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# IMPLICATIONS OF CHINA'S UNPRECEDENTED LNG-CONTRACTING ACTIVITY

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Global gas markets are experiencing a period of unprecedented tightness[1] that has worsened since the Russian invasion of Ukraine in February 2022, as illustrated by the record spot prices of well above $50/million British thermal unit (mmBtu) in Asia and Europe as of early September 2022.[2] While the European Union (EU) is attempting to drastically increase its liquefied natural gas (LNG) imports to partially replace dwindling Russian natural gas supplies, European companies have signed very few long-term LNG contracts; they are caught between Europe's strong need for LNG in the short term and the expectation that LNG imports will decline in the long term due to the EU's decarbonization strategy.

Meanwhile, China has already replaced Japan as the world's largest LNG importer in 2021.[3] Chinese companies contracted record LNG quantities that year and have continued to do so in 2022. This strategy is in part driven by the record-high spot prices, which have pushed Chinese players to seek protection in long-term contracts. But the fact that half of these contracts have a duration of at least 20 years, and some only start in 2026 or later, indicates that China sees gas as more of a transitional fuel, compared to Europe, and anticipates a long-term need for LNG. In contrast to the previous decade, many Chinese LNG contracts have been signed with US companies, signaling a change in the China-US relationship on LNG and helping to balance the broader trade relationship between the two countries.

China's recent contracting activity will make the country increasingly dependent on both Russian gas (pipeline and LNG) and US LNG. The latter dependency in particular could be a security concern for China, especially absent signs that China-US tensions will abate anytime soon and in the context of polarization between the West and Russia over the war in Ukraine. But China has been making progress in alleviating gas import dependency concerns by boosting domestic production, expanding infrastructure, and diversifying import sources.

This commentary explores the rapid expansion of China's LNG import portfolio against the backdrop of unprecedented tightness within global LNG markets and the implications of this development for China and the rest of the world.

## China's Increasing Appetite for Long-Term Contracts

In 2021, China took in approximately 108 billion cubic meters (bcm) of LNG,[4] roughly 29 percent of its total gas consumption for that year (378.7 bcm[5]). China is particularly dependent on Australian LNG, which represented almost 40 percent of its LNG imports in 2021, compared to around 11–12 percent from each of the United States, Russia, and Malaysia.[6] In fact, China increased its LNG imports from Australia by almost 2 bcm (or 4.4 percent) in 2021, even amid tensions between the two countries since mid-2020, which caused China to ban Australian coal imports.[7]

China has traditionally relied on a mix of spot and short-term contracts[8] to complement long-term contracts from countries such as Australia, Qatar, Indonesia, Malaysia, and Russia, as well as contracts with aggregators[9] such as Shell, bp, and TotalEnergies. In 2021, spot and short-term LNG represented about 46 percent of China's total LNG imports, up from 43 percent in 2020 and 41 percent in 2019.[10] These levels are likely to decline going forward, however. In 2021, China's LNG-contracting activity surged with 20 new contracts, including 15 in the second half of the year (see Table 1). These contracts amounted to 38 bcm (28 million metric tons per annum [mtpa]) of LNG, most of which is slated for delivery in 2022 or 2023 and have a duration of 10 to 20 years, indicating that the companies buying the LNG see a long-term need for the product. China's robust contracting activity has continued in 2022, with nine long-term contracts signed as of late August, eight of which are at least 20 years in duration. Unlike the contracts signed in 2021, the supplies linked to these new contracts are scheduled to start delivery in 2026 or 2027.

To put things in perspective, the LNG contracts of 10 years or longer signed by China since January 2021 amount to almost 52 bcm (38 mtpa),[11] which is slightly more than the spot and short-term LNG quantities imported by China in 2021 (36.8 mtpa). Such contracting activity is exceptional: China alone represented about 40 percent in volume terms of all new LNG contracts signed in 2021.[12] This amount is highly significant even for a large market such as China, which had only 67 bcm of LNG supply under active long-term contracts as of the end of 2021. In 2020, China signed only five contracts, three of which were short term, totaling 4.6 bcm (3.4 mtpa) of LNG. Uncertainties linked to the global pandemic and low spot prices meant fewer incentives for buyers to secure long-term contracts that year. China's activity over the past year and a half thus signals a shift in its buying strategy toward long-term contracts.

**Table 1:** Long-term LNG contracts signed by Chinese buyers, 2021 to August 31, 2022

| Date | Buyer | Seller | Quantity (mtpa) | Start | Duration (years) |
|---|---|---|---|---|---|
| Feb 2021 | Shenergy Group | Novatek | 0.2 | Arctic LNG 2 | 15 |
| Mar 2021 | Shenergy Group | TotalEnergies | 1.4 | 2021 | 20 |
| Mar 2021 | Sinopec | QatarEnergy | 2.0 | 2022 | 10 |
| Apr 2021 | CNOOC | Arctic LNG 2 | 1.98 | Arctic LNG 2 | 20 |
| Apr 2021 | CNPC | Arctic LNG 2 | 1.98 | Arctic LNG 2 | 20 |
| Jul 2021 | Shell | QatarEnergy | 1.0 | 2022 | 10 |
| Jul 2021 | Guangzhou Development | bp | 0.65 | 2022 | 13 |
| Jul 2021 | CNOOC | Petronas | 2.2 | LNG Canada | 10 |
| Sep 2021 | CNOOC | QatarEnergy | 3.5 | 2022 | 15 |
| Oct 2021 | Shenzhen Gas | bp | 0.3 | 2023 | 10 |
| Oct 2021 | ENN | Cheniere Energy | 0.9 | Jul 2022 | 12 |
| Nov 2021 | Sinochem | Cheniere Energy | 0.9–1.8 | Jul 2022 | 17.5 |
| Nov 2021 | Foran Energy Group | Cheniere Energy | 0.3 | 2023 | 20 |
| Nov 2021 | Sinopec | Venture Global LNG | 4.0* | Plaquemines LNG | 20 |
| Nov 2021 | UNIPEC | Venture Global LNG | 1.0 | Mar 2023 | 3 |
| Dec 2021 | CNOOC | Venture Global LNG | 2.0 | Plaquemines LNG | 20 |
| Dec 2021 | CNOOC | Venture Global LNG | 0.5 | Mar 2023 | 3 |
| Dec 2021 | SPIC | bp | 0.2 | 2023 | 10 |
| Dec 2021 | Guangdong Energy | QatarEnergy | 1.0 | 2024 | 10 |
| Dec 2021 | Suntien Green | QatarEnergy | 1.0 | 2022 | 15 |
| Jan 2022 | ENN LNG | Novatek | 0.6 | Arctic LNG 2 | 11 |
| Mar 2022 | ENN NG | ET LNG | 1.8 | Lake Charles LNG | 20 |
| Mar 2022 | ENN Energy | ET LNG | 0.9 | Lake Charles LNG | 20 |
| Apr 2022 | ENN | NextDecade | 1.5 | Rio Grande LNG | 20 |
| Apr 2022 | Guangzhou Development | Mexico Pacific | 2.0 | MPL LNG | 20 |

