

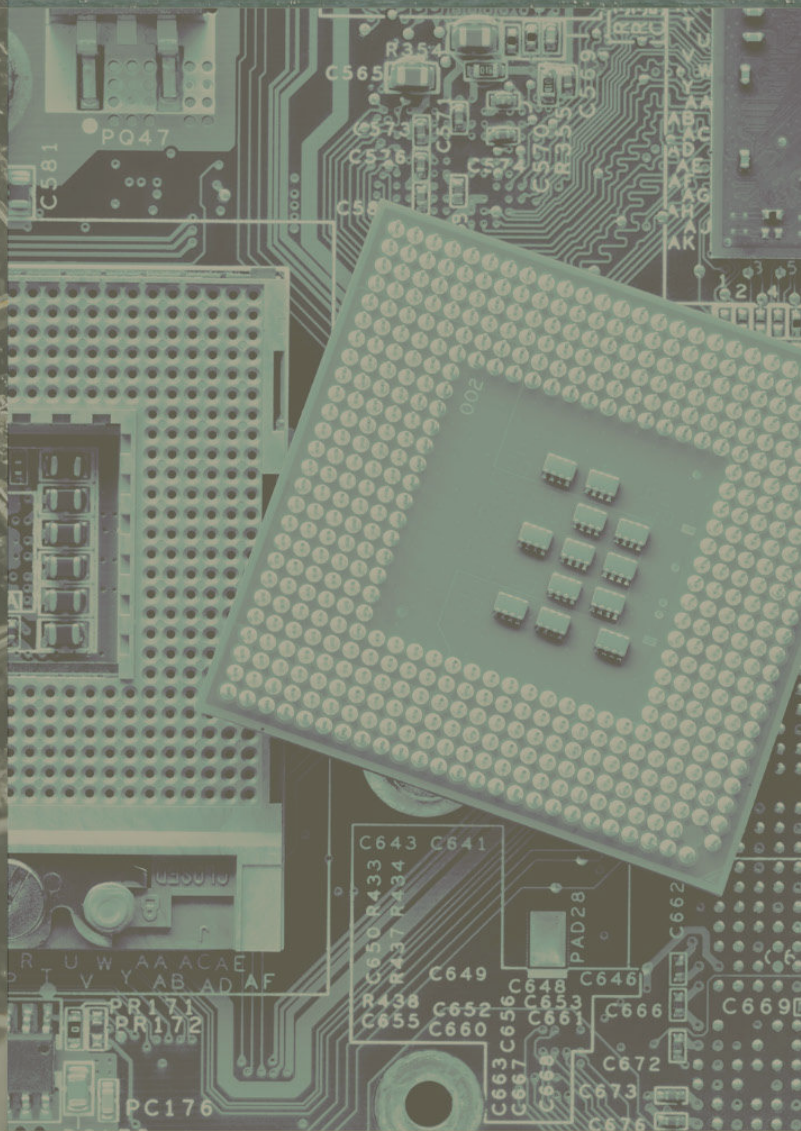


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Gas Supply Security in Europe and Asia Beyond 2030

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The security of supply for natural gas – and the risks that a lack thereof could entail – hinge on the fuel's importance for any given country and its fungibility. Long lead times for production projects make gas supplies inflexible. Gas exports, which require the fuel to be either transformed into liquefied natural gas (LNG) or transported via pipelines, are even less versatile.

Replacing gas in the short term is thus challenging. Yet the demand for the fuel – which is mainly used for power generation, heating and industry at large – can be reduced to some extent within a limited period. Wind and solar farms have relatively short lead times of about one to two years. Switching to coal or oil for power generation and industry could also depress the need for gas without requiring a major overhaul of existing infrastructure.

Since the short-term fungibility of gas remains constrained, long-term demand curtailment is set to be an integral part of minimizing risks to security of supply.

