

# MEGAWATT DAILY

Friday, April 17, 2020

NEW DAILY HYDROGEN ASSESSMENTS

**NEWS HEADLINES**

**PJM capacity market overhaul largely survives second look by FERC**

- RECs, RGGI not subject to MOPR, FERC clarifies
- Self supply, energy efficiency will be mitigated
- Glick offers strong rebuke of rehearing orders

**Renewables sector could emerge even stronger after pandemic turmoil, consolidation**

- Power and gas price recovery needed
- Consolidation expected

**Cal-ISO peak demand served by renewables jumps 136% month on month in March**

- 23,757 MW: Cal-ISO installed renewable resources
- 10,903 MW: peak demand served by renewables in March
- 179,081 MWh: March curtailments, up 46.5% from 2019

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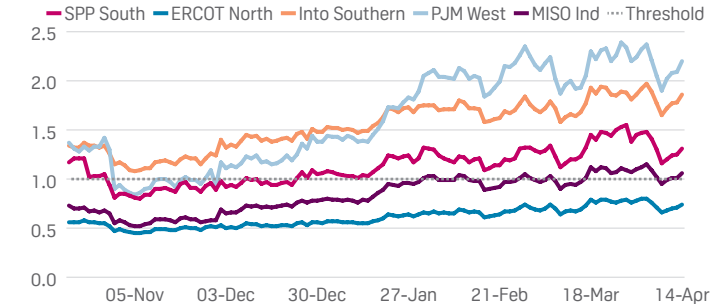
ISO Price Locations	Day-ahead peak prices			Regional weather trends		
	17-Apr	Daily chg	Prior 7-day avg	17-Apr	Daily chg	7-day forecast
CAISO NP 15	22.97	0.66 ▲	21.11	59.1	-2.3 ▼	61.8
ERCOT North Hub	20.50	7.08 ▲	18.12	59.2	-2.0 ▼	69.8
ISONE Internal Hub	16.66	-0.90 ▼	17.55	42.0	-0.6 ▼	46.6
MISO Indiana Hub	20.85	-0.76 ▼	23.11	36.9	1.6 ▲	50.9
NYISO Zone G	15.51	-0.66 ▼	15.72	41.0	-1.2 ▼	50.1
PJM West Hub	18.29	-1.14 ▼	19.12	43.9	1.7 ▲	52.6
SPP South Hub	17.81	10.64 ▲	14.19	43.1	-4.0 ▼	58.3
<b>Bilateral indexes</b>						
Into Southern	18.83	-1.17 ▼	18.44	63.8	4.3 ▲	69.0
Palo Verde	14.88	0.88 ▲	14.38	60.5	-1.8 ▼	63.4
COB	18.75	-1.00 ▼	20.80	54.5	0.4 ▲	55.4
Mid-C	16.91	-0.98 ▼	19.93	54.5	0.4 ▲	55.4

Source: Platts

**HOURLY INDEX VALUES**

15-Apr	Mid-C hourly (\$/MWh)	Cal ISO curtailment (MW)
On-peak	11.03	7241.27
Off-peak	14.16	0.00

**COAL-vs-GAS \$/MWh FUEL COST RATIOS**



The Platts coal-vs-gas fuel cost ratios indicate the regional competitiveness of gas versus coal for power generation. The ratio is calculated by dividing the \$/MWh fuel cost for coal by that of gas. Gas generation is cheaper than coal generation when the ratio is greater than one. All price data reflects prompt month fuel contracts.

Source: S&P Global Platts daily OTC coal prices and M2MS gas prices

**PLATTS PEAK DAILY DEMAND (GW)**

ISO	Daily change								Season		Season average					
	08-Apr	09-Apr	10-Apr	11-Apr	12-Apr	13-Apr	14-Apr	15-Apr	Chg	% Chg	Min	Max	2020	2019	Chg	% Chg
BPA-Puget	7.20	6.76	6.63	6.49	6.85	7.17	6.87	6.33	-0.54	-7.86	5.57	8.63	7.49	7.44	0.06	0.79
IESO	14.55	14.45	14.17	13.96	13.72	14.66	15.02	15.35	0.33	2.20	12.87	18.18	15.91	18.96	-3.04	-16.05
CAISO	24.60	24.55	23.69	22.53	22.39	23.71	24.19	24.25	0.06	0.25	20.09	28.09	25.14	26.56	-1.42	-5.35
ERCOT	55.18	49.33	40.00	39.86	45.78	37.59	37.69	37.72	0.03	0.08	32.61	55.18	42.63	45.44	-2.81	-6.18
SPP	31.87	27.26	26.53	25.39	26.44	29.34	29.51	29.33	-0.18	-0.61	24.96	31.87	28.55	35.69	-7.14	-20.00
MISO	73.23	70.62	64.07	61.72	63.46	69.35	69.38	69.45	0.07	0.10	60.98	79.50	71.58	86.48	-14.90	-17.23
PJM	78.11	78.57	202.81	73.16	70.82	79.74	80.86	72.81	-8.05	-9.96	24.89	202.81	85.95	94.24	-8.29	-8.80
NYISO	15.63	16.30	16.52	15.60	14.89	16.11	16.00	16.14	0.14	0.88	14.89	19.28	17.04	18.54	-1.50	-8.08
NEISO	12.92	13.84	13.19	12.52	11.87	13.46	12.70	12.83	0.13	1.02	10.57	15.72	13.80	14.62	-0.82	-5.62
AESO	9.84	9.65	9.56	9.63	9.65	9.67	9.56	9.70	0.14	1.46	9.56	10.79	10.24	10.95	-0.72	-6.55

Season definitions: Summer (June – August), Fall (September – November), Winter (December – February), and Spring (March – May).

Source: S&P Global Platts

## NEWS

## PJM capacity market overhaul largely survives second look by FERC

- RECs, RGGI not subject to MOPR, FERC clarifies
- Self supply, energy efficiency will be mitigated
- Glick offers strong rebuke of rehearing orders

A divided Federal Energy Regulatory Commission Thursday voted to approve key clarifications to its overhaul of PJM Interconnection's capacity market in a move that also cleared the way for legal challenges related to the closely-watched proceeding to move forward.

During its monthly open meeting, FERC largely affirmed a June 2018 order (EL16-49) in which a deeply divided commission found that PJM's then-existing capacity market rules failed to address potential price distortion caused by state-sponsored clean energy resources.

In doing so, the commission also addressed requests for rehearing and clarification to a December 2019 order (EL18-178) directing the 13-state grid operator to expand its minimum offer price rule (MOPR) to all new resources and some existing generators seeking to participate in its capacity market that receive a material state subsidy.

Bitterly opposed by renewables advocates, FERC's December 2019 order also created confusion among market participants and PJM who sought clarification on whether the administratively set price floor would apply to private clean energy transactions and generators in states covered by the Regional Greenhouse Gas Initiative.

In a win for corporate clean energy procurement, Chairman Neil Chatterjee clarified during the Thursday meeting that the MOPR will not apply to voluntary purchases of renewable energy credits (RECs). Following the meeting, Chatterjee also clarified to reporters that RGGI will not be viewed as a state subsidy because the regional cap-and-trade scheme does not amount to "a payment or concession."

The full text of the orders was not available directly after the meeting, which was held virtually due to the coronavirus pandemic

### Further clarifications

Commissioner Richard Glick, who dissented from both of the rehearing orders, said in an interview that further clarifications to the agency's December 2019 directive will also subject energy efficiency resources to the MOPR "even though there's nothing in the record to suggest that [energy efficiency] causes any price suppression."

Glick said the commission's action Thursday could also cause certain demand response resources to be implicated in market mitigation. "The order handles demand response by essentially calling into question the way PJM takes demand response into account," he said.

Speaking to reporters after the meeting, Chatterjee cited Glick's dissent to the commission's June 2018 order as a way of justifying its decision to affirm the MOPR will apply to publicly-owned utilities that procure their own generating resources, known as self-supply entities.

"Commissioner Glick himself has made the case in a prior dissent that resources like utilities with guaranteed cost recovery are not competitive, and so at the end of the day all this rule requires is that

## S&P Global Platts

### MEGAWATT DAILY

ISSN: 1088-4319

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Megawatt Daily is published daily by Platts, a division of S&P Global, registered office: 55 Water Street, 37th Floor, New York, N.Y. 10038.

Officers of the Corporation: Charles E. Haldeman, Jr., Non-Executive Chairman; Doug Peterson, President and Chief Executive Officer; Ewout Steenbergen, Executive Vice President, Chief Financial Officer; Steve Kemps, Executive Vice President, General Counsel

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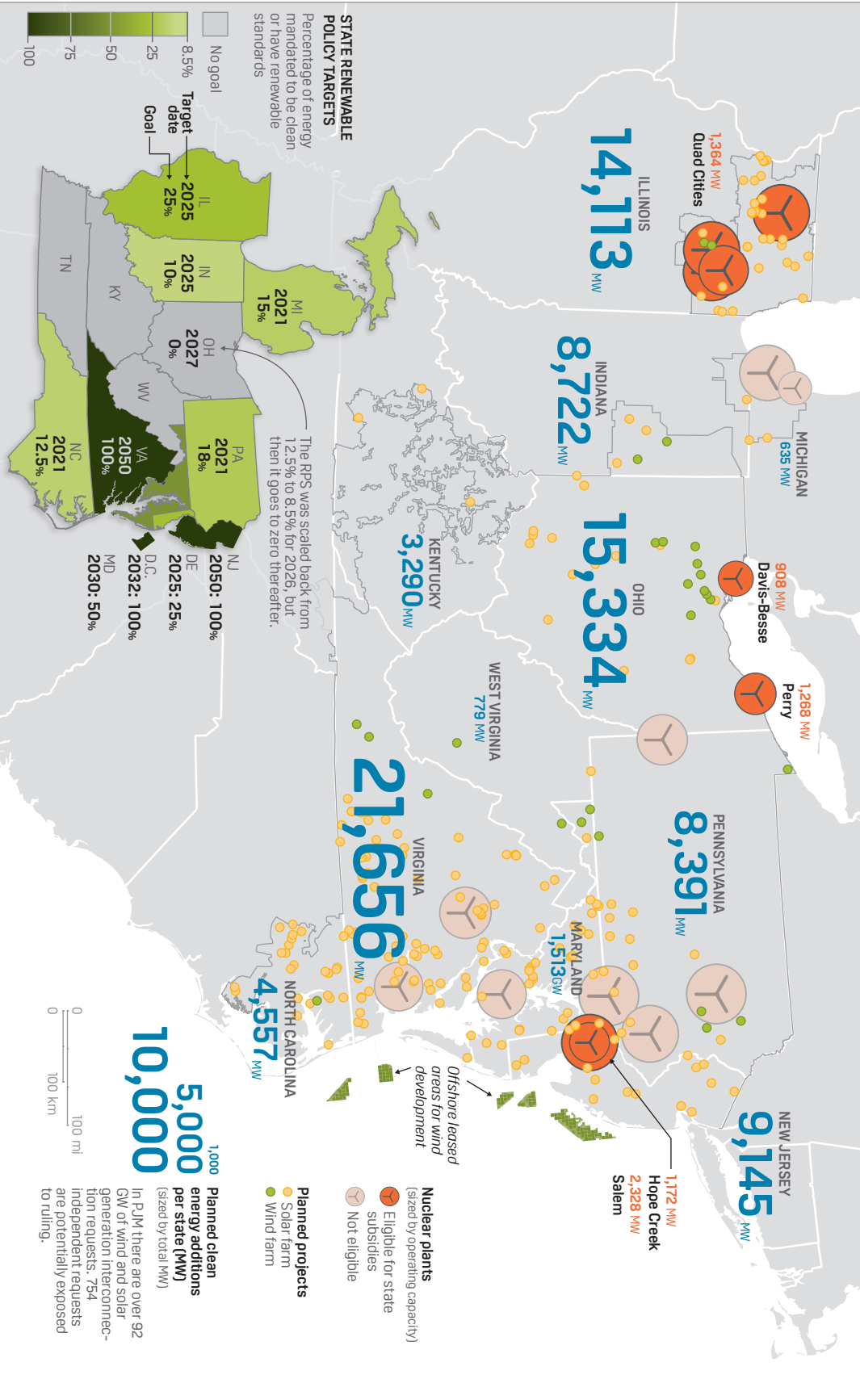
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# PJM MARKETPLACE FACES WIDESPREAD IMPACTS FROM FERCS MOPR ORDER

The Federal Energy Regulatory Commission issued an order December 19 (EL 16-49, EL 18-178) designed to combat the potential price-suppressing effects of subsidized resource participation in PJM Interconnections's capacity market by expanding application of the minimum offer price rule (MOPR) to all new and existing resources in PJM that are eligible to receive state subsidies. Renewable projects close to interconnection are exempt from the MOPR and could clear in the next auction, but there is uncertainty regarding renewable energy project competitiveness longer-term for non-exempt projects. The proceeding continues to unfold and the ultimate impact on state-subsidized resources is still being determined.



Sources: PJM, S&P Global Market Intelligence, S&P Global Platts, PJM Interconnection Queue

new entrants are competitive," Chatterjee said.

But Glick later called that a "mischaracterization," explaining he made that point while asserting MOPRs are generally ineffective because all resource types arguably receive some form of subsidy.

"You can't distinguish between them, which is why you shouldn't go down the MOPR path at all," Glick said.

### 'Stunningly awful'

Glick offered a strong rebuke of the rehearing orders during the meeting, maintaining his position that FERC's actions would dramatically increase the price of capacity and slow PJM's transition to a clean energy economy.

He called FERC's response on rehearing to the December order "stunningly awful" as "it continues to target state clean energy policies and force consumers to pay billions of dollars more for generating capacity that they don't need."

Among his concerns was that FERC failed to consider the costs associated with broadening the application of the MOPR.

Chatterjee later told reporters that Glick's cost estimates were overblown and based on incorrect assumptions.

Glick responded in a statement: "People can quibble over assumptions, but my analysis was one of many that showed costs in the excess of \$1 billion/year."

The clean energy sector expressed dismay with FERC's decision to largely reject rehearing requests, but advocates were encouraged by the acknowledgement that voluntary RECs would not trigger the MOPR.

Despite disappointment with FERC's decision to stay the course, trade groups representing solar and wind power advocated for a swift resumption of PJM's three-year-forward capacity auctions.

Meanwhile, competitive power producers celebrated FERC's orders Thursday as sound policy. "The bottom line is that customers pay the price when certain resources and companies enjoy an unfair market advantage that squeezes out competitors and removes the pressure to innovate, perform efficiently, control costs, and nimbly respond to changing circumstances," Todd Snitchler, president and CEO of the Electric Power Supply Association, said in a statement.

### Court appeals

The rehearing orders clear the way for entities to take their gripes with the MOPR orders to the DC Circuit Court of Appeals.

Protective petitions for review have already been filed by the New

Jersey Divisions of Rate Counsel, the National Rural Electric Cooperative Association and most recently East Kentucky Power Cooperative in light of a separate court case challenging FERC's issuance of tolling orders.

