American Gas Association

Energy Markets, Analysis and Standards

Energy Analysis

AGA Energy Insights **December 1, 2021**

AGA 2022 Winter Heating Outlook

The American Gas Association (AGA) examines market conditions and natural gas utility preparation for winter. This write-up presents a summary of AGA's 2022 Winter Heating Outlook, which examined the following areas:

- Natural gas supply, demand, and prices.
- Utility preparation to meet customer winter energy requirements.
- Customer bills and associated greenhouse gas emissions.
- Utility actions to ensure affordable energy services for customers.

Representing the nation's natural gas utilities, AGA routinely examines natural gas market fundamentals issues, surveys its members on winter supply portfolio development and expectations for the winter heating bills, and analytically models economic and environmental considerations based on consumer fuel and technology options.

In its 2021 Winter Heating Outlook, AGA offers some critical conclusions:

- Natural gas continues to be an affordable energy option for home heating.
- Natural gas utilities work in and with their communities to offer and participate in several energy assistance programs to help customers in need.
- Despite increased use, customers will save money and lower their carbon footprint using natural gas compared to other energy sources.

The following sections present the different components examined as part of AGA's Winter Heating Outlook.

Trends in natural gas market indicators

US natural gas demand has been strong, with growth coming almost entirely from LNG exports and pipeline exports to Mexico.

Overall natural gas demand has grown in 2021, rising from levels in part subdued by the pandemic and economic slowdowns. Average US lower-48 demand from June 2021 through October 2021 was 87.0 Bcf per day, up nearly 7% from the same period in 2020.

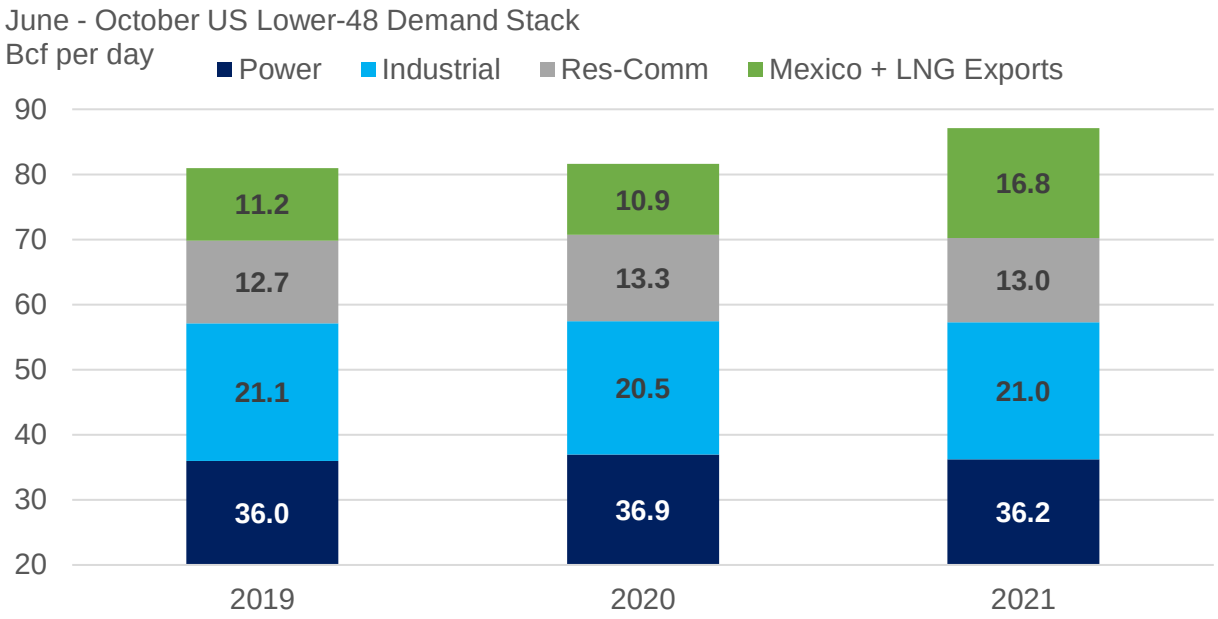
The US saw significant growth in export demand this year, with export facilities operating near capacity as natural gas fetches a higher price in European and Asian markets dealing with supply shortages. As a result, LNG exports feedgas are nearly 61% greater year to date compared with 2020. Additionally, pipeline exports to Mexico reached record highs over the summer months to fulfill significant cooling demand. Year to date volumes of pipeline exports to Mexico are averaging 12% more than 2020 year-to-date volumes.

Despite higher natural gas prices in 2021, natural gas flows to the power sector did not decrease significantly. Coal plant retirements in recent years and near-term rising coal prices have mitigated coal-to-gas switching in the generation stack. More fundamentally, the ability of natural gas capacity to maintain reliable and flexible power generation continues to support gas flows to the power sector.