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| Date | Buyer | Seller | Quantity (mtpa) | Start | Duration (years) |
|---|---|---|---|---|---|
| **Jun 2022** | China Gas | ET LNG | 0.7 | Lake Charles LNG | 25 |
| **Jul 2022** | China Gas | NextDecade | 1.0 | Rio Grande LNG (T2) | 20 |
| **Jul 2022** | Guangdong Energy | NextDecade | 1–1.5** | Rio Grande LNG (T1) | 20 |
| **Jul 2022** | PetroChina | Cheniere Energy | 1.8 | Corpus Christi Stage 3 | 25 |
| **TOTAL** | | | 38.3–39.7 mtpa (52–54 bcm) | | |

*Source: GIIGNL, "Annual Report 2022"; see note 13 for additional information.*

*Note: Gray shading represents contracts signed with a US seller. Most data on LNG contracts are given in million tons (mt) or million tons per annum (mtpa). For conversion to bcm, the authors used a conversion factor of 1.36 (1 mtpa = 1.36 bcm per year). If the start year of the contract is not given, it is linked to the start of the specific LNG facility indicated in the fifth column of the table. ET LNG refers to Energy Transfer. A 0.5 mtpa contract between Pavilion Energy and Zhejiang Hangjiaxin Clean Energy has not been included in the absence of data on duration as well as a contract between Shell and CNPC in the absence of data on volumes. *The contract with Sinopec consists of two contracts of 2.8 and 1.2 mtpa, respectively, but they are often aggregated and reported with a total of 4 mtpa. ** Right to buy an additional 0.5 mtpa.*

## Explaining China's Current Rush to Contract So Much Term LNG

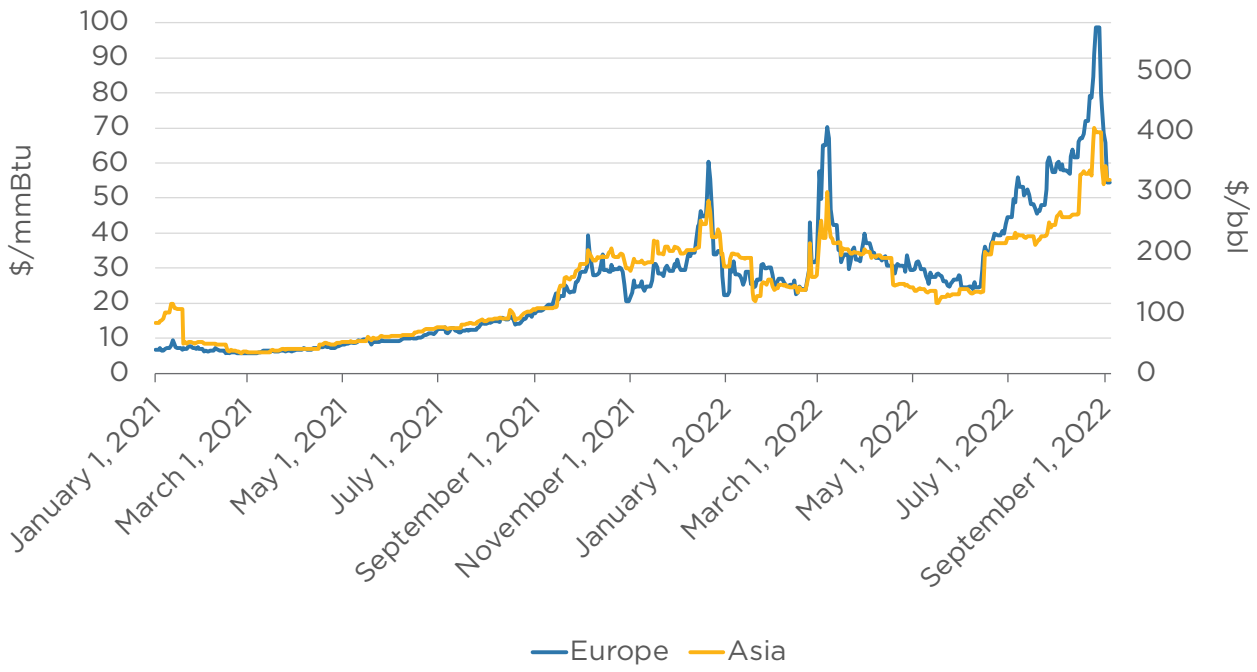
China's accelerated LNG-contracting activity was caused by two short-term triggers—rising LNG demand and record-high Asian spot gas prices—as well as expectations of growing gas and LNG demand in the long term.

China's LNG imports rose by 15 percent in 2021.[14] In the second half of 2021, China experienced its worst power shortage in two decades, seriously impacting two provinces in September 2021. Multiple factors contributed to the shortage, including surging power demand after the pandemic, tight energy supplies, and high global energy prices, as well as local governments' implementation of dual control over energy consumption and intensity.[15] Some factories and power plants were forced to cut production or even shut down, which impacted China's gross domestic product (GDP) growth and global supply chains. Despite the supply constraints and high energy prices, China's gas demand increased by 12.8 percent in 2021,[16] notably in the power generation sector where alternative fuels to hydro and coal were needed. As a result, Beijing requested that Chinese energy companies, especially national oil companies (NOCs) such as PetroChina, Sinopec, and China National Offshore Oil Corporation (CNOOC), secure gas supply for the winter of 2021–2022 at any cost. To do so, the NOCs had to rely on spot LNG procurement.

