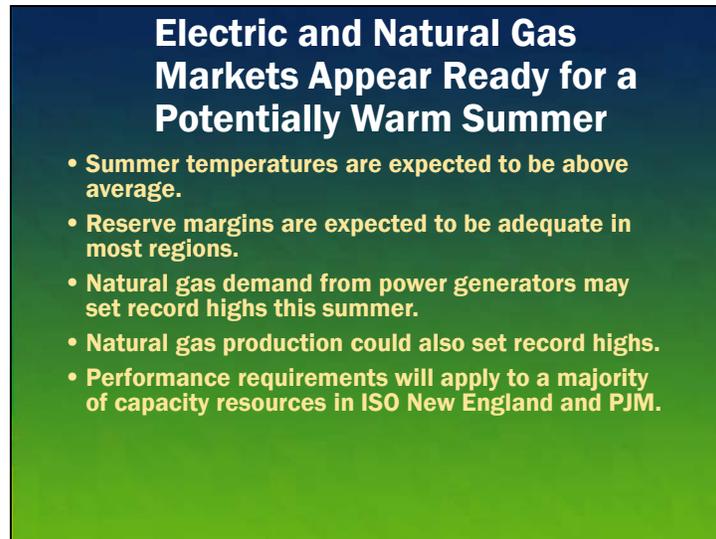


Item A-3 Presentation:

Slide 1



“Good morning Mr. Chairman and Commissioners.



Electric and Natural Gas Markets Appear Ready for a Potentially Warm Summer

- **Summer temperatures are expected to be above average.**
- **Reserve margins are expected to be adequate in most regions.**
- **Natural gas demand from power generators may set record highs this summer.**
- **Natural gas production could also set record highs.**
- **Performance requirements will apply to a majority of capacity resources in ISO New England and PJM.**

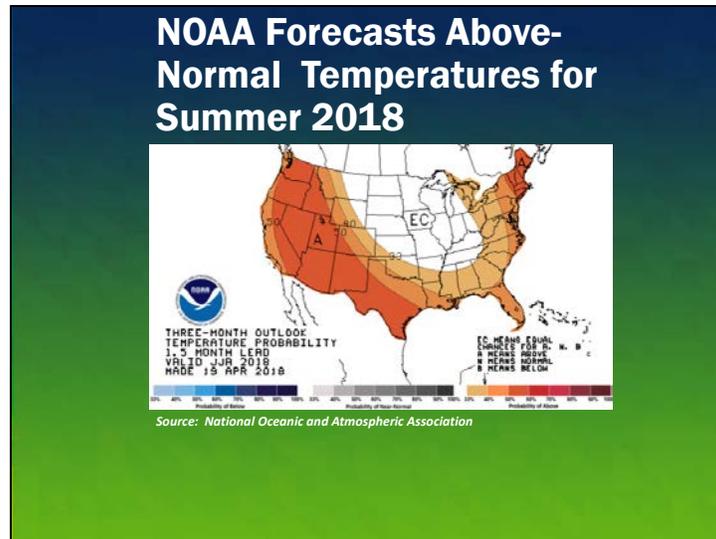
“The Office of Electric Reliability and the Office of Enforcement are pleased to present the 2018 Summer Assessment. This is staff’s high level summary of the reliability challenges that are anticipated in the coming operating season and staff’s corresponding assessment of electric and natural gas markets as we head into the summer months. We will discuss current and future trends, as well as how recent developments may influence market outcomes.

“Please note that some information in this presentation comes from NERC’s 2018 Summer Reliability Assessment which will be released at a later date and is still subject to change. The National Oceanic and Atmospheric Administration (NOAA) forecasts a warmer than average summer for most of the country.