There has been a modest increase in aggregate volumes to the industrial sector in 2021. Generally, the year-over-year increases have been due to rebounds in the US and global economy. Natural gas consumption fell in the US industrial sector during 2020 when a decline in US economic activity led to a decline in output among industries that consume natural gas, such as the metals, petroleum and coal products, paper, and chemicals industries.

In short, increases in industrial demand and exports more than offset residential, commercial, and power generation demand reductions, resulting in total demand for 2021 greater than the demand in recent years.

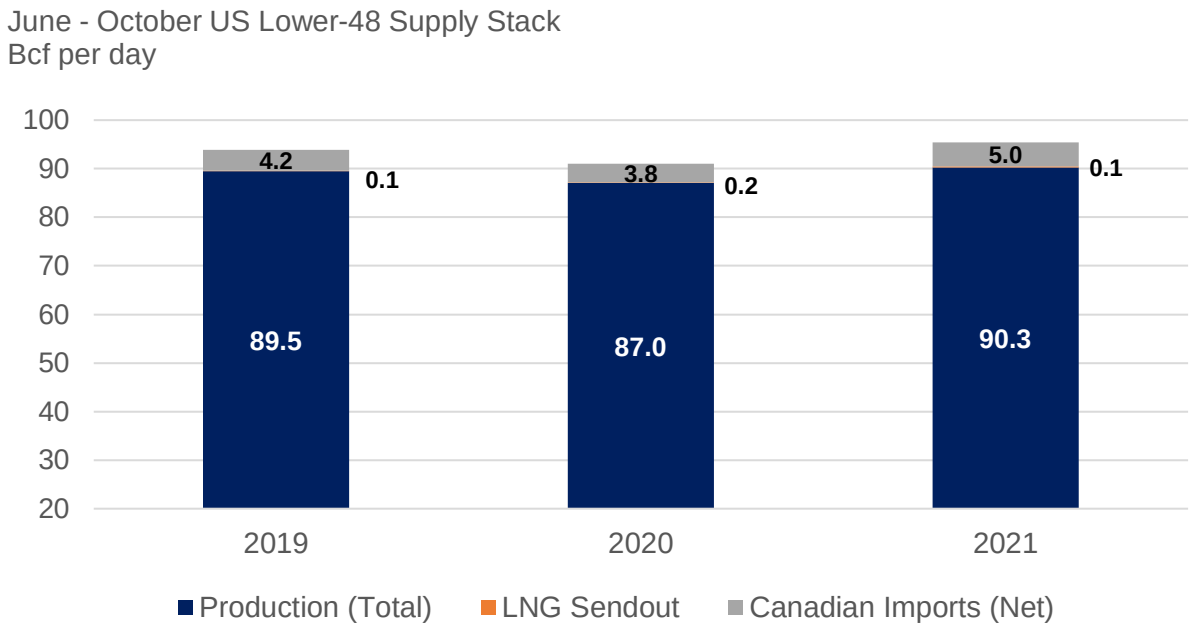
Figure 1



Source: S&P Global Platts Analytics

Supplies have grown from the slowdown of 2020 but have not kept pace with demand.

