearth the manufacturing and O&M of ports that have been previously "written off."

"So, there may be a lot of potential that perhaps some of us have not seen yet in California ports," Cotrell said.

Pilot Concerns

Some workshop participants took issue with another aspect of the CEC's objectives, advising the commission against seeking to develop a full-scale FOSW pilot, saying the cost would far exceed EPIC grant budgets.

"If the funding is intended to put hardware in the water and do a physical demonstration, you're looking at a very large sum of money, and that is in the tens of millions of dollars," Weinstein said. "I think there needs to be a realization that installing a full-size prototype in the water probably will not happen just because of the amount of money that will be required is beyond the funding that you have and the cost-share that would be required would be effectively prohibitive."

Weinstein said that, unless a pilot is installed in state waters — which would not be representative of the actual builds in federal lease areas — it will require a lease from BOEM "that takes years and a lot of money and will not really lead to a demonstration project."

"I think it's really important for the commission to understand that developers are poised and ready to build utility-scale off the coast of California," said Ross Tyler, senior developer at RWE Renewables. "Yes, there are still lots of unknowns from a technical perspective, but some of the technical challenges are being addressed as we speak, and I think [EPIC] is a noble effort to be part of that."

But Tyler agreed with Weinstein that a full-scale pilot would be cost-prohibitive and said the industry is not really seeing demonstration projects, which would have to be permitted by BOEM and completed within the next three years.

"I think you really need to take a look and perhaps eliminate this notion of having pilot-scale in the water. Otherwise, the developers will not really be interested in participating. That's my take," Tyler said.

Cotrell agreed with Weinstein and Tyler about the infeasibility of a full-scale FOSW pilot but

"I think there needs to be a realization that installing a full-size prototype in the water probably will not happen just because of the amount of money that will be required is beyond the funding that you have and the cost-share that would be required would be effectively prohibitive."

—Alla Weinstein, CEO of Castle Wind

did see potential benefits from pilot projects for individual FOSW components.

"For example, in our case, we have some concepts and a little bit of funding to explore the 3D concrete printing of suction bucket anchors, which are the third-most capital-intensive component of a floating wind turbine," behind the turbine itself and its foundation, Cotrell said.

He said his company could manufacture those anchors and even tow them out to sea and embed them at pilot-scale but could not attach them to a full-scale FOSW turbine at EPIC funding levels.

"I just wanted to offer the different perspective of a component developer that pilot-scale tests and projects are certainly possible, but a lot of care has to be taken with the definition," Cotrell said. ■




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CAISO/West News

California EPIC Symposium Talks Trees and EVs

Governor's Landmark Orders Prompt Discussion at Energy Commission Forum

By Hudson Sangree

Discussion of high-tech solutions to climate change and the proliferation of electric vehicles turned to soil amendments and forest management at last week's California Energy Commission EPIC Symposium.

The annual three-day summit is an expo for the cutting-edge projects funded by the state's Electric Program Investment Charge (EPIC) to ratepayers. The program awards more than \$130 million a year to entrepreneurial efforts to electrify buildings and transportation, and to store renewable energy and enhance grid resilience.

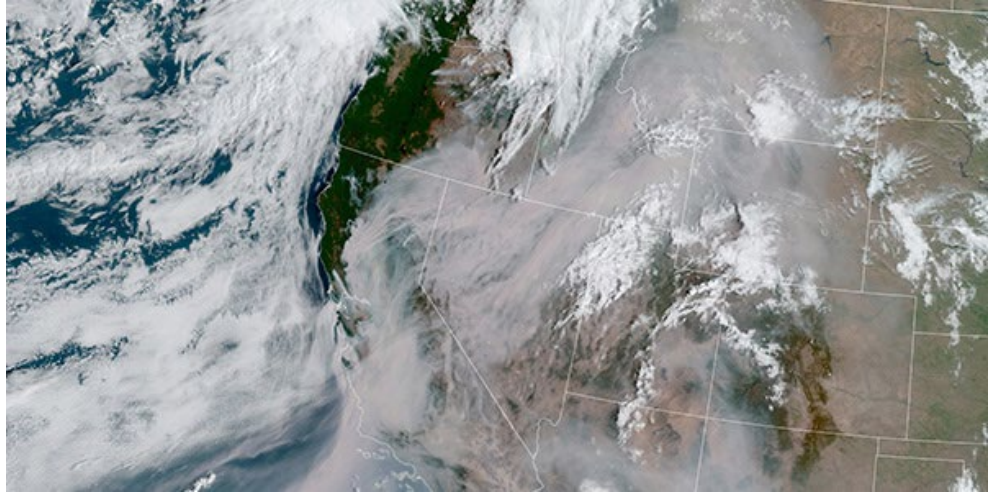
Typically, the summit fills exhibit halls with the latest electric vehicles from the likes of Honda and BMW and packs ballrooms with hundreds of participants. This year's summit tried to recreate that experience with virtual exhibit halls and a variety of forums in which stakeholders discussed the state's latest efforts toward decarbonization.

On Wednesday, Wade Crowfoot, secretary of California's Natural Resources Agency, talked with CEC Chair David Hochschild in an online "fireside chat" about the state's role in clean energy innovation. Crowfoot said an Oct. 7 order by Gov. Gavin Newsom to better manage the state's forests and farmlands was a new front in the battle against climate change and wildfires.

More than 4 million acres have burned in California this fire season, one of the worst on record. Smoke blanketed the West and traveled to the Midwest and East Coast. Particulate matter choked Los Angeles and San Francisco, giving California the worst air in the world at times in August and September.

Tens of millions of tons of greenhouse gasses billowed skyward, canceling out the state's gains in reducing emissions from fossil fuel generation and gas-powered vehicles, Crowfoot said.

"All that smoke that's going into the air and going into our lungs is obviously finding its way into the atmosphere," Crowfoot said. "And unfortunately, this catastrophic fire [season] is actually wiping out these emissions savings that we have in all of these other areas. So, smart land management of working forests, for example, will reduce emissions from these catastrophic wildfires."



Smoke from California wildfires covered the West in August. | NASA Earth Observatory

Newsom's order instructs Crowfoot's agency and other state entities to develop strategies to restore wetlands, manage forests and improve soils, with the goal of sequestering more carbon.

"There's been an increasing global movement that recognizes the way that we steward land — both our natural areas and our working lands, like farms and ranchlands — actually matters to the global effort to combat climate change," Crowfoot said. One effort he cited involves recycling organic waste and adding it to farmland, allowing soil to absorb more carbon and retain more water.

The governor's order was sparse on details, leaving implementation to state agencies. The extent to which the state can direct forest owners to act on the order must still be determined. Millions of acres of the state's forests are owned by the federal government, logging companies and utilities such as Pacific Gas and Electric. Those forests contain immense stands of dead and dying trees from years of drought and bark beetle infestation. The Creek Fire in the rugged Sierra Nevada foothills near Fresno grew into one of the largest fires ever, at 359,000 acres, by feeding on dead trees in and around the Sierra National Forest.

On its Earth Observatory [website](#), NASA showed the dense concentrations of black carbon fouling the air after a series of lightning-sparked wildfires in mid-August.

"Black carbon particulates, commonly called soot ... can harm humans and other animals by entering the lungs and bloodstream; it also

"There's been an increasing global movement that recognizes the way that we steward land — both our natural areas and our working lands, like farms and ranchlands — actually matters to the global effort to combat climate change."

—Wade Crowfoot, secretary of California's Natural Resources Agency

plays a role in global warming," NASA said.

Mass Switch to EVs and Electric Heating Needed

Crowfoot called a Newsom order on EV adop-

CAISO/West News

tion a “huge and bold stroke” toward electrifying transportation. The Sept. 23 order requires all new passenger vehicles sold in the state to be zero-emissions vehicles (ZEVs) by 2035 and provides a much needed market signal to car manufacturers to focus their efforts on EV production, he said.

The transportation sector accounts for more than half of California’s carbon emissions; the order will reduce automobile emissions of GHGs by 35%, the governor’s office said. (See *Calif. to Halt Gas-powered Auto Sales by 2035.*)

Meeting Newsom’s mandate — and the state’s larger decarbonization goals — will require rapid acceleration of EV sales and charger installations. (See *Can California Meet Its EV Mandates?*)

Senate Bill 100 requires the state’s load-serving entities to provide retail customers with 100% carbon-free energy by 2045, and an executive order by former Gov. Jerry Brown requires the state to attain carbon neutrality the same year. Brown signed both in September 2018.

To meet the requirements, Southern California Edison estimates that 75% of light-duty vehicles on the road must be EVs by 2045, along with two-thirds of medium-duty vehicles and a third of heavy-duty vehicles. Russell Ragsdale, SCE’s director of asset and engineering strategy, said during a symposium panel on accelerating the integration of renewable energy.

SCE is pushing forward with adoption of EVs



| © RTO Insider

through its “charge-ready” programs for light-, medium- and heavy-duty vehicles, Ragsdale said. The utility is “looking to accelerate the adoption [of EVs] across California by enabling access to charging and helping to limit range anxiety,” the fear drivers have of running out of power, he said.

In August, the California Public Utilities Commission gave SCE’s efforts a big boost by authorizing \$437 million to fund the installation of 38,000 charging ports for EVs via SCE’s Charge Ready 2 infrastructure program, the largest single-utility EV charging program in the nation. (See *CPUC OKs 1.2 GW of Storage by 2021, 38,000 EV Chargers.*)

Switching to EVs won’t be enough; Californians must electrify buildings so that 75% of water and space heating will be electric to meet the state’s 2045 decarbonization requirements, Ragsdale said.

Moreover, California will need huge new amounts of renewable energy, including 80 GW of utility-scale generation and 30 GW of utility-scale storage, plus 30 GW of distributed generation and 10 GW of distributed storage, he said.

“This combination of cleaning the power source and then electrifying these various uses will help us to get the carbon out of our economy,” Ragsdale said. ■

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ERCOT News



ERCOT Briefs

Staff Resettling 25 Operating Days Following Market Errors

ERCOT staff have begun issuing price corrections and resettling 25 operating days affected by two market errors earlier this year.

The Board of Directors approved the price corrections earlier this month, as the errors were not caught in time by staff to resettle the operating days on their own. Staff are working with stakeholders to better define “significance,” the only threshold required to take pricing errors to the board. (See “Board Approves 2 Sets of Price Corrections,” [ERCOT Board of Directors Briefs: Oct. 13, 2020](#).)

Staff began issuing market notices with the final resettlements last week, two days at a time. The grid operator released tables with the resettled amounts for the [June 8-9](#), [June 10-11](#), [June 12 and 15](#) and [June 16-17](#) day-ahead operating days.

In an email to *RTO Insider*, Dave Maggio, ERCOT’s director of market design and analytics, said the resettlement tables are intended to provide a “market-wide net change in dollars broken out by different components of settlement.”

As an example, he said, the June 10 price cor-

rection addresses the effect on market participants that had day-ahead energy sales for that day. A net amount of approximately \$5,000 will be redistributed to those participants.

“It’s worth noting that the same market participant is likely to be involved in multiple components of settlement,” Maggio said. “For example, an individual market participant may be receiving additional dollars for day-ahead energy sales and may owe additional dollars for day-ahead real-time obligations that were purchased.

“When it comes down to it, the resettlement is really just a shuffling of dollars around between market participants,” Maggio said.

RTC Group’s Protocol Work Completed

Staff said a stakeholder group working on revision requests needed to implement real-time co-optimization (RTC) has completed its review process by reaching consensus on all proposed protocol changes.

The revision requests will be finalized and posted with urgent status before going before several stakeholder groups, culminating in the Technical Advisory Committee and Board of Directors meetings in November and December, respectively. The TAC and the board will



Dave Maggio, ERCOT | ERCOT

be asked to endorse and approve 11 change requests.

The Real-Time Co-optimization Task Force has met 33 times since April 2019, first developing key principles and then protocols. The Texas Public Utility Commission in 2019 directed ERCOT to add RTC, a market tool that procures energy and ancillary services every five minutes to find the most cost-effective solution for both requirements. The grid operator plans to go live with the tool in 2024. (See [ERCOT Stakeholders Dig into Real-Time Co-optimization](#).)

ERCOT OKs Petra Nova’s Mothballing

ERCOT said on Oct. 20 that a reliability analysis has determined NRG Energy’s Petra Nova Power Unit 1 is not needed to support the transmission system and can be mothballed as requested.

NRG last month sent the grid operator a notification of suspension of operations (NSO) that indicated it intended to place the resource in seasonal mothballs, effective Dec. 20. The unit will be available to the market June 1 to Sept. 30. (See [NRG to Mothball Petra Nova CCS Plant](#).)

Petra Nova has a summer capacity of 71 MW. It was retrofitted at a cost of \$1 billion to capture carbon from one of NRG’s nearby W.A. Parish Generating Station coal-fired units. Industry analysts don’t expect the plant to return to operation until oil prices stay consistently above \$50 or \$60/barrel.

ERCOT’s protocols require it to perform the reliability analysis before approving an NSO. ■

— Tom Kleckner



ERCOT has approved the mothballing of NRG’s Petra Nova plant, part of the world’s largest carbon-capture facility. | [NRG Energy](#)

ISO-NE News

ISO-NE Planning Advisory Committee Briefs

Cape Cod Resource Integration Study Initiated

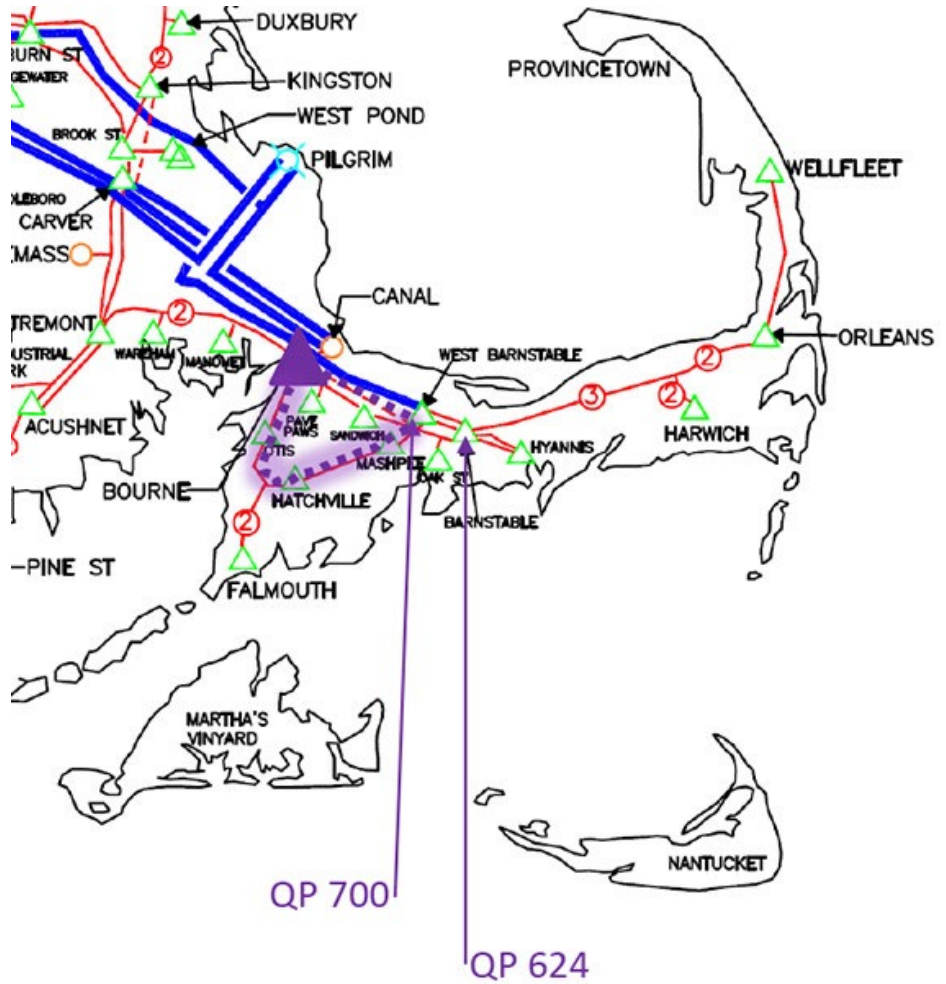
ISO-NE last week presented its *notice of initiation* for the Cape Cod Resource Integration Study, which will focus on potential infrastructure to interconnect queued generation and quantify resources that could interconnect with new transmission according to the network capability interconnection standard (NCIS).

Conceptual cluster-enabling transmission upgrades include adding new 345-kV transmission infrastructure between West Barnstable and Bourne, Mass. The study will also identify the number of megawatts that could be interconnected while recognizing the export limitation from Cape Cod from a 2019 economic analysis by the New England States Committee on Electricity (NESCOE).

Al McBride, a system planner for ISO-NE, said the RTO had completed several interconnection studies on Cape Cod, most recently a system impact study for the proposed *Vineyard Wind 2*, which would connect to the 345-kV West Barnstable substation.

The project, which is under evaluation by utilities in Massachusetts, could be either 400 or 800 MW; ISO-NE studied the 800-MW option. It would require network upgrades, including a 345-kV line from West Barnstable to Bourne, a new 345-kV substation at Bourne and a 345/115-kV autotransformer at West Barnstable.

There are also several more interconnection requests in the queue, including 2,948 MW of



The Cape Cod Resource Integration Study will focus on the addition of new 345-kV transmission infrastructure between West Barnstable and Bourne, Mass. | ISO-NE

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ISO-NE News

generation and an elective transmission upgrade, seeking to interconnect to Barnstable/West Barnstable or Bourne.

The conditions used in NCIS system impact studies, described in *Planning Procedure 5-6*, include peak-load and light-load testing and resources modeled at their nameplate ratings (50 or 0 degrees Fahrenheit, as appropriate). New resources may also dispatch against existing resources under NCIS interfaces modeled at the transfer limit.

One admittedly “curious” stakeholder asked McBride why the RTO is initiating this study now, as potentially eligible projects for this cluster have already had feasibility studies done.

“This isn’t a new realization that there are more megawatts here than can be fully deliverable from the cape,” the stakeholder said.

McBride said there was consideration given to starting the cluster “sooner ... but because we were able to complete [the Vineyard Wind 2 study] serially, we did so, and we feel that’s the way that the process is supposed to be implemented.” McBride added that “given our experiences with [Vineyard Wind 2], and what we were seeing on the system, and then our jump ahead into the future through the economic study ... all of the conditions became apparent, and so that’s why we’re initiating it now.”

Another stakeholder asked McBride if the peak load for Cape Cod “is different rather than simultaneous with the system peak, how is it going to be handled in this study?”

“Somewhere like the cape, for nine months to approximately a year, you’re going to be experiencing lower loads, and you might use less of these injected megawatts,” McBride said. “And if there are any time constraints, getting megawatts off the cape might add to that. ... I don’t have anything necessarily specific that we might add into this study, but it’s something that we’re thinking of, and if we have anything more, we’ll come back” to the committee.

The RTO will accept additional stakeholder feedback on the initial conceptual transmission upgrades until Nov. 20 and present results of the Cape Cod Resource Integration Study within 12 months. However, the economic analysis previously performed by NESCOE and the interconnection studies is expected to speed up this time frame.

