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1977-2017
CELEBRATING 40 YEARS
Winter 2017-18
Energy Market Assessment
Docket No. AD06-3 | Item No. A-3 | October 19, 2017

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Good morning Mr. Chairman and Commissioners. The Office of Enforcement presents its 2017-18 Winter Energy Market Assessment. The Winter Energy Market Assessment is staff's opportunity to look ahead to the coming winter and share our thoughts and expectations about market preparedness, including an assessment of risks. Natural gas markets are entering this winter with a strong storage base and an expanding pipeline network that is delivering more supply to local markets and beyond. A lag in natural gas production over the past year-and-a-half is expected to give way to renewed production growth as a result of increased drilling activity, while LNG projects in the Gulf and East coasts are expected to increase demand. Weather forecasts call for warmer than normal winter temperatures that look to moderate demand in the most sensitive markets, for example the Northeast, during the upcoming season. In the electric markets, electric capacity is sufficient in all regions based on current load forecasts. Since the extreme winter events of 2014, grid operators in the East have paid closer attention to winter readiness and reliability. For example, PJM and ISO New England continue to phase in performance requirements for capacity resources and the RTOS and ISOs have initiated other programs and procedures that focus on winter readiness. In the West, the Energy Imbalance Market (EIM) continues to expand this winter with the addition of Portland General Electric. These developments are expected to improve electric market operations in the winter months. Both the natural gas and electricity markets are unlikely to be impacted by long-lasting outages from hurricanes Harvey and Nate, which collectively forced the closure or reduced operations of more than 10 refineries in Texas and Louisiana in late August and early October, respectively.

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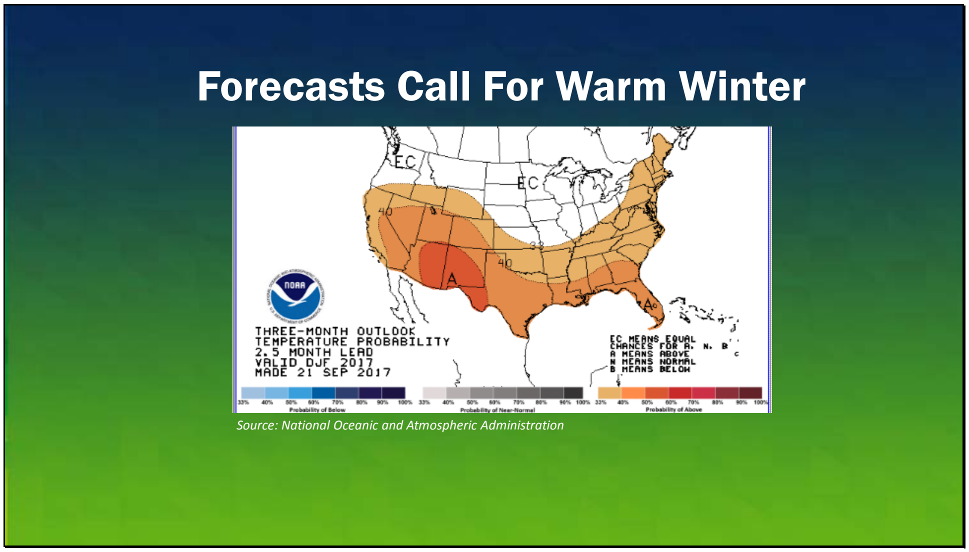

Current long-term temperature forecasts for the winter months indicate the greatest probability is for a warmer than normal winter throughout most of the continental United States. The National Oceanic and Atmospheric Administration, at this time, predicts that the El Niño-La Niña effect will be neutral this winter. A neutral effect generally means that average Pacific Ocean temperatures will have little influence on continental United States temperatures or precipitation. These forecasts suggest that fuel and electric demand will likely be moderate this winter. However, there is always the possibility of extreme weather events, which can dramatically alter short-term demand.

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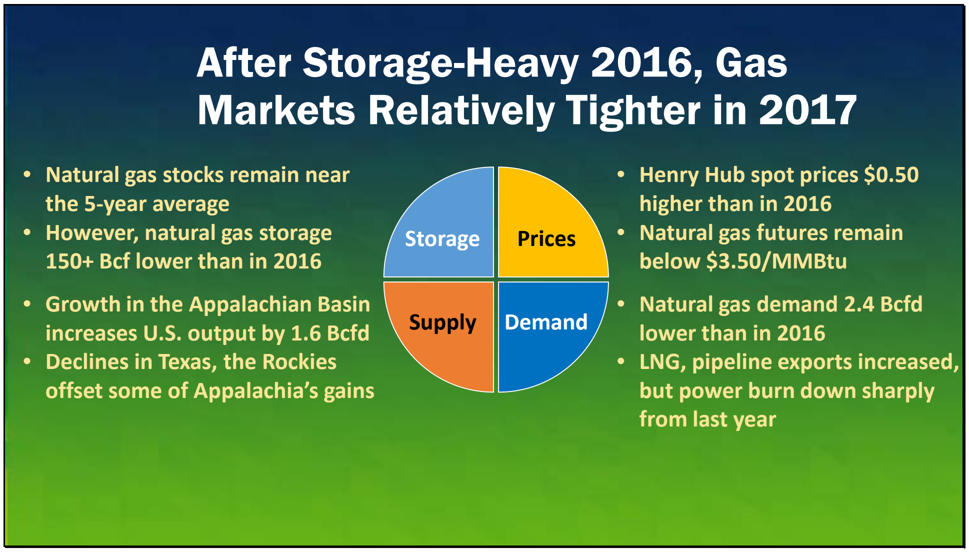

