Understanding the Symbols

- Upward market pressure
- Flat market pressure
- Downward market pressure
Last Year’s Projection: How Did We Score?

<table>
<thead>
<tr>
<th>Predicted Pressure on Prices</th>
<th>Actual Pressure on Prices</th>
<th>Score</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
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<td>✔</td>
</tr>
</tbody>
</table>

Correctly predicted:
We correctly projected record-breaking demand and supply, but both supply and demand growth exceeded even our projections, due to cold winter and new pipeline capacity. Result: Neutral pressure on prices

- Last winter 2018-2019 average Henry Hub price = $3.33 MMBtu
- Previous winter 2017-2018 average Henry Hub price = $2.99 MMBtu

2019-2020 Winter Outlook: Outline

- Looking ahead to Winter 2019-2020
  - Market pressure points:
    - Weather
    - Economy
    - Demand
    - Storage
    - Production
  - Wild card factors
  - Winter expectations
- Summary
**Demand: Winter Weather**

<table>
<thead>
<tr>
<th>Last Winter (Nov. – March) 2018-2019 Actual</th>
<th>This Winter 2019-2020 Forecast</th>
</tr>
</thead>
<tbody>
<tr>
<td>Actual winter heating season:</td>
<td>Forecast:</td>
</tr>
<tr>
<td>4% colder than previous winter</td>
<td>4% warmer than last year</td>
</tr>
<tr>
<td>2% colder than 30-year average</td>
<td>2% warmer than 30-year average</td>
</tr>
<tr>
<td>3,620 Heating degree days (NOAA)</td>
<td>3,469 Heating degree days</td>
</tr>
<tr>
<td>Winter-to-winter pressure on natural gas prices</td>
<td></td>
</tr>
</tbody>
</table>

Maps: National Oceanic and Atmospheric Administration; Data: Energy Ventures Analysis

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**Demand: Economy**

<table>
<thead>
<tr>
<th>Winter Season Period-to-period change</th>
<th>Last Winter 2018-2019 Actual</th>
<th>This Winter 2019-2020 Forecast</th>
</tr>
</thead>
<tbody>
<tr>
<td>Economy</td>
<td>Expanding</td>
<td>Modest growth</td>
</tr>
<tr>
<td>GDP growth</td>
<td>2.6%</td>
<td>2.1%</td>
</tr>
<tr>
<td>Unemployment rate</td>
<td>3.8%</td>
<td>3.6%</td>
</tr>
<tr>
<td>Manufacturing</td>
<td>1.8%</td>
<td>-1.5%</td>
</tr>
<tr>
<td>CPI</td>
<td>1.9%</td>
<td>2.3%</td>
</tr>
<tr>
<td>World GDP Growth</td>
<td>2.8%</td>
<td>2.5%</td>
</tr>
<tr>
<td>Consumer Sentiment Index</td>
<td>96.3</td>
<td>95.9</td>
</tr>
</tbody>
</table>

Winter-to-winter pressure on natural gas prices

Data Source: IHS Markit
### Demand: Customer Demand

<table>
<thead>
<tr>
<th>Winter Season</th>
<th>Last Winter 2018-2019 Actual</th>
<th>This Winter 2019-2020 Forecast</th>
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</thead>
<tbody>
<tr>
<td><strong>Domestic Demand</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Residential/Commercial</td>
<td>39.6 Bcf/d</td>
<td>36.1 Bcf/d</td>
</tr>
<tr>
<td>Electric</td>
<td>25.7 Bcf/d</td>
<td>27.0 Bcf/d</td>
</tr>
<tr>
<td>Industrial</td>
<td>24.7 Bcf/d</td>
<td>24.8 Bcf/d</td>
</tr>
<tr>
<td><strong>Subtotal</strong></td>
<td>90.0 Bcf/d</td>
<td>87.9 Bcf/d</td>
</tr>
<tr>
<td><strong>Exports</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pipeline exports - Mexico</td>
<td>4.8 Bcf/d</td>
<td>5.8 Bcf/d</td>
</tr>
<tr>
<td>LNG exports (net)</td>
<td>4.5 Bcf/d</td>
<td>8.3 Bcf/d</td>
</tr>
<tr>
<td><strong>Subtotal</strong></td>
<td>9.3 Bcf/d</td>
<td>14.1 Bcf/d</td>
</tr>
<tr>
<td><strong>Total Natural Gas Demand</strong></td>
<td><strong>106.2 Bcf/d</strong></td>
<td><strong>109.3 Bcf/d</strong></td>
</tr>
<tr>
<td><strong>Growth sector</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>LNG Exports +50%</td>
<td></td>
<td>LNG Exports +84%</td>
</tr>
</tbody>
</table>

*Includes "Lease, Plant and Pipeline Fuel"

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### Electric Demand for Natural Gas Likely to Set Record This Winter

**Winter Electric Demand for Natural Gas**

![Graph showing winter electric demand for natural gas](image)

**Note:** Light blue = cold winter, red = warm winter, dark blue = normal winter.

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*Data Source: Energy Ventures Analysis*
Increase in Electric Demand for Natural Gas Driven by New Gas-fired Generation and Temporary Switching

WEATHER-ADJUSTED INCREASES IN WINTER POWER BURN OF NATURAL GAS (Compared to Winter 2013-2014)

