State of the Power Market

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Mike leads NextEra Energy's fundamental research on power, natural gas, liquefied natural gas, natural gas liquids, oil, oil products, and related markets. He has been active in the energy markets for over 25 years. Mr. Zenker has testified before the U.S. Congress, the Federal Energy Regulatory Commission, and the California Public Utilities Commission. As a frequent contributor to energy industry publications and events, he has appeared on television, in print media and on radio. Mr. Zenker has a Bachelor's degree in Nuclear Engineering, and an MBA, both from the University of California, and is a registered professional engineer in nuclear engineering

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Will the Current Swoon and Then Expected 2021 Rally in Wholesale Power Prices Impact the Outlook for Renewables Development?

June 19, 2020

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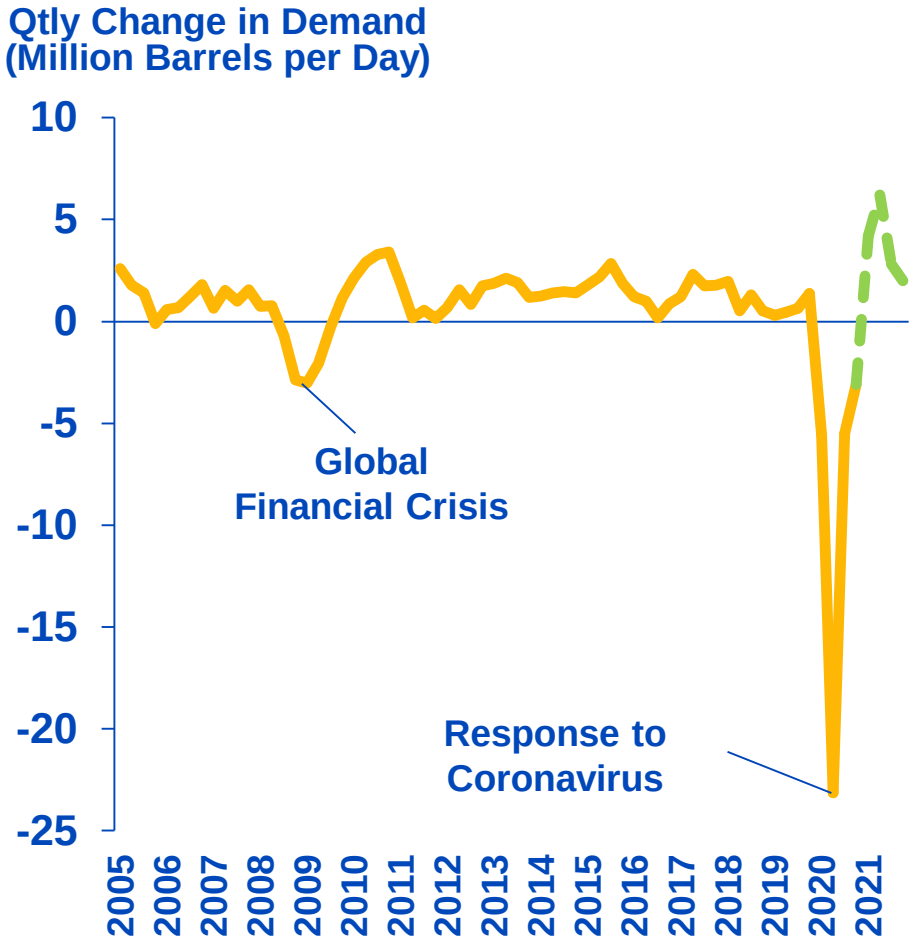
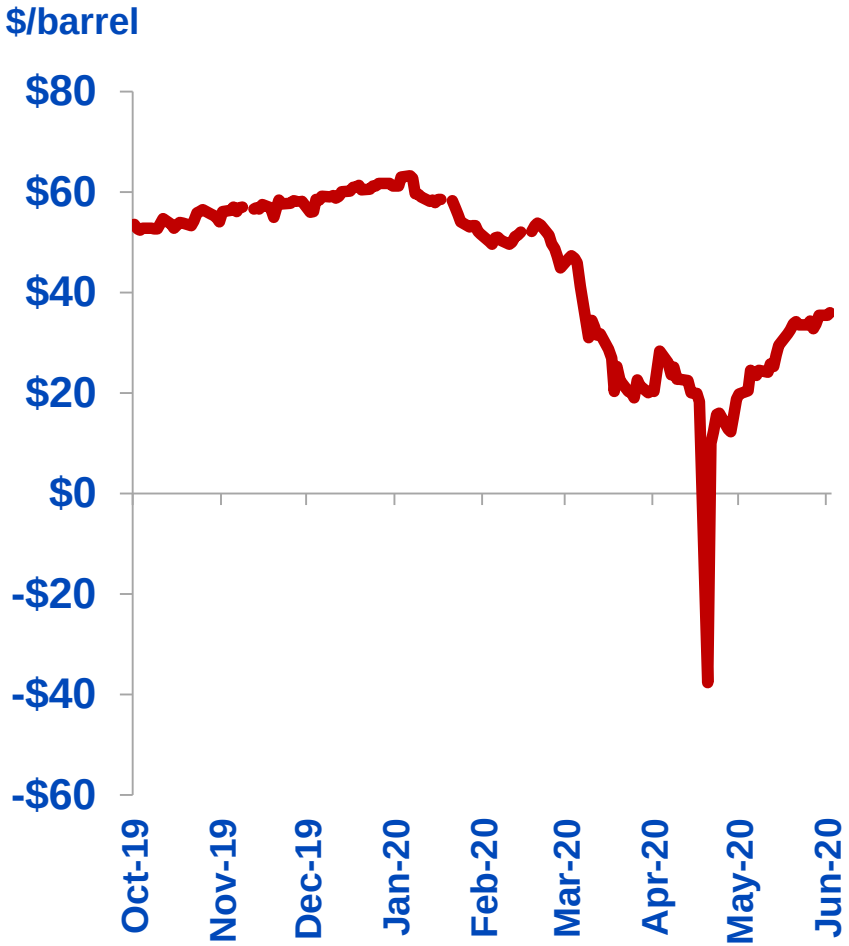
NextEra Energy Resources

Global lockdowns in response to the coronavirus caused an unprecedented plunge in oil demand, driving oil prices down