FERC earlier in the week filed motions to dismiss the two earlier proceedings as "incurably premature" since commission action was not yet final as rehearing requests were still pending. "Today's orders render that motion moot and removes outstanding rehearing requests as an obstacle to judicial review," a note from ClearView Energy Partners said.

ClearView added that other entities now have until June 15 to seek appeal. It cast doubt on the likelihood of a stay of the orders being granted by the DC Circuit.

PJM now has 45 days to submit a filing addressing the issues raised in FERC's Thursday orders. Comments on a compliance filing PJM submitted last month are also due May 15.

— *Jasmin Melvin, Zack Hale, S&P Global Market Intelligence*

## Renewables sector could emerge even stronger after pandemic turmoil, consolidation

- Power and gas price recovery needed
- Consolidation expected

US renewable energy market participants said Thursday they remain bullish on the renewable energy industry despite the challenges posed by the coronavirus pandemic, but getting higher returns on investment will rely on an energy price increase.

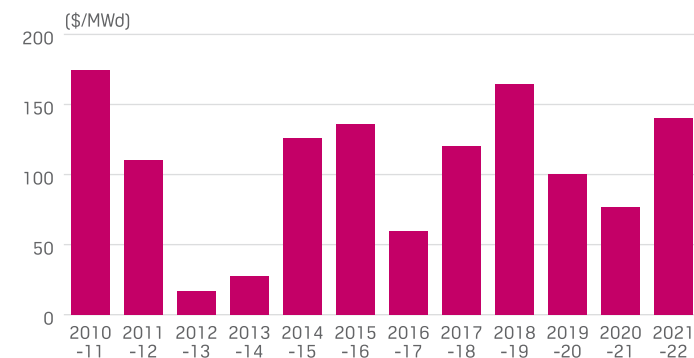
"To get higher returns, power prices need to be higher," Joram Cukierman, managing director of Goldman Sachs commodities, said during a webinar hosted by law firm Bracewell.

"Higher returns require higher power prices at the back end of the curve," Cukierman said.

Long-term pricing in the PJM Interconnection and California Independent System Operator are "pretty stable" ... and "my sense is that fundamentals in markets mean a lot of producers will shut down and prices will go up ... longer term we need higher pricing on natural gas to remain competitive," Yuri Horwitz, CEO of solar energy firm Sol Systems, said.

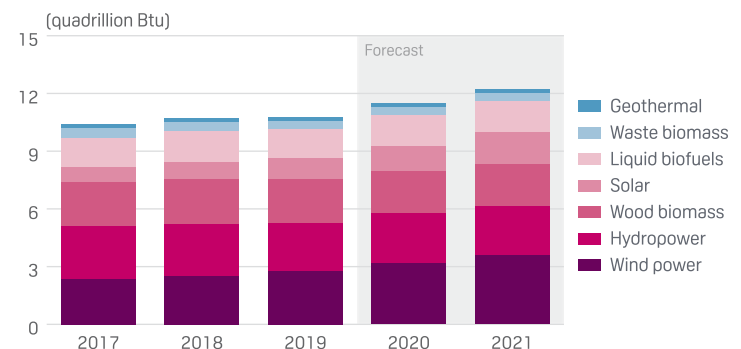
Asked about project level impacts from the coronavirus pandemic,

### PJM BASE RESIDUAL AUCTION RESOURCE CLEARING PRICES (RTO)



Source: PJM

### US RENEWABLE ENERGY SUPPLY



Source: EIA's Short-Term Energy Outlook

the panelists said early-stage projects are more likely to face delays and other challenges than more advanced projects.

Cukierman said they have seven or eight projects about to reach commercial operational dates that have not been too severely impacted, but the bigger question is about projects in earlier stages of development where permitting offices might be closed or panels or turbines need to be delivered from overseas.

With regards to receiving equipment, Horwitz said there is some variation but the Chinese supply chain is mostly back on line along with other Asian manufacturing centers. Suppliers of trackers and racks have been nimble in using factories in different countries that are open, but some European manufacturers are being impacted.

### Force majeure

Danielle Garbien, a partner at Bracewell who moderated the discussion, said Bracewell clients so far are saying they can still work subject to some exceptions.

Ricardo Alicea, senior legal counsel at Brookfield Renewables, said to date Brookfield has not had to declare force majeure and has not had suppliers or developers do it, but “the longer this goes on and the more restrictions are put in place, it becomes more likely.”

New York Governor Andrew Cuomo on Thursday extended the state’s stay-at-home order through May 15.

There are multiple factors that can trigger force majeure in contracts, Alicea said, and one of the easier bars to clear is the coronavirus pandemic being something not in reasonable control of the contracting parties.

“We are hearing all sorts of stories about permitting issues,” he said. If you can’t get a permit, you can’t build so that could potentially lead to a force majeure claim.

Another pandemic-related impact is that some developers have recently looked to get out of projects.

“We have seen some early-stage assets go on the block in PJM and Texas and could see more,” Horwitz said. But projects in which investors are betting on long-term cash flows for 10 or 15 years “should be okay,” he said.

“Good projects tend to get built,” Cukierman said. The good projects will go to the developers with the best financial wherewithal that have the best contacts in the market, he said.

Santosh Raikar, managing partner and head of renewables at investment management firm Silverpeak noted that renewable energy businesses rebounded well after the 2008 financial crisis.

There will be winners and losers, and the winners will be ones with new business models, Raikar said. “I believe there will be a lot of adaptation ... renewable energy will come out stronger,” he said.

Cukierman said Goldman is seeing a good amount of corporate buying interest from companies who think commodity prices are low and think they should lock in long-dated hedges for energy.

Asked where the renewable energy industry will be one year from now, the panelists all had positive outlooks.

“There will be big consolidation over the next year ... it will take bigger balance sheets to succeed,” Horwitz said. But he said he’s always been optimistic about the renewable energy industry and ESG mandates from pension funds and others should continue to drive growth.

Alicea sees a lot of work coming for lawyers. “It will be a challenging environment over the next year with some bankruptcies,” but he remains bullish on the renewable energy industry.

— *Jared Anderson*

## Cal-ISO peak demand served by renewables jumps 136% month on month in March

- 23,757 MW: Cal-ISO installed renewable resources
- 10,903 MW: peak demand served by renewables in March
- 179,081 MWh: March curtailments, up 46.5% from 2019

California Independent System Operator had a spike in the amount of peak demand served by renewables in March, jumping 136% on the month, even as installed renewables dipped 0.53%, according to a report from the grid operator.

The ISO had 10,903 MW renewables serve peak demand on March 26, up from a peak of 4,611 MW in February and an 89% spike year on year, according to the report. The record for renewables serving demand stands at 80.3% reached on May 15, 2019 at 2:45 pm, according to the report. The previous record was 78% on April 20, 2019.

Throughout March, peak demand reached 28,419 MW on March 5, down 4.2% month on month, as solar generation peaked at 10,527 MW in March, up 2.5% month on month, and wind generation peaked at 4,125 MW, down 6.1% month on month.

The last renewable record set in the ISO was on July 2, 2019, as solar generation peaked at 11,473 MW, surpassing a record of 11,435 MW set just a day earlier, according to the report.

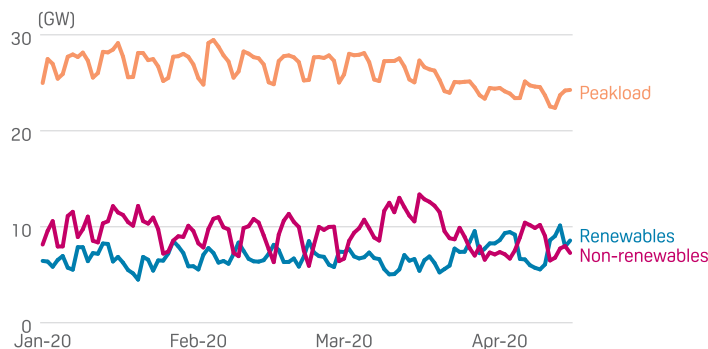
The ISO did not respond to requests for comments by deadline.

### Installed renewables

There are currently 23,757 MW of installed renewable resources across the ISO footprint, a dip of 0.53% month on month but a gain of 5.3% year on year, according to the report. Installed solar slipped 1% month on month in March as installed wind decreased 3.5%, according to the report.

Of all installed renewables, 54.1%, or 12,875 MW, is from solar, an increase of 7.7% year on year. Wind accounted for 29.4% of renewables, or 6,991 MW, up 7.5% year on year. Geothermal made up

### CAL-ISO PEAKLOAD AND RENEWABLES GROWTH YEAR TO DATE



Source: Cal-ISO

7.4% of installed renewables, or 1,773 MW, a jump of 43.7% year on year. Small hydro was 5.3%, or 1,256 MW, a decrease of 29.6% year on year, while biofuels made up 3.6%, or 862 MW, down 9.4% year on year.

**Managing oversupply**

Cal-ISO wind and solar curtailments totaled 179,081 MWh in March, up 14% month on month and an increase of 46.5% year on year, according to the ISO. For comparison, March 2019 curtailments reached 122,225 MWh, an increase of 48% month on month, while April 2019 curtailments totaled 190,070 MW, a jump of 55.5% month on month.

— *Kassia Micek*

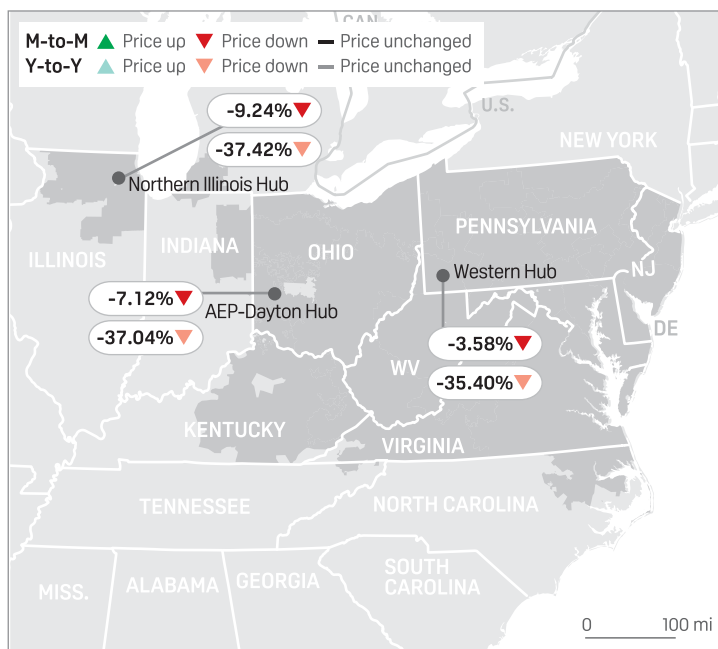
**PJM Tracker: Power prices dip on slowing economy, milder weather, cheaper gas**

- Gas, nuclear, wind shares increase
- Forwards fall with gas futures, weather forecast

Wholesale power prices in the PJM Interconnection dropped both month to month and year on year, as the weakening economy and milder weather sapped energy demand and weakened natural gas prices.

At three geographically dispersed PJM hubs, day-ahead on-peak locational marginal prices averaged in the high teens to low \$20s/MWh, down by more than 35% from the same period of 2019 and down between 3.5% and 9.3% from this February's averages, according to

**PJM DAY-AHEAD POWER PRICE CHANGES**



**DAY-AHEAD ON-PEAK AVERAGE PRICE COMPARISON (\$/MWh)**

Location	Mar-20	Feb-20	Mar-19	MtoM	YtoY
PJM AEP-Dayton Hub	19.63	21.14	31.19	-1.50	-11.55
PJM Northern Illinois Hub	18.14	19.99	29.00	-1.85	-10.85
PJM Western Hub	20.24	20.99	31.33	-0.75	-11.09

Source: S&P Global Platts

S&P Global Platts data.

Peakloads averaged 87.9 GW in March, down from 99.6 GW in February and 98.2 GW last March, according to PJM data.

Population-weighted heating-degree days this March averaged 37.5% less than February and 30.5% less than March 2019, according to CustomWeather data. Population-weighted daily low temperatures averaged 40.3 degrees Fahrenheit in March, up from in February's 31.4 degrees F and last March's 37.7 degrees F.

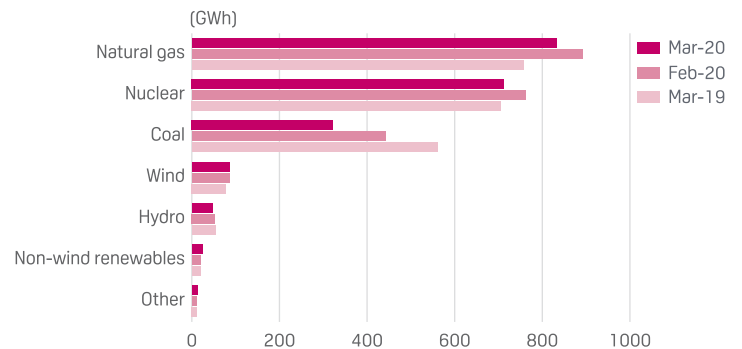
Eleven of the 12 states served at least in part by PJM instituted stay-home orders or advisories in response to the novel coronavirus pandemic between March 20 and March 30, and the last one, Pennsylvania, issued its statewide stay-home order on April 1.

As power demand diminished, so did natural gas prices. At the Texas Eastern M3 pricing point, spot gas averaged \$1.463/MMBtu in March, down from \$1.764/MMBtu in February and \$2.871/MMBtu last March.

**Generation mix**

With such inexpensive fuel, gas-fired generation easily expanded its leading share of the PJM average daily generation mix to almost 41%, up from 39.4% this February and 34.6% in March 2019.

**PJM AVERAGE DAILY GENERATION MIX**



Source: PJM Interconnection

Nuclear generation also expanded its share to 35% in March, up from 33.6% in February and 32.3% in March 2019.

Wind's share increased to 4.2% of supply in March, up from 3.8% in February and 3.6% in March 2019.

In contrast, coal-fired generation's share continued to diminish, falling to 15.8% of the average daily generation mix in March, down from 19.5% in February and 25.6% in March 2019.

**Forward markets**

PJM's forward packages followed a pattern of weakness similar to day-ahead markets, reflecting natural gas futures and mild weather forecasts.

PJM West April on-peak packages averaged \$22.28/MWh in March, down from \$26.13/MWh in February and down from \$34.86/MWh for the comparable package in March 2019.

PJM West May on-peak averaged \$22.60/MWh in March, down from \$26.47/MWh in February and down from \$35.86/MWh for the comparable package in March 2019.

Tetco M3 April gas averaged \$1.461/MMBtu in March, down from

\$1.656/MMBtu in February and down from \$2.627/MMBtu for the comparable package in March 2019.

Tetco M3 May gas averaged \$1.467/MMBtu in March, down from \$1.634/MMBtu in February and down from \$2.552/MMBtu for the comparable package in March 2019.

The National Weather Service forecast for April, issued March 31, indicates enhanced chances – between 40% and 50% – for above-normal temperatures for all of the PJM footprint. The forecast for April, May and June, issued March 19, featured even stronger chances – between 40% and 60% – for above-normal temperatures for the PJM region as a whole.

