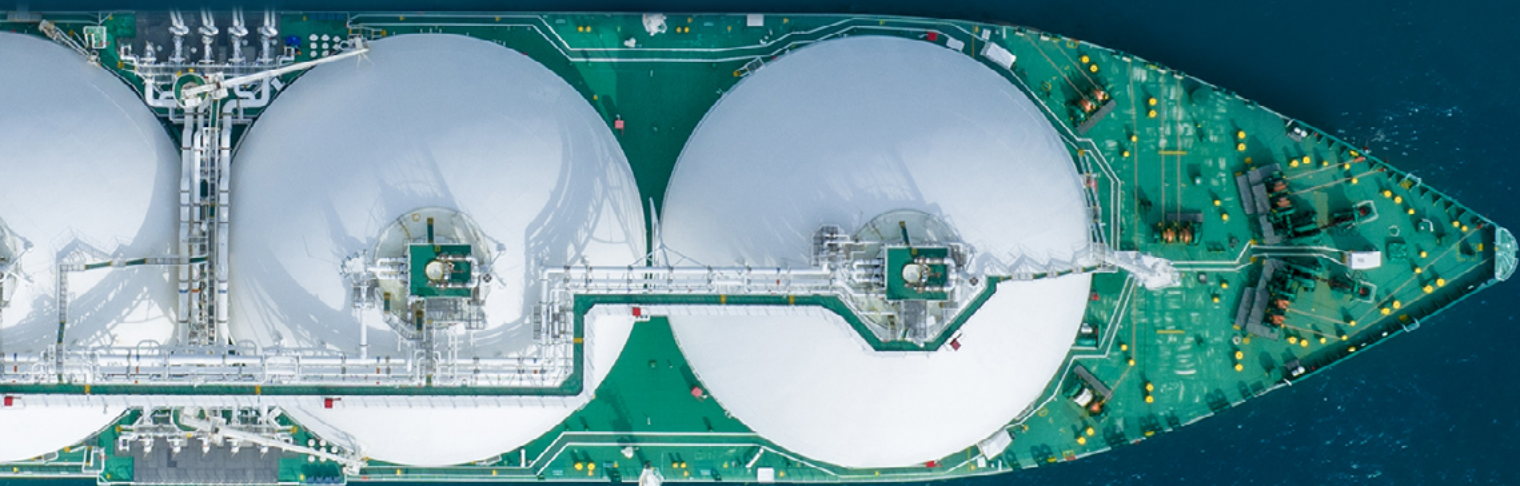




European Union Agency for the Cooperation
of Energy Regulators

Analysis of the European LNG market developments 2024 Market Monitoring Report

19 April 2024





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EXECUTIVE SUMMARY

Introduction

- 1 This first edition of the ACER European LNG Market Monitoring Report offers a comprehensive overview of the role of LNG in the European natural gas market. The report describes the most recent dynamics in the global LNG market, provides insights into the latest trade developments and LNG contractual arrangements, and addresses a few select regulatory considerations. It sets out two recommendations on the future role of gas and a further three recommendations related to LNG terminals and their regulations.
- 2 ACER's decision to publish a dedicated LNG report this year is prompted by the EU's growing reliance on LNG and the important implications of the global LNG market for price and flows in the EU energy market.

Key take aways of the report:

The EU's coordinated approach to the energy crisis, with the prominent role of the REPowerEU plan, has proven effective in ensuring gas security of supply whilst diversifying gas imports away from Russia with LNG playing a key role.

The global landscape of the LNG trade has reshaped since the Russian invasion of Ukraine. Europe has emerged as the biggest LNG import market globally ahead of China and Japan. Meanwhile the United States have surpassed both Qatar and Australia and became the largest LNG exporter.

Since February 2022, the LNG regasification capacity in the EU has expanded by 50 bcm to facilitate the surge in LNG imports. New regasification infrastructure has helped to alleviate congestion and contributed to reduce price spreads between European gas hubs and LNG spot prices.

A massive expansion of global LNG export capacity is happening. By 2030, more than 200 million tonnes¹ are projected to be added, equivalent to approximately 50% of the current yearly LNG traded. The construction of new capacity will be led by the United States, where the recently announced pause on granting new LNG export approvals will not affect projects that are already operational or under construction.

The upcoming long-term LNG contracts from liquefaction capacity under construction, coupled with gas demand reductions outlined in the REPowerEU scenario, will trigger a significant shift in Europe's spot LNG market. This transition will move Europe from an undercontracted stance of 49 bcm in 2023 to an overcontracted position of 30 to 40 bcm from 2027 to 2030.

Market fundamentals keep supporting the downward price trend, driving gas prices in the first quarter of 2024 back to pre-Russian invasion levels.

ACER calls for:

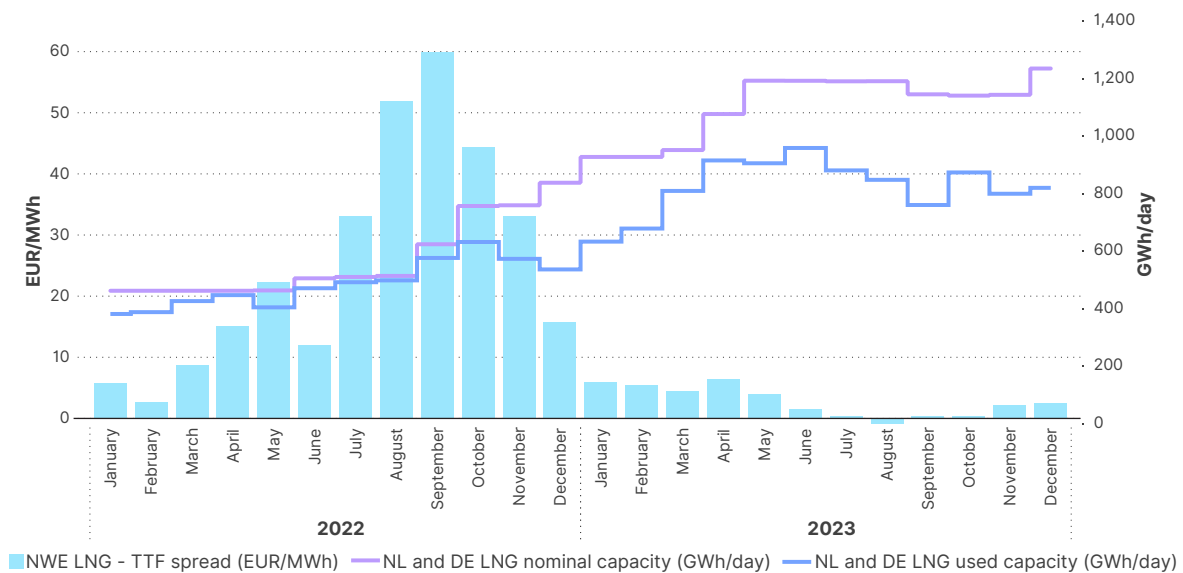
- LNG system operators to enhance the operational flexibility for terminal users to the extent possible.
- Regulators to favour market-based capacity allocation mechanisms, such as auctions, to assign primary capacity when demand exceeds offered capacity.
- Implementation of consistent reporting by LNG system operators to improve transparency and regulatory oversight.

¹ LNG production is commonly measured in tons, Conversion factor: 1 million ton = 1.36 billion cubic meters (bcm).

Role of LNG in the European energy market: recent market trends and outlook

- 3 Since the Russian invasion of Ukraine in February 2022, the European energy system has been under considerable pressure. That pressure led to an unprecedented soaring of energy prices across 2022 and their recovery in 2023². The adoption of the REPowerEU plan, requiring demand reduction as well as supply diversification among others, led to a series of coordinated measures³ across the EU. Overall, the efforts to secure alternative gas sources, notably through rising LNG imports, have been instrumental in replacing a substantial share of the Russian gas pipeline supplies in record time. This rise in LNG imports has positioned Europe as the largest LNG importer, placing the European Union ahead of other importing countries such as China and Japan.
- 4 To step up LNG imports, Member States have undergone a fast and significant expansion of LNG regasification capacity. This has resulted in an extra capacity addition of 50 bcm since 2022. Such a growth in regasification capacity has helped to ease supply congestions and contributed to reduce spreads between the EU hub prices and the price of LNG. As it is illustrated by Figure i, there is a time correlation between the addition of new regasification capacity in the Netherlands and Germany and the reduction of the spreads between the Dutch Title Transfer Facility hub (TTF) and the price of LNG spot cargoes.

Figure i: Overview of North West Europe LNG and TTF month-ahead price difference (EUR/MWh), Netherlands and Germany nominal and used LNG send-out capacity (GWh/day) - January 2022 - December 2023



Source: ACER based on data from Platts and Gas Infrastructure Europe.

- 5 The surge in EU LNG demand rose at a faster pace than the global additions of new liquefaction capacity. That led to a considerable market tightness and hence a global LNG price escalation across 2022 and parts of 2023. The high LNG price environment incentivised a boost in final investment decisions⁴ in new liquefaction projects, which will result in the addition of over 200 million tonnes of LNG production capacity by 2030. The recently announced pause on granting LNG export approvals in the United States will not affect projects that are already under construction.
- 6 In 2023, Europe received 18 bcm of Russian LNG imports. Notably, a portion of the imported volumes was re-exported to China, Taiwan, India, and Turkey among other destinations through LNG reloads. Some anticipate that at least 1 bcm, but possibly more⁵, of Russian LNG could have been re-exported from Europe to other markets in 2023.

² ACER's [European gas market trends and price drivers MMR 2023](#) examines the drivers that led to the unprecedented price rise in European gas markets in the summer of 2022.

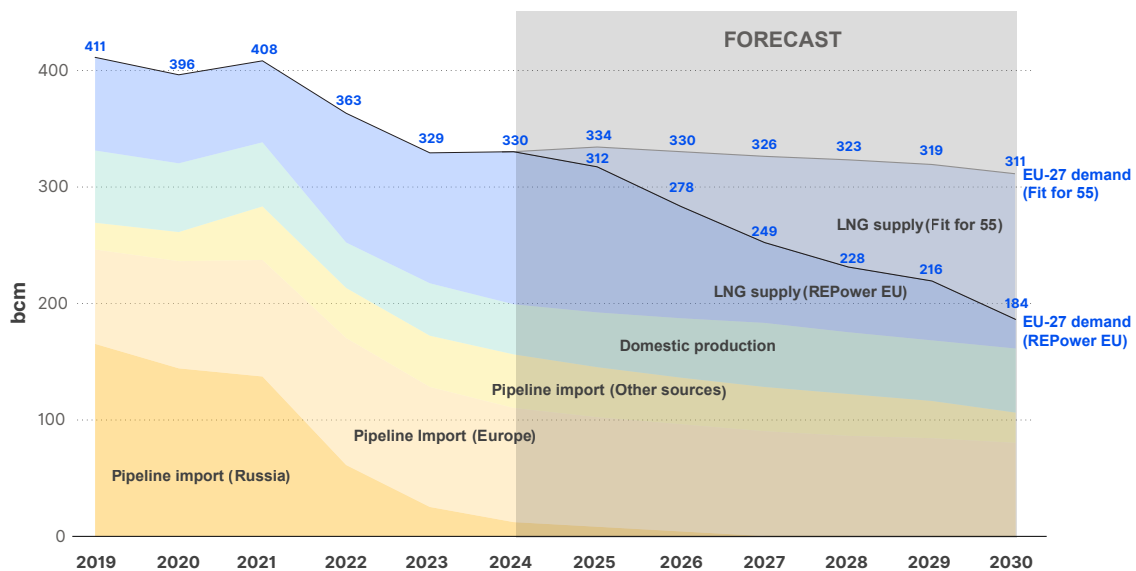
³ A specific case box about the Joint Purchase Platform is available in chapter two of this report.

⁴ Booking most of the LNG plants' annual production capacity throughout long-term agreements with off-takers is a prerequisite to obtain project financing, and therefore proceed with the final investment decision.

⁵ Estimations regarding the re-exported volumes of Russian LNG from the EU remain subject to caveats due to incomplete data disclosure.

- 7 Europe's Fit for 55 legislative package envisages a decrease in EU gas demand by 30% by 2030, relative to 2019 levels. The REPowerEU plan, which builds on Fit for 55 goals sets more ambitious goals for renewable energy and energy efficiency targets⁶. If REPowerEU targets are fully met, the gas demand reduction foreseen by 2030 will be slightly over 200 bcm, relative to 2019. Certainly, the evolution of EU gas demand will shape the EU LNG imports needs across this decade. As shown in Figure ii, LNG is expected to provide most of the required flexibility to accommodate EU gas supply and demand balance⁷.

Figure ii: EU gas supply and demand outlook and assessed LNG supply needs relative to Fit For 55 and REPowerEU scenarios by 2030 (bcm)



Source: ACER based on data from ICIS, Platts, and REPowerEU.

Note: The demand evolution from 2024 to 2030 reflects a linear decrease in alignment with the target set for 2030. The potential gas demand reduction described in REPowerEU associated with 20 Mt of green hydrogen introduced by 2030 is not factored in the assessed scenario.

- 8 [Figure iii](#) shows Europe's reliance on the LNG spot market⁸ under the REPowerEU scenario and in this scenario the EU relies on LNG spot slightly above 40 bcm between 2024 and 2025, but the uncontracted LNG gap is reduced to 11 bcm already in 2026. Notably, from 2027 to 2030, there is a complete turnaround. The EU LNG long-term contracted volumes to date⁹ would exceed the projected LNG supply needs. As a result, EU's exposure to spot LNG would be limited to mere balancing and scheduling adjustments. EU's over contracted position would account from 30 to 40 bcm of LNG surplus over the 2027 – 2030 timeframe. Yet, the resulting EU LNG contractual surplus is expected to be delivered to other LNG markets globally. This will be facilitated by the inherent flexibility of the Free-on-Board contractual arrangements¹⁰.
- 9 Certainly, enhanced flexibility provisions in LNG long-term supply agreements will be crucial to manage the reduction in gas demand targeted by EU decarbonization goals. The Free-on-Board contracts such as those signed with United States' producers will be particularly valuable for mitigating such risk if over-contracted LNG scenarios materialise. Furthermore, while Qatari LNG long-term contracts do not follow Free-on-Board shipping terms, public statements suggest that recently signed long-term contracts (for a period of 27-years) involving major European off-takers, would allow the diversion of LNG cargoes outside Europe.

6 See a detailed analyses on the demand reduction targets and technologies in the dedicated case box in Section 1.2.2.

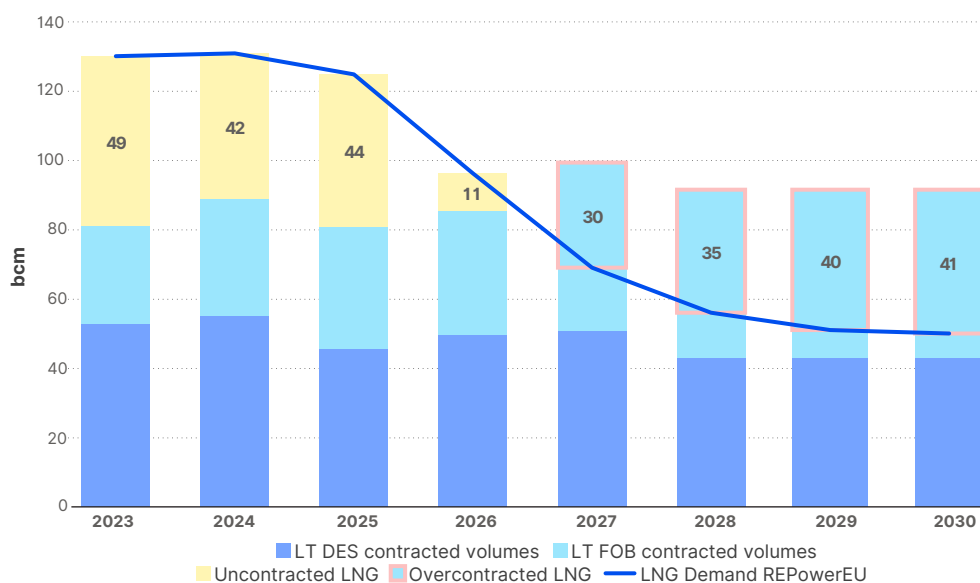
7 Based on the assumption that there will be no capacity expansion in pipeline gas supplies to Europe. Therefore, pipeline supply will remain relatively stable following a slight downward trend due to ageing conditions of existing gas fields.

8 ACER's assessment of EU's exposure to the LNG spot market stems from the mapping of the current long-term LNG contractual positions in comparison to LNG demand foreseen under REPowerEU scenario.