In parallel, Asian spot prices (Japan Korea marker [JKM)]) kept breaking record-high levels in 2021 amid global energy tightness, surging LNG demand in Asia, and rising tensions between Russia and Europe. The average JKM price that year reached $18.6/mmBtu, quadrupling

the 2020 average of $4.4/mmBtu (see Figure 1).[17] Since the Russian invasion of Ukraine in February 2022, both tension in global gas markets and prices have remained elevated: JKM averaged about $29/mmBtu in the first half of 2022 and reached around $50/mmBtu by September 2022.

**Figure 1:** Global spot gas price markers



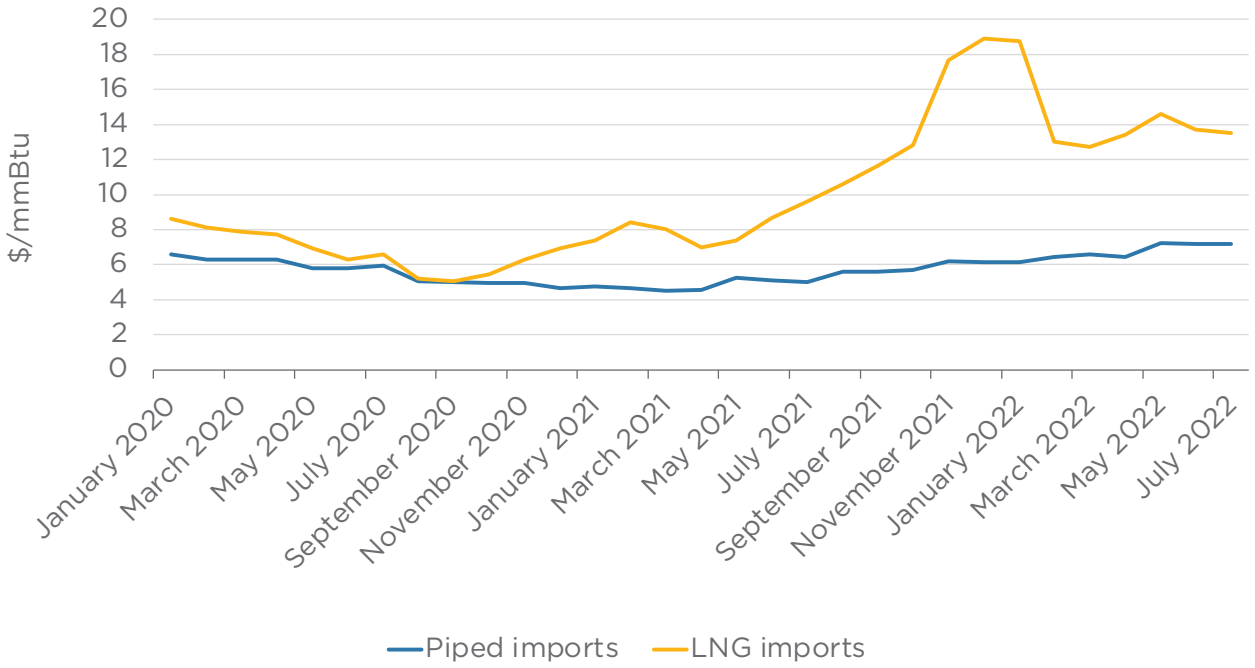

*Source: Bloomberg LP, "JKL1 Comdity" and "TTFGDAHD," accessed September 6, 2022.*

As a result, China's average LNG import price in 2021 increased by 60 percent from 2020, massively squeezing the profits of Chinese buyers (see Figure 2). The average price for the first seven months of 2022 is $14.2/mmBtu, up from $10.7/mmBtu during the previous year. Despite this significant increase, it is important to understand that average LNG import price reflects a mix of cheaper long-term contracts usually indexed to oil or Henry Hub (HH) and more expensive spot LNG. On average, Chinese buyers pay a price for imported LNG that is far lower than JKM. In 2021, China derived nearly two-thirds of its imported LNG from long-term contracts, and buyers are reluctant to purchase spot cargos when the JKM spot price is so high.

This situation has forced Chinese companies to rethink their LNG trading strategy. Previously, especially in 2019 and 2020, Chinese companies favored procuring spot LNG due to its high flexibility and low price. But when LNG spot prices started to surge at the end of 2020, Chinese buyers suddenly found themselves exposed to spot market price risks and uncertain about spot LNG supply stability due to global LNG supply tightness. The problems began with

very cold weather in Northeast Asia in January 2021, which compelled many Asian companies to search for additional LNG supplies only to realize that the market had become very tight and supplies were suddenly scarce and expensive. Russia's invasion of Ukraine in February 2022 then exacerbated this situation. The EU's growing LNG needs amid the threat and imposition of Russian gas cutoffs have resulted in high European and Asian gas spot prices. Because European gas prices were at a premium over Asian prices, Europe attracted LNG away from Asia in the first half of 2022 (see Figure 1).[18]