After the publication of the final report, the RTO will open the window for eligible projects to proceed to the cluster system impact study (CSIS) phase. Eligible projects must meet CSIS entry requirements to move into the study, including submitting a cluster participation deposit.

Lessons Learned on Order 1000 Competitive Solicitations Process


ISO-NE’s Michael Drzewianowski *introduced* the RTO’s plans to gather feedback for “lessons learned” on competitive solicitations under FERC Order 1000. The recently completed Boston 2028 transmission solicitation was the RTO’s first-ever request for proposals under Order 1000.

“While the cost of the competitive solicitation was considered a success, the ISO and stakeholders have noted areas that could be improved, and the ISO is taking this formal process to collect and evaluate feedback from stakeholders,” Drzewianowski said.

The RTO ran its initial RFP from December 2019 through July of this year. The process concluded with selecting a \$49 million project by utilities National Grid and Eversource Energy, which was the cheapest of the 36 received proposals. (See *ISO-NE Chooses Incumbent as Boston RFP Winner*.) ISO-NE also promised stakeholders, who challenged its selection process, discussions on what did not work well or could be improved in future RFPs and their execution, including developing a submittal template that will summarize any recommendations and guide Tariff and process changes. Drzewianowski added that the RTO already initiated one-on-one discussions with qualified transmission project sponsors who submitted proposals.

Drzewianowski said if there are issues with the RFP or suggested improvements, he would encourage stakeholders to work through the process. Comments on the draft lessons learned submittal template are due Nov. 2, and the final template will be distributed at the Nov. 6 PAC meeting. Completed templates should then be sent to the RTO by Nov. 25, with a discussion of the submittals slated for the Dec. 16 committee meeting. ■

— Jason York



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ISO-NE News

NEPOOL Reliability Committee Briefs: Oct. 20, 2020

Greater Boston Transmission Project Cost Revisions Fail to Gain RC Support

NEPOOL's Reliability Committee failed to endorse cost overruns on Eversource Energy's Greater Boston Transmission Project during the committee's monthly meeting Oct. 20.

The proposal won 60% support, below the 66.7% needed for a recommendation to the PC.

The project's cost increased by \$191 million (33%), primarily because of the underground Wakefield-Woburn, Mystic-Woburn and Sudbury-Hudson lines. Those three lines will cost an additional \$147 million, which brings their total to \$352 million.

The need to underground the 115-kV Sudbury-Hudson, initially proposed as an overhead line, accounts for an increase to \$91 million, which is more than double the original cost of \$45.3 million. Eversource was unable to secure property leasing rights from the Massachusetts Bay Transportation Authority (MBTA) for an overhead line. The project has an in-service date of December 2023.

Eversource performed an updated alternative analysis and found that a new 9-mile, 115-kV underground transmission line within an MBTA right of way was the "most cost-effective and constructible alternative." The two alternatives analyzed — a new 10.3-mile, 115-kV underground transmission line en-

tirely in roadways (\$110.4 million), or multiple upgrades to convert a 14.5-mile, 69-kV line to 115 kV, reconductor 11.6 miles of other 115-kV lines and upgrade seven substations (\$116.1 million) — had higher costs.

The Wakefield-Woburn and Mystic-Woburn lines increased to a combined \$260.6 million from \$160.2 million, representing more than half of the total cost increase. Eversource said additional restrictions on the design and construction required a realignment of underground work within roadways to avoid interference with existing utilities. Restrictions on work hours and the number of crews also increased the construction bids, the company said.

The remaining 30 parts of the project saw an additional 12% increase in cost to \$411 million from \$367 million. However, these transmission cost allocations were previously supported by the RC and approved by ISO-NE.

RC Supports Proposed Revision to ISO-NE/NYISO Coordination Agreement

The RC voted in support of the RTO's proposed revisions to its Coordination Agreement (CA) with NYISO to eliminate the need to make a FERC filing when the grid operators update their description of shared interconnection facilities.

The grid operators share interconnections at NY/NE Northern AC Interconnection (com-

prising the PV-20, K7, K6, E205W, 393, 690/FV and 398 interties), the Northport-Norwalk Harbor Cable and the Cross-Sound Cable Interconnection (CSC).

ISO-NE and NYISO will update the detailed list of interconnection facilities on their respective websites rather than maintaining it in Schedule A of the CA, which requires a FERC filing any time changes are made to it. The addition or removal of an interconnection would still go through the grid operators' respective stakeholder processes and filed with FERC.

ISO-NE and NYISO have agreed to add the "+/-" notation to the CSC Intertie, which is in the list of interconnections within the list of interconnection facilities that will be posted on both websites. ISO-NE will use "its best efforts" to notify the RC within one week following the posting of any revision to the listing of interconnections. If an RC member identifies and reports a perceived error, the RTO will contact NYISO and discuss the concern. The posting will be modified if they agree a change is warranted. ISO-NE will notify the RC member and explain why the change is not justified as well. Entities can also subscribe to the ISO-NE webpage to receive immediate notices of the revision of posted documents.

The Participants Committee will vote on the CA revisions at its Nov. 5 meeting. ISO-NE and NYISO expect to file the revised CA by the end of the year with an effective date in early 2021.

ICR and Related Values for ARAs Recommended by Vote

The RC voted to recommend that the PC support ISO-NE's proposed installed capacity requirement (ICR) and related values for Forward Capacity Auction 12's three annual reconfiguration auctions (ARAs) to be conducted in 2021.

The committee approved net ICRs of 32,925 MW for 2021/22 (ARA 3), 32,765 MW for 2022/23 (ARA 2) and 32,980 MW for 2023/24 (ARA 1). The committee also approved a 958-MW value for the Hydro-Québec interconnection capability credit for ARA 3, with the amount rising to 969 MW for ARA 2 and down to 941 MW for ARA 1.

The PC will vote on the ICR and related values on Nov. 5, with a FERC filing expected by Nov. 30. ■



Hydro-Québec transmission substation

— Jason York

ISO-NE News

Proponents Tout Combined Heat and Power Potential

By Jason York

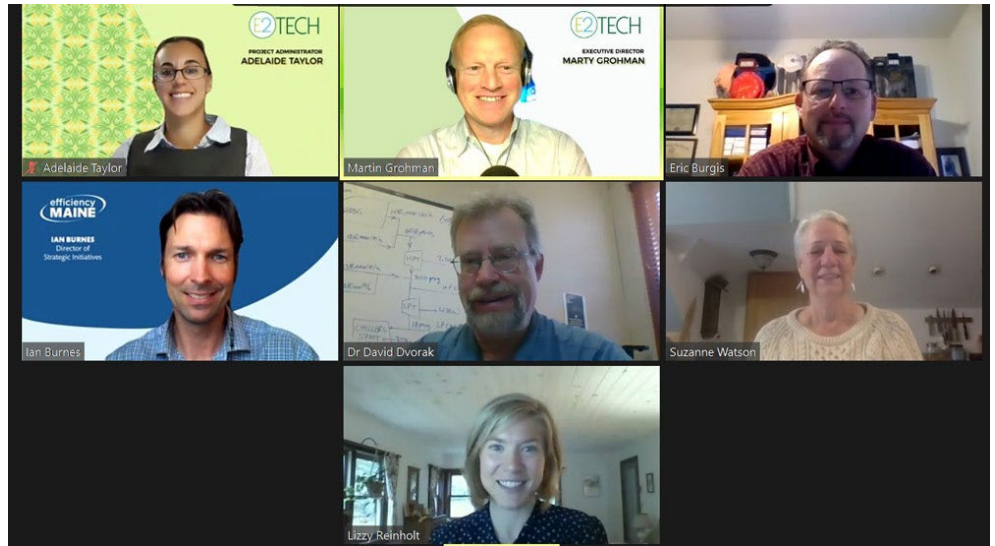
Combined heat and power (CHP) systems harbor great potential for small applications, but adopters face the current reality that system costs do not fall in proportion to size, according to proponents.

CHP systems, or cogeneration, are an efficient way to generate electricity and heat from a single fuel source, such as biomass or natural gas. CHP is fuel-efficient, as it uses otherwise wasted heat productively for heating or cooling. It also reduces the need to purchase distributed electricity from the grid, which increases energy security.

The Environmental and Energy Technology Council of Maine on Oct. 20 hosted a webinar to discuss emerging markets for the technology.

David Dvorak, director of New England Combined Heat and Power Technical Assistance Partnership and professor of mechanical engineering technology at the University of Maine, said more than half the 80.7 GW of CHP installed capacity in the U.S. are “typically very large-scale systems.” Dvorak said these types of CHP systems “work very well,” but they also need to be installed by on-site engineers.

In smaller applications, Dvorak sees changes. “Out of 4,000 sites that we currently have in our installation database, what we’re seeing is that in the past four years, there have been



From top left: Adelaide Taylor, E2Tech; Martin Grohman, E2Tech; Eric Burgis, Energy Solutions Center; Ian Burnes, Efficiency Maine; David Dvorak, New England Combined Heat and Power Technical Assistance Partnership; Suzanne Watson, Watson Strategy Group; and Lizzy Reinholt, Summit Utilities | E2Tech

quite a few smaller-scale systems, for instance in multifamily [homes] and schools, that are put into place,” he said. “These tend to be smaller systems where there may or may not be in-house expertise to do a full engineering analysis.”

Dvorak said this represents “technical potential” in New England.

Ian Burnes, strategic initiatives program manager for Efficiency Maine, said that CHP is “a great technology, but the upfront installation cost “is really challenging.” Large-scale CHP installed at an assisted-living facility can cost \$300,000 for the total system cost and \$80,000 for electrical engineering.

Dvorak added that even with small-scale or micro-CHP systems, the interconnection costs and associated expenses do not scale down with them.

“There’s a certain aspect of [cost] that’s fixed, and it becomes a larger fraction of the total cost, and this is a real challenge, but we see more and more opportunities in these smaller systems,” Dvorak said. “We’re hoping to find ways actually to see more of these small-scale systems installed.”

Burnes said Efficiency Maine offers capped financial incentives on total project costs and 50% coverage up to \$20,000 for a technical assistance study and free scoping audit of utility data that includes a final report.

Lizzy Reinholt, senior director of sustainability

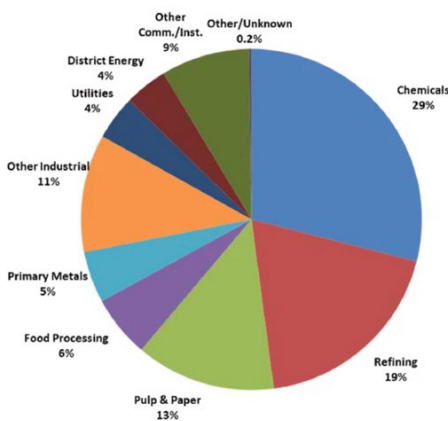
and corporate affairs for Summit Utilities, added that getting people to realize the benefits of CHP is “really important.”

Reinholt said local distribution companies have leadership roles in building a sustainable energy future. Summit — which operates in five states, including Maine — is focused on renewable natural gas and its role in reducing emissions and helping states meet their climate goals. She said Maine Gov. Janet Mills has been pushing an aggressive agenda around emissions reductions and creating the Maine Climate Council, which recently released a draft of its four-year *Climate Action Plan* that included recommendations for CHP.

It is an “exciting time to work in the energy field,” she said, adding that it is also a critical and transitional time, as regulatory and legislative frameworks need adaptation to better link to goals for reducing emissions and mitigating climate change impacts. Building strong partnerships with lawmakers and regulators is essential, she said.

“Right now, there is a strong push to find a silver bullet to solving all the problems we face, both reducing emissions and reducing costs, and there are no easy answers,” Reinholt said. “I feel grateful for the work that’s already been done that has stayed technology agnostic and instead focused on outcomes. How do we keep that moving forward so that we can be ready to seize on those innovations and emerging technologies in the marketplace?” ■

Existing CHP Capacity: 80.7 GW



Combined heat and power installations through Dec. 31, 2019 | *New England Combined Heat and Power Technical Assistance Partnership*

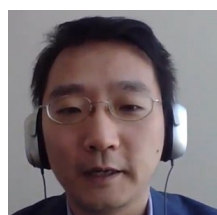
MISO Market Symposium

MISO Seeks Rx for Increased Uncertainty

Market Symposium Panelists Tout DR, Data

By Rich Heidom Jr.

Facing growing uncertainty from intermittent resources, MISO and other grid operators must increase use of demand resources and provide market participants with tools to hedge risks, academics, consultants and others told the RTO's Market Symposium last week.



Andy Sun, Georgia Tech | MISO

"The challenge facing ISOs around the world in the next decade or 15 years is quite unprecedented," said Andy Sun, associate professor at the Georgia Institute of Technology's H. Milton Stewart School of Industrial and Systems Engineering.

"We're moving into territory I think we haven't seen before in terms of the uncertainty that will be in the system. Demand and supply are all becoming a lot more stochastic — which means it's both uncertain and also dynamic."

Scott Harvey of FTI Consulting said California's and Australia's challenges in managing higher levels of solar output foreshadow MISO's future and the limits of markets.



Scott Harvey, FTI Consulting | MISO

"One of the key things we have to look at is:

Are the markets consistent with the actions the operators are taking? Are they reinforcing those actions?" he said. "What we're seeing in California is [that] the failure of some of the tools to deliver — to perform as intended — has led to a continuation of operators taking out-of-market actions."

Harvey and Sun were among the panelists in a discussion Oct. 20 on "Addressing Uncertainty, Variability and Risk via Power Markets and Operations."

Need for DR

Harvey and Ross Baldick, professor emeritus in the Department of Electrical & Computer Engineering at the University of



Ross Baldick, University of Texas, Austin | MISO



Grid emergencies in MISO began increasing in 2016, with 21 of the 28 events occurring in non-summer months that rarely posed reliability problems in the past. | MISO

Texas, Austin, also called for more emphasis on demand resources.

More than 90% of demand response in MISO is only available in the lead up to an emergency, and there is little DR in much of MISO South, according to testimony by former Ohio regulator Paul Centolella that was filed with a complaint over state DR opt-out policies in MISO on Oct. 20. (See *DR Firm Challenges FERC, MISO on State Opt-out*.)

"I think there is an incredibly invaluable role that needs to be played by the demand side," Baldick said. "We're simply, in a high renewable world, moving away from the presumption that we can serve all demand no matter what. And the way I would like to see that worked out is that we have a lot more price-based demand response that gives us gigawatts and gigawatts of flexibility."

Harvey said the most important areas for MISO to improve in the operational time frame are DR and ensuring the demand curve and operating reserve demand curve provide resources needed to balance variations in net load and reduce operators' "ad hoc" actions.

"We need to get demand response into the market — not just have demand response be something you pay for providing phantom response, but actually be there, providing regulation [and] reserves that the operators can see and count on.

"If we're going to get into energy-limited situations, I think we're going to need demand-side resources that can provide 30-minute

reserves or longer; reserves that can drop off for periods of time to enable us to conserve energy, and not necessarily during emergency conditions," he continued. "We may need to conserve energy before we get into the emergency so we can get through the emergency. So that's another [thing] we need to study."

In a panel discussion Wednesday on "Infrastructure as an Enabler," Julian Leslie, head of networks for National Grid Electricity System Operator in the U.K, said grid operators will move from dispatching generation to meet demand to dispatching load to meet generation.

"So, on those windy days, the hydrogen electrolyzers are running; people are charging their electric vehicles; they're charging their batteries in the lofts of their houses. And on those non-windy days, they'll be using all that stored energy," he said. "We've got one supplier here in Britain that offers you a negative pricing tariff, so when it's really windy and the demand is low, say on a Sunday afternoon, this supplier will pay its customers to consume electricity." About 150,000 customers have signed up for the service, he said.

"This is a great resource; it's cheap," said James McCalley, a professor of electrical and computer engineering at Iowa State University who appeared on the panel with Leslie. "The only problem there is [is] to identify the right kinds of loads to go after. Not all loads are created equal."

One desirable type of load, he said, is water treatment plants. "They have an inherent

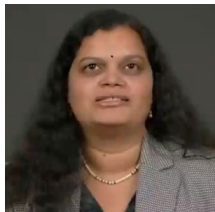
MISO Market Symposium

flexibility in when they use their energy as a result of the ability to store water," he said. "And they're ubiquitous. ... Every region has many, many water treatment plants, so this is a very good target."

New Products

Harvey said the future will require new products, calling on grid operators to start "radically thinking about regulation in next 10 years."

"We may need two types of regulating resources — those that can only regulate up five minutes because they're a battery and they're going to run out [of energy] ... and others that can keep reg up, and as we need more and more and more, they can keep going up and up and up. That's something the ISOs, as they encounter this, need to talk to each other and do joint research," Harvey said.



Renuka Chatterjee,
MISO | MISO

Renuka Chatterjee, MISO's executive director of systems operations, said she sees change coming also.

"One of the biggest MISO value propositions is our large footprint. So, we could be having snowstorms

up north and hurricanes in the south simultaneously. We operate that market today with 400 MW of regulation, and we don't use most of it on most days. We operate very, very well within that 400 MW for a 125-GW peak load system.

"I keep wondering when we'll change the algorithm," Chatterjee said. "So, the traditional thinking ... is about to change."

Baldick said grid operators might consider a product that addresses the reduced inertia provided by renewables.

"When we've defined things like contingency reserves, spinning reserves ... we haven't fully represented all the physics. We've captured the essence of the issue, and we find a constraint that is a pretty good surrogate for capturing the issue most of the time," he said. "Maybe we need to do something like that for inertia or maybe some other products."

Don't Act Without Data

Several of the speakers said MISO and other grid operators should put an emphasis on data gathering before thinking about potential solutions.

"Let's not make choices about how we're going to build the software or how we're going to

solve the problem too soon. I think [there should be] a lot of looking at this and learning from each other and then deciding which road is the best for everybody," Harvey said.

He noted that CAISO is trying to calculate the demand for flexibility resulting from intermittent resources, unpredictable load and resources that fail to follow dispatch instructions.

"So, you can try to do that calculation and assign [the costs] to the resources that are creating the uncertainty and perhaps incent them to behave differently," he said. "But it is complicated, and it's going to be a burden on your settlement system. ... So, you have to make a judgment of: Is this going to make enough difference in behavior and resource choices to improve the outcomes?"

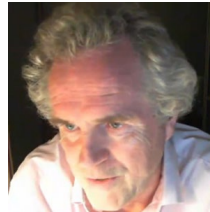
Mark O'Malley, professor of electrical engineering at University College, Dublin, agreed. "Why don't we experiment? Why don't we understand it before we do it?" he said. "If you've got a product in a market that's got a zero-price ... then you didn't need it. And I think some of the products thrown out there [are unnecessary]. ... I think people go too far with markets sometimes."

He said grid operators should concentrate on "real measurements after the fact, collecting large amounts of data. ... Get enormous amounts of data that's real and use that. That's better than any model data."