9 Both existing and future long-term contracts associated with projects already under construction or sourced from portfolio players have been considered. Contracts linked to projects that had not reached the final investment decision (FID) by the end of 2023 are excluded.

10 Free on Board (FOB) shipping terms in long-term supply contracts entitles LNG off-takers full flexibility to set the final destination of the LNG deliveries.

Figure iii: Exposure to the LNG spot market under the REPowerEU scenario by 2030 (bcm)



Source: ACER based on data from REPowerEU and ACER's proprietary database of long-term LNG contracts.

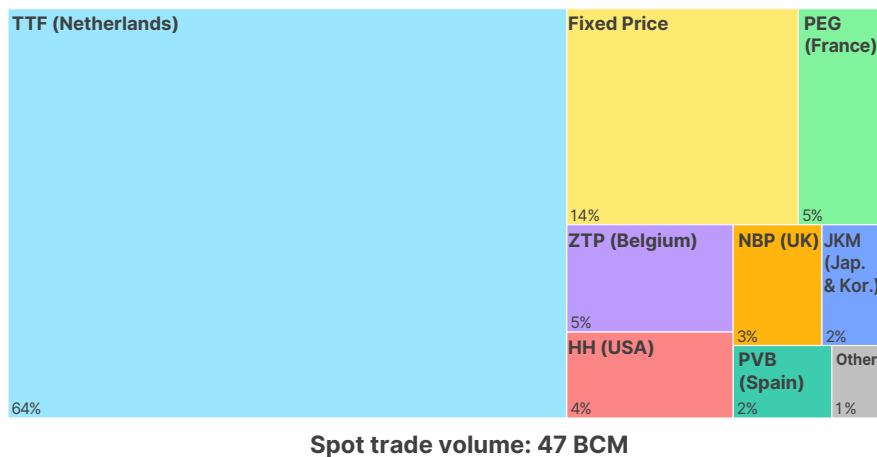
Recent LNG price developments

- 10 The mild temperatures in the northern hemisphere have reduced natural gas demand across the last winter. Moreover, events such as the slow recovery of the Chinese economy after a strict zero-Covid policy and the restart of nuclear power reactors in Japan have freed up substantial volumes of LNG, favouring European LNG imports. Most recently, the transit restrictions on the Panama Canal, following droughts that limited water availability, have offset the price premium favouring United States LNG deliveries to Europe over Asia.
- 11 In parallel, renewable power generation has risen in Europe to a record share of 45% of overall electricity output in 2023. And the trend is being maintained across 2024. The rise has been led by wind and solar technologies, offsetting coal and gas fired power generation needs¹¹. Furthermore, around 60% of the volumes in EU underground storages were still available by 1 April 2024, equivalent to circa 60 bcm of natural gas or around 45 million tonnes of LNG. The stocked volume exceeds the annual demand for EU LNG spot imports and contributes to reduce price volatility.
- 12 The average LNG spot price for the first quarter of 2024 in Europe is 26.5 EUR/MWh, less than half of the price recorded when ACER's LNG Price Assessment was launched in mid-January 2023.
- 13 Price spikes witnessed in Europe seem to have reduced the attractiveness of the Dutch Title Transfer Facility (TTF) and other European hubs for indexation with respect to new long-term LNG supply contracts¹². Instead, ACER has observed an increasing preference for crude oil indexation, particularly for contracts signed outside the United States. TTF nevertheless remains the indexation of choice for spot and short-term trades in Europe.

¹¹ See an analysis of the latest developments in EU gas markets, as well as assessment of the significance of gas-fired-generation for EU Electricity markets in the latest [ACER's Key Developments in European Gas and Electricity markets reports](#), jointly published in 20 March 2024.

¹² Henry Hub is the indexation term used in the price formula for more than half of the LNG volumes contracted on long term basis intended for Europe.

Figure iv: Breakdown of price references/indexation for spot & short-term trade in Europe 2023



Source: ACER's LNG Price Assessment.

The current Report recommends

i. More strategic planning concerning the future role of LNG and cross-border flows:

Various new regasification terminals - as well as selected capacity expansion projects in existing ones -, remain in the planning stage. However, in parallel, the EU efforts to reduce gas demand and promote alternative fossil-free supply options pose some risks of very low utilisation factors for existing and newly built LNG facilities in Europe in the coming years. While the reliance on Floating Storage and Regasification Units allows for the potential to repurpose or relocate the floating infrastructure in other markets¹³, the development of additional LNG import capacity should be done under strategic planning and regional coordination to optimize infrastructure utilization.

The increasing reliance on LNG following the massive decrease in Russian gas pipeline supplies continues to reshape gas flows throughout Europe. This is notably seen in the flow reconfigurations occurring across Central and Eastern European countries, which are steadily turning to LNG. However, new charges set on cross-border transportation points are increasing the cost of cross-border LNG imports and pose a risk of gas market fragmentation, reducing the benefits of free trade. Relevant regulatory bodies shall regionally coordinate and assess the suitability of any such measures, and through a joint effort, correct them to enable a smooth source competition in the internal gas market.

ii. Monitoring and better regulation of LNG terminals

The Report highlights how the EU's heightened reliance on LNG will reshape gas flows and amplify the LNG's role in driving overall gas hub price formation. The LNG imports significance is further underscored by the increasing role that LNG will play in meeting the growing flexibility needs within electricity markets.

This new scenario presents a series of challenges that require attention to safeguard the competitiveness and integration levels of the EU's gas market. In particular, while it is acknowledged that the high long-term booking levels at most new LNG terminals have played a crucial role in supporting initial investments and ensured stability in revenue recovery, there is a simultaneous need to prevent excessive market concentration that could undermine healthy competition. This concern is particularly pertinent if the lack of competition expands over several interconnected hubs, where LNG can be purchased or transported. Consequently, continuous monitoring of market competition developments at both terminals and hubs is imperative. If monitoring reveals significant shortcomings in the future, such as constrained flows or unhealthy competition affecting gas price formation, additional policy considerations shall prevent such shortcomings that may lead to the distortion of the market.

¹³ As section 1.2.3 further analyses, all the new LNG projects developed across 2022 and 2023, as immediate reaction to the Russian supply shock, took the form of Floating Regasification Units.

ACER therefore proposes three concrete actions:

- 1 LNG System Operators, supervised by National Regulatory Authorities, shall implement transparent and consistent reporting mechanisms for operational data, which should particularly extend to access tariffs, in order to facilitate the access to terminals.
- 2 National Regulatory Authorities should favour market-based capacity allocation mechanisms, such as auctions, to assign primary capacity when demand exceeds offered capacity. This practice has been established for transmission networks with great success allowing to allocate capacity to those valuing it the most. Moreover, exclusive allocation of the entire capacity in the initial round should be avoided to prevent market foreclosure. Additionally, enabling the utilisation of booked but unutilised capacity in the primary market is key to maximise the usage of the terminal and provide market entry opportunities to other players. Transparency in the secondary capacity allocation needs to be fostered, particularly at those terminals that offer limited or no primary capacity. That proposal goes in hand with the implementation of secondary capacity platforms where any market participant can acquire capacity rights.
- 3 LNG System Operators should strive to enhance the operational flexibility for terminal users to the extent possible within technical boundaries of terminals and connecting transmission grids. This entails reinforcing the possibility to allocate unbundled products - which can incentivize the participation of new market participants, enabling them to engage in LNG trading and to supply gas from terminals without physically downloading the gas – and increasing the flexibility of gas send-out profiles.

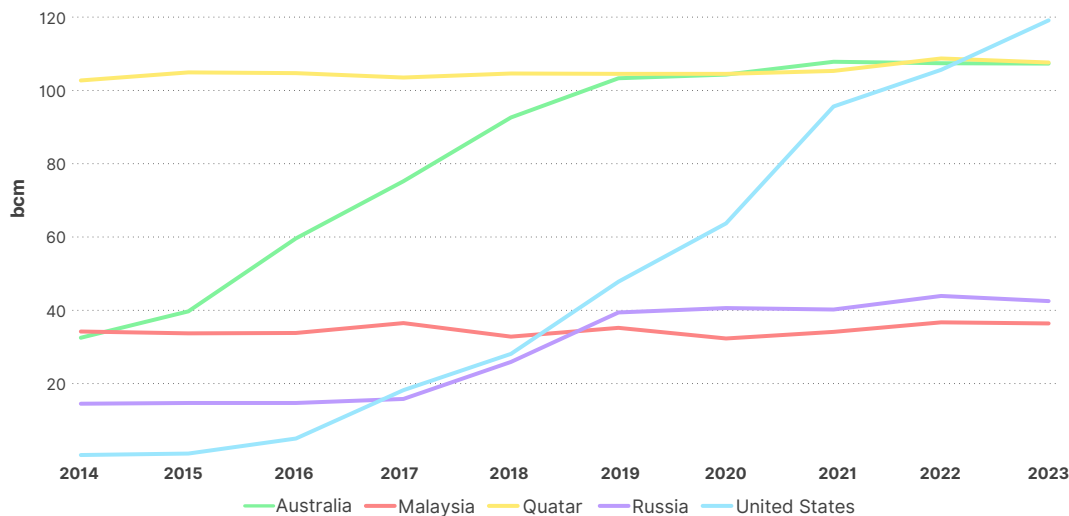
1. Global LNG Market Dynamics

- 1 This first chapter describes the most recent global LNG market dynamics, with a focus on the evolution of production and demand. Its aim is to offer a broad overview to enhance understanding of how global LNG developments impact the European gas market.

1.1. LNG production

- 2 In 2023, global LNG production reached approximately 409 million metric tonnes (or 557 bcm¹⁴), representing 15% of total global natural gas production. Global LNG production is widely distributed across the Atlantic and Pacific basins: US is the largest producer in the Atlantic basin, followed by Russia and some countries in South America and West Africa. LNG production in the Pacific basin is jointly led by Qatar and Australia, followed far behind by Malaysia.
- 3 As Figure 1 shows, the US has become the largest global LNG producer following a substantial surge in production across recent years (i.e., the country's production has more than doubled since 2018, whilst it grew by 13% in 2023 relative to 2022). US LNG production, which is mainly exported to Europe and progressively more to Asia, accounted for 86 million tonnes, or 21% of global LNG production. Australia and Qatar follow the US, both maintaining relatively stable production levels in last years, at around 80 million tonnes each. Russia, with 31 million tonnes, and Malaysia, with 27 million tonnes, round out the top five LNG producers. Notably, these five countries account for 75% of global LNG production, among the 20 countries involved in global LNG production.

Figure 1: Top 5 largest LNG producers (bcm) - 2014 - 2023

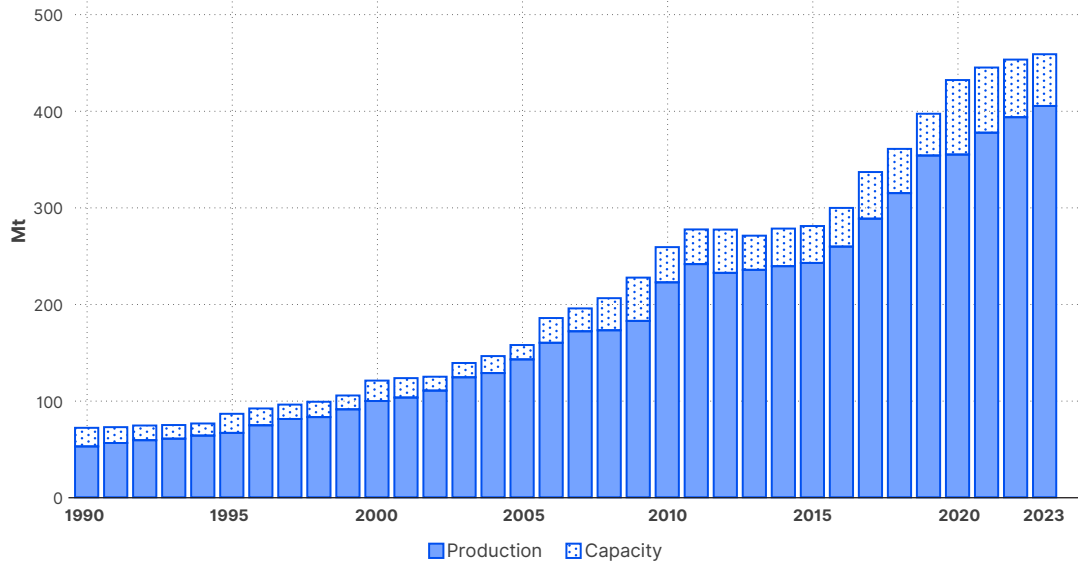


Source: ACER based on data from ICIS LNG Edge.

- 4 In 2023, global LNG production rose by 3% year on-year. Improved availability of production capacity across several existing facilities and the addition of 10 million tonnes of production capacity starting commercial operations (an annual increase of 2.4%) backed the rise. LNG global production has grown by 70% over the last decade. The expansion can be attributed to a confluence of factors. The main drivers relate to the steady growth of global energy demand and, more specifically, to the rise in demand for natural gas, which allows to meet the higher energy needs of many nations and replacing coal with gas, a cleaner alternative to coal. Additionally, the growth in LNG production has been backed by technological advancements in production and transport, importantly by the development of more flexible and interconnected global supply chains, backed by improved market liberalisation, and enhanced trade dynamics.

14 Across this report the conversion factor used between Million tonnes of LNG (the standard and most commonly used unit to measure LNG production) and bcm (standard unit used in European natural gas markets) is 1.36 bcm per million tonnes.

Figure 2: Historical evolution of LNG production and nameplate capacity (Mt) - 1990 - 2023

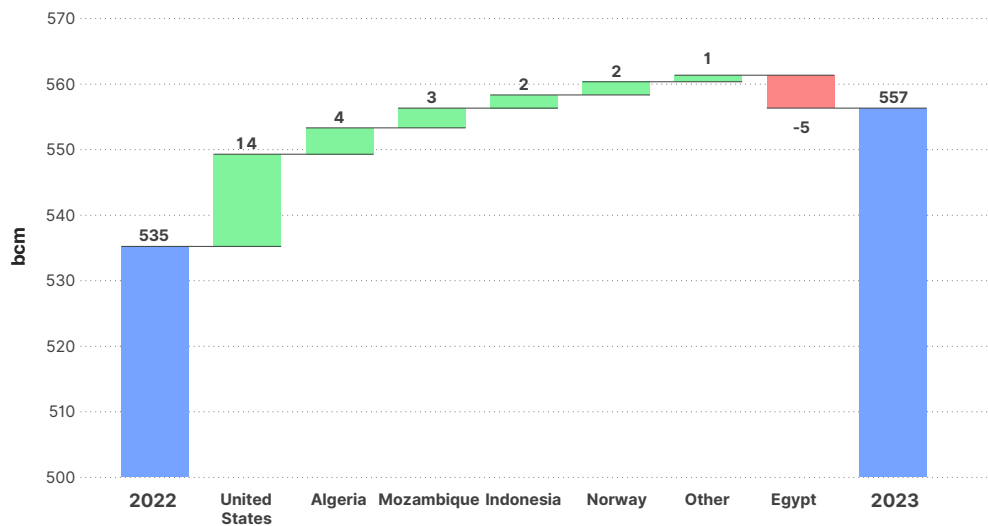


Source: ACER based on data from ICIS LNG Edge and Platts.

A focus on 2023: United States cement its position as leading global LNG producer

5 Figure 3 offers an overview of the relative changes in global LNG production throughout the year 2023. The main change across the period relate to the incremental production achieved by the United States. The increased US LNG output was mainly driven by the rum-up in the Calcasieu Pass project, which contributed to additional 3 million tonnes compared to 2022. Furthermore, the increased availability of Freeport LNG facility, after an extensive maintenance in the period from June 2022 to February 2023, contributed to this gain in production and resulted in 6 million tonnes in 2023 additional to what was available in 2022.

Figure 3: Global LNG production variations in 2023 compared to 2022 (bcm)



Source: ACER based on data from ICIS LNG Edge.

6 Other notable LNG production increases, albeit to a lesser extent, occurred in Algeria, Mozambique, Norway, and Indonesia. Mozambique achieved a total production of 2.4 million tonnes during 2023, after the successful ramp-up of the Coral South project, which started exporting initial cargoes in December 2022. In the case of Norway and Algeria, the rise in LNG production was the result of improved gas availability conditions, together with the high price incentive to monetise any additional production. Conversely, the most substantial decline in production was observed in Egypt, attributed to deteriorating conditions for feedgas availability due to the ongoing military and political conflict of Israel against Hamas in the Gaza Strip.

