2022-2023 WINTER OUTLOOK
MARKETS MATTER
Understanding the Symbols

- Upward market pressure
- Flat market pressure
- Downward market pressure
LOOKING AHEAD TO WINTER 2022-2023

Market Pressure Points

Production/Supply | Weather | Economy | Demand | Storage

Wild Card Factors

Winter Expectations

SUMMARY
Supply: Winter Production Projected 4% Higher Than Last Winter

Winter 2022-2023 Supply Forecast: 104 Bcf/d
Previous 3-year average: 98.8 Bcf/d  Last winter's average 100.2 Bcf/d

Production up 4% winter-over-winter
Approaching record levels

Imports remain a valued 5% share of supply

Winter-to-winter pressure on natural gas prices

Data Source: Energy Ventures Analysis, Inc.
EIA
The Resounding Comeback of Natural Gas Production

2022 Natural Gas Production Compared to 2020

All-time high in July

Data Source: Platts Global Insights, Oct. 2022
Drilled but Uncompleted Wells Inventory in Major U.S. Producing Areas

- Anadarko
- Appalachia
- Bakken
- Eagle Ford
- Haynesville
- Niobrara
- Permian
- Total Rig Count

New Gas Supply Source Growth Indicators: DUC vs Rig

- Depletion rate of DUC inventory
- Growth of New Rigs

Data Source: EIA; Energy Ventures Analysis
### Last Winter 2021-2022 ACTUAL

**ACTUAL:** 3,327 Heating degree days
1% *warmer* than last 3 winters

### This Winter 2022-2023 FORECAST

**Forecast:** 3,437 Heating degree days
3.3% *colder* than last winter
2.8% *colder* than last three winters

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

*Data Source: Energy Ventures Analysis.*
### Winter Season

<table>
<thead>
<tr>
<th>Winter Season</th>
<th>Last Winter 2021-2022</th>
<th>This Winter 2022-2023</th>
</tr>
</thead>
<tbody>
<tr>
<td>Period-to-period change</td>
<td></td>
<td></td>
</tr>
<tr>
<td>GDP Growth (Year-over-Year)</td>
<td>2.7%</td>
<td>-0.5%</td>
</tr>
<tr>
<td>Manufacturing</td>
<td>77%</td>
<td>79.8%</td>
</tr>
<tr>
<td>Unemployment rate</td>
<td>3.9%</td>
<td>3.7%</td>
</tr>
<tr>
<td>Consumer Sentiment Index</td>
<td>83%</td>
<td>65%</td>
</tr>
</tbody>
</table>

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

*Data Sources: Moody’s Analytics, Bureau of Labor Statistics, Bureau of Economic Analysis, University of Michigan, Energy Ventures Analysis*
**Demand: Demand Projected 2% Higher Than Last Winter**

Winter 2022-2023: Forecast 118.1 Bcf/d

Previous 3-year average: 112.7 Bcf/d  Last winter’s average: 116.0 Bcf/d

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

**Data Source: Energy Ventures Analysis, Inc.**
Increases in natural gas power generation partially due to **new** gas-fired generation, partially due to greater use of **existing** generation because of pricing compared to other fuel options.

**Winter-over-winter increases in power burn of natural gas compared to baseline of 2015**

<table>
<thead>
<tr>
<th>BCFD</th>
<th>Structural Changes</th>
<th>Economic Dispatch</th>
<th>Henry Hub Prices</th>
<th>$/MMBTU</th>
</tr>
</thead>
<tbody>
<tr>
<td>2017/18 Winter</td>
<td>1.6</td>
<td>-0.5</td>
<td>-4.0</td>
<td>$0.00</td>
</tr>
<tr>
<td>2018/19 Winter</td>
<td>3.7</td>
<td>-0.8</td>
<td>-2.0</td>
<td>$2.00</td>
</tr>
<tr>
<td>2019/20 Winter</td>
<td>5.5</td>
<td>0.0</td>
<td>0.0</td>
<td>$4.00</td>
</tr>
<tr>
<td>2020/21 Winter</td>
<td>6.5</td>
<td>-3.1</td>
<td>2.0</td>
<td>$6.00</td>
</tr>
<tr>
<td>2021/22 Winter</td>
<td>6.4</td>
<td>-1.0</td>
<td>4.0</td>
<td>$8.00</td>
</tr>
<tr>
<td>2022/23 Winter</td>
<td>6.8</td>
<td>-3.7</td>
<td>6.8</td>
<td>$10.00</td>
</tr>
</tbody>
</table>

