

# 2016-2017 Winter Outlook for Natural Gas

## Markets Matter

### Executive Summary

The Natural Gas Supply Association's (NGSA) *2016-2017 Winter 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.

Based on publicly available information, NGSA forecasts whether natural gas prices will be subject to upward, downward or level pressure for the upcoming winter of 2016-2017 compared to the winter of 2015-2016, but the association does not forecast actual prices.

**Based on an analysis of the weather, economy, consumer demand, production and storage, NGSA expects upward price pressure on the natural gas market in winter 2016-2017 compared to last winter's unusually low wholesale natural gas prices. Last winter the average wholesale price for natural gas at the Henry Hub was \$1.98 per MMBtu – by far the lowest average winter price since the winter of 1999-2000.**

Colder weather and growing demand are the most significant factors impacting this winter's forecast. Our expectation for upward price pressure is based on a forecast for winter weather to be 12 percent colder than last winter, spurring growth in demand from the residential/commercial sector, in addition to growth in Mexican exports and small amounts of LNG exports.

Industrial demand is also expected to slightly increase due to new builds and capacity expansion projects. In contrast, electric sector demand is forecasted to decrease because of less short-term switching to natural gas-fired generation due to higher prices.

#### **A glance at the natural gas market's major pressure points for winter 2016-2017 reveals:**

- **WEATHER:** The National Oceanic and Atmospheric Administration (NOAA) predicts that the continental United States will on average experience a winter that will be 12 percent colder than last winter and 3 percent warmer than the 30-year average. NOAA places last year's five-month winter heating season as the second warmest on record. Compared winter-over-winter, total heating degree days (HDDs) are estimated to be significantly greater this winter than the previous winter, leading to a projection that colder weather will place **upward pressure** on prices.
- **ECONOMY:** Public data anticipates the economy will continue to grow, but forecasted GDP growth rate of 2.1 percent is so similar to last winter's 1.7 percent growth rate that it translates to **neutral pressure** on prices compared to last winter.
- **DEMAND:** When all sectors are combined, **overall demand** is projected to be 3.2 Bcf/day – about 4 percent – more than the winter of 2015-2016, which is expected to place **upward pressure** on natural gas prices.
  - Energy Ventures Analysis (EVA) expects colder weather to increase demand from the *residential and commercial* sectors by 4 Bcf/day, and expects slight *industrial* demand growth of 0.7 Bcf/day. Industrial growth is linked to the construction of major gas-intensive facilities and capacity expansions in the petro-chemical and fertilizer industries.
  - EVA forecasts exports to Mexico of 4 Bcf/day and LNG exports of 0.8 Bcf/day.
  - In contrast, EVA projects a 3.3 Bcf/day decrease in demand from the *electric* sector because less temporary, economically-driven fuel switching is expected due to higher natural gas prices compared to last winter's unusually low average winter wholesale price.
- **STORAGE:** The natural gas industry is on track to reach a record amount of inventory in storage by late October or early November, just as it did last winter. Storage is forecasted to place **neutral pressure** on prices.
- **SUPPLY:** EVA projects a decrease in total supply of 2.3 Bcf/day due to slightly less production combined with flat Canadian imports. The forecasted winter-over-winter decrease in supply is slight, and is likely to result in **flat pressure** on natural gas prices. NGSA emphasized that winter supply, combined with record amounts of natural gas in storage, is ample to meet winter demand.

All of these projected pressure points are interrelated and a deviation in one affects the other assumptions in this equation.

