

[Slide 1 Title Slide]



Winter 2018-19 Energy Market Assessment

Item No.: AD06-3-000 | October 18, 2018

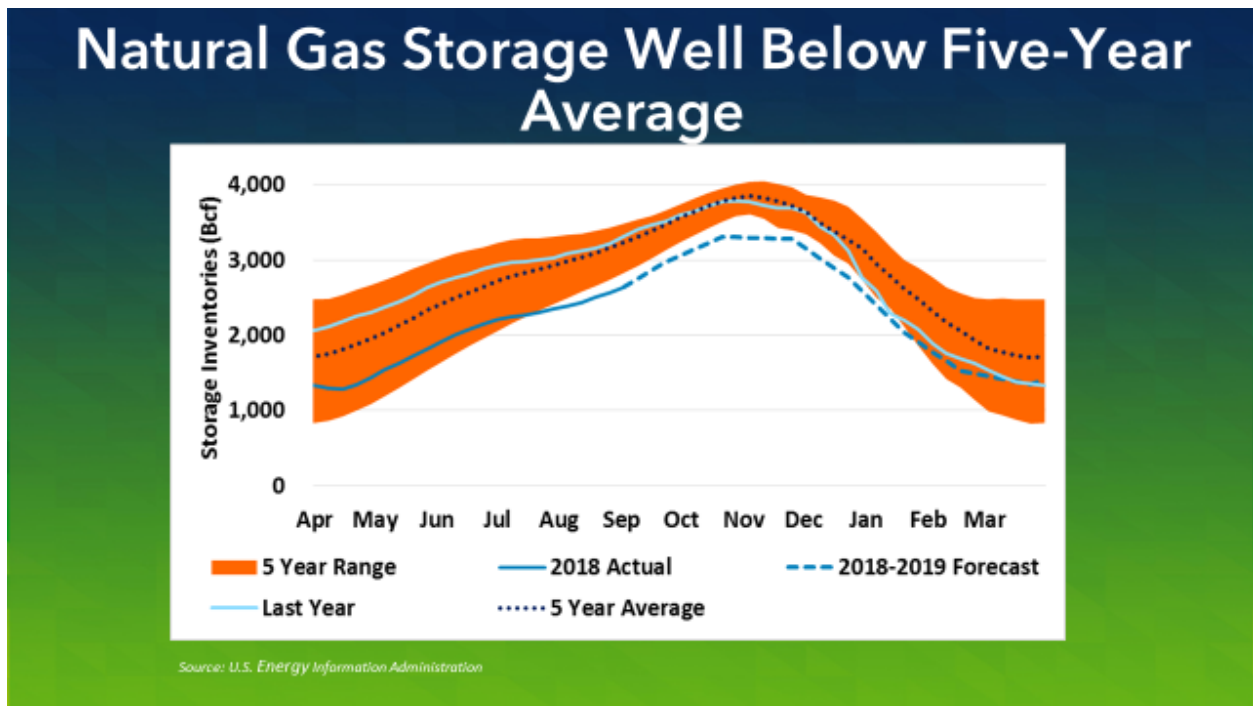
[Slide 2 Intro Side]

Introduction

- NOAA forecasts a warmer than average winter.
- Regional pipeline constraints in New York City, Boston, and Los Angeles increase the risk of price volatility.
- Winter reserve margins exceed the reference margins this winter for all assessment areas.
- Fuel security remains an area of focus given the increasing use of natural gas-fired generation capacity.

Good morning Mr. Chairman and Commissioners, the Office of Enforcement presents its 2018-2019 Winter Energy Market Assessment. The Winter Energy Market Assessment is staff's opportunity to look ahead to the coming winter and share its thoughts and expectations about market preparedness. The National Oceanic and Atmospheric Administration (NOAA) forecasts a warmer than average winter. However, a warmer than average winter may still have prolonged periods of cold temperatures that can stress natural gas and electricity markets despite reserve margins exceeding reference levels.