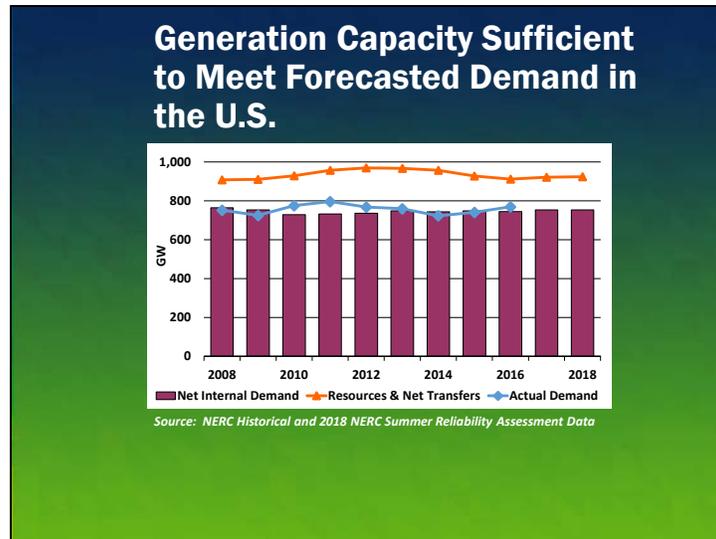
“The North American Electric Reliability Corporation (NERC) Regional Entities anticipate that power resources will be able to meet the reference margin levels in most regions this summer. The Electric Reliability Council of Texas (ERCOT), however, anticipates its reserve margin will be below its reference margin level.

“In Southern California, lower-than-average hydro generation may create challenges as natural gas-fired generation, the replacement for hydro production shortfalls in past years, may be limited due to reduced gas storage capacity and local pipeline outages in the region. Nationwide, this may be a record summer for natural gas demand for electric generation. EIA forecasts that natural gas production will climb to near record highs.

“Performance requirements for all capacity resources in ISO New England will take effect on June 1, while over 80 percent of capacity resources in PJM will be subject to a performance requirement for the upcoming capacity year.



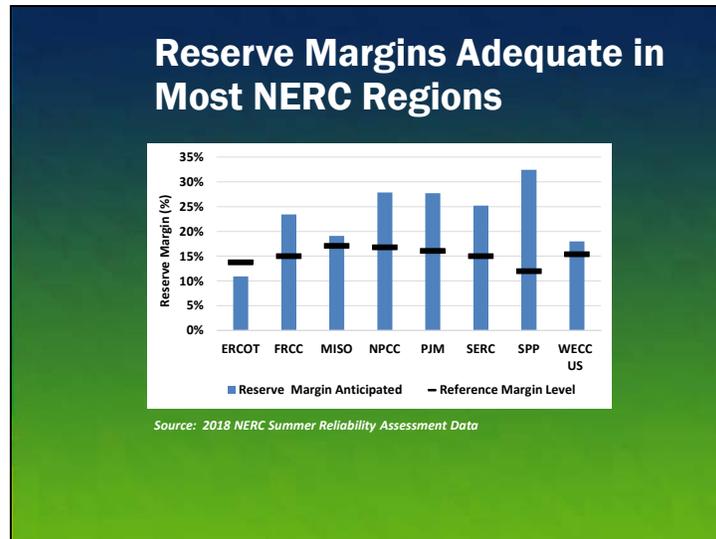
“NOAA forecasts an above-normal chance for higher than average temperatures for the West, South, and East for June, July, and August. The expectation for higher than average temperatures is greatest in New England and along a band running from West Texas through the Pacific Northwest.



“The NERC Regional Entities forecasted net demand for electricity to be approximately the same as it was last summer. The projected lack of growth in the net peak is mainly attributable to the higher implementation of demand response in certain areas, and an increase in behind-the-meter distributed energy resources.

“Over 25 GW of new generating capacity plans to enter commercial service through the end of the summer period. A majority of the capacity additions will come from natural gas-fired and renewable resources, such as solar and wind.

“Approximately 14 GW of generating capacity has retired since May 2017, including approximately 10.8 GW of coal-fired capacity and 2.3 GW of natural gas-fired capacity. Notable coal retirements within the past six months include the 1,187 MW Big Brown, 1,980 MW Monticello, and 1,282 MW Sandow power plants in Texas. In addition, the 1,358 MW St. Johns River Power Park coal plant in Florida retired this year.



