

2018 Summer Outlook for Natural Gas

Markets Matter

Executive Summary

The Natural Gas Supply Association's (NGSA) *2018 Summer Outlook for Natural Gas* summarizes the association's view of this summer's natural gas market conditions and fundamentals. The analysis covers the key points that can affect supply and demand dynamics, which ultimately impact all consumers of natural gas.

NGSA forecasts whether natural gas prices will be subject to upward, downward or level **pressure** for the upcoming summer compared to the summer of 2017, but the association **does not forecast actual prices**.

Based on an analysis of the weather, economy, consumer demand, production and storage, NGSA expects neutral (flat) price pressure on the natural gas market in summer 2018 compared to last summer.

Our expectation for flat price pressure is based on a forecast for tremendous growth in demand that is matched by even more impressive growth in production.

A glance at the natural gas market's major pressure points for summer 2018 reveals:

- **WEATHER:** The National Oceanic and Atmospheric Administration (NOAA) predicts that the continental United States will on average experience a summer that will be 5 percent cooler than last summer, but 2 percent warmer than the 30-year average. Compared summer-over-summer, the total number of cooling degree days (CDDs) is less than in summer 2017, leading to a projection that weather will place **downward pressure** on demand and prices.
- **ECONOMY:** Public data anticipates the economy will show positive growth in GDP and a significant improvement in manufacturing, however the growth is similar enough to summer 2017 that it translates to **neutral pressure** on natural gas prices compared to last summer.
- **DEMAND:** NGSA expects record demand in summer 2018, fueled by record growth in electric sector demand for natural gas due to massive natural gas-fired generation additions since last summer, along with temporary coal-to-gas switching that together are forecasted to spark a summer-over-summer 10 percent increase in demand for natural gas from the power sector. An increased volume of LNG exports further contributes to this summer's demand growth, with a forecasted summer-over-summer increase of 1.6 Bcf/day — about a 76 percent increase for this young, but fast-growing market. Demand from the residential and commercial sectors is forecasted to grow by 7 percent, primarily attributable to a cold April that prolonged the use of space heating. The industrial sector is projected to experience slight growth of 0.5 Bcf/day in gas demand compared to last summer, with most growth attributed to new construction and capacity expansions. Mexican exports are also projected to grow by 0.5 Bcf/day. When all sectors are combined, overall demand is projected to be more than 6 Bcf/day (9 percent) greater than the summer of 2017 and thus to place **upward pressure** on natural gas prices compared to last summer.
- **STORAGE:** The natural gas industry entered the summer cooling season with storage inventories that were below the five-year average and below last summer. Filling storage to adequate levels will require weekly injections of 70 Bcf — about 23 percent larger than last summer's weekly injections. Storage is forecasted to place additional **upward pressure** on prices.
- **PRODUCTION:** Production is projected to smash through previous robust levels, due to increased production of both dry gas and “wet” gas often associated with oil and valuable natural gas liquids (NGLs) production. The increased production also reflects continued advances in drilling efficiency and a number of wells coming online. Dramatic increases in summer-over-summer levels of production are likely to result in **downward pressure** on natural gas prices.

All of these projected pressure points are interrelated and a deviation in one affects the other assumptions in this equation. *Increased demand from the power sector, for LNG exports and to build storage inventories all together place upward pressure on prices that is counterbalanced by tremendous growth in production — ultimately resulting in a forecast for neutral pressure on prices compared to the summer of 2017.*

The following pages will provide more detailed information about each of the five factors analyzed in NGS's 2018 Summer Outlook, as well as a look at possible "wild card" factors and a discussion of natural gas industry trends that transcend this summer's time frame.