— [Mark Watson](#)

## ISO-NE proposes long-term fix for region's reliability, fuel-supply problems

- Three new day-ahead ancillary reserve markets proposed
- ISO-NE asked for approval before winter season

The ISO New England on April 15 asked the Federal Energy Regulatory Commission to approve a long-term proposal to address the region's electric reliability concerns driven by the lack of fuel security and a changing generation resource mix (EL18-182 et al.).

Under the proposal, the ISO-NE would establish three new day-ahead ancillary services reserve products. That proposal received the support of just 40% of the ISO-NE's stakeholders, however. An alternative proposal, attached to the ISO-NE's filing, was developed by states in the region, makes 3 changes to ISO-NE's proposal and is supported by 61% of the grid operator's stakeholders.

The dueling proposals are aimed at offering a long-term market-based solution to reliability issues that have cropped up ever since New England began becoming more reliant on natural gas as a generation fuel source. According to the filing, gas-fired generators provided 49% of New England's electric generation in 2018, up from just 15% in 2000.

Meanwhile, coal- and oil-fired generation each provided just 1% of the region's generation in 2018, down from 18% and 22%, respectively, in 2000. And solar generation capacity has grown from just 40 MW in 2010 to 2,900 MW in 2018 and is projected to reach 6,700 MW in 2028. And as of April 1, 2019, proposed solar photovoltaic and wind generating facilities comprised more than 76% of the nameplate capacity of proposed new resources in the ISO-NE's interconnection queue.

The ISO-NE explained in its filing that in the past, it had little problem meeting demand if a large generator unexpectedly went offline or demand spiked because the regional generation fleet had large, ready stockpiles of fuel in the form of on-site coal supplies and tanks full of oil.

With the shift to a greater dependence on natural gas-fired plants over the past 20 years, however, most of New England's generation fleet became reliant on "just-in-time" gas delivered through a constrained pipeline system. And in the winter under extremely cold conditions, those generators must compete for scarce pipeline capacity with residential and commercial consumers who use gas to heat their homes and businesses.

Increased use of renewable generation also can cause similar

problems because those resources "often have their own 'just-in-time' fuel in the form of the sun and the wind," the filing added.

"Given the evolving power system, the current approach, which assumes there will be sufficient energy available each day in real-time from resources that have no day-ahead commitment, no longer works," the ISO-NE asserted. "In other words, the region has an energy security problem."

More specifically, the grid operator said it is too dependent on "free" resources — those without day-ahead schedules that it can depend upon to provide energy on demand — that no longer are free. That is because resources now need extra compensation to invest in the additional "energy supply arrangements and the technologies that ensure these capabilities remain available to the power system each day."

To do this, the ISO-NE said it must create three new day-ahead ancillary reserve markets that will provide that compensation. The ISO-NE said an independent analysis of the proposal found that the cost to consumers of these new markets will be modest.

The first new day-ahead market, for energy imbalance reserve, would provide a day-ahead means to ensure energy will be available to meet the forecasted load for the next day when that forecast exceeds the total physical supply cleared in the day-ahead energy market.

The second new market, for contingency reserve, would secure fast-start and ramping capability to compensate for sudden, unanticipated generation losses during the operating day. The third market, for replacement energy, would provide a product that would allow the system to handle an unanticipated loss of supply or increase in demand that persists for a significant period of time during the operating day.

Finally, the grid operator proposed to do away with several interim nonmarket fixes for its energy security issues that focused on shoring-up key facilities' fuel stocks to alleviate near-term fuel security risks. The proposed new market design "can only function if it can competitively price the reliability need without interference from out-of-market measures that provide the same services under a non-market price," the ISO-NE maintained.

The ISO-NE said the proposal supported by some New England states amends its proposal in three discrete and highly technical ways but otherwise adopts the ISO-NE's design. But the grid operator insisted that its proposal is superior and the alternative should not be considered on equal terms pursuant to FERC's jump ball provision, which allows the agency to choose between two proposals.

The ISO-NE asked FERC to approve the proposed changes no later than November 1 so market participants can have certainty before the grid operator runs its next forward capacity auction in February 2021.

— [Glen Boshart, S&P Global Market Intelligence](#)

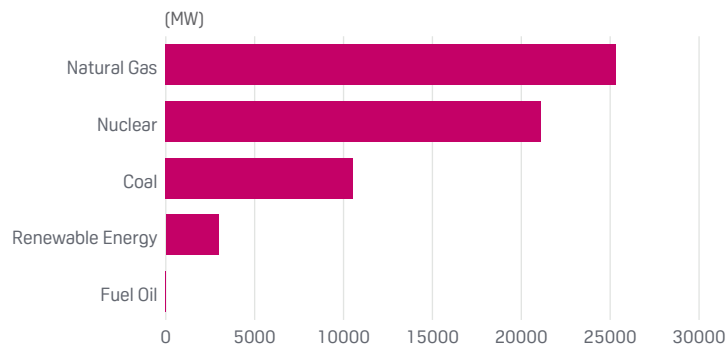
## Xcel says it expects 168-mile Hobbs to Lubbock power line to be completed in June

- Line to move power from Texas to New Mexico
- Xcel works to complete 522-MW Sagamore wind farm
- 1,920 shipments needed over six months

Xcel Energy said Thursday it expects its 168-mile, 345-kV transmission line between Hobbs, New Mexico, and Lubbock, Texas, to be completed in June, and that the roughly \$400 million line will allow the

## OUTAGES

### US MEGAWATTS OFFLINE BY FUEL TYPE



Source: IIR Energy  
For more information please contact IIR Energy at [iirteam@iirenergy.com](mailto:iirteam@iirenergy.com) or at their website, [www.iirenergy.com](http://www.iirenergy.com)

### NORTH AMERICAN DAILY GENERATION OUTAGES BY REGION, APR 16

ISO Region	MW OFF	NERC Region	MW OFF
AESO	0	ERCOT	5,561
CAISO	4,662	FRCC	3,180
ERCOT	5,561	MRO	1,820
ISONE	1,760	NPCC	6,771
MISO	9,598	RFC ECAR	5,930
NYISO	1,521	RFC MAAC	4,866
Ontario IESO	3,490	RFC MAIN	1,836
PJM	9,642	SERC	17,183
SPP	2,775	SPP	2,731
		WECC	10,039
		US TOTAL	59,916

Source: IIR Energy

For more information please contact IIR Energy at [iirteam@iirenergy.com](mailto:iirteam@iirenergy.com) or at their website, [www.iirenergy.com](http://www.iirenergy.com)

company to deliver “clean energy at a lower customer cost.”

The \$400 million project will be completed in June when the final link is put into service between Yoakum Substation southeast of Plains, Texas, and TUCO Substation north of Abernathy in Hale County, Texas.

The company said: “Lower fuel costs have resulted in lower total bills over the last three years, thanks to efficiencies built into the regional grid and pathways to import less expensive energy from the wider power market.”

A company spokesman noted on Thursday that the line will help Xcel move power from the Texas market into New Mexico.

Xcel has two natural gas-fired facilities located near Hobbs — the 466-MW Cunningham facility, and the 173 MW Maddox facility. It also has three long-term power purchase agreements with combined-cycle facilities in the region that have combined capacity of 604 MW.

In Texas, Xcel has two coal-fired facilities with 2,085 MW of capacity, three gas-fired facilities with 1,690 MW of capacity and a new 478 MW wind facility. Its total Texas capacity it said on Thursday is 4,253 MW.

It said that it has invested in over 1,300 miles of new transmission lines since 2011 in New Mexico, Texas and Oklahoma.

“Another 200 additional miles of transmission line is planned to be

### GENERATION UNIT OUTAGE REPORT, APR 15

Plant/Operator	Cap	Fuel	State	Status	Return	Shut
<b>Northeast</b>						
BruceA-G4/Bruce	780	n	Ont.	MO	Unk	02/18/20
BruceB-G6/Bruce	872	n	Ont.	MO	Unk	01/21/20
Darlington-G2/OPG	887	n	Ont.	MO	Unk	02/19/20
Lennox-G2/ OPG	525	g	Ont.	MO	Unk	02/19/20
Pickering-1/OPG	516	n	Ont.	MO	Unk	01/10/20
Seabrook/Nextera	1302	n	NH	MO	Unk	04/01/20
TBayBow/RFP	116	bio	Ont.	MO	Unk	04/15/20
<b>West</b>						
El Segundo/SCE	263	g	Calif.	PMO	Unk	04/15/20
Gateway/PG&E	585	g	Calif.	PMO	Unk	03/31/20
Helms Pump-2/PG&E	407	h	Calif.	MO	Unk	04/06/20
High Desert/SCE	830	g	Calif.	PMO	Unk	03/31/20
Inland Empire-1/SCE	376	g	Calif.	PMO	Unk	01/24/20
Lodi/NCPA	303	g	Calif.	MO	Unk	01/24/20
Ormond Beach-2/SCE	750	g	Calif.	PMO	Unk	03/24/20
Otay Mesa/SDGE	604	g	Calif.	PMO	Unk	04/15/20
Palo Verde-2/APS	1314	n	Ariz.	PMO	Unk	04/06/20

#### Southeast & Central

Arkansas 2/ Entergy	930	n	Ark.	MO	Unk	03/23/20
Fermi 2/ DTE	1100	n	Mich.	MO	Unk	03/23/20
Grand Gulf/Entergy	1443	n	Miss.	MO	Unk	03/06/20
Hatch 2/ SNOG	883	n	GA	MO	Unk	04/15/20
McGuire 2/ Duke	1156	n	N.C.	MO	Unk	03/23/20
Oconee 3/Duke	934	n	SC	MO	Unk	04/13/20
Saint Lucie-2	1078	n	Fl.	MO	Unk	02/18/20
Sequoyah 2/TVA	1155	n	Ten.	MO	Unk	04/13/20
South Texas 1/ STP	1280	n	TX.	MO	Unk	03/16/20
Summer/SCE&G	1008	N	SC.	MO	Unk	04/13/20
Turkey Pt.3/FP&L	823	n	Fl.	MO	Unk	03/30/20

#### PJM & MISO

Beaver 2/Entergy	879	n	PA.	MO	Unk	04/13/20
Gina/Constellation	568	n	NY	MO	Unk	04/06/20
N. Anna 2/Dominion	903	n	Va.	MO	Unk	04/14/20
Salem 2/PSEG	1156	n	NJ	MO	Unk	04/13/20
Susquehanna 1/Talen	1330	n	PA	MO	Unk	03/30/20

Daily generation outage references: MO=unplanned maintenance outage; RF=refueling outage; PMO=planned maintenance outage; Unk=unknown; OA=offline/available. Fuels: Nuclear=n; Coal=c; Natural gas=g; Hydro=h; Wind=w; Solar=s

Sources: Generation owners, public information and other market sources.

constructed through 2021. Since 2011, over 75 new substations have been built or upgraded. Another 11 substations will be built or upgraded through 2021. The transmission expansion represents more than \$3 billion in investment,” the company said.

Powering the southeast New Mexico area around Hobbs “will require 300 miles of new distribution and 100 miles of transmission line to be built this year,” the company said.

Currently, work is underway on a \$65 million, 345-kV transmission line stretching 34 miles in lower Eddy County, New Mexico. The Eddy-Kiowa transmission line is expected to be complete in November 2020.

### Trains and trucks

Xcel also has 452 MW of wind energy resources located in New Mexico, with its largest wind facility, the 522-MW Sagamore Wind Project under construction in Roosevelt County near the border with Texas.

Xcel said its crews have completed more than 150 of the 240 wind turbine foundations thus far, and that wind turbine components are

currently arriving by train to Hobbs,

Base sections are arriving first, the company said, followed by generators and blades. Xcel said it will require 1,920 shipments to deliver all the components over a six-month period, and trucks will have to travel 100 miles to deliver the equipment to the job site near Dora, New Mexico.

Sagamore will be Xcel's first company-owned wind farm in New Mexico. The Hale Wind Project in Texas was its first company-owned facility in that state.

Xcel Energy Power Plants—Texas and New Mexico

Name Location Fuel Capacity MW

Tolk Tx Coal 1,067

Harrington Tx Coal 1,018

Jones Tx Nat gas 822

Nichols Tx Nat Gas 457

Plant X Tx Nat Gas 411

Hale Tx Wind 478

Cunningham NM Nat Gas 466

Maddox NM Nat Gas 173

Source: Xcel Energy

— [Jeffrey Ryser](#)

## S&P: US, global economies to take longer, more severe hit than previously expected

- Global GDP for this year drops to 2.4% contraction
- US unemployment rate forecast to peak at 19% in May

S&P Global Ratings further revised its GDP forecasts for the US and the global economy in 2020, saying the fallout from the coronavirus pandemic has become "longer and more intense" than previously estimated as countries extend restrictive measures imposed to contain the health crisis.

The rating agency flipped its global GDP estimate for this year to a 2.4% contraction from the 0.4% growth projected in March. The forecast for the U.S. was revised to a full-year GDP slump of 5.2% from a 1.3% contraction.

"We now see the toll on GDP will be far more severe than we once thought," S&P Global Ratings said in its forecast for the U.S., which also cited other drags to growth such as Boeing Co.'s suspension of its 737 MAX aircraft production and the recent oil price plunge.

S&P Global Ratings expects U.S. real annualized GDP to plunge 7.6% in the first quarter and 35% in the second quarter. The unemployment rate is forecast to peak in May at 19%, which would be the biggest jump in records going back to 1948.

"While the recovery will kick into gear during the second half of the year, it won't be enough to offset overall economic losses caused by COVID-19," S&P Global Ratings said.

The GDP forecasts for the eurozone and the U.K. were also sharply downgraded, showing contractions of 7.3% and 6.5%, respectively, after earlier projections of a 2.0% economic decline. The growth forecast for China was lowered to 1.2% from 2.9%.

The forecast revisions reflect the impact of extended lockdown measures or social distancing restrictions as well as the spillover of

the slowdown in economic activity to trade, financial and health sectors, according to S&P Global Ratings.

"The gradual lifting of restrictions implies a more gradual recovery," the rating agency said.

S&P Global Ratings expects the U.S. and global economies to bounce back in 2021 with full-year growth rates of 6.2% and 5.9%, respectively. The eurozone and U.K. economies would expand by 5.6% and 6.0%, respectively, while China's GDP growth is seen to accelerate to 7.4% in 2021.

S&P Global Ratings said the length and pace of economic recovery will depend on health and economic policies, the response of consumers and businesses, labor market conditions, and the state of small and medium enterprises.

Smaller businesses are expected to take a larger hit from the pandemic compared to larger companies, and services would suffer more than manufacturing, S&P Global Ratings said.

— [Emmanuel Louis Bacani, S&P Global Market Intelligence](#)

## California PUC hears from citizens voicing concerns over PG&E reorganization plan

- PG&E filed for Chapter 11 bankruptcy January 29, 2019
- Hearing scheduled for May 27 on PG&E's reorganization plan
- PG&E on schedule to meet June 30 statutory deadline

California Public Utility Commissioners heard from numerous people voicing concern over the Pacific Gas and Electric reorganization plan that would bring the company out of bankruptcy.