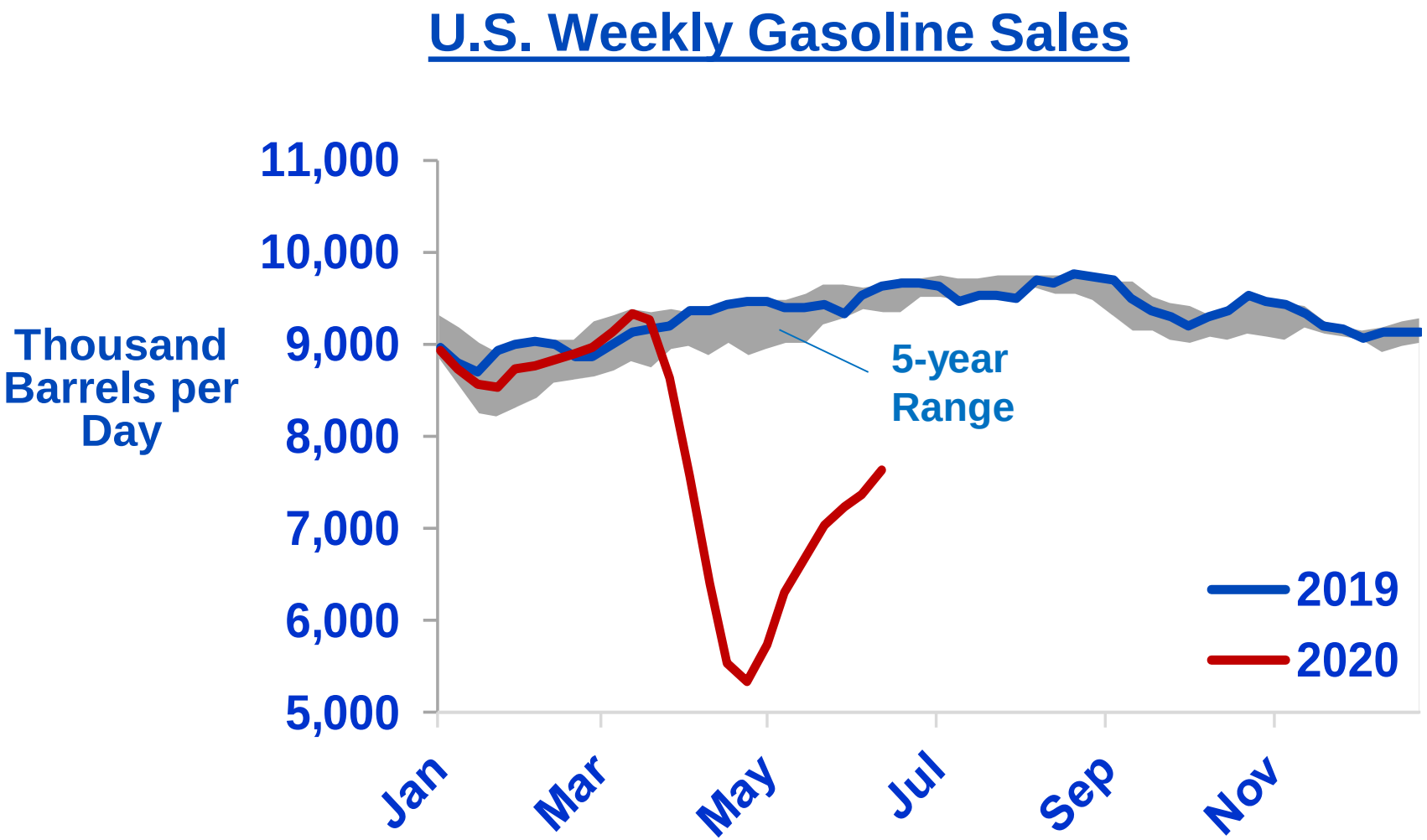
Change in Global Oil Demand



U.S. Oil Prices



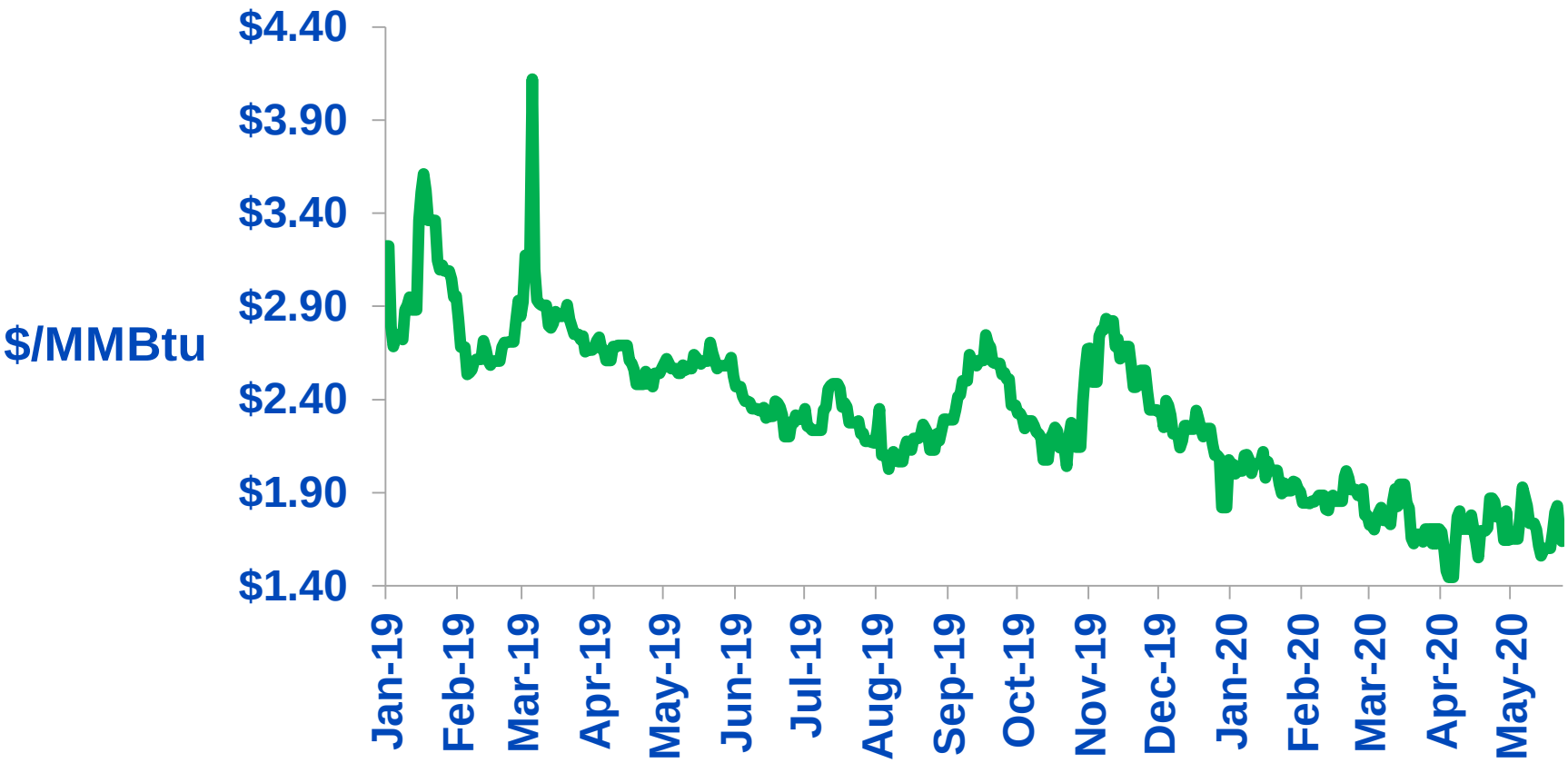
Gasoline consumption in the U.S. has recovered ~65% of the April loss



Source: EIA

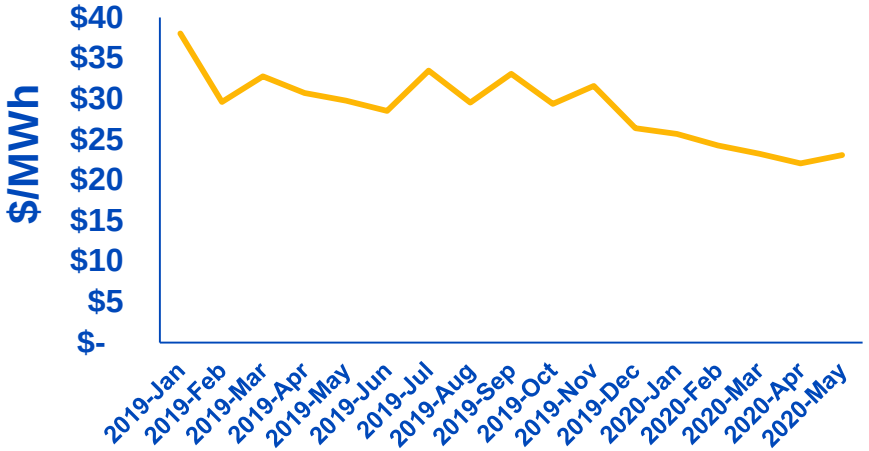
Cash natural gas prices remain low

Henry Hub Wholesale Natural Gas Cash Price

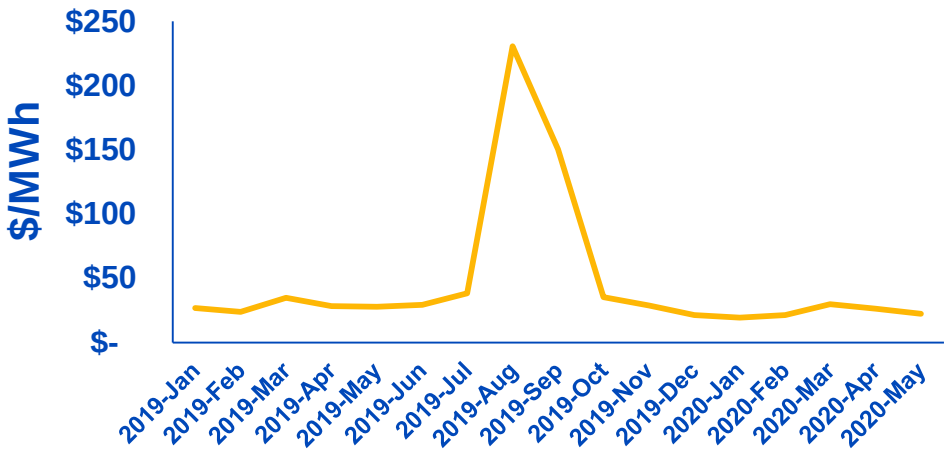


Spot power prices have followed natural gas lower

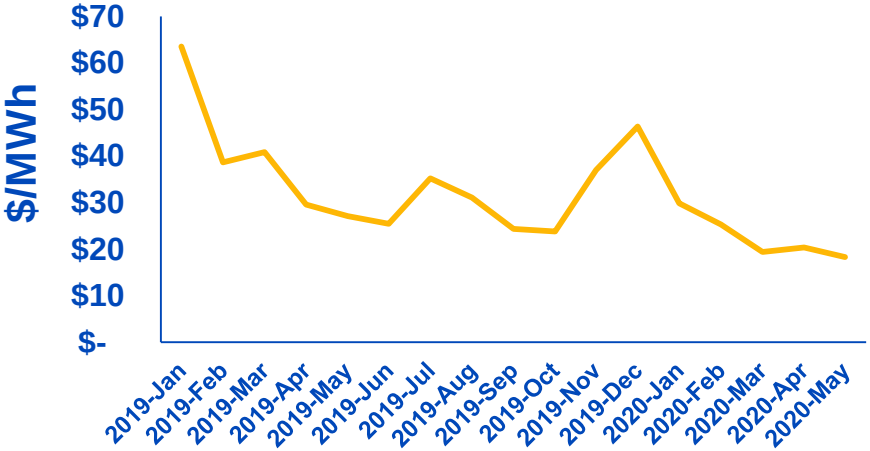
MISO-Indiana Hub Monthly Spot On-Peak Power Prices



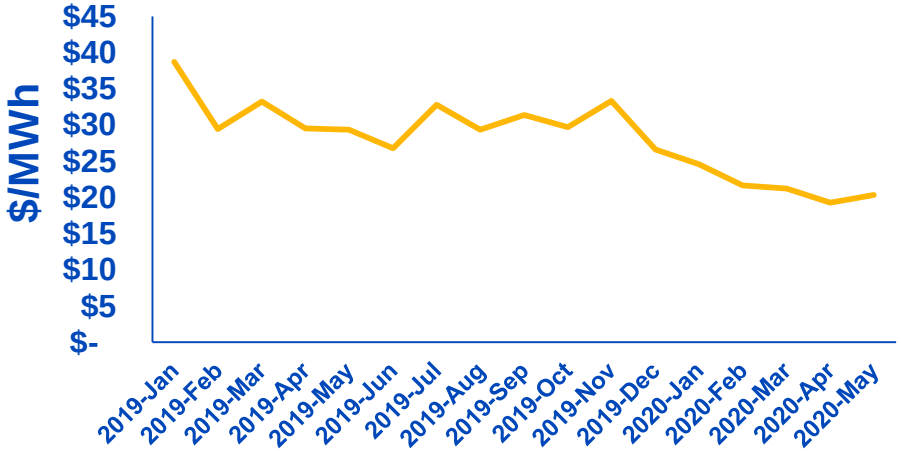
ERCOT North Monthly Spot On-Peak Power Prices