Weather/Demand

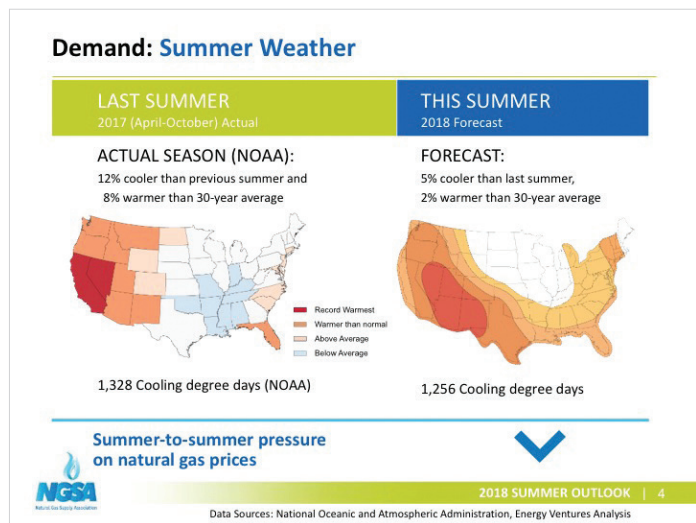
Based on NOAA's current projections for April-October 2018 temperatures, Energy Ventures Analysis, Inc. (EVA) forecasts that the summer months will be 2 percent warmer than the 30-year average, yet still 5 percent cooler than the summer of 2017.

On a regional basis, for the months of June through August, the NOAA forecast projects hotter-than-normal summer weather in most of Nevada, Utah, Colorado and Arizona, and warmer-than-normal weather in most of the rest of the United States. Only a handful of midwestern states are forecasted to experience summer temperatures near the 30-year average.

Over the full seven-month summer cooling season (April 2018-October 2018), EVA is forecasting 1,256 cooling degree days (CDDs) this summer, compared to 1,328 CDDs last summer. The number of cooling degree days is defined as the difference between 65 degrees Fahrenheit and the average outside temperature for that day.

Although the three months of June-August look considerably hotter than the same period last year, the CDD calculation includes the months of April and May, which trended much cooler than normal, thus decreasing the CDDs for the full seven-month cooling season.

Based on the summer-over-summer cooling degree days, the forecast is for **weather to put downward pressure** on natural gas prices.



Economy/Demand

This summer, public forecasts anticipate an economy that will grow at a slightly stronger rate than it did last summer.

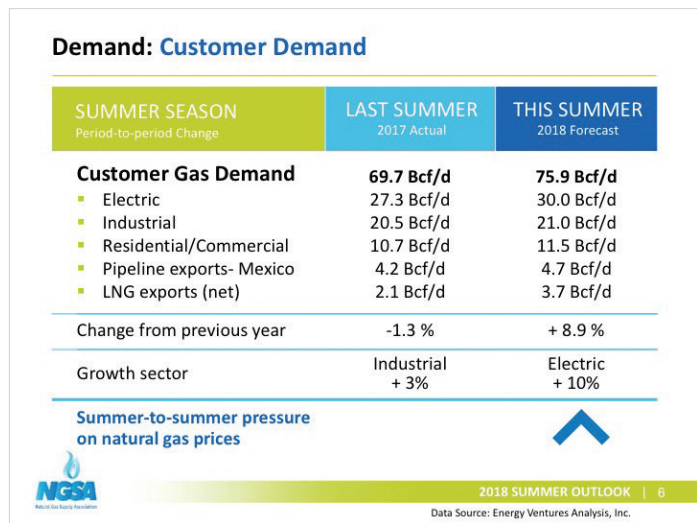
A key component of economic health is the Gross Domestic Product (GDP). According to IHS Economics, a nationally recognized economic forecasting firm, the GDP is expected to increase by a solid 2.8 percent compared to the summer of 2017, when GDP expanded by 2.3 percent.

IHS also predicts that manufacturing, an important influence on the GDP, will show very strong growth of 2.7 percent in summer 2018, a significant increase from last summer's 1.3 percent growth. Bolstering growth in manufacturing, the latest Consumer Sentiment Index (CSI) shows that consumers have strong positive feelings about the economy, with the CSI tracking at a robust 100 percent, indicating general consumer optimism, probably a reflection of the expanding economy and job growth. The Consumer Sentiment Index is a gauge of consumer confidence in the economy conducted for more than 40 years by the University of Michigan.

These economic indicators all reflect good news for consumers, but are similar enough to last summer's economic figures that NGS's anticipates the **economy will place neutral summer-over-summer pressure** on natural gas prices.

Overall Natural Gas Demand

An independent demand analysis performed by EVA notes that summer-to-summer natural gas demand will reach an all-time summer record this year. EVA forecasts overall summer 2018 demand for natural gas at 75.9 billion cubic feet per day (Bcf/d) compared to 69.7 Bcf/d last summer – about a 9 percent increase.