Global gas demand growth likely to slow but not stall

Gas is considered a transition fuel, thanks to its lower emissions intensity than either coal or oil. The ease with which gas-fired power generation can be ramped up adds to its appeal, making it an ideal candidate to compensate for the increasing level of intermittency as the world's share of wind and solar energy grows.

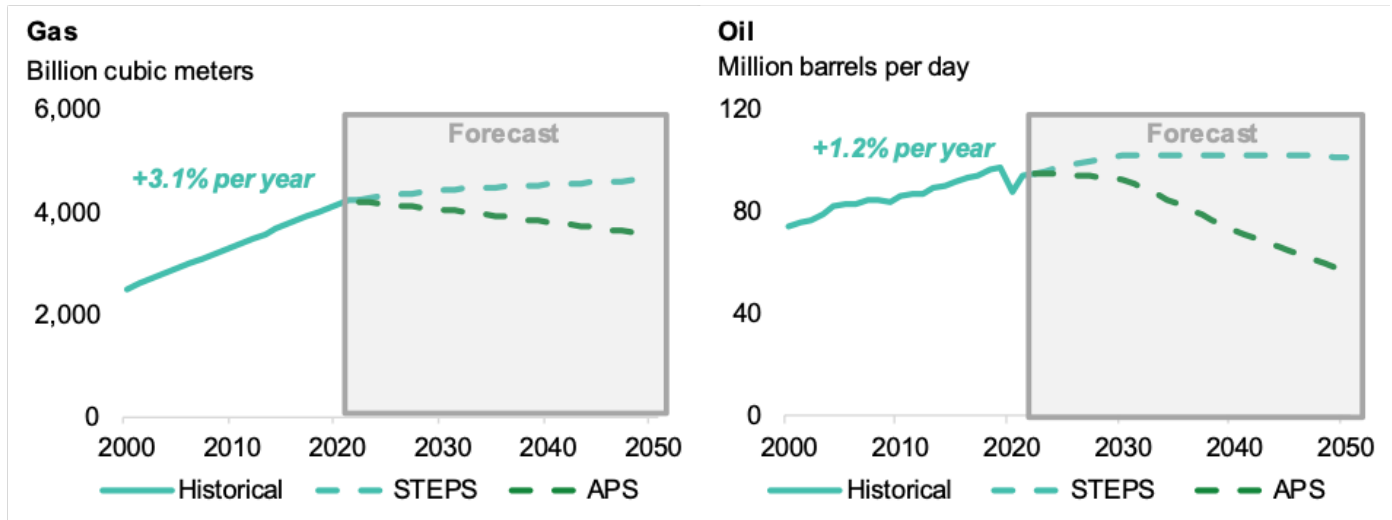
Consequently, both BloombergNEF and the International Energy Agency (IEA) expect gas demand to remain relatively stable up to 2050. By contrast, oil demand is poised to either stagnate from 2030 onward or decline. Throughout the 21st century so far, global gas consumption has grown at almost three times the rate of that of oil, further corroborating the continued importance of gas (Figure 1).

However, the gas supply crunch following the Russian invasion of Ukraine in early 2022 and the resulting curtailment of Russian gas supplies to Europe have led to a surge in prices. Years of underinvestment in oil and gas production, as well as in Liquefied Natural Gas (LNG) production capacity, have rendered alternatives scarce, suggesting that high gas prices are here to stay.¹ In turn, many developing countries will be more reluctant to switch from coal to gas for power generation, while developed states will expedite their renewable energy deployment and incentivize efficiency.

In other words, limited demand growth will likely result from insufficient supplies pushing up the prices for the fuels. The IEA's 2022 gas demand forecasts have therefore dropped some 150 billion cubic meters (bcm) by 2030 and 800bcm by 2050 compared to the previous year's edition, from a 2022 demand of some 4,200bcm.²

1 "Tight Oil Market on Horizon as Capex Decouples from Prices," BloombergNEF, 2022.