**Figure 2:** Average LNG and pipeline gas import price for China



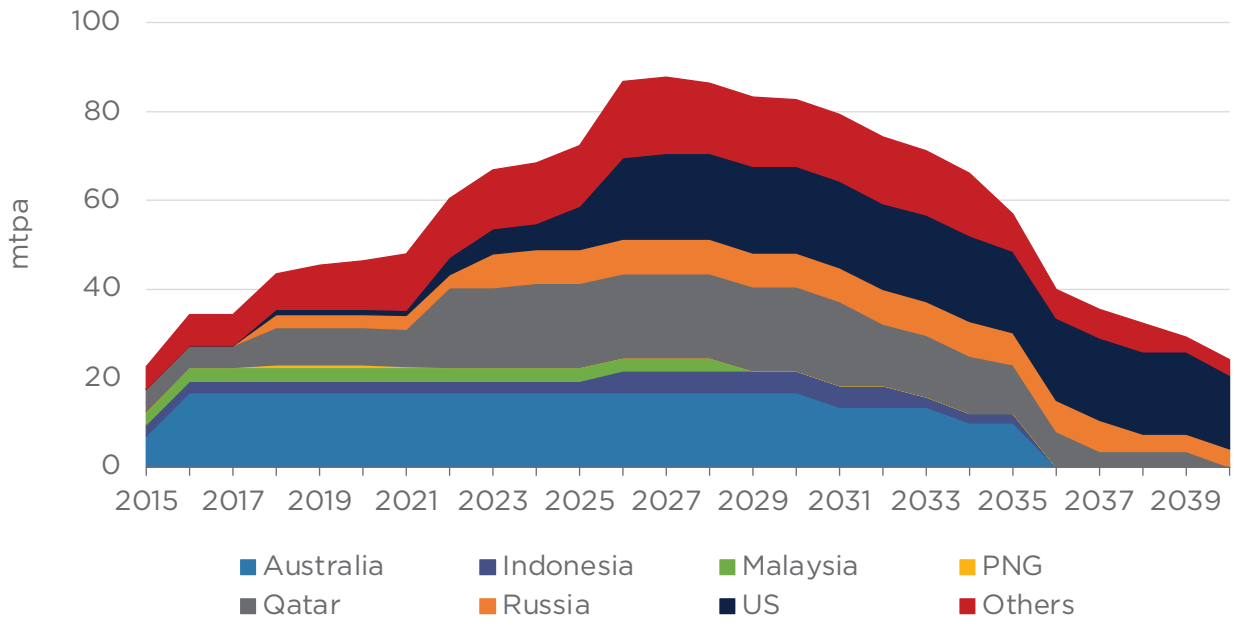

*Source: China Customs, "Good: Natural Gas, Code: 27112100" and "Good: Liquefied Natural Gas, Code: 27111100," accessed August 28, 2022, http://43.248.49.97/.*

Compounding matters is that high Asian spot prices are now expected to persist for years to come. The REPowerEU strategy has highlighted LNG as one of the key alternative gas supply sources for Europe to replace Russian gas.[19] Europe is planning to increase its regasification capacity in Northwest Europe to import more LNG in the short term. According to the International Energy Agency's recent estimates, world gas demand rebounded in 2021 by 4.4 percent but is expected to drop in 2022 before resuming growth between 2023 and 2025. Led by its industrial sector, China's gas demand is expected to be the single-largest contributor to this global gas demand growth, accounting for half of the increase between 2021 and 2025. In 2022, China's gas consumption growth is anticipated to slow but will still hover around an annual rate of 3.6 percent.[20] However, little new LNG export capacity will start operating until

the end of 2025, leaving Asia and Europe to compete for scarce additional LNG volumes. Booking LNG under long-term contracts enables China not only to secure those volumes but also to have different indexation than spot prices as many of the contracts that Chinese companies signed are indexed to either oil or HH prices.

Looking forward, China's gas demand is likely to continue to increase through the current decade at least. The Chinese government and Chinese consumers view natural gas as a "transition fuel" within Beijing's plan to reduce coal consumption, improve air quality, and achieve carbon peaking by 2030 and carbon neutrality by 2060. China's coal-to-gas switching policy, which requires small coal-fired boilers to be replaced by gas-fired ones to reduce air pollution, is expected to remain important but with less of an emphasis than before as high gas prices persist over the coming years.[21] The period beyond 2030 is more uncertain, reflecting how long-term scenarios may produce a different set of outcomes compared to short-term ones. Projected LNG demand tends to be lower in climate-ambitious scenarios. For example, bp projects that Chinese LNG demand will range between 135 bcm and 172 bcm (99–126 mtpa) by 2030, and between 37 bcm and 165 bcm (27–121 mtpa) by 2050; the lowest LNG import numbers are consistent with bp's "Net Zero" scenario. Meanwhile, in "Shell LNG Outlook 2022," Chinese LNG demand will reach 177 bcm (130 mtpa) by 2040.[22] But as legacy contracts expire in the late 2020s, the demand-supply gap is expected to widen, so new LNG supplies will be needed.

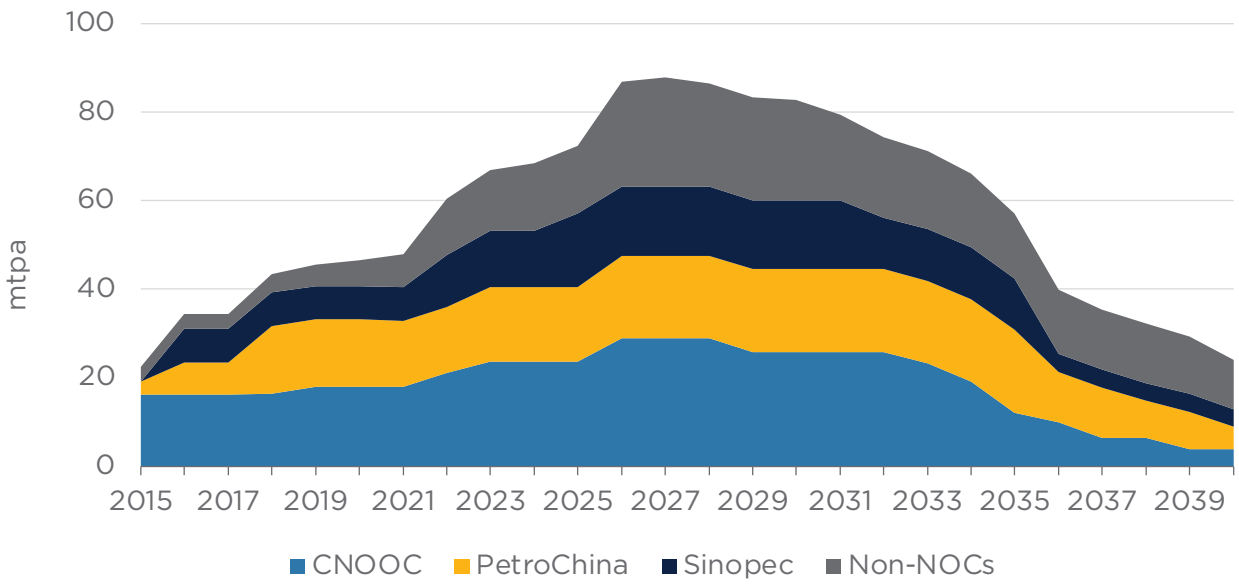
**Figure 3:** China's long-term LNG import contracts by supplier country




*Note: This figure only includes contracts signed by August 31, 2022.*

*Source: GIIGNL, "Annual Report 2022" for contracts signed before 2022; see Table 1 for information about contracts signed in 2022.*

**Figure 4:** China's long-term LNG import contracts by buyer company




*Source: GIIGNL, "Annual Report 2022" for contracts signed before 2022; see Table 1 for information about contracts signed in 2022.*

In response to the short-term triggers and long-term considerations, Chinese companies have rushed since September 2021 to return to long-term contracting. However, China is also keen to diversify its supply sources and risks and not be wholly reliant on LNG. For this reason, in February 2022, China signed a long-term pipeline contract with Russia, which will supply 10 bcm of pipeline gas through its Far Eastern route, probably starting in 2026. This contract complements an existing long-term contract with Russia for up to 38 bcm linked to the Power of Siberia pipeline, as well as other pipeline contracts with several Central Asian countries and Myanmar. Although there's no sign of discussions about new pipeline gas deals between China and Turkmenistan, Chinese pipeline imports from Turkmenistan could expand in the future if the price gap continues and additional pipeline capacity is available.