Thus far in 2017, the natural gas market has charted a very different course than in 2016. Where 2016 was dominated by an abundance of storage volumes that demand was slow to pare back, 2017 has seen slower production growth that has resulted in lower storage levels. However, these stocks are hovering near the five-year average, outweighing early October storage levels in five of the past 10 years. From this robust base, the natural gas market should be positioned to meet anticipated needs for natural gas throughout the winter. Of course, this outlook could be affected by unexpected major weather events or significant operational issues.

Compared to a year ago, spot natural gas prices today are averaging 50 cents higher at Henry Hub, making natural gas less competitive as a fuel source for power generation in some regions. However, gains in exports, such as pipeline deliveries to Mexico and LNG deliveries to international markets, have partially offset the domestic decline in demand. On the supply side, production gains have not been as strong as in 2014 and 2015, as decreasing output in Texas and the Rockies mitigated some of the production gains in Appalachia. Looking toward this winter, prices are likely to average at or near the low levels seen in 2016, outside of weather-driven peak days during which prices may surge higher.

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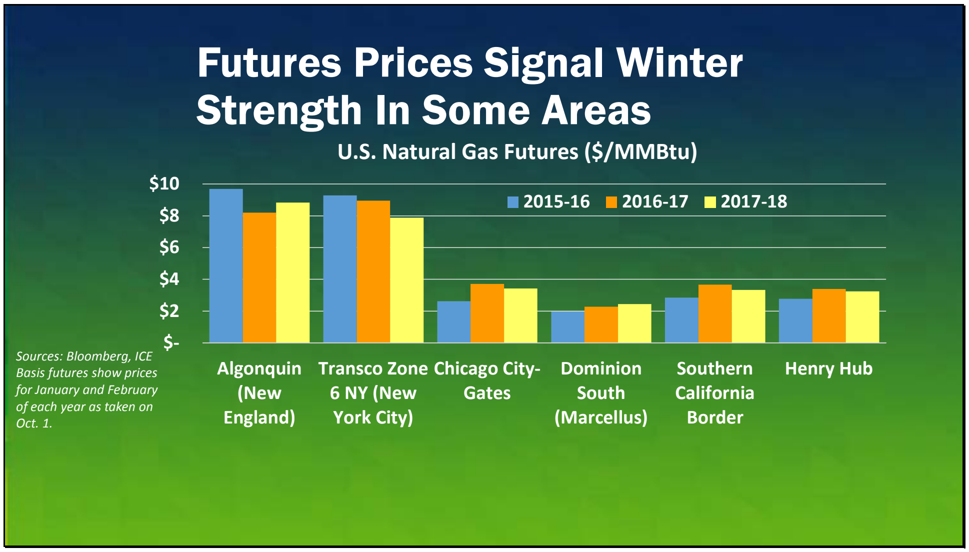

Basis futures prices are signaling market expectations for slightly higher prices in New England during the winter, while many other regions see some relief from 2016 levels. Henry Hub futures prices averaged in the low $3/MMBtu range for January and February, a few cents below last year's market expectations going into winter. Futures prices in Southern California and in the Midwest are similarly showing a slight drop from 2016 prices, while New York City futures are more than one dollar lower, though still near $8/MMBtu. New pipeline connections from Appalachia into the Northeast and Midwest helped to tame winter prices in those markets, while New England is still facing capacity constraints during peak conditions.

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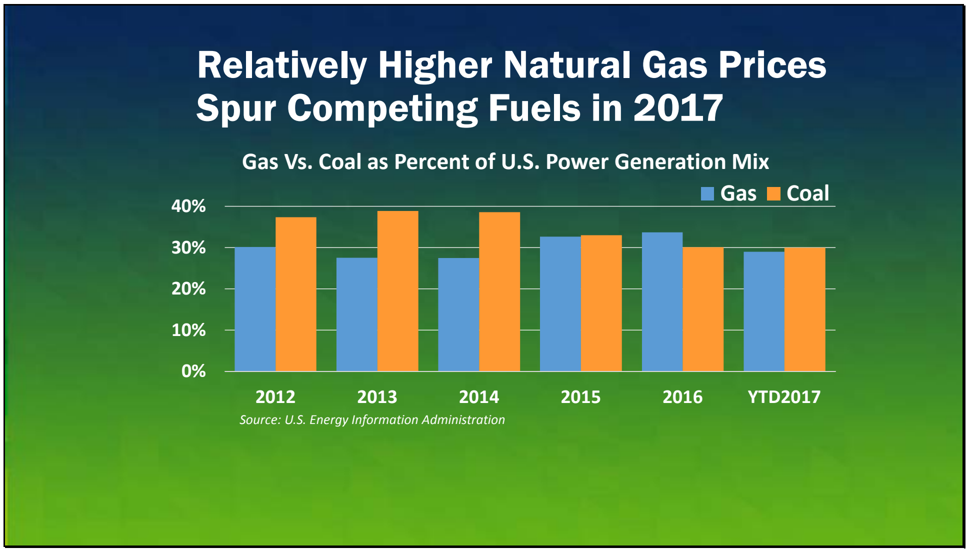

Throughout 2017, slightly higher gas prices in some regions, such as the Midwest and Southeast, have made competing fuels—namely coal—more competitive for power generation. This led to some relative shifts in fuel usage patterns, with coal overtaking natural gas on average thus far in 2017 after being supplanted by natural gas in 2016. This dynamic is likely to continue through the winter, when coal typically takes a more prominent position in the generation mix.

