

# **The Global Future of Natural Gas in a Low-Carbon World**

Global Gas Phase 2

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# Global Gas: Issues Examined in the Phase II Study



Global climate commitments, the war in Ukraine, and other geopolitical issues place natural gas at the center of global conversations but do little to clarify its long-term future. This study will assess the role of natural gas in a future global energy economy moving toward deep decarbonization and the range of energy security issues raised by recent events.

## Energy Security

- Analyze the energy security needs of the US and its allies for the geostrategic interests of the US
- Examine the role of natural gas in energy security with a specific focus on Europe and Asia and how these markets have been impacted by the Russian invasion of Ukraine
- Understand the bottlenecks in US export supply chain



**Timeline:** Q4 2022 – Q3 2023



**Funders:**

Natural Allies  
GTI  
Mitchell Foundation  
Chesapeake Energy  
Tellurian  
IEEJ  
Venture Global  
PAGE

## Global and Regional Decarbonization

- Explore implications of global and regional decarbonization policies for the role of natural gas and how natural gas can help advance the low-carbon energy system transition.
- Fuel switching from coal to natural gas continues to reduce GHG emissions
- New technologies and applications are emerging for GHG abatement for natural gas (i.e., hydrogen)
- Movement toward a 1.5 degree mid-century target and the implications for natural gas

# Workshop Report Key Takeaways



1

Climate goals and energy security—both affordability and availability of supply—need to be addressed in the same conversation.



2

Natural gas will continue to be crucial for fulfilling global goals for decarbonization, energy security, and food security.



3

The deployment of current technologies and additional regulations are needed for the natural gas industry to address its greenhouse gas emissions, including methane.



4

Federal, state, and local government permitting issues are a major challenge to meeting deep decarbonization and energy security goals.



5

The timelines for financing and building energy infrastructure may not be sufficient to meet global energy security and decarbonization needs.



6

Natural gas prices in the U.S. are affected by the dynamics of global energy markets as well as domestic politics and concerns.



7

The United States must decide what role to play in supplying natural gas and enabling global decarbonization goals.



8

Although Europe needs gas in the near term, it may not be a long-term market for U.S. exports.



9

In Asia, developing nations are primarily concerned about the affordability of natural gas, while developed nations worry more about the reliability of supply.

# Sofia Roundtable Questions



The following is a list of Europe-specific questions for discussion during the Sofia Roundtable.

## **How does Europe perceive the role of U.S. gas in supplying global markets?**

- Is U.S. gas perceived as a green source of LNG? (Given that natural gas supply chains are less emissions intensive than Russia's)

## **How will EU decarbonization policies impact near and long-term LNG demand?**

- REPowerEU, CBAM, volatile prices/price cap, EU Corporate Sustainability Reporting Directive (CSRD), etc.
- Are countries in the region on track to meet their Nationally Determined Contributions as part of the Paris Agreement? Have regional approaches been discussed or designed to address climate change mitigation? If not, what are significant factors that impact efforts to meet targets?
- Are countries in your region focused on policies to limit stranded assets from legacy natural gas infrastructure?
- What role do natural gas emissions abatement technologies (such as carbon capture and sequestration, advanced leak detection and repair, enhanced management of methane emissions) and emerging gas technologies (such as renewable gases) play in the region's energy transition outlook?

## **What are Europe's gas needs for power generation, industrial usage for the clean energy transition, and agriculture usage through 2050?**

- Some forecasts predict that Europe will experience a 30% gas demand reduction by 2030 – how does this affect EU's energy transition and reliance on hydrogen?
- How could LNG contracts be structured to meet Europe's near-term demand without impeding decarbonization goals?
- EU timetable to increase LNG import capacity vs. Timeline for decarbonization.
- Will new regasification infrastructure and midstream infrastructure currently under construction to meet EU near-term gas demand be compatible with hydrogen?