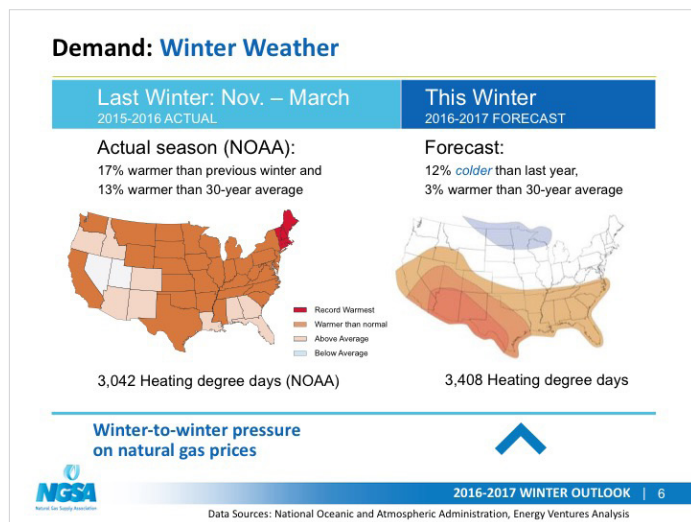
The following pages provide more detailed information about each of the five factors analyzed in NGSA's *2016-2017 Winter Outlook*, as well as a look at possible "wild card" factors and a discussion of natural gas industry trends that transcend this winter.

## Weather/Demand

Based on NOAA's current projections for colder winter temperatures, EVA forecasts that the winter months will be 12 percent colder than the winter of 2015-2016 – which was the second warmest winter heating season on record – on a national average, and 3 percent warmer than the 30-year average.

On a regional basis, NOAA's weather forecast cleanly divides the country into thirds. The southernmost tier covers the bottom half of the country and is projected to be warmer than average. The uppermost tier that is expected to be colder covers just a small handful of states: a portion of Wisconsin, Minnesota and North Dakota. The remaining middle tier, which includes all the remaining states, is projected to have typical winter temperatures.

As a nation, over the full five-month winter heating season (November 2016-March 2017), EVA is forecasting 3,408 heating degree days (HDDs) this winter, compared to a mere 3,042 HDDs last winter. The number of heating degree days is defined as the difference between 65 degrees Fahrenheit and the average outside temperature for that day. Based on the difference in winter-over-winter heating degrees, the forecast is for **weather to put upward pressure** on natural gas prices.



## Economy/Demand

This winter, public forecasts anticipate an economy that will grow at a similar sluggish rate to last winter.

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 2.1 percent compared to the winter of 2015-2016, when GDP expanded by 1.7 percent. The difference is not expected to be significant enough to exert pressure on natural gas prices.

### Demand: Economy

| Winter Season<br>Period-to-period change | Last Winter<br>2015-2016<br>ACTUAL | This Winter<br>2016-2017<br>FORECAST |
|--|------------------------------------|--------------------------------------|
| Economy                                  | Slow                               | Still sluggish                       |
| GDP growth                               | 1.7%                               | 2.1%                                 |
| Unemployment rate                        | 5.0%                               | 4.9%                                 |
| Manufacturing                            | 0.2%                               | 0.7%                                 |
| CPI                                      | 0.7%                               | 2.1%                                 |
| Consumer Sentiment Index                 | 91.4                               | 91.9                                 |

**Winter-to-winter pressure on natural gas prices**



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Data Source: IHS Economics

IHS Economics also predicts that manufacturing, an important influence on the GDP, will grow 0.7 percent in winter 2016-2017, which is a small but welcome improvement from last winter's weak growth of 0.2 percent. The slow growth of the manufacturing sector is attributed to global economic uncertainty and the relative strength of the dollar impacting international sales.

Meanwhile, the latest Consumer Sentiment Index (CSI) shows that consumers feel generally positive about the economy, with the CSI tracking at 91.9 percent, reflecting consumer optimism, probably the result of a strong labor market (4.9 percent unemployment), low inflation and lower prices for energy. 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 these economic indicators generally reflect good news for consumers, the changes are too small to pressure prices. Therefore NGSA anticipates the **economy will place level winter-over-winter pressure** on natural gas prices.

## Overall Customer Demand

An independent demand analysis performed by EVA notes that total demand for natural gas will increase compared to last winter. EVA forecasts overall winter 2016-2017 demand for natural gas at 92.3 billion cubic feet per day (Bcf/d) compared to 89.1 Bcf/d last winter. A sector-by-sector breakdown follows.