NEPOOL Mass Hub Monthly Spot On-Peak Power Prices

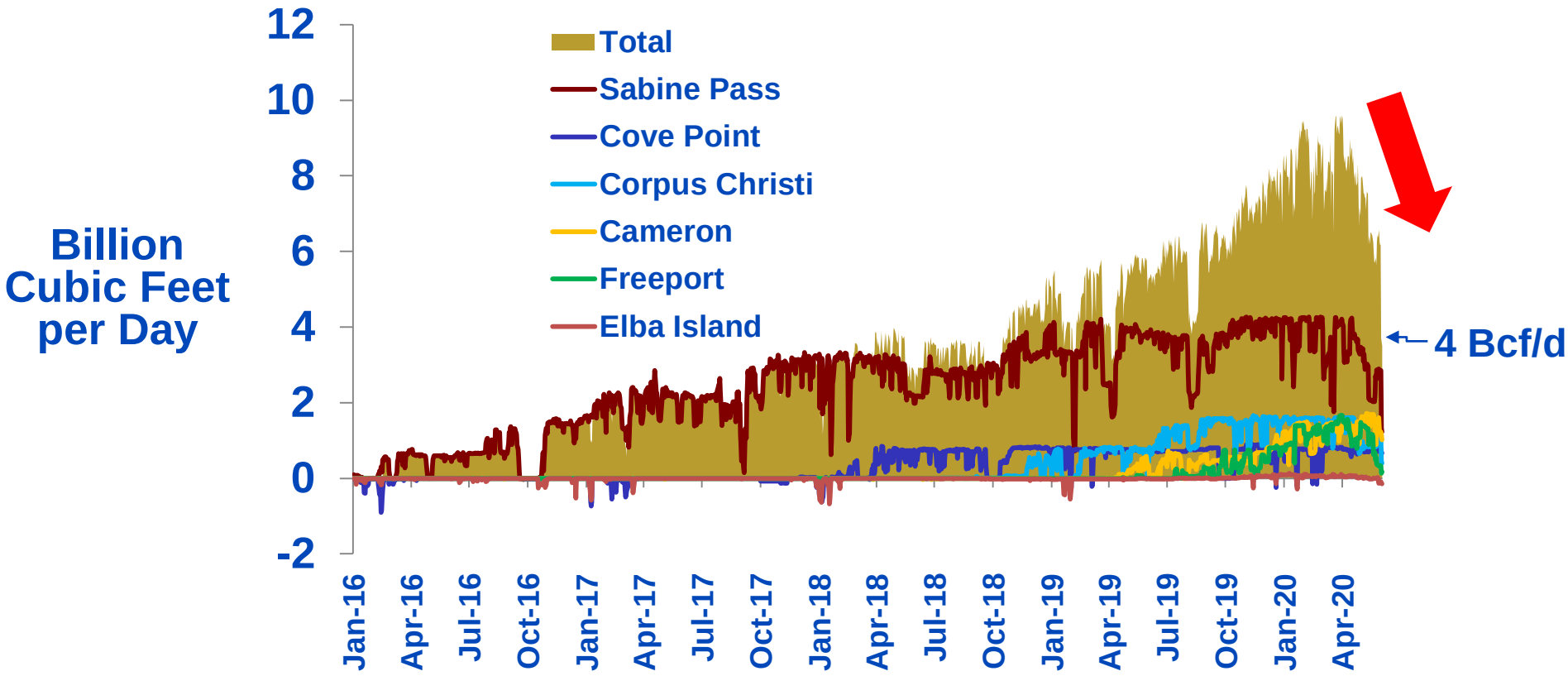


PJM West Monthly Spot On-Peak Power Prices



Dropping LNG exports add to the bearish summer 2020 picture

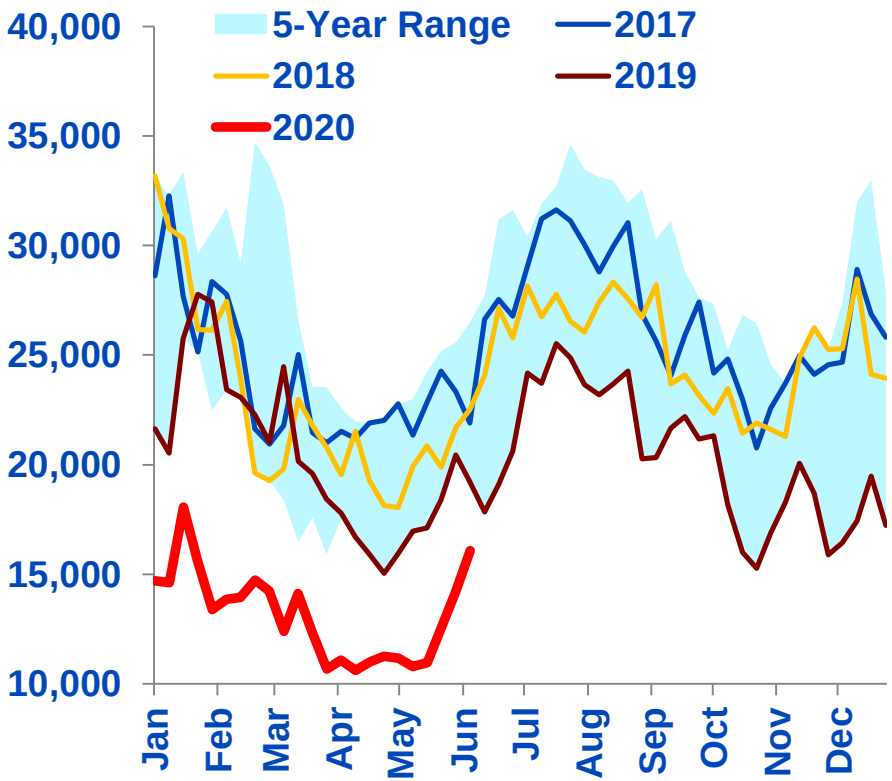
U.S. LNG Exports



Surplus gas is being consumed in the power sector

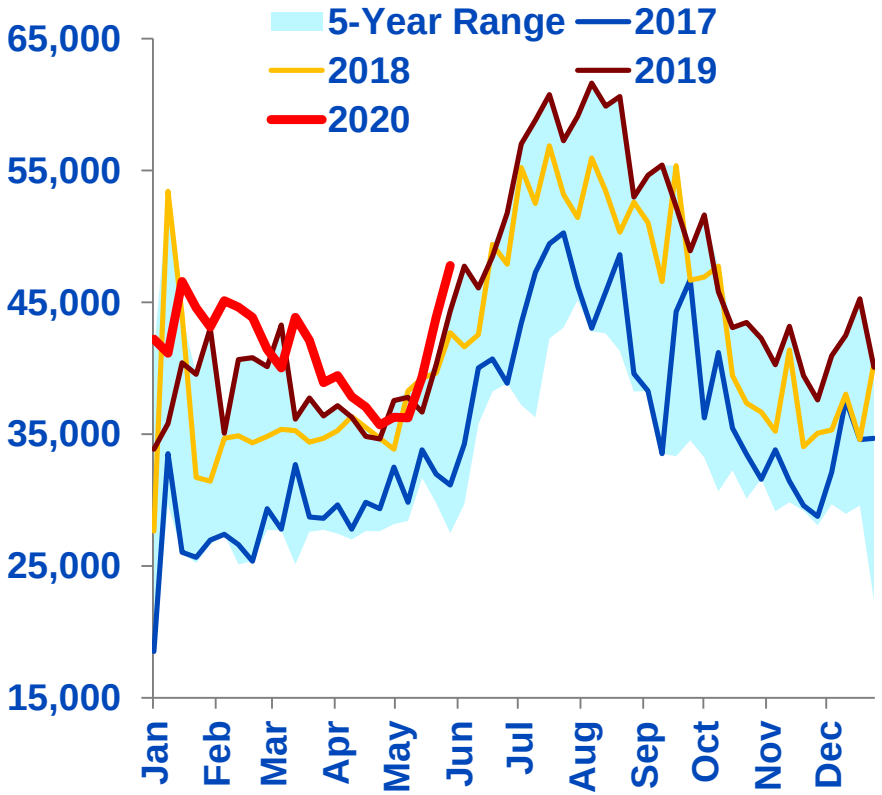
U.S. Coal-fired Generation

MWh, weekly

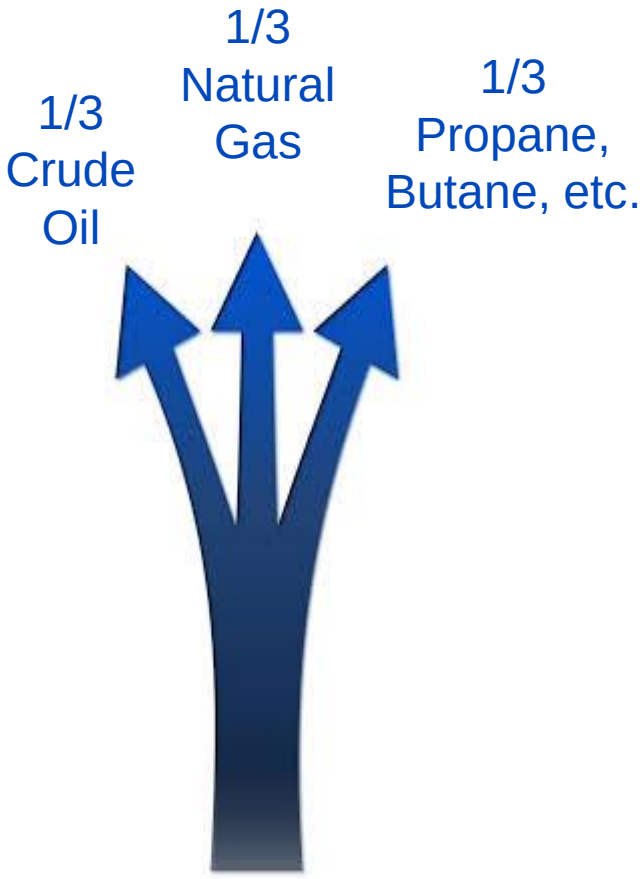


U.S. Gas-fired Generation

MWh, weekly

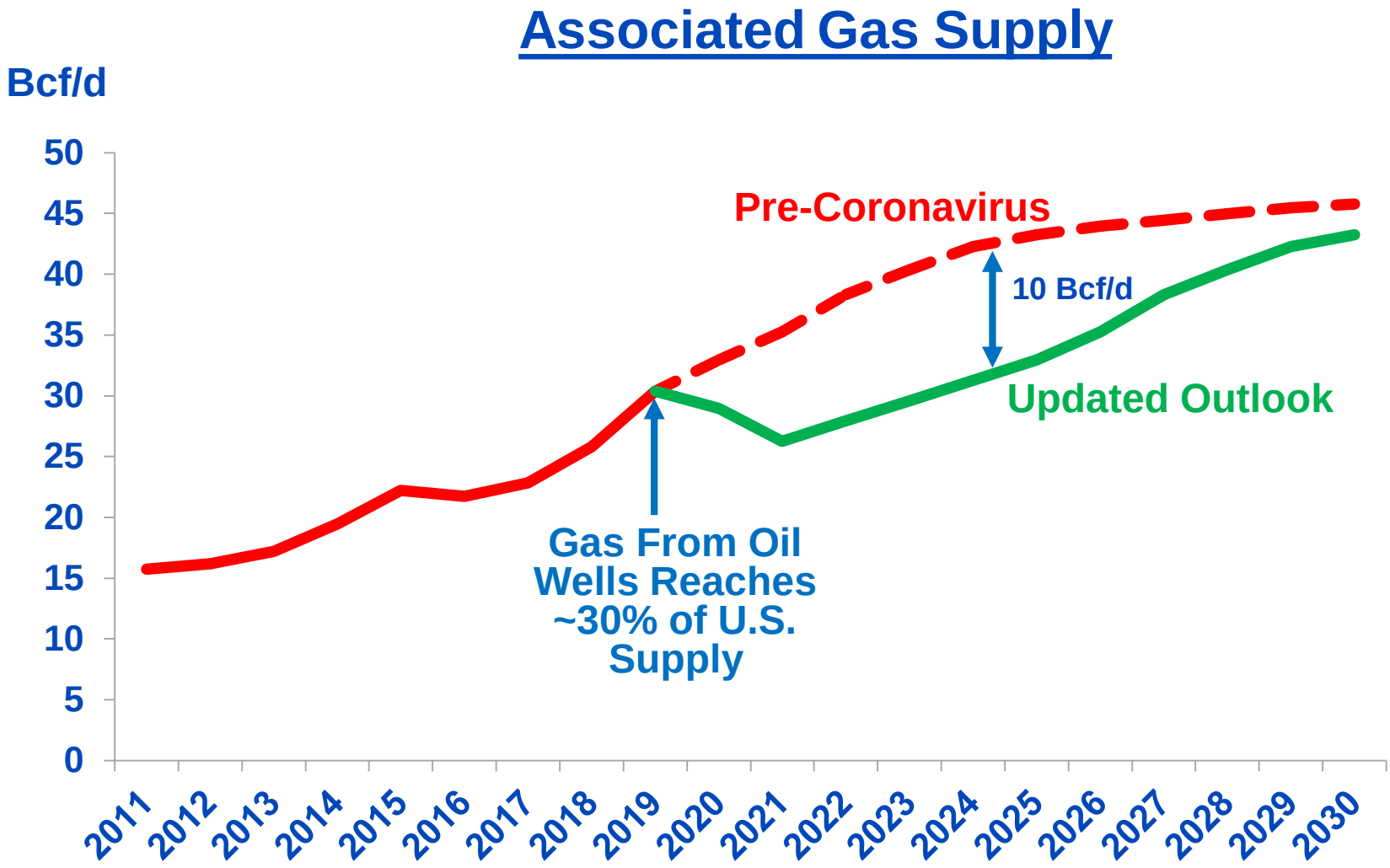


Most shale oil wells produce oil, natural gas, and other liquids



Typical Permian Well

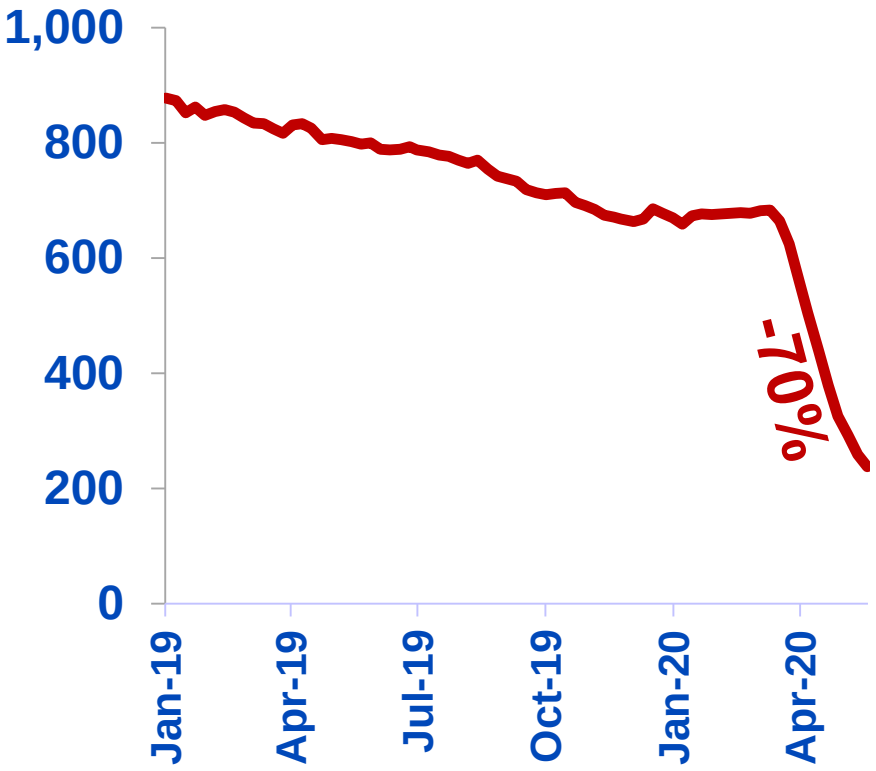
Associated gas was expected to represent more than 50% of 2020-2025 supply growth, but falling oil production will pull associated gas supply lower until oil prices improve