2 According to the STEPS (Stated Policies Scenario) of the IEA.

Figure 1: Historical and forecast global fossil fuel demand

Source: BloombergNEF, IEA. Note: STEPS refers to the IEA's Stated Policies Scenario, APS refers to the IEA's Announced Policies Scenario. Forecast data taken from the World Energy Outlook 2022.

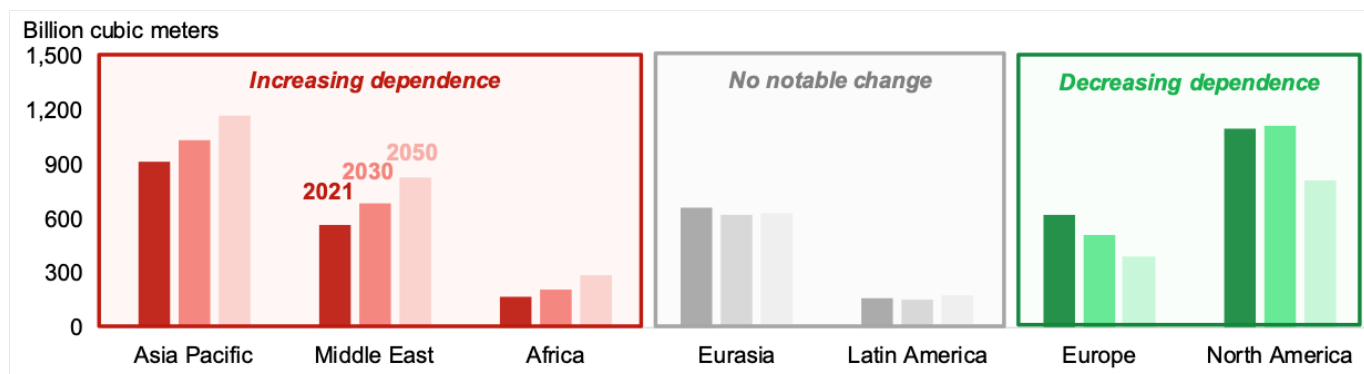
Asia, Africa and the Middle East lead demand growth

Gas demand trends differ by region. Asia, Africa and the Middle East are expected to see an increase in gas consumption of 28%, 70% and 47% respectively by 2050 compared to 2021 levels (Figure 2). This growth is driven by an expansion of industrial activities. The Middle East also seeks to phase out many of its oil-fired power plants and replace them with gas-fired facilities.³

By contrast, demand in Europe and North America is forecast to decline by 37% and 26% respectively over the same period, as an accelerated deployment of wind and solar energy, biomethane and hydrogen eat away from gas consumption within these regions' power sectors. Substantive energy efficiency policies will further reduce the amount of gas used for both electricity generation and the heating of buildings.⁴

³ "Fossil Fuels Central to Middle East Oil Giants' Transition", BloombergNEF, 2022.

⁴ "World Energy Outlook 2022" (International Energy Agency, 2022), <https://iea.blob.core.windows.net/assets/830fe099-5530-48f2-a7c1-11f35d510983/WorldEnergyOutlook2022.pdf>.

Figure 2: Forecast gas demand by region

Source: BloombergNEF, International Energy Agency. Note: Based on the IEA's STEPS.

Europe and Asia will be heavily dependent on gas imports

The overall geographical distribution of gas production and consumption will remain largely unchanged in the three decades ahead.

The US, Middle East and Eurasia continue to enjoy a major production surplus (Figure 3). While the Middle East is ramping up production significantly, rising domestic demand keeps the countries' export potential at bay. Qatar is the only country in the region that is slated to expand its export capacity significantly, as its annual production is forecast to double to 326bcm by 2050 and its domestic demand remains relatively subdued.⁵

Meanwhile, both Europe and Asia remain heavily reliant on gas imports. Yet, Europe's dependency is waning, while Asia's continues to grow. Asia's deficit is set to reach about 645bcm by 2050, spurred by industrialisation in the region's developing countries, a surge in electricity demand and limited domestic reserves. Only China has notable gas reserves that it seeks to bank on, adding 85bcm to its annual production volumes by 2050 compared to 2021.