- Increase in Electric Demand for Natural Gas

Data Source: Energy Ventures Analysis

$83 Billion Investment to Build

Increase of 2 Bcf/d by 2023

34 New Projects
- 29 Petrochemical
- 3 Fertilizer
- 2 Steel

9 Expansions
- 8 Petrochemical
- 1 Steel

4 Re-starts
- 3 Steel
- 1 Petrochemical

In addition to

40 COMPLETED Projects for additional $50 Billion and 1.6 Bcf/d from 2015-2018

Photo courtesy: Chevron U.S.A. Inc., 2017 (Passagoula)

Data Source: Energy Ventures Analysis, Sept. 2019
U.S. LNG Exports: First Wave Materializes

Supply: Winter Storage

- **Start-of-winter inventory**
  - Last Winter 2018-19: 3,237 Bcf
  - This Winter 2019-20: 3,712 Bcf
- **Compared to 5-year average**
  - Last Winter: 12% lower
  - This Winter: 2% higher
- **Average daily withdrawal from storage**
  - Last Winter: 12.9 Bcf
  - This Winter: 12.3 Bcf
- **New storage capacity**
  - Last Winter: 3 Bcf
  - This Winter: 0 Bcf

Winter-to-winter pressure on natural gas prices

Data Sources: Energy Information Administration and Energy Ventures Analysis
## Supply: Winter Production and Imports

<table>
<thead>
<tr>
<th></th>
<th>Winter Season</th>
<th>Last Winter</th>
<th>This Winter</th>
</tr>
</thead>
<tbody>
<tr>
<td>Winter average production (Lower 48)</td>
<td>88.2 Bcf/d</td>
<td>92.0 Bcf/d</td>
<td></td>
</tr>
<tr>
<td>Canadian imports (net)</td>
<td>4.7 Bcf/d</td>
<td>4.7 Bcf/d</td>
<td></td>
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### Winter-to-Winter pressure on natural gas prices

## Supply: Record Growth in Production Continues

26 BCFD GROWTH IN U.S. GAS PRODUCTION FROM 2013 TO 2019 YTD, OR ~40%
New Pipeline Capacity Bringing Long-Awaited Relief to Permian

Permian Pipeline Takeaway Capacity vs. Production Growth

Permian North Expansion (El Paso)
Gulf Coast Express
Permian Highway Pipeline
Blueberry Market Express
Bakerfield Compressor Station
Observed Production Growth

Winter Outlook: Wild Cards

Weather?
Trade/Tariffs?
Escalating U.S. China Tariff Showdown: Effect on Industrial Sector and Exports?

US raises 25% tariffs on List 3 products, totaling $200 billion. **August 2018**

US imposes 10% tariffs on steel and aluminum. **May 2018**

US implements 25% tariffs on steel and aluminum. **June 2018**

China imposes retaliatory 25% and other mixed 25% tariffs on agricultural products, mineral fuels, iron and steel products. **April 27, 2018**

China raises tariffs on US-listed goods, totaling $34 billion. **July 2018**

US increases from 10% to 25% on List 1, totaling $50 billion. **June 2018**

US increases from 10% to 25% on List 2, totaling $34 billion. **August 2019**

China responds with retaliatory tariffs on US-listed goods. **August 2018**

China responds to US tariffs with retaliatory tariffs on other US goods. **July 6, 2018**

China responds to US tariffs with retaliatory tariffs on US-listed goods. **September 2018**

China responds to US tariffs with retaliatory tariffs on US-listed goods. **October 1, 2018**

China responds to US tariffs with retaliatory tariffs on US-listed goods. **August 2019**

China responds to US tariffs with retaliatory tariffs on US-listed goods. **September 2018**

China responds to US tariffs with retaliatory tariffs on US-listed goods. **June 2019**

China proposes 25% tariff on List 5 products. **June 2019**

China proposes 25% tariff on List 4 products. **August 2019**

Natural Gas-Renewables Partnership: Path to Clean Energy Future
## This Season’s Winter Outlook

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<thead>
<tr>
<th>Winter Season</th>
<th>This Winter 2019-2020 FORECAST</th>
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<tr>
<td>Period-to-period change</td>
<td></td>
</tr>
<tr>
<td>Weather</td>
<td>▼</td>
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<tr>
<td>Economy</td>
<td></td>
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<tr>
<td>Overall demand</td>
<td></td>
</tr>
<tr>
<td>Storage</td>
<td>▼</td>
</tr>
<tr>
<td>Winter supply</td>
<td></td>
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<tr>
<td>Winter-to-winter pressure on natural gas prices</td>
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</tr>
</tbody>
</table>

### Comparison of Impact of Severe Weather on Daily Prices

**What a Difference a Decade Makes**

![Graph showing comparison of impact of severe weather on daily prices](image)

Data Source: Gas Daily
Natural Gas Outlook: Flexible, Reliable Natural Gas Market

- Record customer demand driven by domestic and export growth
  - Exports – LNG and pipeline – increase and provide stability in ebbs and flows of market
  - New gas-fired generation could push electric demand to new winter record despite expectation for milder winter
  - Minimal growth in industrial demand due to trade uncertainty and slowing global growth

- Record strong reliable production continues
  - Efficiencies in drilling and production continue to make wells productive at lower cost
  - Associated gas a significant share of production
  - Diverse supply sources contribute to greater flexibility and resilience evidenced by limited supply impact of deep freeze, hurricanes

About NGSA

- Represents major producers and suppliers of domestic natural gas
  - Integrated and independent companies: 14 members
  - Founded in 1965

- Only national natural gas association representing producers and suppliers with a dedicated focus on downstream issues

- Promotes benefits of competitive natural gas markets, resulting in reliable and efficient transportation and delivery, increased supply and demand

- Combined with the Center for LNG
2019-2020 Winter Outlook

Markets Matter

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