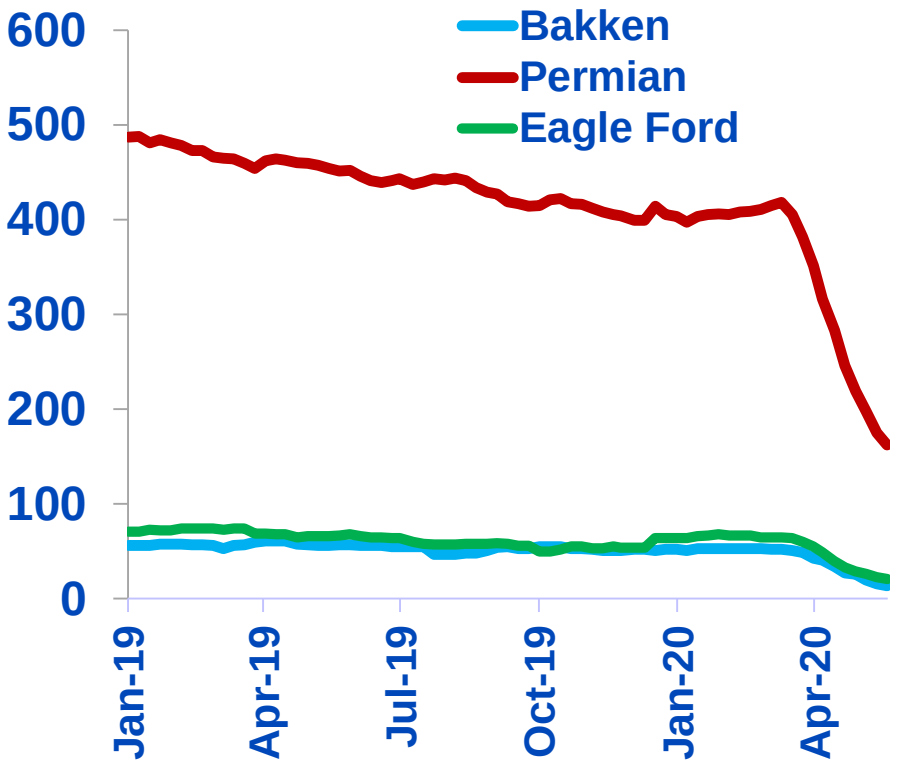
Source: Wood Mackenzie, NEM Forecast

Oil producers have slashed drilling

Rigs Drilling for Oil

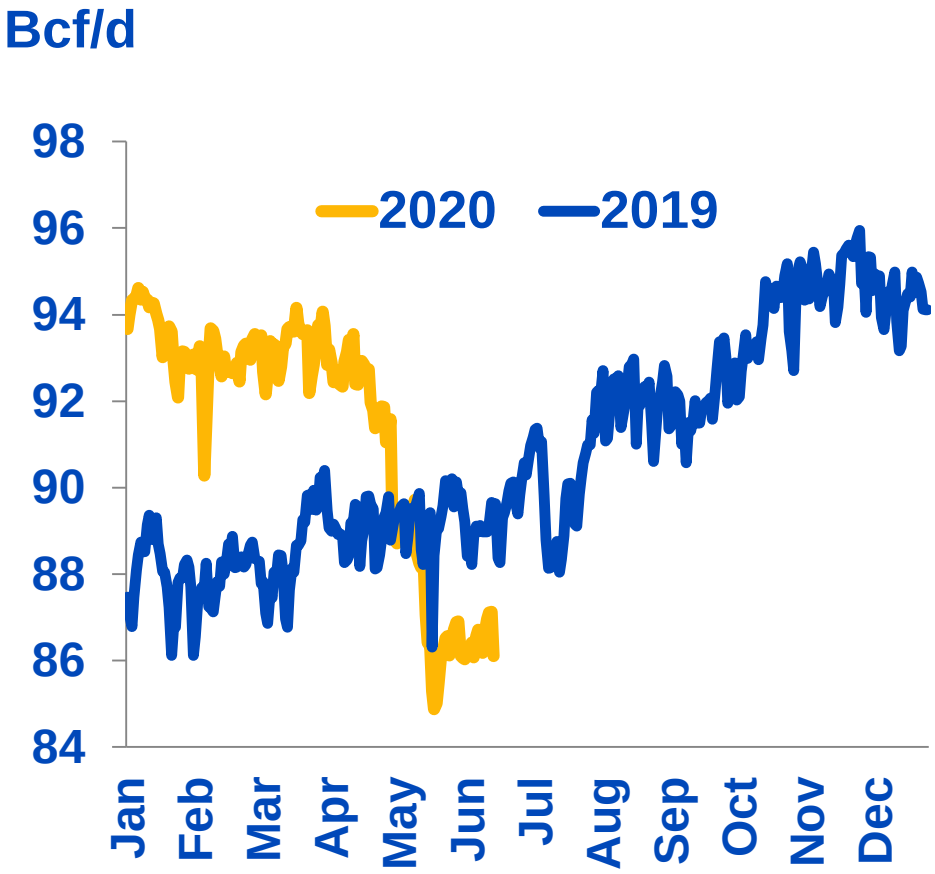


Rigs Running in Select Basins

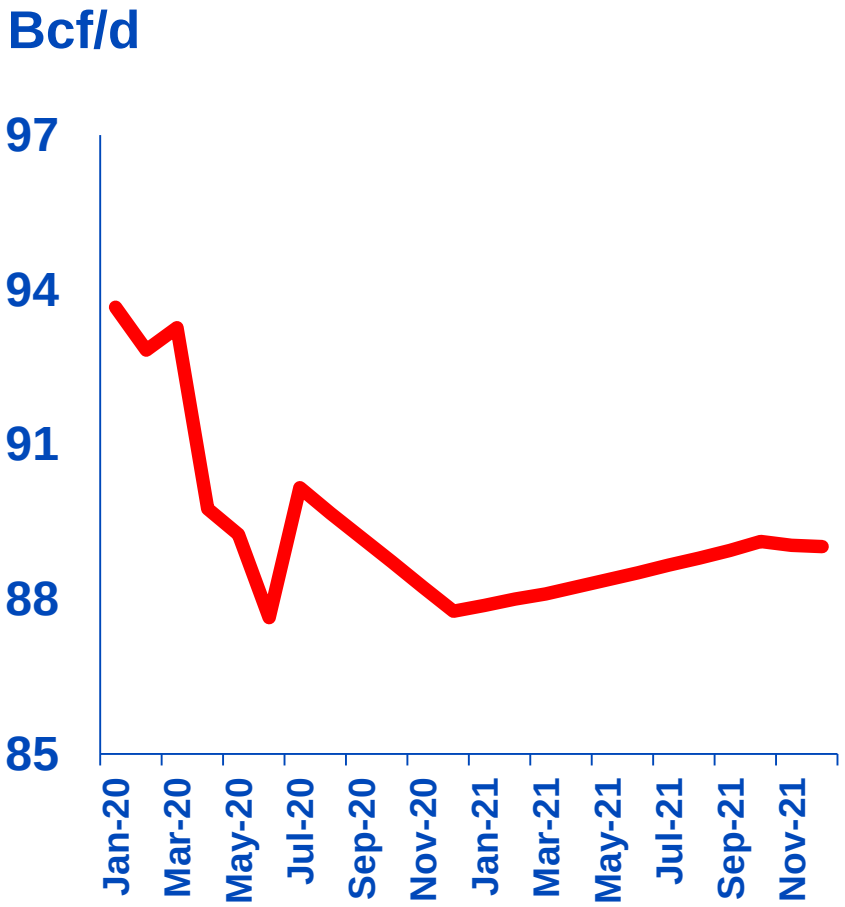


Gas production is expected to fall ~9% by year end

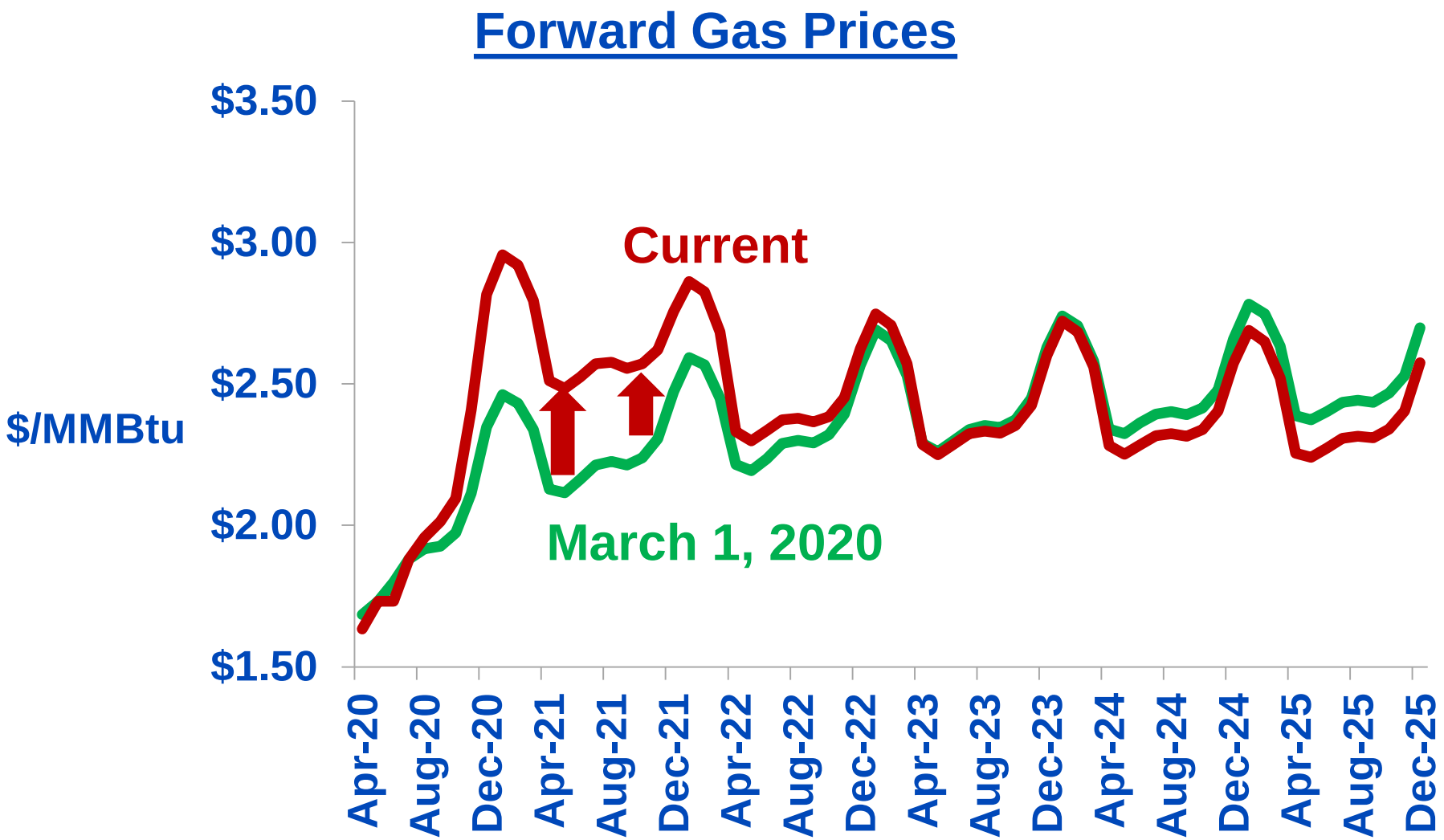
Historical Gas Production