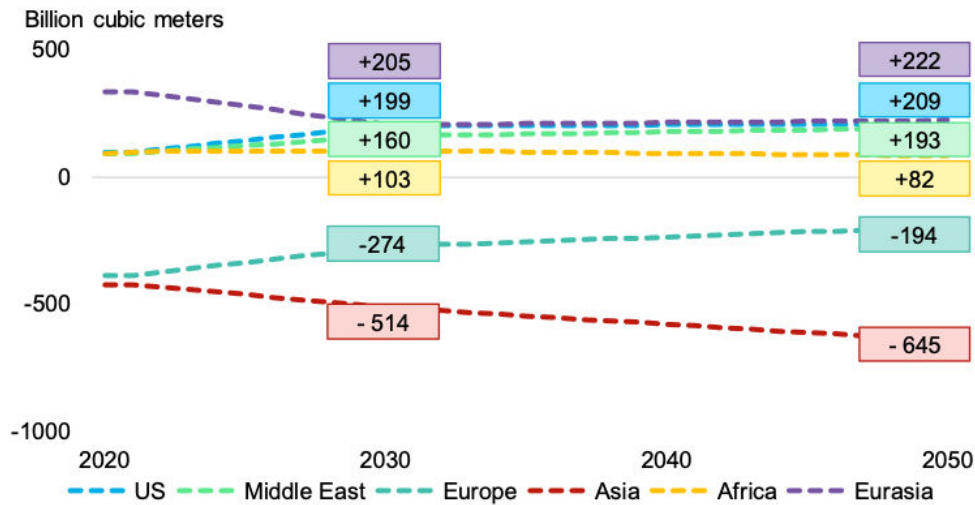
Europe predominantly relied on pipeline gas until 2022, when the Russian invasion of Ukraine galvanised the European Union (EU) to rid itself of Russian fuels. This left a gap of about 180bcm of annual imports. As existing free pipeline capacity excluding Russia to Europe is negligible, and any prospect of new pipelines seems both unlikely and unfeasible, the continent is being pushed toward LNG.⁶

That said, the REPowerEU package, introduced by the European Commission in May 2022, aims to reduce European gas demand by more than half by 2030. This is set to be achieved by a combination of increases in efficiency, fuel switching, demand curtailment and the expedited uptake of hydrogen.

⁵ "World Energy Outlook 2022.", 377.

⁶ "Europe Will Struggle to Replace Gas From Russia With LNG," BloombergNEF, 2022.

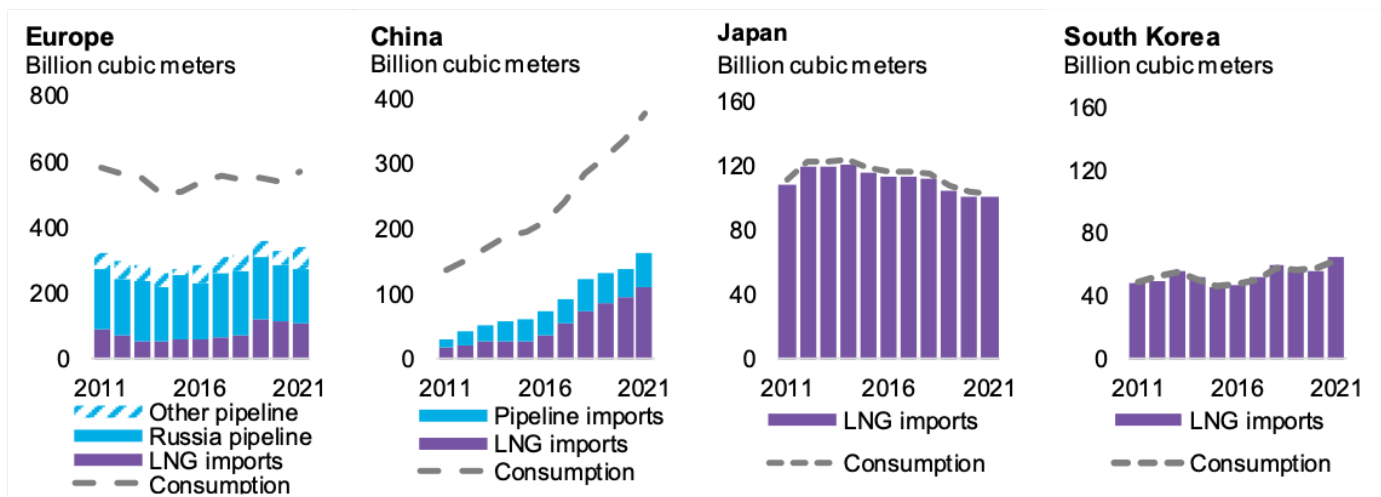
Figure 3: Gas production surplus or deficit by region