“The NERC Regional Entities’ data indicates that planning reserve margins for most assessment areas will be adequate this summer. The columns shown on this chart display the anticipated reserve margins for the markets and regions, while the black bars indicate the reference margins.

“ERCOT anticipates that its reserve margin will be 10.92 percent, which is below its reference margin level of 13.75 percent. According to the ERCOT summer assessment, significant resource changes since last summer have reduced reserve margins in ERCOT, including the retirement of 4,449 MW of coal capacity in January and February 2018; the retirement of 806 MW of gas-fired capacity in late 2017; and delay in construction of new resources, totaling about 2,100 MW, that will not be available to serve load during the peak.

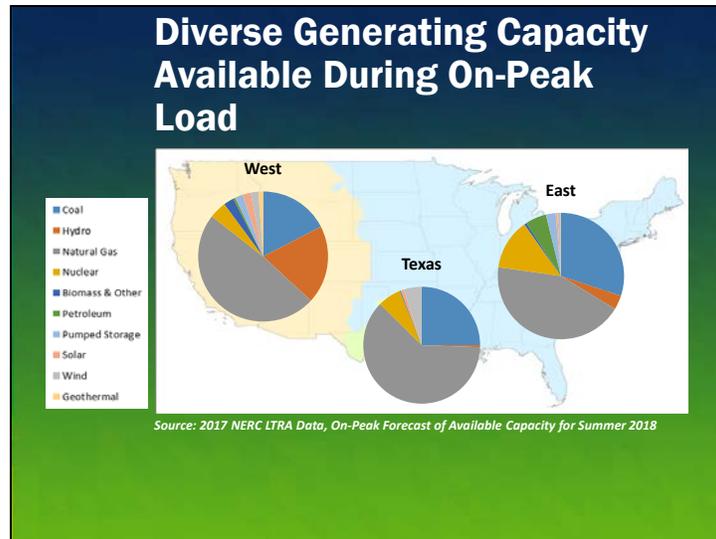
“ERCOT expects to have sufficient operational tools to manage tight reserves and maintain system reliability. Those operational tools include deploying ERCOT- contracted load resources and emergency response services, using a previously mothballed unit expected to return to service in May 2018, requesting power across the existing DC ties, calling on generating resources that can switch between the Eastern Interconnection and ERCOT, and block-load transfers with SPP and MISO. There are also voluntary actions that consumers and market participants may take, such as conservation, operating distributed generation, and price responsive demand response.

“MISO’s reserve margin for summer 2018 is projected to be 19.1 percent, which is two percentage points higher than the reference margin level of 17.1 percent. Since last summer in

MISO, some large units retired, but these were offset by additions. With a reserve margin of 19.1 percent, MISO does not anticipate reliability issues for the normal forecast for the upcoming season. In addition, MISO's Summer Assessment studies system reliability for both high-outage and high-load scenarios. For these conditions, MISO expects to rely heavily on demand response.

“Finally, the summer 2018 reserve margin for the portion of WECC that is mostly CAISO is projected to be 20 percent, which is 5 percent higher than the reference reserve margin of 15 percent. Generally, CAISO expects an adequate supply for normal load and supply forecasts. However, CAISO's 2018 Summer Loads and Resources Assessment expects tighter supply conditions if high-load and below-average hydroelectricity production conditions occur. CAISO indicates that it expects demand response and consumer conservation to mitigate tight supply conditions in that scenario.