# The Global Future of Natural Gas in a Low-Carbon World



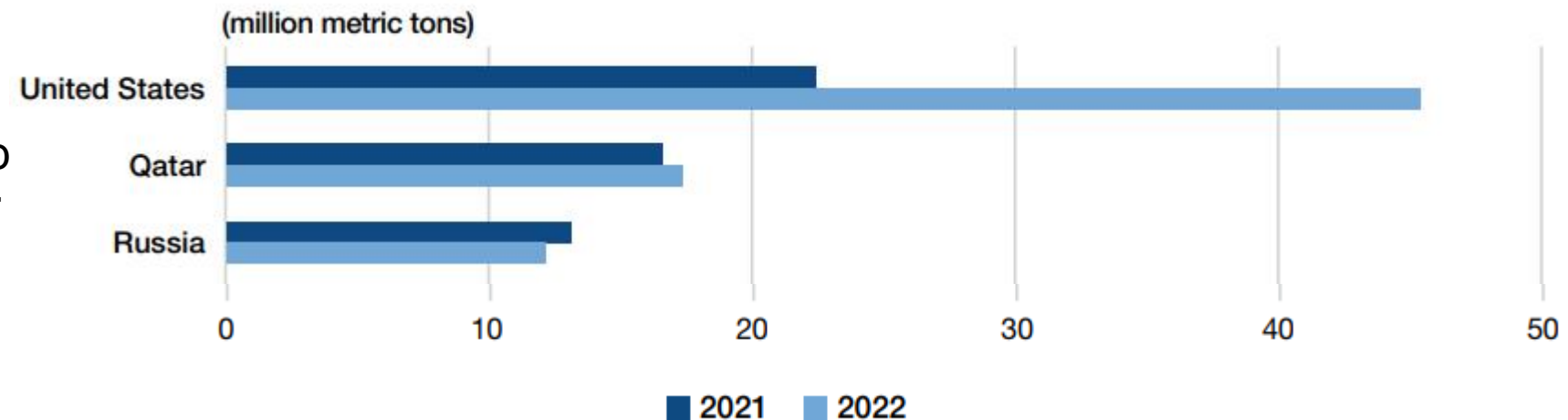
## Back-Up Information

# 1. Climate Goals and Energy Security

**Climate goals and energy security—both affordability and availability of supply—need to be addressed in the same conversation.**

- ❑ Energy security, climate goals, geopolitics, and economics are all part of the same conversation.
- ❑ The global energy transition is disruptive to current energy paradigms.
- ❑ Policymakers should plan for different scenarios given the conflict in timelines for investment, infrastructure, energy security, and decarbonization.
- ❑ Diverse stakeholders need to collaborate with one another to address energy security and climate goals.

**Change in European LNG supply sources from 2021 to 2022 (January-October of 2022)**



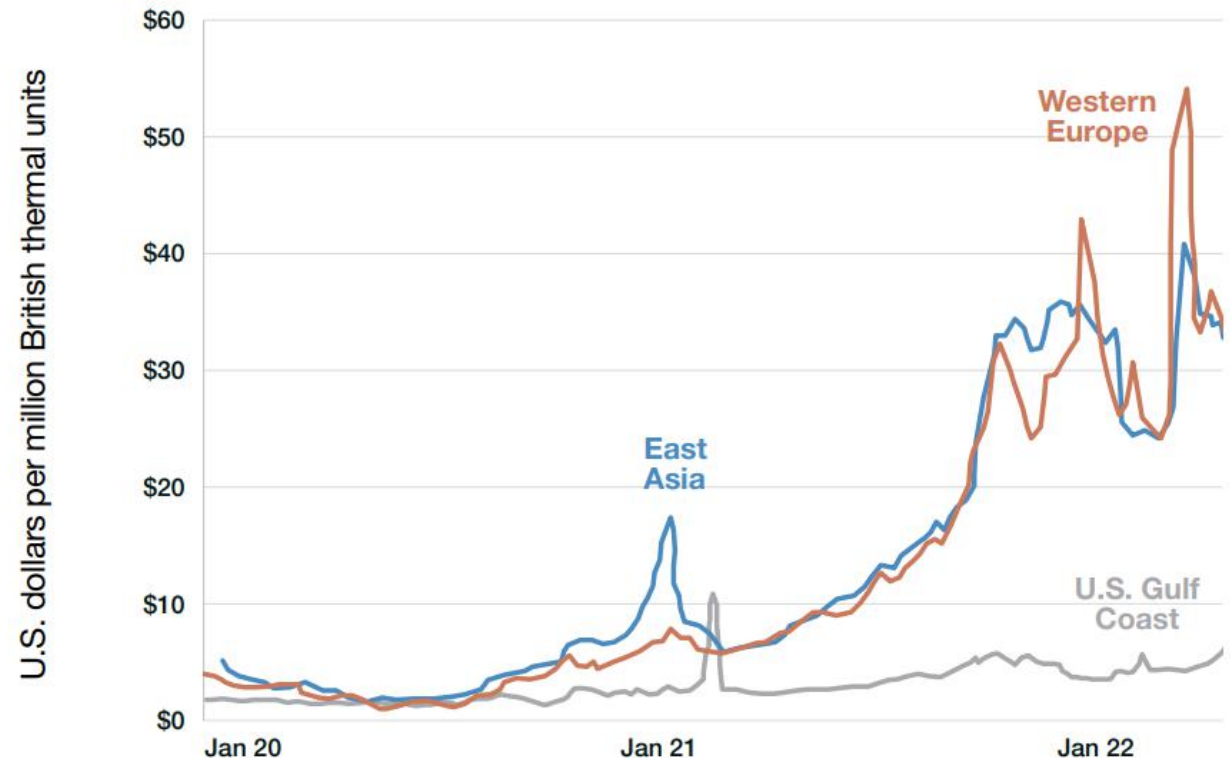
## 2. Decarbonization, Energy Security, and Food Security