### Demand: Customer Demand

| Winter Season<br>Period-to-period change | Last Winter<br>2015-2016<br>ACTUAL | This Winter<br>2016-2017<br>FORECAST |
|--|------------------------------------|--------------------------------------|
| <b>Customer Gas Demand*</b>              | <b>89.1 Bcf/d</b>                  | <b>92.3 Bcf/d</b>                    |
| ▪ Electric                               | 24.5 Bcf/d                         | 21.2 Bcf/d                           |
| ▪ Industrial                             | 22.2 Bcf/d                         | 22.9 Bcf/d                           |
| ▪ Residential/Commercial                 | 32.2 Bcf/d                         | 36.2 Bcf/d                           |
| ▪ Mexican exports                        | 3.2 Bcf/d                          | 4.0 Bcf/d                            |
| ▪ LNG exports                            | NA                                 | 0.8 Bcf/d                            |
| Growth sector                            | Electric                           | Residential<br>+ 12%                 |

**Winter-to-winter pressure on natural gas prices**

\*Includes "Lease, Plant and Pipeline Fuel"



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Data Source: Energy Information Administration

Energy Ventures Analysis (EVA) expects that most of the increased demand will come from the *residential and commercial* sectors, where colder weather is projected to spur a solid increase in demand of 4 Bcf/day, which is a 12 percent increase in that sector.

EVA further projects slight *industrial* demand growth of 0.7 Bcf/day. Although a small increase, overall industrial demand for natural gas is record-setting. The growth in industrial demand is linked to the construction of major gas-intensive facilities and capacity expansions in the petro-chemical and fertilizer industries, which are moving forward on building and expanding numerous facilities in the 2015-2021 time frame.

EVA points out that an extended forward view of industrial demand shows 71 new and expanded major natural gas-intensive industrial projects occurring from 2015 to 2021, representing an investment of about \$121 billion to build and an increase of 3.7 Bcf/day by 2021.

The industrial growth projected over the next five years is primarily due to 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 some projects in Midwestern states.

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

#### Focus On Industrial Demand:

Natural Gas Spurring 71 Major Industrial Projects 2015–2021



Data Source: Energy Ventures Analysis, June 2015

When analyzing the *electric sector's* projected demand for natural gas this winter, EVA predicts decreased demand averaging over 3 Bcf/day, despite the forecast for colder winter temperatures. The major cause of the decreased demand from the electric sector can be attributed to a significant drop in coal-to-gas switching compared to the previous winter.

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, temporary decision that is purely an economic choice based on the current price of the competing fuels. Fuel switching is projected to continue this winter, but at about 50 percent less than last winter because of projected higher wholesale natural gas prices. 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 years since 2008.

The level of LNG imports is exceeded by exports this winter and the U.S. is for the first time forecasted to be a net exporter of 0.8 Bcf/day. Although the U.S. has shifted to a net LNG exporter, the amount of LNG to be exported is projected to remain merely a small slice of overall demand. EVA projects LNG exports to reach 7 Bcf/day by 2020.

Finally, EVA expects natural gas exports to Mexico in the range of 4.0 Bcf/day, with the construction of new pipelines in Mexico and its growing economy.

When customer demand from exports, the electric, industrial, and residential/commercial sectors are combined, overall demand averages 3.2 Bcf/day – about 4 percent – more than last winter prices. **Overall customer demand is expected to place upward pressure on prices this winter.**

## Storage/Supply

Traditionally, underground natural gas storage has allowed 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, it is projected that 3,995 Bcf of natural gas will be in storage – approaching a record setting 4 trillion cubic feet. Although the amount in storage is projected to reach an all-time high, it is similar enough to last winter's level of 3,950 Bcf in storage to have little impact on prices. Storage always serves as an important hedging and reliability tool during the winter heating season. The similarity in abundant storage levels is expected to place **neutral pressure** on natural gas prices this winter.