[Slide 3 Storage]

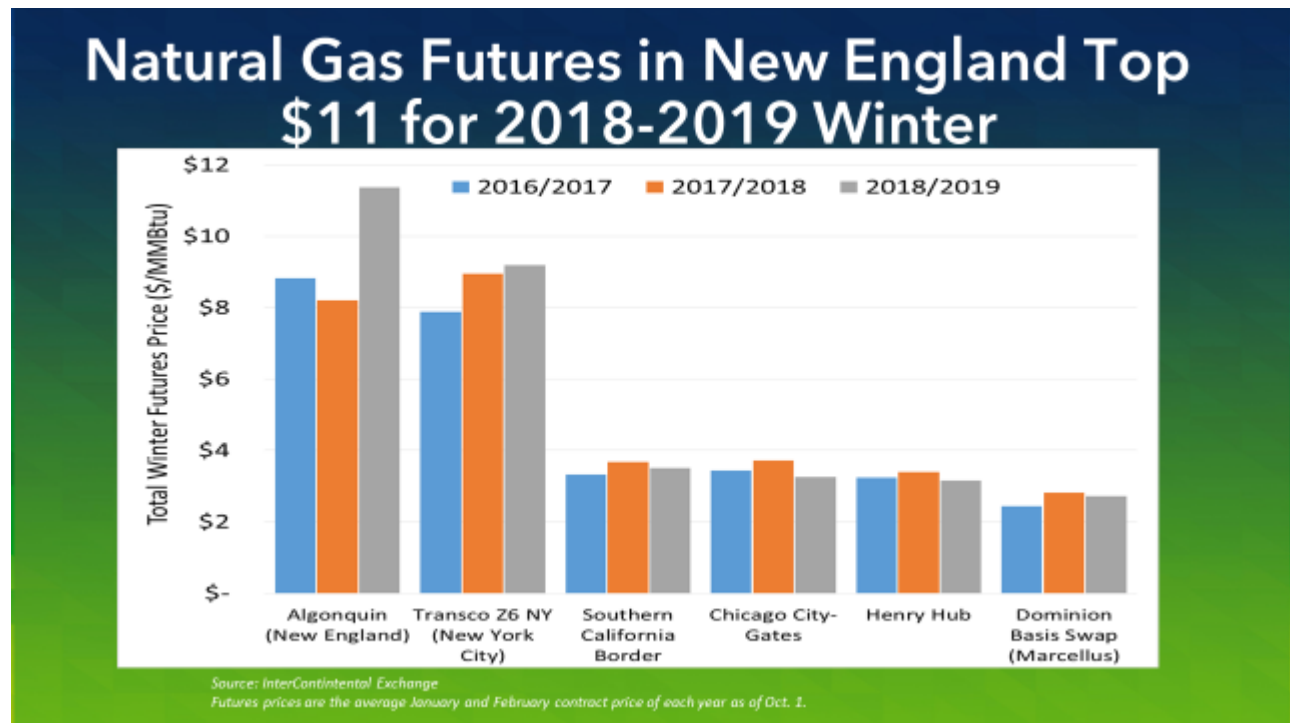


Natural gas storage inventories began the 2018 injection season in April at 1,354 billion cubic feet (Bcf), which is on the low end of the 5-year range and has carried over to lower storage volumes for this winter.

The Energy Information Administration (EIA) projects natural gas storage inventories to start the withdrawal season with 3,308 Bcf. This would be the lowest inventory level since 2005 and a 12.7 percent decrease from last year's level.

EIA forecasts that the storage deficit will decrease over the withdrawal season, with storage levels finally returning to levels within the 5-year range by the beginning of February.