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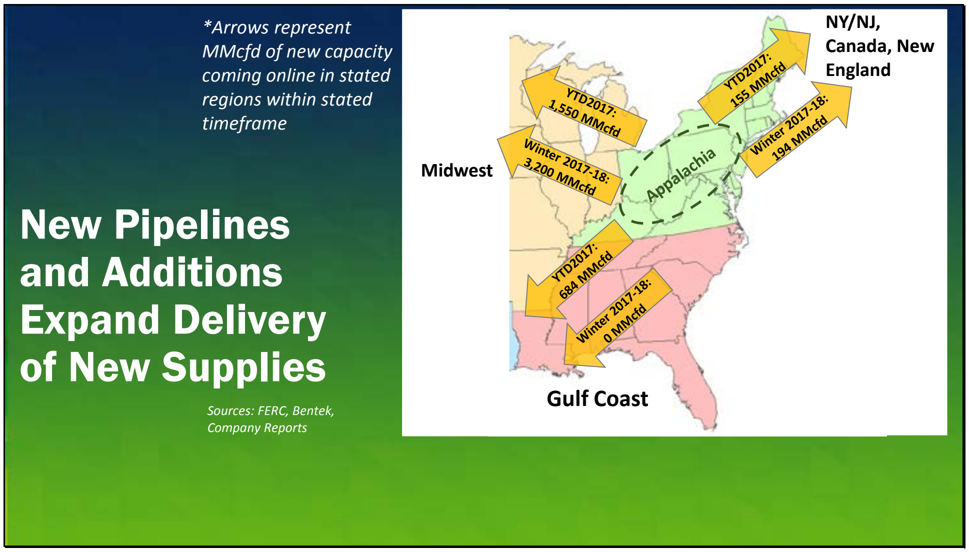

The tempering of winter prices in some markets is due in part to the added capacity linking relatively cheap Appalachian supply to markets on the East Coast, in the Midwest, and further south. Since 2016, nearly 2.5 Bcfd of new field-to-market capacity has been added and another 3.4 Bcfd is expected to come online between now and April. Collectively, these additions provide consumers in markets from New York City to Chicago with cheaper supply from which to feed winter needs. Among the expansions and greenfield projects expected to come online this winter are TransCanada’s TCO Leach Xpress, which would add 1.5 Bcfd to the Northeast, and the Rover Pipeline, which would carry 3.25 Bcfd toward the Midwest.

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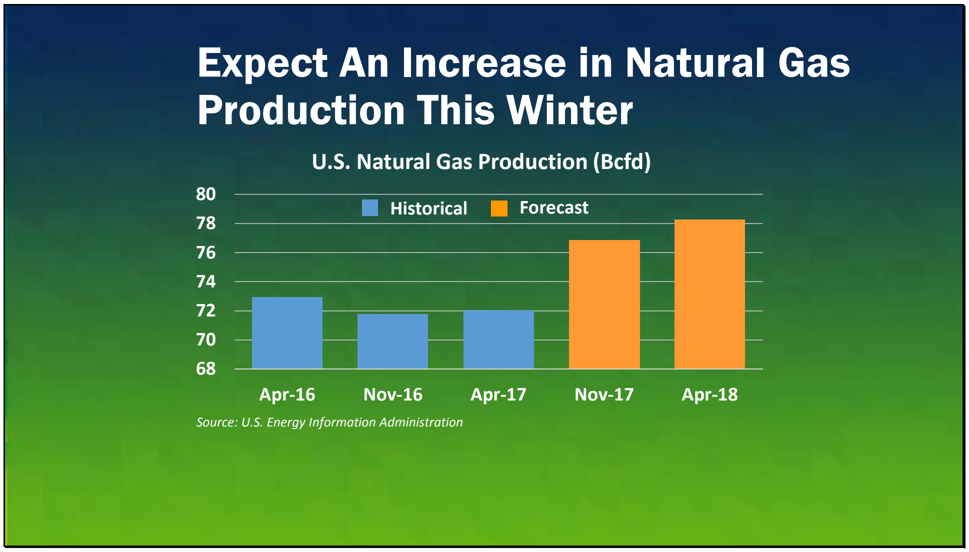

After a temporary idling of production growth, United States operators are poised to see strong production gains from shale fields across the country. The pace of growth reached an inflection point in July, when United States natural gas output increased for the first time in 15 months. Expectations are that the trend will continue through the winter, as new pipeline projects come online and producers are able to reach higher priced markets.