Figure 2



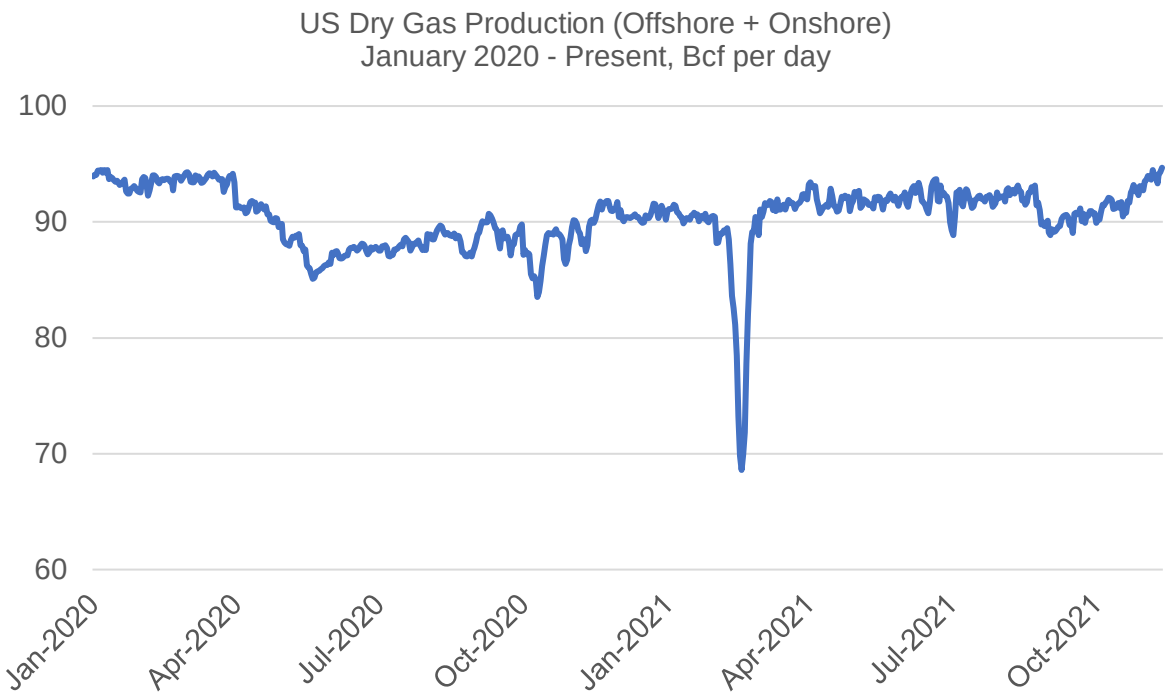
Source: S&P Global Platts Analytics

Natural gas production in 2021 have recovered from significant declines in 2020. Last year beginning in April 2020, as the global pandemic disrupted energy markets and commodity prices collapsed, oil operators shut-in production and cut off associated gas supplies. Natural gas production slowly recovered for the remainder of 2020 and into 2021. For much of 2021, dry gas production has been elevated compared to last year and is back to pre-pandemic levels.

Despite the growth in natural gas production during 2021, rising dry gas volumes did not keep pace with increasing demand. More recently, however, since October, US natural gas production has begun edging higher. By the end of November, dry gas flows reached above 95 Bcf per day as oil drillers in the Permian increased activity, and production flows from the Haynesville, Marcellus, and Utica have grown.

Continued price support in oil and natural gas markets could incentivize additional activities contributing to gas supplies during the 2021-2022 winter heating season and later in 2022.

Figure 3

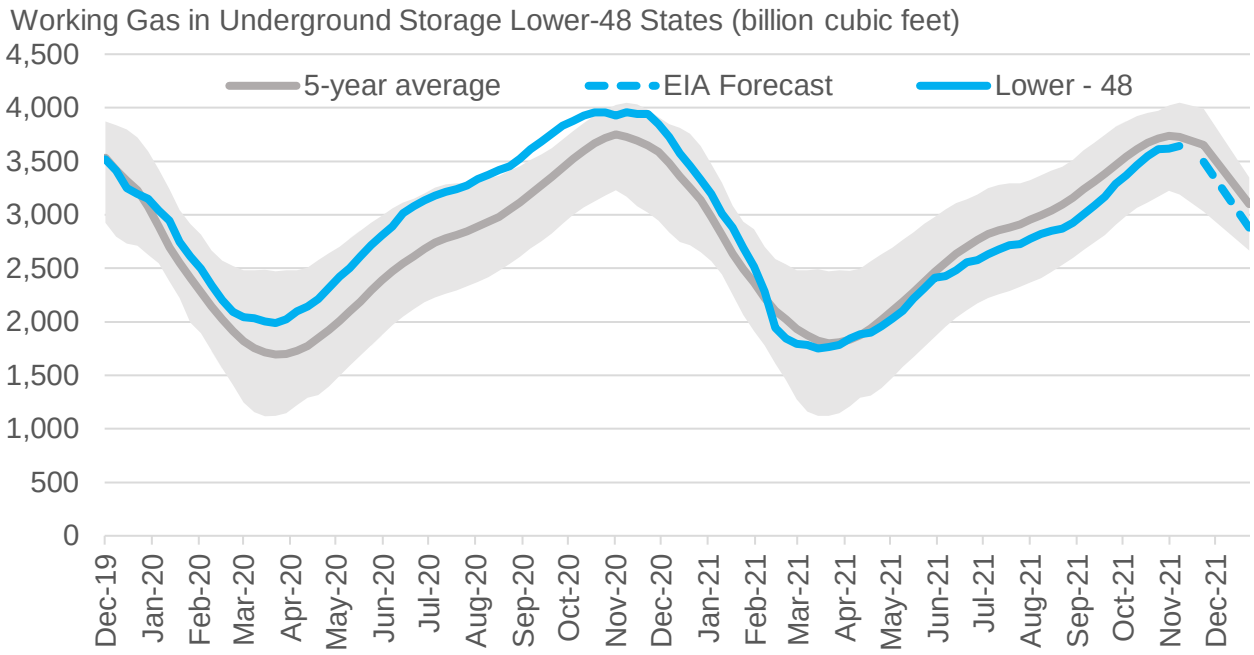


Source: S&P Global Platts Analytics

Storage inventories will begin the winter heating season slightly below the five-year average in every region.

