

2016 Summer Outlook for Natural Gas

Markets Matter

Executive Summary

The Natural Gas Supply Association's (NGSA) *2016 Summer Outlook for Natural Gas* summarizes the association's view of existing 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 2015, but the association does not forecast actual prices.

Based on an analysis of the weather, economy, consumer demand, production and storage, NGSA expects downward price pressure on the natural gas market in summer 2016 compared to last summer.

Our expectation for downward price pressure is based on a forecast for lower GDP growth together with considerably smaller weekly storage injections, while production continues to be robust.

A glance at the natural gas market's major pressure points for summer 2016 reveals:

- **WEATHER:** The National Oceanic and Atmospheric Administration (NOAA) predicts that the continental United States will on average experience a summer that will be 3 percent cooler than last summer, but 8 percent warmer than the 30-year average. Compared summer-over-summer, the total number of cooling degree days (CDDs) is nearly identical to 2015, leading to a projection that weather will place **neutral pressure** on demand and prices.
- **ECONOMY:** Public data anticipates the economy will show unimpressive growth in GDP and a decline in manufacturing, translating to **downward pressure** on natural gas prices compared to last summer.
- **DEMAND:** NGSA expects record demand to take place in the electric sector in the summer of 2016, led by a combination of temporary coal-to-gas switching and permanent coal retirements that are forecasted to spark a summer-over-summer 11 percent increase in demand for natural gas. The industrial sector is projected to experience minimal growth in gas demand compared to last summer, with all growth attributed to new construction and capacity expansions in five key natural gas-intensive industries. Demand from the residential and commercial sectors is forecasted to be similar to last summer. When all sectors are combined, overall demand is projected to be more than 4 Bcf/day (6 percent) greater than the summer of 2015 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 67% higher than the same time last summer. Filling storage to adequate levels will require weekly injections that are only about half the size of last summer's. Storage is forecasted to place **downward pressure** on prices.
- **PRODUCTION:** Production is projected to reach or slightly exceed last summer's robust levels, even though rig counts have decreased. The increased production is the result of continued advances in drilling efficiency and a number of offshore and onshore wells coming online. Similar summer-over-summer levels of production are likely to result in **neutral 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 electric sector and the forecast for smaller weekly storage injections and sluggish GDP growth are the most significant factors impacting this summer's forecast.*

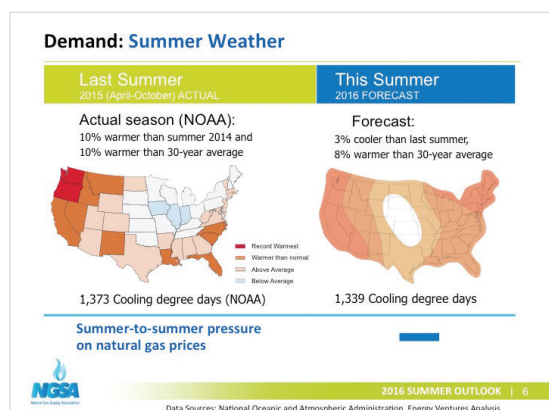
The following pages will provide more detailed information about each of the five factors analyzed in NGSA's 2016 Summer Outlook, as well as a look at possible "wild card" factors and a discussion of natural gas industry trends that transcend this summer's time frame.

Weather/Demand

Based on NOAA's current projections for warmer-than-average summer temperatures, EVA forecasts that the summer months will be 3 percent cooler than the summer of 2015 on a national average, and 8 percent warmer than the 30-year average.

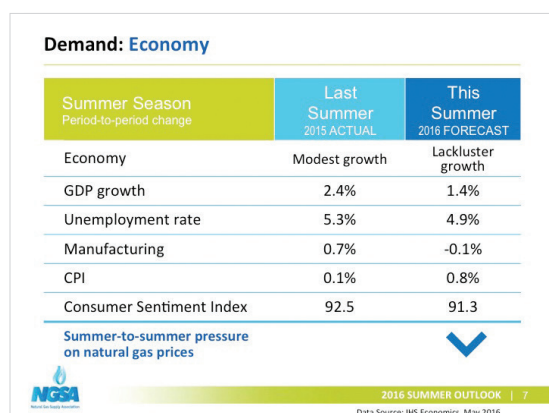
On a regional basis, NOAA's forecast neatly divides the country. The west coast, mountain, northeastern and southeastern coastal states are projected to be warmer than normal, while the center of the United States is forecasted to experience fairly typical summer temperatures.

As a nation, over the full seven-month summer cooling season (April 2016-October 2016), the firm Energy Ventures Analysis, Inc. (EVA) is forecasting 1,339 cooling degree days (CDDs) this summer, compared to 1,373 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. Based on the similarity in summer-over-summer cooling degree days, the forecast is for **weather to put neutral pressure** on natural gas prices.