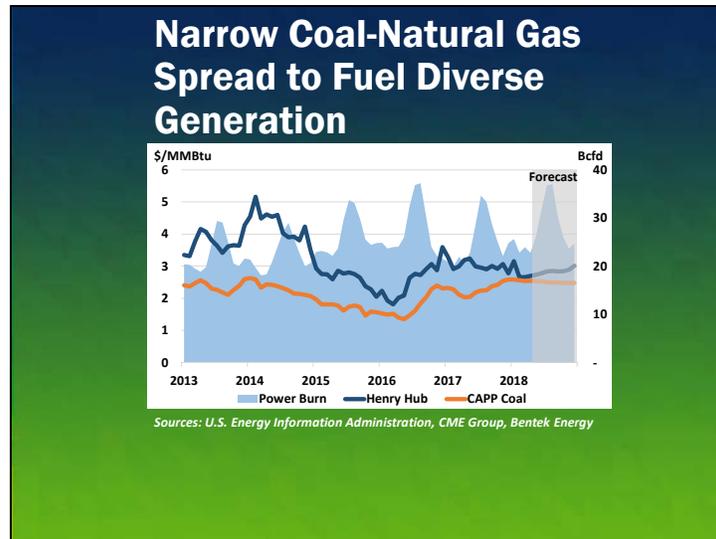
“In the Mid-Atlantic and Northeast regions, as well as SPP and Florida, reserve margins appear to be more than adequate, ranging between 5 and 10 percent above reference levels.



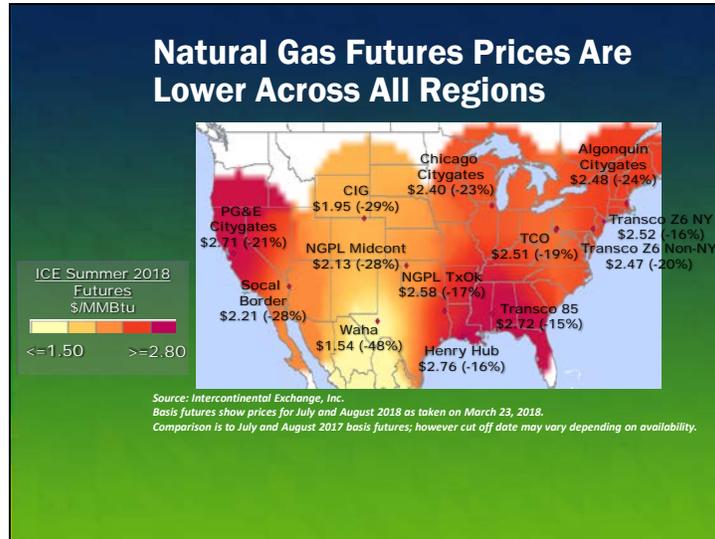
“This graphic shows a breakdown of this summer’s expected generating capacity to be available on peak by primary fuel type across the Eastern, Texas, and Western Interconnections. Looking more broadly at the nameplate capacity additions forecasted to occur during the summer period (May 1 through September 30), the Eastern Interconnection expects to add approximately 11,286 MW of natural gas-fired capacity, 4,835 MW of solar photovoltaic capacity, and 2,476 MW of wind capacity, based on ABB Velocity Suite.

“ERCOT expects an additional 355 MW of gas capacity to be added by September 30, 2018, which is the end of ERCOT’s summer “peak load season.” Also, ERCOT expects an additional installed renewable capacity of 1,348 MW to be added by September 30, 2018 including 961 MW coming from wind and 387 MW from solar.

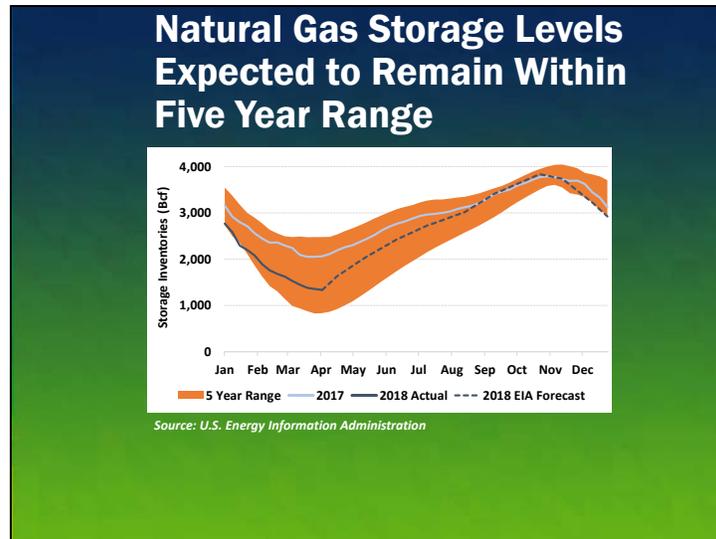
“Finally, WECC anticipates installed capacity additions in the Western Interconnection of 319 MW of natural gas, 570 MW of solar photovoltaic, 968 MW of wind capacity, and 568 MW of hydro capacity by the end of 2018.