Source: BloombergNEF, IEA. Note: Based on the IEA's STEPS.

Meanwhile, China's reliance on LNG imports has been climbing at a fast pace, as its demand growth outstrips domestic production growth and pipeline imports (Figure 4). Prospected heightened pipeline imports from Russia and Central Asia are intended to reduce the reliance on LNG, but will probably not suffice to counterbalance the growing need for LNG imports.⁷

Figure 4: Gas supply by region



Source: BloombergNEF, BP Statistical Review. Note: Does not show pipeline exports from Norway to Europe, which stand at about 110bcm per year.

⁷ John Kemp, "Column: China's Reliance on Gas Imports Threatens Security | Reuters," *Reuters*, October 10, 2022, <https://www.reuters.com/business/energy/chinas-reliance-gas-imports-threatens-security-kemp-2022-10-07/>.

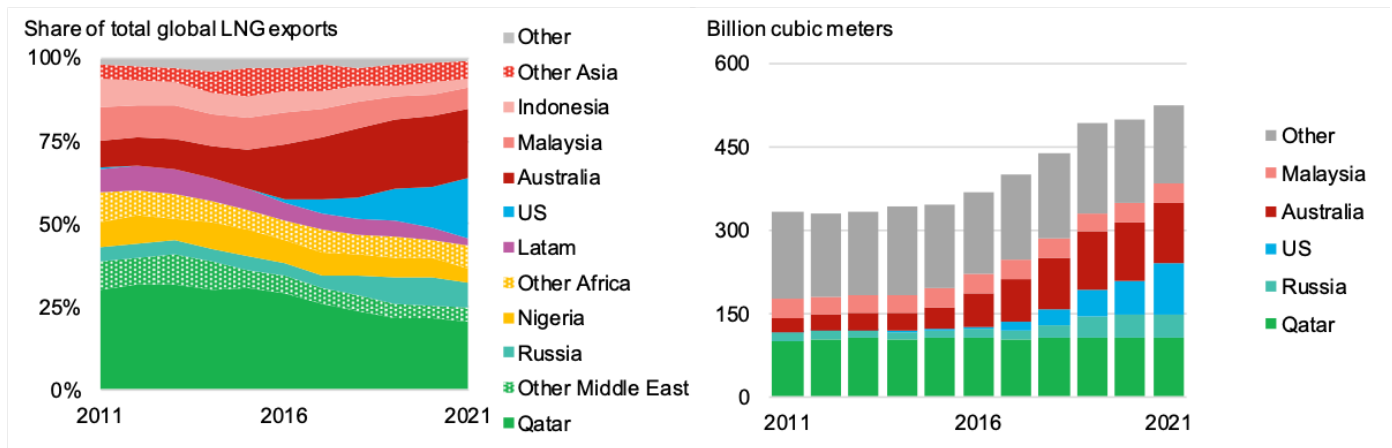
Japan and South Korea remain almost entirely dependent on LNG imports to meet their gas demand. Yet Japan's gas demand has fallen over the past decade, a trend that will likely accelerate in the years ahead. The country restarted its Kansai Electric Takahama 1 and 2 nuclear reactors in 2023, squeezing gas out of the power mix. Rapid deployment of renewable energy and a return to nuclear energy will further reduce the country's dependence on gas.⁸ South Korea has made a similar U-turn on its nuclear phase-out policies, restarting the construction of two facilities and potentially halting the country's gas demand growth.⁹

