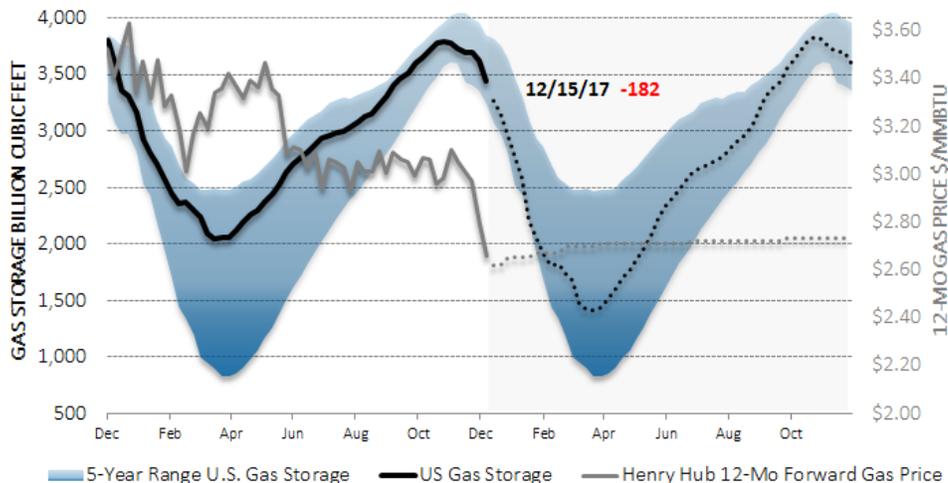


Natural Gas Storage vs Natural Gas Price



Natural Gas

- Earlier this morning the EIA reported a draw of 182 Bcf for last week, which was more than expected and expanded the year on five-year storage deficit.
- Although the initial price reaction to the report was a bullish move up, prices quickly retreated and the front-month NYMEX Henry Hub contract closed trading at \$2.602, a drop of \$0.035/MMBtu.
- Prices through January 2020 are all down, but beyond that there is some buying interest.
- The near-term lower movement may be more of a reaction to updated temperature forecasts calling for temperatures to be less severe (cold) next week than previously forecasted.
- Working gas in storage now stands at 3,444 Bcf as of last Friday, which is 183 Bcf less than the same time last year.

Power Markets

West Power prices are relatively soft this week with a slightly weaker Natural Gas market. Forwards traded about 1-2% lower through Cal 2019 this week across the western region. Heat Rates tied to Nymex Gas continue to see pressure to the upside as gas basis and Carbon prices continue to hold power prices firm.

ERCOT ERCOT spot prices cleared in the high teens over the past week on relatively mild temperatures and loads. Term prices are flat week-over-week as natural gas continues to hover around its lows that were set last week.

East It seems like gas production is trumping any cold weather forecasts in the market. Production remains robust around 77 BCF per-day and seems to be keeping a lid on any upward pressure in the gas markets. Cash winter prices and term markets have been volatile but are now trading in the lower range. It would likely take sustained cold weather to increase prices as the generation stack remain strong.

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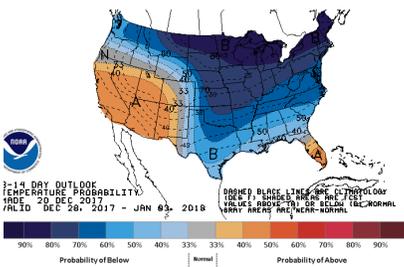
Battery Storage, Tax Extender Act of 2017

Impact of Battery Innovations in the U.S. More Important Than Ever

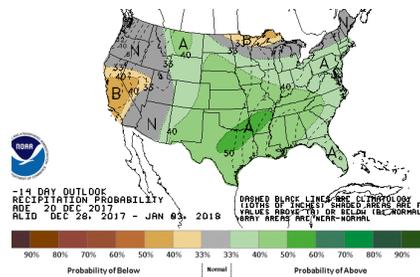
For the past 10 to 15 years, U.S. power markets have experienced a significant (but not total) shift from fossil fuels to renewables. Two main drivers of this change have been the increase in consumer demand for cleaner energy and the dramatic decrease in the cost of energy from wind and solar in the past few years. However, despite such positive developments, harnessing energy from renewable sources carries its own set of problems.

For instance, one of the most documented issues with solar is the inability of solar units (which, of course, generate plenty of electricity during the day) to produce any power at night. To solve this riddle, other sources such as natural gas have had to make up for solar's nocturnal drop-off. Unfortunately, although this is a viable solution, it entails running generators neither as efficient nor as environmentally friendly.

The basic proposition is to be able to store excess power generated by solar and wind for use when those sources are simply unable (i.e., unavailable) to meet demand. Fortunately, like solar and wind generation technology itself, the battery technology necessary to achieve that on a utility scale has become more economical, providing another long-term solution to the problem. Therefore, the question becomes simply whether there is enough demand for such storage facilities. The generation queue for PJM shows a noticeable increase in reliance on stored energy, and GTM Research foresees an opportunity to deploy 6.5 to 10 GW of stored energy in the next decade. Although retail energy prices could rise in the near term as utilities recoup the cost of utilizing energy storage solutions, they should eventually fall as the cost of storing energy continues to drop, making it more cost-effective to replace those gas peakers.



- ### Weather
- During the 1-to-5-day forecast period, temperatures are predicted to be above average in the eastern U.S. but slightly below average in the Midwest.
 - As polar air moves south from Canada, extremely low temperatures are expected in the upper Midwest and Northeast during the 6-to-10-day forecast period. Precipitation will be heaviest in the Midwest and East.
 - Sustained cold temperatures are anticipated in the Midwest and Northeast over the 11-to-15-day forecast period.
 - Forecasts for the upcoming winter call for variable cold streaks and a weak La Nina pattern which will bring generally cooler than normal temperature to the northern half of the U.S. and warmer weather to the southern half of the U.S.



Tax Extender Act of 2017

Yesterday, Senator Orrin Hatch of Utah released the Tax Extender Act of 2017, which is a new bill that aims to extend tax credits for the development of carbon capture technology, nuclear power, and other energy-related projects. The bill would extend production tax credits for new nuclear power facilities as well as lengthen the 45Q tax credit for carbon capture and sequestration technology. Additionally the new legislation would provide extensions for credits associated with residential solar, solar water heating, geothermal heat pumps, and fuel cells through 2021. Tax credits associated with alternative fuel vehicles and energy efficient new homes would be extended through 2018.

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