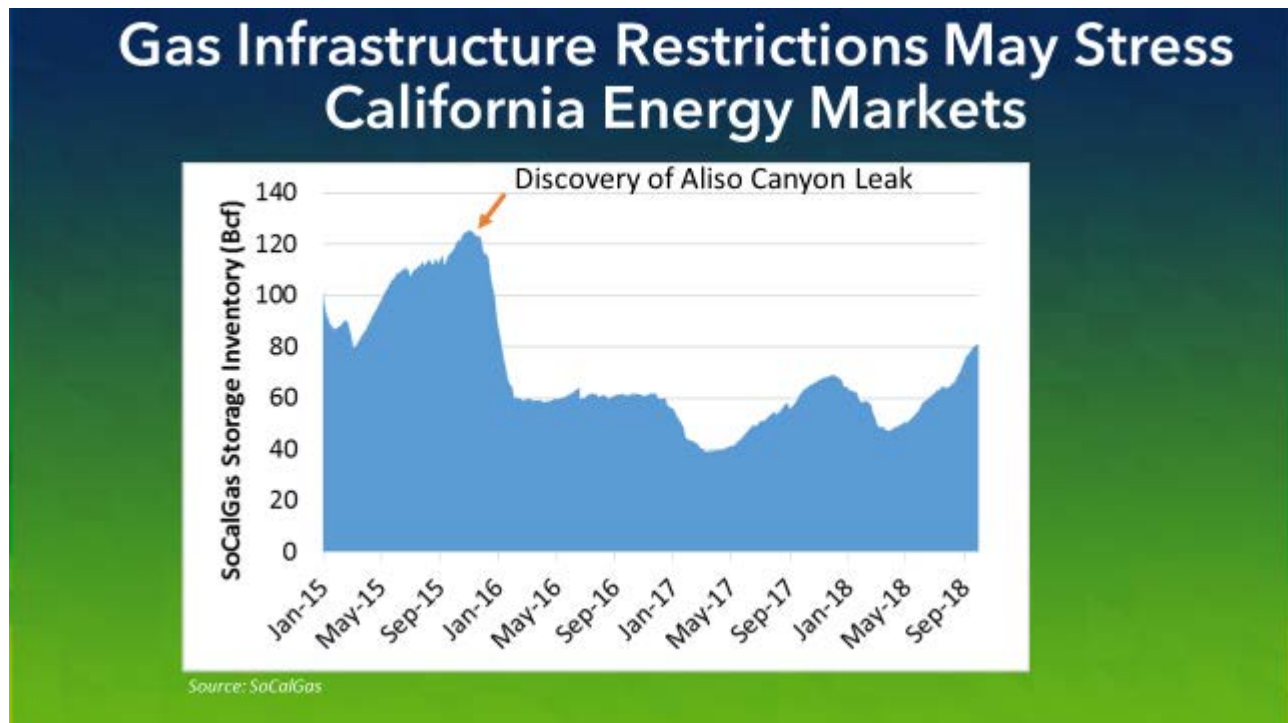
[Slide 4 Gas Futures Prices]



The graph above shows the total natural gas futures prices for the past and upcoming winters for regions across the U.S. As of October 1, 2018, the Henry Hub futures price, which measures the general cost of the natural gas commodity, was \$3.12/MMBtu, 24 cents below last winter's futures price measured on October 1, 2017. As a result, total prices across the U.S. (outside of New England and New York City) are lower than last year for the upcoming winter.

However, basis futures prices, which approximate the cost to deliver natural gas to regional markets this winter, have generally increased across the country. Basis futures prices in New York City and Boston averaged \$6.03/MMBtu and \$8.21/MMBtu, up \$0.47/MMBtu and \$3.40/MMBtu respectively from last year. This suggests a market expectation that both regions may face pipeline transportation constraints this winter.

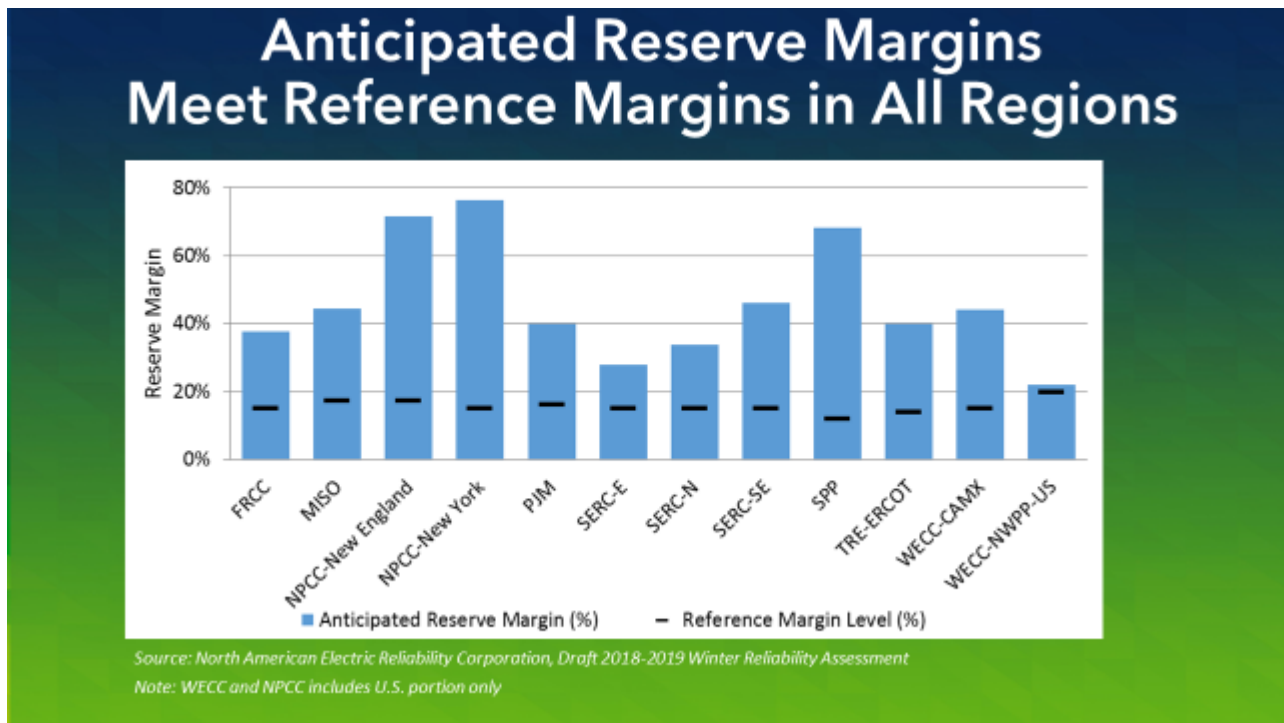
[Slide 5 Aliso Canyon]