Socializing Risk

Baldick said MISO shouldn't seek to eliminate market volatility resulting from the increased variability of renewables. "We do have to think very carefully about how to navigate who takes on those risks, who hedges them," he said. "From my own philosophical perspective, the risks that can be borne by market participants are best left with those market participants, and we should only hope to socialize the risks that are truly ones that pose systemic risks to the operation of the system — cascading outages, as a good example. ... To the extent possible, [MISO should be] making sure that market participants are seeing those risks and are provided with the right incentives to hedge them whenever it's economically efficient to hedge them."

Even the best data and the most carefully



Mark O'Malley, University College, Dublin | MISO

"If you've got a product in a market that's got a zero-price ... then you didn't need it. And I think some of the products thrown out there [are unnecessary]. ... I think people go too far with markets sometimes."

—Mark O'Malley, professor of electrical engineering at University College, Dublin

designed market tools will not eliminate the increasing uncertainty, speakers said.

"Ultimately, we need to pay more attention to the underlying statistics of renewables — and particularly wind — to really understand the answers to questions like: If we connect MISO with PJM and average out the wind across that footprint, do we significantly reduce the relative variability or not?" Baldick asked.

"It's pretty clear to me that there are fundamental stochasticities that aren't going to be smoothed out by larger and larger footprints until we average coastal [and] far inland wind, for example; until we average storms in the western half of the United States with weather in the eastern half. ... So, while I certainly want to improve weather forecasting, it's not going to take away from the fundamental variability of those renewables."

"What we need to forecast is how big the variability could be," Harvey said. "Even if we can't forecast what load can be, can we forecast how high net load could go? That's complicated enough."

Forecasts also need to be matched with an understanding of transmission congestion, he added, citing CAISO's load-shed events in August.

"It's not just, 'How much variability is there [and] when?' It's when [and] where. Because congestion is critical. A lot of the reasons why the CAISO's ramp product has completely failed is because of locational constraints. They had enough upward ramp capability, but it was behind transmission constraints. If we're going to use storage to balance some of this, we not only need to know how much [and] where but for how long and how much energy we're going to need." ■

MISO Market Symposium

MISO Symposium Tackles Data Analytics

By Rich Heidom Jr.

Officials from CAISO, NYISO and French grid operator RTE joined MISO on the final day of its Market Symposium on Friday to discuss the challenges of developing data analytics to support system operators' decision-making.

Elliot Mainzer, who became CAISO's CEO last month after 18 years at the Bonneville Power Administration, said one of his first actions in his new job was creating a new chief operating officer position.

"We're integrating our operations and transmission infrastructure and market policy and technical groups under one executive so that we can maximize alignment among those groups and make sure that the technical platform evolves as efficiently across the organization as necessary."

When BPA started adding wind generation more than a decade ago, it had no tools to address ramping issues and curtailments. The difference between "accommodating" renewables and "integrating" them in the system was developing those tools, he said in a conversation with Todd Ramey, MISO's chief digital officer.

"If you want to really integrate them as efficiently as possible, you have to take that time to do the design work," Mainzer said.

BPA introduced intra-hour scheduling, held a competition to find the best wind forecasting provider and aligned its tariff and pricing mechanisms to encourage operators to use the new tools.

He said he learned the need to involve control center operators in the design of the systems from the beginning.

"Something that was very important was, first of all, making sure that the systems were integrated so that folks weren't running around having to make 12 decisions at the same time. ... We just don't have a lot of room for a lot of friction in the system anymore as we're trying

to meet our resource adequacy requirements."

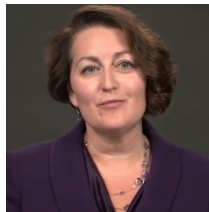
David Edelson, NYISO's manager of operations performance and analysis, said operators need to make "second-to-second decisions."



David Edelson, NYISO
| MISO



Todd Ramey, MISO (left) and CAISO CEO Elliott Mainzer | MISO



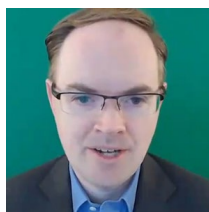
Keri Glitch, MISO
| MISO

"There's really little time to interpret data; therefore, that data needs to be presented to control room operators very clearly, in ways that suit their preferences so that they can make quick decisions — generally binary decisions," he

said during a panel discussion moderated by Keri Glitch, MISO's chief information security officer.

Avoiding False Positives

"They can't be presented with unnecessarily large volumes of data — large numbers of false alerts — because that's going to lead to mistrust of the data, as well as hesitations in their response," Edelson said.



Mykel Kochenderfer,
Stanford University
| MISO

False positives was also the subject of remarks by Mykel Kochenderfer, a Stanford University associate professor who develops applications for aerospace and automated vehicles. "Many of the challenges are exactly the same" as in the power sector, he said, recalling his work on an aircraft collision avoidance system.

"In this situation, you have imperfect sensor information, so you don't know exactly the current state of the world. And you also have

imperfect information about how the world will evolve: You don't know the future trajectories of the other aircraft. And you have competing objectives. On one side, you want it to be extremely safe, and on the other side, you want to be efficient. You don't want to be alerting the pilot constantly to avoid collisions when there's not a significant threat present."

The system took about a decade to develop, "and much of that time was just establishing trust that the system will behave correctly in operation," he said.

For that reason, Kochenderfer said, not all artificial intelligence is suited for mission-critical systems. "A lot of artificial intelligence is just using statistics and optimization together, but it has also come to mean ... the use of neural networks.

"Neural networks are incredibly powerful. We've had major breakthrough in terms of computer vision applications and natural language processing applications. But in those domains, failure is tolerable. If Alexa doesn't recognize your question correctly, people won't be losing power; airplanes won't be crashing."

Edelson said the power sector will have to overcome its conservatism to get the most out of advanced analytics.

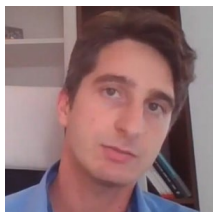
"We operate the system conservatively, justifiably so, because of its importance. ... We apply margins large enough to accommodate fairly infrequent events. [Getting] system operators to rely on more advanced data analytics that allow for the system to be operated leaner will require organizational, cultural changes. That's

MISO Market Symposium

going to be a challenge.”

Changes will be required as the grid moves away from the traditional dispatchable thermal resources to much more variable generation, Mainzer said. As “we start running into real resource adequacy challenges ... using every megawatt of available supply in the system — both bulk [system] resources and the behind-the-meter and distributed energy resources — is going to become increasingly important,” he said.

‘Trash in/Trash out’



Anthony Papavasiliou, Catholic University of Louvain | MISO

Anthony Papavasiliou, associate professor in the Department of Mathematical Engineering at the Catholic University of Louvain in Belgium, talked about the “trash in/trash out” challenge in estimating the need for system reserves.

“One of the reasons why ... stochastic unit commitment is difficult is that you need to create reasonable inputs, the scenarios: Which resource should be outaged? Which forecast error should we consider? Building that input so that you get a meaningful answer from

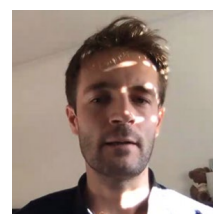
“Which resource should be outaged? Which forecast error should we consider? Building that input so that you get a meaningful answer from the optimization itself can be as difficult an exercise as actually solving the optimization problem that gives you the answer.”

—Anthony Papavasiliou, associate professor in the Department of Mathematical Engineering at the Catholic University of Louvain

the optimization itself can be as difficult an exercise as actually solving the optimization problem that gives you the answer.”

Kochenderfer said early AI applications sometimes failed because they did not properly account for uncertainty.

“Another potential pitfall is using overly complicated methods. ... We should definitely strive to test out the simplest possible ones first and then only use more complicated methods if we can justify that complexity in terms of performance on well defined metrics.”



Antoine Marot, RTE | MISO

Some complexity can't be avoided, however, said Antoine Marot, AI team lead for RTE, the French transmission system operator.

“There’s been a lot of research for the last 10 years about how do

we endure more uncertainties in the system. How do we go beyond [the] N-1 deterministic role [to] considering more probabilities?” he said. “Since we have a lot more risk and uncertainties to assess the thing we’d like to do for sure is speed up the computation of the simulations.” ■

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MISO Market Symposium

Overheard at MISO Market Symposium 2020

RTO officials, stakeholders and academics discussed the challenges of operating a grid with increasing renewables and uncertainty at MISO's three-day Market Symposium last week. Here's some of what we heard.

Removing Barriers, Accepting Regional Differences

FERC Commissioner Richard Glick, speaking with Richard Doying, MISO's executive vice president of market and grid strategy, said the commission has done much in the last decade to remove barriers to entry for new technologies, noting its rulemakings in Order 764 (intermittent generation), Order 841 (electric storage), Order 845 (demand response) and Order 2222 (aggregation of distributed energy resources).

"But there's more to do, for instance, on hybrid technologies," he said, noting the commission's technical conference on the subject in July. (See *Hybrid Resource Developers Ask for Uniform Rules.*)

The commission will hold a technical conference today on *offshore wind*. "I think there's a lot we can do in terms of transmission development and transmission planning to figure out if there are any barriers to the development of transmission systems that would enable a significant number of offshore wind farms to

be developed" on the East Coast, he said.

Glick also commented on the commission's tradition of letting grid operators in different regions adopt tailored approaches to compliance with FERC's rulemakings, joking, "I wish I had a dime for every time I hear, 'Let a thousand flowers bloom.'"

"I think it's important for the commission to continue to allow RTOs ... the flexibility they need," he said. "I would say it's still important that we have a baseline," he added. "We need to ... make sure that the goal is achieved."

360-degree Review for RTOs



Lisa Barton, AEP | MISO

Lisa Barton, American Electric Power's executive vice president for utilities, joined MISO Chief Operating Officer Clair Moeller on Wednesday for a discussion about seams coordination and right-sizing infrastructure investments.

Asked how MISO could improve its seams management, Barton said the RTO should engage in a lessons-learned exercise with its neighboring RTOs and subject itself to a

360-degree review by regulators, industry and other stakeholders: "What are we doing well? What do we need to work on? What ... would help move the ball from a seams standpoint?"

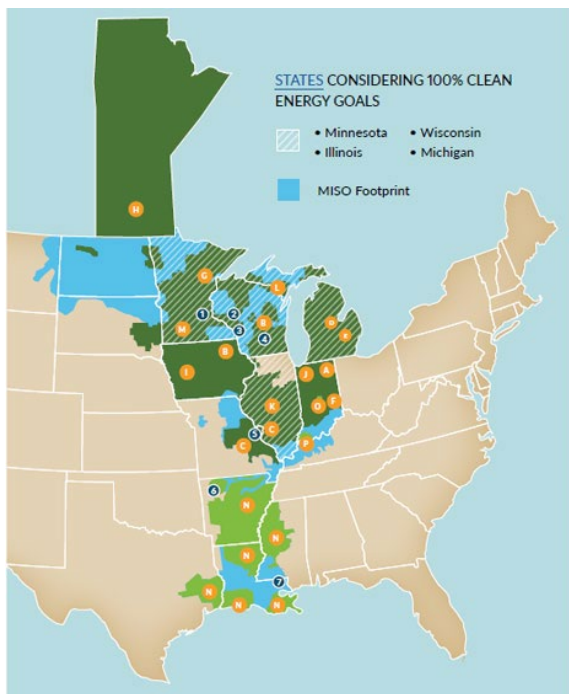
Barton said other stakeholders should subject themselves to a similar review. Individual stakeholders "don't always behave as well as we should either. ... We can be self-interested. But this is an industry that must be about the customers. It must be about the communities," she said.

"I think if there's one thing we know about the future, it's got to be about decarbonizing. ... If we can accelerate the transformation ... to electric vehicles, think about what that does for the industry. Think about what that does for the environment. There's so many good things associated with that."

Moeller agreed. "There's something for everybody if we all pull together. ... When we wander into the parochial — 'my interest is more important than everybody else's interests' — we tend to get into trouble."

While the industry excels at responding to hurricanes and other crises, Barton said, it needs to become more proactive and shouldn't worry so much about overbuilding.

"I hear that from economists quite a bit. 'Well, there might be 5% of capacity in that trans-



MISO States, Cities, and Utilities with Decarbonization or Clean Energy Goals

CITIES WITH 100% CLEAN ENERGY GOALS

- 1 Minneapolis, Minn.
- 2 St. Paul, Minn.
- 3 Eau Claire, Wis.
- 4 La Crosse, Wis.
- 5 Madison, Wis.
- 6 St. Louis, Mo.
- 7 Fayetteville, Ark.
- 8 Abita Springs, La.

UTILITIES WITH 80%+ TARGETS

- A. AEP
- B. Alliant
- C. Ameren
- D. Consumers
- E. DTE
- F. Duke
- G. Great River Energy
- H. Manitoba Hydro (achieved, not a target)
- I. MidAmerican
- J. Northern Indiana Public Service
- K. Vistra
- L. WEC Energy Group
- M. Xcel

UTILITIES WITH 50%+ TARGETS

- N. Entergy
- O. Indianapolis Power and Light
- P. Vectren/SIGE

“There’s something for everybody if we all pull together. ... When we wander into the parochial — ‘my interest is more important than everybody else’s interests’ — we tend to get into trouble.”

—Clair Moeller, MISO Chief Operating Officer

MISO Market Symposium

mission line that's not used.' That's OK. We shouldn't be afraid of that," she said. "What we should be afraid of is having load-shed events [and] not having sufficient resource adequacy. ... That's when you cannot have electric vehicles be a part of your future and a part of the solution."

"I ask people occasionally, 'Which mistake would you like to make: the one where you build a little too much a little too early, or the ones where you didn't build enough?'" Moeller responded. "The ramifications of those two mistakes are dramatically different."

Moeller said he believes a growing "coalition of the willing" is in favor of an "interstate highway sort of grid" to facilitate the kind of energy transfers that allowed MISO to maintain reliability during its last polar vortex.

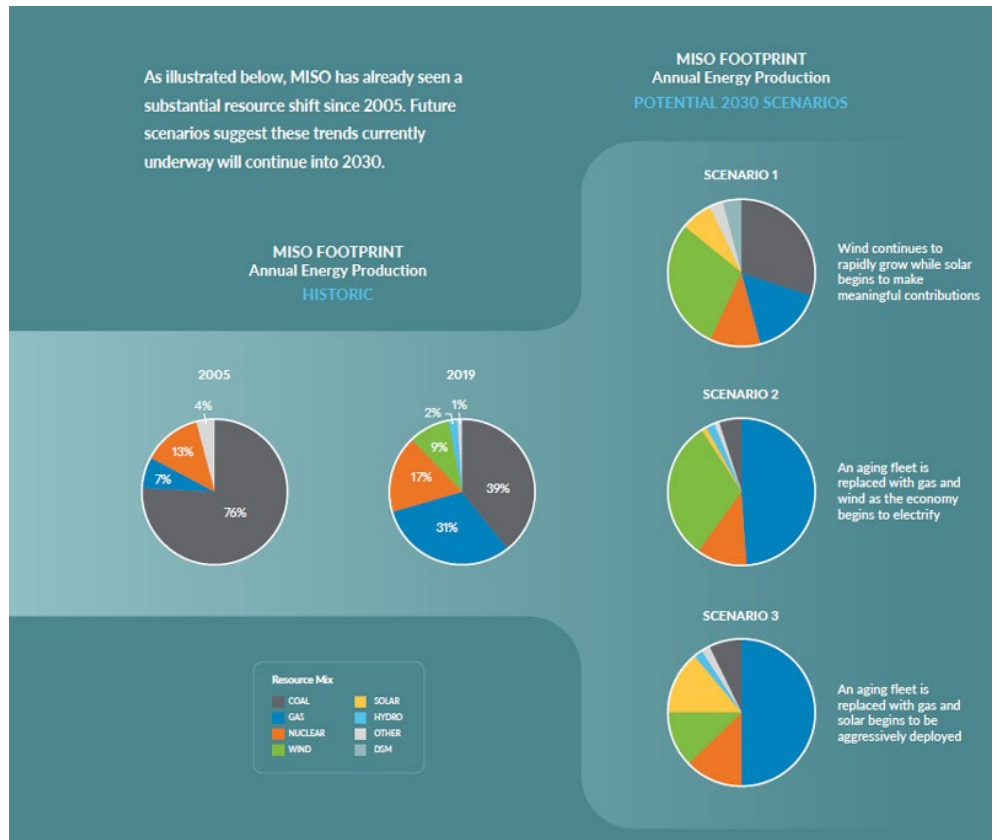
"We had a 25% forced outage rate on every resource: coal, gas, demand-side management, wind. You guys in PJM were kind enough to send us 19,000 MW an hour for about six hours, which for us was the difference between load shed and not load shed. ...

"I think we need to find a way to value that [resilience] so it shows up in a business case, so we can make the investments we need to make the future safe and affordable," he added.

Jay Caspary, vice president of consulting firm Grid Strategies, had a similar take in a session moderated by Jennifer Curran, MISO vice president of system planning and chief compliance officer, on "Infrastructure as an Enabler."



Jay Caspary, Grid Strategies | MISO



MISO has already seen a substantial resource shift since 2005. Future scenarios suggest these trends currently underway will continue into 2030. | MISO

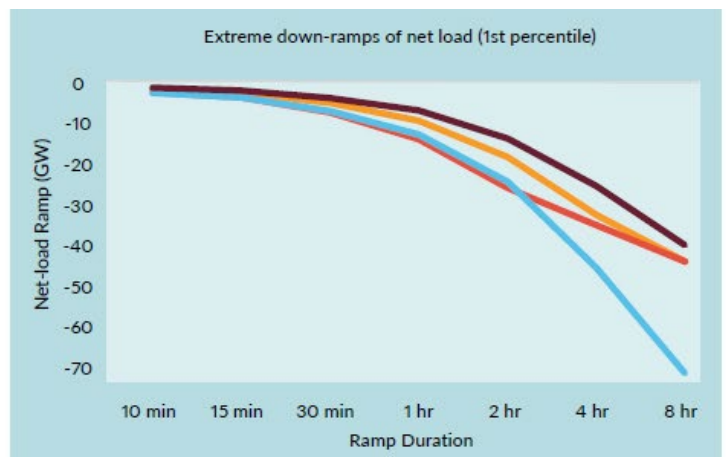
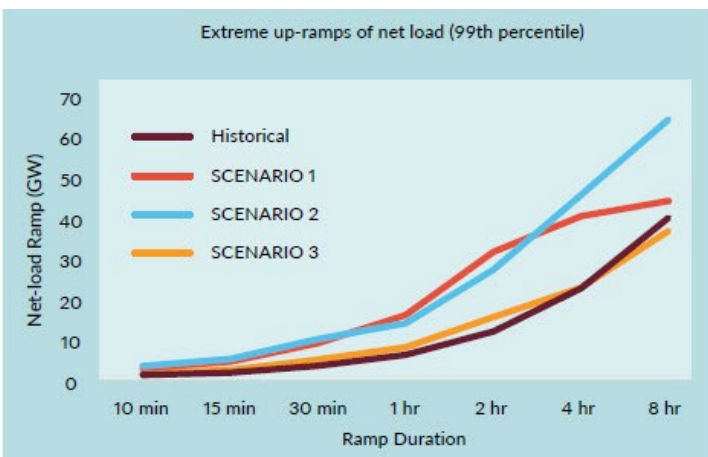
"One of the benefits I think we have in the near term is there's a lot of assets that are reaching their end of life. I think if we started working with our neighbors, we can identify some key [transmission] corridors and target those in our regional and interregional plans and move forward," Caspary said.