2021 saw relatively flat production and strong demand. As a result, as Figure 4 shows, working gas inventories have lagged behind the five-year average, resulting in lower volumes of natural gas in storage. Strong injections late in the season have helped narrow the large gap in inventories present towards the end of the summer. In early November, the injection season turned to withdrawals with a working gas volume available in storage of 3.6 trillion cubic feet (Tcf). NOAA is forecasting the 2021-2022 heating season to be colder than recent winters. Thus, inventories could draw down more quickly than average this winter heating season.

Figure 4



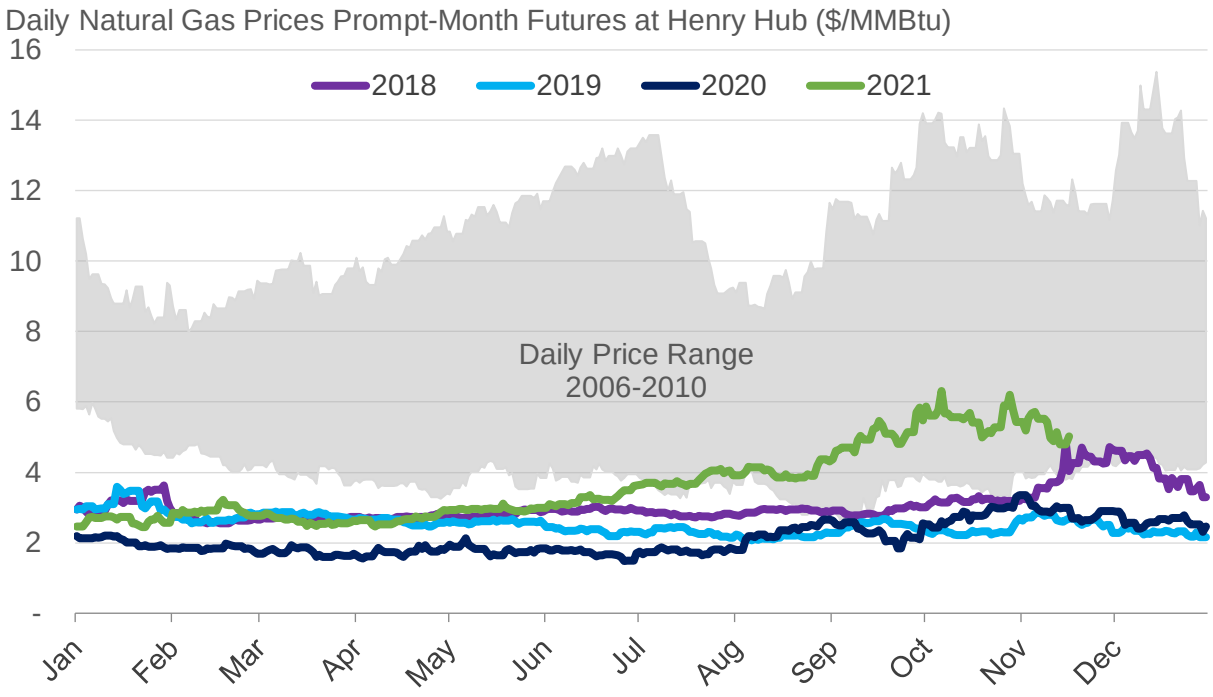
Source: Energy Information Administration

Natural gas prices have remained relatively low and stable.

The tail end of 2021 has also seen relatively mild temperatures across the lower-48, resulting in subdued demand and may be contributing to recent reductions in prices as we enter the last two months of the year.

Natural gas futures prices at the Henry Hub averaged $3.51 per MMBtu over the first half of the year. However, the late summer saw significant price increases spurred by increased demand and lower year-over-year gas inventories for the upcoming heating season. While natural gas prices are higher than the past few years, as Figure 5 shows, prices are relatively low and stable, particularly compared to history.

Figure 5



Source: Energy Information Administration

Utility preparation for the winter heating season

Utilities use a range of physical and financial tools to achieve a balanced portfolio of gas assets, which helps to reduce the effects of market volatility on customer bills while helping to ensure reliable and economically procured supplies for service to their customers.