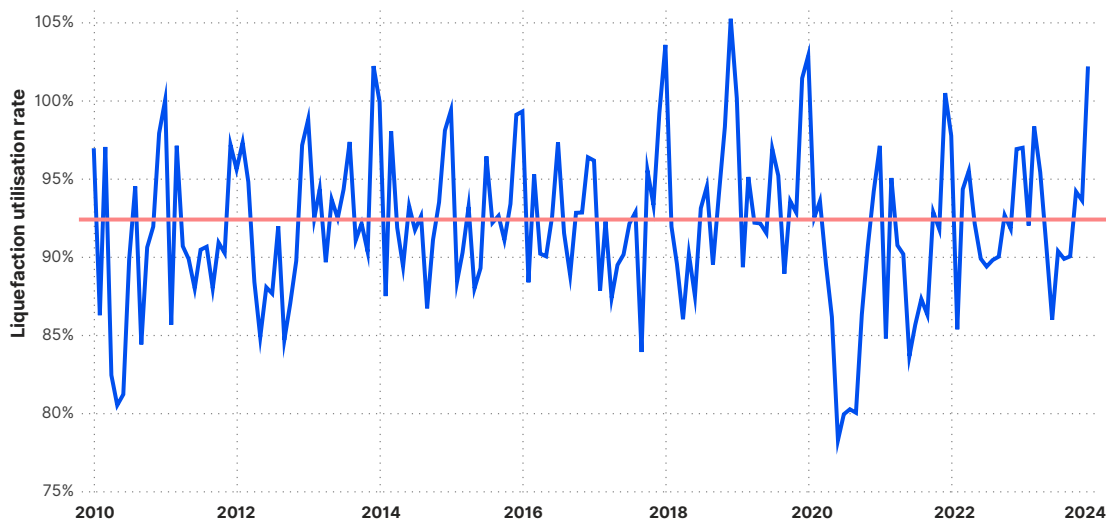
7 Notably, additional LNG liquefaction capacity of 10 million tonnes was added in 2023, representing an annual increase of 2.4%. Apart from the newly deployed 3.4 million tonnes capacity in Mozambique,

other significant addition came from Tangguh Train 3 in Indonesia, contributing an additional 3.8 million tonnes.

Production outages and other factors for unavailability

- 8 Outages at LNG production terminals can occur due to various reasons, resulting in lower production. The most common causes for outages relate to planned maintenance¹⁵, but they can also include technical failures, feedstock gas shortages, security issues and extreme weather events. Figure 4 offers an overview of the average utilisation of liquefaction production in recent years. The average utilisation factor reaches 92.5%. It is noticeable that utilisation rates can exceed 100%, as the design nameplate capacity can be surpassed under low temperature environments, resulting in higher efficiencies than running under standard conditions. The improved utilisation ratio in 2023 relative to 2022 is attributed among others to increase availability in the US Freeport liquefaction project, but also to some improvements in the availability of production facilities in Algeria, Nigeria, Malaysia and Australia, which were affected by upstream shortages in 2022.

Figure 4: Global LNG export infrastructure utilisation (%) - 2010 - 2023



Source: ACER based on data from Platts.

Expansion of LNG production infrastructure

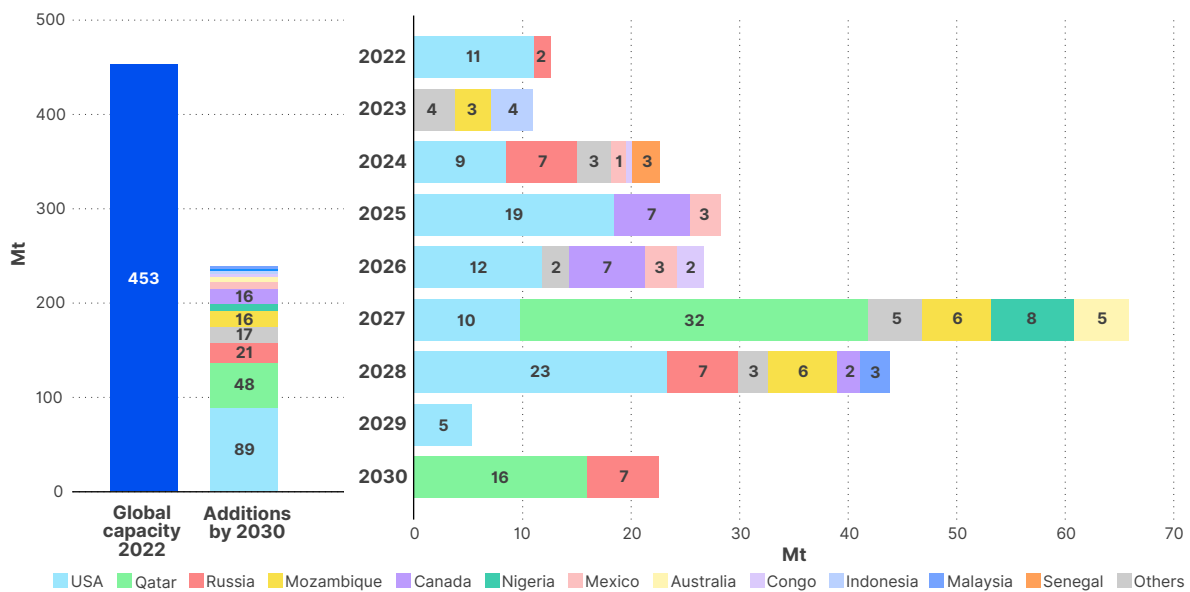
- 9 LNG production capacity is expected to grow significantly along this decade underpinning the increasing role of LNG in the global gas trade. Most substantial increments in production are expected across 2026 and 2027. The implications that the development of this additional production capacity might have in the LNG contractual arrangements will be addressed across Chapter 2.
- 10 The rise in global LNG production will primarily stem from new liquefaction plants being developed in the United States and Qatar, whilst Russia could also partly contribute to this rise, as shown in [Figure 5](#).

In January 2024, the United States' government announced a temporary pause on the pending approvals for LNG exports to countries without a free trade agreement (non-FTA). The approvals will need to be reviewed and ultimately decided by the U.S. Department of Energy (DOE), after conducting additional studies that shall include a climate impact assessment.

The suspension does not affect any ongoing construction project. However, several US liquefaction projects will be impacted by this decision. Namely, those projects currently in pre-FID phase, despite the financial backing from long-term agreements signed with off-takers. As long as they don't receive DOE's authorization to export to non-FTA countries, they will be suspended. Those projects include CP2 LNG, Lake Charles, Port Arthur Phase 2, Commonwealth LNG, and Corpus Christi Trains 8-9, totalling more than 57 Mt or 77 bcm.

¹⁵ The average downtime for a liquefaction plant attributed to planned maintenance is estimated at around 5%, equivalent to approximately 20 days per year. Maintenance is typically scheduled during the shoulder season. Routine light maintenance is conducted over a 10-day period annually, while major maintenance occurs every two or three years, with potential durations extending up to one month.

Figure 5: New capacity developments in global LNG liquefaction (Mt) - 2022 - 2030



Source: ACER estimations based on data from Platts.

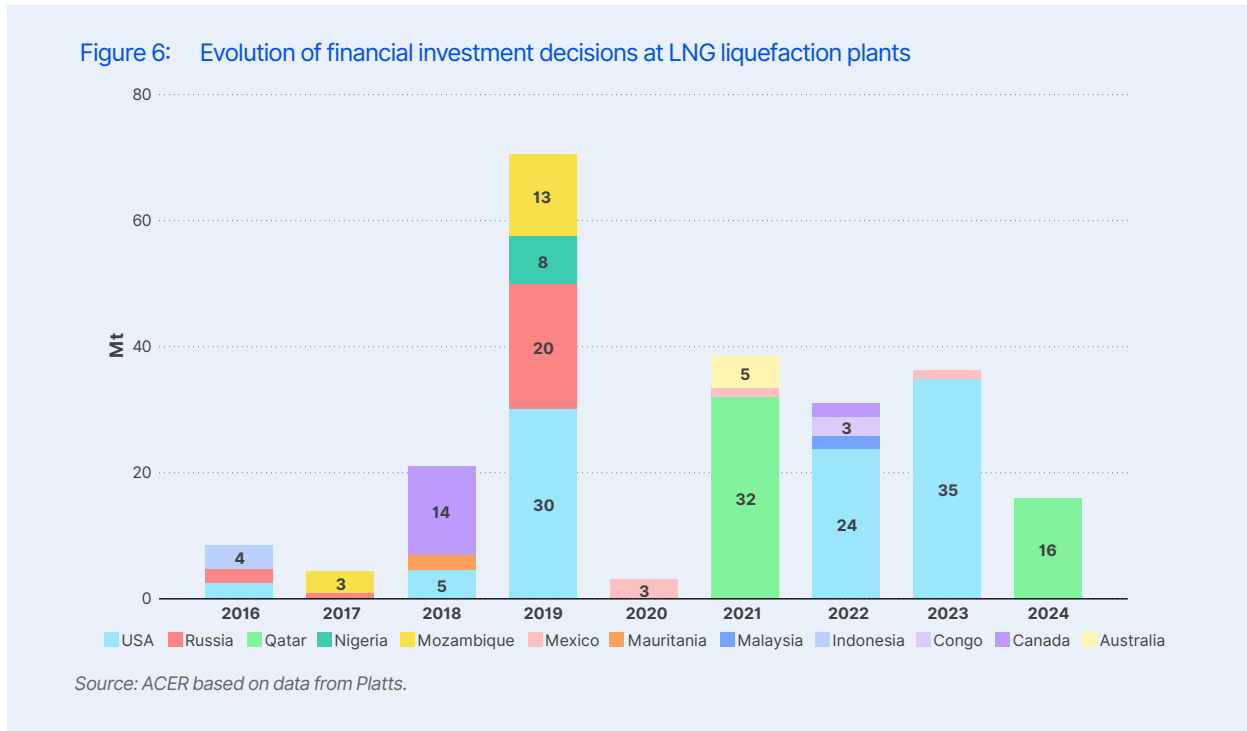
- 11 By March 2024, 17 liquefaction projects were reported in different stages of construction worldwide (the list of projects is made available in [Table 1](#), in Annex 1). They collectively are projected to increase global LNG production capacity by up to 173 million tonnes by the end of the decade. Should all these new projects materialise, additional 200 million tonnes of LNG production capacity would have been incorporated since the Russian invasion of Ukraine in February 2022 and until 2030. Such a potential surge in production capacity would account close to half of the presently traded global LNG volumes.
- 12 Many of the decisions backing the investments in new projects were taken several years ago. Yet some others have been triggered by more recent gas market developments, including Europe’s urgent need to diversify supply away from Russia.
- 13 Focusing on 2024, and in the absence of significant delays, production is anticipated to increase by 20 million tonnes. The anticipated new capacities scheduled for commissioning across 2024 include Golden Pass Train 1 and the ramp-up of Calcasius Pass in the US, Fast Altamira LNG in Mexico, Greater Tortue FLNG in Senegal, FLNG in Congo, and Terminal 1 of Arctic LNG2 in Russia. The Russian project encounters significant challenges though, as critical equipment remains unavailable due to international sanctions, which may impact to increase its liquefaction output. On the downside, Australia faces potential capacity reductions as Darwin closes, and Northwest Shelf prepares to close a train.

Financial investment decisions in the cyclical LNG industry

Investment in LNG production capacity is commonly considered as cyclical, reflecting several factors, and adapting to the specific lead times inherent to the LNG industry dynamics. The construction of liquefaction plants tends to take multiple years (typically from 4 to 6 years after FID) and involves different phases from project planning, permitting, securing financial resources, actual construction, and commissioning. Lengthy timelines tend to expose investment decisions to shifting gas demand and supply fundamentals, and overall shifting economic cycles. Consequently, the signing of long-term contracts between LNG project promoters and LNG offtakers is tied to the final investment decisions of the plants.

In most cases, the financing of the liquefaction projects is contingent upon securing long-term sales of around 90% of the total production capacity. Moreover, LNG Sale and Purchase Agreements (SPAs) are requested to be signed with creditworthy off-takers, which provides financial stability to project promoters and lenders. Flexibility in long-term contracts serves LNG offtakers to mitigate demand and price risks consequence of the evolving gas market dynamics. Adjustments in volume and price or even the possibility to resell or divert cargoes are provisions of particular interest for LNG offtakers of long-term contracts as it will be discussed in Chapter 2.

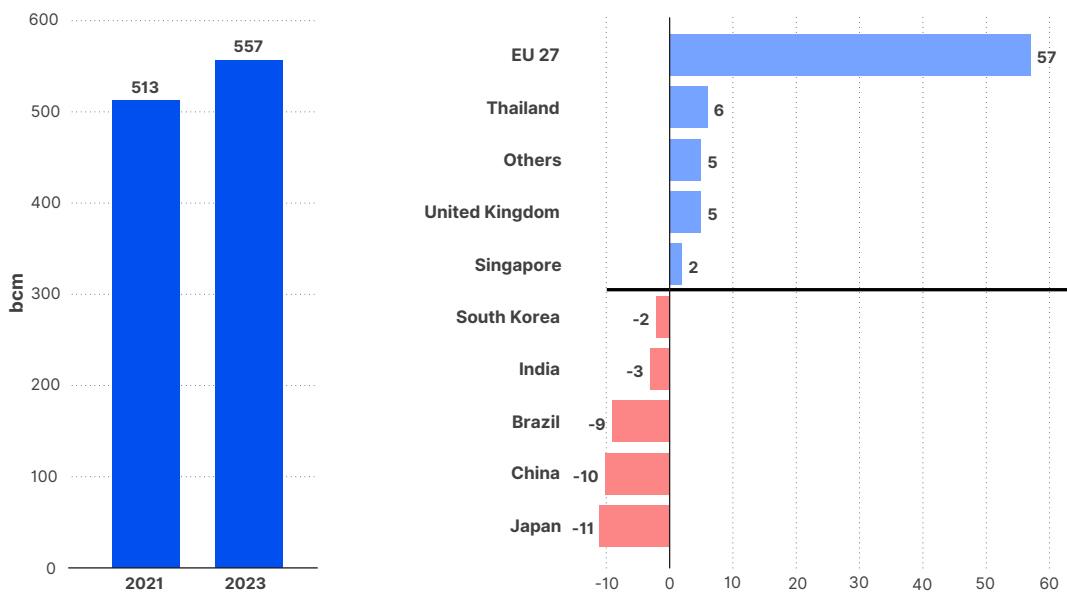
Figure 6: Evolution of financial investment decisions at LNG liquefaction plants



1.2. LNG demand

- 14 On the demand front, global LNG consumption increased by more than 40 bcm since the Russian invasion of Ukraine reaching 557 billion cubic meters in 2023, with Europe being the largest source of incremental demand (57 bcm) compared to 2021, accounting for more than a quarter of the total LNG trade.
- 15 The mild temperatures in the Northern Hemisphere have overall reduced natural gas demand across the last winter. Other events such as the slow recovery of the Chinese economy after a strict zero-Covid policy and the restart of nuclear power reactors in Japan have helped to freed up substantial volumes of LNG favouring European LNG imports during 2022 and 2023.

Figure 7: Global LNG production in 2023 vs 2021 (left) and LNG demand variation between 2021 and 2023 (right) - bcm

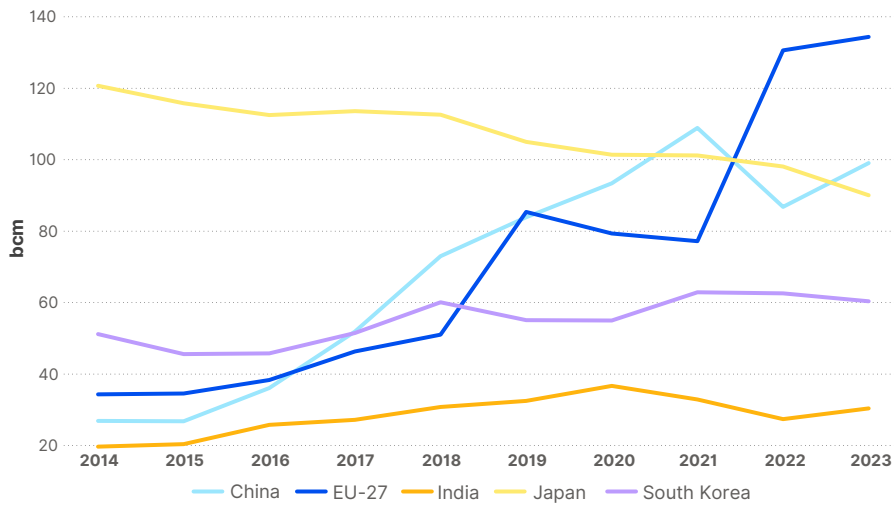


Source: ACER based on data from ICIS LNG Edge.