"You know, when [President Dwight] Eisenhower [proposed] the interstate highway sys-

tem in 1955, it took decades for that to come into fruition. And it had to evolve as things changed, and spurs were added and toll roads [were added] to make the traffic flows efficient around metropolitan areas. I think we need something like that that we can all buy into."

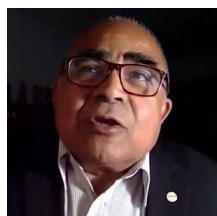
Macrogrid or Microgrid?

"It's fashionable in some circles to say the big



Growing amounts of wind and solar will increase net-load ramps both in frequency and magnitude. Out-of-market actions taken during emergencies can lead to price suppression, and the absence of price-responsive demand requires MISO set prices administratively during shortages. | MISO

MISO Market Symposium



Anjan Bose, Washington State University | MISO

grid is going to go away. I doubt that that is the case,” said Anjan Bose, regents professor at Washington State University. “As long as there is going to be cheaper generation resources like wind somewhere in the country and a lack of it

in other areas, we are going to see the need for transmission. But I do want to emphasize that the microgrid concept — the fact that there are a lot of technologies coming in [at] the edge of the grid — is not going to go away, and it will probably speed up. The question is, how do we work that into planning, and how do we make sure we take advantage of these microgrids?”

Planning Challenges

“The need to plan for extreme events ... has always been difficult because of the infrequency at which they occur. So instead, we plan to the standard reliability criteria: N-1 or N-1-1, maybe N-2. And extreme events which may be N-K — where K



James McCalley, Iowa State University | MISO

is a very large number — don’t get that much attention,” said James McCalley, a professor in electrical and computer engineering at Iowa State University. “Yet it is clear that we may be seeing more frequent occurrences of hurricanes, floods, wildfires — and being from Iowa, I’m very sensitive to derecho, the straight-line winds that we had recently here in my state.”

Bose questioned whether the kind of probabilistic methods used in planning would be applicable for operations.

“In planning, we tend to take into account the probability of these occurrences. The question in my mind is: Are those same tools good enough in the operations area, or even applicable in the operations area?”

“In operations, we are not using probabilistic methods to determine how probable the region is to overload or under-voltages or whatever. We use very deterministic methods, meaning we say, ‘Well, if this happens, then we will be able to survive it. Or if this happens, we’ll really have a problem over in this part of the grid.’”

Planning is also more difficult because there are “so many different objectives to be taken

care of,” he continued.

“The reliability criteria are getting more difficult to find out what they actually mean. ... In California, for example, where we ran out of resources [and were forced into load shedding in August], the question really was: Is the loss of wind an N-1 contingency, and should we be putting that into our studies?”

Although NERC reliability standards currently have no metrics for measuring resilience, “it’s obviously going to come,” with the risk of forest fires, earthquakes and derechos to be considered in some regions, he said. “That has to be translated into mathematics and the tools that we have.”



Julian Leslie, National Grid | MISO

Julian Leslie, head of networks for National Grid Electricity System Operator in the U.K., said grid operators need data and input about stakeholders’ visions of the future to ensure they build the right tools for managing operations.

“I never thought working for a transmission system operator [that] I’d be talking to electric vehicle manufacturers or Google [and Amazon] and people like that just to really understand what their direction is, what is their future strategy.”

McCalley called for increasing “the dimensionality of the solution space — that’s a complicated way of saying we need more ways to solve our problems.”

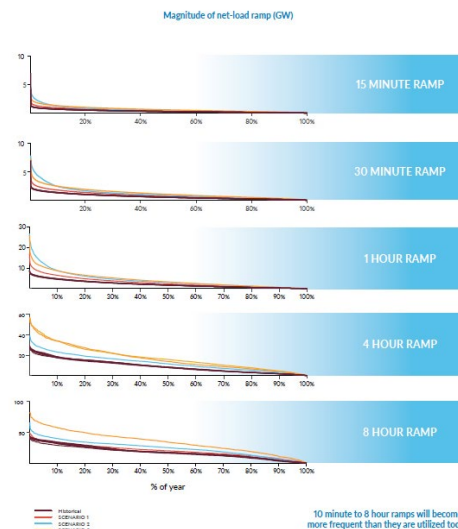
He suggested *voltage source converter*-based HVDC technology and making better use of demand response. (See related story, [MISO Seeks Rx for Increased Uncertainty](#).)

It also means tapping into the control capability of wind. “They have inertia. They have control capability,” McCalley said. “Let’s use it.”

Gathering Data

Bose acknowledged complaints that the research community has not been getting the data needed to be able to do proper studies. “But I think [the Department of Energy] and others are now trying to get enough synthetic data on which research can be done, which doesn’t expose [the] sensitivity of actual transmission data.

“The bigger problem in my mind is the power companies getting the data that they need to do their planning work. This is a serious [prob-



The largest 1% of up- and down-ramps shorter than one hour are predicted to be 40 to 150% larger in future scenarios than they are today. These fast ramps may require more fast-ramping resources to be online because they may occur too fast for offline resources to start up. Note: Differences in scale for different ramp scenarios. | MISO

lem], especially on the Eastern Interconnection where data exchanges have been somewhat limited.

“I think this needs to be looked at from an industry point of view and a national security point of view as to how this data can be kept so that everybody — all the power companies — can do legitimate work on the expansion planning. ... All the data exchanges that take place today is done by bilateral agreements. This is ridiculous because you know there are 18,000 power companies in the country. So, there need to be agreements that are country-wide. That needs to happen so that this data is available. As to what data is needed, that depends on the tools we have [and] on what we are trying to solve.”

Caspary said the industry is good at sharing operational data. “When it gets to planning data, we share models, but we really don’t get into the actual performance characteristics of the components in the system. I would be particularly interested in the remaining life that’s being projected on assets and how we would ... project the availability of those assets and the mean time to failure.”

Current models assume every asset has the same probability of failure, he said. “I just don’t think that’s a very smart way of planning the system.” ■

— Rich Heidorn Jr.

MISO News

MISO Members Recommend Voting Rights for New Sector

By Amanda Durish Cook

MISO's Advisory Committee has voted to allow the RTO's newly created Affiliate sector voting rights in certain committees.

Sector *representatives* voted 15-9 during the committee's teleconference Thursday to recommend that the Board of Directors allow MISO's 11th sector one vote in the AC and one vote on issues before the Planning Advisory Committee.

The minority of AC members *voted* in favor of splitting the Environmental Groups sector's existing two votes with the Affiliate sector. The latter sector was borne from the previous Environmental and Other Stakeholder Groups sector. Currently, it is not allowed a vote in committee matters but had one designated non-voting seat during meetings. (See [New MISO Sector Gets FERC OK – with a Catch.](#))

The decision is considered advisory in nature to the board, where the final determination rests, and came after a failed motion from some members to delay the vote. Some representatives complained that the new sector's purpose was still too shadowy to yet determine if it is worthy of casting votes like other sectors that have clearer intents.

Representatives have said that the sector should receive one vote when the AC votes on advisory items to the board or RTO leadership. But some members last week seemed split on the issue. Some also said it wasn't clear how the sector would access or communicate with MISO directors about stakeholder issues.

Environmental Groups representative Beth

Soholt called for a "comprehensive" understanding of what exactly is the sector's purpose before deciding to award it any votes on AC recommendations.

"We've heard this is a standalone, catch-all sector, and we've also heard this will be an incubator sector. ... There is a number of outstanding issues," Independent Power Producers and Exempt Wholesale Generators representative Travis Stewart said.

During the committee's Sept. 16 meeting, Public Consumer Advocates representative Christina Baker had also said her understanding of the Affiliate sector was that of an "incubator" for new members until enough like-minded entities joined to branch off into a new sector. She said she was unsure if a collection of miscellaneous entities could get along and agree on a vote.

AC Chair Audrey Penner pushed back on the notion that there was confusion about the Affiliate sector's purpose.

"I don't know how else it could be interpreted but that it's a home for all newcomers that can't find a place in another sector," Penner said. She also said she viewed voting rights as a separate issue from how the new sector would interact with the board.

Existing sectors will now draft eligibility criteria and mission statements so it's clearer where new MISO members should be placed.

Unlike the divergent opinions around Affiliate sector voting rights, nearly all sector representatives have opposed the consolidation of some existing sectors, an idea that was pre-



MISO's Carmel, Ind., headquarters | © RTO Insider

sented earlier as the committee was considering restructuring. (See [MISO AC Works on Sector Rules as FERC Timeline Ticks.](#))

"There's no desire to consolidate, not even to align," Penner said.

"We believe that one strength of the MISO stakeholder process is the diversity of opinions," Soholt said at the committee's September meeting.

Representatives have also asked that the grid operator allow more informal and less stage-managed access to the board.

"We're looking for more meaningful interaction with the board," Stewart said.

Many sector representatives have also expressed the desire to curtail new sector creation in the future.

"We hope that the creation of new sectors will be really limited in the future, and MISO will work hard to find places for new members in the existing sectors," the State Regulatory Authorities sector's Julie Fedorchak said. ■

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MISO News

DR Firm Challenges FERC, MISO on State Opt-out

Continued from page 1

The company asked FERC to consider its complaint on a fast-track schedule and deliver a ruling in time for the company to enter MISO's 2021 Planning Reserve Auction in March.

"The failure to unleash demand competition poses an acute threat in MISO, where a combination of factors, including reduced reserve margins, increased forced outages and the integration of variable renewable resources has led to increased maximum generation emergency events, signaling increasing operational risk to the grid," Voltus said.

MISO did not immediately respond to a request for comment, saying only that it was reviewing the complaint.

Order 719

In all but three of MISO's 15 states, aggregators of DR that are not acting on behalf of a load-serving entity are barred from directly participating in the RTO, Voltus said.

Order 719 directed RTOs and ISOs to allow ARCs to bid DR on behalf of retail customers "unless the laws or regulations of the relevant electric retail regulatory authority do not permit a retail customer to participate."

On rehearing, the commission amended the order, saying RTOs cannot accept an ARC bid for small utilities that distribute less than 4 million MWh without the utility's permission. For larger utilities, the grid operator must accept an ARC bid unless the relevant authority prohibits it.

Most states — Indiana, Iowa, Michigan, Minnesota, Missouri, North Dakota, South Dakota and Wisconsin — adopted restrictions on ARC participation around 2009 or shortly thereafter, following the commission's rehearing ruling on Order 719, Voltus said.

Others — Kentucky, Louisiana and Mississippi

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MISO News



pi — adopted ARC bans in 2017 and 2019, in response to efforts by aggregators to enter the markets, Voltus said.

In addition, Arkansas enacted a bill in 2013 restricting ARCs unless the Public Service Commission approved their participation as in the public interest. In August, PSC staff recommended that ARCs be allowed to participate; the case is pending.

Inconsistent with Recent Orders, Rulings

Voltus said court rulings since Order 719 was adopted “now [dictate] that the opt-out approach taken in Order 719 is inconsistent with the Federal Power Act’s basic jurisdictional divide, as states simply do not possess the authority to directly determine whether resources are permitted to participate in RTO/ISO markets.”

It cited both the outcome of litigation over Order 745 and Order 841 and the commission’s issuance of Order 2222 last month.

Order 745 in 2011 set rules for compensating DR. In its 2016 *FERC v. EPSA* decision, the Supreme Court rejected a challenge to the order, saying market operators’ payment of DR commitments directly affect wholesale rates and that the commission’s rulemaking did not intrude on state jurisdiction. (See [Supreme Court Upholds FERC Jurisdiction over DR.](#))

In Order 841 in 2018, the commission refused to grant states the right to block energy storage resources (ESRs) from participating in wholesale markets, even when they are interconnected at the distribution-level. In July, the D.C. Circuit Court of Appeals rejected complaints that the lack of an opt-out provision violates states’ authority to regulate their distribution systems. “Nothing in Order No. 841 directly regulates those distribution systems. ... States remain equipped with every tool they possessed prior to Order No. 841 to manage their facilities and systems,” the court said. (See [FERC Storage Order Survives State Challenge.](#))

In September, FERC also rejected a broad opt-out in Order 2222, which removed barriers to aggregations of distributed energy resources. Instead, the commission created an opt-in mechanism for small utilities, similar to that in Order 719-A for DR. (See [FERC Opens RTO Markets to DER Aggregation.](#))

“The commission’s conclusion that its exclusive jurisdiction over wholesale market rates precludes states from barring participation of storage or distributed energy resources applies with equal force to demand response,” Voltus said. “Order 719’s anomalous treatment

of demand response can no longer stand.”

MISO’s Need for DR

The complaint cites MISO’s acknowledgment of its increasing need for intraday flexibility as its region adds increasing quantities of intermittent and emergency-only resources.

“Though it had previously not experienced a maximum generation emergency since 2007, between 2016 and 2019, MISO experienced 27 such emergencies. It additionally declared a maxgen alert requiring conservative operation on Feb. 21, 2020, and again in July and August,” Voltus said.

“At the same time that MISO recognizes that the additional operational flexibility offered by demand response is critical to the challenges it faces now and for the foreseeable future, it considers the suite of demand response resources currently available insufficient to meet operational needs. In particular, although a large quantity of capacity participates in MISO as ‘load modifying resources’ (LMRs), MISO has found the historical performance and operating characteristics of existing LMRs to be inadequate to meet MISO’s changing needs.”

About 90% of DR in MISO are LMR resources — DR and behind-the-meter generation that clear MISO’s PRA and provide interruptible load services during capacity shortages. About 20% of LMRs require longer than a six-hour notification. “In contrast, emergency demand response products in PJM, CAISO and NYISO allow for only 30-minute to at most two-hour notice,” the company said.

Without incentives from their regulators, Voltus said, traditionally regulated utilities are unlikely to adopt ambitious DR programs. “Unsurprisingly, the operational capabilities of existing demand response assets in MISO lag significantly behind that of other organized markets, even though many utility-run programs are supported by significant subsidies through retail rate charges. Lack of competition brings exactly the lackluster results one would expect: high cost and poor performance.

“Worse, the absence of competition is holding back the full capability of demand response within MISO at a time when it is needed more than ever to provide the grid flexibility in the face of shrinking reserve margins and a changing resource mix. During some recent events, a mere hundred megawatts or so of demand response, available in the right location and able to respond quickly, could have alleviated tight supply conditions.”

It noted FERC’s conclusion that DR can miti-

“The commission should order MISO at minimum, and potentially all other RTO/ISOs, to incorporate consideration of demand response aggregators in the ongoing stakeholder work to implement Order 2222 coordination mechanisms.”

—Voltus

gate generator market power and cited a PJM study that found “a modest 3% load reduction in the 100 highest peak hours corresponds to a price decline of 6 to 12%.”

Relief Sought

Voltus said MISO’s acceptance of opt-outs other than that of Arkansas — the result of legislation — violates Order 719.

“The commission should order MISO at minimum, and potentially all other RTO/ISOs, to incorporate consideration of demand response aggregators in the ongoing stakeholder work to implement Order 2222 coordination mechanisms,” it said. It also requested the commission issue a Notice of Proposed Rulemaking to eliminate Order 719’s opt-out.

“The tremendous potential of Order 2222 will remain unrealized while the demand response opt-out remains in place,” it said. ■

MISO News

Missouri PSC Looking at Utilities' RTO Membership

Regulators Direct Participation in Workshop, Staff Analysis

By Tom Kleckner

Missouri regulators have opened a working case to determine whether the state's investor-owned utilities' continued RTO membership "is in the ratepayers' best interest."

The state's Public Service Commission issued an *order* on Oct. 14 that directs each IOU to participate in a workshop that has yet to be scheduled and to cooperate with the "investigation." PSC staff will file a report with their findings by June 30, 2021 (*EW-2021-0104*).

The order applies to Evergy Missouri Metro, Evergy Missouri West, Empire District Electric and Ameren Missouri. Evergy Metro and Empire are SPP members; Ameren is a MISO member; and Evergy West is a member of both.

The PSC said it "believes there are benefits" to the IOUs' RTO memberships but that they "exceed the long-term costs and commitments of RTO membership, especially given that the structure, services and membership of both Southwest Power Pool and the Midcontinent Independent System Operator continue to change significantly with the passage of time. ...

"The commission must inquire into the nature of the benefits of RTO membership, the monetized value of those benefits and what time horizons should be employed to compare asset lives (costs) to the values of benefits streams," the PSC said.

According to the order, the workshop will determine:

- the information needed to respond to the commission's current and previous orders on RTO membership;
- whether such information is reasonably and economically available, and if not, what kind of information could be used as a proxy to control costs and expeditiously respond to the commission;
- the cost of gathering, analyzing and interpreting such information; and
- whether there are any identifiable "deal breaker" events or event categories that would make it unreasonable for an IOU to remain in an RTO.

SPP said it welcomes the study and stands ready to support its members' efforts to "evaluate the cost and benefits of their membership."



The Missouri PSC office building in Jefferson City, Mo. | Richard A. Howerton Properties & Development

"We fully respect that the states and utilities we serve need to ensure they're receiving adequate value from their membership in SPP," spokesman Derek Wingfield said. "We remain committed to continually finding new ways of adding value in collaboration with our stakeholders."

MISO said it is aware of the investigation and is waiting for further guidance on how to assist.

The issue stems back to the early aughts, when the PSC initially placed contingencies on IOUs wishing to transfer functional control of their transmission systems to the RTOs. That allowed the commission to maintain jurisdiction and better understand whether RTO membership would provide the IOUs' expected benefits, former Commissioner Steve Gaw said.



Former PSC Commissioner Steve Gaw | @RTO Insider

"At that time, there was no track history to go by in the Midwest, and the net-benefit calculations were estimated," said Gaw, now with Advanced Power Alliance after six years on the PSC.

The problem has been that the IOUs have continually kicked the proverbial can down the road.

In 2011, the Evergy companies — then op-

erating as Kansas City Power & Light — filed an interim report requesting the commission approve their continued participation in SPP beyond October 2013. In May 2013, the commission *approved* an interim agreement between KCP&L, PSC staff, the Office of the Public Counsel (OPC), SPP and Dogwood Energy that extended its approval through September 2018 (EO-2012-0136).

Four years later, the commission *accepted* the companies' motion to extend the interim period to 2021 and to absolve them of the requirement to file the 2017 interim report.

Ameren Missouri, which does business as Union Electric, received PSC approval in 2012 to transfer functional control of its transmission system to MISO, subject to certain conditions. Those conditions required the utility to file a new case addressing its continued participation in the RTO in 2015. At Ameren's request, the commission extended the date to November 2017 and then March 2020 (EO-2011-0128).

In March 2019, the commission *granted* a motion by Ameren, commission staff, the OPC and the Missouri Industrial Energy Consumers to delay the rate-case filing until March 2023.