Intrastate and distribution level natural gas infrastructure outages in Southern California are likely to impact natural gas and electricity markets this winter. Ongoing restrictions on Southern California Gas Company's (SoCalGas) Aliso Canyon storage facility currently limit working gas capacity to 34 Bcf, down 60 percent from the 86 Bcf capacity prior to the 2015 leak. Unplanned remediation work on SoCalGas's Line 4000 started on September 18, 2017, and a force majeure event related to a pipeline rupture on Line 235 began on October 1, 2017. Combined, these outages have reduced receipt point capacity in the Northern Zone of the SoCalGas system by approximately 1,070 million cubic feet per day (MMcfd).

The restrictions to Lines 235 and 4000 have impacted both deliverability of natural gas supplies as well as regional natural gas prices, and will likely continue to affect both natural gas and electricity prices this winter when regional gas demand peaks. The ongoing restrictions to natural gas pipelines and storage facilities increase the potential for natural gas curtailments this winter, but winter power system flexibility and cooperation between SoCalGas and CAISO should help maintain electric reliability.

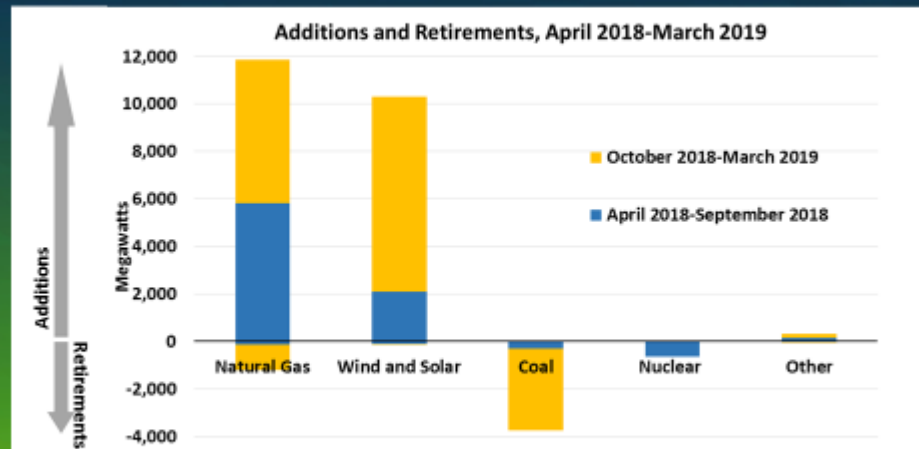
[Slide 6 Reference Margins]



In its preliminary 2018-2019 Winter Reliability Assessment, NERC estimates that reserve margins for all assessment areas will meet reference margins this winter. The columns on the chart display the anticipated reserve margins for the regions comprising the U.S., while the black bars indicate the reference margins identified by the RTO or reliability region. Although all regions are expected to maintain healthy reserve margins through the winter, reserve margins are not always guarantors of reliable operations during the winter. Staff notes that fuel availability, particularly natural gas and fuel oil can affect electric reliability, and must be monitored.

[Slide 7 Capacity Additions]

New Plants and Retirements Continue Shift Toward Natural Gas and Renewables



Note: Based on net winter capacity. Planned is all changes with effective dates October 2018-March 2019; excludes AK and HI.