## The Recent Drop in China's LNG Imports

Asian and Chinese LNG imports have dropped by 8 percent and 22 percent year-over-year (YOY), respectively, between January and June 2022 as European spot prices exceeded Asian spot prices and LNG supplies were diverted to Europe. The significant drop in Chinese LNG imports can be explained by a mix of subdued gas demand due to COVID-19 restrictions, high spot prices, and cheaper pipeline gas imports, as follows:

- *Weaker economic growth.* China's gas demand growth has been slowing since the end of 2021 due to weaker economic growth in addition to surging LNG prices and

a mild winter. The recent COVID-19 outbreaks and widespread lockdowns in China have compounded the country's economic growth decline. In lockdown regions, factories are forced to slash production or even shut down, restaurants and shops are required to close, and transport is largely restricted. In the first quarter and second quarter of 2022, China's GDP grew by only 1.3 and 0.4 percent year on year,[23] and its national power consumption grew by 5 and 0.8 percent year on year.[24] In April 2022, industrial production dropped by 2.9 percent, negative for the first time since March 2020, though it recovered slightly in May 2022 and increased by almost 4 percent in June and July. China's apparent gas demand in April dropped 6 percent YOY, which is exceptional in China's gas development history.[25]

- *High gas prices.* Meanwhile, high gas prices continue, further reducing China's downstream gas demand growth potential. Residential end user prices are regulated, but large importers such as China National Petroleum Corporation (CNPC) have started to pass on the higher costs of spot LNG to nonresidential users. After the Chinese government improved the cost-pass-through mechanism in gas markets in recent years, downstream gas prices better reflect the cost of the imported gas. For this year, PetroChina raised its sales price by up to 20 percent above city gate benchmark for regulated gas in nonresidential sectors and by up to 80 percent for unregulated gas. In response, some factories have had to reduce production or shut down.[26] While the recent reform in power prices allows for a 20 percent swing above the benchmark price, the ability to pass through the extremely high gas spot prices may be limited to the power sector.[27] Long-term LNG contracts could relieve pressure on these cost-sensitive industries (JKM prices are far too high for the power sector), but affordability will remain a structural factor impacting gas demand in those sectors.

- *Increased pipeline gas supplies.* Finally, China has been increasing pipeline gas supplies because the import price of those supplies is much lower than that of LNG (see Figure 2). China's contracted pipeline imports from Russia and Central Asia have been ramping up, and there is newly signed Russian gas that will start delivery around 2026. These contract prices are oil-indexed and materially lower than spot LNG prices. However, they only represent the price delivered at the border. Given that China's major LNG markets are located along the eastern coast, it is necessary to add the cost of long-distance pipeline transport from the border to the coast when comparing the LNG import price to the pipeline import price.

Whether this drop in LNG demand will recover depends on China's COVID-19 strategy going forward, which will impact economic activity in the remainder of 2022 and beyond. Due to China's zero-COVID-19 policy, many banks have forecasted lower Chinese GDP growth in 2022, with a median of estimates at 3.8 percent, well below the government's own estimate of 5.5 percent.[28] Weather can also play an important role as use of gas in China's residential and commercial sectors has dramatically increased over the past decade. Assuming that gas demand recovers and import needs increase during the rest of 2022, Chinese companies will first seek to maximize cheaper pipeline gas supplies before turning to oil-indexed LNG contracts and possibly HH-linked contracts (depending on HH price levels). Therefore, though it is likely that China's LNG imports will drop in 2022, the strong contracting activity by its

major LNG importers (NOCs) and smaller LNG players suggests they are anticipating and preparing for higher LNG demand in the future. That demand growth will depend on China's ability to secure affordable gas. Chinese buyers may consider HH-linked contracts more advantageous than oil indexation for moderating long-term gas prices, but they have also witnessed wide volatility in HH prices recently, which have climbed from $1.7/mmBtu in mid-2020 to a range of $5.7–$10/mmBtu between May and August 2022.[29]

## The Recent Participation of Non-NOCs in LNG Trading

Previously, most Chinese LNG contracts were in the hands of NOCs (see Figure 4). The relative absence of non-NOCs in this area was related to their limited access to LNG and pipeline capacity and lack of access to the downstream market, pricing regulations, their lower creditworthiness relative to NOCs, and their lack of experience in LNG.[30] Rather than seek long-term contracts, non-NOCs tended to buy on the spot market.

Chinese non-NOCs' increasing LNG demand and contracting activities reflect the importance of China's gas market reform over the past decade, which has partially opened the upstream sector, providing third-party access to gas pipeline and LNG infrastructure and deregulating gas prices. By the end of 2021, the number of non-NOCs operating LNG terminals had increased (JOVO LNG, Shenzhen Gas, Shenergy Group, Guanghui Energy, and ENN), even though it remained relatively low. Meanwhile, seven terminals are now operated by PipeChina, which opened mid- to long-term (5 to 20 years) LNG import slots in 2021, allowing companies such as Sinochem to contract term LNG without owning any LNG terminals.[31] Moreover, accelerated construction of LNG-receiving terminals and improved third-party access terms support long-term contracting activities. China has issued a draft plan to build 34 coastal LNG-receiving terminals and add 224 bcm (165 mtpa) of receiving capacity by 2035, more than doubling the country's current capacity.[32]