Acknowledging Ameren's contention that "it would be unduly expensive to perform the comprehensive cost-benefit study" necessary to assess the value of its MISO membership, the PSC agreed that the study's cost "outweighs the importance of the study." ■

NYISO News



New York Holds Final CLCPA Emissions Hearings

By Michael Kuser

New York held its final hearings on emissions standards last week, with Administrative Law Judge Molly McBride conducting two public comment webinars Oct. 20 for the recently proposed statewide emissions limits for 2030 and 2050.

The limits are proposed as 60% and 15%, respectively, of estimated 1990 greenhouse gas emissions, a baseline that increased by 70% under new statutory requirements that include upstream emissions in the calculation. Final comments on the proposed (Part 496) emissions limits are due at the Department of Environmental Conservation (DEC) by 5 p.m. today. (See [NY Seeks Comment on Proposed Emissions Limits](#).)

The Climate Leadership and Community Protection Act (CLCPA) mandates, among other targets, that 70% of the state's electricity come from renewable resources by 2030 and that generation be net zero, or 100% carbon-free, by 2040. (See [Cuomo Sets New York's Green Goals for 2020](#).)

Climate Action Council Involvement

Robert Howarth, Cornell University professor of ecology and environmental biology, and a member of the state's Climate Action Council, summarized his written comments, citing his own recent study for how New York should account for methane emissions under the CLCPA. (See [NY Study Highlights Rising Methane Emissions](#).)

"I appreciate the difficulty in estimating greenhouse gas emissions for back in 1990, and given this difficulty, I feel the estimates derived for the new [GHG] emission limits are reasonable overall," Howarth said. "I particularly commend DEC for their inclusion of the carbon dioxide emissions that occurred outside of the state but that were associated with the development, processing and transportation of fossil fuels used within the state in 1990."

The direct emissions of carbon dioxide in New York state from the combustion of fossil fuels also seem well estimated by the DEC, he said. But its estimate of methane emissions associated with the use of fossil fuels is lower than what he estimated by about 16%.

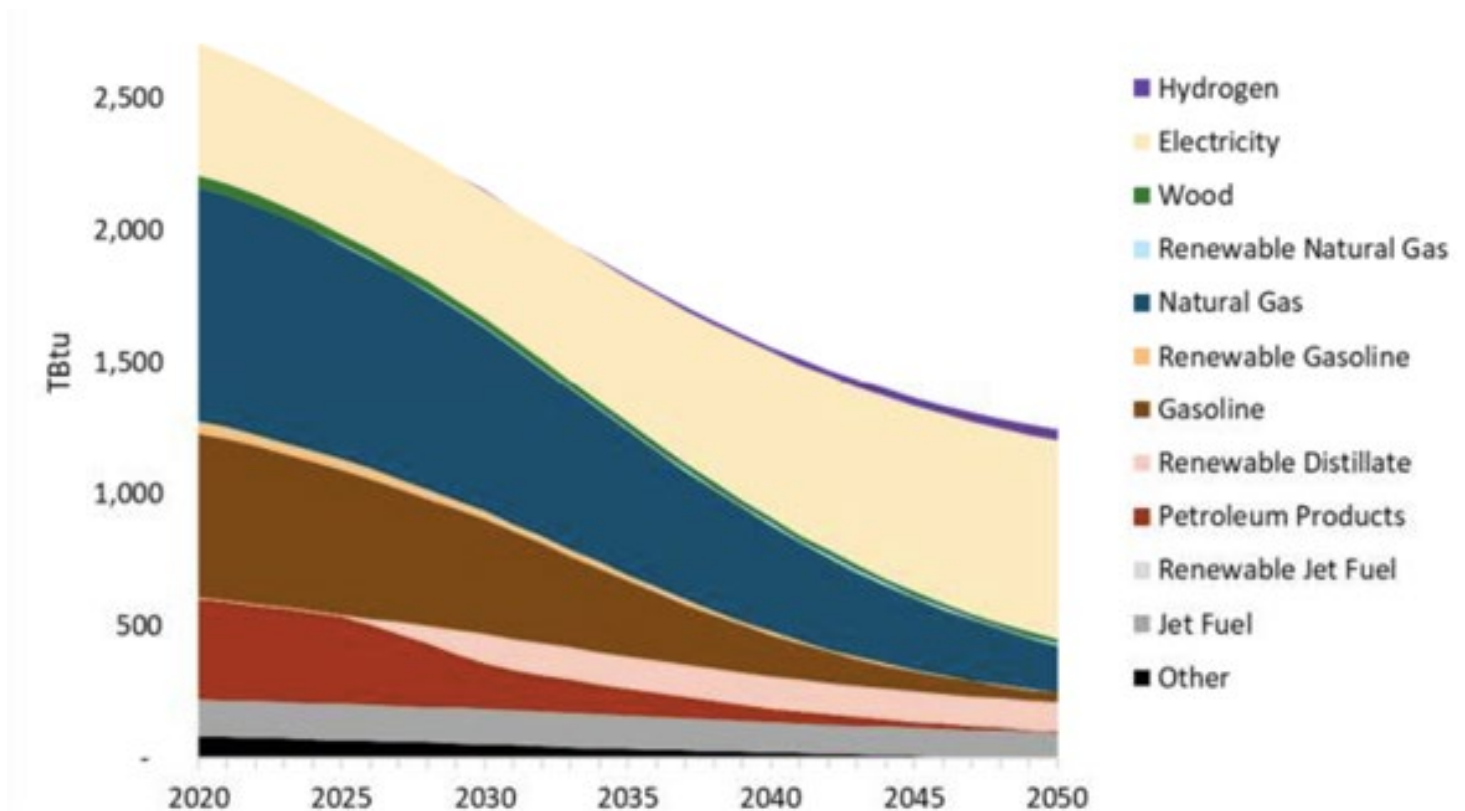
"I believe my estimate is a better one, as it's consistent with the analysis by [Johns Hopkins University professor Scot] Miller, et al. published in 2013, and as I explained in a peer-reviewed paper in 2014, that estimate is based on data from the late 20th century using top-down estimates, and I believe those are more reliable than the estimates upon which DEC relies," Howarth said.

The difference is relatively small, he said, but the DEC nonetheless should reconsider their choice.

"Moving forward over the next year to look at modern emissions, it becomes much more important to use the top-down approach," Howarth said.

He commended the DEC for using the 20-year global warming potential as derived from the Intergovernmental Panel on Climate Change (IPCC) to compare methane and carbon dioxide emissions, which is consistent with the CLCPA requirement and his own recommendations.

"I would be happy to work with DEC and others as they work on their approach for modern emissions, and I strongly urge that the Climate



Projected 2050 energy demand by fuel | NYSERDA

NYISO News



Action Council be more directly involved in the process moving forward over the next year,” Howarth said.

Other Voices

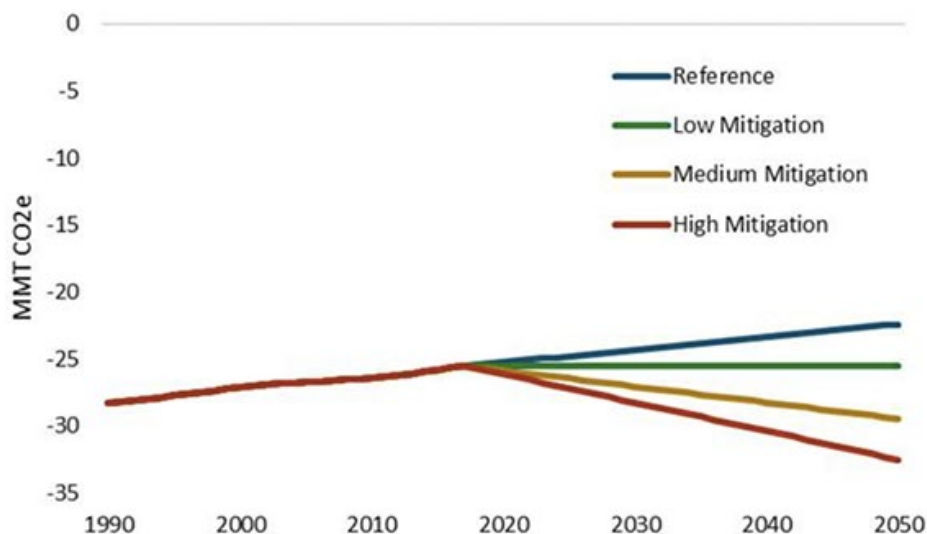
Setting emissions limits is arguably one of the most difficult elements in implementing the CLCPA when it comes to the impact on people’s jobs and the state’s economic and environmental future, said Kevin Schwab, a vice president of CenterState CEO, an economic development organization in Syracuse.

“We’re really going to need a full and accurate baseline of CO₂ equivalents to make sure that the work results that [the Climate Action Council is] trying to produce are going to produce the best outcomes for the environment,” Schwab said.

He noted concern among upstate businesses about the IPCC protocols as they relate to imported energy and fugitive emissions.

“Historical reporting in these areas is certainly going to produce some competing data, collection methods and estimates,” Schwab said. “For example, our overall emissions related to energy production have gone down since 1990, but there are estimates available that would suggest that our emissions from energy imported into New York have risen over that period ... [which] requires more scrutiny.”

John Rath, director of operations for NY Geothermal Energy Organization (NY-GEO), said he had recently moved to New York from Texas and that “it’s great to be living in a progressive state that recognizes climate realities and the need for action. ... In addition to the larger goals, I think it would be helpful to incorporate



New York state annual net carbon emissions | NYSERDA

some interim targets along the way.”

Eric Weltman, a senior organizer in Brooklyn for the national advocacy group *Food & Water Watch*, said, “We want to send a message to Gov. [Andrew] Cuomo and the DEC that it’s time to match rhetoric with action and demonstrate the commitment, provide the resources and implement the policies necessary to meet the urgency of the climate crisis. Five years ago, Cuomo banned fracking in New York, but since then he’s allowed a buildout of pipelines and power plants that have increased our reliance on fracked gas, a dangerous inconsistency in policy.”

John Bartow, executive director of the Empire State Forest Products Association (ESFPA), said

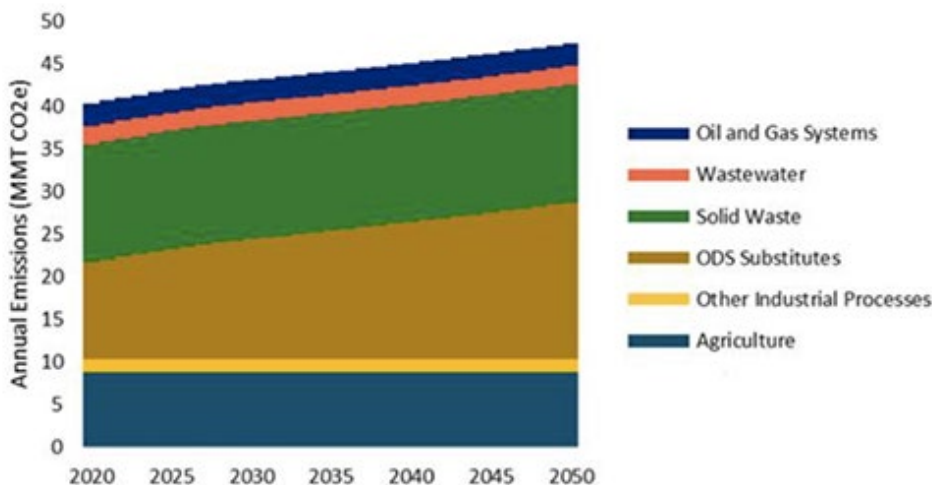
his organization is committed to addressing climate change in a way that recognizes the value of wood products and the role that private forest land owners contribute to climate resilience.

“The CLCPA does not require the DEC to report emissions related to bioenergy produced in another state and imported into New York, which could create a competitive disadvantage of bioenergy production in New York,” Bartow said. “For example, wood pellets produced in New York would be accounted for both their production and consumption emissions, while a Pennsylvania facility would only be accounted for their New York consumption emissions. Why would any bio-energy production facility want to produce in New York?”

Tara Vamos, a member of New Yorkers for Cool Refrigerant Management, said that setting the emissions limits is a tremendous opportunity to include all refrigerants, which are incredibly potent short-lived climate pollutants (SLCPs).

New York joined with other states to form the U.S. Climate Alliance, which issued the SLCP Challenge to Action to meet the goals of the 2015 Paris Agreement on climate change, she said.

“Page 19 of that roadmap says that states can take steps to support the global transition away from HFCs [hydrofluorocarbons], detect and repair leaks, and collect and destroy used refrigerants,” Vamos said. “By addressing all three areas, states can reverse trends in emissions from this fast-growing sector and reduce them by as much as 40 to 50% by 2030, which would be tremendous.” ■



Reference scenario from NYSERDA data | NYSERDA

NYISO News

Moody's: NY Faces Long Economic Recovery

By Michael Kuser

Unlike spring, when New York City was the epicenter of the COVID-19 pandemic, health indicators are now pointing in the right direction for the city, but its unemployment rate is still about double the national average, according to Moody's Analytics.

Moody's expects the recovery of the U.S. economy to extend over one to two years, given the unlikelihood of an effective vaccine becoming available before spring 2021. But after national GDP fell more than 10% last spring, the economy is slightly more than half-way back, Adam Kamins, a director at Moody's, said Wednesday at the NYISO Fall Economic Conference.

The economy was technically in recession for only two or three months before it began to recover, but the hit was "extraordinarily deep," he said.

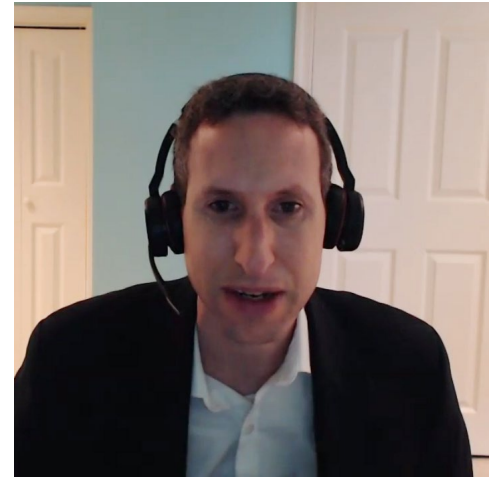
"A lot of the lower hanging fruit was plucked, because firms reopened; people started to re-engage with the economy; you started to

see a little bit more restaurant reopenings and stores starting to reopen and a return to something resembling normalcy," Kamins said. "For sports fans like me, it's almost a microcosm of what you saw over the course of the summer; you saw sports return, but in a weird and different way, with no fans. That's how you can think of the economy too."

Moody's calls the current period "the pre-vaccine recovery" phase, with a "pretty stagnant economy" projected through 2021, Kamins said.

"First, the fiscal stimulus has expired, and our baseline expectation is that there won't be more stimulus coming from the federal government until probably after the next inauguration in January," Kamins said. "The other factor is that COVID-19 cases are rising, and they are starting to rise pretty rapidly in a lot of the country," especially in the Sunbelt states and in the Upper Midwest.

New York's economic outlook is "still pretty bleak," he said. The shock from being the national epicenter of the pandemic was so severe that the city's unemployment rate shot up to

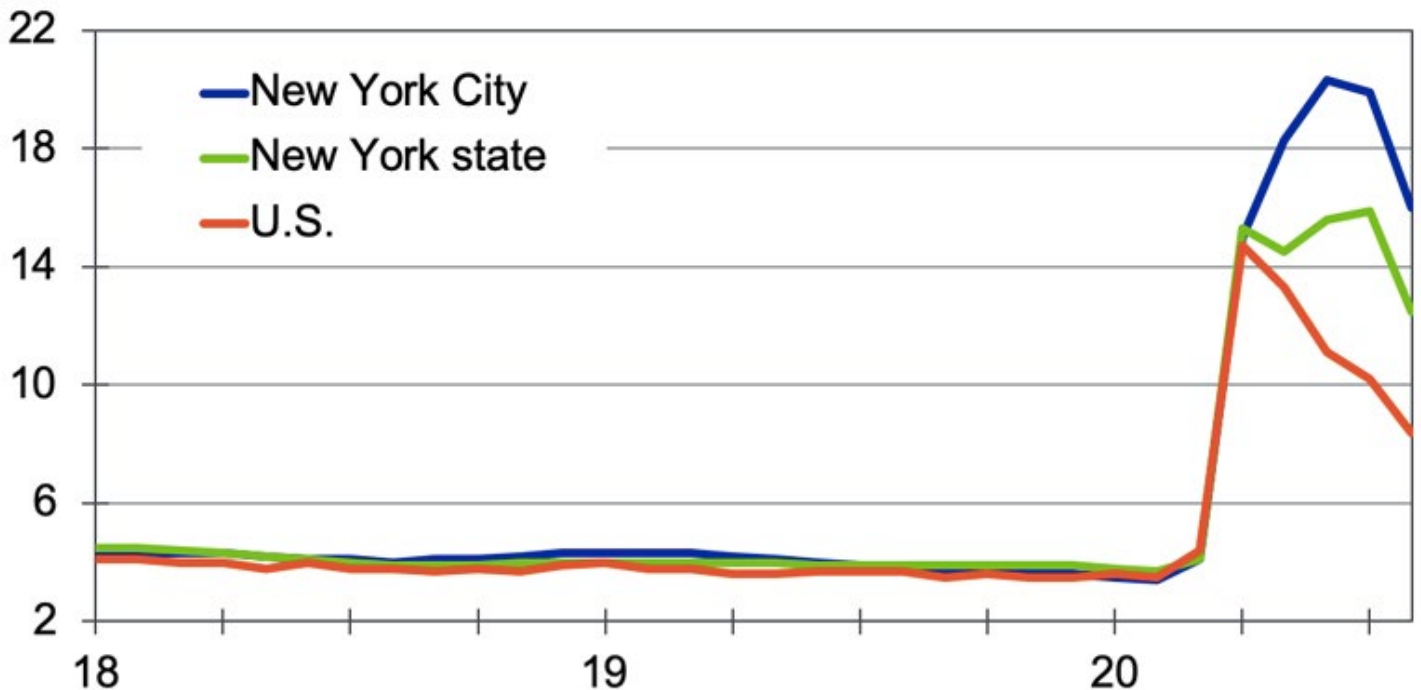


Adam Kamins, Moody's Analytics | NYISO

20%, easily an all-time high since statisticians started keeping records 50 years ago.

The gaps are starting to narrow between the city, the rest of the state and the rest of the country. But the state was the second-worst performing in terms of three-month annualized growth through August, after Hawaii, he said.

Unemployment rate, %



Moody's Analytics said that unlike in spring when NYC was the epicenter of the pandemic, indicators are pointing in the right direction but the city's unemployment rate is still about double the national average. | *Moody's Analytics*

NYISO News



State Handling COVID

In terms of its handling of the pandemic, while infection and death rates are rising everywhere in the U.S., New York is actually better off than most of the country, he said.

“We have an alarming trend here where cases are starting to spread out from the middle of the country,” Kamins said. All but two states are experiencing an increase in daily per capita cases, so the country is in “a pretty tough spot” while it waits for a dependable, widely available vaccine, he said.

Western New York and the capital region have fared particularly well in terms of infection rates, and “two relatively large metro areas are at the top of the list in terms of best performance with respect to COVID-19. ... We have fewer than one out of 1,000 residents in both Rochester and Albany that have tested positive, and those are the lowest numbers in the U.S.,” Kamins said.