The start of Thursday's PUC meeting included the better part of an hour of public comments, most of which were citizens and organizations speaking against PG&E's plan of reorganization and urged the commission not to approve the plan, which was not on the day's agenda.

"We in California want to wash our hands of PG&E," one commenter said.

"I don't want to pay for the failures of PG&E," another commenter said.

One commenter called the plan "unacceptable" and said it does nothing to address the underlying problems at PG&E.

The goal of the reorganization plan is "to fairly compensate wildfire victims, other prepetition creditors and other stakeholders; prioritize the interests of our customers and communities; and meet PG&E's legal obligations," according to PG&E. The company added that the plan will allow it to emerge from Chapter 11 financially sound and meet California's clean energy goals.

However, those addressing the commission disagreed.

"This plan does nothing to advance the state's climate goals," one commenter said.

The state has a renewable portfolio standard of 44% by 2024, 52% by 2027, and 60% by 2030, and a goal of 100% clean energy by 2045.

### Plan details

"Throughout this process, our focus has remained on getting victims paid fairly and as soon as possible, continuing to deliver safe and reliable electric and gas service, and implementing needed

changes across our business to improve our operations for the long term,” according to PG&E.

PG&E has reached agreements with all major wildfire claimants including wildfire victims, cities, counties and other public entities, insurance companies and bondholders, according to PG&E.

“The settlement with individual wildfire victims has the support of the Tort Claimants Committee that represents and has fiduciary duties to fire victims, as well as the majority of law firms representing individuals holding approximately 70% in number of the prepetition fire claims filed against PG&E,” according to PG&E.

The Governor’s office filed a statement March 20 in the Bankruptcy Court in support of PG&E’s plan and its compliance with Assembly Bill 1054. The Governor’s Bankruptcy Court filing states that, assuming the Bankruptcy Court and CPUC approve PG&E’s commitments, PG&E’s Plan of Reorganization “will, in the Governor’s judgment, be compliant with AB 1054,” according to PG&E.

### Background

Both PG&E the utility and PG&E Corporation, the holding company, filed for Chapter 11 bankruptcy January 29, 2019.

PG&E stated in an application filed November 4, 2019 that it would be required to issue significant amounts of debt, approximately \$27.35 billion, as part of its exit financing for its bankruptcy. Numerous parties filed responses and protests to that filing.

PG&E and PG&E Corporation entered into a restructuring support agreement January 22 with a group of investment funds that hold senior notes issued by PG&E. The RSA led PG&E to file on January 27 an amendment to its application that reduced the long-term debt to \$5.825 billion.

As a result of the RSA, PG&E expects to reinstate about \$9.575 billion in existing debt and to issue roughly \$11.95 billion in new long-term debt at agreed interest rates, which does not need to be hedged.

The Bankruptcy Court is scheduled to hold a hearing May 27 on the confirmation of PG&E’s reorganization plan, following a vote on PG&E’s plan by relevant parties that will take place in the coming weeks, PG&E said. PG&E remains on track to have its Plan of Reorganization confirmed by the statutory deadline of June 30, 2020.

— *Kassia Micek*

### SUBSCRIBER NOTES

#### Platts launches California carbon price assessments

S&P Global Platts is launching carbon price assessments, reflecting the value of traded carbon instruments in California, beginning April 16, 2020.

These weekly assessments of current-year Regional Greenhouse Gas Initiative (RGGI), California Carbon Allowance (CCA) and California Offset prices will be published on Thursdays, or the prior business day if Thursday is a public holiday. The price assessments aim to reflect the prevailing value, in \$/ton, for carbon prices on the day of publication at 2:30 pm ET. The assessment will be published in Megawatt Daily and Energy Trader.

Symbol Description

ARECB04 Carbon California Carbon Allowance Weekly

ARECC04 Carbon California Offset Weekly

ARECA04 Carbon RGGI Weekly

Additionally, Platts will also begin publishing the Renewable Energy Certificate (REC) assessment in Energy Trader, beginning April 16, 2020, and every successive Thursday, or the prior business day if Thursday is a public holiday.

Please send any comments to the above to [electricityprice@spglobal.com](mailto:electricityprice@spglobal.com) and [pricergroup@spglobal.com](mailto:pricergroup@spglobal.com). For written comments, please provide a clear indication if comments are not intended for publication by Platts for public viewing. Platts will consider all comments received and will make comments not marked as confidential available upon request.

**EMISSIONS MARKETS****Carbon markets trend higher, extending previous week's momentum**

- RGGI V20 gains 12 cents to \$5.75/mt
- CCA V20 rises by 75 cents

Intercontinental Exchange trading activity for the California Carbon Allowance contracts was in a tighter range on the week between \$14.35/mt to \$16.90/mt for the trading week ended April 15.

CCA Vintage 20 for December 2020 delivery was assessed at \$15.50/mt, up 75 cents from the previous week.

The CCA V20 December strip had over 230 trades on ICE for a total of more than 6,000 contracts.

Regional Greenhouse Gas Initiative prices increased by 12 cents to be assessed at \$5.75 while the California offset increased 65 cents to be assessed at \$13.25, on par with the most recent ICE settlement.

— *Isabel Milton*

**REC MARKETS****Massachusetts, Connecticut V19 RECs continue on downward slump**

- Massachusetts SREC V19 up \$1.75 on week
- Ohio SREC V19 rolls off the board

Massachusetts V19 RECs and Connecticut V19 RECs continued their downward momentum, falling about \$3 to price in the low \$20s/REC.

The Connecticut V19 REC traded in a wide range on ICE, from the low \$20s/REC to the low \$30s/REC, totaling at over 500 contracts.

Elsewhere in the Northeast, Maryland V20 and Pennsylvania V20 each gained 25 cents on the week to price at \$7.75/REC. New Jersey continued last week's upward momentum, gaining another 25 cents to \$8/REC.

The Ohio V19 rolled off the board as S&P Global Platts assessed the V20 for the first time at \$6.75/REC.

In Solar Renewable Energy Certificates, Massachusetts V20 gained the most on the week, rising \$1.75 to be assessed at \$388.25/SREC. Both Pennsylvania and New Jersey V20 remained flat on the week at \$24/SREC and \$225.50/SREC, respectively.

The Ohio SREC V19 rolled off the board on April 15, leading Platts to assess the V20, which priced lower than the V19 contract at \$5.25/SREC.

Any Technology RECs, Wind and Texas Voluntary V20 RECs remained flat from previous week.

— *Isabel Milton*

**EMISSIONS MARKETS APR 16 (\$/ton)**

	Low	High	Close
RGGI	5.75	5.75	5.75
California Carbon Allowance	15.50	15.50	15.50
California Offset	13.25	13.25	13.25

**RGGI CARBON ALLOWANCE FUTURES, APR 15 (\$/allowance)**

ICE	Settlement	Volume
Dec20 V20	5.75	0
Dec21 V20	5.93	0
Dec22 V20	6.11	0
Dec20 V21	5.75	0
Dec21 V21	5.93	0
Dec22 V21	6.11	0
Dec20 V22	5.75	0
Dec21 V22	5.93	0
Dec22 V22	6.11	0
Dec20 V23	5.75	0
Dec21 V23	5.93	0
Dec22 V23	6.11	0

The Regional Greenhouse Gas Initiative is a carbon cap-and-trade program for power generators in nine Northeast and Mid-Atlantic US states. One RGGI allowance is equivalent to one short ton of CO<sub>2</sub>. The volume listed is the number of futures contracts traded. Each futures contract represents 1,000 RGGI allowances.

**RENEWABLE ENERGY CERTIFICATE MARKETS APR 16 (\$/MWh)**

	Low	High	Mid
<b>Class I/Tier I RECs*</b>			
Connecticut	22.50	22.50	22.500
Maryland	7.75	7.75	7.750
Massachusetts	22.25	22.25	22.250
New Jersey	8.00	8.00	8.000
Ohio	6.75	6.75	6.750
Pennsylvania	7.75	7.75	7.750
Texas	0.75	0.75	0.750
<b>Solar RECs*</b>			
Maryland	71.75	71.75	71.750
Massachusetts	388.25	388.25	388.250
New Jersey	225.50	225.50	225.500
Ohio	5.25	5.25	5.250
Pennsylvania	24.00	24.00	24.000
<b>California RPS*</b>			
California Bundled REC (Bucket 1)	15.50	15.50	15.500
California Bundled REC (Bucket 2)	11.00	11.00	11.000
California Tradable REC (Bucket 3)	2.50	2.50	2.500
<b>Voluntary RECs*</b>			
National voluntary, any technology	0.84	0.84	0.840
National voluntary, wind	0.85	0.85	0.850

\*Prices are for the value of the environment attribute of the renewable energy certificate only and do not include energy. Bundled transactions are normalized by subtracting the market price of electricity.

## HYDROGEN

## NORTH AMERICA HYDROGEN ASSESSMENTS, APRIL 15\*

Production Pathway	Excluding Capex		Including Capex	
	\$/kg	Change	\$/kg	Change
<b>Alberta (C\$/kg)</b>				
SMR w/o CCS	0.33	-0.01	1.27	-0.01
Alkaline Electrolysis	1.72	+0.19	2.43	+0.19
PEM Electrolysis	1.93	+0.21	2.84	+0.21
<b>Appalachia</b>				
SMR w/o CCS	0.25	-0.01	1.24	-0.01
Alkaline Electrolysis	0.98	-0.06	1.64	-0.06
PEM Electrolysis	1.10	-0.06	1.94	-0.06
<b>Gulf Coast</b>				
SMR w/o CCS	0.27	-0.01	1.11	-0.01
Alkaline Electrolysis	0.95	-0.09	1.57	-0.09
PEM Electrolysis	1.06	-0.10	1.85	-0.10
<b>Midcontinent</b>				
SMR w/o CCS	0.21	-0.02	1.10	-0.02
Alkaline Electrolysis	0.65	-0.42	1.29	-0.42
PEM Electrolysis	0.73	-0.47	1.54	-0.47
<b>Northeast</b>				
SMR w/o CCS	0.29	-0.01	1.35	-0.01
Alkaline Electrolysis	0.91	+0.17	1.58	+0.17
PEM Electrolysis	1.02	+0.19	1.88	+0.19
<b>Northern California</b>				
SMR w/o CCS	0.54	0.00	1.76	0.00
Alkaline Electrolysis	1.10	-0.08	1.83	-0.08
PEM Electrolysis	1.23	-0.10	2.18	-0.10
<b>Northwest</b>				
SMR w/o CCS	0.25	0.00	1.29	-0.03
Alkaline Electrolysis	0.83	-0.04	1.50	-0.04
PEM Electrolysis	0.94	-0.04	1.79	-0.04
<b>Rockies</b>				
SMR w/o CCS	0.23	0.00	1.16	0.00
Alkaline Electrolysis	0.88	-0.03	1.53	-0.03
PEM Electrolysis	0.99	-0.03	1.82	-0.03
<b>Southeast</b>				
SMR w/o CCS	0.27	-0.01	1.14	-0.01
Alkaline Electrolysis	0.88	-0.02	1.52	-0.02
PEM Electrolysis	0.99	-0.01	1.80	-0.01
<b>Southern California</b>				
SMR w/o CCS	0.40	-0.01	1.57	-0.01
Alkaline Electrolysis	0.81	-0.15	1.53	-0.15
PEM Electrolysis	0.91	-0.16	1.83	-0.16
<b>Upper Midwest</b>				
SMR w/o CCS	0.28	-0.01	1.23	-0.01
Alkaline Electrolysis	1.17	+0.06	1.84	+0.06
PEM Electrolysis	1.32	+0.07	2.18	+0.07

\*Assessed previous day

## NETHERLANDS HYDROGEN ASSESSMENTS, APRIL 15

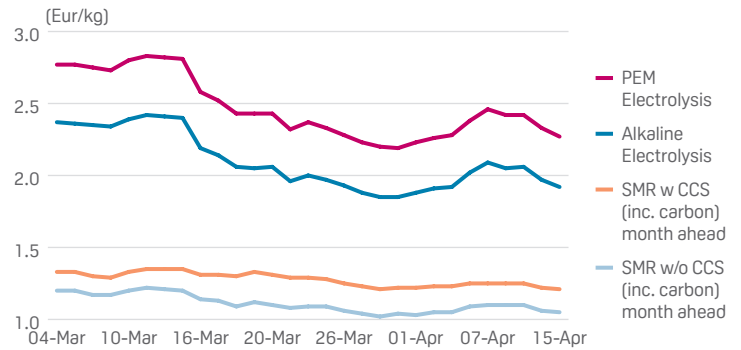
Production Pathway	Eur/kg	Change	Eur/MWh	Change
SMR w/o CCS	0.3698	-0.0084	12.3254	-0.2800
SMR w/o CCS (inc. Capex)	0.8533	-0.0066	28.4405	-0.2200
SMR w/o CCS (inc. Carbon)	0.5651	-0.0143	18.8348	-0.4766
SMR w/o CCS (inc. Capex & Carbon)	1.0486	-0.0124	34.9498	-0.4133
SMR w CCS	0.4052	-0.0091	13.5053	-0.3033
SMR w CCS (inc. Capex)	1.1930	-0.0061	39.7627	-0.2033
SMR w CCS (inc. Carbon)	0.4268	-0.0098	14.2252	-0.3267
SMR w CCS (inc. Capex & Carbon)	1.2146	-0.0068	40.4826	-0.2267
Alkaline Electrolysis	1.1482	-0.0600	34.4494	-1.8002
Alkaline Electrolysis (inc. Capex)	1.9173	-0.0571	57.5248	-1.7131
PEM Electrolysis	1.2833	-0.0672	38.5029	-2.0162
PEM Electrolysis (inc. Capex)	2.2694	-0.0634	68.0888	-1.9022

## JAPAN HYDROGEN ASSESSMENTS, APRIL 15\*

Production Pathway	Excluding Capex		Including Capex	
	Yen/kg	Change	Yen/kg	Change
SMR w/o CCS	56.07	-1.08	222.93	-1.08
Alkaline Electrolysis	272.84	+8.20	395.16	+8.20
PEM Electrolysis	305.77	+9.19	462.59	+9.19