- 16 In 2023, EU LNG imports increased mostly in Germany, as the country started to directly import liquefied gas via its newly commissioned LNG import terminals. Other international markets where LNG imports rose include China, Thailand, and India, backed by an increasing economic activity, but also by lower hydro-power generation availability. Conversely, South Korea and Japan experienced relative declines

in their annual LNG imports, associated with lower demand and higher nuclear output respectively, see Figure 8 below.

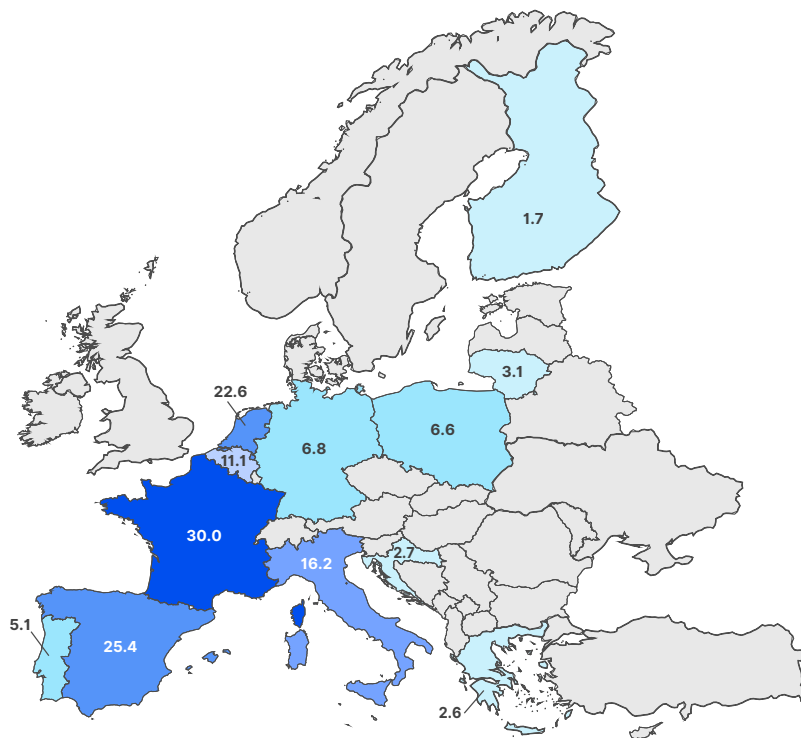
Figure 8: Top 5 largest LNG importers (bcm) - 2014 - 2023



Source: ACER based on data from ICIS LNG Edge.

17 European LNG imports, including the EU and also the United Kingdom, were relatively flat throughout 2023 relative to 2022, reaching 158 bcm as Figure 9 shows. In 2022, the dramatic drop in Russian pipeline flows to the EU prompted an urgent and vast increase in European LNG imports. These imports aimed also at refilling underground storage stocks ahead of winter that were below average filling levels. In 2022 the EU almost doubled its LNG imports year-on-year supported by the high prices offered at European gas hubs¹⁶.

Figure 9: EU LNG imports by country in 2023 (bcm)



Source: ACER based on data from ICIS LNG Edge.

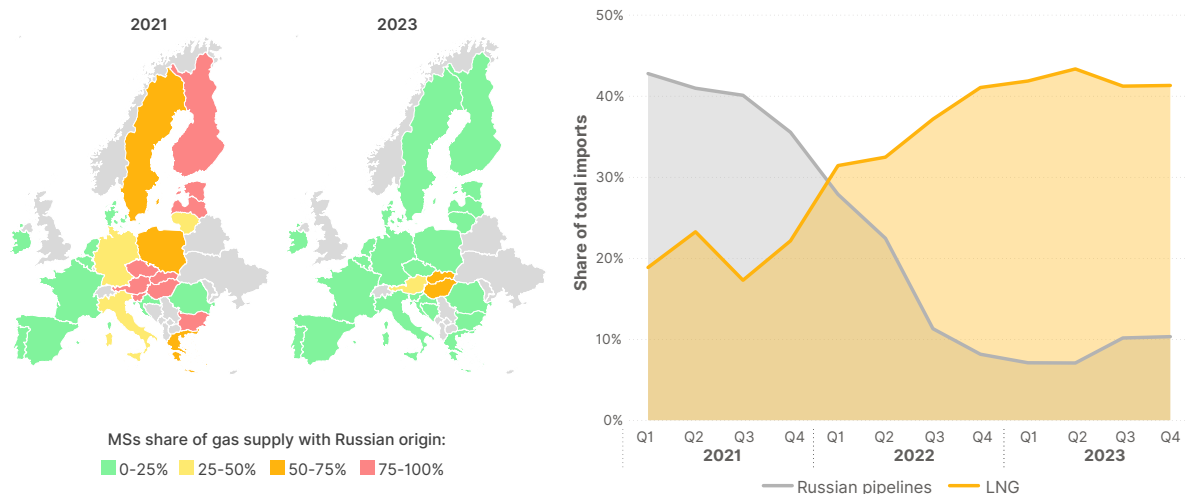
Note: LNG imports volume corresponds to 134 bcm of gross imports. After deducting re-exported volumes, EU27 net LNG imports accounted for 132 bcm.

16 See an assessment of how this higher LNG imports contributed to move EU gas prices up in ACER’s European gas market trends and price drivers [2023 Market Monitoring Report](#), issued in October 2023.

1.2.1. The role of LNG in meeting EU natural gas demand

- 18 EU Member States imported 134 bcm of LNG in 2023. The figure represents 42% of the European Union's total gas imports. France has become the largest EU LNG importer with 30 bcm in 2023, surpassing Spain (25 bcm in 2023). The Netherlands, Italy and Belgium follow, as the third, fourth and fifth largest LNG importing countries in the EU. The share of LNG in gas consumption differs within each market. For instance, the French or Dutch LNG imports play a key role in facilitating exports to neighbouring countries in the North-West and Central European region.
- 19 Figure 10, on the right, illustrates that the percentage of LNG supply relative to total EU gas imports surpassed 40% in 2023, doubling its share in 2021. The major rise in LNG imports enabled a substantial reduction of supply dependency from Russian pipeline flows in most EU Member State, notwithstanding that gas markets remained tight while this structural change has occurred. The information related to this is highlighted in Figure 10 on the right.

Figure 10: Estimated share of gas supply with Russian pipeline origin per Member State 2021 vs 2023 (left) and share of EU gas imports with LNG and Russian pipeline imports - 2021 – 2023 (right)



Source: ACER estimations based on data from ENTSOG TP, Eurostat, Platts and Bruegel.

- 20 The increasing EU reliance on LNG coincides with a diminishing role of EU's domestic production. In 2023, the sum of natural gas imports accounted for 85% of EU gas supplies, while Member States indigenous production covered the remaining 15%¹⁷. Romania, Denmark, the Netherlands, Germany stand out as the largest EU conventional gas producers. However, the declining production and the closure of the Dutch Groningen field¹⁸, together with the UK production not being accounted as part of EU production, has reduced EU's domestic gas production significantly. Domestic biogas and biomethane production is expected to rise, partly compensating the steady drop in conventional gas production. In this context, EU's production of biogas and biomethane has doubled in the last 10 years and accounted for approximately 19 bcm, or circa 6% of final EU gas consumption, in 2022. REPowerEU Plan calls to produce a combined volume of 35 bcm by 2030, almost doubling present figures.
- 21 In turn, non-Russian gas pipeline sources delivered 161 bcm in 2023. Norway was the largest supplier, accounting for 107 bcm, followed by Algeria (44 bcm) and Azerbaijan (10 bcm), as [Figure 11](#) illustrates. However, pipeline supply has overall restricted upside potential, what will make LNG imports increasingly relevant for Europe at least during this decade. Norwegian flows are expected to slowly decline, stabilising at 90 bcm in 2030¹⁹. Azeri supply could further grow, under long-term commitments²⁰.

¹⁷ EU domestic production reached 48 bcm in 2023, following a 5% year on year drop. For reference, EU-28 domestic production covered for 125 bcm or circa 30% of total EU gas supply in 2015.

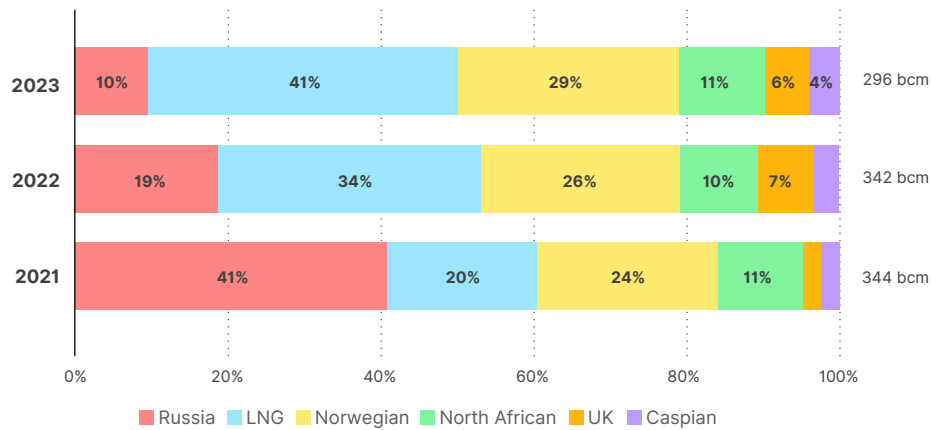
¹⁸ In October 2023 the field stopped its regular production and will from now only produce under exceptional circumstances. Groningen was the largest field in Continental Europe, producing 54 bcm in 2013. In 2022/2023 it still produced 2.4 bcm to alleviate the impact of the Russian supply disruption. Groningen reserves are estimated in 480 bcm.

¹⁹ See for example this [OIES report](#) Norwegian Gas Exports – Assessment of Resources and Supply to 2035.

²⁰ A number of projects and underlying contracts are under consideration with the aim to expand the flows to 20 bcm by the end of the decade. But the feasibility of those projects, and importantly the long-term buyer commitment are still unclear, as discussed for example [in this report](#).

Additional pipeline imports from Algeria will be subject to develop new gas fields in the Berkine South basin, although current prospects remain relatively modest²¹. Finally, gas pipeline imports from the United Kingdom – mainly consisting of LNG unloaded at UK terminals and exported to the EU across the IUK and BBL pipeline interconnectors – is expected to decline from their 2022 highs, due to narrowing price spreads between British NBP hub and Continental hubs and increased EU LNG import capacity.

Figure 11: Evolution of gas deliveries into the EU by supply route (bcm) - 2021 - 2023



Source: ACER based on data from ENTSOG TP.

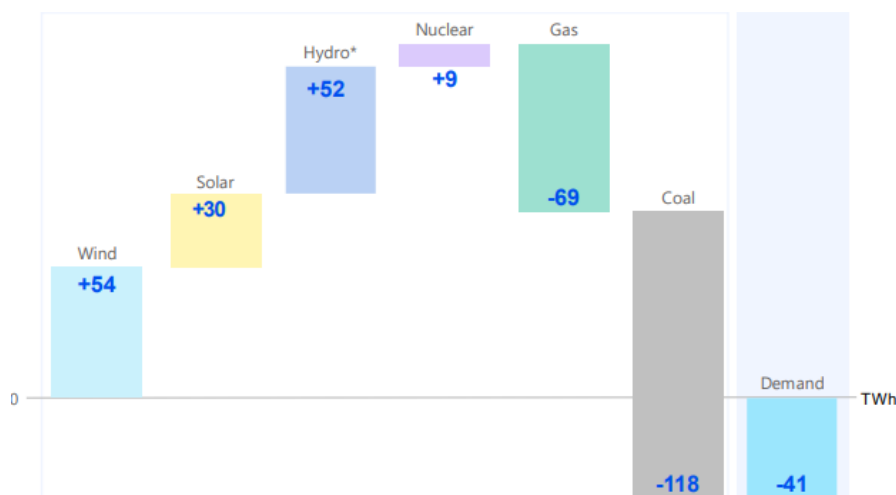
1.2.2. European LNG demand drivers and outlook

- 22 The evolution of LNG demand in Europe needs to be contextualised within the overall natural gas developments in the Continent. The EU LNG imports have risen consistently in past years as a mean to diversify energy supply away from Russia. In the same context demand declined driven by the high price environment triggered by the crisis. Notwithstanding the crisis, the gas consumption trajectory in the EU will have a downward trend due to electrification and decarbonisation.
- 23 EU gas demand experienced a considerable decrease of over 50 billion cubic meters in 2022, representing a 14% year-on-year drop. The 2022 gas demand reduction resulted from a strategic response aimed at mitigating the impacts of the curtailment of Russian pipeline gas supplies, as well as it was prompted by the historical high prices that reduced industrial and household consumption. In 2023, EU gas demand has further declined by an additional 8%, or 30 bcm compared to 2022.
- 24 The largest relative reduction was observed in the power generation sector, which experienced a reduction in gas consumption of 18%, equivalent to 16 billion cubic meters. The decline in gas-fired power production was primarily driven by an increase in wind and solar generation (a 15% year on year rise, or 84 extra TWh), higher hydro generation (13% increase or additional 52 TWh), the augmented EU nuclear output (2% or 9 TWh) chiefly due to enhanced availability in the French nuclear fleet, and an overall decrease in electricity demand (of 3.2% or -82 TWh)²².

²¹ See for example [Montel article](#) referencing potential production rises of up to 15%, that could result in corresponding rising exports to EU Member States.

²² See expanded considerations in ACER Key developments in EU electricity wholesale markets 2024 MMR.

Figure 12: Electricity generation in 2023: Renewables (wind, solar and hydro) replace gas and coal generation.



Source: ACER Key developments in EU electricity wholesale markets 2024 MMR.

Note: Year-on-year change for the main generation technologies in the EU-27/EEA (Norway, Switzerland), 2023 (TWh). Hydro does not include hydro-pumped storage. Hydro-pumped storage, biomass and other generation sources were accounted for separately, with other generation sources for which the aggregated variation in generation for 2023 was zero.

- 25 In the EU industrial sector, gas demand registered a steep relative decline in the first part of 2023, continuing the drops witnessed in 2022 when industrial energy consumption was heavily affected by the historical high prices. However, industrial gas consumption moderately recovered in second half of 2023, amid lessening energy prices and overall improving economic activity.
- 26 Residential and commercial gas demand dropped in 2023 by a 4% or 10 bcm year on year. The consolidation of energy efficiency behaviours in response to the high prices, together with the energy saving measures promoted by Member States, and the more benign winter conditions backed that trend. Moreover, the increasing number of installed heat pumps electrifies heating demand at the expense of natural gas.

Role of LNG in Europe by 2030

- 27 The projected European gas demand is subject to different scenarios, contingent upon the electrification ambitions of the EU energy system, achievements in energy efficiency, energy pricing dynamics, gas consumption reduction measures²³ and the pace of transition to decarbonized technologies. For example, it is expected that heat pumps deployment aligned with the modernisation and isolation of buildings will reduce continuously natural gas demand in space heating. Faster roll-out of renewable power generation technologies, mainly wind and solar, should also reduce natural gas consumption in gas-fired power plants.
- 28 This report factors in the European Commission's Fit for 55 and the even more ambitious REPowerEU demand scenarios as referential benchmarks to project EU gas demand. On that basis, a number of analyses related to EU's LNG import needs are carried out. The case box below first summarises the key considerations of Fit for 55 and REPowerEU demand projections.

23 The European council formally adopted in March 2024 the recommendation that encourages member states to continue reducing their gas consumption until 31 March 2025, by at least 15% compared to their average gas consumption in the period from 1 April 2017 to 31 March 2022. This recommendation will help Member states to take adequate supply security measures until the transposition of the directives on energy efficiency and renewables in 2025.

REPowerEU and Fit for 55 demand scenarios

The REPowerEU²⁴ gas demand scenario, released in May 2022, foresees higher gas demand reduction targets than the ones proposed by the Fit for 55 legislative package, published as draft proposal in 2019 and adopted in 2023. Fit for 55 has the overarching goal of achieving a reduction of at least 55% in net greenhouse gas emissions by 2030. To that end, it targeted to decrease EU gas demand by 30% in 2030 relative to 2019 levels.

REPowerEU promotes higher demand reduction targets. Its full implementation would lead to an additional demand reduction of around 100 bcm of gas by 2030 relative to the targets established by Fit for 55. This additional reduction enacts additional measures of demand reduction as the table below shows.