Gas distributors such as Shenergy Group, ENN, and Foran Energy Group keep increasing their contracted volumes, and new players such as Sinochem, Guangzhou Development, and State Power Investment Corporation (SPIC) Overseas have emerged since 2021 and signed initial long-term contracts. An increasing number of companies have expressed interest in LNG trading. Sinochem, for example, which neither owns an LNG terminal nor has LNG import experience in China, signed a 17.5-year LNG contract with Cheniere Energy in November 2021, citing China's progress in achieving its energy transition goals and leveraging its 40-year crude oil trading experience and overseas procurement platforms.[33]

While more non-NOCs have signed long-term contracts, some obstacles to their participation in LNG markets remain. Non-NOC contracts represented around 40 percent of the volumes signed since early 2021 but usually account for lower individual volumes than NOC contracts. Many have been signed with aggregators such as bp and TotalEnergies, which have more experience and appetite to deal with smaller counterparties with weaker creditworthiness.[34] Still, QatarEnergy and Novatek signed several long-term contracts with various non-NOCs. In 2022, many companies that support new US LNG projects (NextDecade, Energy Transfer) have done so as well—a sign that such players may be increasingly ready to face the risk of dealing with the new Chinese buyers. The current high gas prices may have put additional pressure on non-NOCs by taking them beyond their credit limits—another reason for them to

seek long-term contracts with indexations other than spot.[35] However, low creditworthiness may still be an obstacle for some non-NOC players in China.[36]

### China's Procurement of a Large Volume of US LNG since Early 2021

Among all the contracts that China has signed since early 2021, around half in volume terms are for US LNG. China only imported 9 million tons (mt) of US LNG in 2021, about 11 percent of its total LNG imports, but it became the largest offtaker of US LNG ahead of Japan and Korea. This spate of US LNG contracts provides China a more mixed LNG supply portfolio with a lower share of Australian LNG in the future at a time of tense relations between China and Australia. It also allows China trading flexibility (as most of the contracts are free on board [FOB][37]) and potentially low costs (depending on HH gas price levels). Crucially, the US currently has the largest number of projects close to final investment decision (FID) among LNG exporters, making it the ideal choice for China as a source of additional volumes in the medium term. US LNG presents some features that are attractive to Chinese buyers:

- *HH indexation provides pricing diversification for China.* With most of China's non-US long-term LNG contracts Brent indexed, Chinese buyers have been heavily exposed to the pricing of that index.[38] The term LNG contracts signed between China and the US, by contrast, are indexed to HH, providing pricing diversity to China's contracts pool. Moreover, compared with Asian spot prices, which surged drastically in 2021, HH prices have been stable. The recent increase in HH prices to around $7–$10/mmBtu in mid-2022 may push buyers to look for different price indexation, including other US gas hubs, though US LNG is still priced lower than Asian spot prices. Additionally, HH prices are anticipated to come down as domestic US supply/demand rebalances. The Energy Information Administration (EIA) expects HH to drop to $6/mmBtu in 2023.[39] While LNG based on HH indexation may look like a good opportunity in a context of high Asian spot prices, if and when the market turns to oversupply, it may turn out to be more expensive than spot LNG (as witnessed in 2020).

- *FOB basis offers flexibility to Chinese buyers in LNG trading.* Compared with the delivery ex-ship-based contracts that dominate China's portfolio, FOB basis allows buyers more flexibility regarding destination and can be more easily traded on the market. Many companies including Shell and Cheniere Energy have been moving to portfolio sell. This meets Chinese buyers' interest in enhancing their trading presence, as many Chinese companies have been growing their LNG trading desks. Their ability to play between the Chinese market and other destinations could allow them to rival existing LNG traders.[40]

- *Many market sources reported surprisingly low tolling fees to entice buyers.*[41] Such liquefaction fees were reported to be as low as $2/mmBtu, particularly for brownfield projects. However, future projects may have higher tolling fees due to rising raw material, labor, and engineering, procurement, and construction costs.[42]

## Policy Implications

China's high LNG-contracting activities will have implications for its relationship with existing and future LNG suppliers, notably the US, with which many Chinese companies have signed

long-term deals. China's attitude vis-à-vis LNG can also be contrasted with the low number of contracts signed by EU companies, which have been diverting LNG away from Asia, especially China.

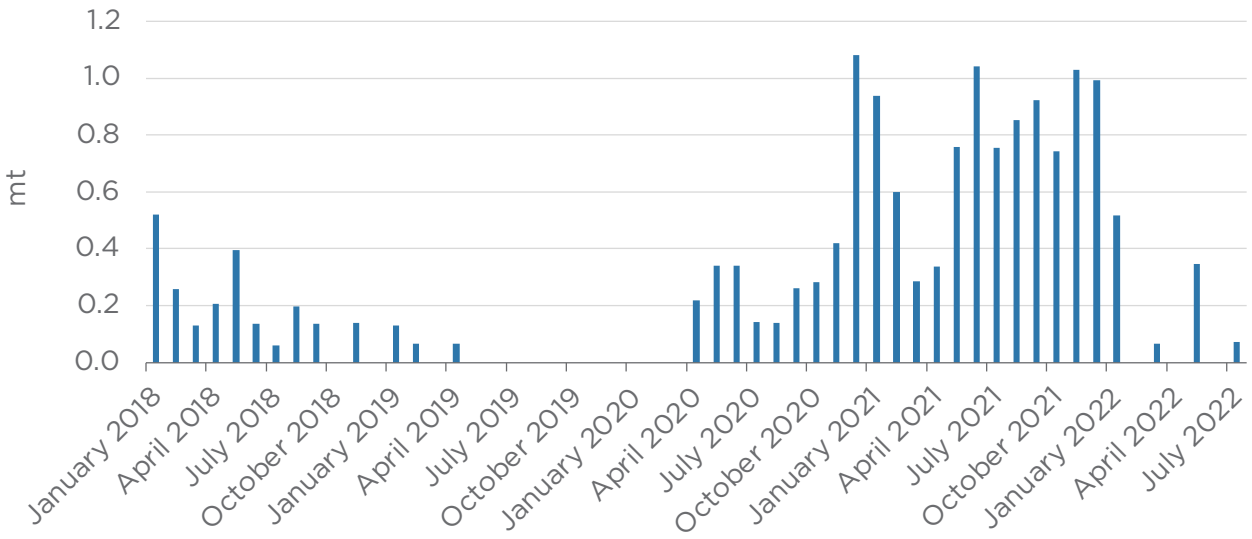
## China-US Relations Have Been Steering LNG Trade between the Two Countries

China-US LNG relations are booming even as the bilateral relationship between the two countries is arguably at its lowest point in decades. China was the largest buyer of LNG in 2021, and the US is set to become the largest exporter of LNG in 2022. Looking forward, China's LNG demand is anticipated to continue to grow, while the US has many LNG projects at an advanced stage of development compared to other LNG exporters, making it a likely option for Chinese buyers. By contrast, while the recent European demand surge has driven much spot US LNG toward Europe, this has resulted in only a handful of long-term contracts being signed.