“This summer could see near-record-high gas demand from natural gas-fired power generators. EIA forecasts natural gas power burn to average 35.16 Bcf through June, July, and August, just 0.3 Bcf less than the record high natural gas power burn set in the summer of 2016, and 3 Bcf higher than last year. The addition of over 16,000 MW of new capacity to the natural-gas fired generator fleet since the record highs in 2016 and relatively low natural gas prices contribute to expectations for strong natural gas generation this summer. Futures prices for Central Appalachian (CAPP) coal are less than \$2.50/MMBtu, while the Henry Hub natural gas futures summer strip reaches as high as \$2.87/MMBtu.



“Summer 2018 natural gas futures prices are generally lower compared to those for summer 2017. At \$2.76/MMBtu, Henry Hub summer futures prices are down \$0.52/MMBtu, or 16 percent, compared to a year ago. The difference between the summer futures prices around the country and the futures price at the Henry Hub, also known as basis, fell for most domestic natural gas production regions, except for Transco Zone 4 which is up \$0.03/MMBtu from last year and Dominion South which is up \$0.08/MMBtu from last year.



“Natural gas storage inventories began the injection season on April 1, at 1,354 Bcf, about 350 Bcf less than the 5-year average. This is the largest deficit to the 5-year average at the start of an injection season since 2014.

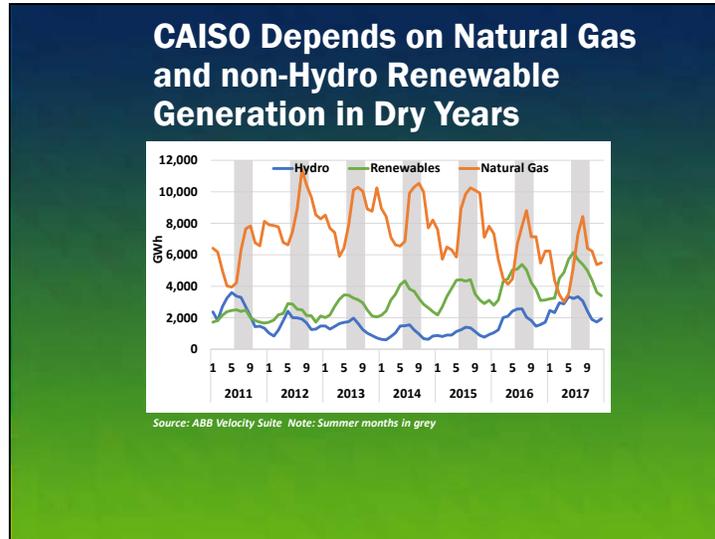
“Growing gas production from fields in Appalachia, Texas, and elsewhere increased U.S. output to record highs. In March 2018, the U.S. produced 84.9 Bcf/d of marketed natural gas, a year-over-year gain of over 8 Bcf/d. Continued production at this volume should position the market to meet summer demand and adequately restock storage inventories. Specifically, EIA forecasts that inventories will grow to about 3,800 Bcf by November, which is within the 5-year range.

Performance Requirements Will Apply to a Majority of Capacity Resources in PJM and ISO New England

- **PJM and ISO New England are adopting performance requirements in their capacity markets.**
- **PJM and ISO New England assess penalties when providers fail to perform in specified hours; give rewards to over-performers in those hours.**
- **No Performance Assessment Hours have been declared in PJM since the program began.**
- **ISO New England Pay for Performance rules start June 1.**

“Both PJM and ISO New England are implementing changes to their three-year forward capacity markets to enhance reliability through market incentives. These changes alter capacity markets in both regions to compensate and/or penalize capacity suppliers based on how well they perform when called upon by system operators during shortage conditions. Resources that fail to perform during these shortage conditions will have compensation subtracted from their capacity revenues, while those resources that over-perform in providing energy and reserves will receive additional compensation. In the two delivery years thus far in which some resources in PJM have been subject to Capacity Performance rules, there have been no shortage conditions that triggered an assessment of penalties or rewards.