RePower EU Plan	Equivalent gas savings (Additional to FitFor 55)
Residential sector: energy efficiency and heat pumps	37 bcm
Industry: energy efficiency and electrification	12 bcm
Renewable Hydrogen 20 Mt	25 - 50 bcm
Solar & Wind	21 bcm
Biomethane	17 bcm

The achievement of these ambitious targets relies on a large development of renewable energy and enhancement of energy efficiency. However, the complete attainment of REPowerEU demand goals remains uncertain, particularly concerning ambitious endeavours like green hydrogen production, which may prove challenging in light of current achievements. For example, REPowerEU envisages 20 million tons of renewable hydrogen production by 2030. Out of which, 10 Mt meant to be produced in the EU, 6 Mt imported from third countries and 4 Mt in the form of ammonia or in other subdued chemical substances. The scenario considers that the capacity for transporting hydrogen into Europe is already established by 2030. On biomethane, the REPowerEU target is set at 35 bcm by 2030 increasing by 20 bcm the target established in FitFor 55. On the other hand, in 2022 alone, demand notably experienced a drop of 50 bcm amid price increase affecting the industrial and household consumption. Most of that drop has been structurally maintained²⁵.

Finally, both REPowerEU and Fit-for-55 demand reduction targets rely heavily on a quick and ambitious deployment of fossil-free technologies. However, various bottlenecks may put this deployment and the energy security objectives at risk, such as the dependence on rare earths, supply chain constraints, skilled labour shortages, tailoring complex value chains and financing. A number of sources monitor the progress made towards achieving REPowerEU objectives to date, revealing delays²⁶.

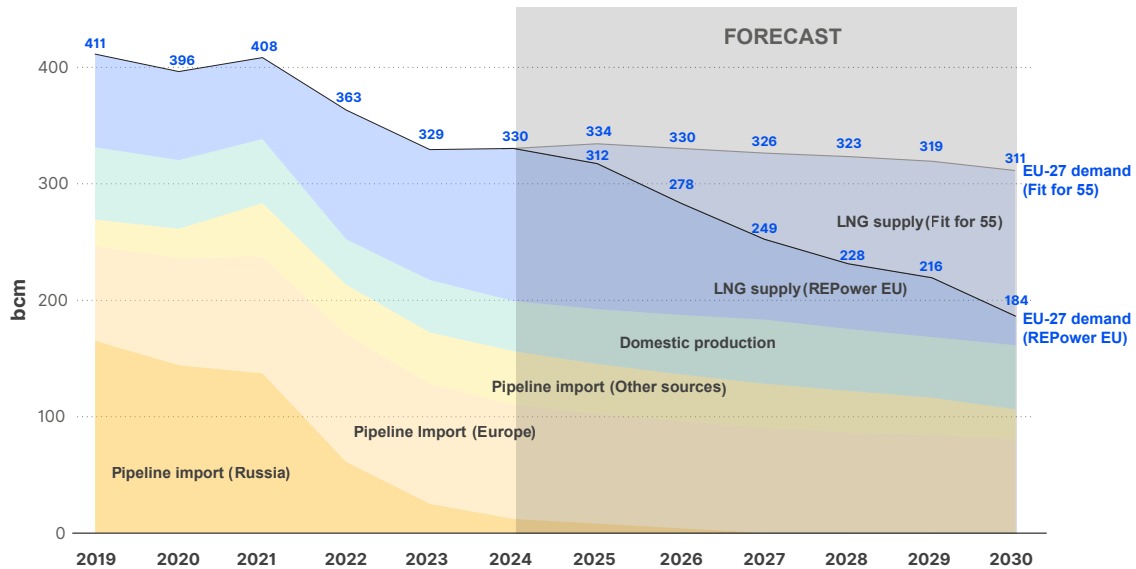
- 29 Building on the Fit for 55 and REPowerEU demand projections up to 2030, [Figure 13](#) estimates the future EU LNG import needs to cover for the share of EU gas demand unmet by pipeline imports, domestic production and biomethane production. This theoretical exercise factors in a relatively stable evolution of pipeline imports (except from Russia), attributing to LNG to offer flexible gas supply that meets the variable EU gas demand.

24 See [REPowerEU](#): affordable, secure and sustainable energy for Europe issued on 18 May 2022.

25 As a key target, REPowerEU ambitioned to drastically reduce supply dependency on Russian by means of increasing EU LNG imports by 50 bcm in 2022 and increasing 10 bcm of non-Russian pipeline gas imports. Both objectives have been also met.

26 See Columbia Center on Global policy Energy [REPowerEU tracker](#).

Figure 13: EU gas supply and demand outlook and assessed LNG supply needs relative to Fit For 55 and REPowerEU scenarios by 2030 (bcm)

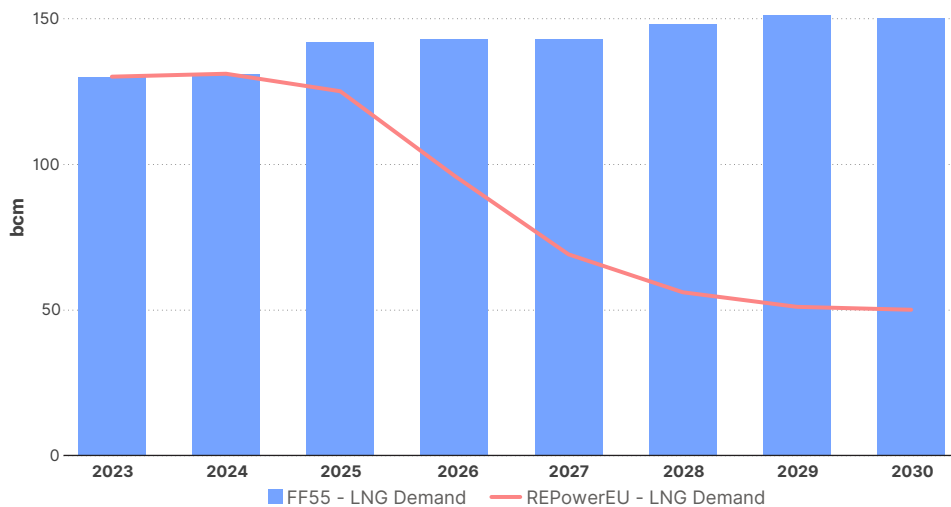


Source: ACER based on data from ICIS, Platts, and REPowerEU.

Note: The demand evolution from 2024 to 2030 reflects a linear decrease in alignment with the target set for 2030. The potential gas demand reduction described in REPowerEU linked to the 20 Mt goal for green hydrogen by 2030 is not factored in the assessed scenario.

- 30 As illustrated by Figure 13, LNG supply is expected to provide most of the flexibility to accommodate to the overall gas demand and supply balance. This will occur while the EU further diversifies its supply options away from Russia with LNG playing a pivotal role in this transition. However, ultimately EU gas demand is expected to gradually decrease and consumption to decarbonise prompting EU LNG supplies to decrease.
- 31 The projected supply-gap left for LNG imports to meet EU gas demand by 2030 ranges from 50 bcm in the REPowerEU scenario to 150 bcm in FitFor 55 scenario (with probably, the most likely referential scenario being close to the range middle point) as zoomed in [Figure 14](#). This wide range underscores the necessity of ensuring flexibility in LNG contractual arrangements, to effectively accommodate the decreasing yet uncertain trajectory of EU demand. Generally, there are trade-offs to be considered between securing sufficient LNG volumes by means of expanding or signing new long-term contracts, or alternatively increasing the reliance on more flexible, but arguably less assured or costlier, spot and short-term volumes. Indeed, long-term contracts have proven effective in underpinning security of supply and – depending on the evolution of the indexation terms – certain price stability. However, it's also crucial to ensure sufficient flexibility in these same contracts to manage a potential over-contracted position. Long-term supply contracts are also essential to underwrite investments in LNG production infrastructure and are also aligned with the practice of booking long-term capacity at regasification plants.

Figure 14: Estimated LNG needs under Fit For 55 and REPower EU scenarios (bcm) - 2023-2030



Source: ACER based on data from Platts and REPowerEU.

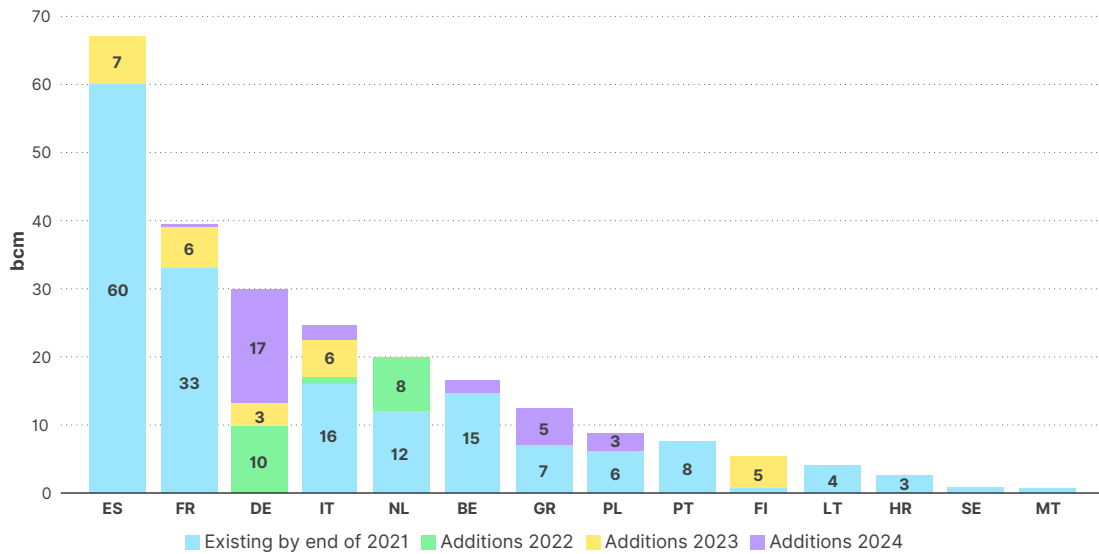
- 32 Overall, modelling the role that LNG can play in meeting the future EU gas demand is subject to many assumptions and requires consideration of different aspects. Those include price evolution, global competition for LNG resources, the evolution of EU's legacy supply contracts and the availability of other supply options from pipeline suppliers.

1.2.3. LNG Infrastructure developments in Europe

- 33 A crucial factor in adapting to the LNG supply and demand developments within the EU will be the availability of import capacity. The shock and the drastic change in flows in 2022 faced a highly congested and insufficiently developed LNG infrastructure in most parts of Europe. However, since then, the gradual expansion of EU LNG infrastructure capacity - articulated around constructing additional LNG terminals, expanding the existing capacities, but also in trying to maximise the number of allocated slots - proved pivotal in attracting higher volumes of LNG. This gradual expansion has helped alleviate supply congestion over time and led to a reduction in prices from the peak levels observed in the summer of 2022.
- 34 ACER's 2023 European gas market trends MMR Report and the latest CEER's LNG study on accessing conditions to LNG terminals²⁷ have both analysed the technical features of the new LNG infrastructure. Around 75% of the new regasification capacity developed since the beginning of 2022, as reaction to the Russian supply shock, took the form of Floating Storage and Regasification Units (FSRUs). Complementarily, the capacity expansion of the existing terminals accounted for 25% of the capacity added.
- 35 FSRUs present advantages relative to land-based regasification plants, related to faster planning, construction, and deployment processes, whereas they have the significant added benefit of flexible redeployment, as they usually are subject to renting arrangements and/or can be repurposed as regular carriers for the shipment of gas. Moreover, FSRUs reduce the constraints of land space availability and have overall lower investment cost (although higher operational ones), whilst conversely represent projects of lower scale restricted by the size of the vessels. In parallel, a number of more structural on-shore projects are intended to become permanent in the years to come. [Figure 15](#) summarises the recently concluded and planned developments. The technical features of the individual plants are more thoroughly analysed in the two reports and in [Table 2](#) at Annex 1.
- 36 As shown in [Figure 15](#), around 50 bcm of LNG regasification capacity were added in the EU since 2022. Further regasification capacity expected to come online by the end of 2024 will result in a total EU's LNG regasification capacity of around 235 bcm, able to meet over 55% of the European annual gas demand based on the gas consumption average of the last 5 years. Additional projects, still in the planning phase, could bring to the EU LNG an aggregate import capacity above 260 bcm by 2025.

²⁷ See ACER report section 2.6 (linked in footnote 10) and [CEER's report](#) the influence of new LNG terminals on the future EU energy market of February 2024, respectively.

Figure 15: Overview of existing EU LNG capacity per Member State and yearly additions by 2024 (bcm)

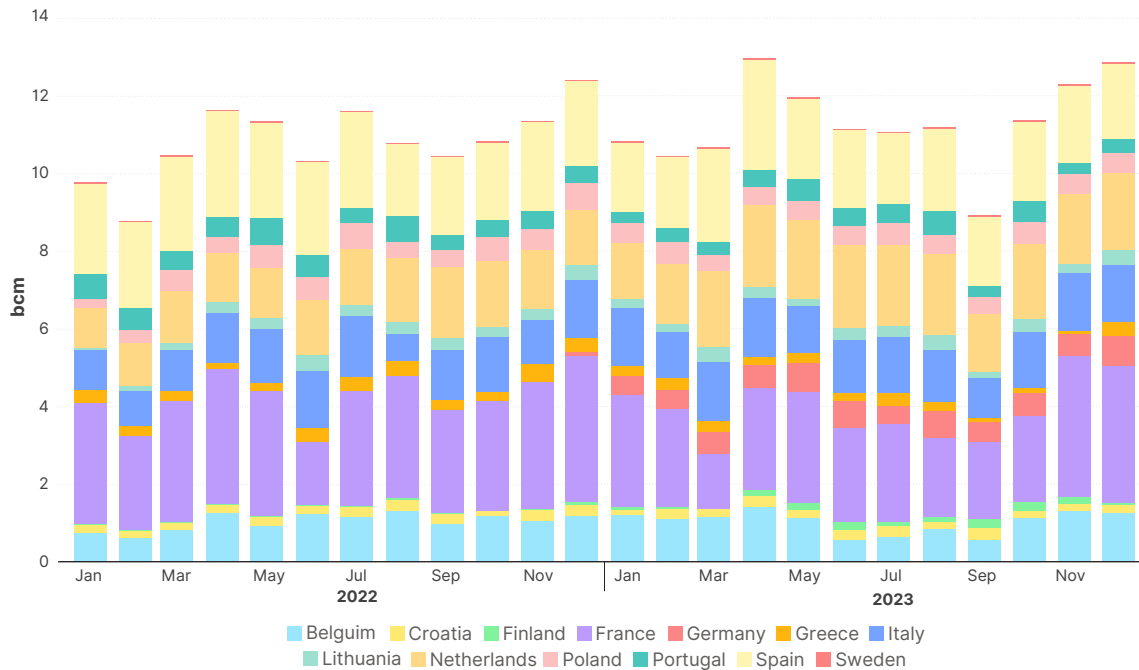


Source: ACER based on data from GIIIGNL 2023 annual report and ICIS LNG Edge.

Note: Capacity additions in 2023 for Spain correspond to El Musel LNG terminal. The terminal was already built but was mothballed and had not started commercial operations.

1.2.4. EU LNG terminals' utilisation

Figure 16: Monthly evolution of EU LNG send-out by Member State (bcm/month) – January 2022 – December 2023



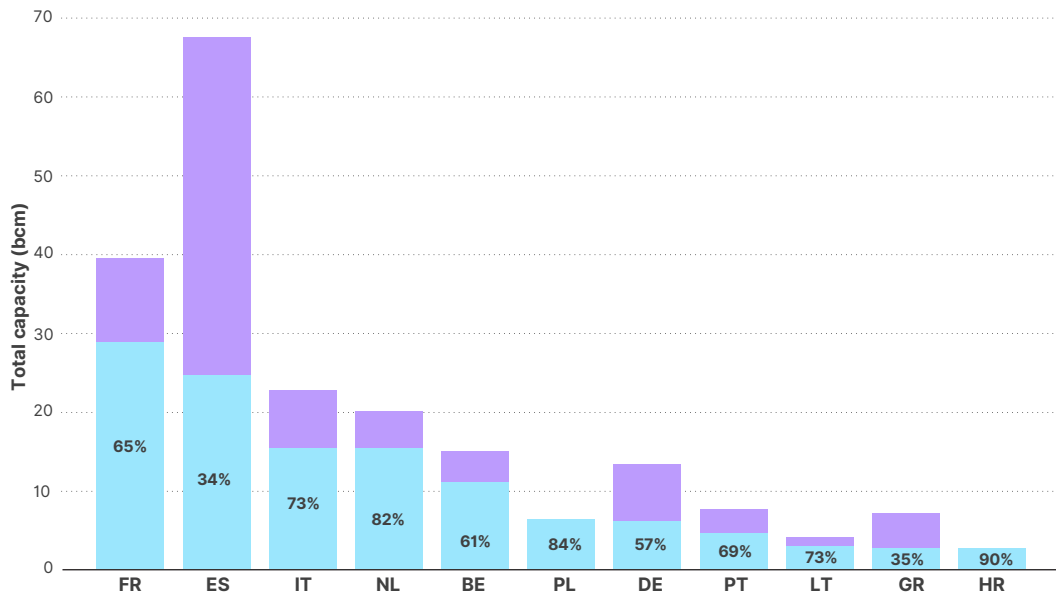
Source: ACER based on data from Platts.