This fact is all the more impressive considering that New York’s testing capacity is as high if

not higher than that of any other state, so it is well positioned to ride out a second wave of COVID infections, he said.

Election Outcomes

Kamins closed out his national presentation with a one-page summary of the policy differences between former Vice President Joe Biden and President Trump.

“Generally, in terms of governing and COVID-19 response, a Biden administration would be looking at a federally led approach, would be looking to strengthen institutions and the federal government,” he said. “The Trump administration’s approach has been more state-led; they’ve taken more proactive steps to weaken government oversight in some ways, weaken some institutions.”

A Democratic-controlled Senate with Biden in the White House would likely pass a hefty fiscal stimulus package, which would create more jobs, he said, noting that the Biden campaign had cited Moody’s numbers. (See [‘Massive’ Clean Energy Stimulus Under Biden Likely.](#))

“Take that for what it’s worth, but our point of view is pretty clear: that that would be the most beneficial outcome for the economy,” Kamins said.

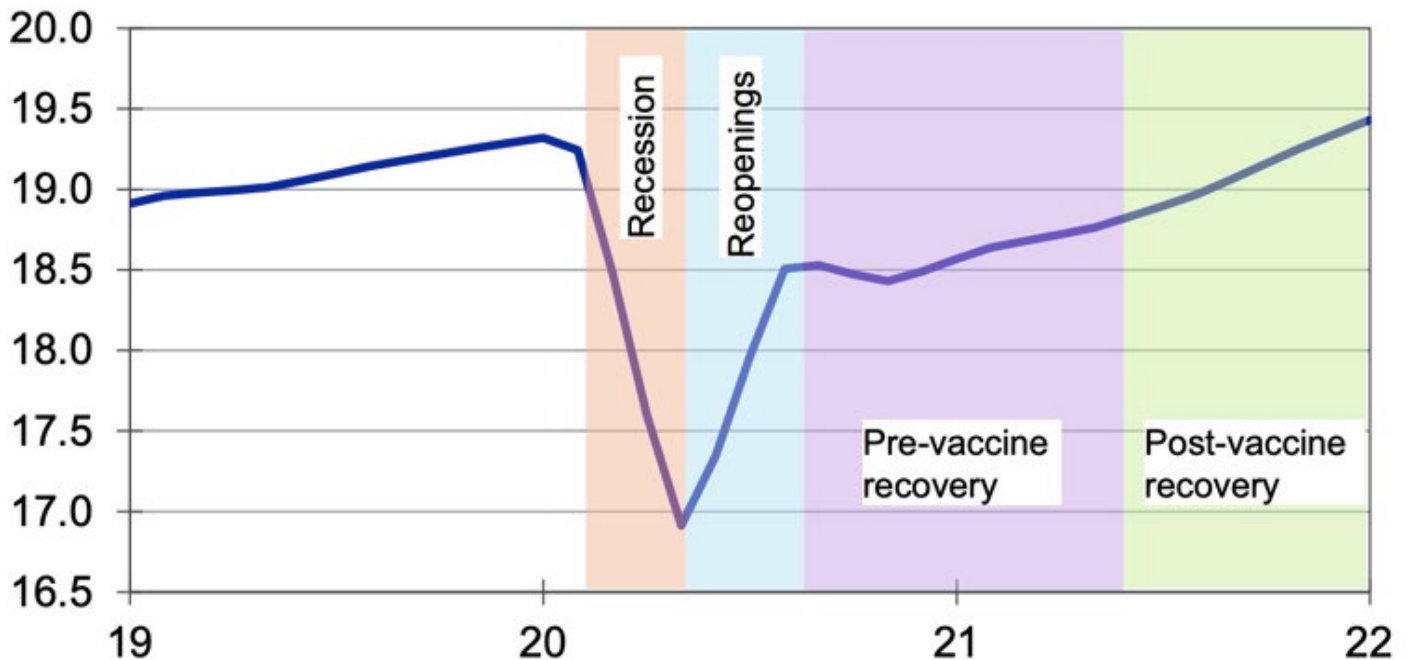
Moody’s model indicates a narrow win for Biden, but “I still remember vividly telling you four years ago that our model predicted a pretty decisive win for [Hillary] Clinton, and then I was sitting in the airport that night flying home, and that’s when,” on Oct. 28, 2016, FBI Director James Comey told Congress the bureau had discovered more of the former secretary of state’s emails sent from a private server. Comey’s letter was “possibly one of the most consequential turning points in the election,” Kamins said.

No one can really diagnose why some of the predictions in 2016 were as off as they were, he said.

“We changed our model a bit to control more for turnout, because that’s what we found was missing. Ultimately, Trump was much more successful in turning out his base than Hillary Clinton was,” Kamins said. ■

The Road Ahead Is Foreboding

U.S. real GDP, Sep baseline forecast, 2012\$ tril, SAAR



Moody’s Analytics expects the economic recovery nationally may extend over one to two years, given the unlikelihood of an effective vaccine becoming available before spring 2021. | [Moody’s Analytics](#)

PJM News



Report: Urban Land Use Key for Md. Solar Goals

By Michael Yoder

Placing solar arrays in urban areas would help Maryland reach its renewable portfolio standard while conserving productive farmland, according to a report issued Oct. 20.

The report, released by Chesapeake Conservancy's Conservation Innovation Center (CIC), lays out large-scale opportunities for solar placement on degraded land and underutilized industrial sites; the rooftops of commercial, industrial and residential buildings; and parking lots. It used geospatial analysis to identify optimal solar sites and determine if there are enough optimal sites for Maryland to reach its solar energy goals.

The Maryland Governor's Task Force on Renewable Energy Development and Siting estimates that the land needed to meet the state's RPS will require between 7,000 and 35,000 acres of land across the state.

"This report is a timely reminder we can make real progress on our greenhouse gas reduction and environmental protection goals for a win-win with smart solar siting policies," said Ben Grumbles, Maryland environment secretary and chair of the state's Climate Change Commission. "We can expand our state's home-grown clean and renewable energy supplies by utilizing rooftops, brownfields and waste sites, while avoiding prime farmland and ecologically sensitive lands and forests."

Maryland is one of 30 states with an RPS to increase electricity production from renew-



Solar panels cover the roof of a Target store in Middle River, Md. | Chesapeake Bay Program

able sources. The state's mandate currently requires 50% of electricity sold by utilities to come from renewable sources by 2030, with 14.5% from solar in the Clean Energy Jobs Act of 2019 (SB 516).

To meet this goal, the CIC estimates the state will need six times the current solar energy production as siting becomes more difficult as the amount increases. The projects can include everything from small rooftop to utility-scale systems.

Susan Minnemeyer, vice president of technology for the CIC, said the analysis sought to identify enough opportunity sites to produce Baltimore County and Baltimore City's share of the state's solar goal. Minnemeyer said based on energy consumption, that share is 1,967 GWh/year of electricity, or about 18% of the statewide goal of 9,000 GWh/year

from solar.

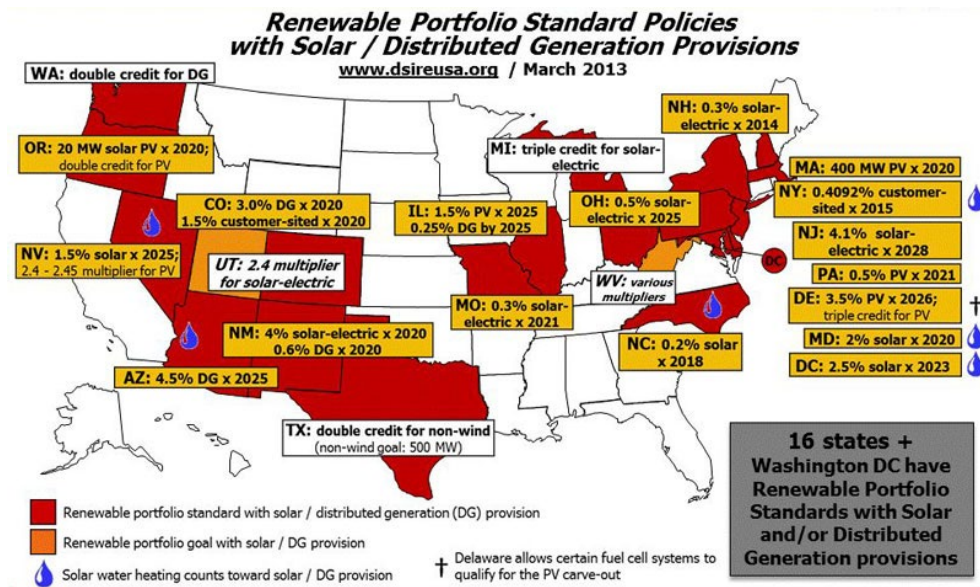
Through the analysis, Minnemeyer said that more than enough optimal sites were identified in the Baltimore region: 22,789 GWh/year. She said only 8.6% of the optimal sites identified would need to prove viable to meet the region's share of solar energy needs.

"Our analysis demonstrates significant opportunities to scale up solar energy development through optimal siting in Baltimore county and city, making use of rooftops, parking canopies and degraded lands to grow Maryland's solar electricity generation," Minnemeyer said. "Providing incentives for solar energy development on optimal sites may be one of the best ways to minimize the amount of land needed for solar and avoid potential adverse impacts of development."

Teresa Moore, executive director of the Valleys Planning Council, who commissioned the study, said her organization supports renewable energy efforts but has been concerned that a lack of siting regulations would lead to farmland being the main target for large-scale solar projects. Moore said almost all the applications in Baltimore County for the first three years of the community solar pilot program have been focused on farmland and not on optimal sites in urban settings.

Moore said her organization would like to see Maryland follow the example of a state like New Jersey that has mapped out optimal solar sites and created a ranking system.

"This helps achieve other goals included in Maryland's solar legislation calling for job creation and benefits to low- and moderate-income residents, in addition to avoiding conflicts with long-established programs and policies to protect our best farm and forest lands," Moore said. ■



State incentives for renewable sources, including solar | DOE

PJM News



PJM MRC/MC Preview

Below is a summary of the issues scheduled to be brought to a vote at the PJM Markets and Reliability and Members committees on Thursday. Each item is listed by agenda number, description and projected time of discussion, followed by a summary of the issue and links to prior coverage in *RTO Insider*.

RTO Insider will be covering the discussions and votes. See next Tuesday's newsletter for a full report.

Markets and Reliability Committee

Consent Agenda (9:05-9:10)

B. The MRC will be asked to endorse *revisions* to Manual 15: Cost Development Guidelines resulting from the biennial periodic review process. The revisions include reformatting and rewording in sections 2.6.1 and 2.6.8 to provide more clarity.

Endorsements/Approvals (9:10-9:45)

1. 2020 Installed Reserve Margin Study Results (9:10-9:25)

Members will be asked to *endorse* the 2020 Re-

serve Requirement Study *results*, including the installed reserve margin (IRM) and forecast pool requirement (FPR). PJM is recommending an IRM of 14.4%, down from 14.8% in 2019. The FPR is essentially the same as 2019, at 1.0865 (8.65%) instead of 1.086 from the previous year. The study determines the IRM and FPR for 2021/22 through 2023/24 and establishes the initial values for 2024/25. The results are based on the 2020 capacity model, load model and capacity benefit of ties. (See "Installed Reserve Margin Study Results," *PJM PC/TEAC Briefs: Oct. 6, 2020*.)

2. Liquidation Process (9:25-9:45)

Members will be asked to endorse proposed *Tariff* and *Operating Agreement* revisions addressing PJM's rules for liquidating defaulted financial transmission rights positions. PJM is *looking* to re-establish the ability to liquidate defaulted FTR open positions and to provide flexibility in the way it exercises liquidation rights based on market liquidity, the size of the defaulted portfolio and market conditions. (See "Liquidation Process," *PJM MRC/MC Briefs: Sept. 17, 2020*.)

MC endorsement will be sought on the same day.

Members Committee

Endorsements/Approvals (12:45-1:15)

1. Schedule 9-2 Options (12:45-1:00)

Stakeholders will be asked to endorse near-term *changes* to PJM's administrative rates as *recommended* by the Finance Committee. The RTO recovers its operating expenses through *Schedule 9* of the Tariff, with 90% of Schedule 9 revenue tied to actual load multiplied by a transmission factor, and the rest connected to transactional activity.

The transactional FTR billing volume, which has increased 97% since 2011, is tied to Schedule 9-2, PJM said, with the FTR administration service revenues exceeding costs because of an increase in the volume of FTR bidding activity. (See "Schedule 9-2 Options," *PJM MRC/MC Briefs: Sept. 17, 2020*.) ■

— Michael Yoder

ERO Insider

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Six Russians Charged for Ukraine Cyberattacks

PUC Cancels Texas RE as ERCOT's Reliability Monitor

WECC Examining August Heat Wave with West-wide Lens

MRO, Texas RE to Lead Align Software Training

SERC Appoints 1st Independent Board Members

Plan Would Consolidate, Cull WECC Stakeholder Groups

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PJM News



NJ Stakeholders Supportive of PSE&G EV, Storage Program

By Michael Yoder

New Jersey is moving closer to adopting wide-ranging programs promoting the deployment of electric vehicles and energy storage throughout the state.

The New Jersey Board of Public Utilities held two days of hearings last week to hear comments on Public Service Electric and Gas' [petition](#) to implement the EV and energy storage portion of its Clean Energy Future [program](#). Commenters at the hearing were generally in support of the petition.

The BPU approved the company's plan last month to commit \$1 billion toward energy efficiency investments over the next three years.

Joseph Accardo, vice president of regulatory affairs for PSE&G parent Public Service Enterprise Group, provided an overview of the EV and storage portion, saying the initiatives will bring the benefits of cleaner air, more renewable resources and a more reliable electrical grid through electrification of transportation and "targeted, cutting-edge energy solutions."

"PSE&G's electric vehicle filing supports the development of electric vehicle infrastructure

and energy storage solutions in New Jersey to benefit customers, meet state goals and spur the state's green economy," Accardo said.

EV Charger Buildout

PSE&G originally filed its petition with the BPU in October 2018. The objective of the program is to accelerate EV adoption and deployment of storage technology in New Jersey, supporting the goals set forth in the state's energy master plan, Accardo said. (See [NJ Unveils Plan for 100% Clean Energy by 2050](#).)

The plan calls for the installation of nearly 40,000 EV charging stations across the state. As charging stations have grown in other states at a pace of purchase of vehicles, Accardo said, New Jersey ranks 45th in the country for stations per registered EV. He said PSE&G's plan emphasizes that the state needs to provide consumers with easy access to charging infrastructure.

For the EV portion of the program, PSE&G is seeking BPU approval to commit up to \$261 million in direct investments over a period of six years. It includes a \$93 million residential subprogram that will pay for the cost of a home EV charger and installation for EV users, with a

cap of \$2,000 per installation.

The proposal includes a \$39 million mixed-use charging subprogram and a \$62 million DC fast-charging subprogram. It also features a \$45 million vehicle innovation subprogram to promote EV use, including a \$33 million electric school bus project and \$12 million to fund other vehicle electrification projects.

Approving the program would initially increase electric rates to customers by about \$9.7 million over an 18-month period, PSE&G said, with rate recovery continuing until 2064. A peak revenue requirement would occur in the 2024-2025 time frame.

Storage Component

New Jersey's Clean Energy Act calls for 600 MW of energy storage by 2021 and 2,000 MW by 2030.

For the storage portion of its program, PSE&G is seeking approval to commit up to \$109.4 million in direct investment over a period of six years. It includes subprograms to smooth intermittent solar generation (\$13.1 million), resolve forecasted distribution grid overload conditions (\$38.6 million), deploy mobile



| © RTO Insider

PJM News



battery storage devices (\$20 million), develop microgrids for critical facilities (\$25.7 million) and facilitate peak reduction for public sector facilities (\$11.9 million).

Approval of the program would increase rates by about \$700,000 over an 18-month period. Rate recovery for the program would continue until 2045, with a peak revenue requirement in the 2025-2026 time frame.

Stakeholder Responses

A typical PSE&G residential electric customer would see a \$1.24 (0.09%) increase in their annual bill, the company said.

Testimony at the BPU hearing featured several hours of stakeholder comments from across the state, with all parties expressing support for PSE&G's proposal.

James Sherman, vice president of Climate Change Mitigation Technologies (CCMT), a New Jersey-based developer of medium- and heavy-duty battery electric truck projects, provided testimony on the EV program. Sherman said the possibility exists to make New Jersey "the East Coast center" of the zero-emission, medium-duty truck and bus industry.

Sherman said his company is closely following developments in California's EV program, especially within the California Energy Commission. (See *California Looks to EVs for Grid Resilience*.) He said the PSE&G subprogram is consistent with what is happening in California and will accelerate charging infrastructure to deploy more EVs.

The school bus fund and the vehicle innovation portion are also key, Sherman said, providing money for towns and cities to convert to EV fleets. CCMT is working on building an EV bus and truck manufacturing plant in Patterson,

he said, with operations to begin in 2021 if sufficient orders and state-level funding are in place. The plant would add 45 new jobs at full production, with 500 trucks and buses being manufactured per year.

Sherman said all the EV programs fit like a puzzle, creating a new clean energy economy in the state.

"When put together, we get advanced, zero-emission vehicle technologies, job creation and, hopefully, increased grid reliability," Sherman said. "We get school buses made in New Jersey and driven in New Jersey. We get immediate clean air benefits at the community level."

Shihab Kuran, CEO of Power Edison, a New Jersey-based clean energy solutions company focused on energy storage, said he is in "full support" of PSE&G's filing, though he called the storage subprogram a "very, very small step" toward increased reliability. He said he would like to see it approved quickly to move on to other programs with "meaningful megawatts" in helping New Jersey meet its goals.

"We are far behind other states in the U.S. when it comes to energy storage," Kuran said. "We have set up our own targets. ... But frankly, I don't see a path for how we can get to 600 MW by 2021. We should have started the work two to three years ago."

Trenton Mayor Reed Gusciora also spoke in support of the programs. He said his city is made up of dense areas experiencing the pressures of urban environments, including pollution.

Gusciora said the concept of environmental justice is important to the residents of Trenton, leading to "fairness, opportunity and a better

quality of life." Steps have been taken by companies and communities to be more environmentally friendly, he said, but only a small portion can be done on a local level to solve current environmental issues.

The mayor said proposals like PSE&G's are a step in the right direction, spurring statewide interest in EVs that will lead to better air quality.

"PSE&G's proposal to deploy nearly 40,000 EV charging stations across the state is the kind of initiative that can deliver public health and environmental and economic benefits to all residents across New Jersey," Gusciora said. ■

"PSE&G's proposal to deploy nearly 40,000 EV charging stations across the state is the kind of initiative that can deliver public health and environmental and economic benefits to all residents across New Jersey."

—Trenton Mayor Reed Gusciora

November 18, 2020
9:00 am - 12:15 pm

Impacts of COVID on Energy Use & Pursuit of Clean Energy

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SPP News

SPP Responding to WEIS Tariff Protests

By Tom Kleckner

SPP staff are busy preparing to address critical comments on the grid operator's *revised Tariff* for its Western Energy Imbalance Service (WEIS) as they work to keep the project on track.

