



Analyzing the factors that influence U.S. public support for exporting natural gas

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ARTICLE INFO

Keywords:

Public opinion
Energy policy
Hydraulic fracturing
Risk communication

ABSTRACT

The U.S. is now the global leader in natural gas production. The federal government is changing policies and priorities to expand natural gas export to foreign energy markets. Such an expansion requires increased pipeline capacity and the development of export terminals for shipping. While natural gas export is a burgeoning energy and environmental issue, we know little about what influences public support/opposition for the practice. Such information is vital to all levels of government and stakeholders. Using a national online survey sample ($n = 1042$), we examine what factors influence public support/opposition. Results of regression analysis indicate that supporters tend to be male, hold a bachelor's degree or higher, wealthier, politically conservative, and reference affective images of the economy, energy, and trade. In contrast, opponents tend to be women, politically liberal, and reference affective images related to keeping natural gas in the U.S., the environment, and hydraulic fracturing. Based on these findings, we discuss implications for energy policy, public communication about this issue, and future research.

1. Introduction

The recent expansion of U.S. natural gas development, via the combination of hydraulic fracturing (a.k.a. fracking) and horizontal directional drilling, has made the U.S. the world's top producer of natural gas since 2009 (U.S. Energy Information Agency (EIA), June 7, 2017). With average domestic natural gas prices in 2016 at their lowest level in nearly two decades, natural gas producers have repeatedly sought to export natural gas to more lucrative overseas markets (U.S. EIA, 2017b). In 2016, 96% of the natural gas produced in the U.S. was consumed domestically, but natural gas exports reached record high levels. In 2017, for the first time in almost 60 years, the U.S. became a net exporter of natural gas and is expected to remain so in the near future (U.S. EIA, 2018).

Scholars and researchers have focused less on understanding the factors that influence public opinion about natural gas export than other issues related to natural gas production, such as fracking or pipelines. However, natural gas export is fundamentally important to U.S. energy policy, as indicated by statements and actions by the Trump Administration. For example, according to former National Economic Council Director Gary Cohn, “We could be and should be the largest exporter of LNG [liquefied natural gas] in the world...We're going to permit more and more of these LNG plants” (Collins, 2017; Krauss,

2017). Indeed, the Trump Administration has made natural gas export fundamental to its “energy dominance” agenda – permitting additional export terminals (Gardner, June 29, 2017); certifying natural gas pipeline capacity (U.S. EIA, 2017a); opening up the Chinese market to U.S. natural gas exports (DiChristopher and Shaffer, 2017); and proposing to streamline approvals for small-scale (i.e., 140 million cubic feet per day or less) natural gas export (Cama, 2017), among other actions.

Proponents of natural gas export argue that it will provide economic benefits, enhanced security for foreign allies currently dependent on more unstable sources of natural gas (i.e., European allies dependent on Russia), and help address climate change by encouraging a transition in electricity generation from coal to cleaner-burning natural gas (ExxonMobil, N.D.; Green, 2017). These larger benefits are touted in addition to more localized benefits to communities hosting terminals in the form of employment and tax revenue (Caruso Jr., 2014). In contrast, opponents argue that exporting natural gas would increase fracking by opening up foreign markets to domestically-produced natural gas, therefore escalating carbon emissions. This argument is based on studies that place life-cycle carbon emissions from natural gas on par with coal (Jaramillo et al., 2007). Environmental organizations, such as the Sierra Club (Segall, N.D.) and Greenpeace (Snape et al., N.D.), worry about the localized environmental impacts of the terminals and

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associated pipelines as well as the public health, safety, and environmental risks created by potential spills or leaks. The manufacturing industry has also expressed concerns about export. Natural gas is an important feedstock for many manufacturing processes, and the industry has enjoyed a resurgence in part due to low natural gas prices created by the shale gas revolution (Cooper et al., 2015). Exporting natural gas may result in higher domestic prices that could disrupt this resurgence in manufacturing. Similar concerns have been raised by consumer advocates and utilities (Lascher, 2012).

Natural gas export is a burgeoning national energy and environmental issue. However, we know little about what influences public support for or opposition to exporting natural gas – such information is critically important for planners involved in local siting disputes (Boudet and Ortolano, 2010; Boudet, 2016); government agencies issuing permits and determining regulation (Davis, 2012; Rabe and Borick, 2013); and advocates interested in communicating its potential benefits and risks (Heikkilä et al., 2014a, b).

1.1. How do we export natural gas?

The U.S. exports natural gas in two ways: (1) 92% was via pipeline in 2016 to Canada and Mexico with less than 1% also sent via truck or train; and (2) shipping from export terminals (U.S. Department of Energy (DOE), 2017; EIA, June 29, 2017). More than 99% of natural gas exports are domestically produced, and less than one percent is from the re-export of foreign sourced natural gas (EIA, June 29, 2017). Exporting natural gas via pipeline – in particular to Mexico – has experienced steady growth since the advent of the shale gas boom, but truly opening up domestically-produced natural gas to the world market requires the siting and construction of export terminals (DOE, 2017). An export terminal, prepares and sends natural gas to another country for sale, often in the form of liquefied natural gas (LNG). LNG export terminals receive natural gas and liquefy it for distribution in tankers to ship to other countries.