37 As shown in Figure 17, the utilisation rates of EU terminals have risen in last years amid the shifting and increasing role played by LNG to meet EU demand. The (virtual) Spanish LNG system currently boasts the highest available capacity among the largest markets. This seems to provide enhanced import flexibility, particularly for spot cargoes. The highest utilisation rates are observed in Croatia, Poland, Lithuania and selected French sites.

38 In 2023, the utilization of the new German terminals has been modest, averaging at 54%, albeit with variations across different plants. The substantial filling of underground storages in Germany during the summer months contributed to increased LNG supply, consequently boosting utilisation rates. However, several factors including overall low demand, the gradual expansion of relative capacities,

routine maintenance, supply constraints, and consistent pipeline deliveries have collectively led to a subsequent decline in these rates.

Figure 17: LNG terminals capacity and utilisation rate breakdown by EU-27 country - 2023



Source: ACER based on data from ALSI GIE.

- 39 As discussed, various regasification terminals remain in the planning stages for potential future development throughout this decade. However, the capacity expansions achieved to date, alongside the efforts to reduce gas demand, decarbonise and promote alternative supply options to natural gas, raise some concerns about potential risk of overinvestments in LNG infrastructure. In ACER’s view, it is crucial to recognize that the investments made post-spring 2022 were strategically aimed at rapidly increasing gas imports, chiefly addressing peak winter supply demand, but also providing support for seasonal storage injections during the summer. While the possibility of idle capacity remains, it is important to interpret the achieved investments as a strategic insurance policy during an unprecedented crisis.
- 40 Positively, 58 bcm out of 73 bcm or around 80% of capacity additions between 2022 and 2024 are FSRUs which allows for the potential repurpose or relocation of these floating infrastructure should their utilization significantly decline. Overall, as the landscape evolves, strategic planning will be necessary to manage investments in new LNG import capacity also considering the future utilisation of hydrogen or ammonia.

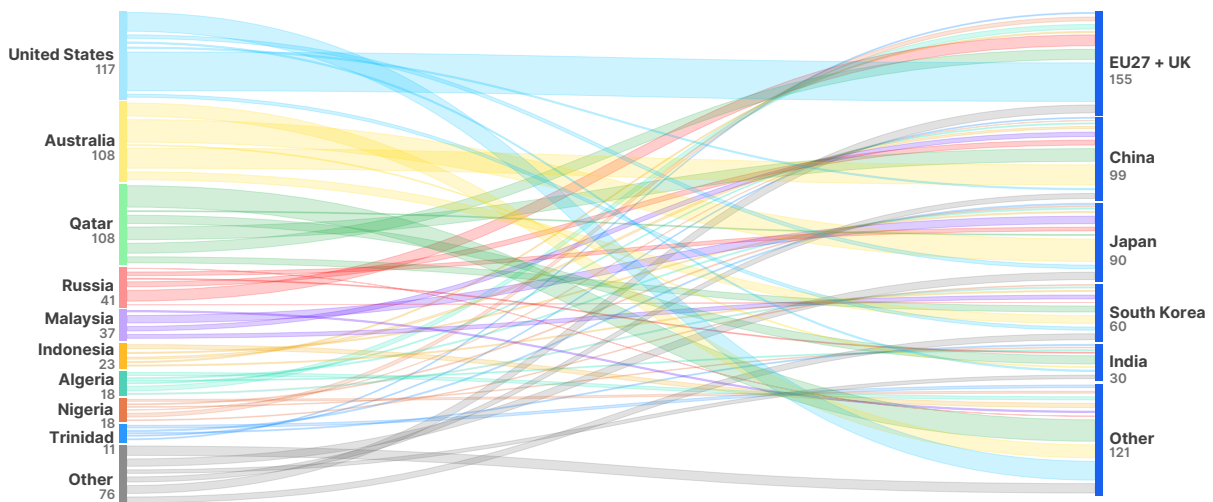
2. LNG Trade

41 This Chapter draws on the commercial aspects of LNG trade. It first describes the latest developments observed in global LNG trade, and the evolution of the LNG contractual arrangements since the Russian invasion of Ukraine. Then it focuses on revising the contractual positions of EU market participants.

2.1. Global LNG trade

42 Global LNG trade continues to expand over time, integrating a growing number of market participants in different countries and regions. Figure 18 illustrates the LNG trade interconnections between importing and exporting countries in 2023, highlighting the relevance of the major regional LNG players. In 2023, global LNG trade connected 20 producing countries with 48 importing markets. United States was the largest supplier of LNG to Europe in 2023 accounting for almost half of the deliveries or 63 bcm (74 bcm also including deliveries to the UK), out of 134 bcm. Russia and Qatar delivered close to 18 bcm each followed by Algeria and Nigeria exporting around 9 bcm each.

Figure 18: Sankey diagram of bilateral global LNG trade in 2023 (bcm)



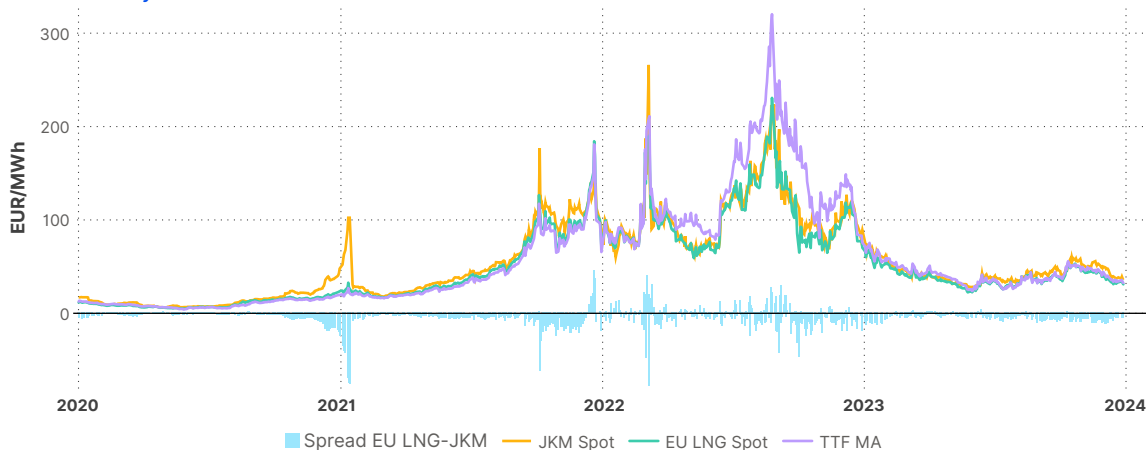
Source: ACER based on data from ICIS LNG Edge.

43 While most of the LNG trade takes place traditionally between countries located within the same ocean basin, LNG deliveries are proving increasingly responsive to price signals in the spot and short-term timeframes. Over recent years, global LNG trade has become more dynamic, resulting in the ability to further redirect shipments, adopt more flexible contractual terms and optimize the utilization of liquefaction and regasification infrastructure.

44 The price signals from the major LNG demand regions increasingly influence the short-term responsiveness of LNG trade. Favourable relative price spreads between the EU and Asian markets, exceeding transportation costs, can prompt the redirection of LNG shipments between both regions. As shown in [Figure 19](#), a key factor influencing the responsiveness of LNG traded volumes is the price signals from dominant regions. The netback position of TTF in the EU in relation to JKM in Asia and vice versa are responsible to divert flows between these regions.

45 As analysed in [Figure 19](#), LNG prices in the EU surged above Asian LNG prices during summer 2022 amid urgency to diversify supply away from Russia. That situation marked a departure from historical trends, where Asian prices used to be higher.

Figure 19: Overview of EU and Asian spot LNG prices and of TTF front-month hub prices (EUR/MWh) – January 2020 – January 2024



Source: ACER based on data from Platts.

Note: EU LNG Spot' prices correspond to the average second half-month prices for delivery in North-West Europe and Mediterranean area assessed by Platts. 'Spread EU LNG-JKM' is computed as 'EU LNG Spot' minus 'JKM Spot'.

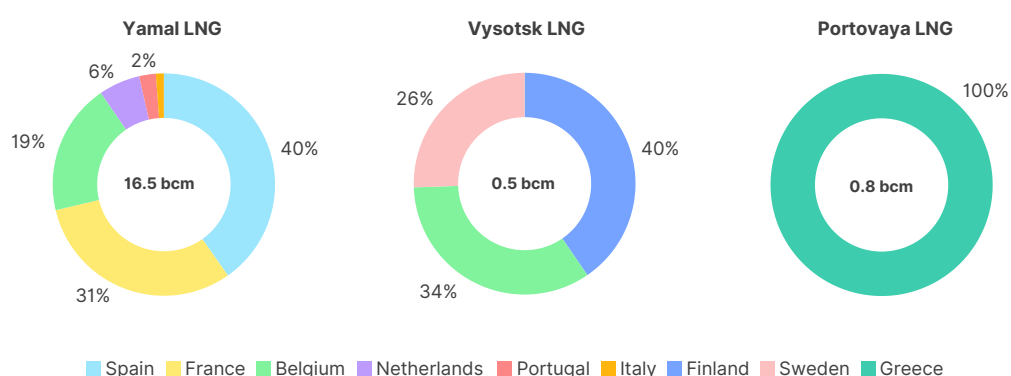
- 46 Since the second half of 2023, Asian prices have more frequently traded at a premium to EU markets. This has occurred in a context of stabilisation of EU LNG imports and lower EU hub prices due to reduced gas demand and record volumes in gas storage filling. Both markets have different structural factors that impact price formation and LNG imports flexibility: for example, fuel switching to oil or coal as substitutes of LNG is much higher in Asian markets. Gas pipeline switching may also take place in markets such as China. In Europe, the ability to switch gas to coal for power generation is rather limited after the phase out of a large part of the European coal power fleet in recent years. On the contrary, Europe enjoys large storage sites serving as the main source of flexibility supplemented by spot LNG.
- 47 Finally, the US Henry Hub price – used in many of the LNG contracts sold by North American producers – along with transportation costs from the US to Europe or Asia plays a referential role in the spot price formation in both regions. Particularly, when the global LNG market is less constrained, European and Asian prices tend to more closely correlate to US prices plus transportation costs.
- 48 Additional factors influencing the extent of spot LNG trades are related to production-side flexibility. While most LNG production tends to be price inelastic, with export terminals operating at or near maximum output regardless of short-term prices due to sunk investment costs and underlying long-term supply contracts, a portion of LNG production, particularly in North America, can be curtailed if their netback selling prices to European or Asian markets fall below the marginal cost of production. Conversely, LNG producers may also opt to maximize production at their facilities to increase revenue when global demand is very high, that resulting in higher traded volumes.

2.1.1. Russian LNG deliveries to Europe

- 49 Russian LNG production in 2023 accounted for 42 bcm. The main initial²⁸ destinations of Russian LNG were EU27 (18 bcm), China (11 bcm), Japan (8 bcm) and South Korea (2 bcm), altogether representing more than 90% of the Russian LNG. A part of the 18 bcm of Russian LNG imported by the European terminals was finally re-exported to China, Taiwan, India, and Turkey among other destinations in the form of LNG reloads. Estimations regarding the re-exported volumes of Russian LNG from the EU remain subject to caveats due to incomplete data disclosure. Nevertheless, some estimations suggest that at least 1 bcm, but possibly more, of Russian LNG could have been re-exported from Europe to other markets in 2023.
- 50 Russian LNG delivered to Europe primarily was sourced from the Yamal liquefaction project, which contributed over 16 bcm out of a total of 18 bcm. The remaining volumes came from the Portovaya liquefaction project, with 0.8 bcm delivered to Greece, and the Vysotsk liquefaction project, accounting for 0.5 bcm with deliveries to Finland, Sweden, and Belgium. Among the EU 27 countries supplied from Yamal LNG are Belgium, France, Italy, the Netherlands, Portugal, and Spain, however, the majority of deliveries were concentrated in Spain, France, and Belgium, totalling 15 bcm out of 16 bcm.

²⁸ A portion of the Russian LNG initially delivered to EU terminals is re-exported to non-EU markets.

Figure 20: Total LNG deliveries to European countries from Russian liquefaction plants in 2023 (bcm)



Source: ACER based on data from ICIS LNG Edge.

Note: The figure accounts for the total deliveries of Russian LNG reaching EU terminals. A certain part of those deliveries ARE re-exported to non-EU markets.

- 51 It's important to note the logistical complexity of the Yamal liquefaction project. Due to seasonal limitations on navigation routes across the Arctic Ocean and the Bering Strait for LNG deliveries to Asia, alternative methods are employed. With the exception of summer months, LNG from Yamal LNG is loaded onto icebreakers in the origin port of Sabetta and later transferred to conventional LNG carriers through ship-to-ship or transshipment operations. These operations are primarily conducted near the Montoir (France) and Zeebrugge (Belgium) import terminals. Specifically, in 2019, a 180,000 m³ LNG tank was constructed at the Zeebrugge LNG terminal in connection with a 20-year agreement with Yamal LNG to facilitate transshipment operations. This tank serves as a buffer for transferring LNG between vessels that are not simultaneously berthed.

Table 1: Long-term LNG Sale and Purchase Agreements sourced from Russia

Loading Port	Seller	Buyer	Signed	ACQ	Start	End	Incoterm	Destination
Sabetta	Yamal LNG	CNPC	2014	4.1 bcm (3 Mt)	2018	2038	DES	China
Sabetta	Yamal LNG	Gazprom Marketing & Trading (now SEFE ²⁹)	2015	3.9 bcm (2.9 Mt)	2018	2038	FOB	-
Sabetta	Yamal LNG	Naturgy	2013	3.4 bcm (2.5 Mt)	2018	2038	DES	Spain
Sabetta	Yamal LNG	Novatek	2015	3.4 bcm (2.5 Mt)	2018	2038	FOB	-
Sabetta	Yamal LNG	Total Energies	2013	5.4 bcm (3 Mt)	2018	2041	DES	France
Sabetta	Yamal LNG	Total Energies	2013	1.4 bcm (1 Mt)	2018	2033	FOB	-
Novatek Portfolio	Novatek	Gunvor	2015	0.7 bcm (0.5 Mt)	2018	2038	FOB	-
Novatek Portfolio	Novatek	Shell	2015	1.2 bcm (0.9 Mt)	2019	2041	FOB	-
Novatek Portfolio	Novatek	Total Energies	2015	1.4 bcm (1 Mt)	2018	2041	DES	France
Novatek Portfolio	Novatek	Repsol	2021	1.4 bcm (1 Mt)	2024	2038	DES	Spain
Novatek Portfolio	Novatek	Zhejiang Energy	2021	1.4 bcm (1 Mt)	2023	2038	DES	China
Novatek Portfolio	Novatek	ENN Energy	2022	1 bcm (0.6 Mt)	2025	2035	DES	China

Source: ACER based on information from GIIGNL 2023 Report, ICIS and Platts.

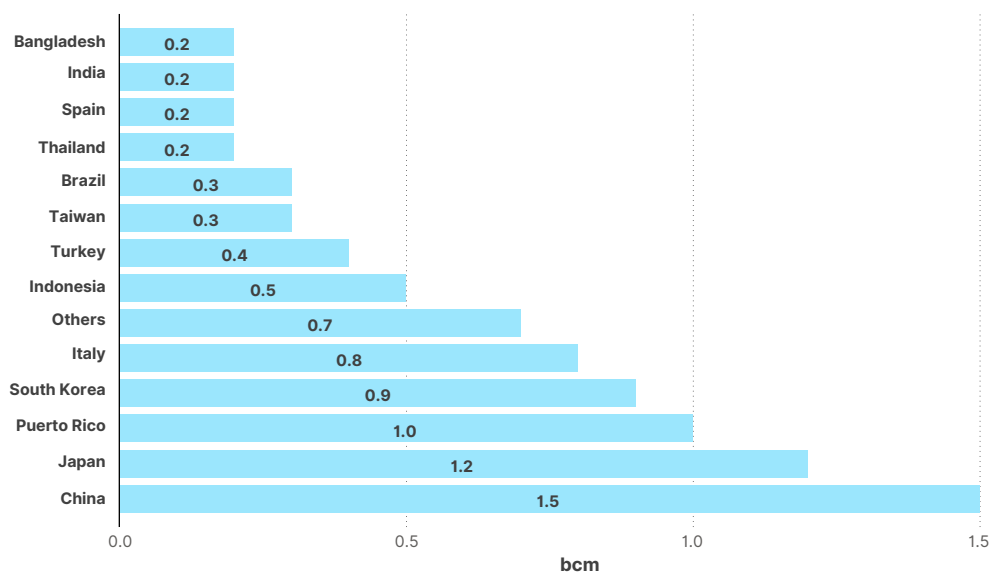
29 In 2022, The German Government nationalised the German subsidiary of the Russian Gazprom due to the insolvency risk of the company and to ensure country's security of supply. Russia imposed a ban on trade with several companies including Gazprom Germania now rebranded as Secure Energy for Europe (SEFE). In 2023 the Russian government made a special dispensation for the SEFE to allow the LNG sales from Yamal until the end of 2024. On year later, the permission has been extended until December 31, 2040.