Forecast Gas Production

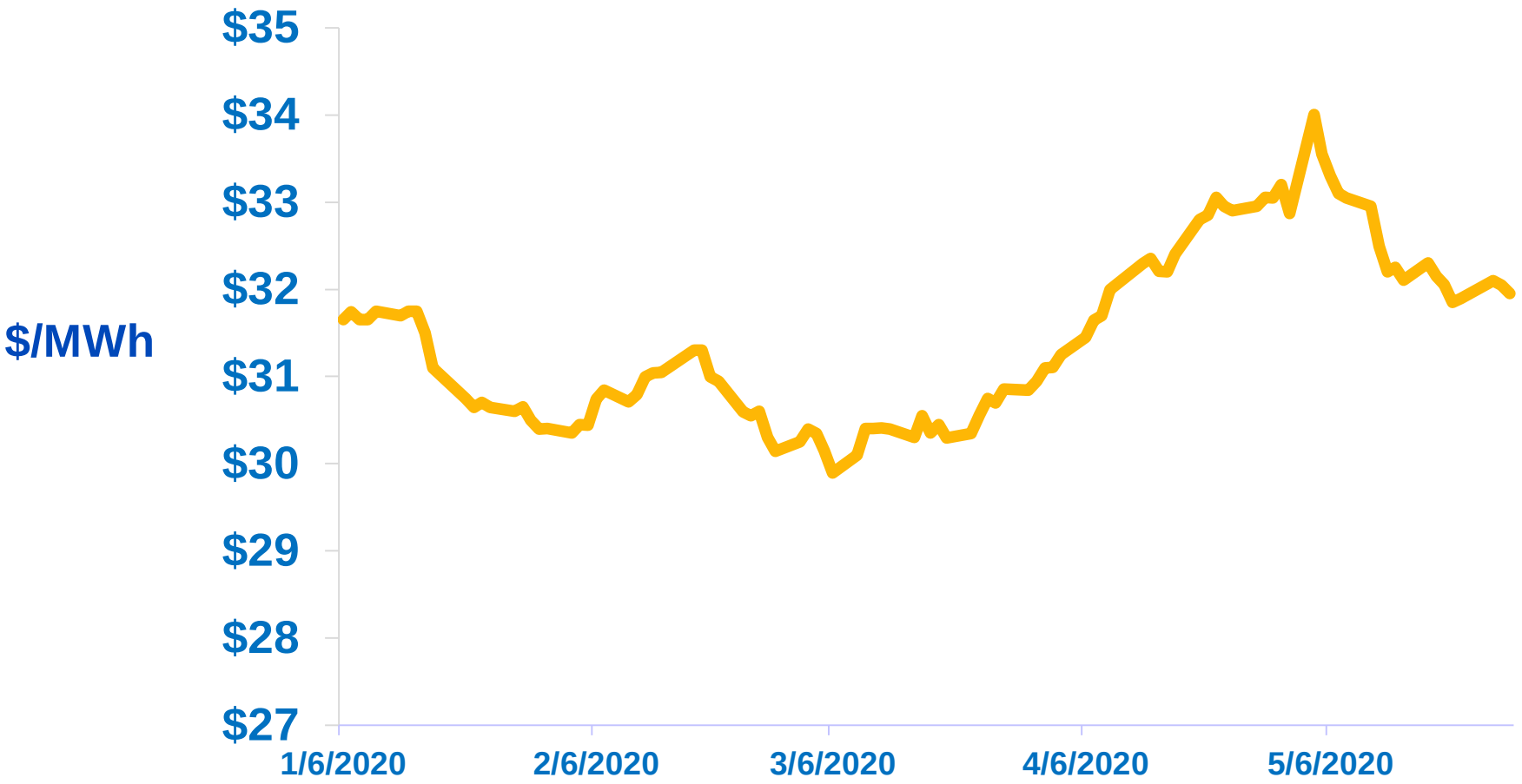


Forward gas prices are reflecting falling supply



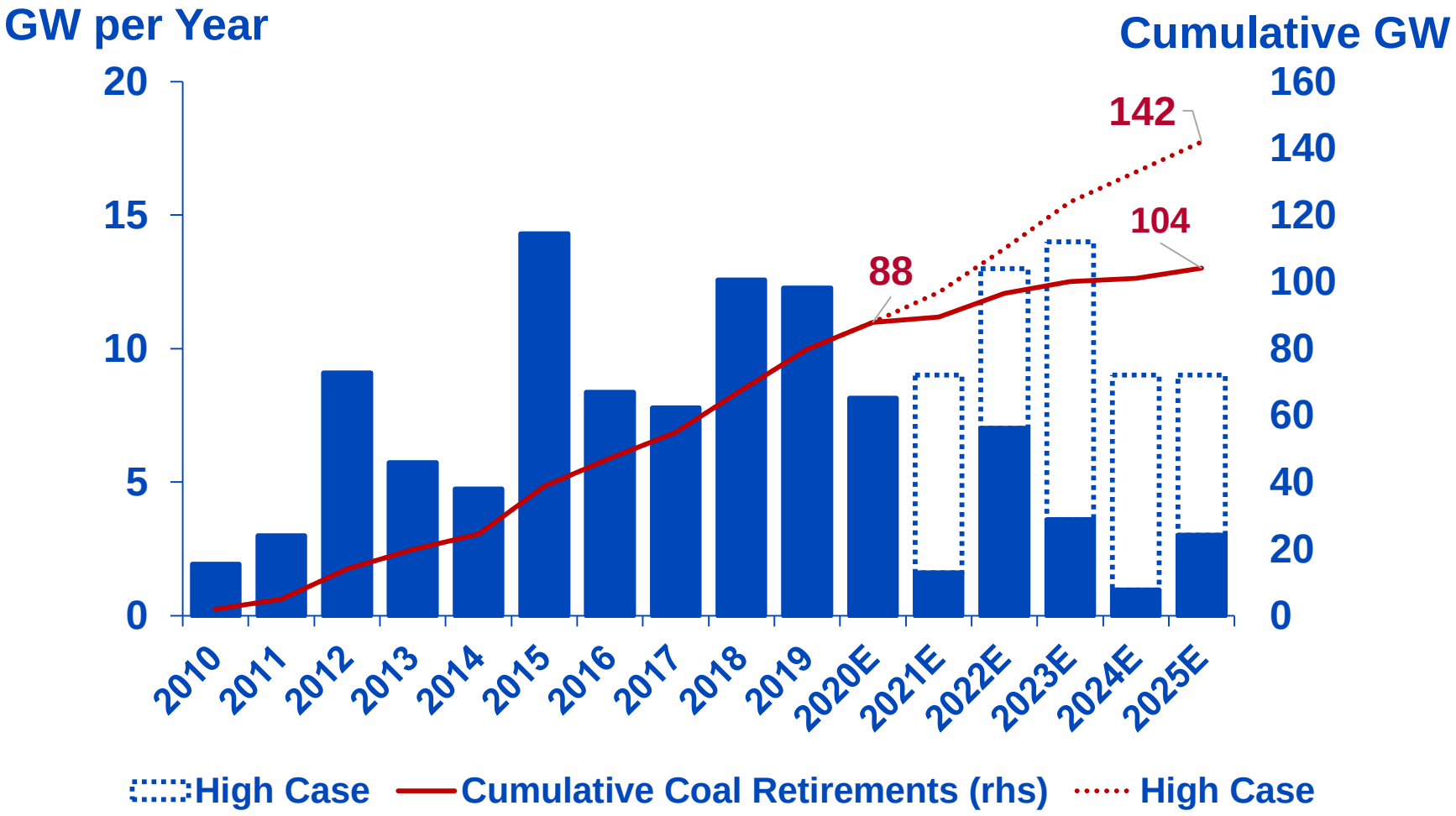
Forward power prices are rising with forward gas prices

MISO-Indiana Hub 2021 On-Peak Power Prices



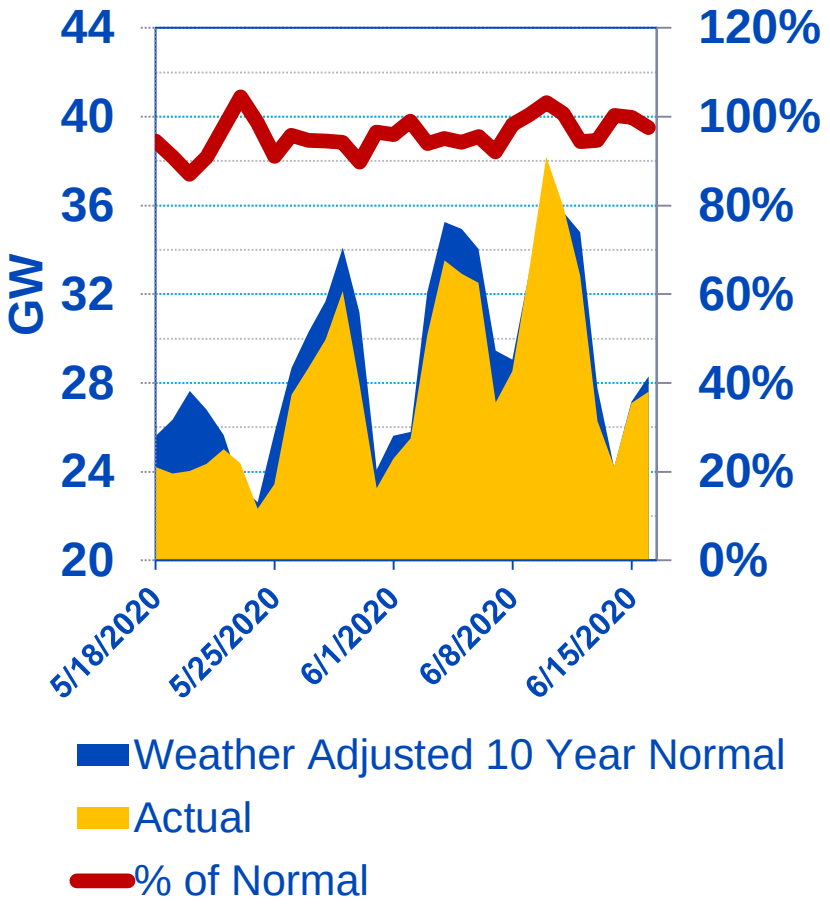
Low power prices are continuing to force near-record coal retirements; ~half of the 300 GW U.S coal fleet will likely be retired by 2030