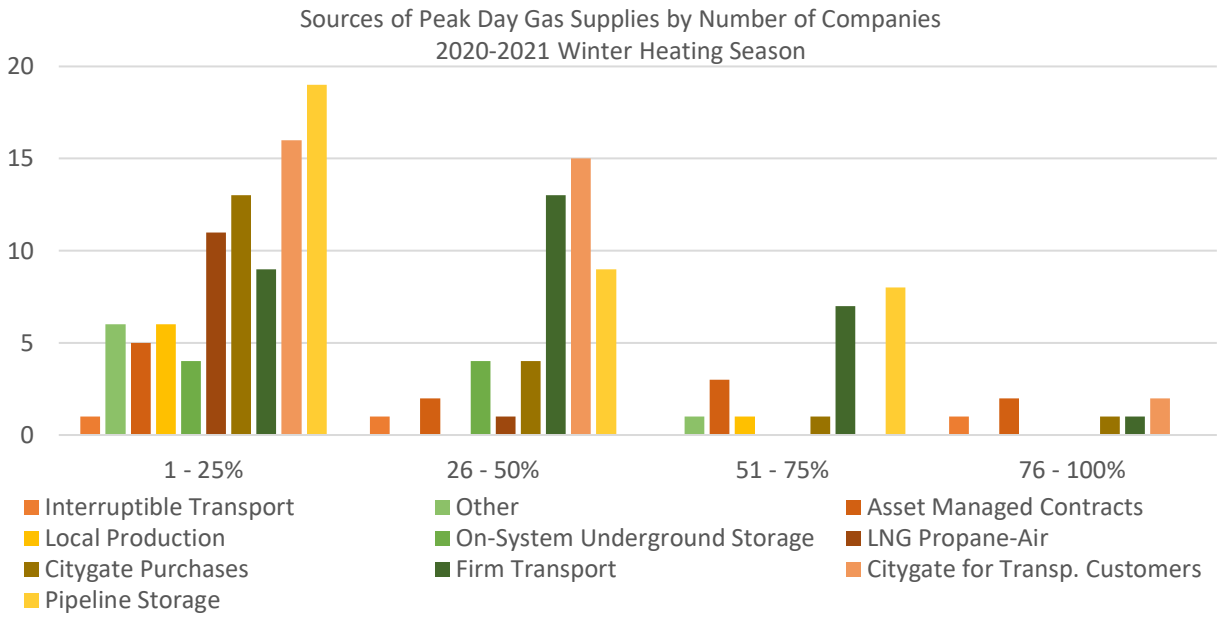
Gas utilities plan supply purchases throughout the year to ensure sufficient volumes are available to meet winter demand on a seasonal and peak basis. Local market conditions and geography will shape individual gas procurement strategies and management of supplies during the winter.

Utilities generally have several purchasing options and may develop a portfolio of supply sources using a range of physical and financial mechanisms. Utilities help to ensure economic gas supply flexibility to meet delivery obligations by contracting for gas from several sources, employing physical assets such as underground storage, and utilizing financial instruments and hedging.

Each year, the American Gas Association surveys its gas utility membership to understand the range of gas supply portfolio practices and strategies utilized to meet its customer energy requirements during the winter heating season. Based on individual utility-specific conditions, utilities plan for daily, weekly, monthly, and seasonal natural gas deliveries by matching supply resources to forecasted demand and by preparing for "design day" conditions (or a historic peak day load).

Figure 6 shows the variety of gas sources used by 48 AGA members to create physical hedges during the 2020-2021 winter heating season. As the figure shows gas utilities utilize a range of supply options when building their peak-day supply portfolios.

Figure 6



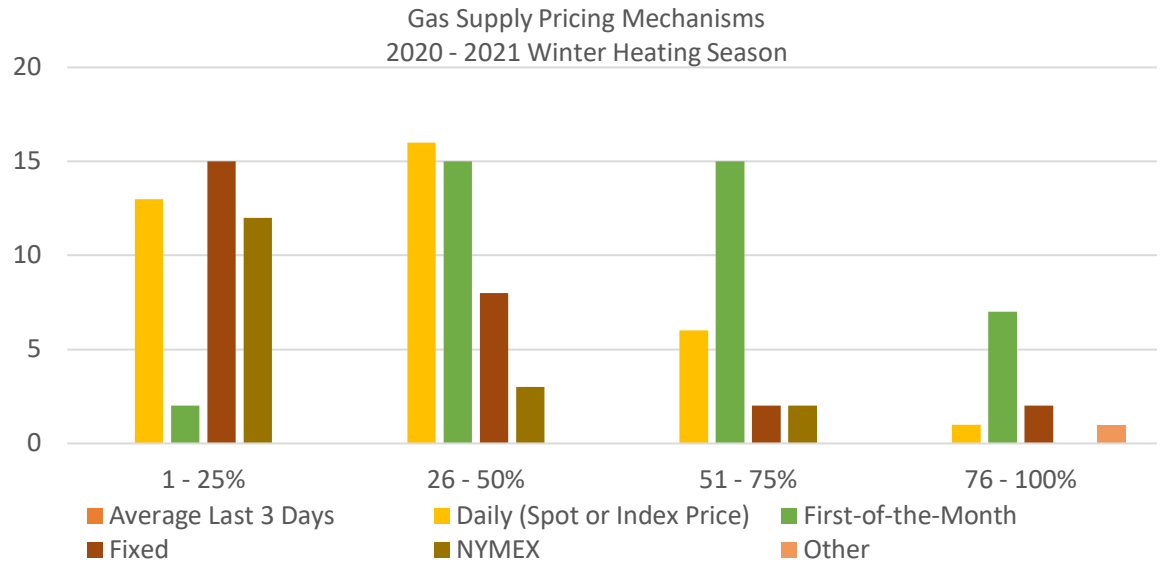
Source: AGA 2020-2021 Winter Heating Season Survey Report