Natural gas will continue to be crucial for fulfilling global goals for decarbonization, energy security, and food security.

- ❑ Natural gas can contribute to meeting decarbonization goals by helping countries switch from coal to gas and enabling the production of clean hydrogen.
- ❑ Renewable energy-based grids can benefit from the stability and security provided by natural gas.
- ❑ Food production depends on natural gas as a feedstock for nitrogen-based fertilizer.

Weekly natural gas prices (Jan. 1, 2020 to April 29 2022)

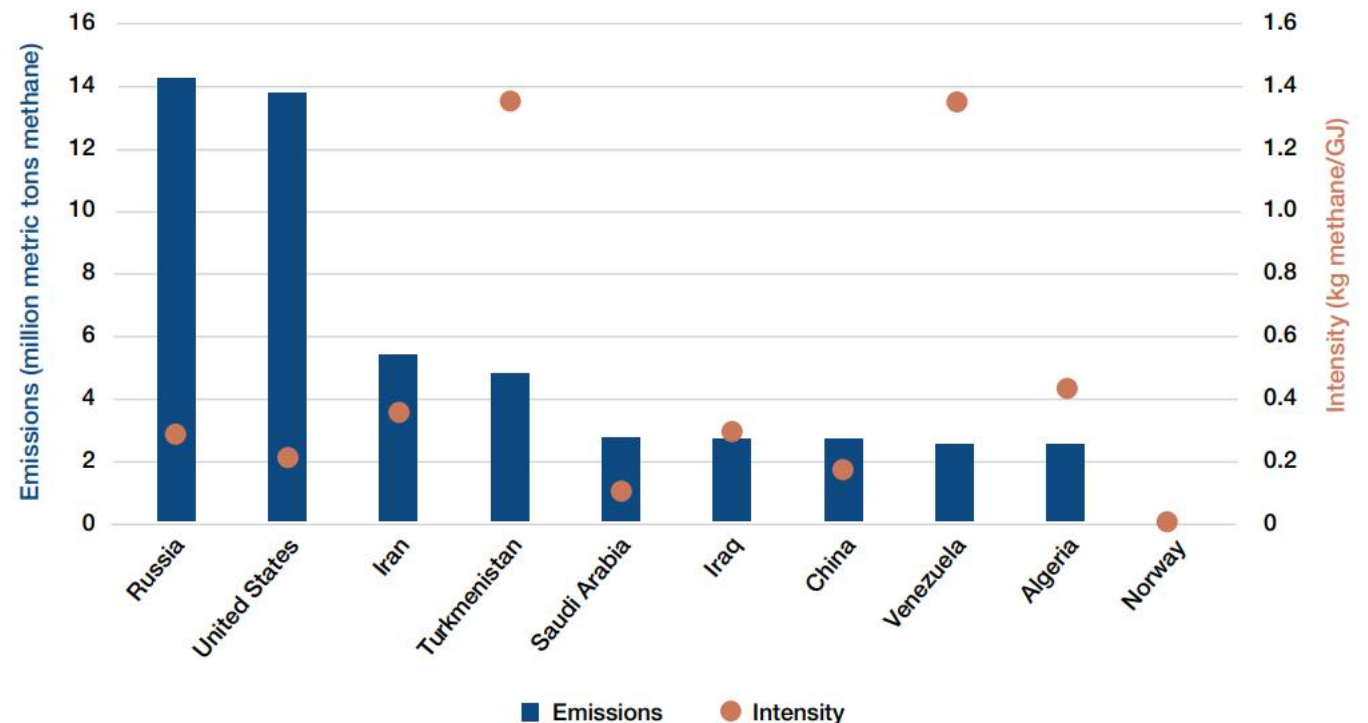


# 3. Technologies and Regulation

The deployment of current technologies and additional regulations are needed for the natural gas industry to address its GHG emissions, including methane.