U.S. Coal Retirements

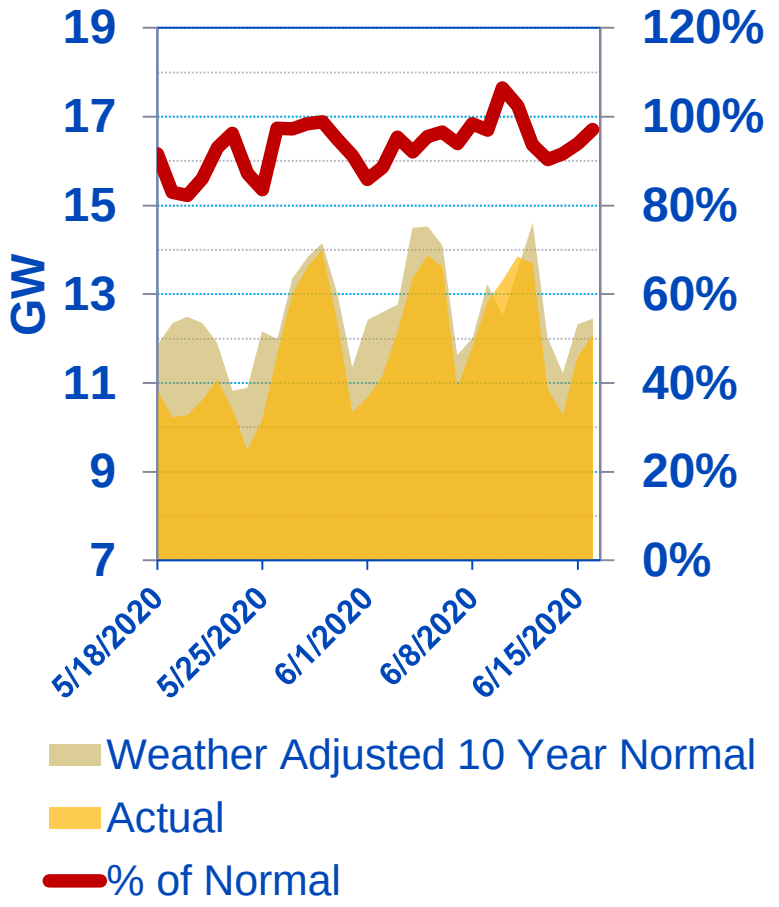


Power loads have been affected by closed schools and businesses; May U.S. power demand down ~8% but recovering

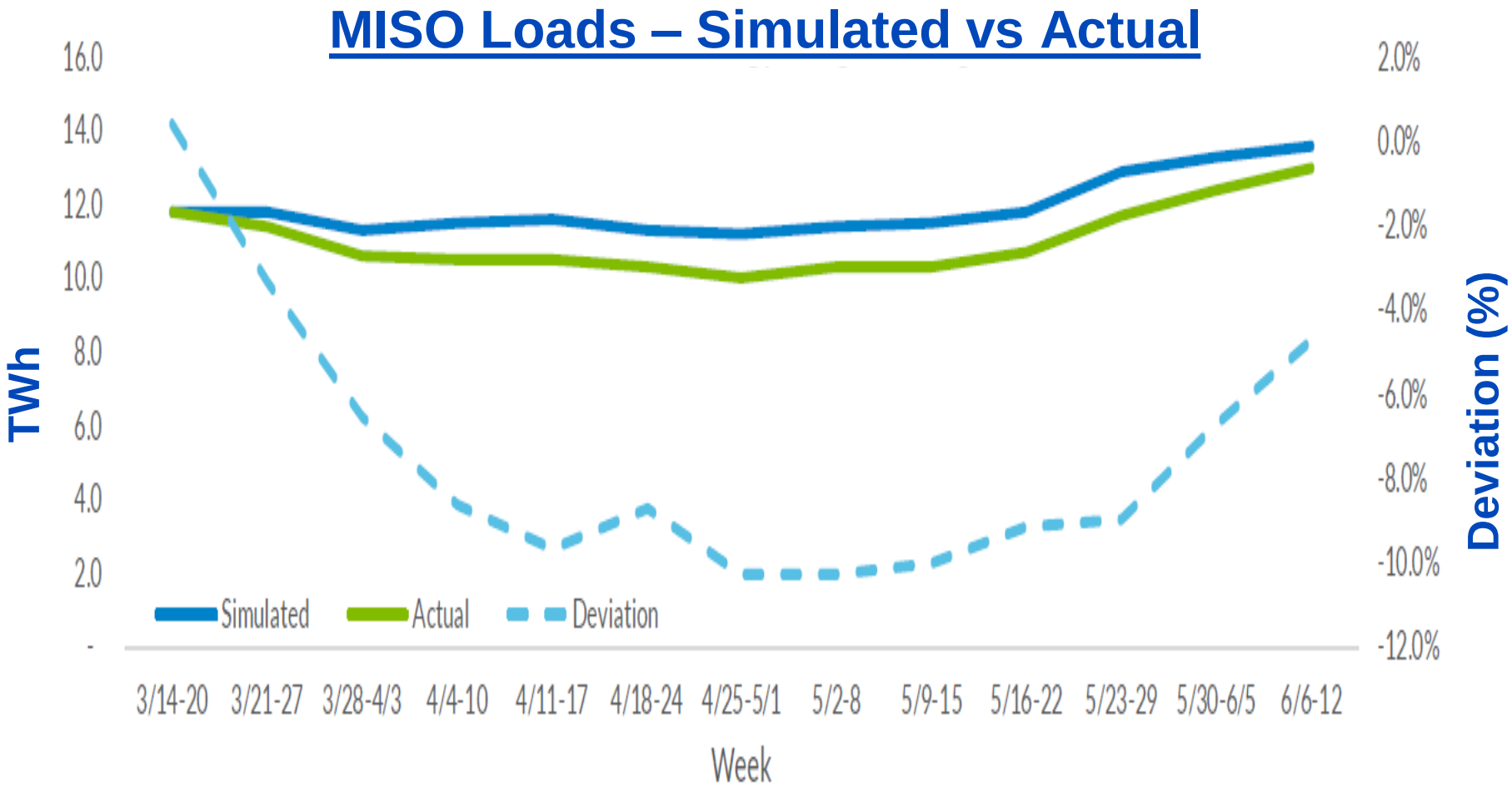
PJM Loads



NEPOOL Loads



Midwest power loads have been affected by closed schools and businesses, but have been recovering