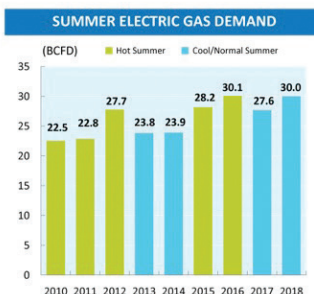
A sector-by-sector breakdown of customer demand follows.

■ **Electric Sector** — EVA projects significant growth in gas demand from the electric sector this summer, accounting for the largest increase in summer-over-summer customer demand. Several factors explain the increase: new natural gas-fired power plants added to the generation fleet since last summer; an expectation for low availability of hydro-generation in the Southwest; and current low prices for natural gas. EVA projects a dramatic 10 percent increase in natural gas power burn in summer 2018 compared to last summer.

Power Sector: Increased Natural Gas Burn Due to Permanent Structural Change & Some Temporary Price-driven Switching

Compared to last summer

- Additional 10.6 GW of new natural gas capacity (approximately 2 Bcf/day)
- Some temporary price-driven fuel switching to natural gas
 - More than 2017;
 - Less than 2016



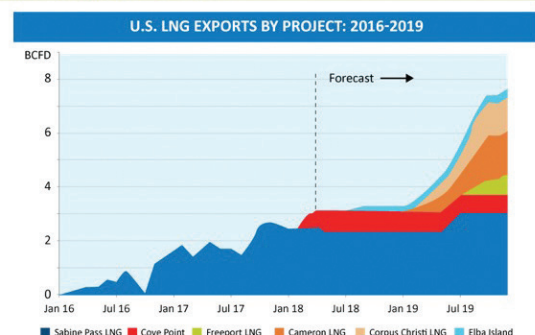
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Data Source: Energy Ventures Analysis, Inc.

EVA also expects some coal-to-natural gas switching in the power sector that is driven by price sensitivity. The amount of temporary price-driven switching to natural gas is expected to exceed the summer of 2017, but not to be as much as occurred in summer 2016. The phenomenon of short-term coal-to-gas switching, also known as fuel switching, occurs when electric utilities choose to run natural gas-fired power plants rather than coal plants to generate electricity. Switching is a short-term decision that is purely an economic choice based on the current price of the competing fuels, and this summer's switching is the result of the competitive price of natural gas and the prediction for warm summer weather that in turn increases demand for air conditioning.

- Exports** — The second-largest expected increase in demand is projected to come from exports of liquefied natural gas (LNG) this summer, which EVA forecasts to **increase from 2.1 Bcf/day in summer 2017 to 3.7 Bcf/day in summer 2018**, driven by the addition of Sabine Pass Train 4 and Dominion's Cove Point projects to the pre-existing trains 1-3 at Sabine Pass. In addition to the increase in LNG exports, **U.S. exports to Mexico are expected to increase by 0.5 Bcf/day to a total of 4.7 Bcf/day in the summer of 2018**. The primary factor behind this steady increase is the building of new pipeline capacity on both sides of the border, particularly the Mexican side.

Demand: U.S. LNG Exports Grow as Projects Come Online 2016-2020



Note: Mexican natural gas supply sources 2011-2020.



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Data Source: BP Statistical Review, SENER, EVA.

- Residential/Commercial Sector** — The residential/commercial sector is expected to account for the third-largest increase in demand for natural gas for the April-October summer 'cooling' season, although some of this growth is attributable to high demand this April when unseasonably cold weather kept furnaces and water heaters blasting longer than normal.

- Industrial Sector** — This sector is expected to slightly increase its summer consumption of natural gas to average out at 21 Bcf/day — an increase of only 0.5 Bcf/day over last summer. EVA attributes growth in industrial demand to healthier activity in energy-intensive industries, which have partially recovered from the lows of 2016 and 2017 and are using more of their existing capacity, along with new projects coming online this year to boost demand, such as fertilizer, methanol, ethylene, propylene and polyethylene facilities. An extended forward view of industrial demand shows 44 major new or expanded natural gas-intensive industrial projects on the 2018-2021 horizon, with total added demand of 2 Bcf/day, combined with 32 previously-completed projects over 2015-2017, which already have added approximately 1.4 Bcf/day.

Storage/Demand

Underground natural gas storage enables companies to purchase and physically stockpile natural gas supplies in the spring and summer for use during the winter when demand for natural gas space heating is at its peak.