- ❑ The deployment of current technologies and additional regulations are needed for the natural gas industry to address its GHG emissions, including methane.
- ❑ Clear and incentives-based regulations are needed to reduce natural gas emissions.
- ❑ Technology can help improve emissions data to increase transparency and accountability.
- ❑ The industry can demonstrate good faith to the public by reducing methane emissions.
- ❑ The U.S. natural gas industry can demonstrate global leadership by reducing its emissions throughout the value chain.

Total methane emissions and methane intensity of production in selected oil and gas producers, 2021.



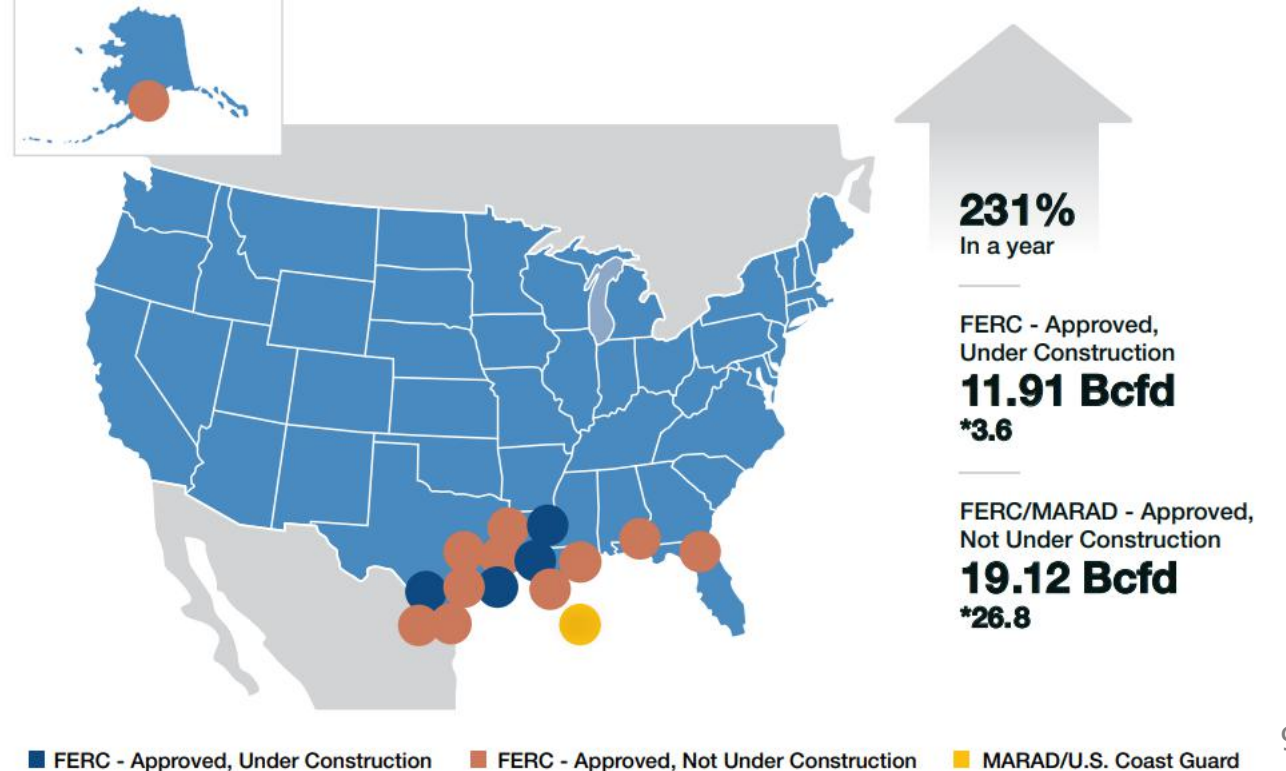


# 4. Permitting Issues

Federal, state, and local government permitting issues are a major challenge to meeting deep decarbonization and energy security goals.