Utilities use a range of gas supply pricing mechanisms to ensure economical gas purchasing.

Natural gas utilities, guided by past experience and through regulatory oversight, plan natural gas deliveries on a daily, weekly, monthly, and seasonal basis. Local distribution companies this year, as in the past, will use a full suite of supply assets and tools to fulfill their obligation to serve customers reliably and safely.

The costs associated with commodity pricing during the winter can affect consumer bills. Many factors may affect natural gas market pricing, such as weather, supply, demand, and financial markets. Natural gas utilities do not set the market pricing for supplies, nor do utilities profit from the sale of natural gas to their customers. To ensure reliable and economically procured commodity for service to customers, natural gas utilities may utilize a range of pricing mechanisms that allow gas supply portfolio managers to hedge or lock in a portion of the commodity cost components of gas supply. Figure 7 shows some of these contract options utilities use.

Figure 7



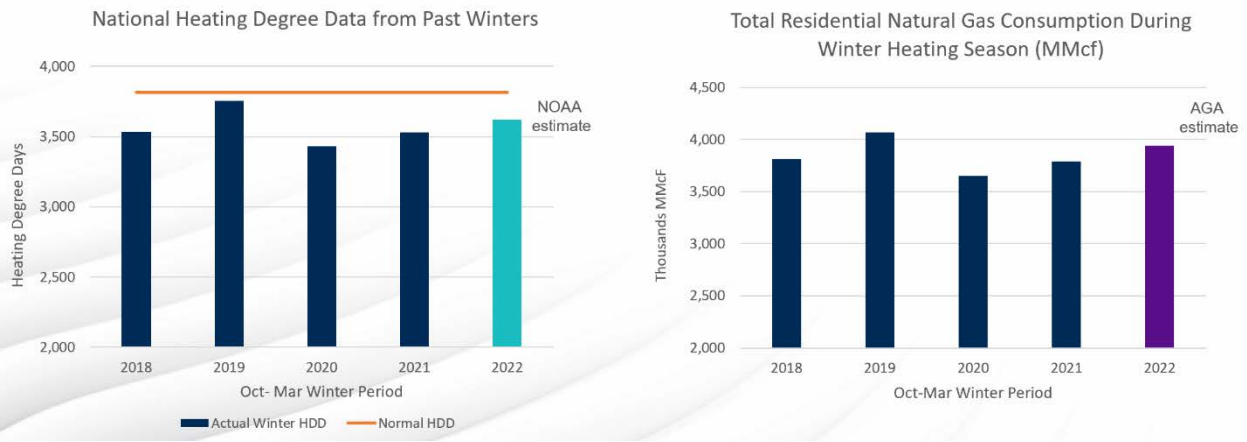
Source: AGA 2020-2021 Winter Heating Season Survey Report

Winter 2021-2022 Evaluation of Customer Economics and Environmental Impacts

Homes that heat with natural gas will see significant savings compared to homes that heat with electricity or other forms of energy. The cost of heat depends on customer demand and the energy efficiency of the space heating appliances used.

The US National Oceanic and Atmospheric Administration forecasts that temperatures will be below-average this winter. Figure 8 depicts the relationship between NOAA's forecasted temperatures, as measured by total heating degree days, and EIA's expected natural gas demand. As the figure shows, demand is expected to be higher this year than last year. AGA members estimate that the cooler weather will induce a 4 percent increase in gas throughput.