2015 was the first year retired over 10 GW of Coal, the beginning of large-scale coal retirements
Source: Energy Ventures Analysis
Note: 2022/23 winter prices are NYMEX settlements as of 8/17
Banner Year for Change in U.S. Power Generation

Net change in U.S. generating capacity

- New natural gas generation capacity: + 10 GW
- New wind + solar + battery storage: + 45 GW
- Coal retirements: - 17 GW

Source: Energy Ventures Analysis, U.S. EIA
Focus: Industrial Demand Peak Growth Phase

Natural Gas Spurring 22 Major Industrial Projects 2022-2025

$33 Billion Investment to Build

Increase of 1.0 Bcf/d by 2025

15 New Projects
12 Petrochemical
2 Steel
1 Fertilizer

3 Expansions
2 Fertilizer
1 Steel

1 Re-start
1 Steel

In addition to

46 COMPLETED Projects for additional $72 billion and 1.2 Bcf/d from 2017-2021

Data Source: Energy Ventures Analysis, September 2021
Photo Courtesy: Chevron U.S.A. Inc., 2017 (Pascagoula)
Global LNG price

$/MMBTU

TTF  JKM  HH  13% Brent

EU LNG prices
Asia LNG prices
U.S. natural gas prices

Source: ICE. Future curves are based on 8/17/2022 settlements
U.S. LNG Exports Respond to European Crisis

U.S. LNG Export Capacity vs. Feedgas Deliveries

Source: Energy Ventures Analysis, EIA
Natural gas infrastructure required to support increased need for fast-ramping resources and retiring coal plants

Appalachian Natural Gas Output Quickly Fills Pipeline Takeaway Capacity 2014-2022

Capacity utilization averaged 87% over the last two years
## Supply: Winter Storage

### Winter Season: Period-to-period change

<table>
<thead>
<tr>
<th></th>
<th>Last Winter 2021-2022 Actual</th>
<th>This Winter 2022-2023 Forecast</th>
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<tbody>
<tr>
<td>Start-of-winter inventory</td>
<td>3,644 Bcf</td>
<td>3,450 Bcf</td>
</tr>
<tr>
<td>Compared to 5-year average (Percent of total storage inventory)</td>
<td>similar</td>
<td>9% lower</td>
</tr>
<tr>
<td>Average daily withdrawal from storage</td>
<td>15.8 Bcf</td>
<td>14.2 Bcf</td>
</tr>
<tr>
<td>New storage capacity</td>
<td>+ 0 Bcf</td>
<td>+ 0 Bcf</td>
</tr>
</tbody>
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**Winter-to-winter pressure on natural gas prices**

*Data Source: Energy Information Administration and Energy Ventures Analysis.*
# This Season’s Winter Outlook

## Winter Season

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<tr>
<th>Period-to-period change</th>
<th>This Winter 2022-2023 FORECAST</th>
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<tr>
<td>Winter production + imports</td>
<td>![arrow up]</td>
</tr>
<tr>
<td>Weather</td>
<td>![arrow down]</td>
</tr>
<tr>
<td>Economy</td>
<td>![arrow down]</td>
</tr>
<tr>
<td>Overall demand</td>
<td>![arrow up]</td>
</tr>
<tr>
<td>Storage</td>
<td>![arrow up]</td>
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**Winter-to-winter pressure on natural gas prices**
Winter Outlook: Wild Cards

Economy

LNG Exports

Weather
Natural Gas Outlook: Flexible, Responsive Gas Market

Winter production surges in response to strong demand for natural gas

- Producers ramping up production to record levels
- DUCs enabling production to get to market faster
- Drilling rigs up 60% compared to last winter
- Associated gas grows

Tight winter supply-demand balance

- Storage at low end of 5-year average
- Exports – LNG exports increase as EU countries struggle to replace Russian gas
- Industrial demand buoyed by colder weather and higher utilization rates
- Power sector fuel mix continues to evolve with less coal, more gas, more renewables
About NGSA

- Represents major producers and suppliers of domestic natural gas
  - Integrated and independent companies: 7 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