- ❑ Natural gas can contribute to meeting decarbonization goals by helping countries switch from coal to gas and enabling the production of clean hydrogen.
- ❑ Markets should be the primary decider of which natural gas infrastructure projects are constructed.
- ❑ Permitting challenges at the federal, state, and local level hinder the construction of natural gas infrastructure.
- ❑ Stakeholders, including investors, communities, companies, and governments, need a stable and predictable permitting and regulatory framework to make longterm decisions.

North American LNG export terminals that have been approved but not yet built (as of Feb. 21, 2023).



# 5. Financing Infrastructure

**The timelines for financing and building energy infrastructure may not be sufficient to meet global energy security and decarbonization needs.**

- ❑ Traditional timelines for financing natural gas infrastructure projects do not align with current needs.
- ❑ The U.S. could support long-term projects to meet global demand and reduce risk for investors.
- ❑ Investment in natural gas projects outside the U.S. is challenging because of uncertain investors and lack of incentives.
- ❑ Industry stakeholders may be willing to take on the risk of future stranded assets.

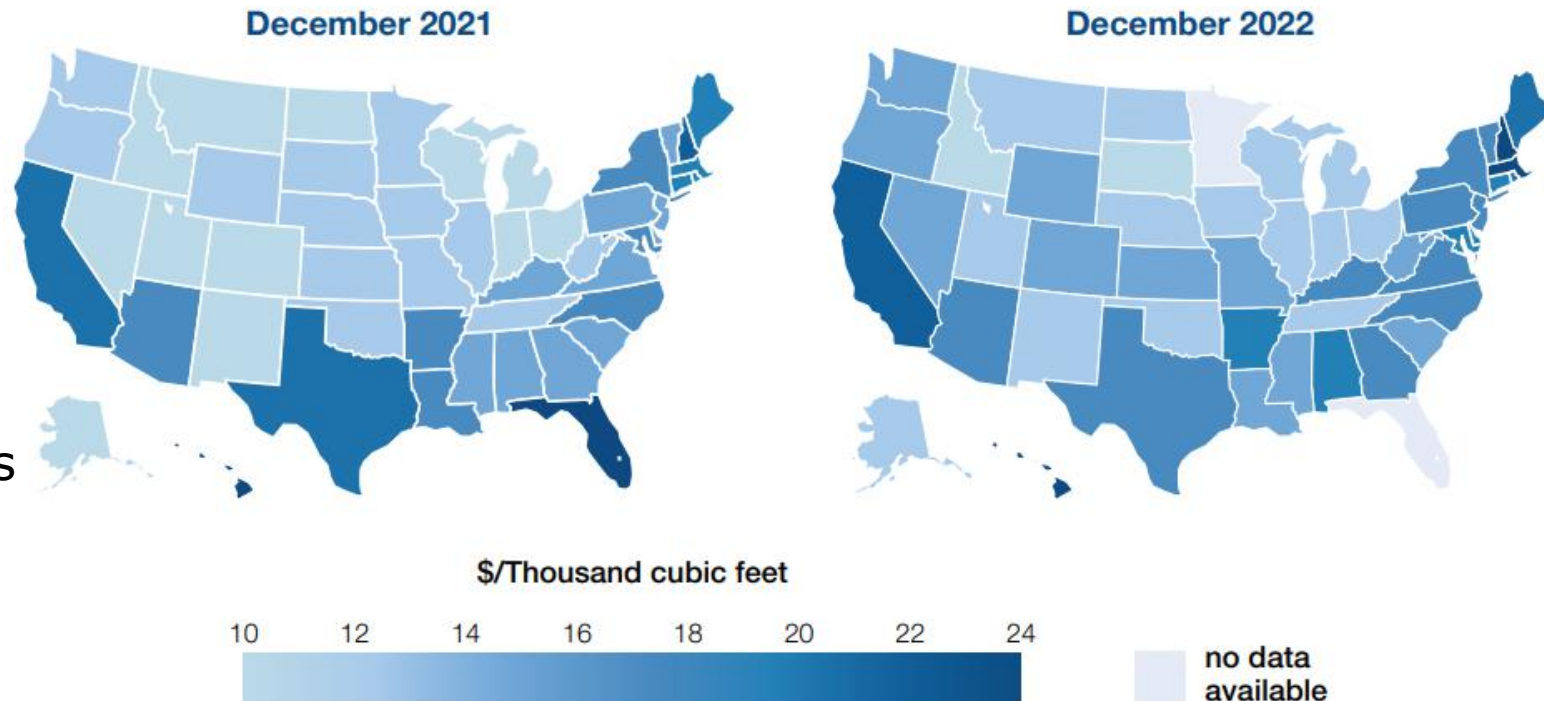
**The passage of the Inflation Reduction Act (IRA) provides reason to be optimistic that investment flows are coming back to the United States for energy projects, but it is important to ensure that projects from a diverse range of energy sources are built.**

# 6. Impact on Price

Natural gas prices in the United States are affected by the dynamics of global energy markets, as well as domestic politics and concerns.