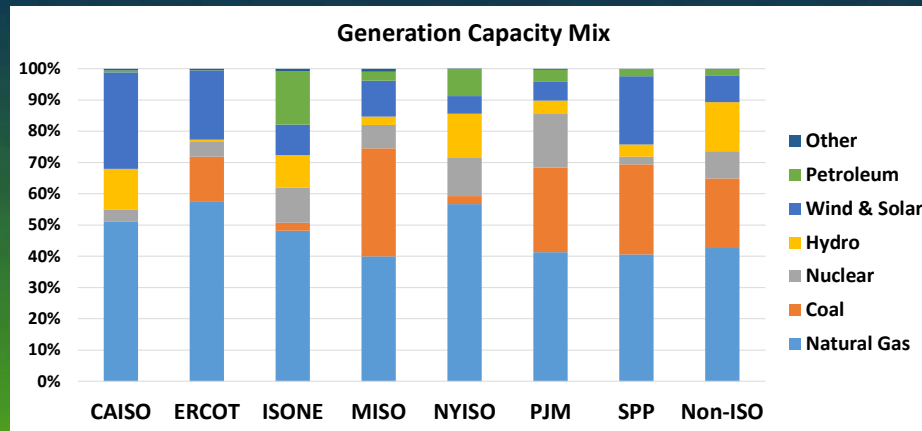
Source: U.S Energy Information Administration, Form No. 850M, June 2018

The largest share of planned capacity additions this winter are powered by natural gas, solar, and wind, according to EIA. PJM will see the most total capacity added this winter; these additions are predominantly natural gas-fired capacity. CAISO will add the most renewable capacity.

Expected retirements this winter include coal and natural gas-fired capacity, with most occurring in PJM. This follows retirement trends in recent years.

In recent years, nuclear power plant retirements have occurred in CAISO, ISO-NE, PJM, MISO, and SPP. For example, Oyster Creek nuclear power plant in New Jersey ceased operations in September 2018. In addition, the Pilgrim nuclear power plant in Massachusetts will operate through the 2018-2019 winter before closing at the end of May 2019.

Natural Gas Has a High Share of Capacity in RTO and Non-RTO Regions



Source: Resource to BAA mappings are as reported by EIA in Form 860M, June 2018.

Note: Percentages based on net winter capacity; excludes AK, HI, and resources that do not report a BAA. Includes resources with status of operating and standby.

An assessment of each region's preparation for the winter season should take into account capacity mix and fuel source. Nuclear and coal power plant retirements combined with natural gas power plant additions are resulting in an increasing reliance on natural gas-fired generation. This growing dependence is reflected in the high percentage of natural gas-fired capacity in both RTO and bilateral markets.

The widespread dependence on natural gas-fired generation is resulting in RTOs taking actions to ensure that there are adequate fuel supplies during extended cold weather. Both ISO-NE and PJM have amended their capacity constructs to reward resources that perform at high levels, and penalize resources who fail to perform under emergency conditions. Also, RTOs have instituted formal gas-electric coordination programs with pipelines serving natural gas power plants.

[Slide 9 ISO-NE's Market Rule Changes]

ISO-NE's Capacity Market Was Modified in Response to Fuel Delivery Issues

- Dependence on natural gas for power generation continues to increase.
- Pipeline capacity is limited and frequently operates at maximum capacity during cold weather.
- New England has limited natural gas storage capacity.
- Price responsive demand is fully integrated into the daily energy market.
- Pay-for-performance capacity market incentives take effect, replacing the Winter Reliability Program.

New England continues to be an area of notable attention for the winter months. The region has become increasingly dependent on natural gas for both home heating and power generation, yet pipeline capacity into the region is constrained.

Two major market rule changes were implemented on June 1, 2018, which have positive implications for ISO-NE's potential response to challenging winter conditions. The first is the full integration of price-responsive demand into the daily energy market.

The second is the introduction of the Pay-For-Performance capacity market incentives. These rules established protocols to reward resources that over-perform during shortage conditions on the regional power system by requiring underperforming resources to pay the over-performers.

Also, this is the first winter that ISO-NE will operate without its Winter Reliability Program, since its start in 2013-2014.

This concludes our presentation, and the complete 2018-2019 Winter Assessment will be publicly available on the Commission's website. We are available to answer any questions.