Going into the winter heating season, EVA projects that 3,507 Bcf of natural gas will be in storage by the end of the 2018 injection season, which would require an average weekly injection of 70 Bcf. This level of injection is robust and significantly larger than last summer's average weekly injections of 57 Bcf, but much less than the summer of 2014's average weekly injections of 89 Bcf. **The difference in the size of the weekly injections between the summers of 2017 and 2018 is expected place upward pressure on natural gas prices this summer.**

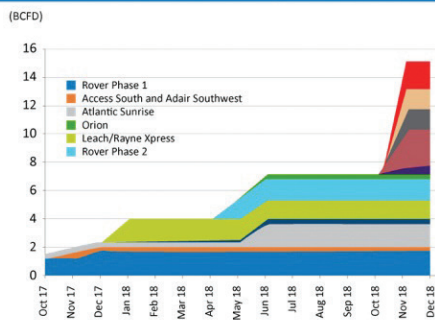
Production/Supply

Turning to natural gas production, EIA expects summer domestic production to exceed last summer's record-breaking production figures. Domestic natural gas production this summer is forecasted to be 80.4 Bcf/day, a sizeable increase over last summer's 72.5 Bcf/day.

Among the reasons that summer production is expected to increase so dramatically are: strong production from the Marcellus and Permian basins and associated gas plays, strong production from shale gas plays as previously drilled but uncompleted (DUC) wells come online; increased efficiencies in natural gas extraction techniques; and improved takeaway capacity in the form of pipelines and processing plants in areas such as the Marcellus.

Focus on Supply: Northeast Pipeline Takeaway Capacity to Increase 8 Bcf/day

NORTHEAST PRODUCT TAKE AWAY PROJECTS (THROUGH THE END OF 2018)



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Data Source: Energy Ventures Analysis, Inc.

In summary, natural gas production will increase to an all-time record, placing **downward pressure** on natural gas prices compared to the summer of 2017.

The *2018 Summer Outlook* also predicts a moderately-sized, but important, contribution to supply from low-cost Canadian imports, including supply from TransCanada's two new NGTL expansion projects.

"Wild Card" Market Factors

There are always a few "wild card" factors that can influence the market, in addition to the fundamentals addressed in this Outlook. This summer's wild card:

- An unpredicted and very active hurricane/storm season materializes, which would mainly affect demand, since most onshore producing gas fields are not vulnerable to hurricanes.

In conclusion, NGSa's analysis of various data indicates overall neutral (flat) pressure on natural gas prices this summer compared with last summer, primarily due to upward pressure from the power sector, exports market and need to rebuild storage, mitigated by dramatic downward pressure from booming production. A recap of the five major pressure points reveals:

- Production exceeding previous summer record levels, aided by new pipeline capacity and fueled by drilling efficiencies, increased production of natural gas found in association with oil and NGLs and newly-completed onshore and offshore wells.
— **DOWNWARD PRESSURE**
- Overall record demand — electric demand expected to grow 10 percent and exports also to grow exponentially.
— **UPWARD PRESSURE**
- Cooler summer weather — **DOWNWARD PRESSURE**
- Similar summer-over-summer economic conditions.
— **FLAT PRESSURE**

- Significantly larger (than last summer) weekly injections required to bring storage to estimated 3,507 Bcf
— **UPWARD PRESSURE**

Natural Gas Outlook: Summer of Flexibility

- Unparalleled production growth
 - Associated gas significant contributor due to value of oil, NGLs
 - Efficiencies in drilling and production make wells more productive at lower cost
 - Pipeline infrastructure expansions provide greater deliverability
- Summer (April-October) demand growth
 - Driven by new gas generation, exports and unseasonably cool spring
- Exports provide growth, stability to market
 - Welcome outlet for strong production
- Overall, stable natural gas outlook for consumers and a diverse market for producers



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OVERVIEW: Record Production Enables Industry to Easily Match Record Demand

- Strong production supporting remarkable electric growth and growth in U.S. LNG exports
- Electric demand growth fueled by numerous new gas-fired power units coming into services and temporary fuel switching.
- Growing LNG exports along with pipeline exports to Mexico.
- Industrial demand spurred mainly by new builds and expansions in petrochemical, fertilizer and steel.

For more information, please visit www.ngsa.org or contact us directly.