Economy/Demand

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



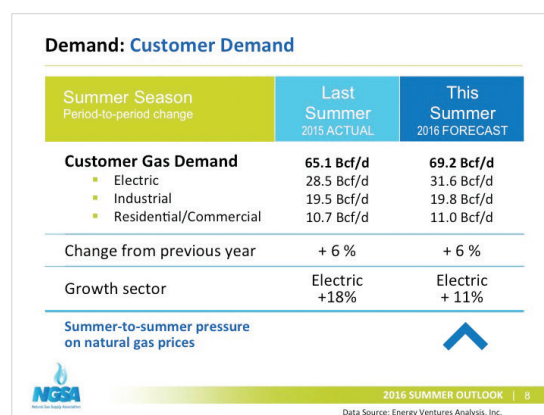
A key component of economic health is the Gross Domestic Product (GDP). According to IHS Economics, a nationally recognized economic forecasting firm, the GDP is expected to increase only 1.4 percent compared to the summer of 2015, when GDP expanded by 2.4 percent.

IHS also predicts that manufacturing, an important influence on the GDP, will actually experience a contraction to -0.1 percent in summer

2016, a significant drop even from last summer's unimpressive 0.7% percent growth. Despite the decline in manufacturing, the latest Consumer Sentiment Index (CSI) shows that consumers feel very positive about the economy, with the CSI tracking at a strong 91.3 percent, indicating general consumer optimism, probably a reflection of lower unemployment and decreased energy prices. The Consumer Sentiment Index is a gauge of consumer confidence in the economy conducted for more than 40 years by the University of Michigan. While some of these economic indicators reflect good news for consumers, the decline in GDP and manufacturing are important influences on natural gas prices. Therefore NGSA anticipates the **economy will place downward 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 high this summer. EVA forecasts overall summer 2016 demand for natural gas at 69.2 billion cubic feet per day (Bcf/d) compared to 65.1 Bcf/d last summer.



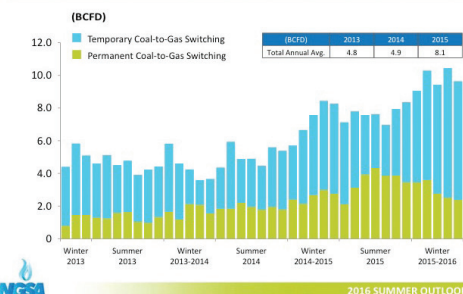
When all customer sectors are combined, overall demand is expected to be even greater than last summer. A sector-by-sector breakdown follows.

EVA projects significant growth in gas demand from the electric sector this summer. The major cause of the increased demand from the electric sector can be attributed to two causes: a significant increase in permanent coal-to-gas switching due to retiring coal plants compared to the previous summer and increase in temporary coal-to-gas switching.

A long-term, structural shift in the electric sector accounts for 70 percent of the increased demand for gas-fired generation this summer. The electric industry escalated the pace of its retirement of coal-fired power plants in 2015 due to the Mercury Air Toxics Standards (MATS) rule to reduce mercury emissions. As a result, demand increased for gas to serve natural gas-fired power plants that permanently replace coal-fired plants.

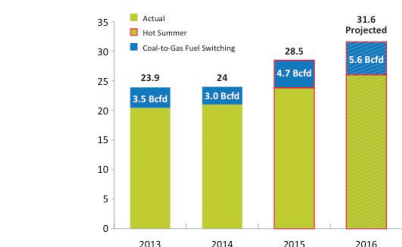
In contrast, short-term coal-to-gas switching, also known as fuel switching, occurs when electric utilities choose to run natural gas-fired power plants rather than coal plants to generate electricity. Switching is a short-term decision that is purely an economic choice based on the current price of the competing fuels, and this summer's switching is the result of the current competitive price of natural gas and the prediction for warm summer weather that in turn increases demand for air conditioning.

Electric Demand: Coal-to-Gas Switching Driven by Permanent Structural Change and Temporary Price-driven Change



EVA's prediction for short-term fuel switching to reach a sizeable 5.6 Bcf/day of natural gas demand this summer is all the more remarkable in light of the fact that, prior to the shale revolution, coal-to-gas switching had never lasted longer than a few days at a time. In contrast, switching has now persisted for eight consecutive summers since 2008.

Focus on Electric Demand: Temporary price-driven fuel switching this summer compared to recent summers



Note: 2015 was a very hot summer. Coal-to-gas switching in 2016 is forecasted.

Data Source: Energy Ventures Analysis 2016 Summer Outlook, June 2016

For summer 2016, the level of short-term fuel switching is expected to be the second-highest amount on record, second only to summer 2012.

The **industrial sector** is expected to only slightly increase its summer consumption of natural gas to 19.8 Bcf/day — an increase of less than 1 Bcf/day over last summer, as the manufacturing sector is experiencing sluggish global demand. EVA attributes all of the growth in industrial demand to *new* builds and capacity expansions in the petrochemical, steel and fertilizer sectors. An extended forward view of industrial demand shows 67 major new or expanded natural gas-intensive industrial projects on the 2015-2020 horizon, together representing a \$111 billion investment to build.

Focus On Industrial Demand: Natural Gas Spurring 67 Major Industrial Projects 2015–2020 Excludes \$17 Billion for the 39 additional projects built 2010-2014



Photo courtesy: Chevron U.S.A. Inc., 2015 (Pascagoula)

Data Source: Energy Ventures Analysis, June 2016

The industrial growth projected over the next five years is primarily due to the petro-chemical, fertilizer, and steel industries expanding to take advantage of affordable, abundant natural gas in the U.S. Most of these major projects are slated for southern states, with the exception of several steel projects in Midwestern states.