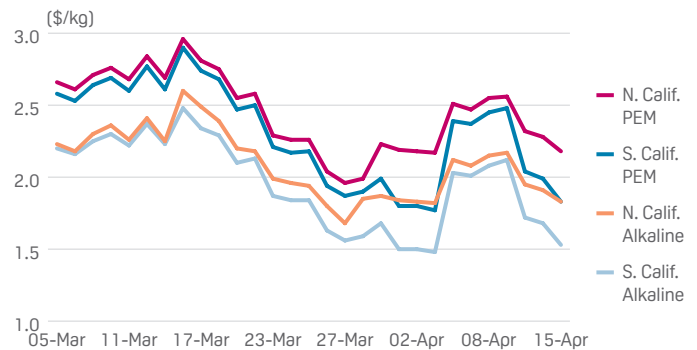
\*Assessed previous day

## NETHERLANDS HYDROGEN (INCLUDING CAPEX)



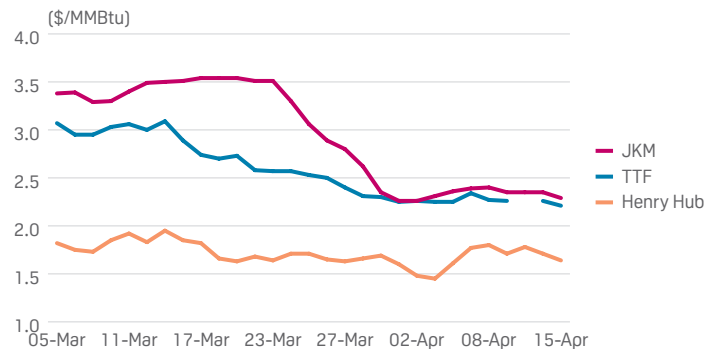
Source: S&amp;P Global Platts

## CALIFORNIA ELECTROLYSIS (INCLUDING CAPEX)



Source: S&amp;P Global Platts

## NATURAL GAS/LNG



Source: S&amp;P Global Platts

## ASSESSMENT RATIONALE

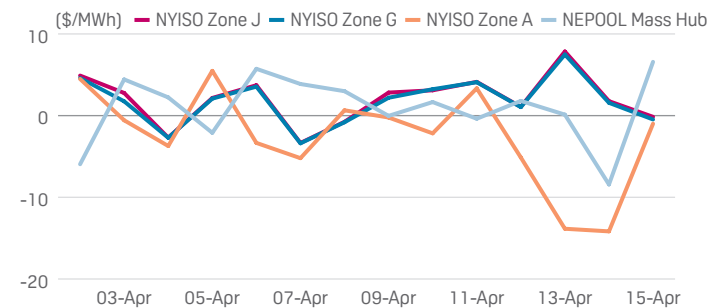
The daily and month ahead hydrogen assessments are valuations that incorporate fixed capital and operating costs and variable natural gas, electricity, and carbon prices. Details on hydrogen methodology can be found at <https://www.spglobal.com/platts/en/our-methodology/methodology-specifications/electric-power/hydrogen-methodology>

**NORTHEAST POWER MARKETS**

**NORTHEAST DAY AHEAD POWER PRICES (\$/MWh)**

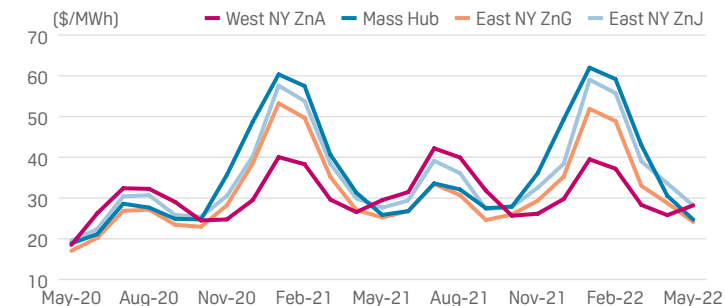
Hub/Index	Symbol	17-Apr	Marginal heat rate	Spark spread		Price change		Prior 7-day Average	Month Min	Month Max	Yearly change			
				@7K	@12K	Chg	% Chg				Apr-20	Apr-19	Chg	% Chg
<b>On-Peak</b>														
ISONE Internal Hub	IINIM00	16.66	10350	5.39	-2.66	-0.90	-5.1	17.55	14.67	25.53	19.25	28.78	-9.53	-33.1
ISONE NE Mass-Boston	IINN000	17.13	10640	5.86	-2.19	-0.77	-4.3	17.86	14.94	26.10	19.60	28.84	-9.24	-32.0
ISONE Connecticut	IINC000	15.82	10371	5.14	-2.48	-1.09	-6.4	16.99	14.20	24.49	18.49	28.70	-10.21	-35.6
NYISO Zone G	INYHM00	15.51	10173	4.84	-2.79	-0.66	-4.1	15.72	13.18	17.49	15.67	28.25	-12.58	-44.5
NYISO Zone J	INYNM00	15.81	11214	5.94	-1.11	-0.68	-4.1	15.96	13.34	17.81	15.93	31.87	-15.94	-50.0
NYISO Zone A	INYVM00	15.19	10623	5.18	-1.97	3.22	26.9	10.34	6.74	15.71	12.14	26.26	-14.12	-53.8
NYISO Zone F	INYCM00	15.59	11054	5.72	-1.33	-1.69	-9.8	17.30	13.76	21.19	16.42	28.00	-11.58	-41.4
<b>Off-Peak</b>														
ISONE Internal Hub	IINIP00	14.77	9172	3.50	-4.55	-2.30	-13.5	14.79	11.56	17.75	15.35	23.35	-8.00	-34.3
ISONE NE Mass-Boston	IINNP00	15.02	9327	3.75	-4.30	-2.29	-13.2	14.97	11.67	17.97	15.56	23.41	-7.85	-33.5
ISONE Connecticut	IINCP00	14.25	9344	3.57	-4.05	-2.18	-13.3	14.36	11.30	17.21	14.84	23.15	-8.31	-35.9
NYISO Zone G	INYHP00	14.25	9341	3.57	-4.06	-0.45	-3.1	13.24	11.53	14.70	12.92	21.33	-8.41	-39.4
NYISO NYC Zone	INYNP00	14.52	10294	4.65	-2.41	-0.46	-3.1	13.44	11.69	14.98	13.11	22.72	-9.61	-42.3
NYISO West Zone	INYWP00	9.72	6800	-0.29	-7.43	-0.40	-4.0	7.60	5.77	12.99	9.23	17.68	-8.45	-47.8
NYISO Capital Zone	INYCP00	15.49	10987	5.62	-1.43	-0.47	-2.9	15.22	11.40	15.96	13.97	22.08	-8.11	-36.7

**NORTHEAST AVG. DAY-AHEAD/REAL-TIME PEAK PRICE SPREAD**



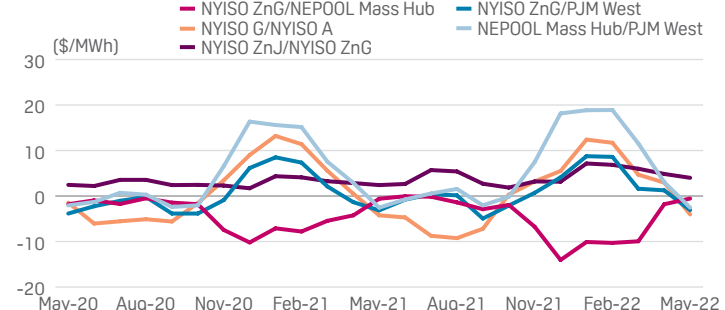
Source: S&P Global Platts

**NORTHEAST PLATTS M2MS FORWARD CURVE: ON-PEAK**



Source: S&P Global Platts

**NORTHEAST PLATTS M2MS LOCATIONAL SPREADS: ON-PEAK**



Source: S&P Global Platts

**Mass Hub falls \$2.50 as demand expectations weaken**

- Power forwards trend down
- ISO-NE expects peakload demand to dip

In the New York Independent System Operator footprint, day-ahead on-peak prices were mixed for April 17 delivery. Zone J and Zone G each fell less than 75 cents to price near \$15.50/MWh.

Bucking the trend, Zone A West Hub on-peak rose about \$3.25 to near \$15.25/MWh.

Off-peak packages in NYISO sank, with Zone J and Zone G each shedding 45 cents to near \$14.25/MWh.

In ISO New England, the Mass Hub on-peak package shed \$2.50 to price at \$17.50 for April 17 delivery. The off-peak package was valued in a bid-offer range of \$14.75/MWh to \$17.75/MWh. ISO New England forecast peakload demand to dip 1.4%, while in NYISO, peakload was set to fall about 3% on the day.

Northeast high temperatures were forecast to continue below average through the end of the week, according to CustomWeather. High temperatures in Boston were expected to sit 6 degrees below average at 51 F. In New York City, temperatures were forecast to continue 13 degrees below average in the low 50s F. Low temperatures were forecast to reach the mid-20s F by the weekend.

Power forwards trended down, despite the NYMEX natural gas front-month contract rising 8.8 cents to settle at \$1.686 /MMBtu on the Intercontinental Exchange. The NYISO Zone G on-peak front-month package shed 30 cents to near \$16.75/MWh. The Mass Hub June on-peak package shed 25 cents to price near \$15.50/MWh.

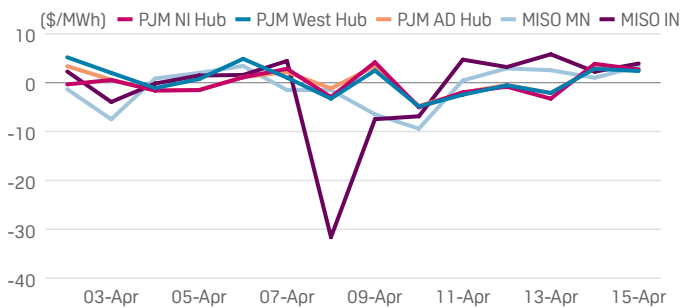
— Isabel Milton

**PJM/MISO POWER MARKETS**

**PJM/MISO DAY AHEAD POWER PRICES (\$/MWh)**

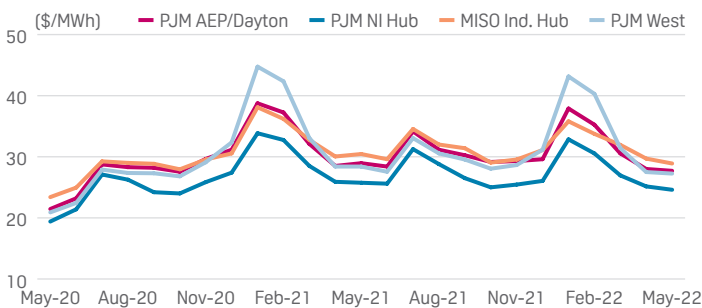
Hub/Index	Symbol	17-Apr	Marginal heat rate	Spark spread		Price change		Prior 7-day Average	Month Min	Month Max	Yearly Change			
				@7K	@12K	Chg	% Chg				Apr-20	Apr-19	Chg	% Chg
<b>On-Peak</b>														
PJM AEP Dayton Hub	IPADM00	18.34	12306	7.91	0.46	-1.52	-7.7	19.10	14.54	20.98	18.24	29.06	-10.82	-37.2
PJM Dominion Hub	IPDMM00	17.39	11552	6.85	-0.67	-1.65	-8.7	18.80	13.29	20.34	17.65	29.03	-11.38	-39.2
PJM Eastern Hub	IPEHM00	16.22	11507	6.35	-0.69	-2.21	-12.0	17.10	13.95	18.43	16.14	26.12	-9.98	-38.2
PJM Northern Illinois Hub	IPNIM00	17.73	11586	7.02	-0.63	-1.53	-7.9	17.76	12.04	20.10	16.80	27.10	-10.30	-38.0
PJM Western Hub	IPWHM00	18.29	12975	8.42	1.37	-1.14	-5.9	19.12	14.39	21.63	18.28	27.96	-9.68	-34.6
MISO Indiana Hub	IMIDM00	20.85	13627	10.14	2.49	-0.76	-3.5	23.11	17.67	24.66	21.49	29.44	-7.95	-27.0
MISO Minnesota Hub	IMINM00	17.99	12158	7.63	0.23	-2.15	-10.7	18.17	11.38	23.10	16.28	25.86	-9.58	-37.0
<b>Off-Peak</b>														
PJM AEP Dayton Hub	IPADP00	16.47	11053	6.04	-1.41	-1.70	-9.4	16.16	10.88	18.17	14.61	22.09	-7.48	-33.9
PJM Dominion Hub	IPDMP00	17.52	11643	6.99	-0.54	-0.98	-5.3	16.15	10.64	18.50	14.62	21.78	-7.16	-32.9
PJM Eastern Hub	IPEHP00	15.18	10768	5.31	-1.74	0.27	1.8	14.73	10.85	17.19	13.62	20.88	-7.26	-34.8
PJM Northern Illinois Hub	IPNIP00	16.01	10463	5.30	-2.35	-1.58	-9.0	15.09	10.42	17.59	13.66	19.98	-6.32	-31.6
PJM Western Hub	IPWHP00	16.57	11755	6.70	-0.35	-1.00	-5.7	16.11	10.86	17.57	14.60	21.35	-6.75	-31.6
MISO Indiana Hub	IMIDP00	16.63	10867	5.92	-1.73	-2.41	-12.7	18.65	13.32	20.92	16.60	22.71	-6.11	-26.9
MISO Minnesota Hub	IMINP00	14.95	10102	4.59	-2.81	-2.86	-16.1	14.78	6.90	19.48	12.18	20.28	-8.10	-39.9

**PJM/MISO AVG. DAY-AHEAD/REAL-TIME PEAK PRICE SPREAD**



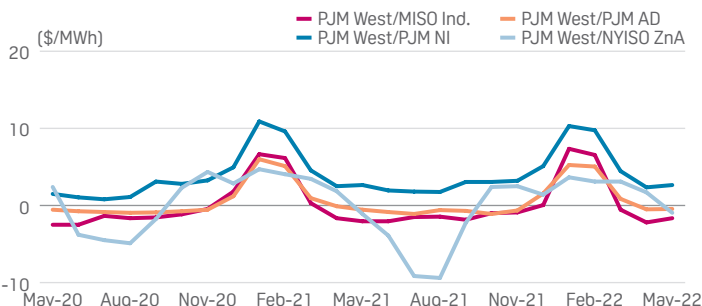
Source: S&P Global Platts

**PJM/MISO PLATTS M2MS FORWARD CURVE: ON-PEAK**



Source: S&P Global Platts

**PJM/MISO PLATTS M2MS LOCATIONAL SPREADS: ON-PEAK**



Source: S&P Global Platts

**PJM, MISO power prices move down on lower natural gas**

- Natural gas prices projected to drop
- Demand trends down as well

PJM electric power prices moved down on Thursday as lower natural gas prices and demand pushed the spot market lower.

PJM West Hub day-ahead on-peak for Friday delivery notched down, falling about 55 cents from Wednesday's Intercontinental Exchange settlement price of \$19.45/MWh to trade around \$18.90/MWh.

Natural gas prices for next day delivery fell on the day, which could be putting downwards pressure on the spot market. Texas Eastern M-3 fell 10 cents from Wednesday's S&P Global Platts' settled price of \$1.510/MMBtu to trade around \$1.409/MMBtu. Michcon also fell on the day, dropping 5 cents from Wednesday's Platts settled price of \$1.535/MMBtu to trade around \$1.490/MMBtu. Though Midwest gas trended downwards, this was not the case across the nation. NYMEX natural gas prompt month contract gained on the day, rising 8.8 cents to settle at \$1.686/MMBtu.

Demand is forecast to fall slightly, which also helps to explain the slight movements seen in spot prices. According to regional transmission organization data, PJM demand is forecast to drop from 85,400 MW on Thursday to 85,100 MW on Friday. Most of these declines were seen in PJM MidAtlantic region, which fell about 2.15% from 29,700 MW to 29,100 MW over the same time frame.

MISO demand moved in the same direction, though not as drastically. According to regional transmission organization data, MISO demand is forecast to tick down from 69.90 GW on Thursday to 69.80 GW on Friday.