The RTO filed its latest version with FERC on Oct. 1 following the commission's rejection of its first attempt. FERC said the Tariff failed to respect the transmission rights of nonparticipants and could improperly burden reliability coordinators, among other concerns. (See [FERC Rejects SPP's WEIS Tariff](#).)

The latest filing has drawn more than a dozen intervenors (ER21-3, ER21-4), including repeat protesters Xcel Energy-Colorado, Colorado Springs Utilities and Black Hills Energy. All three Colorado utilities plan to join CAISO's Western Energy Imbalance Market.

wvP's Nicole Wagner said during the Western Markets Executive Committee's webinar Friday.

RTO staff held a premeeting with FERC staff

a couple weeks ago and will meet this week among themselves to determine next steps and how they will reply to comments and protests. SPP has asked for a response by Dec. 1, which would keep the WEIS market on track for its Feb. 1 go-live date.

FERC staff's primary concern is with the Tariff's joint dispatch transmission service (JDTS) provisions. SPP staff will collaborate with WEIS transmission providers to ensure their respective tariffs incorporate the correct JDTS language.

David Kelley, SPP's director of seams and market design, said the regulatory delay has left the WEIS program in yellow status, which the RTO defines as "needing attention."

Market trials are also considered in yellow status as participants gear up for the start of parallel operations on Dec. 10. Participants are currently testing dispatch signals to resources but will begin "playing" in the production environment during parallel ops.

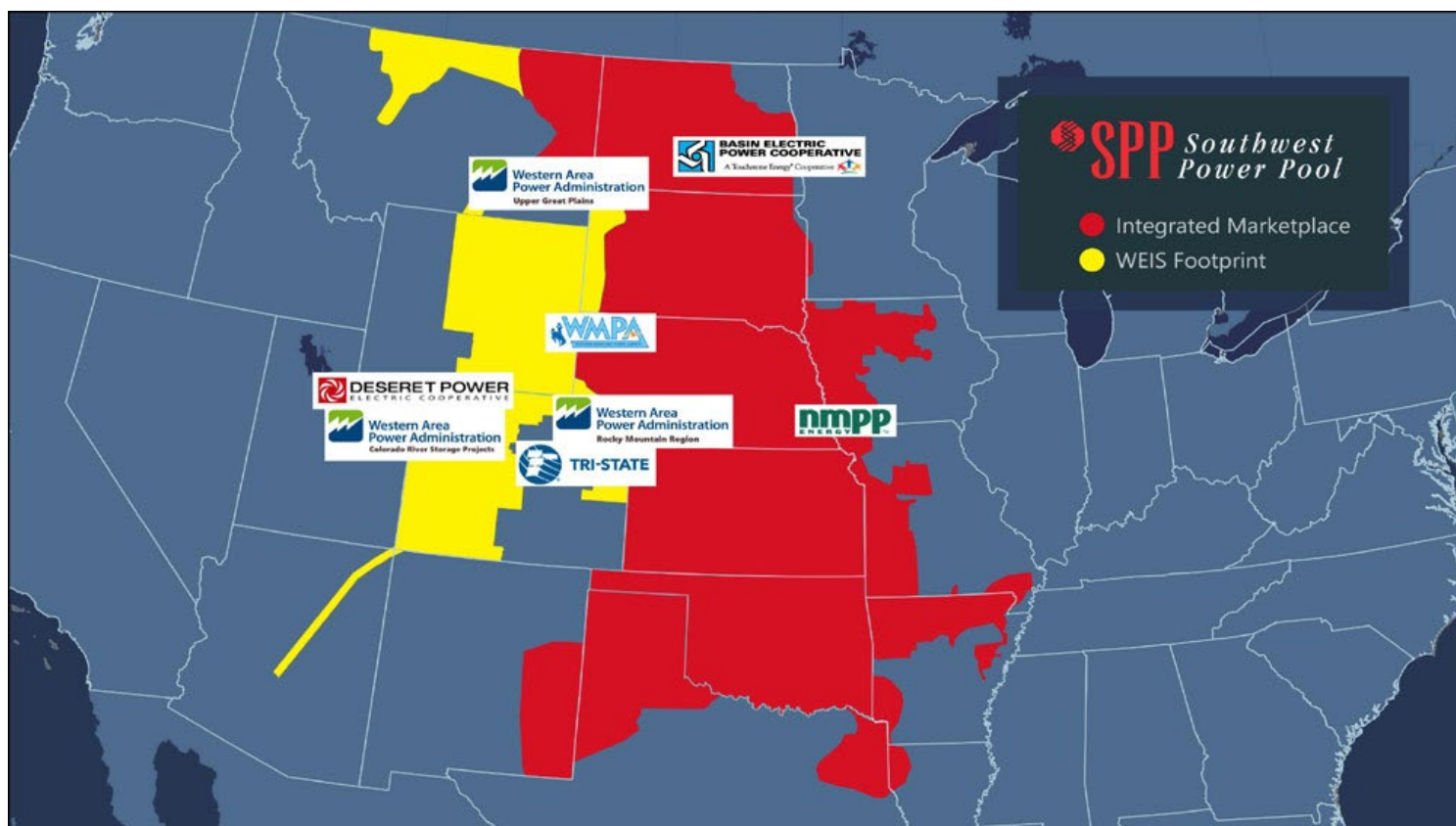
SPP will launch the WEIS with eight members covering the Western Area Power Adminis-



David Kelley, SPP | © RTO Insider

tration's Colorado Missouri and Upper Great Plains West balancing authority areas.

The market, based on the Energy Imbalance Market that SPP operated from 2007 to 2014, continues to attract interest in the West. Bruce Rew, SPP's senior vice president of operations, recently told the RTO's stakeholders that several additional utilities reached out to the grid operator following the rolling blackouts in California late this summer. (See [Theories Abound over California Blackouts Cause](#).) ■



SPP's two market footprints | SPP

SPP News



Colo. PUC Dismisses Complaints vs. Tri-State

FERC Jurisdictional Status Pre-empts Regulators' Authority

By Tom Kleckner

The Colorado Public Utilities Commission last week dismissed formal complaints filed against Tri-State Generation and Transmission Association by two of its members, saying it lacked legal jurisdiction to rule on the proceeding.

In a 3-0 vote during a deliberations meeting Thursday, the PUC *determined* that FERC's August order affirming its exclusive jurisdiction over Tri-State pre-empted it from acting on exit-fee disputes raised by La Plata Electric Association and United Power (19F-0620E, 19F-0621E).

Tri-State and two of its largest members have been battling before the PUC and in district court over the amount of fees to leave the G&T cooperative. Tri-State claimed FERC jurisdiction last year by accepting non-utility member MIECO, a natural gas trader. It subsequently proposed a contract-termination payment methodology that FERC accepted in August. (See *FERC Affirms its Jurisdiction over Tri-State G&T*.)

The PUC said the order reversed an earlier FERC decision allowing the complaints to proceed at the state commission.

The Colorado commission found it also did not have jurisdiction to determine whether Tri-State's admission of MIECO is proper under state law because the question is "a matter of corporate law, not public utilities law." It suggested that United continue pursuing its pending case in Adams County District Court challenging MIECO's membership.

"That court is where the question of MIECO's membership should be answered," the PUC



Duane Highley, Tri-State | SPP

said. "Because [FERC] dismissed the formal complaints without prejudice, the PUC will be ready to adjudicate the exit fee questions if United Power prevails."

Tri-State CEO Duane Highley said in a *statement* that the coopera-

tive was "pleased" with the PUC's decision, and that "questions of Colorado corporate law are a matter for the state courts."

Tri-State has 42 utility members and 45 overall in its four states but has been troubled in recent years by member complaints about high rates and its slow embrace of renewable energy. It reached an exit agreement with Delta-Montrose Electric Association earlier this year. Kit Carson Electric Cooperative was the first to leave Tri-State in 2016.

The cooperative has responded to those complaints by *announcing* its Responsible Energy Plan, designed to transition Tri-State to clean energy resources and reduce rates. (See *Tri-State Increases Members' Self-supply Options*.)

Last week, Tri-State *said* it has filed for FERC approval of its community solar program. Gunnison County Electric Association will be the first member to participate in the program, which the cooperative said provides additional flexibility for its members' community solar projects. ■



The Colorado Public Utilities Commission headquarters building in downtown Denver | LoopNet

Company News

Avangrid to Acquire PNM Resources for \$4.3B

Merger Would Create One of the Biggest Clean Energy in the US

By Jason York

Avangrid is poised to expand into the Southwest after announcing Wednesday that it will spend \$4.3 billion in cash to acquire PNM Resources, which operates regulated utilities in New Mexico and Texas.

Connecticut-based Avangrid has agreed to pay \$50.30/share for PNM, a 19.3% premium over its average closing price over the last 30 days, and will assume \$4 billion in debt.

Avangrid's parent company, Spanish energy giant Iberdrola, said the merged company would have assets worth \$40 billion and generate around \$2.5 billion in earnings and a net profit of \$850 million.

PNM shareholders unanimously approved the transaction. Additional approval from state

and federal regulators is needed, including FERC, the New Mexico Public Regulation Commission, the Public Utility Commission of Texas, the Federal Communications Commission and the Nuclear Regulatory Commission. The deal must also be cleared under the antitrust provisions of the Hart Scott Rodino Act and receive approval from the Committee on Foreign Investment in the United States. Regulatory approvals should take approximately 12 months.

Avangrid CEO Dennis Arriola will continue in that role for the combined company. In a statement, Arriola said the merger is "a strategic fit and helps us further our growth in both clean energy distribution and transmission, as well as helping to expand our growing leadership position in renewables."

PNM's utilities provide electricity to nearly

800,000 homes and businesses in New Mexico and Texas; Avangrid has 3.3 million customers in Connecticut, Maine, Massachusetts and New York. PNM also owns power plants and wind farms in New Mexico. Avangrid currently owns 1,900 MW of renewable energy in 22 states and has a pipeline of 1,400 MW of renewables assets in New Mexico and Texas.

Iberdrola CEO Ignacio Galán said during an earnings call Wednesday that the merger "fits our strategy and improves our position and growth potential significantly in the United States ... one of our key geographies."

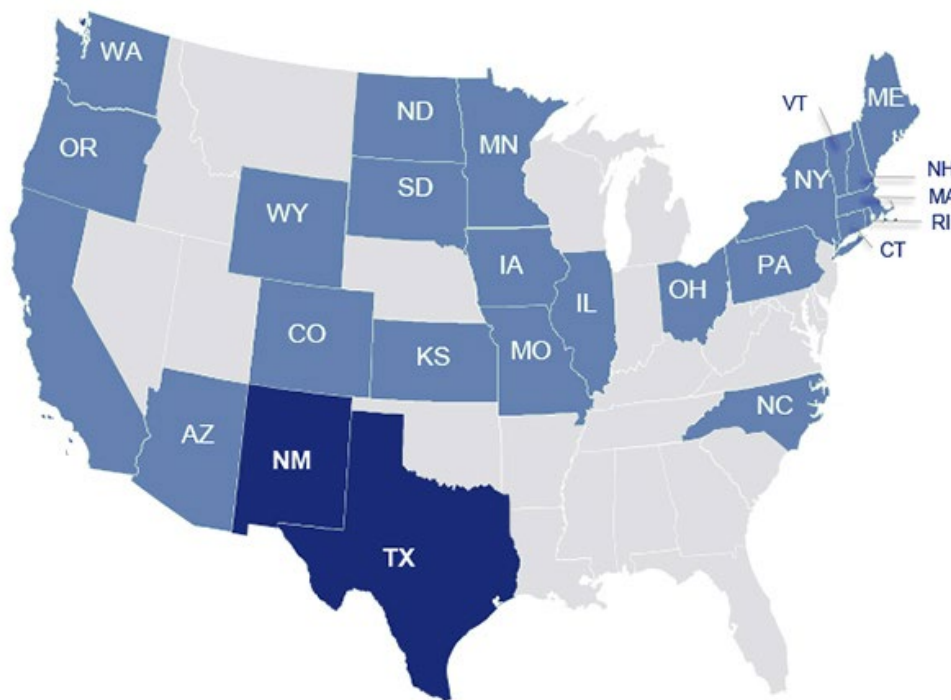
It also creates one of the biggest clean energy companies in the U.S., with 10 regulated utilities in six states and renewable energy operations in 24 states. The enlarged company will be the third-biggest U.S. renewables operator, with about 7.4 GW of capacity, nearly all of which is onshore wind, and a growing pipeline of offshore projects including Vineyard Wind and Park City Wind in New England.

Vineyard is an 800-MW joint venture between Avangrid and Copenhagen Infrastructure Partners (CIP). The project's expected in-service date has been pushed back to no earlier than 2023 because of delays from the U.S. Bureau of Ocean Energy Management in issuing its final environmental impact study and record of decision. (See *BOEM Issues Revised EIS for Vineyard Wind*.) Avangrid also partnered with CIP to develop the 804-MW Park City project, which has an expected in-service date of 2025.

"When nobody believes [that] the electricity can be produced with clean sources and everybody thought coal would remain for centuries, and the oil and gas are absolutely needed, we were already the only one saying that we can already generate and produce electricity with clean sources," Galán said.

PNM has received regulatory approval to more than triple its renewable power capacity to 2 GW by the end of 2022, with a goal to be 100% emissions-free by 2040. There is also an approved exit plan for the 2022 retirement of the coal-fired San Juan Generating Station, of which PNM owns 66.3%, with securitization bonds used to recover the investment, a portion of decommissioning and other costs.

Pedro Azagra Blázquez, corporate development director for Iberdrola, said the company and its subsidiaries "will have no control of any coal asset" by 2022. ■



■ Avangrid locations

■ PNM locations

The merger of Avangrid and PNM Resources gives the combined company utilities in 6 states and renewable energy operations in 24 states. | Iberdrola

Company News

AEP: 'Light at the End of the Tunnel'

Company Beats Analysts' Expectations with Strong 3rd Quarter

By Tom Kleckner

As he is often wont to do, American Electric Power CEO Nick Akins opened his company's third-quarter earnings call with financial analysts Thursday by quoting a rocker. He used Lenny Kravitz' hit "Fly Away" to symbolize the shared pain "many of us have ... during 2020 with these multiple challenges":



AEP CEO Nick Akins | © RTO Insider

"I wanna fly away."

"Probably figuratively and literally," Akins mused. "But there is light at the end of the tunnel."

AEP's year-to-date residential sales are up 2.6% when compared with last year, largely because of people spending more time at

home during the COVID-19 pandemic, Akins said. Commercial and industrial sales are still down year-to-date, 4.9% and 7%, respectively, but showing signs of life.

"Both our commercial and industrial classes are showing steady improvement from the low we experienced in the second quarter as some businesses reopened over the summer," he said. "We expect this trend will continue into 2021, barring additional unanticipated negative economic impacts from the pandemic."

The Columbus, Ohio-based company reported third-quarter earnings of \$749 million (\$1.51/share), compared with earnings a year ago of \$734 million (\$1.49/share). That beat Zacks Investment Research's consensus estimate of \$1.47/share.

AEP reaffirmed its 2020 operating earnings guidance range of \$4.25 to \$4.45/share.

Akins headed off questions about the ongoing

federal investigation into an alleged bribery scheme tied to the passage of Ohio House Bill 6 during his prepared remarks. (See [FirstEnergy, AEP CEOs Deny Wrongdoing](#).)

"I'll just say flatly that we have nothing new to report from AEP's perspective," he said. "Any potential legislative change is not imminent, particularly given a noisy election cycle. So, perhaps we'll hear more after the election."

"As we've said earlier, any change to the existing legislation is likely to be financially insignificant for AEP, and we will still be pushing for forward-looking legislation regarding clean energy options, energy efficiency and other technology enhancements," Akins said. "Regarding the legal issues surrounding HB6, also nothing new to report, and my previous comments stand on this subject."

AEP's share price, which closed Wednesday at \$90.40, closed at \$92.20 on Thursday, the highest it been since early March. ■

NextEra Energy Eyes Greater RTO Involvement

Company Announces Strong Earnings, Additional Renewables

NextEra Energy's recent acquisition of GridLiance and its three subsidiaries gives the company a greater voice in RTO transmission-investment decisions and renewables development, CFO Rebecca Kujawa said Wednesday.

"There are investment opportunities ... we would have in GridLiance," Kujawa said during NextEra's third-quarter earnings call with financial analysts. "But it also positions us to have a seat at the table in these [RTOs] as they contemplate new transmission projects. And obviously, GridLiance would seek to compete effectively for those opportunities."

"As we think about a broad and substantial expansion of renewables across the U.S., it becomes important, and increasingly so over time, to continue to invest in the transmission grid across the U.S.," she said.

NextEra Energy Transmission announced last month it will pay \$660 million for GridLiance. The company's three subsidiaries, members of both MISO and SPP, own 700 miles of high-voltage lines in Illinois, Kansas, Kentucky,



NextEra Energy Resources' Pinal Central Energy Center in Arizona, combining solar with storage | NextEra Energy Resources

Missouri, Nevada and Oklahoma. (See [NextEra Buying GridLiance for \\$660M](#).)

The company said its NextEra Energy Resources subsidiary added nearly 2.2 GW of renewables since July to its now 15-GW backlog: 580 MW of wind, 911 MW of solar, 594 MW of energy storage and 86 MW of wind repowering.

The Juno Beach, Fla.-based company reported third-quarter earnings \$1.23 billion (\$2.50/share), compared to \$879 million (\$1.81/

share) for the third quarter of 2019.

NextEra's board of directors last month approved a four-for-one common stock split intended to make ownership "more accessible." Trading on a stock split-adjusted basis began today.

The company's share price opened Wednesday at \$299.06 but slowly lost steam during the day and was trading at \$297.68 in the after-hours session. ■

— Tom Kleckner

Company Briefs

Robert Murray Dies Week After Announcing Retirement



Robert Murray, the founder and former CEO of U.S. coal company Murray Energy, died at his home in St. Clairsville, Ohio, Sunday morning. He was 80 years old.

No official cause of death was given. Murray had recently applied for black lung benefits with the U.S. Department of Labor. He had long depended on an oxygen tank to breathe.

Murray had just a week ago announced his retirement after six decades as chairman of the board of directors for American Consolidated Natural Resource Holdings, which Murray Energy became after it emerged from Chapter 11 bankruptcy last month. Murray was replaced as president and CEO of the company by Robert D. Moore when the bankruptcy was first announced in October 2019. Moore still heads the new company.

"Throughout my life in and about coal mines and in our industry, I have given all that I had to our employees and their families to sustain their family livelihoods and jobs for the hard working people in our mining communities," Murray said in his retirement announcement.

Murray had fought federal mine safety regulations for years, with his company suing unsuccessfully in 2014 over regulations to cut the amount of coal dust in mines to reduce the incidence of black lung disease.

More: [The Associated Press](#); [The Associated Press](#)

Coal Producer Arch Outlines 'Exit Strategy'

Arch Resources mapped out plans to slow and sell assets tied to its thermal coal operations, including mines in Wyoming's Powder River Basin.