Gas supply remains centralised

LNG is thus becoming increasingly important to both Europe and Asia. Yet the supply side of LNG remains more centralised than that of oil. High upfront costs for liquefaction facilities and the focus of most gas-producing countries on meeting domestic demand pose a high barrier to new entrants.

This centralisation has magnified over the past decade. Qatar, Russia, the US, Australia and Malaysia alone account for close to 75% of all global LNG exports as of 2021 (Figure 5). By contrast, the five largest exporters of crude oil – Saudi Arabia, Russia, the US, Iraq, and the United Arab Emirates – only make up about half of total global crude oil exports.¹⁰

Figure 5: Global LNG exports by country and region of origin



Source: BloombergNEF, BP Statistical Review

⁸ "Gas and LNG: 10 Things to Watch in 2023," BloombergNEF, 2023.

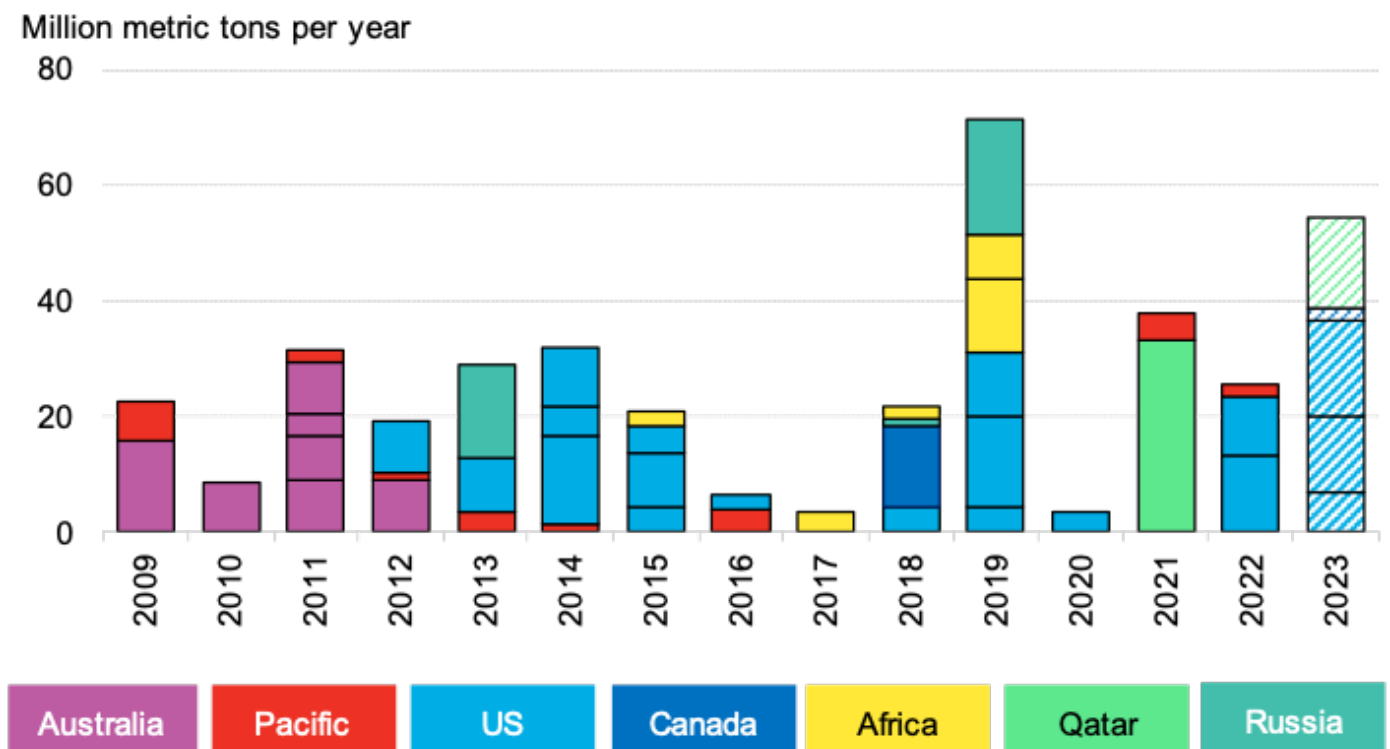
⁹ "World Energy Outlook 2022.", 292.