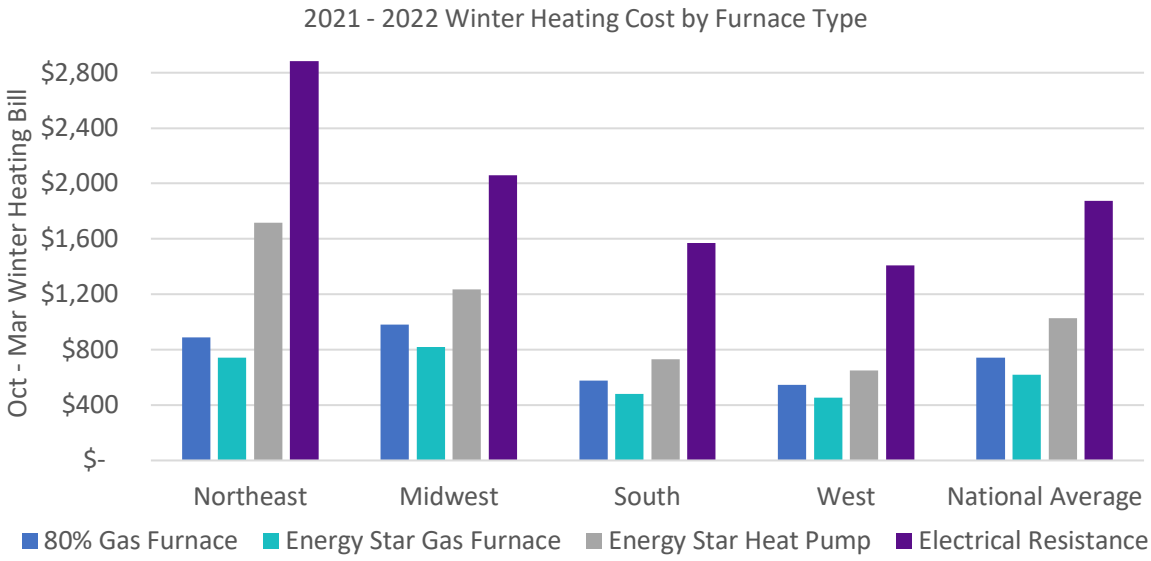
Figure 8



Source: National Weather Service Climate Prediction Center, Energy Information Administration

To examine the impact of energy efficiency and fuel choice on customer bills, AGA modeled the performance of different appliances using EIA's forecasted residential energy prices and consumption trends based on past winters with similar outlooks to this winter. Given the colder weather projections and higher energy prices, customer heating bills are likely to be higher this year, regardless of the fuel source used. All else being equal, natural gas will remain the least expensive heating option for customers. This winter, home heating with natural gas could save between 28 and 67 percent compared to even the most efficient electrical options. This conclusion is consistent with EIA's winter fuels forecast.

Figure 9

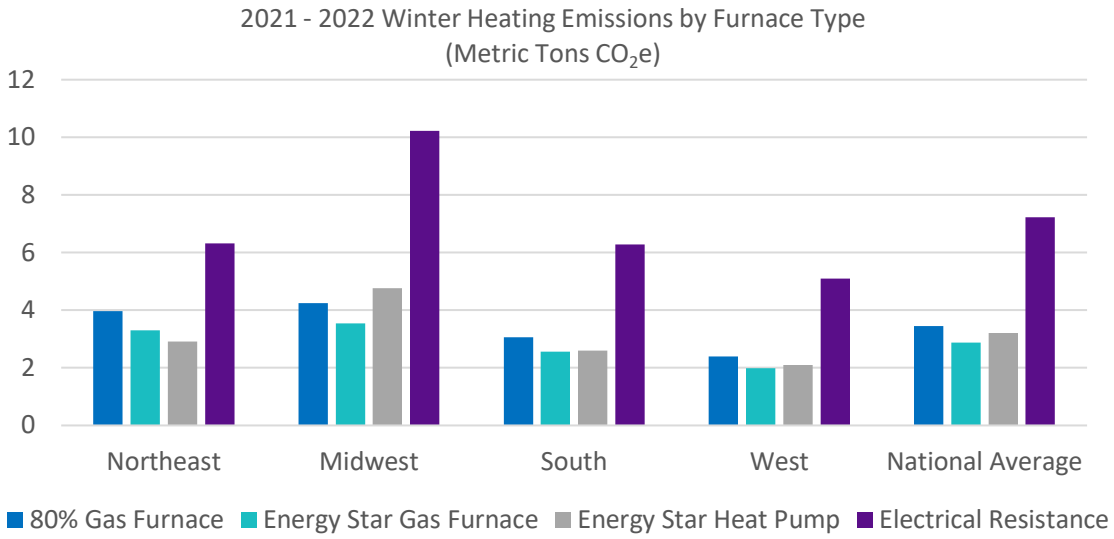


Source: AGA model based on 2017 and 2020 winter heating data

The environmental impacts of home heating depend on appliance use and efficiency and the relative carbon intensity of fuel sources. On average, heating with an Energy Star natural gas furnace is 11%

cleaner than an Energy Star rated electric heat pump and 60% lower carbon emissions than an electric resistance furnace. As Figure 10 shows, households can reduce emissions this winter by installing a high-efficiency gas furnace compared to electric and older gas appliances.