- ❑ DOE studies of natural gas have shown that an increase in LNG exports would have a minimal impact on domestic natural gas prices.
- ❑ The lack of permitting infrastructure and inflation have had a more substantial impact on prices than have LNG (or pipeline) exports.
- ❑ Political polarization, environmental concerns, and anti-export sentiments have complicated the public policy conversations on natural gas.

## U.S. regional gas price differences

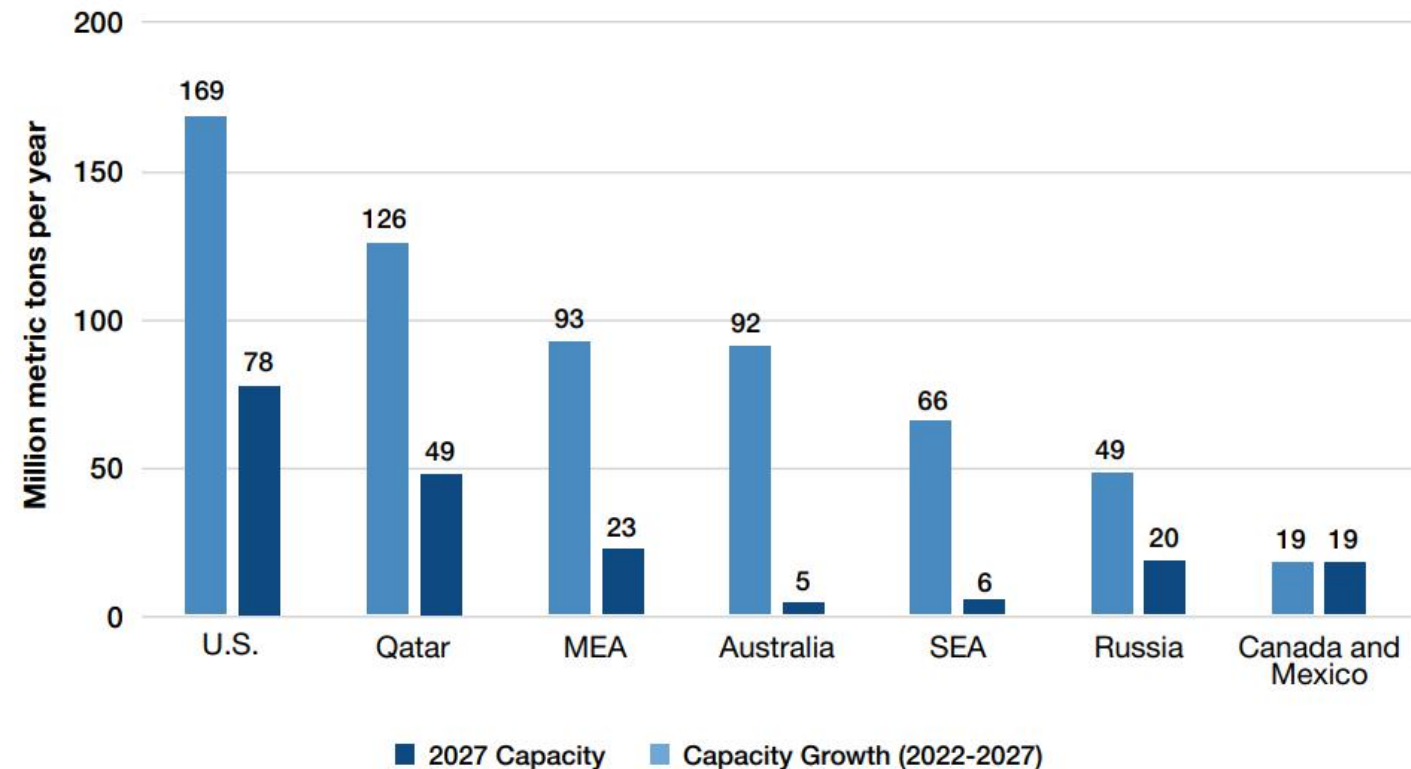


# 7. Role of U.S. Natural Gas

The United States must decide what role to play in supplying natural gas and enabling global decarbonization goals.