Prior to 2021, there were no term LNG contracts between China and the US aside from the CNPC-Cheniere Energy one signed in 2018. Chinese companies were simply reluctant to make long-term commitments amid all the uncertainty surrounding the two countries' relationship and to enter contracts with an HH indexation, which they were less familiar with than oil indexation. After China-US trade tensions escalated in 2018, US LNG exports to China even fell to zero for 11 consecutive months in 2019–2020 (see Figure 5). This drop was partly a response to the tariffs China imposed on US LNG as part of the China-US trade war: tariffs increased from 10 percent in September 2018 to 25 percent in June 2019, making US LNG imports less competitive relative to alternative sources of LNG.[43]

The turning point came in January 2020, when Beijing signed the phase-one deal agreement with Washington that included a commitment to increase purchases of US energy products, including LNG, crude oil, refined products, and coal, by $52.4 billion above a 2017 baseline over the next two years.[44] With the deal in place, US cargos quickly returned to China, though it is worth noting that China's purchase of energy products fell well below the deal's targets (47 percent of Chinese imports or 37 percent of US exports of the phase-one commitment).[45] The past 18 months have seen multiple long-term contracts signed between China and the US, a development that is attributable to both China's thirst for LNG and the increased confidence of energy companies in China-US energy cooperation. Additionally, HH spot-indexed LNG is currently much less expensive than Asian spot LNG, and many US LNG projects either have spare LNG to sell (Cheniere Energy, Venture Global LNG) or are very close to taking FID (NextDecade, Energy Transfer). Additional contracts may be signed when China's economy and gas demand recover from the recent COVID-19 outbreaks.

**Figure 5:** US LNG exports to China




*Source: China Customs, "Good: Liquefied Natural Gas, Code: 27111100" and "Country: US, Code 502," accessed August 28, 2022, http://43.248.49.97/.*

## China and the US Have Been Strengthening Their Climate Relations, Which Could Open More Commercial Opportunities for Chinese and US Energy Companies, but Disruptive Risks Remain

In April 2021, China and the US held a high profile, two-day climate summit in Shanghai, resulting in a joint statement on climate change cooperation and strengthening the implementation of the Paris Agreement. In October 2021, the Brookings Institution released a report highlighting the science and technology opportunities between the two countries on climate change.[46] At COP26 in November 2021, China and the US signed a joint declaration to address the global climate crisis over the coming decade, which is regarded by the international community as one of the most significant breakthroughs of the conference. In a virtual meeting between President Xi Jinping and President Joe Biden during that same month, Xi emphasized that China and the US should strengthen cooperation on natural gas and new energy and work together to bolster global energy security. This kind of political will could open up commercial opportunities in the energy sector, including in LNG trade, with the caveat that lingering tensions between the two countries could disrupt cooperation at any point, as illustrated by China's suspension of talks with the US on climate change in response to Speaker Nancy Pelosi's recent visit to Taiwan.[47]

## Improved Energy Cooperation between China and the US Will Help the Two Countries Cement Their Relationship and Reach Their Climate Targets

By increasing its LNG imports, China can accelerate its coal (and greenhouse gas emissions) reductions in the medium term and achieve its goal of carbon peaking by 2030 and neutrality by 2060. But for China to replace coal entirely, LNG needs to be far more affordable than $15–$50/mmBtu. Moreover, additional LNG alone will not suffice to reach peak neutrality, unless it is complemented by substantial carbon capture, utilization, and storage development at home as well as sinks or negative carbon technologies. If the success in LNG trading between the two countries is just the starting point for their energy cooperation, they could have more binding relations on tackling climate issues, therefore accelerating the two countries' progress in achieving their respective climate targets.

One aspect of LNG that has not been at the forefront of China-US negotiations and deals is its carbon footprint, particularly through methane emissions. By contrast, that aspect has been very much present in similar discussions between the US and the European Union. There are several reasons for this divergence. Whereas China is not even a signatory of the Global Methane Pledge, the EU has developed a methane strategy. Moreover, whereas a large portion of China's methane emissions is derived from coal mining (nearly 38 percent of the total methane emissions of the country[48]) and therefore relatively difficult and costly to curb, methane emissions in the US and the EU are concentrated in the oil and gas sectors. Nevertheless, methane emissions were part of the US-China Joint Glasgow Declaration on Enhancing Climate Action in the 2020s, in which both countries deemed curbing such emissions during the current decade a matter of necessity.[49] It will be important to watch whether Chinese companies will put pressure on this particular component of the LNG trade. One positive sign is that some of the projects targeted by Chinese companies (Plaquemines LNG, Rio Grande LNG) are planning carbon capture and sequestration to reduce their $CO_2$ emissions.[50]

## The Impact of the LNG-Contracting Boom on the Future of Supply Security

China's intense contracting activity happens at a time when gas markets are extraordinarily tight but also when energy security has returned to the top of the political agenda of many countries and regions, notably the EU. For the US, the recent long-term contracts with China represent commercial opportunities, and it is worth noting that Chinese buyers purchase LNG to support not only their immediate needs but also their longer-term needs, with some of the projects they have signed on requiring a final investment decision in the coming few years. As such, the contracts will support the next wave of LNG projects such as NextDecade's Rio Grande LNG, Energy Transfer's Lake Charles LNG, and Mexico Pacific's project, all of which are based in North America and will enhance the US's position as a global LNG supplier in competition with Russia, Qatar, and Australia. In the future, additional opportunities related to other energy products may emerge, which would mean additional commercial opportunities for the US. While the recent deals mean higher US exposure to China, the volumes associated with them could be redirected to other markets due to the flexibility on the global LNG market—barring a decline in global LNG demand.