- 52 According to [Table 1](#), long-term volumes committed with Yamal LNG for deliveries to Europe account for more than 11 bcm. Novatek as offtaker of Yamal LNG resells a part of the Yamal LNG output by means of Long-term contracts with Gunvor, Shell and Total and the remaining part from Yamal is sold spot, sometimes issuing sell tenders.
- 53 Certain regulatory provisions outlined in the agreed text of Directive on internal markets for renewable and natural gases and for hydrogen allow Member states to temporarily restrict gas supplies, including LNG, from Russia and Belarus. This includes the ability to limit upfront bidding for capacity at entry points and LNG terminals if needed to safeguard security of supply. While such measures may target to reduce dependence on Russian gas, it's important to note that substantial volumes have already been contracted under long-term LNG agreements before the Russian invasion of Ukraine. Hence, reductions in Russian LNG imports should be approached with caution, particularly in light of the imminent expiration of the ship-or-pay transit contract for gas pipeline supply from Russia to Europe via Ukraine by the end of 2024. This could potentially lead to a loss of 13.6 bcm of natural gas supply compared to the flows in 2023.
- 54 As described in the REPowerEU plan, Europe is aiming to completely end its reliance on Russian fossil fuels by 2027. To this aim, the reduction of Russian LNG imports should be considered in gradual steps starting with spot Russian LNG imports.
- 55 Offtakers of long-term LNG volumes contracted under the Free-on-Board (FOB) scheme should not have major impediments to find alternative markets outside Europe. Conversely, long-term LNG contracts under the Delivery Ex-Ship (DES) shipping mode are expected to face more challenges in terms of destination flexibility so it would request more time for negotiations to reach an agreement. Diversions in the form of a permanent change in the market destination for the LNG deliveries can be mutually agreed between buyer and seller and may be considered as preferable than entering an international arbitration which tends to be costly with an unpredictable outcome. Structural changes occurred in the buyers' market have historically resulted into diversions of long-term LNG sales to alternative markets on a permanent basis. The extraordinary turnaround in the US becoming net exporter of LNG in 2016, just a few years later of the commissioning of Freeport, Sabine Pass, Cameron and Golden Pass import LNG terminals, can serve as examples.

2.1.2. LNG Reloads

- 56 2023 registered over 200 LNG Reload³⁰ operations which accounted for about 8 bcm or 1.5% of the global LNG trade. 19 countries re-exported LNG cargoes to a total of 49 countries. China is the main destination of LNG reloads followed by Japan, Puerto Rico, South Korea, and Italy.

Figure 21: Destination of LNG reloads in 2023 (bcm)

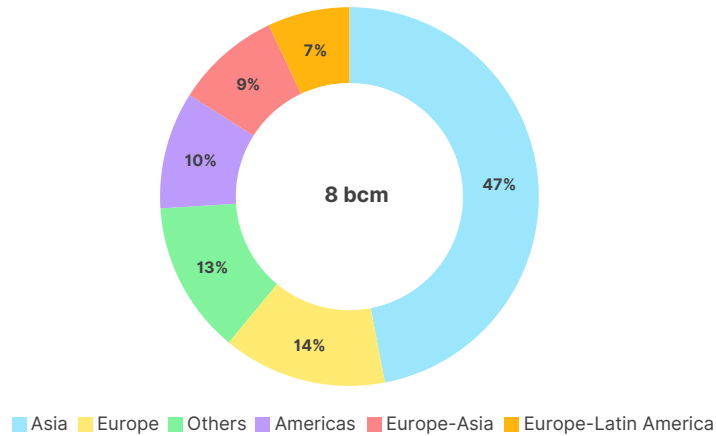


Source: ACER based on data from ICIS LNG Edge.

³⁰ Reloads refers to LNG delivered to an LNG import terminal where it is stored for a period of time before being transferred or reloaded onto an LNG vessel to be exported somewhere else.

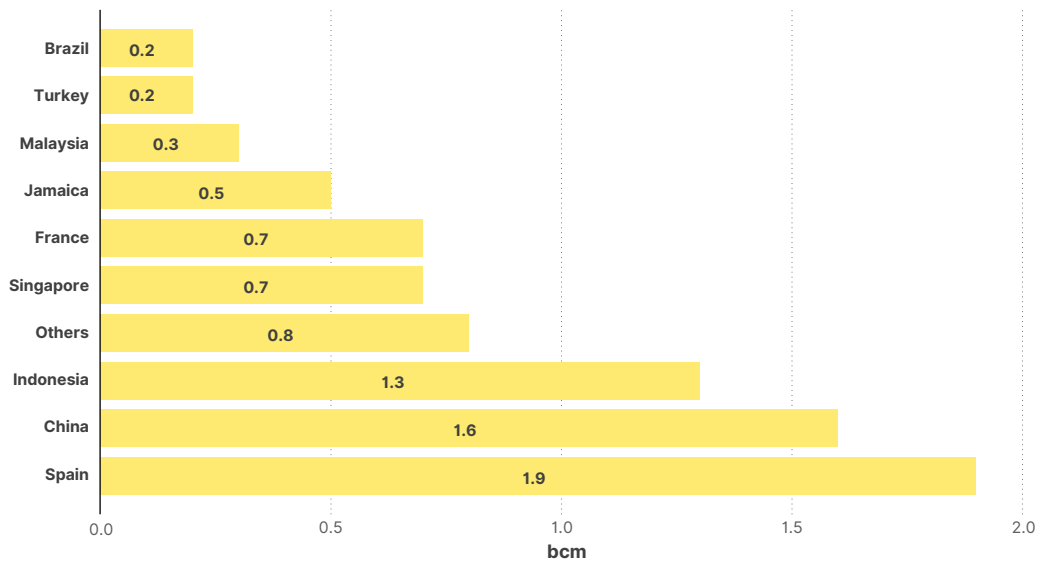
57 The majority of reloads are re-exported to relatively short to medium distance destinations between countries of the same region or continent and sometimes within the same country as in Indonesia and China. Close to half of the LNG volumes reloaded globally are traded within Asia between China, Japan, South Korea, Indonesia, Malaysia, Taiwan, Thailand, Bangladesh, Singapore, and India. In Europe, the trade of reloads is limited and within European countries it accounts for more than 1 bcm. More than half of these volumes correspond to re-exports from Spain to Italy. LNG is reloaded in LNG vessels of smaller size, up to 70.00 cm, which is the maximum vessel size than Panigaglia terminal (La Spezia) in Italy can receive. Sometimes reloads are delivered to other LNG terminals within the same country like in Indonesia but also in China.

Figure 22: LNG reloads trade locations (%) (bcm)



Source: ACER based on data from ICIS LNG Edge.

Figure 23: LNG reloaded by source in 2023 (bcm)



Source: ACER based on data from ICIS LNG Edge.

LNG Joint Purchasing Platform (BOX)

The 2022 gas market shock prompted to consider establishing a temporary EU joint gas purchase platform. The primary goal of the initiative was alleviating the extremely high supply price levels by means of leveraging the EU combined gas demand and its collective market power to negotiate better prices with international suppliers. Moreover, importantly, this coordinated procurement sought to mitigate price competition among EU buyers.

The initial project, the EU Energy Platform, was first launched by the EC in April 2022. This endeavour was initially aimed at supporting EU's diversification efforts and enhance security of supply, by means of improving the international outreach – and hence facilitating the signing of contracts – with key gas-exporting partner countries. After that, amid gradually deteriorating market conditions and following political discussions about its suitability and scale, in December 2022 the Council agreed on Regulation (EU) 2022/2576³¹ and set the conditions and scope to make such platform operational under the name Aggregate EU.

Aggregate EU offers a service for demand aggregation and tendering for companies from EU countries and Energy Community Contracting Parties. The platform operates under a two-step mechanism. It first involves gas-consuming companies to list gas bids³² through a service provider, PRISMA who operates the platform. The platform enables then gas sellers to list offers to supply the aggregated demand, following a tender procedure³³. Once demand and supply interests are matched companies can explore individual or coordinated gas purchase options with negotiations conducted outside the platform. The logistical aspects of supply need to be determined based on the current system capacity allocation architecture, with the assigned suppliers or associated shippers managing capacity and operational considerations.

Notably, the Regulation mandated EU companies to participate in demand aggregation for a volume equivalent to 15% of Member States' storage filling targets (13.5 bcm of gas approx. in 2023). The demand aggregation related to storage is intended to mitigate price pressures arising from EU internal competition, as the need to refill storage sites exerted significant competitive pressure on prices in the summer of 2022³⁴. At any rate, the final contracting of gas via the matched offers in the platform remains voluntary, with no obligation to buy.

The Aggregate EU initiative notably aimed at attracting LNG volumes at competitive prices and assist smaller, less-experienced companies in securing LNG deliveries. It aimed at facilitating the logistical and contractual activities, related to LNG contracting, but also regasification aspects as well as the profiling of large-delivered quantities into monthly baseload products.

There are two types of tenders: short and mid-term tenders. In the former, supply and demand are related to calendar months in the near future. Short-term tenders are mainly intended to cover preparation for the next winter. Mid-term tenders are intended to for longer trade partnerships, up to 5 years, bids and offers are related to a six-month period – summers and winters e.g. Summer 2024 (covers a period from April 1st - September 30th).

By April 2024, five short-term tender rounds and one mid-term round have been celebrated with following results:

31 See [COUNCIL REGULATION \(EU\) 2022/2576](#) of 19 December 2022, enhancing solidarity through better coordination of gas purchases, reliable price benchmarks and exchanges of gas across borders.

32 The demand collection information requested information about the piped or LNG gas origin, location and period for delivery and quantity. Delivery for gas offered is either at one of two virtual LNG delivery locations or at 26 virtual trading points. The minimum quantity was of 5 GWh for piped gas and 300 GWh for LNG, and the maximum period of one year. The platform allows also the use of Central Buyers or Agents on Behalf.

33 For further details on the tender procedure and the overall Joint purchase platform governance see https://energy.ec.europa.eu/topics/energy-security/eu-energy-platform_en.

34 See further considerations on ACER's European Gas market trends report, October 2023.

• **Short term:**

Unit: bcm	Round date	Delivery period	Aggregated demand	Suppliers offers	Demand matched
Round 1	Apr 23-May 23	Jun 23 - May 24	11.6	18.7	10.9
Round 2	Jun 23 -Jul 23	Aug 23 - Mar 25	15.9	15.2	12
Round 3	Sep 23 - Oct 23	Dec 23 - Mar 25	18.1	16.5	11.9
Round 4	Nov 23 - Dec 23	Jan 24 - Mar 25	9.1	10.7	7.4
Round 5	Mar-24	May 24 - Mar 25	1.6	2.01	1.12
		Total short-term	56.3	63.1	43.3

• **Mid-term:**

Unit: bcm	Round date	Delivery period	Aggregated demand	Suppliers offers	Demand matched
Round 1	Feb-24	Apr 24 - Sep 29	33.66	97.36	33.65

Following the negotiations, companies may or may not sign binding contracts, and the corresponding prices after the negotiations remain confidential.

On 21 December 2023, The European Council adopted a 12-month extension of Emergency Regulation (EU) 2022/2576, subsequently extended by 12 months the operational timeframe of Aggregate EU.

Demand aggregation submissions for 2023 have largely exceed the 15% of Member States' storage filling targets (or approximately 13.5 bcm). Interestingly, demand aggregation submitted for 2024 under the mid-term tender is above 30 bcm despite that it stands solely on a voluntary basis since the Emergency Regulation does not foresee mandatory submissions.

Notably, as of January 2025, the demand aggregation mechanism will become a permanent mechanism under the provisions of the Hydrogen and Decarbonised Gas Market Package. The actual decision about the platform's permanent nature triggered some discussions. Some market participants had advocated for its maintenance, but only under exceptional circumstances, as they perceived that the platform had limited impact, while some others viewed it as a complementary tool with positive or non-distortive market impact and hence were supportive of establishing it permanently.

2.2. Spot and long-term LNG trade

58 ACER has internally established a dedicated global LNG contracts database, which comprises proprietary information sourced from both REMIT and the ACER's LNG Price Assessment and supplemented with market data from ICIS, Platts and public sources. ACER's LNG contracts' database comprises thousands of contracts, mainly tied to liquefaction projects but also to portfolio suppliers. ACER's LNG contracts database covers the most recent contracts signed until 2023 and includes both active and upcoming contractual arrangements.

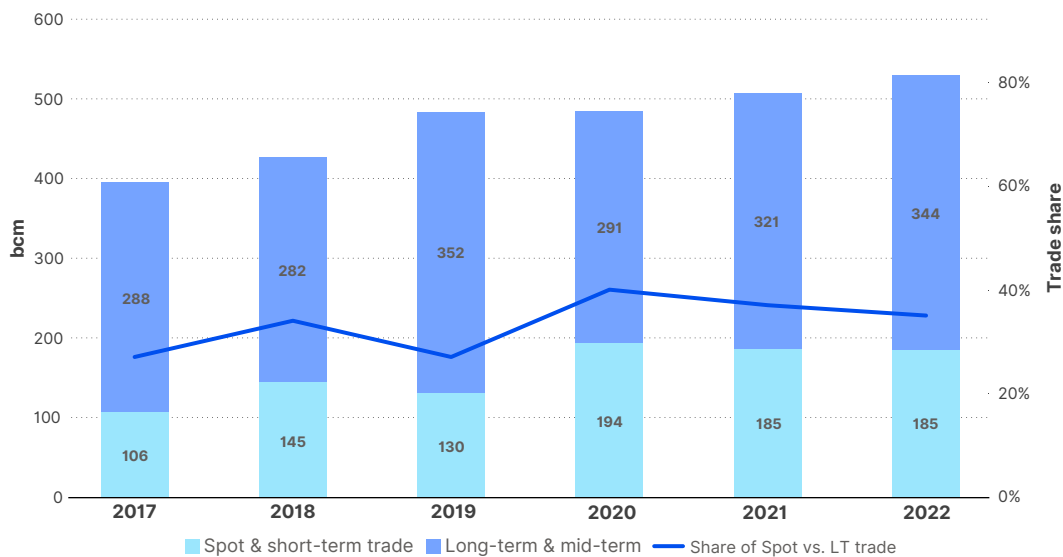
59 In accordance with ACER's information, more than 100 long-term LNG agreements have been signed globally since Russia invaded Ukraine. The average length of these contracts is 15 years, while the average Annual Contracted Quantity (ACQ) is 1.35 Mt (or 1.8 bcm). Despite experiencing some growth over the past decade, the use of TTF and other European gas hubs in the price indexation formulas for long term LNG contract supplies to Europe has significantly declined. The unprecedented price spikes registered in European gas hubs throughout 2022, together with the historically high price volatility in that period, have seemingly reduced the attractiveness of using European gas hub price references in the indexation terms of new long-term LNG supply contracts.

60 The addition of new liquefaction capacity in the US is anticipated to result in further increases of EU LNG imports in the coming next years. Therefore, Henry Hub is expected to emerge as the predominant

reference index in LNG long-term supply contracts for European deliveries on the second half of this decade. The combination of all those factors will result in US Henry Hub prices exerting increasing influence on EU gas prices. As such, EU market participants will be in need to closely follow the price developments in Henry Hub, including adjusting or formulating new hedging strategies including this reference. Interestingly, the rising global demand for US will be anticipated put some pressure on Henry Hub prices, something that has caused certain concerns in domestic US players. Brent³⁵ indexation is anticipated to be second in relevance as this index is present in more than one third of the European LNG contracted volumes by 2030.

- 61 Concerning to the LNG trade and the spot and long-term relationship, there is a widespread belief that global LNG trade is increasingly reliant on spot volumes. However, spot trade has not grown significantly over the last years. In fact, it has decreased since it reached a peak in 2020 and it seems rather stable around 35% of global LNG trade as it is shown below in Figure 24.

Figure 24: Historical evolution of spot and long-term share in the global LNG trade (bcm)



Source: ACER based on data from GIIGNL annual LNG reports.