The Appalachian basin, with the Marcellus and Utica shale plays, outperformed every other major producing region in terms of incremental supply over the past several years. In fact, overall United States production may have fallen further and faster had it not been for gains in the region in early 2017. Marcellus and Utica are expected to grow at a strong pace into the spring of 2018. Additionally, production is increasing in the Haynesville Basin in Louisiana and the Permian Basin in Texas as production costs have fallen. In total, United States production is expected to grow by more than 5 Bcfd year-over-year by April. These production gains could further strengthen the natural gas system's reliability for winter, particularly in and around the Northeast.

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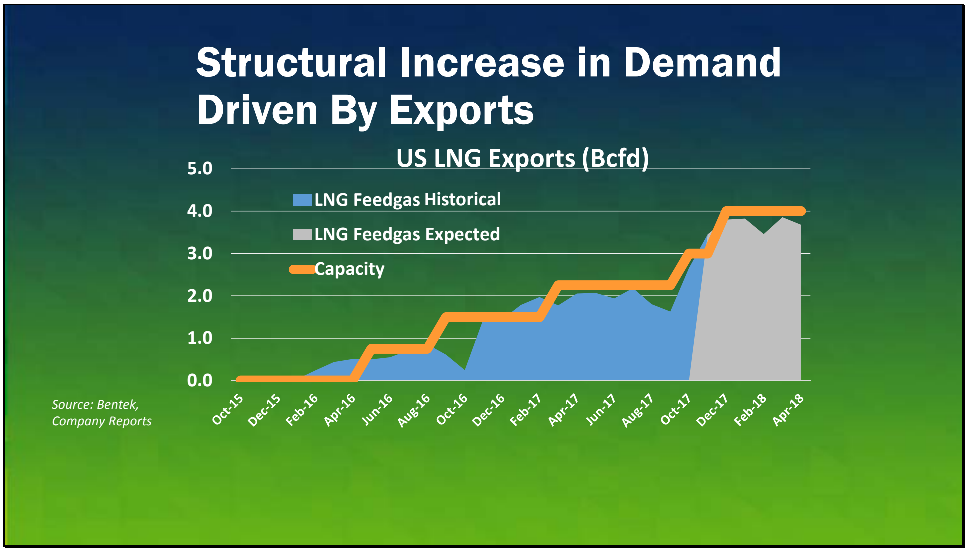

Recent growth in natural gas demand has come primarily from exports. The commercial start-up of the first three trains at Cheniere's Sabine Pass liquefaction plant in Louisiana, paired with increased cross-border flows on pipelines to Mexico, have collectively increased exports by more than 3 Bcfd since the start of 2016. This surge in export volume has also been heavily concentrated in the Gulf Coast, with Texas and Louisiana accounting for more than 80 percent of the incremental demand. The chart above shows the steady increase in flows for LNG exports, which recently peaked at 2.9 Bcfd. At times, flows into liquefaction plants have actually surpassed nameplate capacity, though the overages came during commissioning and testing of new trains in advance of service.

Flows into LNG terminals are expected to increase even more this winter, as the first East Coast LNG project—Cove Point—comes online before year's end. The Cove Point facility has already received pipeline deliveries during commissioning and is nearing start-up. It is highly likely, with the opening of Cove Point and the commercial start-up of an additional train at Sabine Pass, flows into those terminals will collectively surpass 3 Bcfd and stay at that level into spring.

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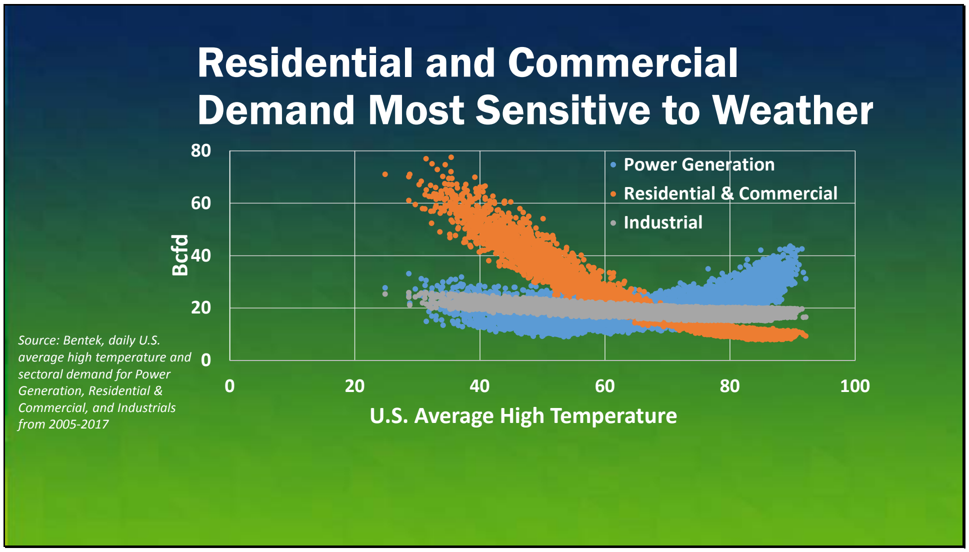

Weather forecasts made months in advance of the peak winter period rarely predict the full magnitude of the season to come. Though early outlooks for this winter call for typical or warmer than normal weather, residential and commercial demand is highly sensitive to changes in the temperatures that actually occur. Since residential and commercial customers rely on natural gas for heating needs, this seasonal factor is amplified during extreme cold events. This scatter chart plots daily U.S. average high temperatures against actual demand for three sectors from 2005 to 2017. It shows great variability for the residential and commercial sector during periods of colder temperatures, while industrials and power generators are relatively static. Over the past seven winters, the residential and commercial sector has averaged 36 Bcfd, with the coldest winter averaging about 10 Bcfd higher than the warmest. This potential for variability has strong implications for both short-term price effects and regional reliability, as well as long-term storage levels.