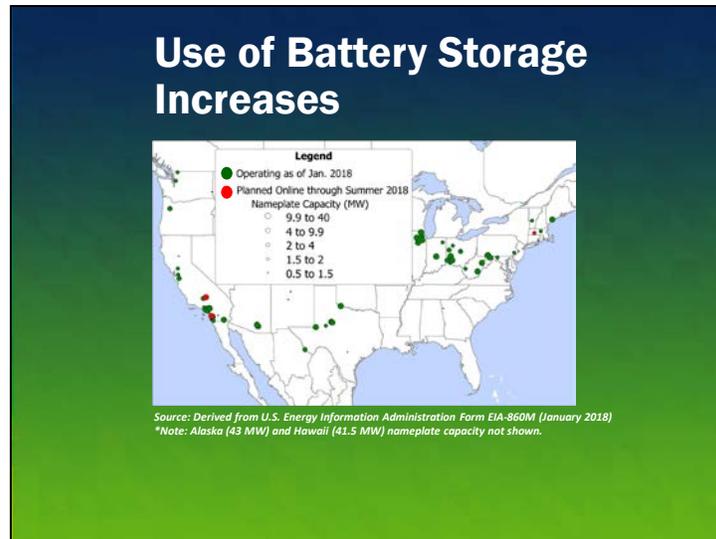
“PJM is phasing in its Capacity Performance; the program now encompasses 80 percent of the total capacity requirement. After one more transition year, 100 percent of resources must meet the Capacity Performance rules in delivery year 2020-2021. ISO New England’s Pay for Performance program imposes similar performance obligations and will apply to all capacity resources beginning June 1, 2018.



“Hydroelectric generation to serve the California ISO depends on precipitation, especially snow pack, in the months leading up to the spring and summer. This year, snowpack in the Pacific Northwest topped normal levels, but fell well below normal in California. With warmer than normal temperatures forecasted for this spring, the snowpack may melt faster than usual, reducing the amount of hydro generation available during the coming summer months to help meet peak electric demand.

“Historically, CAISO has increased use of natural gas fired-capacity and imports to offset lower hydro generation levels. However, natural gas supply limitations in southern California this year may affect CAISO’s use of its natural gas generation fleet and present some risk to CAISO’s markets and operations this summer. Distribution level pipeline outages in southern California could affect the amount of natural gas that can be supplied to power plants and can hamper the movement of natural gas into storage.

“Limited operations at Aliso Canyon natural gas storage facility, plus state rule changes reducing the rate at which natural gas may be injected and withdrawn from storage, may complicate pipeline operations.



“Electric battery storage is deployed across the U.S., with the largest number of installations in PJM and California. As of January 2018, 720 MW of battery storage capacity was in operation nationwide, an increase of 30 percent from the previous year. An additional 63 MW is expected by this summer. According to EIA, 88 percent of battery storage capacity provided frequency regulation, 28 percent served as ramping/spinning reserve, and 23 percent provided voltage or reactive support to the transmission system in 2016, with some serving more than one function during the year.

Conclusions

- Capacity and fuel availability appear adequate in most areas.
- ERCOT expects tight capacity conditions, but has mapped out procedures to maintain grid reliability.
- Lower-than-usual hydro production will affect the Western generation mix and may put upward pressure on energy prices in California.
- Adequate natural gas supplies in most regions will support anticipated gas generators' needs.

“Staff’s analysis of the energy reliability and market conditions and trends going into this summer indicate that most regions appear prepared for the expected summer demand. Areas worthy of attention as we proceed through the summer season are hydro and natural gas availability in Southern California and total generating capacity in ERCOT.