Industry sources suggest there will be demand for over 200 GW of renewables in the U.S. by 2030 driven by a combination of economics, regulatory requirements, and voluntary goals

Wind and Solar Demand Drivers

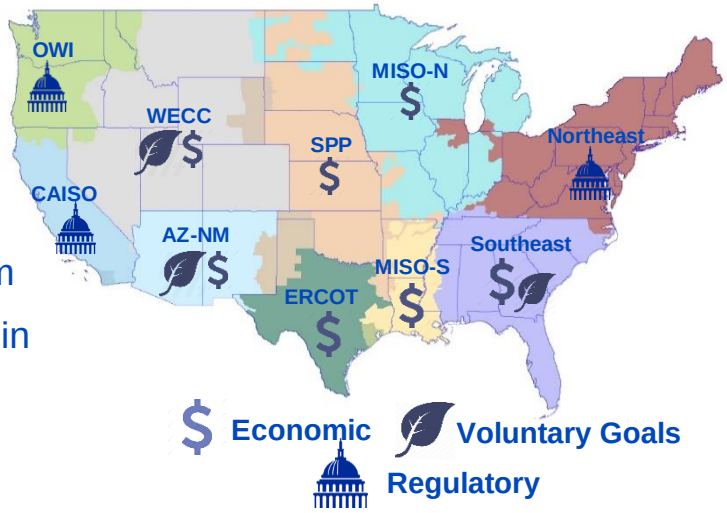
Near Term (2021-2024)

- **Economics** remain the key driver through 2024, with renewables the least cost resource in much of the country
- **Regulatory requirements** drive modest demand in the near term as the next wave of clean energy goals accelerates slowly
- **Voluntary goals** are driving strong demand in the near term, but growth may decelerate if the economy slows

Long Term (2025-2030)

- **Economies** of scale, co-location, and persisting cost declines partially offset PTC/ITC reduction in the long term
- **Regulatory requirements** will create significant demand in the long term as clean energy standards gain momentum
- **Voluntary goals** are expected to follow economics with continued opportunities for C&I solar across the south

Primary Drivers of Long-term Renewable Demand

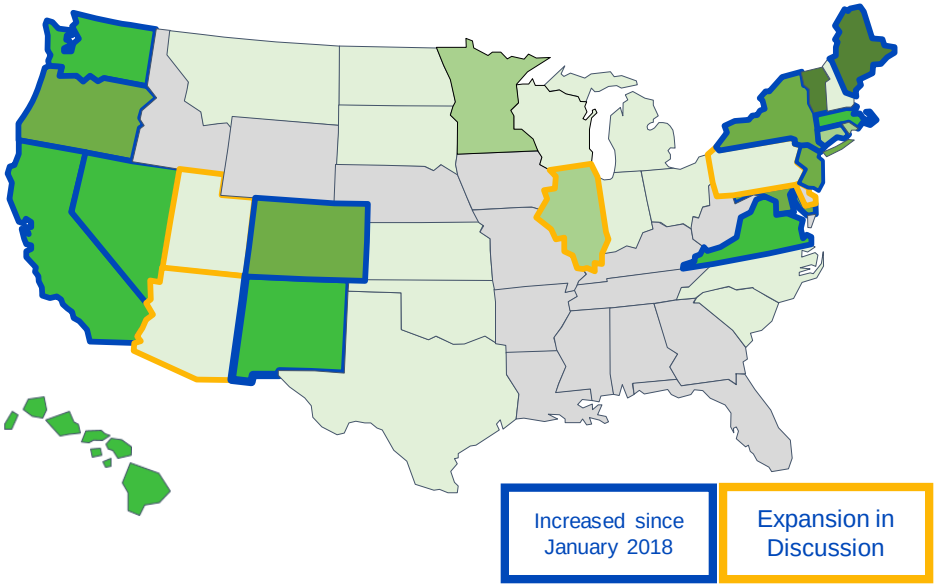


As incentives roll off, regulatory requirements will re-emerge as a key driver of long-term renewable demand

Accelerating clean energy goals will create significant renewable demand after incentives expire

Wind and Solar Demand Drivers – Regulatory

2050 RPS and Clean Energy Goals



100% = 7 States & DC	75% - 99% = 2 States	50% - 74% = 5 States	25% - 49% = 5 States	0% - 24% = 15 States	No Standard = 14 States

- **14 states have raised clean energy goals since 2018, with 7 states now targeting 100%(1)**
  - The most recent addition is Virginia, where IOUs must serve 100% of load w/carbon-free sources by 2050
- **5 additional states are in discussions to further expand clean energy policies(2)**
- **Northeastern and western states will see the largest impact**
  - Northeast: 35 GW by 2030
  - West: 36 GW by 2030

Proposed expansions of clean energy policies could create the demand for an additional 22 GW of new renewables by 2030

1) CA, NV, NM, WA, NY, ME, and VA have adopted 100% "carbon-free" goals, which typically include hydro and nuclear generation in addition to traditional renewables
2) AZ, IL, PA, DE, and UT have RPS or clean energy proposals pending

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Renewables and battery projects are increasingly included in IRPs as planners implement better techniques for modeling battery resources with high levels of renewables

Regulatory Supported Economics[1,2]

PacifiCorp

2019 IRP proposed 650 MW of storage by 2023 and 750 MW in 2028-2030, replacing 2.8 GW of coal capacity

MN

Regulatory rejection of Xcel plan to purchase 575 MW gas plant

IN

Regulatory rejection of Vectren's 850 MW gas plant proposal

MI

Regulatory rejection of DTE IRP; asked to reconsider early retirement of coal units

CA

Load serving entities to procure 3.3 GW of clean energy capacity by 2023, with 50% by 2021, to replace retiring units

VA

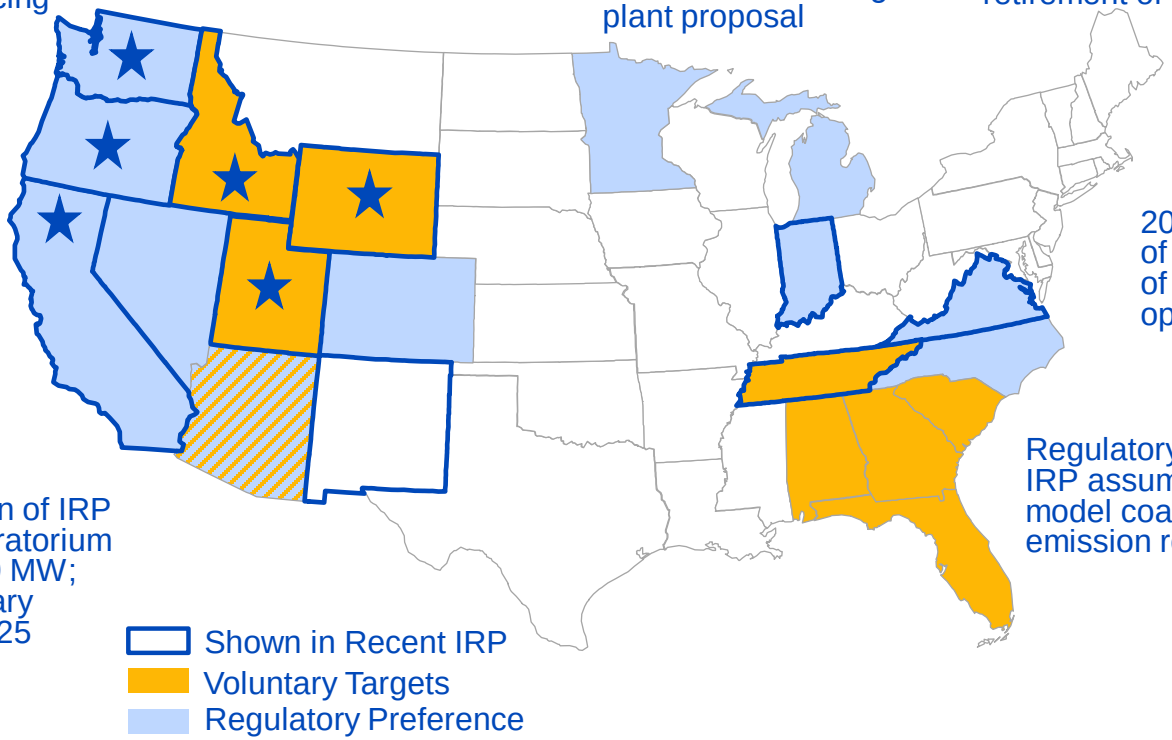
2018 regulatory rejection of Dominion IRP for lack of renewable resource options

NC

Regulatory rejection of Duke IRP assumptions; asked to model coal retirements and high emission reduction scenarios

AZ

2018 regulatory rejection of IRP filed by IOU; placed moratorium on new gas plants >150 MW; APS announced voluntary target of 850 MW by 2025



1) Sourced from EQ Research IRP-as-a-Data Service (April 2020). Data reflects 77 utility IRPs that are predominantly IOUs and large CCAs. Supplemented by data from Energy Acuity that includes coverage of public power and Co-ops
2) Chart includes utilities with >= 20 MW of battery storage in their most recent IRP Preferred Plan