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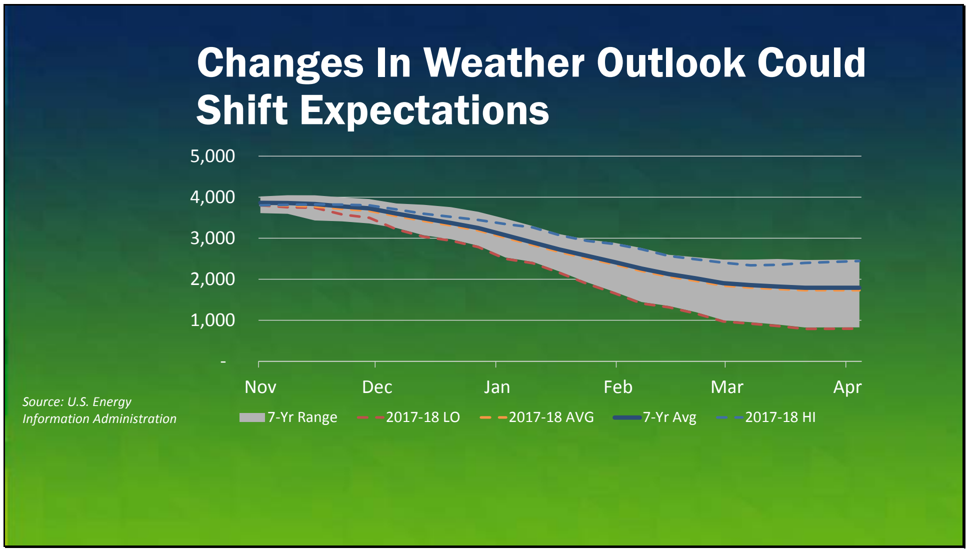

Storage is expected to enter the winter heating season with approximately 3,600 Bcf, relatively close to the long-term average. Assuming a normal winter, with a seasonal draw of about 2,000 Bcf, the market would exit the withdrawal season with approximately 1,600 Bcf, an inventory figure slightly below the seven-year average but still within the seven-year range. However, sustained cold could alter the storage picture greatly. Colder-than-expected temperatures, which boost residential and commercial demand, have a strong effect on storage, which LDCs and other consumers use to balance their needs when supplies are tight. Storage withdrawals have varied by as much as 1,650 Bcf over the four-month season across the coldest and warmest winters.

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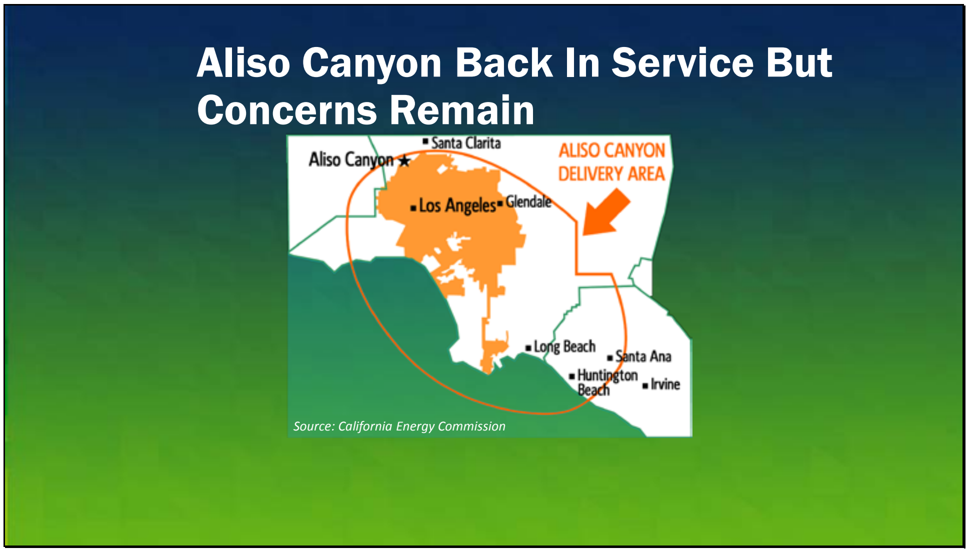

Operational constraints at the Aliso Canyon gas storage facility may continue to pose risks to the functioning of natural gas and electric markets in Southern California during peak winter conditions. Though the facility has returned to service after an extended outage following the 2015 leak, 62 of the facility's 114 wells were taken out of permanent operation, limiting injection and withdrawal capabilities. Currently, the Southern California Gas system holds 65 Bcf in storage, the lowest on record for this time of year since at least 2001 and far below the 118 Bcf the system has averaged over the past 5 years. This low inventory did not disrupt the gas system during the summer with an electric peak near record levels and some periods of stressed conditions. It is conceivable, however, that limitations at Aliso Canyon during periods of the highest winter demand could challenge regional stability and increase natural gas and electricity prices. The recent outages of SoCal Gas Line 235-2 and Line 3000 may also limit flexibility in the region. This risk could also be magnified by upstream pipeline issues, like further outages or wellhead freeze-offs.