Turning to the MISO electricity market, prices were trending in the same direction as PJM. Indiana Hub day-ahead on-peak was down about 40 cents from Wednesday's ICE settled price of \$21.65/MWh to trade around \$21.25/MWh.

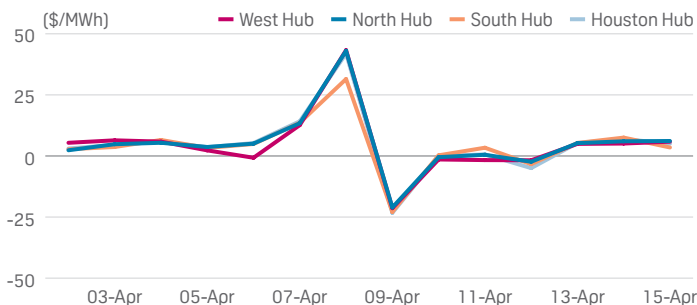
— Humza Jamal

**SOUTHEAST POWER MARKETS**

**SOUTHEAST & CENTRAL DAY-AHEAD POWER PRICES (\$/MWh)**

Hub/Index	Symbol	17-Apr	Marginal heat rate	Spark spread		Price change		Prior 7-day Average	Month Min	Month Max	Yearly change			
				@7K	@12K	Chg	% Chg				Apr-20	Apr-19	Chg	% Chg
<b>On-Peak</b>														
MISO Texas Hub	IMTXM00	19.87	13561	9.61	2.29	-0.43	-2.1	19.83	17.00	30.84	20.52	33.83	-13.31	-39.3
MISO Louisiana	IMLAM00	18.72	12482	8.22	0.72	0.46	2.5	19.72	17.15	27.73	19.99	33.84	-13.85	-40.9
SPP North Hub	ISNOP00	19.04	12866	8.68	1.28	3.33	21.2	16.80	7.99	26.40	16.19	25.55	-9.36	-36.6
SPP South Hub	ISSOM00	17.81	14602	9.27	3.17	10.64	148.4	14.19	4.90	26.12	15.47	23.48	-8.01	-34.1
ERCOT Houston Hub	IERHM00	21.00	14237	10.67	3.30	6.84	48.3	18.49	14.16	95.98	24.81	27.95	-3.14	-11.2
ERCOT North Hub	IERNM00	20.50	13994	10.25	2.92	7.08	52.8	18.12	13.42	94.09	24.11	26.68	-2.57	-9.6
ERCOT South Hub	IERSM00	20.13	13932	10.02	2.79	5.71	39.6	18.12	14.42	94.78	24.36	26.19	-1.83	-7.0
ERCOT West Hub	IERWM00	19.87	50955	17.14	15.19	18.63	1502.4	14.57	1.24	94.40	21.75	23.19	-1.44	-6.2
<b>Off-Peak</b>														
MISO Texas Hub	IMTXP00	14.98	10223	4.72	-2.60	-0.67	-4.3	14.72	12.83	17.32	14.79	22.90	-8.11	-35.4
MISO Louisiana	IMLAP00	14.61	9738	4.11	-3.39	-0.35	-2.3	15.14	13.61	16.59	14.87	22.48	-7.61	-33.9
SPP North Hub	ISNOP00	10.29	6952	-0.07	-7.47	-0.07	-0.7	9.77	-2.99	19.86	7.88	13.93	-6.05	-43.4
SPP South Hub	ISSOP00	2.55	2089	-5.99	-12.10	5.04	202.4	2.96	-10.75	18.07	3.63	9.12	-5.49	-60.2
ERCOT Houston Hub	IERHP00	10.51	7128	0.19	-7.18	1.42	15.6	11.66	8.07	16.61	11.76	15.68	-3.92	-25.0
ERCOT North Hub	IERNP00	8.83	6026	-1.43	-8.75	0.94	11.9	11.49	7.13	16.44	11.35	15.59	-4.24	-27.2
ERCOT South Hub	IERSP00	12.60	8721	2.49	-4.74	2.36	23.0	11.49	7.98	16.51	11.79	14.97	-3.18	-21.2
ERCOT West Hub	IERWP00	2.40	6154	-0.33	-2.28	3.11	438.0	8.15	-0.71	17.24	8.44	12.24	-3.80	-31.0

**ERCOT AVG. DAY-AHEAD/REAL-TIME PEAK PRICE SPREAD**



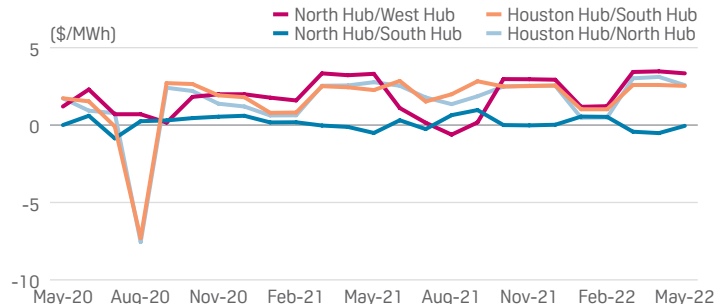
Source: S&P Global Platts

**ERCOT PLATTS M2MS FORWARD CURVE: ON-PEAK**



Source: S&P Global Platts

**ERCOT PLATTS M2MS LOCATIONAL SPREADS: ON-PEAK**



Source: S&P Global Platts

**Southeast, ERCOT power prices mixed on differing fundamentals**

- Southeast power ticks lower on warmer weather
- ERCOT power steps up on lower wind generation

Southeast spot electric power prices moved down on the day Thursday, as warmer weather is forecast in the region.

Into Southern day-ahead on-peak for next day delivery traded at \$19.00/MWh, about \$1.00 lower than Wednesday's S&P Global Platts assessed price of \$20.00/MWh.

Into Southern day-ahead off-peak trended up instead, trading at around \$14.00/MWh, about 50 cents higher than Wednesday's Platts assessed price of \$13.50/MWh.

Into GTC day-ahead on-peak moved in the same direction as Into Southern on-peak, trading down 50 cents to come in at \$19.50/MWh.

Warmer weather is forecast for the region, reducing heating demand. Currently, temperatures are hovering in the shoulder zone, where neither heating nor cooling is really required. According to CustomWeather, Atlanta high temperatures are expected to rise from 71 degrees Fahrenheit on Thursday to 76 degrees on Friday. This is right around the five-day average of 75 degrees typically seen for Atlanta at this time of year.

Turning to the ERCOT region, spot power prices are moving up instead.

ERCOT North Hub real-time on-peak package was trading around \$22.40/MWh, about \$7.90 higher than Wednesday's Intercontinental Exchange settled price of \$14.50/MWh.

ERCOT North Hub real-time off-peak stayed about level, valued near Wednesday's ICE settled price of \$8.80/MWh.

Wind generation is projected to drop day on day, putting upwards pressure on the spot electricity market. According to ERCOT data, average wind generation is forecast to fall from 18,500 MW on Thursday to 10,500 MW on Friday. This is a drop of over 43% on the day.

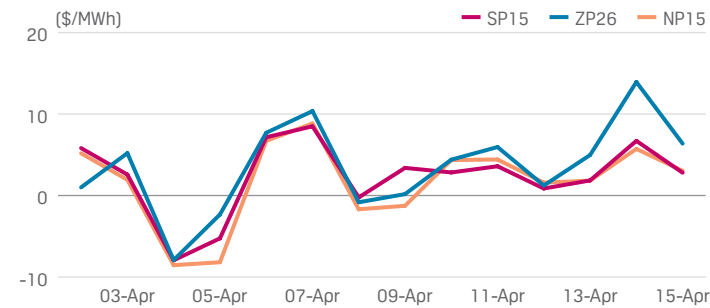
— *Humza Jamal*

**WEST POWER MARKETS**

**WESTERN DAY-AHEAD POWER PRICES (\$/MWh)**

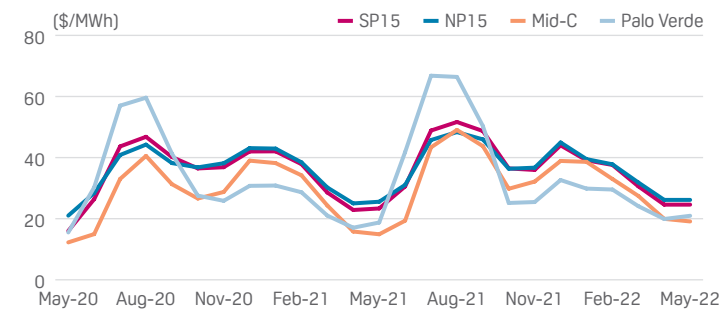
Hub/Index	Symbol	17-Apr	Marginal heat rate	Spark spread		Price change		Prior 7-day Average	Month Min	Month Max	Yearly change			
				@7K	@12K	Chg	% Chg				Apr-20	Apr-19	Chg	% Chg
<b>On-Peak</b>														
NP15	ICNGM00	22.97	10416	7.53	-3.49	0.66	3.0	21.11	15.39	29.08	22.97	21.86	1.11	5.1
SP15	ICSGM00	21.41	16535	12.35	5.87	7.31	51.8	14.79	10.05	27.82	17.27	23.15	-5.88	-25.4
ZP26	ICZGM00	21.90	16912	12.84	6.36	8.70	65.9	14.35	8.77	28.26	16.87	22.81	-5.94	-26.0
<b>Off-Peak</b>														
NP15	ICNGP00	21.41	9709	5.97	-5.05	-0.51	-2.3	25.01	21.27	28.59	24.22	23.04	1.18	5.1
SP15	ICSGP00	21.54	16632	12.47	6.00	-1.09	-4.8	25.08	20.72	28.27	24.07	24.26	-0.19	-0.8
ZP26	ICZGP00	21.44	16554	12.37	5.90	-0.91	-4.1	24.90	20.63	28.17	23.93	24.14	-0.21	-0.9

**CAISO AVG. DAY-AHEAD/REAL-TIME PEAK PRICE SPREAD**



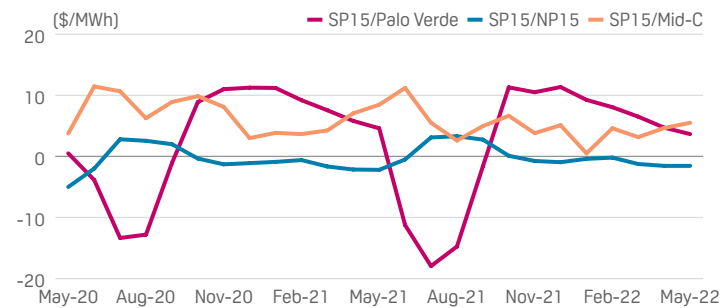
Source: S&P Global Platts

**WESTERN PLATTS M2MS FORWARD CURVE: ON-PEAK**



Source: S&P Global Platts

**WESTERN PLATTS M2MS LOCATIONAL SPREADS: ON-PEAK**



Source: S&P Global Platts

**West power dailies varied as demand tumbles**

- Cal-ISO peakload demand forecast to slide 3.4% Friday
- Power forwards trend up Thursday

Western power dailies were mixed in Thursday trading on the Intercontinental Exchange with demand expected to slide ahead of the weekend.

In the Northwest, the Mid-Columbia on-peak package for Friday-Saturday delivery traded down about \$1 to price at \$17/MWh. The off-peak package was priced virtually unchanged around \$18/MWh, trading above on-peak. Nevada-Oregon Border rose \$1 to \$18/MWh.

Above-average temperatures were expected across the Northwest Friday and Saturday, according to CustomWeather. Temperatures in Portland were forecast 10 degrees above average at 71 degrees Fahrenheit Friday and 2 degrees above average at 63 F Saturday.

In California, Zone SP15 on-peak day-ahead package rose \$1 to price at \$14.75/MWh. The California Independent System Operator forecast peakload demand to slide 3.4% Friday to 23,965 MW. Saturday demand expectations sat lower at 22,634 MW.

So far in April, Cal-ISO average peakload demand sank 8.6% month on month to average 24,296 MW.

Across the Southwest, prices trended up. The Palo Verde on-peak package ticked up 25 cents to \$14.25/MWh. The corresponding off-peak package was valued just 5 cents higher around \$19/MWh. Westwing on-peak gained \$1.50 to trade at \$17/MWh.

The Mead 230 on-peak and Four Corners off-peak packages saw biggest increases, rising \$7 and \$6.50 to price around \$21/MWh and \$23.75/MWh, respectively.

Temperatures in Phoenix were forecast on par with seasonal norms Friday and 3 degrees below average at 83 F Saturday.

In power forwards, packages largely trended up on ICE, with both Mid-C May and June on-peak futures contracts gaining 50 cents on the day to price at \$12.33/MWh and \$14.75/MWh, respectively. One exception was SP15 May day-ahead contract, which traded flat on the day at \$15.75/MWh. Further along the curve, Mid-C July off-peak rose 40 cents to price at \$19/MWh.