The company made the announcement in a quarterly earnings report released last week, which showed a net loss of \$191.5 million. It said it will push to make a "rapid pivot" from coal for power generation to metallurgical coal, which is used in the steel-making process. The company owns several metallurgical coal mines in West Virginia.

Arch said its Powder River Basin operations

produced nearly 75 million tons of coal in 2019 but are expected to come up with less than 55 million tons this year. The plan announced last week could reduce production levels by an additional 50% over the course of the next two to three years.

More: [St. Louis Post-Dispatch](#)

EQT Looking to Sell Mountain Valley Pipeline Capacity

EQT last week announced it is in discussions to offload some or all its Mountain Valley Pipeline capacity and is said to be negotiating with four or five parties.

In 2018, EQT split into two companies: EQT and Equitrans Midstream. The latter is the primary interest owner of the pipeline and will also operate it. The company reported a third-quarter net loss of \$601 million, primarily from decreased operating revenue, increased interest expense and decreased dividends and other income.

The project is about two years behind schedule and about \$2 billion overbudget. In August, Equitrans announced it was targeting an early 2021 full in-service date and that total project costs could increase 5% over the updated \$5.4 billion budget.

More: [Charleston Gazette-Mail](#)

Former Auditor Accuses FirstEnergy of Whistleblower Retaliation



Auditor Michael Pircio last week

filed documents in U.S. District Court that allege FirstEnergy retaliated against him for reporting information to the U.S. Securities and Exchange Commission. He was fired from his position at ClearSulting, the consulting firm that assisted FirstEnergy with an internal audit.

The filings say Pircio reviewed the instructions for FirstEnergy's 2019 audit, as well as the document itself, following the arrests of former Ohio House Speaker Larry Householder and four allies in July. The five face criminal charges in the \$60 million bribery scandal linked to House Bill 6, the \$1 billion bailout of two power plants that had been owned by a FirstEnergy subsidiary. Pircio downloaded information regarding the audit from a ClearSulting database and forwarded it to the SEC.

The filings are a countersuit against ClearSulting and FirstEnergy. The companies

sued Pircio in September for taking the documents after he was fired. Pircio had worked for ClearSulting from March to July 30.

More: [Cleveland.com](#)

GM Unveils Hummer EV, the 'World's First Supertruck'



General Motors last week unveiled its 2022 GMC Hummer EV sport utility truck during national television broadcasts of the World Series and "The Voice."

GM said the vehicle will offer the performance of an exotic sports car, including zero to 60 mph in three seconds, as well as offroad capabilities. It will have a 10-minute fast-charging system that will allow up to 100 miles of range.

The pickup, which will be available next fall, will start at \$112,595, including destination charges, for a launch version called the "Edition 1." A \$99,995 version will be available a year later, followed by \$89,995 and \$79,995 models in the springs of 2023 and 2024, respectively.

More: [CNBC](#)

LafargeHolcim Cement Plant Aims to be 1st in US to Capture Carbon



LafargeHolcim

LafargeHolcim, a global building materials supplier and the owner of a cement plant in Florence,

Colo., last week announced it has received a \$1.5 million grant from the Department of Energy to research and develop a system to capture and sequester the plant's carbon dioxide emissions. It would be the first U.S. facility to use carbon-capture technology on a commercial scale.

Jamie Gentoso, the CEO of U.S. Cement at LafargeHolcim, said the company worked with Svante to build a pilot carbon-capture unit at a plant in British Columbia.

The cement sector is the world's third-largest industrial energy consumer and is the second-largest industrial emitter of carbon dioxide, accounting for 7% of the global emissions, according to the International Energy Agency. As population and urbanization grow, the agency said cement production is expected to increase anywhere from 12 to 23% by 2050.

More: [The Denver Post](#)

MidAmerican Turbines Under Inspection After 2nd Blade Loss

MidAmerican Energy last week said it is inspecting more than 40 wind turbines following a second case of a blade coming off a turbine.

Company spokesman Geoff Greenwood said the latest issue happened about two weeks ago when a technician at the Beaver Creek Wind Farm in Iowa noticed a blade had separated from a turbine. Greenwood said it followed a similar problem in September when the same type of turbine had a blade failure in Adair County. The turbines also had the same type of lightning system that channels lightning into the ground.

MidAmerican identified 46 other turbines that had a lightning strike near them and turned them off for inspection. The company has about 3,000 turbines in the state.

More: [Radio Iowa](#)

Ørsted Offshore North America Names New CEO



Ørsted last week announced that David Hardy will be the new CEO for its North American

offshore wind subsidiary.

Hardy will oversee the development and operations for Ørsted's projects across the U.S. Before joining Ørsted, Hardy held senior executive positions in the industry and had leadership roles in Servion, Vestas Wind Systems and General Electric.

Hardy will succeed Thomas Brostrøm, who will step down and relocate to Europe.

More: [Renewables Now](#)

Report: OGE, CenterPoint May Sell Enable

OGE Energy has joined CenterPoint Energy in pondering a sale of Enable Midstream Partners, according to Bloomberg. OGE is said to have "aligned" its exit strategy with that of CenterPoint, say sources who asked to not be identified because the matter isn't public.

CenterPoint has been conducting a five-month review of its businesses, which is scheduled to be completed soon, and has been open about selling its stake in the gas-gathering company. The utility wrote off a \$1.6 billion loss from Enable in May. (See [New CenterPoint CEO Promises to 'Simplify the Story'](#).)

Earlier this year, Enable halved its quarterly distributions to investors and cut its capital expenditures for 2020 by \$115 million in the face of depressed commodity prices and other economic headwinds. OGE and CenterPoint formed Enable in 2013. The companies own the general partnership, with CenterPoint owning 53.7% of Enable's common units and OGE owning 25.5%.

More: [Bloomberg](#)

LineVision Adds Ex-FERC Commissioner to Advisory Board

Former FERC Commissioner Nora Mead Brownell, who recently headed PG&E Corp.'s board of directors, has joined the expanded advisory board of LineVision, which provides sensors and analytics for monitoring transmission lines and optimizing their capacity.

Other's joining the advisory board are: Gene Dolgin, vice president of strategy at Climacell; Balint Nemeth, head of BME High Voltage Lab; Chris Seiple, vice chairman of Wood Mackenzie's power and renewables practice; and Rick Sergel, former CEO of National Grid and NERC.

More: [LineVision](#)

Federal Briefs

Court Delays Stream Crossings for Mountain Valley Pipeline

The 4th Circuit Court of Appeals last week issued a temporary administrative stay of stream-crossing permits for the Mountain Valley Pipeline. The court said the delay will remain in effect until it has time to consider a full stay.

While Mountain Valley has regained two of three sets of key permits that were set aside by legal challenges, continued delays have raised questions about whether the 303-mile pipeline will be completed by early next year, as targeted by the developers.

More: [The Roanoke Times](#)

Dems Push Expansion of OSW with Ocean Energy Bill

House Democrats last week unveiled the Ocean Based Climate Solutions Act. The bill would direct the Department of the Interior to increase the number of permits for offshore wind projects, as well as pledge to conserve 30% of the oceans by 2030 and



ban drilling along both coasts.

Lawmakers say the legislation, which includes increasing benchmarks for permitting OSW that would double between 2025 and 2030, would speed the construction of projects that have stalled under the Trump administration.

The bill also includes \$3 billion to support "coastal resiliency" efforts designed to combat rising sea levels. The projects could include planting salt marshes or sea grass that help keep coastlines intact and absorb carbon.

More: [The Hill](#)

Ex-EPA Official Claims Retaliation in New Lawsuit

Kevin Chmielewski, a former EPA official who served as deputy chief of staff in 2017 and 2018, last week sued EPA over his removal and the Energy Department for not hiring him by claiming retaliation for speaking out about scandals related to then-Administrator Scott Pruitt.

The lawsuit alleges Chmielewski was "removed for retaliatory reasons and without due process of law because he engaged in a series of allegations to appropriate officials, human resources staff, agency counsel and congressional committees that the administrator was engaged in a pattern and practice of incurring travel expenses, office improvements and use of staff for personal tasks in violation of federal statutes, regulations and EPA policies."

While at EPA, Chmielewski leaked documents and provided information that prompted investigations into scandals like the retroactive altering of Pruitt's public

calendar and a request that staff help him find a condo in D.C.

More: [The Hill](#)

French Government Blocks US LNG Deal



The French government last month stepped in to force domestic company ENGIE to delay signing a \$7 billion deal with U.S. LNG company NextDecade over concerns that its shale gas was too dirty.

ENGIE was set to sign the 20-year contract to buy LNG from NextDecade's planned Rio Grande export facility in Brownsville, Texas, when the French government stepped in and told the company's board of directors to delay, if not cancel, any deal because of concerns that the West Texas oil and gas fields that would supply gas to the facility emit too much methane.

That focus on imports could become a problem for U.S. LNG sellers that get their natural gas from West Texas, where methane emissions are high and many oil-focused companies vent or burn off the gas that is a byproduct of the wells. About 1.4 million metric tons of methane a year escape from the Permian Basin fields.

More: [POLITICO](#)

Judge Denies Tribes' Attempt to Halt Keystone Pipeline Work



U.S. District Judge **Brian Morris** has denied a request by Native American tribes to halt construction of the Keystone XL oil pipeline over worries about potential spills and damage to cultural sites.

The Assiniboine and Gros Ventre tribes of the Fort Belknap Indian Community in Montana and Rosebud Sioux Tribe in South Dakota challenged President Trump's 2019 permit for the project. They say the permit violates their rights under treaties from the mid-1800s.

Morris said the tribes did not show they would suffer irreparable harm from the work that's been done so far, and while he did not make a final ruling, he did invite further arguments.

More: [The Associated Press](#)

White House Approves California Relief for 6 Fires

The Trump administration last week approved California's application for Major Disaster Declaration relief funds to clean up damage from six deadly and destructive wildfires, Gov. Gavin Newsom said.

The approval came two days after the administration initially denied the request. President Trump had agreed with Federal Emergency Management Agency Administrator Pete Gaynor, who said the damage "was not of such severity and magnitude as to be beyond the [state's] capabilities." Newsom originally asked for the declaration on Sept. 28 to cover fires in Fresno, Los Angeles, Madera, Mendocino, San Bernardino, San Diego and Siskiyou counties.

More: [The Associated Press](#)

DOE Awards \$1.4B to Help Build Small Nuclear Reactors in Idaho



The Department of Energy last week awarded Utah energy cooperative Associated Municipal Power Systems about \$1.4 billion to help build a dozen small nuclear

reactors in eastern Idaho. The money will be spread over 10 years and pay for all the one-time costs.

The first-of-a-kind Carbon Free Power Project is part of a DOE effort to reduce greenhouse gasses by using nuclear power to complement intermittent renewable energy. The project involves 12 small modular reactors capable of producing 720 MW (60 MW each) when all 12 are operating.

More: [The Associated Press](#)

State Briefs

CALIFORNIA

El Dorado County to Spend \$1.2M on Generators

El Dorado County announced last week it is putting \$1.2 million toward the purchase of four generators to power facilities during Pacific Gas and Electric public safety power shutoffs.

The generators will be placed at a county jail, a library and the county government center. Funding comes from a combination of grants from the sheriff's office and carry-over savings from prior accumulated capital outlay projects.

More: [Mountain Democrat](#)

Oroville to Leave PG&E, Join Power Authority

The Oroville City Council last week autho-



ized the implementation of the Butte Choice Aggregate Joint Powers Authority's community choice aggregation program. The program allows cities to buy or generate their own electricity and sell it to residents and businesses. Pacific Gas and Electric will continue to deliver electricity and provide meter reading, billing and maintenance services.

"I look at this as kind of a joint powers agreement to buy things. If we can buy this power, that's great," Councilor David Pittman said. "Anytime we can modulate the cost of power, that's a big deal. The difficulty we have now is we're at the mercy of PG&E completely. Whatever they decide to do, that's what we're going to do. We have no authority to change anything. At least in this venue, given the concerns, at least we have the authority to buy a better product in the

world of electricity."

More: [Enterprise-Record](#)

SDG&E Power Line Opponents Want Rehearing



The city of San Marcos and members of the San Elijo Hills homeowners association want the Public Utilities Com-

mission to rehear a decision that approved a 12-mile power line over a portion of the neighborhood. All five members of the PUC approved San Diego Gas & Electric's proposal last month.

SDG&E said the 69-kV line is needed to improve reliability and reduce congestion in a North County area that has grown rapidly. However, residents say the overhead lines increases the risk of a downed line sparking

a wildfire in a residential area.

Attorneys for the homeowners association have until Nov. 4 to file for the rehearing.

More: [The San Diego Union-Tribune](#)

ILLINOIS

Ameren Makes Net Metering Concession



Ameren Illinois last week filed a special permission tariff with the Commerce Com-

mission to help new rooftop solar customers maintain full compensation for the excess power they produce should the commission determine a key net metering calculation be changed.

Under Ameren's proposed changes, residential and small nonresidential rooftop solar customers who complete construction after Oct. 1 will receive retroactive credits for their delivery charges in the event the ICC orders changes to the net metering program. Customers who completed their installations prior to Oct. 1 are continuing to receive full net metering benefits and are not impacted by the proposal.

Ameren told the ICC in September it would end net metering as soon as Oct. 1, but solar advocates filed an emergency motion to prevent the action, which was granted in part by the ICC. On Oct. 5, Ameren rejected the commission's request to continue providing full net metering credits to residential customers until an audit is completed. Ameren's latest action, however, appears to compromise with the ICC and advocates.

More: [Solar Power World](#); [Canton Daily Ledger](#)

Wapella, Mayor File Lawsuit to Stop Wind Farm

The Village of Wapella and Mayor Sherry Mears filed a complaint last week against Enel Energy and DeWitt County claiming procedural measures were not followed when the county board voted 6-5 to grant a special-use permit for the Alta Farms II wind turbine project.

The lawsuit says the board lacked jurisdiction to enact the permit because the vote did not occur within 30 days of a public meeting conducted by the Zoning Board of Appeals as required by the Counties Code. It is the second lawsuit filed this month against the developers and county board following a similar one filed by a group of DeWitt County residents.

More: [Herald & Review](#)

INDIANA

NIPSCO Announces 3 New Solar Projects



Northern Indiana Public Service Co. announced last week that it is planning

three new solar energy projects in Jasper and White counties that will add 900 MW to the company's capacity.

NIPSCO has entered into three "build transfer" agreements with subsidiaries of NextEra Energy Resources on the Dunns Bridge I, Dunns Bridge II and Cavalry solar projects. Construction is expected to begin in 2022, with commercial operations slated to start a year later.

The projects were selected in response to a request for proposals NIPSCO issued as part of its "Your Energy, Your Future" plan.

More: [The Northwest Indiana Times](#)

MONTANA

PSC Candidates Debate Energy Regulation, Climate Change

Two Public Service Commission candidates last week shared their views on clean energy and climate change in a debate hosted by City Club Missoula.

Republican Jennifer Fielder said she does not support expanding alternative energy sources and would not promote wind and solar at the exclusion of fossil fuels. Democrat Monica Tranel talked about the state's bountiful wind and how it has been served by hydropower for more than 100 years.

When asked who will pay for the environmental costs of NorthWestern Energy's Colstrip power plant, Tranel said the system is rigged to favor the utility, which can pass on higher rates to consumers when the plant shutters. Meanwhile, Fielder said the State Legislature sets the statutes and the PSC can only follow them, whether they're fair or not. She claimed the modeling on climate change is wrong, and the potential liabilities born by polluters who contribute to climate change may not come to fruition.

More: [Missoula Current](#)

NORTH CAROLINA

Hertford County Halts New Solar Farm Construction

The Hertford County Board of Commissioners last week unanimously approved a



measure that will put a temporary moratorium to the issuance of permits related to new solar farm construction. The moratorium is effective immediately and will last until June 30, 2021.

During the moratorium period, no building, zoning, conditional-use or special-use permit shall be issued for new construction or the expansion of an existing structure. However, the commissioners agreed to exclude solar facilities that were in the permitting stages of development.

"The moratorium's purpose is to allow the [county] planning board and the commissioners time to examine a host of issues surrounding solar farms," said Murfreesboro attorney Charles Revelle III, who serves as legal counsel to the commission.

More: [Roanoke-Chowan News-Herald](#)

Southport Power Plant to Cease Operations

CPI USA North Carolina last week said it plans to cease operations at its 88-MW power plant near Southport by March 31, 2021, according to a draft special order by consent between the company and the Department of Environmental Quality's Division of Air Quality. The consent order was issued after the state determined sulfur dioxide emissions exceeded the National Ambient Air Quality Standards.

Under the terms of the order, CPI must reduce the amount of sulfur dioxide it releases into the air and "cease operation of all emissions sources" at the plant.

More: [Coastal Review](#)

OHIO

DP&L Reaches Agreement Resolving Cases Including Smart Grid Plan

Dayton Power & Light last week filed an agreement to invest \$249 million in capital projects over the next four years, which the company called "a significant initial step to modernize the grid to provide service that will enhance reliability, efficiency and

customer value.”

The agreement allows DP&L to invest in new technology, equipment and systems, such as upgrading to advanced metering infrastructure; technology that isolates grid problems and automatically reroutes power; implementing rebate programs for electric vehicle supply equipment and smart thermostats; and installing equipment in the west and northwest areas of Dayton, which were the hardest hit locations by the 2019 Memorial Day tornadoes.

More: [DP&L](#)

Yost Challenges Householder on Using Campaign Cash to Pay Legal Fees



Attorney General **Dave Yost** last week said he would file a complaint with the Elections Commission after it was revealed that former House Speaker Larry Householder used campaign money to

cover legal fees stemming from his arrest on federal corruption charges.

Yost [tweeted](#) that the spending was illegal and he was directing staff to pursue a formal

complaint. The post came a day after Householder’s pre-general election campaign finance filing, which included seven expenditures since mid-July totaling more than \$1 million to three separate law firms.

Elections Commission Executive Director Philip Richter confirmed “that using campaign funds for criminal legal representation is improper.”

More: [The Columbus Dispatch](#)

UTAH

Murray City Withdraws from Nuclear Project

The Murray City Council last week voted unanimously to become the fourth city in the state to back out of a first-of-its-kind nuclear power project that has the support of several municipalities.

Opponents of the 12-module, 720-MW plant that would be located at Idaho National Laboratory have raised concerns about environmental and financial risks. City Power Manager Blaine Haacke outlined several advantages of the project but ultimately recommended the council vote to back out of the project, saying there were too many

risks involved in committing another \$1.1 million to \$1.4 million in taxpayer dollars, with an ultimate anticipated price tag of about \$2.1 million.

Haacke also said his biggest concern is that the plant is only 25% subscribed, and it’s not a sure thing new customers will come on board once it’s built.

More: [The Salt Lake Tribune](#)

WISCONSIN

PSC Approves Superior Solar Garden

The Public Service Commission last week approved Superior Water, Light and Power’s 470-kW solar garden near Heritage Park in Superior.

The cost to install and maintain Superior Solar will be paid by customers who chose to participate in the program. Costs will be fixed to protect customers from changes in costs. All options are based on 25-year agreements, but customers will have the ability to leave the program at any time without penalty.

Construction is expected to begin next spring.

More: [Superior Telegram](#)

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