## Winter Sources/Supply

Turning to natural gas winter supply, EIA expects domestic production to drop very slightly compared to last winter, reflecting decreased drilling activity. As a result, domestic natural gas supply this winter is forecasted to be 78.5 Bcf/day compared to last winter's 79 Bcf/day.

### Supply: Winter Sources

| Winter Season<br>Period-to-period change           | Last Winter<br>2015-2016 ACTUAL | This Winter<br>2016-2017<br>FORECAST |
|--|---------------------------------|--------------------------------------|
| Winter average production<br>(Lower 48)            | 73.5 Bcf/d                      | 73.0 Bcf/d                           |
| Canadian imports (net)                             | + 5.5                           | + 5.5                                |
| Winter-to-Winter pressure<br>on natural gas prices |                                 |                                      |



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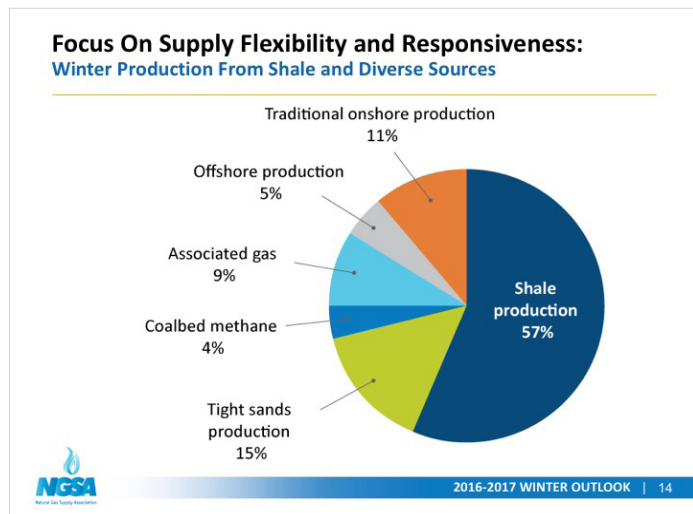
Data Source: Energy Ventures Analysis



Although average winter production slightly decreased, production levels are still robust, reflective of continuous improvement in technology and drilling efficiencies.

The 2016-2017 Winter Outlook also predicts a moderately-sized, but important, contribution from Canadian imports of 5.5 Bcf/day.

In summary, winter supply sources will place **neutral pressure** on natural gas prices compared to the winter of 2015-2016. NGSA emphasized that winter supply remains ample to meet customer demand, with natural gas storage providing further responsiveness and flexibility in the market.



## “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 winter’s wild cards include:

- Unexpected cold – or warm-snaps could affect residential/commercial demand and electric demand;
- And regional pipeline constraints could have short-term impact on regions with tight capacity.



## Summary of Key Factors

**In conclusion, NGSA’s analysis of varying data indicates overall upward pressure on natural gas prices this winter compared with last winter’s unusually low winter average wholesale prices of \$1.98 per MMBtu.** A recap of the five major pressure points reveals:

- Colder winter weather than last winter. — UPWARD PRESSURE
- Overall demand — residential/commercial demand expected to grow 12 percent, industrial demand to grow very slightly, electric demand to decrease, and Mexican and LNG exports to grow. — UPWARD PRESSURE
- Supply slightly less than last winter’s record levels, due to slight drop in production. — NEUTRAL PRESSURE
- Economy grows, but sluggishly. — NEUTRAL PRESSURE
- Storage approaching record inventories, like last winter. — NEUTRAL PRESSURE

## OVERVIEW: *Responsive Flexible* Natural Gas Market

- Robust winter supply
  - Efficiencies in drilling and production continue to make wells more productive at lower cost
  - Diverse supply sources contribute to greater flexibility
  - Storage inventory forecast to reach record levels, providing further flexibility
- Residential/commercial demand increases due to colder weather
- Industrial demand buoyed by capacity expansions and new builds in petro-chemical and industries

**For more information, please visit [www.ngsa.org](http://www.ngsa.org) or contact us directly.**