— *Daryna Kotenko*

## BILATERALS

## SOUTHEAST &amp; CENTRAL DAY-AHEAD BILATERAL INDEXES (\$/MWh)

Hub/Index	Symbol	17-Apr	Marginal heat rate	Spark spread		Price change		Prior 7-day Average	Month Min	Month Max	Yearly change			
				@7K	@12K	Chg	% Chg				Apr-20	Apr-19	Chg	% Chg
<b>On-Peak</b>														
Florida	AAMAV20	22.75	15167	12.25	4.75	-0.75	-3.2	22.86	21.00	23.75	22.44	29.33	-6.89	-23.5
GTC, Into	WAMCJ20	19.67	13201	9.24	1.79	-0.33	-1.6	19.81	18.50	21.00	19.57	29.43	-9.86	-33.5
Southern, Into	AAMBJ20	18.83	12638	8.40	0.95	-1.17	-5.9	18.93	16.50	20.06	18.34	28.80	-10.46	-36.3
TVA, Into	WEBAB20	19.50	13356	9.28	1.98	-1.25	-6.0	19.93	17.25	21.25	19.21	29.33	-10.12	-34.5
VACAR	AAMCI20	18.75	12458	8.21	0.69	-1.50	-7.4	19.18	16.50	20.50	18.60	29.15	-10.55	-36.2
<b>Off-Peak</b>														
Florida	AAMAO20	14.25	9500	3.75	-3.75	1.50	11.8	11.50	9.50	14.25	11.13	17.74	-6.61	-37.3
GTC, Into	WAMCC20	16.17	10852	5.74	-1.71	1.67	11.5	13.21	11.50	16.17	12.95	20.79	-7.84	-37.7
Southern, Into	AAMBC20	14.75	9899	4.32	-3.13	1.25	9.3	12.11	10.00	14.75	11.65	20.24	-8.59	-42.4
TVA, Into	AAJER20	15.75	10788	5.53	-1.77	1.25	8.6	13.11	11.00	15.75	12.60	20.92	-8.32	-39.8
VACAR	AAMCB20	15.50	10299	4.96	-2.56	1.25	8.8	12.86	10.75	15.50	12.44	20.67	-8.23	-39.8

## WESTERN DAY-AHEAD BILATERAL INDEXES (\$/MWh)

Hub/Index	Symbol	17-Apr	Marginal heat rate	Spark spread		Price change		Prior 7-day Average	Month Min	Month Max	Yearly change			
				@7K	@12K	Chg	% Chg				Apr-20	Apr-19	Chg	% Chg
<b>On-Peak</b>														
Mid-C	WEABF20	16.91	12122	7.15	0.17	-0.98	-5.5	19.93	16.91	25.78	20.16	17.03	3.13	18.4
John Day	WEAHF20	18.75	13441	8.99	2.01	-1.00	-5.1	21.71	18.75	27.50	21.94	19.67	2.27	11.5
COB	WEABE20	18.75	13686	9.16	2.31	-1.00	-5.1	20.80	18.00	25.50	20.83	19.52	1.31	6.7
NOB	WEAIF20	18.00	12903	8.23	1.26	1.00	5.9	19.43	17.00	25.00	19.56	19.23	0.33	1.7
Palo Verde	WEACC20	14.88	9822	4.28	-3.30	0.88	6.3	14.38	11.50	17.50	14.22	18.58	-4.36	-23.5
Mona	AARLQ20	18.34	14614	9.56	3.28	0.34	1.9	19.46	15.86	23.00	19.34	18.71	0.63	3.4
Four Corners	WEABI20	16.00	14035	8.02	2.32	1.00	6.7	14.57	11.75	17.50	14.53	18.54	-4.01	-21.6
Pinnacle Peak	WEAKF20	16.50	10891	5.89	-1.68	1.00	6.5	15.89	13.50	19.00	15.97	19.52	-3.55	-18.2
Westwing	WEAJF20	16.67	11003	6.06	-1.51	1.17	7.5	15.68	13.25	19.00	15.71	19.15	-3.44	-18.0
MEAD	AAMBW20	21.00	13861	10.39	2.82	7.00	50.0	15.29	12.81	21.00	16.03	20.41	-4.38	-21.5
<b>Off-Peak</b>														
Mid-C	WEACL20	18.12	12989	8.35	1.38	0.13	0.7	19.28	15.00	24.48	20.00	15.38	4.62	30.0
John Day	WEAHL20	19.75	14158	9.99	3.01	0.00	0.0	21.04	16.75	26.25	21.71	18.12	3.59	19.8
COB	WEACJ20	18.00	13139	8.41	1.56	-1.25	-6.5	20.07	16.25	24.50	20.50	17.88	2.62	14.7
NOB	WEATL20	17.75	12724	7.98	1.01	-1.25	-6.6	18.86	16.00	23.00	19.32	17.48	1.84	10.5
Palo Verde	WEACT20	18.13	11967	7.53	-0.05	-0.62	-3.3	18.19	11.00	19.56	17.43	17.62	-0.19	-1.1
Mona	AARLO20	19.00	15139	10.21	3.94	1.00	5.6	18.55	17.37	23.00	19.45	17.32	2.13	12.3
Four Corners	WEACR20	16.75	14693	8.77	3.07	-0.50	-2.9	16.96	10.50	18.75	16.36	17.58	-1.22	-6.9
Pinnacle Peak	WEAKL20	19.75	13036	9.14	1.57	-0.50	-2.5	19.68	12.50	21.00	18.94	18.34	0.60	3.3
Westwing	WEAJL20	18.00	11881	7.39	-0.18	-0.50	-2.7	17.93	10.75	19.25	17.19	18.20	-1.01	-5.5
MEAD	AAMBQ20	23.50	15512	12.90	5.32	3.25	16.0	20.15	11.75	23.50	19.10	18.88	0.22	1.2

Note: Western bilateral indexes reflect Friday-Saturday delivery

## PLATTS M2MS BALANCE-OF-THE-MONTH, APR 16, (\$/MWh)

	Symbol	On-peak	Symbol	Off-peak		Symbol	On-peak	Symbol	Off-peak
<b>Northeast</b>					<b>Southeast &amp; Central</b>				
Mass Hub	EMHTB00	18.82	EMHUB00	15.85	Southern Into	ESTTB00	20.72	ESTUB00	17.69
N.Y. Zone G	ENGTB00	13.22	ENGUB00	13.40	ERCOT North	ENTNB00	24.49	ETNUB00	16.60
N.Y. Zone J	ENJTB00	14.47	ENJUB00	14.10	ERCOT Houston	ETSTB00	26.44	ETSUB00	18.46
N.Y. Zone A	ENATB00	16.02	ENaub00	10.15	ERCOT West	ETWTB00	22.69	ETWUB00	14.35
Ontario*	EONTB00	9.50	EONUB00	5.00	ERCOT South	ETHTB00	24.77	ETHUB00	16.60
<b>PJM &amp; MISO</b>					<b>Western</b>				
PJM West	EPJTB00	19.67	EPJUB00	14.50	Mid-C	EMCTB00	15.50	EMCUB00	14.90
AD Hub	EECTB00	20.27	EECUB00	14.85	Palo Verde	EPVTB00	14.25	EPVUB00	18.95
NI Hub	ECETB00	19.62	ECEUB00	12.85	Mead	EMDTB00	16.79	EMDUB00	16.79
Indiana Hub	ECITB00	20.22	ECIUB00	17.45	NP15	ENPTB00	20.95	ENPUB00	22.40
					SP15	ESPTB00	15.25	ESPUB00	21.05

\*Ontario prices are in Canadian dollars

**HOURLY INDICES**

**Mid-C hourly power prices fall as demand dips to its multi-months low**

- BPA peakload demand sinks to lowest level since October
- Total BPA generation rises 4% on the day

Mid-Columbia hourly power prices fell Wednesday as regional demand weakened to its lowest level since October 13.

Mid-C on-peak for Wednesday flow hours averaged \$11.03/MWh, falling from \$15.25/MWh seen Tuesday. The corresponding off-peak strip was down from Tuesday's price of \$16.34/MWh, averaging \$14.16/MWh and trading about \$3 above on-peak.

In the day-ahead market, packages were mixed, with Mid-Columbia on-peak assessed Tuesday for Wednesday delivery virtually flat around \$17/MWh. Mid-C off-peak slid about \$2, pricing around \$15/MWh.

Real-time on-peak prices traded in a range of \$4-\$18/MWh, reaching their peak at noon PT. Off-peak prices traded in a range of \$9.50-\$19.50/MWh, with the highest price seen at hour 11 pm PT.

Bonneville Power Administration hourly average demand Monday peaked at 6,302 MW at hour ending 9 am PT during morning peak ramp. The lowest level of 5,386 MW was seen at hour ending 3 am PT.

The BPA peakload demand sank 8% to 6,334 MW Wednesday, the lowest level seen since October 13. As the coronavirus continues to put pressure on demand, peakload demand so far in April has declined about 11% month on month to average 7,091 MW.

Above-average temperatures were seen across the Pacific Northwest over the last few days, with Thursday's temperatures in Seattle sitting 7 degrees above average at 65 degrees Fahrenheit and temperatures in Portland sitting 3 degrees above average at 64 F, according to CustomWeather.

Total BPA generation rose 4% on the day to 221,224 MWh Wednesday, adding to pressure on power pricing. Hydro share increased to about 62% or 137,979 MWh, up from 120,819 MWh seen the day before. Wind was down to 29,494 MWh from 37,467 MWh Tuesday.

— *Daryna Kotenko*

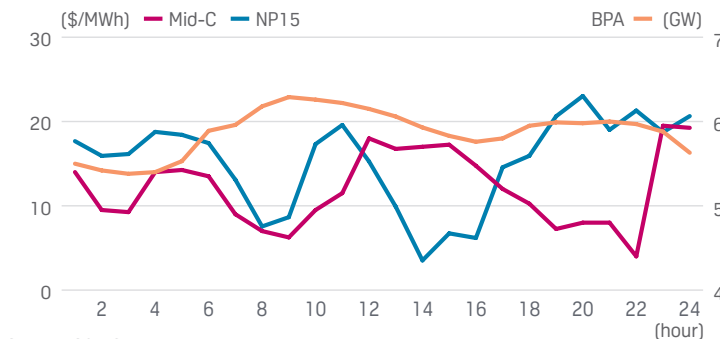
**MID-C HOURLY BILATERAL INDEXES (\$/MWh)**

	Symbol	15-Apr	Range	Deals	Volume (MW)
On-peak	<b>MCRTPE00</b>	11.03	4.00-18.00	90	6887
Off-peak	<b>MCRTO00</b>	14.16	9.25-19.50	17	1250

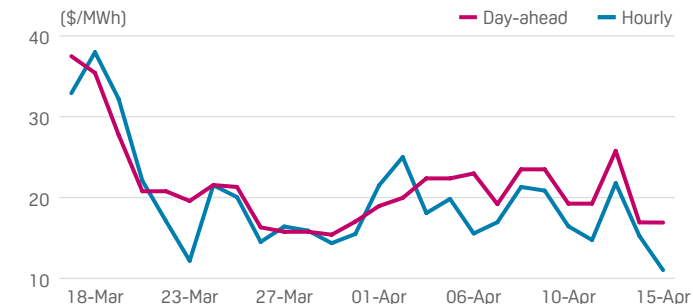
Hour ending	Symbol	15-Apr	Range	Deals	Volume (MW)	Apr-20
1	<b>MCRTH01</b>	14.00	14.00-14.00	1	50	16.73
2	<b>MCRTH02</b>	9.50	5.00-14.00	2	100	16.28
3	<b>MCRTH03</b>	9.25	4.00-14.00	2	95	16.10
4	<b>MCRTH04</b>	14.00	14.00-14.00	1	50	17.20
5	<b>MCRTH05</b>	14.25	14.25-14.25	2	125	18.72
6	<b>MCRTH06</b>	13.50	8.00-21.00	5	230	21.10
7	<b>MCRTH07</b>	9.00	5.00-13.00	6	725	22.02
8	<b>MCRTH08</b>	7.00	4.00-12.00	12	935	20.50
9	<b>MCRTH09</b>	6.25	5.00-10.00	6	575	19.15
10	<b>MCRTH10</b>	9.50	5.00-18.00	5	360	18.25
11	<b>MCRTH11</b>	11.50	5.00-18.00	7	355	18.45
12	<b>MCRTH12</b>	18.00	10.00-23.00	5	295	18.95
13	<b>MCRTH13</b>	16.75	10.00-18.00	4	220	19.07
14	<b>MCRTH14</b>	17.00	16.00-18.00	2	100	18.72
15	<b>MCRTH15</b>	17.25	13.00-20.00	5	175	18.15
16	<b>MCRTH16</b>	14.75	12.00-20.00	5	400	17.83
17	<b>MCRTH17</b>	12.00	5.00-20.00	6	398	16.82
18	<b>MCRTH18</b>	10.25	4.00-20.00	8	497	17.05
19	<b>MCRTH19</b>	7.25	4.00-18.00	7	797	17.48
20	<b>MCRTH20</b>	8.00	4.00-15.00	8	910	17.90
21	<b>MCRTH21</b>	8.00	4.00-14.00	3	127	18.32
22	<b>MCRTH22</b>	4.00	4.00-4.00	1	18	17.23
23	<b>MCRTH23</b>	19.50	13.00-21.00	2	250	18.58
24	<b>MCRTH24</b>	19.25	12.00-21.00	4	475	17.72

**MID-C AND NP15 HOURLY PRICES vs BPA HOURLY DEMAND**



Source: S&P Global Platts, BPA

**MID-C DAY-AHEAD/HOURLY ON-PEAK PRICE COMPARISON**



Source: S&P Global Platts

## CAISO wind, solar curtailments drop as demand increases

- Solar generation climbs to five-month high
- ISO average demand up 1%, peakload up 0.3%
- Real-time power prices increase on the day

Wind and solar generation curtailments declined in the California Independent System Operator footprint on Wednesday, as power demand, solar generation, wind output and real-time prices were all higher on the day.

According to S&P Global Platts data, CAISO solar curtailments fell 19.1% on Wednesday to about 5,639 MW, which was also down 5.4% from the month-to-date average. Wind curtailments dropped to 5.6 MW on Wednesday, down 57% on the day.

Average solar generation increased for the seventh straight day to a five-month high 4,252 MW, according to ISO data, up 3.4% from Tuesday and the highest since 9,570 MW on November 17, 2019.

Wind generation also rose to 1,258 MW Wednesday, up 50.6% from

Tuesday. Wind made up 6.2% of ISO supply, while solar made up 21.1% of the generation stack.

Wednesday's average demand in the ISO was up about 1% on the day at 20,140 MW Wednesday, while peakload ticked higher by 0.3% to 24,253 MW.

Despite stronger wind and solar generation, imports into the ISO were higher on day, climbing 7.5% to average around 4,341 MW, according to CAISO data.

Power imports from the Pacific Northwest along the AC intertie jumped 14.4% Wednesday to average 1,575 MW, according to Bonneville Power Administration data. Along the DC intertie, flows from the Northwest to California fell 18.3% on the day to an average of 1,119 MW.

CAISO real-time power prices were higher day on day. The NP15 real-time prices averaged around \$14.11/MWh during peak hours, up 64.6% on the day. The SP15 price also climbed 5.6% to average around \$9.30/MWh Wednesday.

Both hubs saw real-time prices peak around 10 pm PT, with NP15 climbing to \$28.67/MWh and SP15 at \$29.64/MWh.