¹⁰ "Bp Statistical Review of World Energy" (bp), 2022, <https://www.bp.com/content/dam/bp/business-sites/en/global/corporate/pdfs/energy-economics/statistical-review/bp-stats-review-2022-full-report.pdf>.

This concentration of supplies in a handful of players is set to continue. While Qatar has put a halt to ramping up its exports since 2010, the country now seeks to expand its capacity by about 50% to reach 175 bcm by 2027. The US is also poised to double its liquefaction capacity over the next five years after a recent surge in final investment decisions (Figure 6). This will make the country by and large the biggest LNG exporter on the globe, with a capacity of about 222 bcm.¹¹

By contrast, Australia's growth has been stagnating since 2015. With no new projects in the pipeline and domestic demand rising as the country seeks to curtail its coal consumption, Australia is unlikely to play a larger role in the global LNG markets in 2030.

Figure 6: Final investment decisions, LNG capacity



Source: BloombergNEF. Note: 2023 volumes are forecast.

Russia had significant LNG expansion ambitions for the rest of this decade, but these projects' heavy reliance on international partners makes it unlikely that they will materialise.

Mozambique and Tanzania are expected to become major exporters of LNG, adding up to 30 million tons (about 40 bcm) of supplies by the end of the 2020s. However, their projects have been delayed several times due to a combination of protracted negotiations and security concerns.¹²

¹¹ "US Set to See Dramatic Growth in LNG Capacity," BloombergNEF, 2023.

¹² David Malingha and Will Kennedy, "Tanzania to Sign Key \$40 Billion LNG-Project Accords Next Month," *Bloomberg*, November 7, 2022, <https://www.bloomberg.com/news/articles/2022-11-07/tanzania-to-sign-key-40-billion-lng-project-accords-next-month>.

Conclusion

Both Europe and Asia will remain dependent on gas in the two decades ahead, albeit to varying degrees. Whereas Europe's accelerated uptake of renewable energy is set to eat away some of the continent's need for the fuel, Asian demand will likely grow amid the region's burgeoning economic development.

Meanwhile, there are no signs of a reduced dependency on imports for either region. Europe's production has fallen drastically over the past decade as the Netherlands rapidly shuts down its Groningen gas field, and Norway's production remains stable at best as the country struggles with declining reserves. While Chinese output continues to grow, this growth will be outstripped heavily by a consumption surge.

In turn, the decade ahead heralds an ever-increasing concentration of LNG supplies in a handful of major players, with the US and Qatar becoming dominant forces on the global LNG market. While some countries, such as Mozambique, Tanzania, Canada and Russia, are poised to add some capacity through 2027, those aggregated capacity expansions are less than what the US alone is set to add to the market over the same period.

The implication for policymakers in both Europe and Asia is that reducing demand should be the focal point for mitigating supply security risks in the 2030s. South Korea and notably Japan offer a good example, with both countries reducing their dependency on gas imports by (re)launching nuclear facilities, expediting the deployment of renewable energy and incentivising the maximisation of energy efficiency.

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