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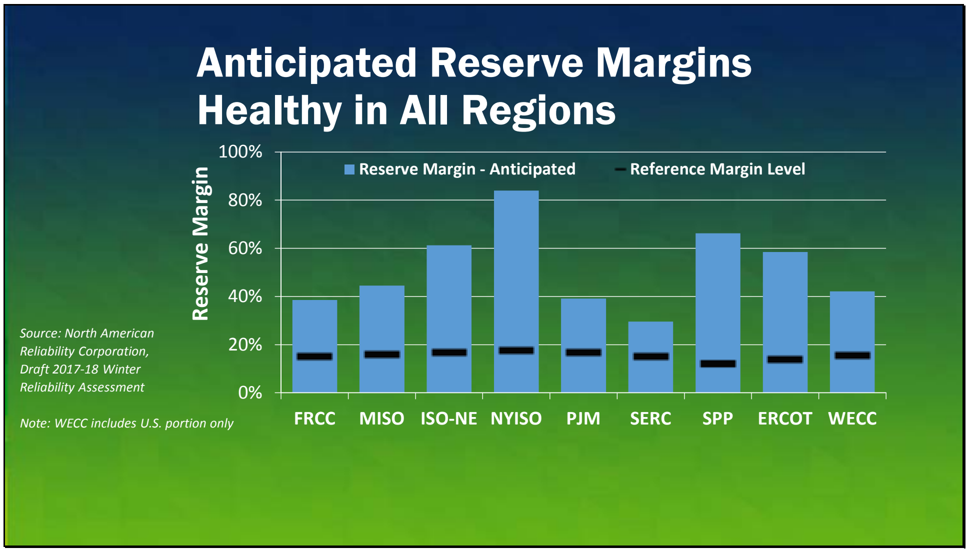

Preliminary data from NERC's Winter Reliability Assessment indicates that reserve margins for all assessment areas are anticipated to be healthy this winter. The columns shown on this chart display the anticipated reserve margins for various regions, while the black bars indicate the Reference Margins, which are the minimum reserves required by the state, the RTO, or other authority. Electric demand is forecast to be slightly higher in some regions, such as SPP and SERC, and slightly lower in others, such as ERCOT and ISO New England. All regions are expected to maintain healthy reserve margins for the winter.

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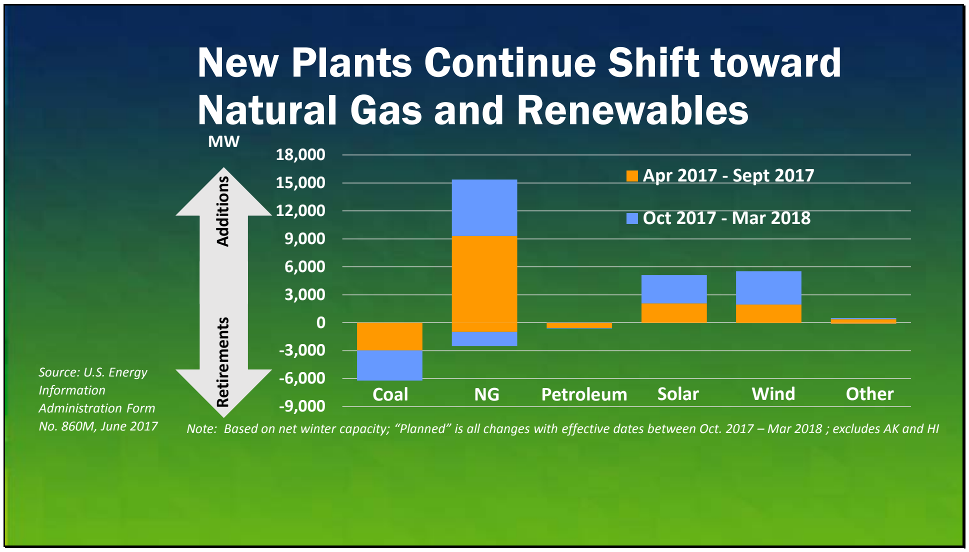

The past few years have seen natural gas-fired plant additions in several parts of the United States, replacing retirements of coal capacity and nuclear capacity. This figure shows actual and planned capacity additions and retirements between April 2017 and March 2018, as reported to the U.S. Energy Information Administration. While nuclear capacity has also retired recently, no retirements have occurred or are planned for the period shown.

As shown in the chart, a large share of recent capacity additions has been natural gas-fired or renewable. From the end of last winter through the upcoming winter, about 15 GW of natural gas capacity have been or will be added across the contiguous United States. The installed capacity of renewable resources continues to increase, including significant additions of wind in SPP and MISO and solar photovoltaic in CAISO.

