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# Completing Pending LNG Export Projects Could Raise Natural Gas Prices for Americans by 9 to 14 Percent

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The Biden administration's pause on pending applications to expand liquified natural gas (LNG) export capacity will allow the U.S. Department of Energy (DOE) to consider energy cost impacts for American consumers and greenhouse gas emissions. This analysis provides an early estimate of potential consumer energy cost increases that could result from approval of these LNG export facilities. **In aggregate, approving pending LNG export terminals would increase near-term expenditures on natural gas by U.S. households, businesses and industry by on the order of $11-18 billion each year.** Over time, exact expenditures may moderate as producers adjust output to demand.

## HIGHER ENERGY BILLS FOR AMERICAN FAMILIES AND BUSINESSES

The pause on LNG export capacity expansion affects proposed and pending facilities[1], with a combined export capacity of 11.6 billion cubic feet (bcf) per day, equivalent to 10 percent of total U.S. natural gas production in 2023. The pause does not apply to currently operating projects, or projects that are already under construction, or approved but not yet under construction. By increasing demand for U.S. natural gas, additional LNG export capacity could increase domestic natural gas prices 9 to 14 percent compared to a scenario where pending terminals are not built.

**Annual heating bills for an average American household heating with natural gas could increase by $20 to $40 per year,** depending on regional heating needs, if pending LNG projects are approved and completed. Americans in states with particularly cold winters such as in the Midwest could see particularly notable increases – in Michigan, consumers could see an increase upwards of $7 per month in winter heating bills.

Because 60 percent of Americans use natural gas to heat their homes, this cost spike could inflict a substantial burden, especially among those who can least afford it. Low-income American households spend about 8.6 percent of their total income on energy bills, a burden nearly three times higher than non-low-income households, so they will disproportionately feel the impacts of these increased heating costs.

Approving pending LNG projects would also decrease the competitiveness of U.S. businesses by increasing their energy costs. The Industrial Energy Consumers of America (IECA) called on DOE to take action to protect and insulate U.S. energy consumers from price hikes and risks "that come with increased LNG exports" in a letter to Energy Secretary Jennifer Granholm.

[1] Our analysis includes proposed and pending LNG projects, and does not include cancelled facilities.

Unlike oil, which is a global commodity with a single global price, natural gas markets are more fragmented due to limited import and export capacity. Because the U.S. is such a large natural gas producer, limiting its export capacity will result in lower natural gas prices for Americans. If oil and gas companies are allowed to export natural gas to other parts of the world where prices are higher, they will sell to the highest bidder, increasing U.S. natural gas prices at the expense of American consumers.

## METHODOLOGY

We calculate the change in domestic natural gas prices based on a basic model of supply and demand derived from [a 2022 report from Resources for the Future]. The paper presents a simple but useful model to evaluate the effect of a price increase due changes in supply or demand based on the economic concepts of elasticity of supply and demand, the relationship between changes in supply and demand to changes in price, or vice versa.

Equation 1: $\frac{dp}{d\lambda_d} = \frac{1}{\frac{\delta s_d}{\delta p} + \frac{\delta c_d}{\delta p}}$

Where:

$\frac{dp}{d\lambda_d} = change\ in\ price\ per\ unit\ change\ in\ demand$

$s_d = supply$
$c_d = consumption$

In this case, we treat LNG exports from proposed terminals as an increase in demand, and use Equation 1 to determine the impact on natural gas prices, under a range of assumptions about the elasticity (or responsiveness) of supply and demand. We identify input values for each of the above variables, except for one, our estimation target: change in price. Once we calculate the change in price, the value of interest, it is straightforward to compare it to the initial price to compute the percentage increase.

With respect to data inputs, we use data from the U.S. Energy Information Administration (EIA) for future natural gas prices and volumes. We assume baseline supply and consumption of domestic natural gas in the U.S. is 106.4 bcf per day, based on the EIA Short-Term Energy Outlook (STEO) projection for 2025, the latest year that STEO projects, as this value is higher than estimated 2030 production in the latest longer-term Annual Energy Outlook 2023 (AEO 2023). For the baseline price of natural gas prior to additional demand from pending LNG terminals, we assume $3.54/MMBtu, based on data from the EIA AEO 2030. We estimate additional gas consumption from pending terminals assuming an 86 percent annual utilization rate (consistent with average industry utilization rates in 2023 from EIA STEO) and assuming liquefaction of natural gas consumes 8.2 percent of exported fuel volumes (as per EIA AEO 2023).

We estimate changes in prices assuming two scenarios for elasticities of supply and demand: a lower elasticity scenario with an elasticity of supply of 0.5 (based on the five-year supply elasticity reported by RFF in 2022) and a demand elasticity of 0.2 (also from RFF); and a higher elasticity scenario assuming supply elasticity of 0.75 (based on the 10-year supply elasticity from RFF) and demand elasticity of 0.4 (double the lower scenario).

After calculating changes in U.S. natural gas prices per unit of gas, we estimate the change in household heating cost based on estimated annual natural gas usage per household (from the EIA 2020 Residential Energy Consumption Survey), using a lower elasticity scenario and an average U.S. home heating with natural gas and the higher elasticity scenario and a home heating with gas in the Midwest, to inform the low and high range.

Energy Innovation collaborated with Jesse Jenkins of Princeton University on the creation and application of this model.