— Tyler Godwin

## SYSTEM-WIDE CALIFORNIA ISO RENEWABLE GENERATION CURTAILMENTS (MW), APRIL 15

### Solar

		Current	Previous
Peak	CAICA00	5638.57	6972.34
Off-Peak	CAICB00	0.00	0.00
24-Hour	CAICC00	5638.57	6972.34

### Wind

		Current	Previous
Peak	CAICD00	5.59	13.01
Off-Peak	CAICE00	0.00	0.00
24-Hour	CAICF00	5.59	13.01

### Combined Solar and Wind

		Current	Previous
Peak	CAICG00	7241.27	8836.05
Off-Peak	CAICH00	0.00	0.00
24-Hour	CAICJ00	7241.27	8836.05

### Curtailment by Hour

Hour	Solar	Wind	Combined
1	0.00	0.00	0.00
2	0.00	0.00	0.00
3	0.00	0.00	0.00
4	0.00	0.00	0.00
5	0.00	0.00	0.00
6	0.00	0.00	0.00
7	0.00	0.00	0.00
8	50.97	0.00	79.98
9	87.62	0.00	111.85
10	165.00	0.00	203.06
11	433.96	0.00	526.35
12	604.33	0.00	731.49
13	723.57	0.00	878.84
14	765.90	0.00	944.34
15	802.80	0.82	1014.06
16	812.49	0.65	1059.07
17	696.54	2.05	951.28
18	491.82	2.07	733.12
19	3.57	0.00	7.83
20	0.00	0.00	0.00
21	0.00	0.00	0.00
22	0.00	0.00	0.00
23	0.00	0.00	0.00
24	0.00	0.00	0.00

### APRIL 2020 HOURLY WEIGHTINGS (%)

Hour	Solar	Wind	Combined
1	0.00	0.13	0.13
2	0.00	0.13	0.13
3	0.00	0.13	0.13
4	0.00	0.13	0.13
5	0.00	0.13	0.13
6	0.00	0.11	0.11
7	0.03	0.10	0.12
8	0.15	0.09	0.23
9	0.30	0.08	0.38
10	0.37	0.09	0.46
11	0.40	0.08	0.48
12	0.41	0.09	0.50
13	0.42	0.09	0.50
14	0.40	0.09	0.50
15	0.40	0.10	0.50
16	0.36	0.11	0.47
17	0.32	0.11	0.44
18	0.24	0.12	0.36
19	0.09	0.11	0.21
20	0.02	0.10	0.12
21	0.00	0.10	0.11
22	0.00	0.11	0.11
23	0.00	0.12	0.12
24	0.00	0.13	0.13

**PLATTS M2MS FORWARD CURVE, APR 16 (\$/MWh)**

Prompt month: May 20

	On-peak	Off-peak
<b>Northeast</b>		
Mass Hub	18.85	14.85
N.Y. Zone G	17.05	14.10
N.Y. Zone J	19.50	14.90
N.Y. Zone A	18.50	11.00
Ontario*	6.94	3.20
*Ontario prices are in Canadian dollars		
<b>PJM &amp; MISO</b>		
PJM West	20.90	15.30
AD Hub	21.45	15.60
NI Hub	19.40	13.55
Indiana Hub	23.40	17.45

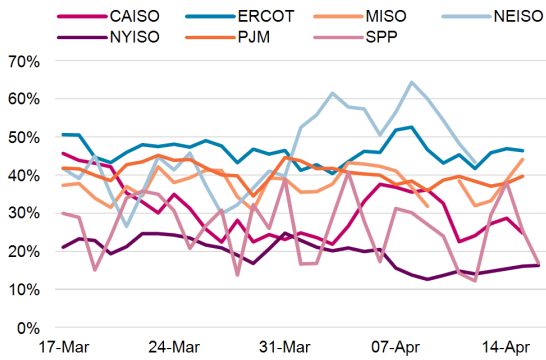
	On-peak	Off-peak
<b>Southeast &amp; Central</b>		
Southern Into	23.32	17.69
ERCOT North	27.70	15.89
ERCOT Houston	29.43	17.26
ERCOT West	26.50	13.90
ERCOT South	27.70	16.64
<b>Western</b>		
Mid-C	12.25	7.35
Palo Verde	15.50	16.25
Mead	16.48	16.96
NP15	21.00	20.95
SP15	16.00	18.80

**ISO DAY-AHEAD LMP BREAKDOWN FOR APR 17 (\$/MWh)**

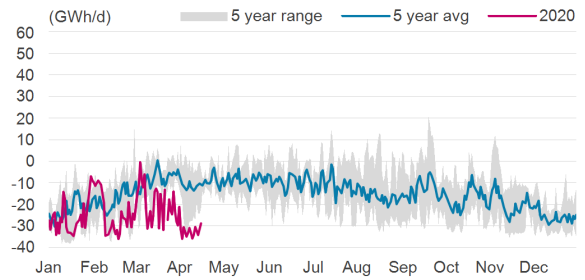
Hub/Zone	Average	Cong	Loss	Change	Avg \$/Mo	Marginal heat rate	Average	Cong	Loss	Change	Avg \$/Mo	Marginal heat rate	
<b>Northeast</b>													
<b>On-peak</b>						<b>Off-Peak</b>							
ISONE Internal Hub	16.66	-0.04	-0.02	-0.90	19.25	10350	ISONE Internal Hub	14.77	0.01	0.01	-2.30	15.35	9172
ISONE Connecticut	15.82	-0.32	-0.58	-1.09	18.49	10371	ISONE Connecticut	14.25	-0.03	-0.47	-2.18	14.84	9344
ISONE NE Mass-Boston	17.13	0.13	0.28	-0.77	19.60	10640	ISONE NE Mass-Boston	15.02	0.03	0.24	-2.29	15.56	9327
NYISO Capital Zone	15.59	-1.23	0.91	-1.69	16.42	11054	NYISO Capital Zone	15.49	-5.35	0.61	-0.47	13.97	10987
NYISO Hudson Valley Zone	15.51	-0.91	1.16	-0.66	15.67	10173	NYISO Hudson Valley Zone	14.25	-3.96	0.75	-0.45	12.92	9341
NYISO N.Y.C. Zone	15.81	-0.92	1.45	-0.68	15.93	11214	NYISO N.Y.C. Zone	14.52	-4.04	0.95	-0.46	13.11	10294
NYISO West Zone	15.19	-1.67	0.08	3.22	12.14	10623	NYISO West Zone	9.72	-0.32	-0.13	-0.40	9.23	6800
<b>PJM &amp; MISO</b>													
<b>On-peak</b>						<b>Off-Peak</b>							
PJM AEP-Dayton Hub	18.34	0.43	0.19	-1.52	18.24	12306	PJM AEP-Dayton Hub	16.47	-0.19	0.37	-1.70	14.61	11053
PJM Dominion Hub	17.39	0.12	-0.45	-1.65	17.65	11552	PJM Dominion Hub	17.52	1.40	-0.17	-0.98	14.62	11643
PJM Eastern Hub	16.22	-1.46	-0.03	-2.21	16.14	11507	PJM Eastern Hub	15.18	-0.89	-0.21	0.27	13.62	10768
PJM Northern Illinois Hub	17.73	0.21	-0.20	-1.53	16.80	11586	PJM Northern Illinois Hub	16.01	-0.28	0.00	-1.58	13.66	10463
PJM Western Hub	18.29	0.64	-0.06	-1.14	18.28	12975	PJM Western Hub	16.57	0.58	-0.30	-1.00	14.60	11755
MISO Indiana Hub	20.85	0.35	0.65	-0.76	21.49	13627	MISO Indiana Hub	16.63	0.00	0.41	-2.41	16.60	10867
MISO Minnesota Hub	17.99	-0.60	-1.26	-2.15	16.28	12158	MISO Minnesota Hub	14.95	-0.48	-0.79	-2.86	12.18	10102
MISO Louisiana Hub	18.72	-0.78	-0.35	0.46	19.99	12482	MISO Louisiana Hub	14.61	-1.30	-0.31	-0.35	14.87	9738
MISO Texas Hub	19.87	0.10	-0.08	-0.43	20.52	13561	MISO Texas Hub	14.98	-1.17	-0.07	-0.67	14.79	10223
<b>Southeast &amp; Central</b>													
<b>On-peak</b>						<b>Off-Peak</b>							
SPP North Hub	19.04	-0.05	0.56	3.33	16.19	12866	SPP North Hub	10.29	2.60	0.20	-0.07	7.88	6952
SPP South Hub	17.81	-0.32	-0.40	10.64	15.47	14602	SPP South Hub	2.55	-4.78	-0.16	5.04	3.63	2089
ERCOT Houston Hub	21.00	-	-	6.84	24.81	14237	ERCOT Houston Hub	10.51	-	-	1.42	11.76	7128
ERCOT North Hub	20.50	-	-	7.08	24.11	13994	ERCOT North Hub	8.83	-	-	0.94	11.35	6026
ERCOT South Hub	20.13	-	-	5.71	24.36	13932	ERCOT South Hub	12.60	-	-	2.36	11.79	8721
ERCOT West Hub	19.87	-	-	18.63	21.75	50955	ERCOT West Hub	2.40	-	-	3.11	8.44	6154
<b>Western</b>													
<b>On-peak</b>						<b>Off-Peak</b>							
CAISO NP15 Gen Hub	22.97	0.68	-0.42	0.66	22.97	10416	CAISO NP15 Gen Hub	21.41	0.00	-0.78	-0.51	24.22	9709
CAISO SP15 Gen Hub	21.41	-0.76	-0.54	7.31	17.27	16535	CAISO SP15 Gen Hub	21.54	0.00	-0.65	-1.09	24.07	16632
CAISO ZP26 Gen Hub	21.90	-0.14	-0.67	8.70	16.87	16912	CAISO ZP26 Gen Hub	21.44	0.00	-0.75	-0.91	23.93	16554

**US POWER FUNDAMENTALS**

**GAS GEN MARKET SHARE BY ISO**

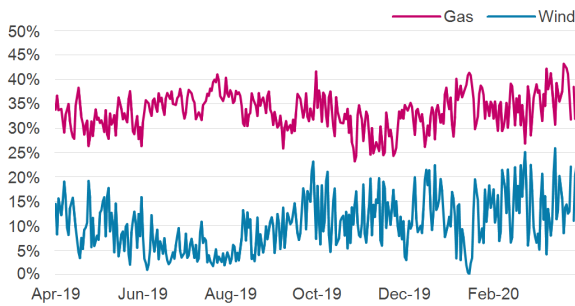


**ISONE-NYISO INTERTIE TRANSMISSION E-W**



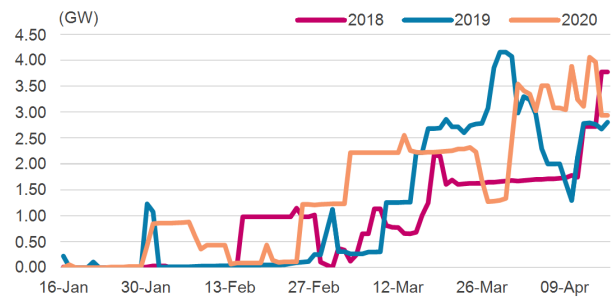
Source: ISONE

**MISO GENERATION MARKET SHARE - GAS VS. WIND**



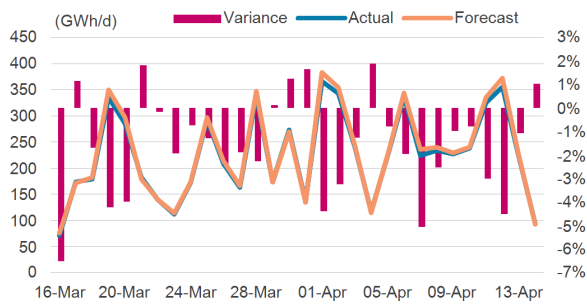
Source: S&P Global Platts Analytics

**ISONE & NYISO NUCLEAR GENERATION OUTAGES**



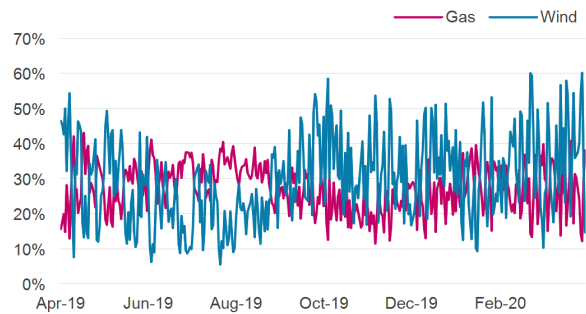
Source: NRC

**SPP ACTUAL WIND GENERATION VS. FORECAST**



Source: SPP

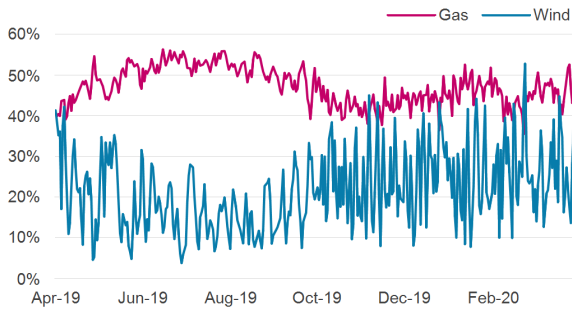
**SPP GENERATION MARKET SHARE - GAS VS. WIND**



Source: S&P Global Platts Analytics

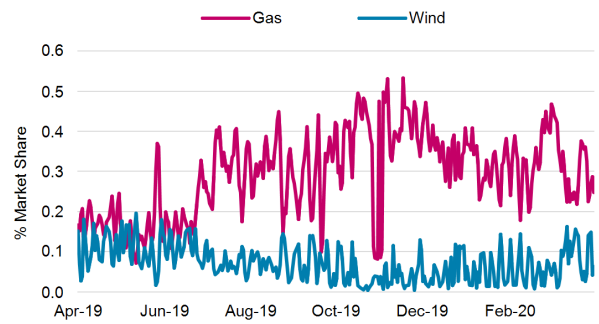
### US POWER FUNDAMENTALS

#### ERCOT GENERATION MARKET SHARE - GAS VS. WIND

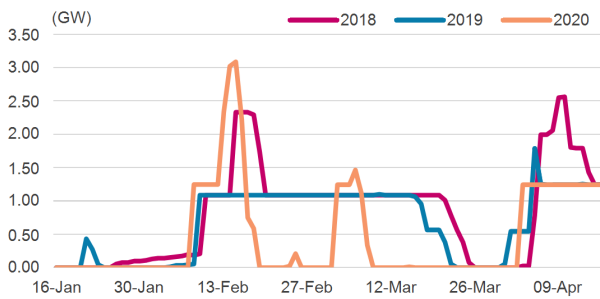


Source: S&P Global Platts Analytics

#### CAISO GENERATION MARKET SHARE

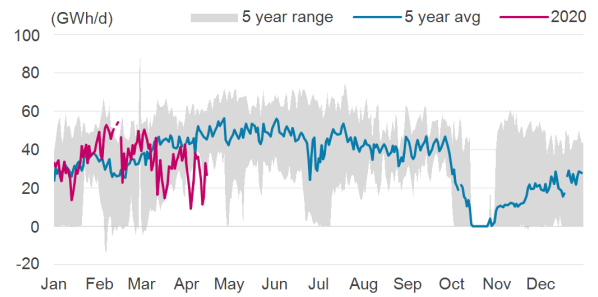


#### WESTERN NUCLEAR GENERATION OUTAGES



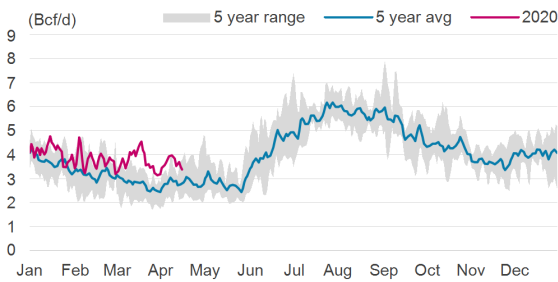
Source: NRC

#### BPA DC LINE TRANSMISSION FLOWS N-S



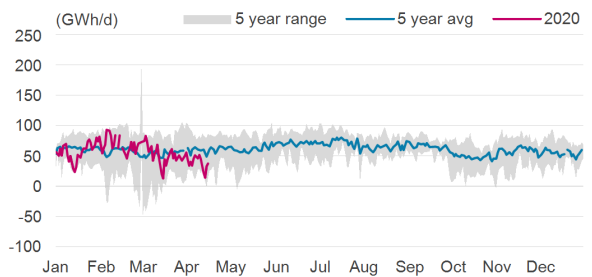
Source: BPA

#### WEST REGION GAS DEMAND FROM POWER GEN



Source: S&P Global Platts Analytics

#### BPA AC LINE TRANSMISSION FLOWS N-S



Source: BPA