LNG export facilities are typically sited in coastal locations with deep-water ports. The Energy Policy Act of 2005 established the Federal Energy Regulatory Commission (FERC) as the final siting authority for onshore LNG terminals. Offshore proposals require federal approval of a deep-water port license under the Deepwater Port Act (DWPA) – authority over which has been delegated to the Maritime Administration. Notably, the DWPA grants veto power to the governor of the adjacent state to the proposed offshore facility. Local and state regulations vary widely depending on land ownership and state-level regulations, with some states requiring the preparation of joint state and federal environmental impact statements and additional permits.

Currently, only two facilities exist in the U.S.: the Kenai LNG plant in Alaska that has not been in operation since 2015, and Sabine Pass in Louisiana. An additional ten export facilities have been approved with six under construction in Georgia, Louisiana, Maryland, and Texas, and four more approved but not under construction in Louisiana and Texas. An additional 16 export facilities are proposed in states including Florida, Mississippi, and Oregon (U.S. Federal Energy Regulatory Commission (FERC), January 24, 2018). In total, there are eight states (AK, FL, GA, LA, MD, MS, OR, & TX) that have an existing, approved, or proposed export terminal.

As described above, a proposed LNG terminal offers both potential risks and benefits to local host communities. Such facilities may bring jobs, tax revenue, and associated business development, but also raise concerns about impacts to public safety, community character, and the surrounding environment. Public perceptions of and response to such proposals has been wide-ranging, varying from ready acceptance to widespread opposition (Boudet and Bell, 2015). The proposed export projects in Maryland and Oregon have been among some of the most controversial in the U.S. (Boudet et al., 2017).

1.2. Opinion polling on exporting natural gas

In contrast to public opinion polling about fracking and the more broadly defined unconventional oil and gas development (UOGD) – which has been relatively widespread – few national polls have surveyed U.S. residents about natural gas export. The University of Texas Energy Poll (UT Energy Poll, 2013, 2017) is one of the few entities that has conducted regular polling on the issue since 2013. Their results indicate that, while many people remain undecided about the issue, support for natural gas export has steadily grown over time. In March 2013, the poll asked a national sample (n = 2113) of U.S. residents whether “the US should permit the export of natural gas to other countries”. The results were that 28% agreed, 39% disagreed, and 33% neither agreed nor disagreed. In their most recent poll conducted in March 2017 (n = 2013), they asked the same question and this time 39% agreed, 22% disagreed, and 39% neither agreed nor disagreed. This shift in responses from 2013 to 2017 indicates that support for exporting natural gas to other countries has grown over time.

2. Literature review

While opinion polls are helpful in providing insights into public perceptions of natural gas export, they do not fully explore what factors shape these views. Drawing on insights from research on public perceptions of emerging technologies and the more recent research on public perceptions of fracking and UOGD, we lay out a series of research questions and hypotheses about the factors shaping public support/opposition to natural gas export. For this literature review, we draw extensively on Thomas et al.’s (2017) systematic review on public perceptions of hydraulic fracturing. We explore each of the following factors in turn: socio-demographics; political ideology; geographic proximity and location; media consumption; familiarity; and affective imagery.

2.1. Socio-demographics

There is a long tradition of examining the role of socio-demographic factors in individual risk perceptions of emerging technologies (Ho et al., 2013). In general, this literature tends to find that women and minorities view new technologies as riskier, and thus express greater opposition, than white males (Ansolabehere and Konisky, 2009). Scholars have argued that the “white male effect” is not actually about gender and race, but larger societal and cultural realities related to power, status, alienation, and trust (Flynn et al., 1994). Indeed, research on hydraulic fracturing and associated infrastructure, like the Keystone XL pipeline, has found that women are less supportive than men (Boudet et al., 2014; Davis and Fisk, 2014; Gravelle and Lachapelle, 2015; Howell et al., 2017).

Although we are unaware of any academic study that has examined the sociodemographic factors that influence support for natural gas export, results from the March 2013 UT Energy Poll¹ suggested a strong gender divide, with women generally less supportive (UT Energy Poll, 2013). Based on these results and the reviewed literature, we propose the following hypotheses:

H1: Non-whites will have lower levels of support for natural gas export;

H2: Females will have lower levels of support than males;

Results for other socio-demographic factors – like age, education and income – have been less conclusive. Using education as an example, Boudet et al. (2014) found that those with higher levels of education

¹ We report results from the March 2013 UT Energy Poll, and not the more recent 2017 UT Energy Poll, because the UT Energy Poll publicly reported summaries by demographic groups for the 2013 poll and not polls conducted in subsequent years.

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