Figure 10



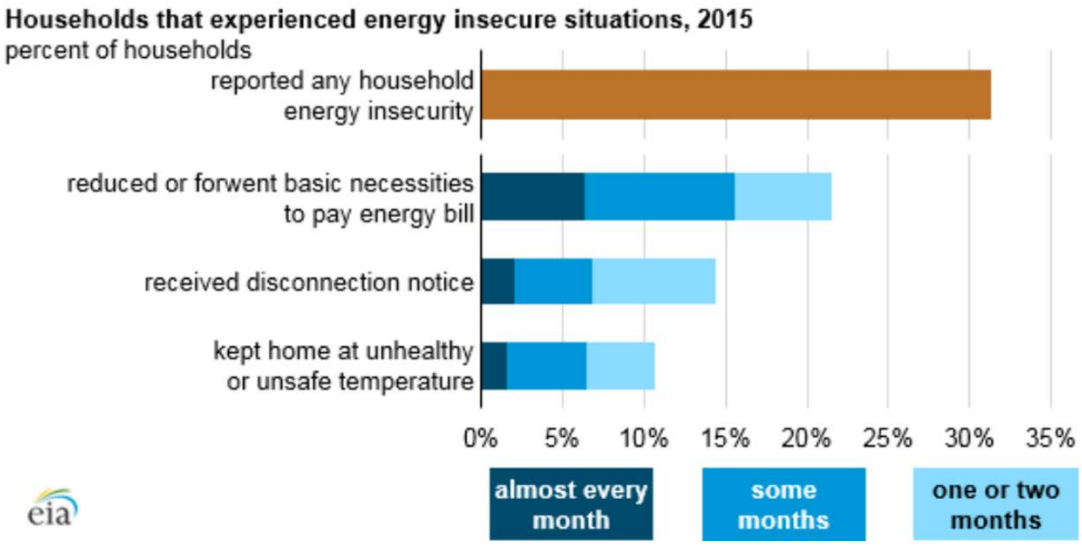
Source: AGA model based on 2017 and 2020 winter heating data; CO2-e emission factors based on 2019 EPA eGrid NERC regional data, EPA Estimates of Natural Gas System Methane Emissions

Energy Assistance Programs are Available for Customers in Need

Natural gas utilities offer and participate in a collection of programs designed to help customers in need.

The EIA reported in 2015 that one-third of US households struggle to pay their energy bills. Other statistics from that report are equally worrying; twenty percent of US households said they had to forgo food and medicine to pay energy bills at some point, and five percent of households reported facing that decision nearly every month. Along these lines, a 2020 survey by Indiana University found that 13 percent of households were unable to pay an energy bill, and 9 percent of those surveyed received a shutoff notice. These findings underscore how vital affordable energy is and that programs that assist those in need are more critical than ever.

Figure 11



Source: US Energy Information Administration, Residential Energy Consumption Survey 2015

Natural gas utilities work diligently to keep customers connected and. In collaboration with state and federal programs and regulators, natural gas utilities provide important energy assistance programs in the form of flexible payment plans and access to funds for customers in need. These programs available to customers include:

- The Low-Income Home Energy Assistance Program (LIHEAP) is a federal block grant program that provides financial assistance to low and fixed-income individuals for fuel and utility bills, as well as low-cost weatherization and energy-related home repairs. When coupled with similar state and local funds, LIHEAP provides energy cost assistance for qualifying low-income customers.

- Budget Billing allows customers to spread costs equally throughout the year, effectively letting customers prepay a portion of the heating season's bills during the cooling season when gas bills are low.

- Payment plans are often available to allow customers to spread the costs of high bills over several months to minimize the impacts of those bills.

- Weatherization assistance and energy-related home repairs help qualifying customers ensure their homes are winter-ready.

Conclusion

Natural gas is a foundational fuel for heating and powering our homes and businesses, and the gas utility industry is prepared for this winter. Energy prices are likely to be higher this winter, regardless of which heating fuel option is used. Natural gas, electricity, propane, and fuel oil costs are expected to be higher, according to the Energy Information Administration. Rising natural gas prices have been shaped by a growing economy and higher shares of exports in the natural gas market. But production gains in October and November bolster the supply picture and contribute to a portfolio of gas supplies available to the market this winter. Still, the costs associated with gas market pricing can affect natural gas utility customers' bills. Local gas utilities carefully consider several physical and financial tools to reduce the effects of market volatility and uncertainty on customer bills to economically procure natural gas supplies to provide service to its customers and reliably meet customer energy requirements. When customers in need face challenges, local distribution companies offer energy assistance programs and flexible payment plans to support customers with unusually high energy costs or trouble paying utility bills.

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