- ❑ The United States should demonstrate its global leadership by supplying clean natural gas to its allies and trading partners.
- ❑ The lack of reliable gas suppliers provides an opportunity for the United States on the global stage.

Global LNG export capacity growth

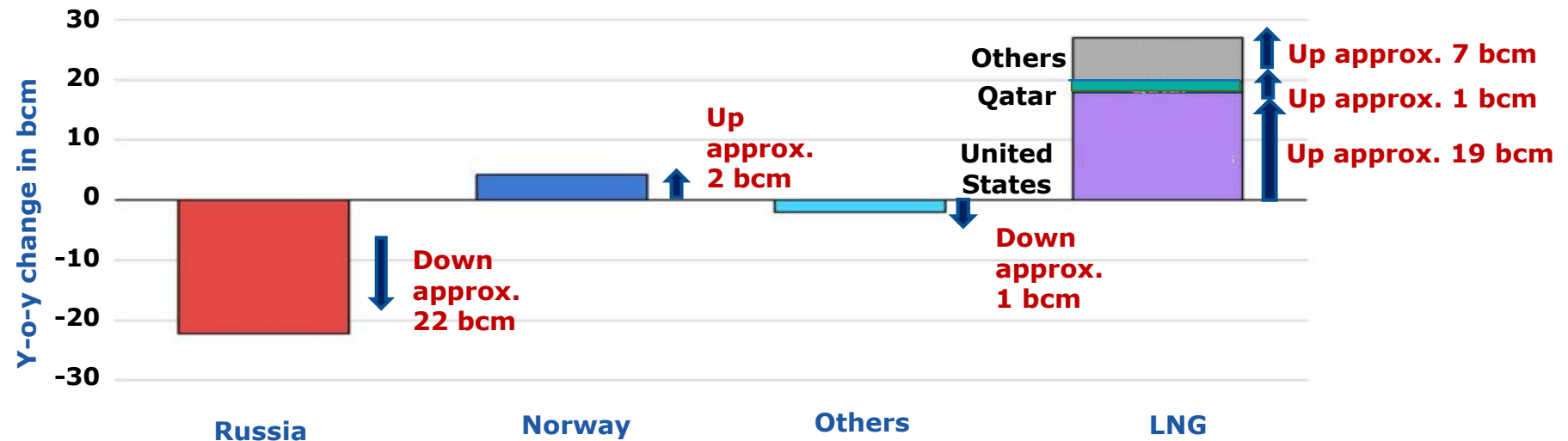


# 8. European Gas Demand

Although Europe needs gas in the near term, it may not be a long-term market for U.S. exports.

- ❑ Europe is the biggest consumer of LNG today.
- ❑ Europe's industrial sector may not be a long-term user of LNG.
- ❑ The long-term future of Europe's demand for gas is uncertain.

Year-on-year change in European natural gas imports and deliveries, 2020-2021 compared to 2021-2022