For China, the story is more complex. The country's increasing reliance on the US for LNG imports could pose a security concern, especially absent signs that tensions between the two countries are de-escalating and in the context of Russia's war with Ukraine. This reliance has aroused major concerns domestically as China's natural gas import dependency remains above 40 percent. But China has been alleviating those concerns by boosting domestic production, expanding infrastructure, diversifying import options, and promoting market reforms. These measures should enable China to balance the need to meet domestic demand with the need to ensure energy security. China is also seeking to procure additional LNG from another large LNG exporter, namely Qatar, from which it has secured around 8.5 mtpa since early 2021 (see Table 1), representing about 20 percent of China's total contracted quantities since January 2021. In addition, China has been rumored to be interested in taking a share in the North Field Expansion (NFE) project to secure additional LNG output, but Qatar has only selected major international oil companies as partners for the project. This approach is consistent with the historical shareholding of Qatar's LNG projects, in which key buyers had only a small share in a limited number of projects, though this time they are completely absent. It is worth noting that Chinese companies have not yet signed for NFE volumes, as all of their recent contracts start between 2022 and 2024, whereas NFE is expected to start by 2025. Another key LNG supplier to China is absent from the list of new LNG contracts—Australia. This partly reflects the tense relationship between the two countries over the past two years but also the fact that very few Australian projects are considered close to taking FID (unlike in the US). Moreover, almost half of Australian LNG to China is spot or short term, which can be replaced through the recently signed long-term contracts if tensions were to flare again.

The war in Ukraine has heightened the complexity of ensuring China's gas supply security going forward, however. China is increasingly dependent on two major protagonists of the conflict for its gas supply: the US for LNG, and Russia for both pipeline gas and LNG. Excluding the portfolio contracts where the aggregators could be sourcing their gas from the US, Chinese companies will have around 26 bcm of contracted LNG from the US by the middle of the decade. This compares with around 48 bcm of pipeline gas supply from Russia (once the Power of Siberia 1 pipeline deal comes to plateau and the new pipeline from the Sakhalin Peninsula is built) and 11 bcm of Russian LNG. There are also discussions of building another pipeline from Russia to China, the 55 bcm Power of Siberia 2 pipeline, which would tap into resources in Western Siberia currently being used to supply Europe. The latter pipeline is far from a done deal, even though it would be in Russia's interest to find an outlet for its currently producing gas fields if exports to Europe continue to be reduced. If the Power of Siberia 2 pipeline were to be sanctioned, it would likely take years to be built and to ramp up to capacity but could potentially displace a great deal of LNG demand post 2030 while also increasing China's dependency on Russian gas supplies (and Russia's dependency on China). Finally, given the sanctions on Russian energy since April 2022, more Russian LNG has been going to China (2.76 mt in the first seven months of 2022, a nearly 11 percent increase compared to 2021).[51]

Given the heightened tensions between the US, the EU, and their allies on the one hand, and Russia on the other, China's dependency on gas supplies from both the US and Russia puts it in a relatively delicate position. From China's perspective, it is also important to think strategically about how much it wants to depend on each of its supply sources, especially

considering the evolution of geopolitical forces and the current situation regarding global gas/LNG markets. As Europe has found out, global LNG markets can be flexible, but such flexibility comes at a price, and volumes can be constrained by the needs of other parties (regardless of price) and LNG import capacity.

Finally, it is worth contrasting China's behavior with that of Europe. Although both are seeking to increase their LNG imports, they are showing completely different attitudes on how to achieve that target. China has been very active in securing long-term contracts while European utilities have committed to few such contracts and have given little support to new LNG plants, despite the European Commission's announcement of higher LNG needs under the REPowerEU program (an addition of 50 bcm by the end of 2022 and 100 bcm by 2030) and the US agreement with the EU to supply at least 15 bcm of additional LNG in 2022.[52] At the time of writing, only the sales and purchase agreements (SPAs) between ENGIE and both Cheniere Energy and NextDecade (3.6 bcm in total), between PGNiG and Venture Global (0.7 bcm), and between RWE and Woodside (1 bcm), as well as the 4 bcm head of agreements between PGNiG and Sempra, the 2 bcm SPA between EnBW and Venture Global LNG, and the 1 bcm SPA between Uniper and Woodside Energy, have been concluded. However, Italy seems to be extremely active with Eni in securing pipeline gas and LNG supplies from Algeria, Egypt, Congo, and Mozambique.

As Europe and China import relatively comparable volumes of LNG, the difference in what they are currently contracting is striking. This reflects the dilemma of European players, who face potentially lower gas demand in the medium to long term due to the EU's decarbonization strategy and are uncertain about the development of other gas supply sources and future Russian gas imports. As seen recently, the outlook for Russian pipeline gas supplies to Europe looks particularly bleak. The dealings between Germany and Qatar show that European importers and LNG exporters are at odds on the level and timeline of LNG commitments.[53] This situation seems comparable to what happened about 15 years ago between China and Europe regarding Central Asian gas: China concluded a deal with Turkmenistan in 2006, built the pipeline in three years across transit countries, and started receiving gas at the end of 2009. In the meantime, and through 2011, Europe sought access to Turkmen gas, which it regarded as a potential supply option for projects from the Caspian region (including Nabucco). Many of these projects intended to acquire pipeline gas from Central Asia, the Caspian region, or the Middle East failed, with the exception of those developing Azeri gas. Options for gaining access to Turkmen gas included developing a consortium of buyers, which failed due to the Directorate-General for Competition's objections. To date, Europe still does not have access to Turkmen gas.

In these times of high uncertainty, the key question is whether China will help bolster EU security in one of two ways: (1) moving some LNG projects forward while European companies hesitate to commit to long-term LNG contracts; or (2) taking away volumes so as to incentivize European companies to commit to such contracts out of fear of insufficient access to LNG in the event of Russian gas disruptions in 2022, and they need LNG for longer than anticipated. As shown in this commentary, Chinese legacy contracts will begin to expire in the late 2020s/early 2030s, likely causing China's LNG demand-supply gap to widen and, in turn, requiring new supplies. While Chinese players may be perceived as taking new price and

volume risks by signing these new contracts, contracted volumes remain well below the most pessimistic LNG demand outlook.

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