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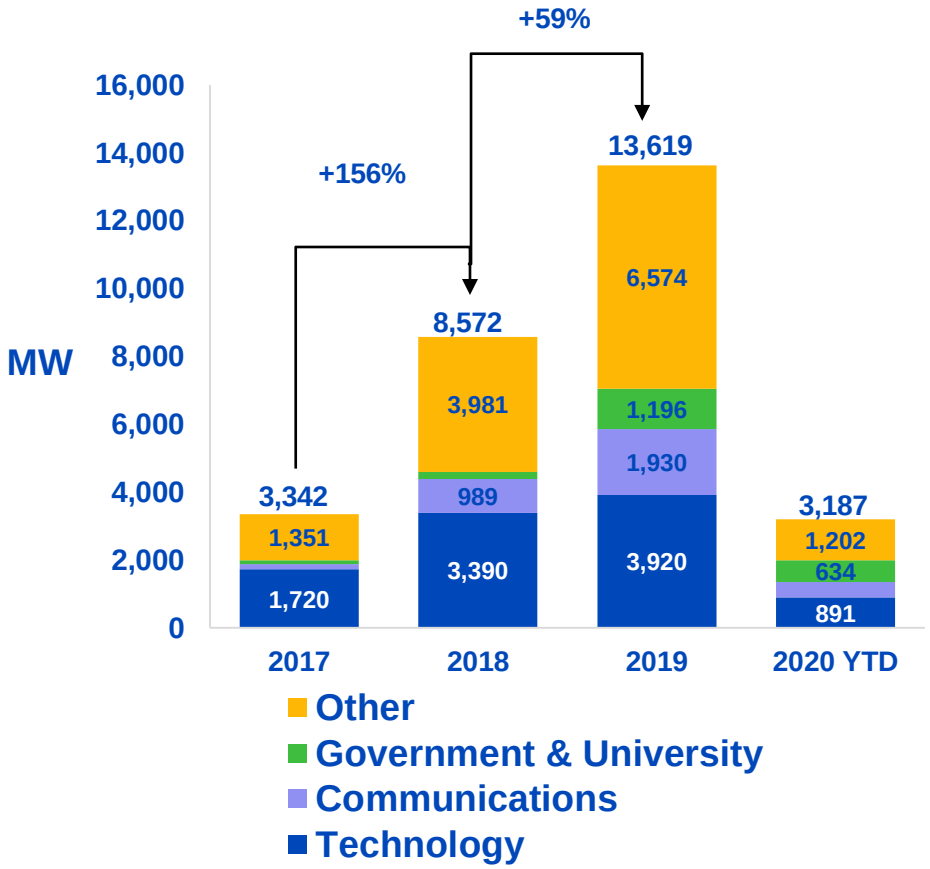
Outside of RPS states, municipal, commercial, and industrial voluntary goals will contribute to demand growth

Wind and Solar Demand Drivers – Voluntary Goals

C&I Renewable Deals by Signing Year



- **Voluntary buyers procured 13.6 GW(1) of wind and solar in 2019; more expected in 2020 with an increasing share of solar**
  - Procurement from smaller C&I customers surpassed Green-Tech(2) in 2019
  - Solar accounted for 58% of signed capacity in 2019; increasing solar share expected in 2020
  - Storage interest is growing but volumes remain small for now
- **C&I demand growth may slow in the near term but is expected to remain robust in the long term**
  - New wind deals are likely to slow in 2020 with declining PTCs
  - Over 50% of contracted capacity procured by technology, communication, gov't & university sectors may be spared coronavirus impact
    - Surge of remote work may spur incremental data center demand
  - Companies in retail and consumer products sectors may slow buying (accounted for ~25% of 2019 demand)

1) Data includes green tariff deals
2) Large-scale technology and data companies such as Apple, Facebook, Amazon, Microsoft and Google, that have heavy data center loads and corporate clean energy targets

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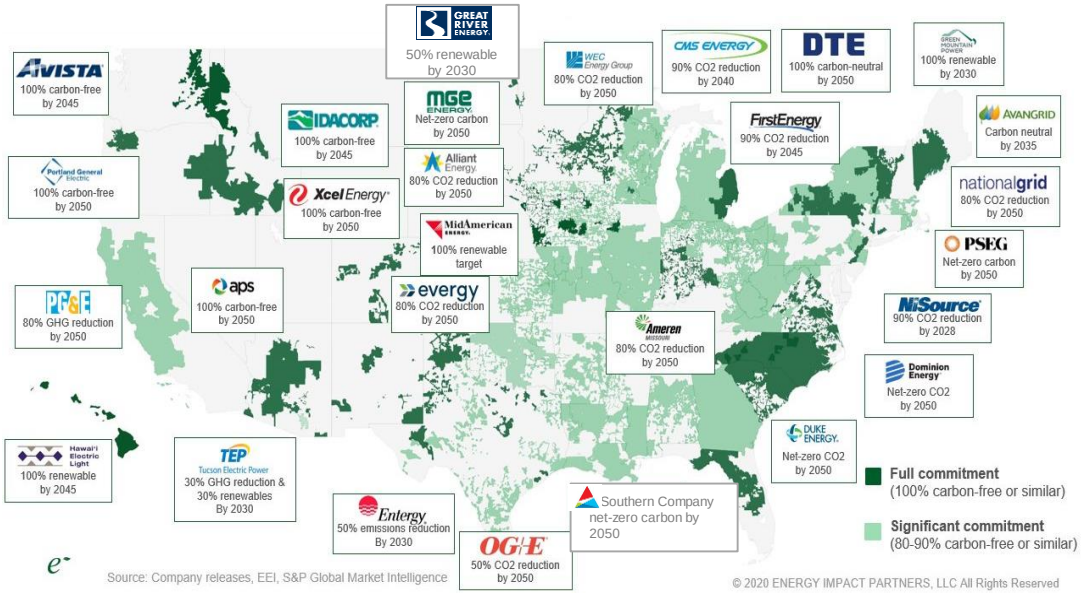
Utilities across the country are setting voluntary emission reduction goals

Wind and Solar Demand Drivers – Voluntary Goals

Utilities with Emission Reduction Commitments



- **Over 20 utilities have adopted voluntary carbon reduction targets; goals expected to be achieved largely by renewable generation**
  - **Economics**: Many utilities are attracted by the low cost of renewable generation
  - **Customer demand**: Strong public and customer preference for clean energy is pushing utilities to commit beyond policy requirements
  - **Investor**: ESG measures are becoming widely adopted by institutional investors and rating agencies in evaluating companies--a trend that could impact long-term cost of capital

We are seeing strong commitments from utilities outside of RPS states, especially in regions where fossil fuel is dominant

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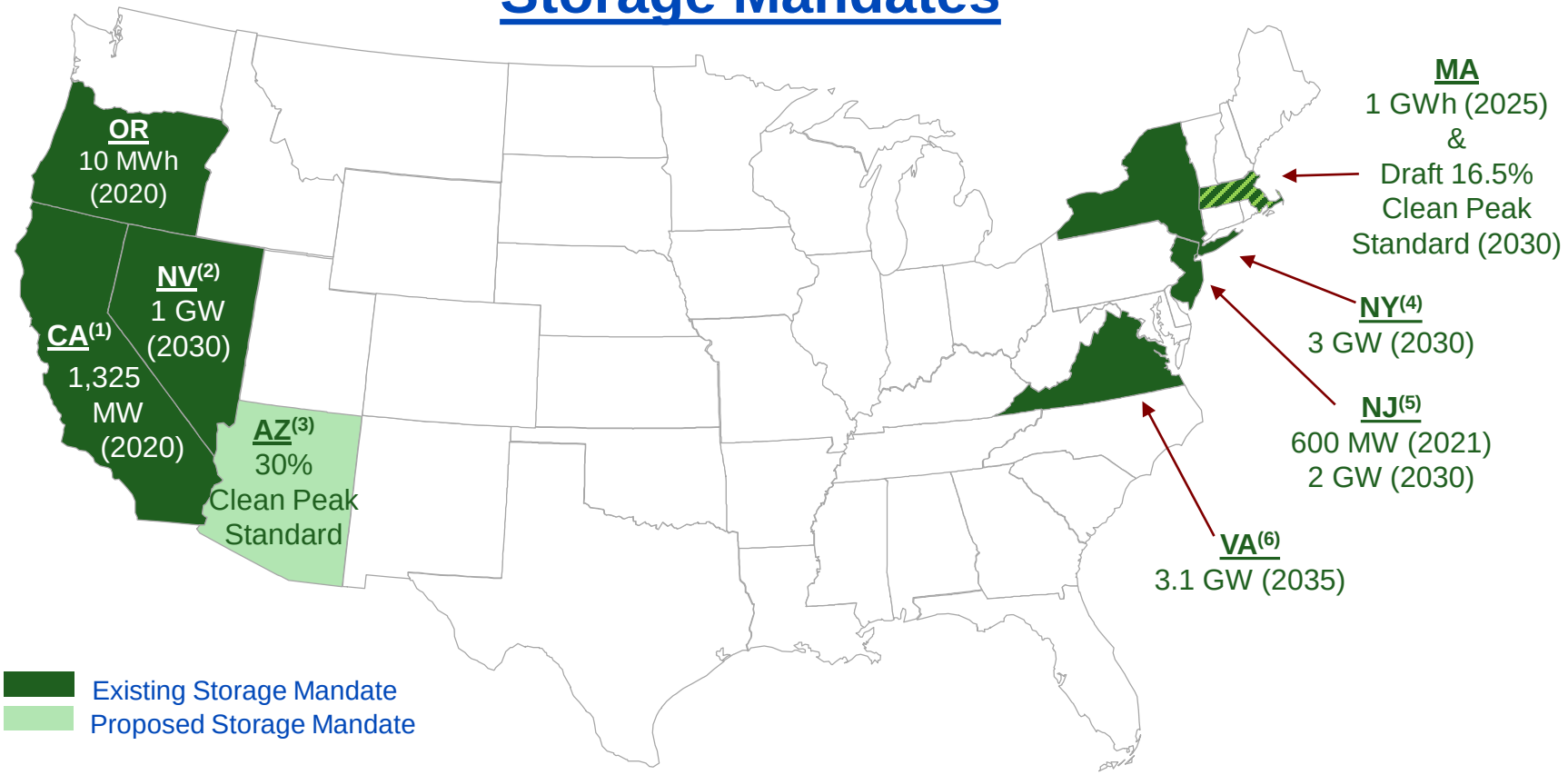
State procurement targets will drive more than 7 GW of battery energy storage systems by 2030

Storage Mandates



1) Additional mandate for 500 MW of behind-the-meter storage resource to be procured by IOUs by 2024
2) NV Energy procured 690 MW of storage last year
3) Proposal by CPS would require 30% of peak period retail sales to come from clean sources including nuclear. APS and SRP share of Palo Verde accounts for more than 10% of Arizona peak load
4) 706 MW is contracted
5) Approximately 250 MW is operating/contracted
6) 400 MW by Appalachian Power and 2.7 GW by Dominion Energy, including Dominion proposed 800 MW of PSH for 2027 COD

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