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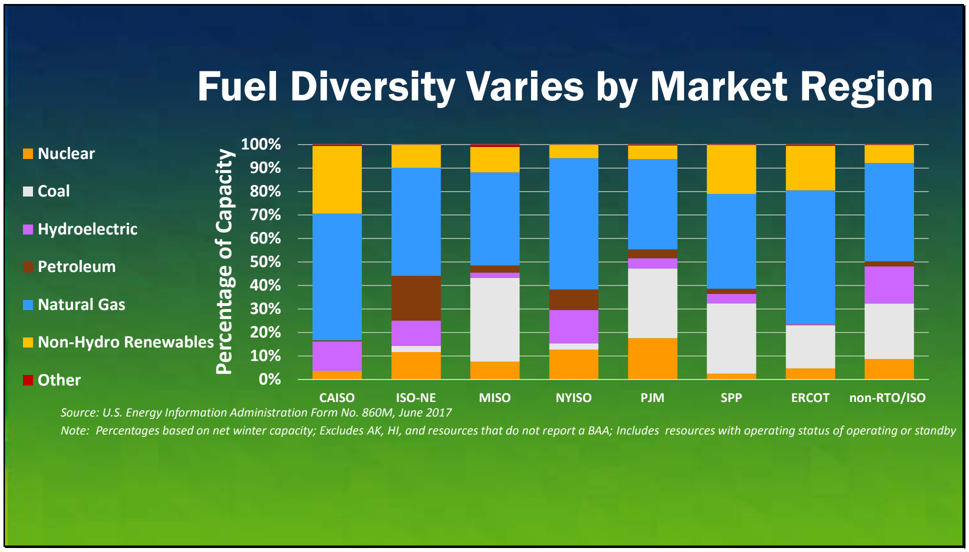

Any assessment of a market's preparation for the winter season must take into account capacity mix and its resulting fuel diversity. Some regions take extra steps to ensure that there are adequate fuel supplies during periods of extreme cold when power generation competes with other uses of natural gas for limited supplies. ISO New England is one of the markets most affected by winter fuel supply considerations and its Winter Reliability Program will be used to manage fuel conditions this winter. The New York ISO has similar challenges in the downstate portion of the region because state rules place restrictions on the reliance of natural gas as a generation fuel at critical times. Regions with greater reliance on coal-fired generation must pay attention to coal delivery issues, especially in areas where coal delivery has been an issue in past winters, specifically the Midwest.

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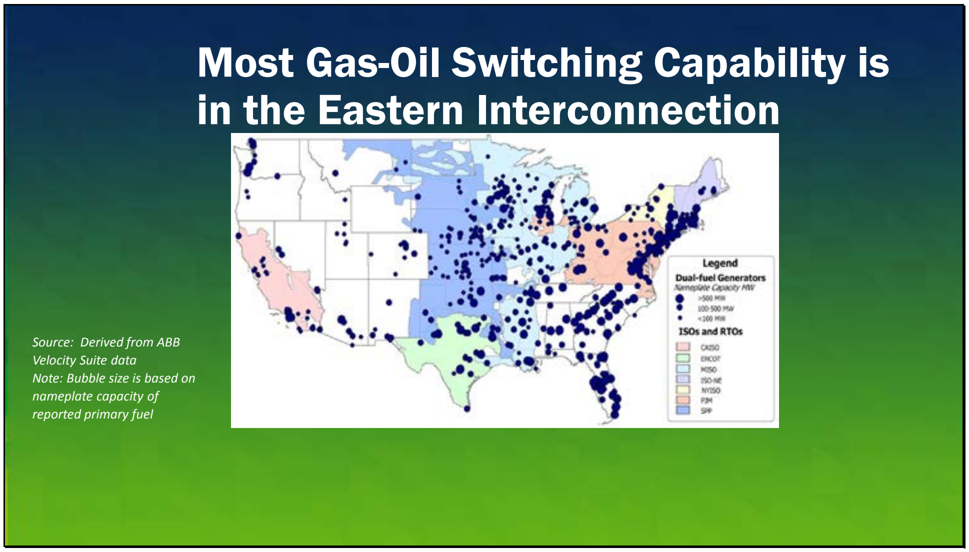

Gas-oil fuel switching refers to the ability of a generator to change between natural gas and oil as its generating fuel. This capability is important for winter preparedness, especially in the northeast, where natural gas supply can become constrained in the winter. Dual-fuel units not only allow for oil to be used as a secondary fuel, but also allow for the storage of oil on-site, mitigating fuel deliverability issues. This map shows the concentration of units with gas-oil fuel switching capability. New York ISO has the largest proportion of natural gas capacity that is capable of gas-oil fuel switching.