- Roughly 80 percent of these manufacturing projects are brand new projects; and
- Approximately 20 percent are expansions.

According to Energy Ventures Analysis, summer-over-summer demand from the **residential and commercial sectors** is expected to be roughly the same as last summer.

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.

Demand: Summer Storage

Summer Season Period-to-period change	Last Summer 2015 ACTUAL	This Summer 2016 FORECAST
Season starting point	1,483 Bcf	2,478 Bcf
Average weekly injections	81 Bcf	44 Bcf
End of injection season	3,953 Bcf	3,875 Bcf projected

Summer-to-summer pressure
on natural gas prices



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Data Sources: Energy Information Administration and Energy Ventures Analysis

Going into the winter heating season, EVA projects that 3,875 Bcf of natural gas will be in storage by the end of the 2016 injection season, which would require an average weekly injection of 44 Bcf. This level of injection is relatively small for the industry and is much less than last summer's average weekly injections of 81 Bcf. **The difference in the size of the weekly injections between the two summers is expected place significant downward pressure on natural gas prices this summer.**

Production/Supply

Turning to natural gas production, EIA expects domestic production to match or slightly exceed last summer's record-breaking production figures, despite a decrease in the number of drilling rigs compared to last summer. Domestic natural gas production this summer is forecasted to be 74.7 Bcf/day, almost identical to last summer's 74.6 Bcf/day.

Among the reasons that summer production is expected to match last year's impressive levels are: strong production from newly-completed "legacy" offshore wells, 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.

In summary, strong **supply** this summer will be similar to last summer's, placing **neutral pressure** on natural gas prices compared to the summer of 2015. The *2016 Summer Outlook*

Supply: Summer Production

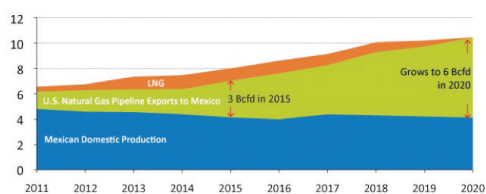
Summer Season Period-to-period change	Last Summer 2015 ACTUAL	This Summer 2016 FORECAST
Summer average production (Lower 48)	74.6 Bcf/d	74.7 Bcf/d
Canadian imports (net)	5.1 Bcf/d	5.3 Bcf/d
LNG (net)	0.1 Imports	0.2 Exports
Mexican exports (net)	- 3.1	- 4.0
Summer-to-summer pressure on natural gas prices		



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Data Source: Energy Ventures Analysis and Energy Information Administration

also predicts a moderately-sized, but important, contribution from Canadian imports, and for the first time, liquefied natural gas (LNG) exports of 0.1 Bcf/day.

Demand: Mexican demand for U.S. pipeline exports expected to double from 2015-2020



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Data Source: BP Statistical Review, SENER, EVA.

U.S. exports to Mexico have been increasing steadily since 2011 and are expected to increase to 4 Bcf/day in the summer of 2016. The primary factor behind this steady increase is the building of new pipeline capacity on both sides of the border, particularly the Mexican side.

There are 13 pipeline projects in the works to take gas from the U.S. to Mexico and Mexico is working on 15 projects on its side of the border. These projects should come online between 2015 and 2020 and help to bring U.S. pipeline exports to Mexico from current levels to 6 Bcf/day in 2020. Mexico's increased demand for natural gas is driven by the country's switch from fuel oil to natural gas as a feedstock for power generation, along with a manufacturing boom. About 20 percent of Mexico's 2015-2020 demand for gas is expected to come from the industrial sector.

"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, NGSAs analysis of various data indicates downward overall pressure on natural gas prices this summer compared with last summer, primarily due to downward pressure from storage and a decreased GDP growth. A recap of the five major pressure points reveals:

- Production matching last summer's record levels, fueled by drilling efficiencies, new infrastructure and newly-completed onshore and offshore wells. — FLAT PRESSURE
- Overall record demand — electric demand expected to grow 11 percent. — UPWARD PRESSURE
- Similar summer weather as last summer — FLAT PRESSURE
- Dip in manufacturing and slowing GDP decrease demand — DOWNWARD PRESSURE
- Significantly smaller (than last summer) weekly injections required to bring storage to 3,875 Bcf — DOWNWARD PRESSURE

OVERVIEW: Strong Production Enables Industry Response to Meet Record Demand

This Season's Summer Outlook

Summer Season Period-to-period change	This Summer 2016 FORECAST
Weather	—
Economy	↓
Overall demand	↑
Storage	↓↓
Summer production	—
Summer-to-summer pressure on natural gas prices	↓



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- Strong production supporting remarkable electric growth
- Fuel switching continues for eighth straight summer — and approaches 2012's record levels.
- Electric demand growth fueled by permanent coal retirements and temporary fuel switching.
- Growing exports to Mexico and LNG exports
- 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.



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