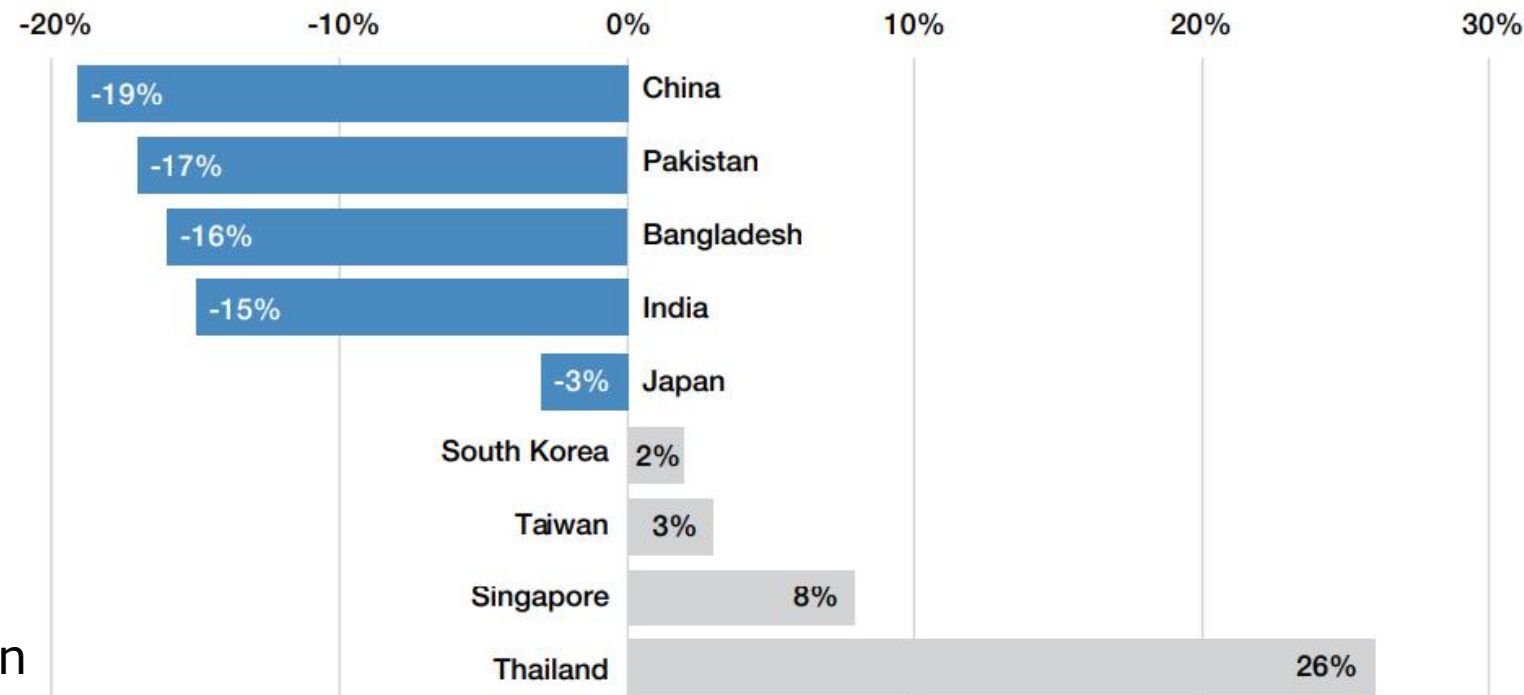


# 9. Asia Gas Demand

**In Asia, developing nations are primarily concerned about the affordability of natural gas, while developed nations worry more about the reliability of supply.**

- ❑ Developing countries in Asia are primarily concerned about affordability and accessibility of natural gas.
- ❑ Developing countries in Asia lack incentives to build natural gas infrastructure.
- ❑ Flexible contracts may present an opportunity for U.S. LNG export growth to developing countries in Asia.
- ❑ Developed countries in Asia plan to use natural gas as a crucial component of their transition to clean energy.

**Change in annual LNG imports in key Asian markets from 2021 to 2022**



# Conclusion



- ❑ Participants clearly articulated that U.S. natural gas exports will play a central role for global energy security, climate, and food security goals, which are part of the same conversation.



- ❑ Industry will need to overcome the challenges of regulatory bottlenecks around permitting infrastructure, which affect financing and timelines.



- ❑ Reducing greenhouse gas emissions throughout the value chain will help build faith in the industry, create a social license to operate, and create more supply by eliminating losses through venting and flaring.



- ❑ Though Europe will be the primary consumer in the short term, the U.S. natural gas industry should continue to engage with and provide affordable and reliable gas to both developed and developing countries in Asia who should be long-term consumers of natural gas for their own security and decarbonization goals.

# Follow-up Research Threads

**This workshop raised several questions that likely will be material to future conversations and the analysis:**

- ❑ Given that natural gas is an important component for fertilizer, how do changes in global gas markets impact food security?
- ❑ How can better communication be fostered among diverse stakeholders both domestically and globally so that long-term solutions can be found that satisfy multiple goals?
- ❑ What is the appropriate level of investment in LNG, natural gas, and oil in a global energy system that is trying to become cleaner, greener, and more equitable, especially given the challenging fossil fuel infrastructure lifespans and investment needs for 20+ years?
- ❑ In response to the growth in the spot market, how are the LNG contracts in the market evolving?
- ❑ What is the ultimate role of natural gas in the European energy mix and how will an accelerated energy transition affect the demand for natural gas (i.e. hydrogen). What ultimately happens to Russian natural gas? What is the impact of the recently implemented EU price cap on natural gas?
- ❑ Where should developing Asian nations, such as China, India, and Southeast Asia, look for supplies of reliable and affordable LNG? What kind and duration of contracts should they sign?



# The Global Future of Natural Gas in a Low-Carbon World



**Thank You**

# Presenter Background

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## CAREER AT A GLANCE