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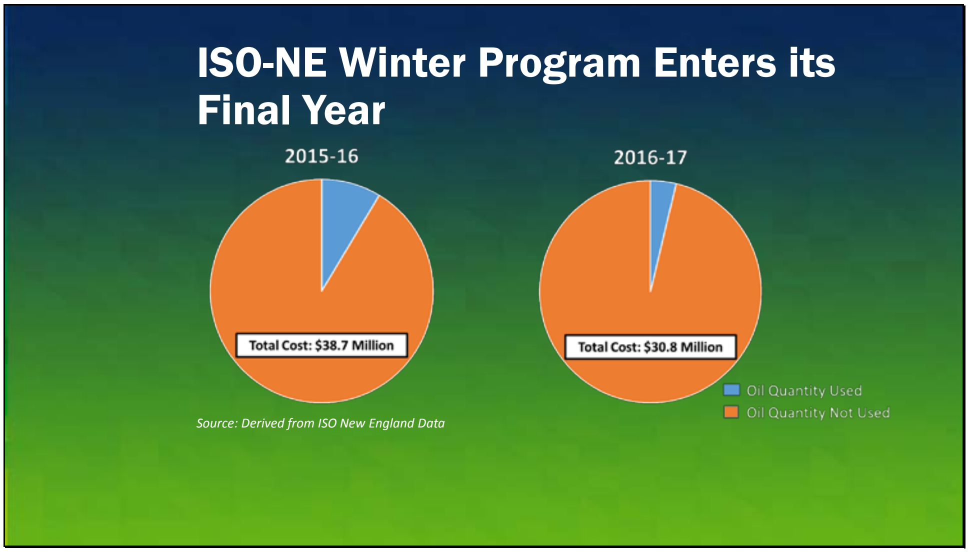

ISO New England is entering the fifth and final year of the Winter Reliability Program. The program provides an incentive for natural gas-fired generation to maintain oil reserves as a stand-by fuel during the winter by paying for eligible reserves that are maintained but not used. The program also provides for LNG and demand response reserves, but the principal reserve is oil. The total cost for last winter's program was $30.8 million. For the upcoming winter, the oil compensation rate has been set at $10.33 per barrel, compared to $10.21 last winter. The total quantity eligible for compensation is being determined this month based on generator applications.

The program is important for ISO New England because the region is highly dependent on natural gas as its predominant fuel for generation and this dependence is increasing due to coal, oil, and nuclear generation retirements. During cold weather, natural gas-fired generation competes with other natural gas uses for adequate supplies from limited pipelines, which are often run at or near capacity. Starting with the winter of 2018-2019, the current Winter Reliability Program will be replaced with new Pay-for-Performance capacity rules.

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This winter season, the Western Energy Imbalance Market (EIM) adds another member, Portland General Electric (PGE). PGE began participating in the EIM on October 1, 2017. The California ISO operates the EIM to help to balance energy supply and demand in real time, leveraging geographically diverse resources. This is particularly important for helping to manage unexpected changes in net load and integrate renewable generation.

PGE will make up to 415 MW of its capacity available for EIM transfers in the winter months as well as 305 MW available for EIM transfers in the summer months. PGE expects to make EIM transfers directly between the PGE BAA and PacifiCorp West BAA using BPA transmission and PGE's on the California-Oregon Intertie (COI).
In addition to PGE, five new balancing authorities have announced plans to join the EIM. These new entries comprise 16 percent of the Western Electricity Coordinating Council in the United States. Moreover, PowerEx, a subsidiary of BC Hydro, plans to join the EIM in 2018, seeking to become the first Canadian entity to participate.

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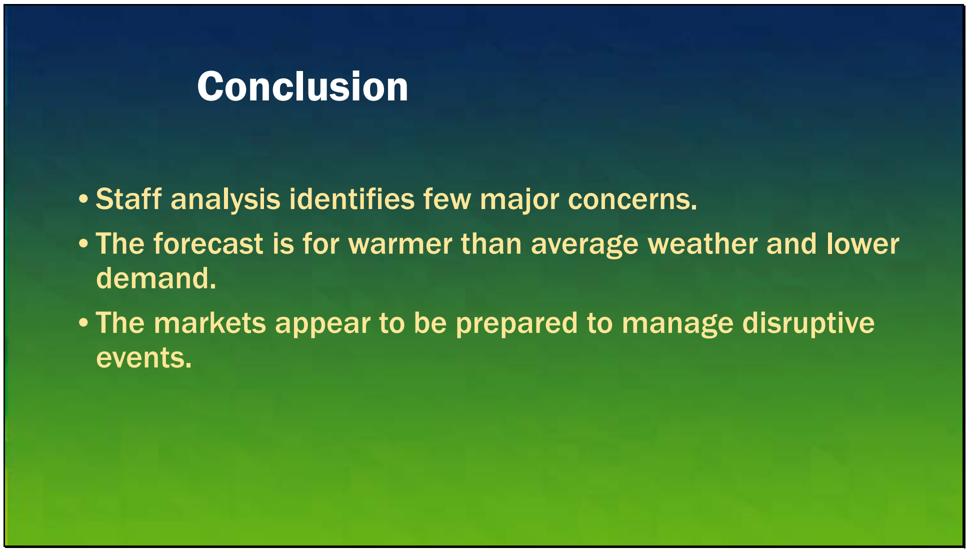

In summation, at this time we do not see major risk factors that would likely lead to significant market disruptions during this winter. There is always the possibility of unforeseen events and staff will continue to monitor developments within the electric and natural gas markets. We will pay particular attention to the issues at Aliso Canyon and in the Northeast. This concludes the 2017-2018 Winter Energy Market Assessment. We are happy to answer any questions you may have.