ACER's LNG Price Assessment & benchmark

- 62 In December 2022, Council Regulation (EU) 2022/2576 tasked ACER with the responsibility of producing and publishing a daily LNG price assessment, which would subsequently evolve into a daily LNG price benchmark, commencing in January 2023. The primary objective of the assessment was identifying the prevailing level at which LNG transactions occurred, to enhance EU LNG price transparency and to better understand the reasons behind the ample price differentials between LNG transactions and the gas prices within EU VTPs³⁶.
- 63 The Regulation granted ACER with the necessary powers to gather data for establishing the LNG benchmark. In pursuit of this, ACER developed reporting guidance and a data reporting tool to collect real-time information on LNG transactions. Concurrently, ACER, assisted by various LNG market experts, developed a methodology clarifying how the reported data are utilized to produce the daily referential price³⁷.
- 64 ACER collects information on spot-type concluded transactions, bids, and offers, as well as data about individual transactions executed under portfolio-type contracts. The latter relate to longer-term gas delivery contracts for longer volumes and comprise several transactions within the same overarching contract. The transactions that must be reported are those with delivery in EU terminals. The methodology establishes the data hierarchy and the calculation steps employed in the assessment process. Essentially, ACER's LNG price assessment comprises a time and volume-weighted average

³⁵ Either as part of a hybrid indexation alongside with Henry Hub or European hub indexes or, in most cases, as the sole indexation term.

³⁶ In the second half of 2022, the price difference between LNG and within VTPs hub prices reached notable levels, as further discussed in Section 3.1 and Figure 27.

³⁷ See [ACER's LNG price assessment methodology](#).

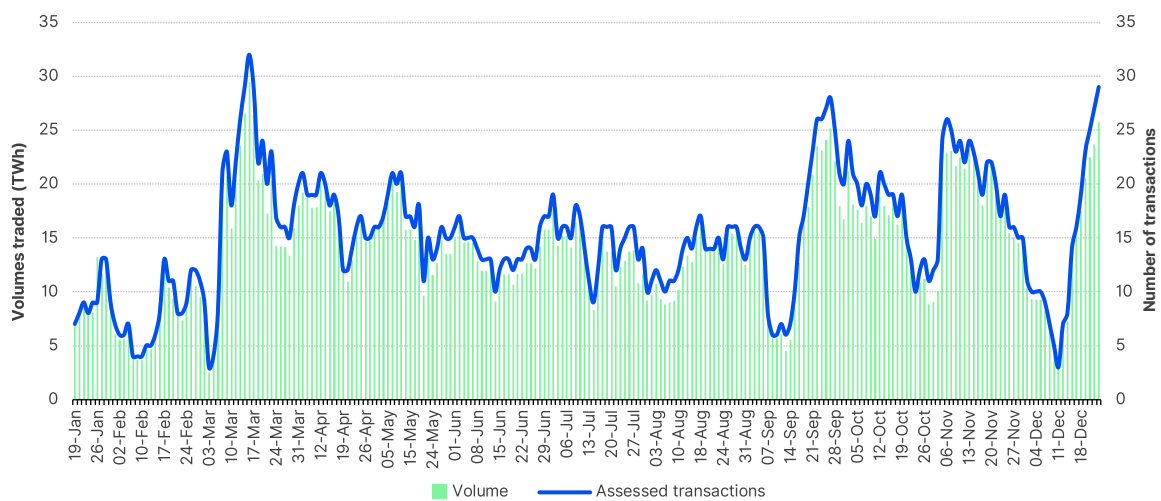
price of spot DES transaction prices, reported for the purchase or sale of LNG with delivery in the European Union. Price estimates are differentiated for two distinct market areas (North-west and South Europe) and for the overall EU.

- 65 This section presents key statistics related to the data reported to ACER for the calculation of the LNG price benchmark, with the aim to enhance transparency. The Section focuses on more structural aspects such as reported volumes or market participants.

Overview of key statistics

- 66 ACER started collecting LNG market data immediately after the entry into force of the Council Regulation (EU) 2022/2576. Since then, ACER has collected on average 10 reports per day, with different delivery periods. In practice, those 10 reports would correspond to 5 individual transactions, as both the selling and buying entities are obligated to submit reports. Approximately, 80% of the reports related to concluded transactions, while bids and offers represent 20%³⁸.
- 67 In the context of daily assessments, the average number of transactions used in each daily assessment done during 2023 was 15, with the associated average volume of those transactions reaching 14 TWh. It is important to underscore that according to the ACER LNG price assessment and benchmark methodology (1.1), for each daily assessment, ACER employs a rolling window, which encompasses the transactions concluded in the preceding 10 days. The price methodology grants a greater weight to the transactions concluded closer to the assessment date. Furthermore, the average number of terminals involved in each daily assessment (i.e., within the 10 days rolling window) is 18. Simultaneously, the average number of market participants over the same 10-day rolling window reaches 18, including both selling and buying sides.

Figure 25: Overview of the number of assessed transactions and related volumes in ACER's LNG price assessment (TWh) - 2023

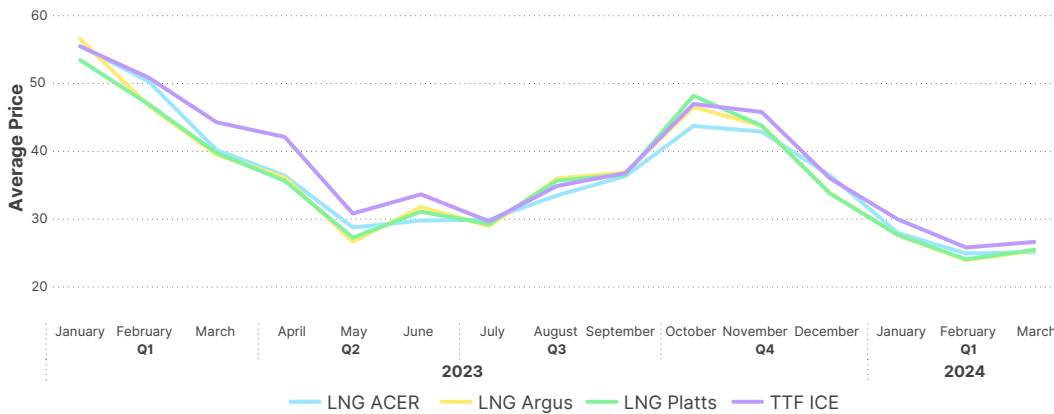


Source: ACER based on LNG price assessment.

- 68 The comparison of the price assessment against other relevant LNG benchmarks, such as those from Platts or Agus, renders relatively similar results. However, certain methodological aspects tend to make ACER's LNG price results less tied to TTF daily price variations. This is particularly those days when the number of reported transactions is null, which requires considering previous transactions from the rolling windows.

38 It is to be noted that ACER will complementarily make use of the data on relevant bids and offers just in the case that less than a defined number of spot DES transactions are available for a daily price assessment. Bids and offers need to relate to comparable cargos, terms and delivery windows for a given assessment date. The mid-price of the most favourable will be estimated and used as additional input for the price assessment calculation.

Figure 26: Overview of TTF month-ahead prices and various NWE DES LNG price assessments (EUR/MWh) – 2023

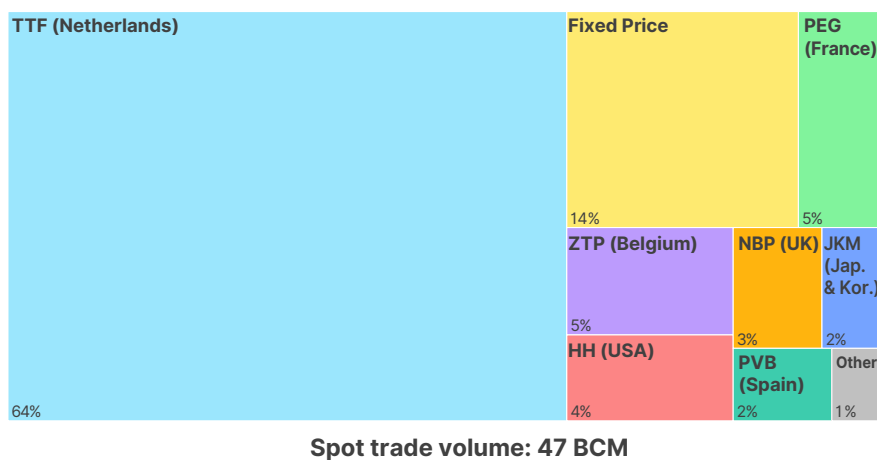


Source: ACER based on LNG price assessment, Argus, Platts, and ICE.

Note: TTF month-ahead price assessments related to ICE exchange. LNG price assessment from Platts, Argus and ACER relate to NWE transactions.

- 69 Based on the trades reported to ACER within the framework of ACER's LNG Price Assessment, spot and short-term trades for LNG cargo deliveries in Europe during 2023 accounted for a volume of 47 bcm. This amount showcases a strong alignment with ACER's evaluation of the uncontracted position in Europe, as depicted in the [Figure 28](#) and [Figure 29](#).
- 70 Traded volume comprised of over 500 reported transactions out of which 89% belonged to DES shipping mode and the remaining 11% to FOB transactions involving 95 companies among buyers and sellers.
- 71 On the buyer side, 50% of the traded volumes was bought by 8 market participants which were involved in more than 250 transactions. The CR3 indicator, representing the market share of the three largest players, accounted for 26% of the traded volumes. On the Seller side, LNG producers were only involved in 27% of the spot and short-term trades while the remaining sales came mainly from portfolio players and traders. Overall, 50% of the sales were concentrated around 9 companies with a CR3 indicator of 20%.
- 72 Figure 27 provides a breakdown of the different indexation terms reported by market participants for the 47 bcm registered as spot and short-term LNG trades with delivery window in 2023 in European receiving LNG terminals.

Figure 27: Breakdown of price references/indexation for spot & short-term trade in Europe 2023



Source: ACER based on information from ACER's LNG Price Assessment & Benchmark

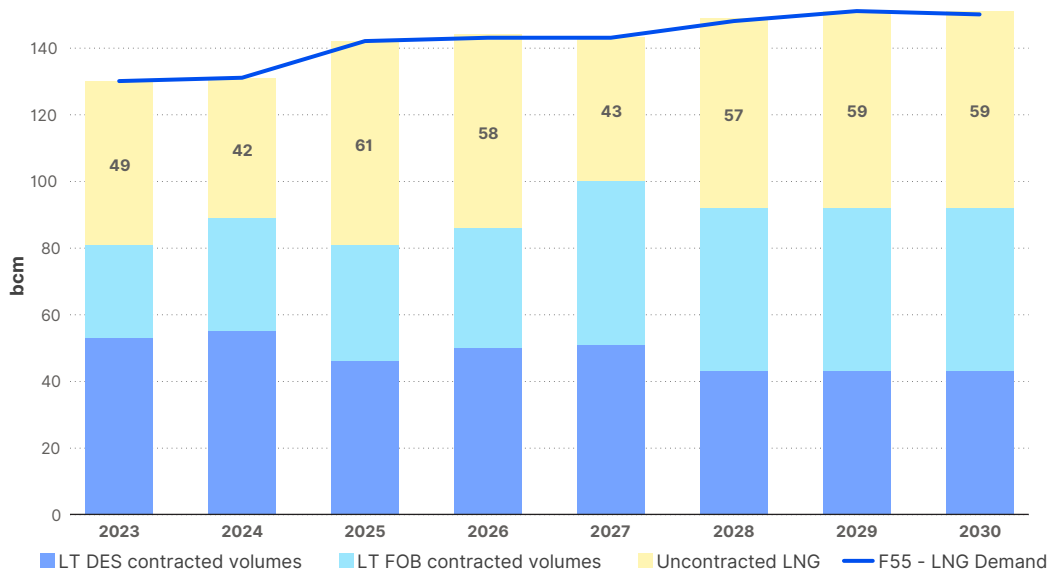
Disclaimer: The analysis uses the data reported by reporting parties to TERMINAL³⁹. The TERMINAL data may not be complete, fully accurate and/or reported in a timely manner. ACER thus reserves the right to update the figures and outcomes of the analysis in the event of newly identified data quality issues.

39 TERMINAL is a dedicated data collection system developed by ACER for the publication of the LNG price assessment and benchmark.

2.3. LNG contracted positioning in EU

- 73 Expanding on the EU LNG demand and supply outlook up to 2030 outlined in Section 1.2.2, this section further explores the EU’s LNG contractual position. The objective is not only to estimate the volumes of LNG the EU will require in the coming years, but also to assess the proportion of long-term and spot contracting for these volumes.
- 74 To perform those analyses, ACER has conducted a comprehensive assessment of the contractual positions adopted by each EU Member State importing LNG. It is imperative to acknowledge that while information pertaining to these contracts may not be perfect, the outcomes and conclusions drawn from the analyses remain reasonably robust and consistently align with observable trends in the LNG industry.
- 75 The assessment begins by examining the already secured long-term LNG supply volumes intended for the European market. This is done by means of mapping out the long-term LNG legacy contracts active during this decade, utilizing the proprietary database mentioned in Section 2.2, and assuming no renewal or extension beyond the expected termination timeframe. Then, the total future EU LNG contractual needs are projected in relation to the evolving EU demand, to determine the volumes of LNG imports that remain unfulfilled and in need to be contracted on a spot basis to meet the EU demand. These spot contractual needs are assessed in reference to the demand scenarios of Fit for 55 and REPowerEU discussed in Section 1.2.2.
- 76 As Figure 28 shows, the LNG volumes already committed for delivery to Europe on a long-term basis during this decade are insufficient to meet Europe’s LNG needs under the Fit for 55 scenario. Long-term contracted volumes account for roughly 60% of the total LNG requirements over the reference period. Consequently, EU suppliers would need to resort to the spot market, or negotiate new long-term contracts, to satisfy the uncontracted volumes, estimated to comprise approximately 40% of the total LNG import needs.

Figure 28: Uncontracted LNG volumes under Fit For 55 scenario by 2030 (bcm)

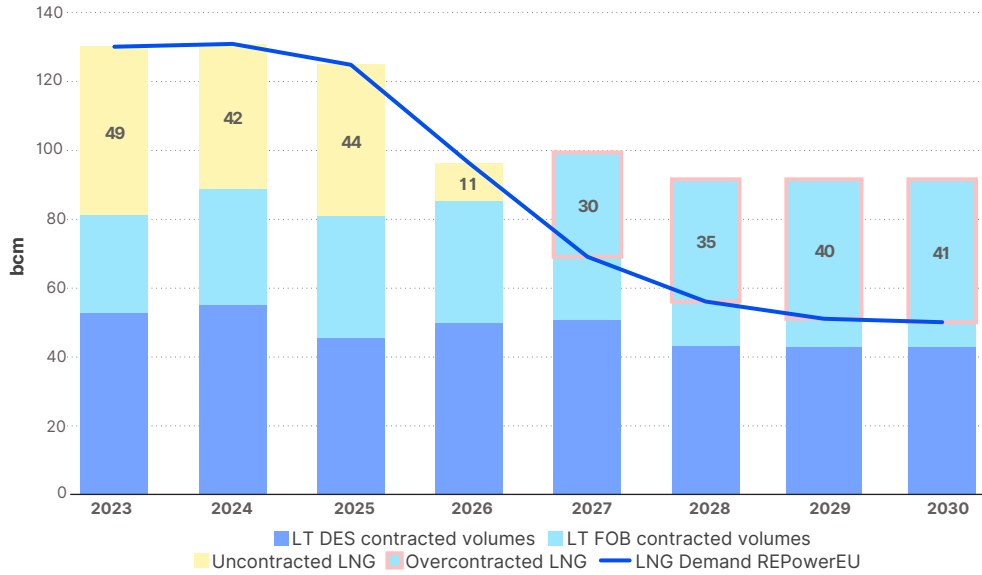


Source: ACER based on data from REPowerEU and proprietary long-term contracts database.

- 77 When considering the more ambitious REPowerEU demand reduction scenario, the analysis reveals two distinct periods of significance. Initially, from 2023 and until 2026, the existing long-term contracts for delivery in Europe are assessed as insufficient to meet the total EU LNG demand. However, from 2027 to 2030, the impact of REPowerEU measures on EU gas demand reductions is expected to result in over-contracted LNG position, with surplus volumes ranging from 30 bcm in 2027 to 66 bcm in 2030.

78 Such contractual surpluses should be easily manageable thanks to the inherent flexibility of the contracts with free-on-board shipping terms and the presence of international portfolio players backing those contracts. In fact, during this period, except for the year 2030, free-on-board volumes exceed the over-contracted volumes. Consequently, those volumes should find little difficulty to be redirected to alternative markets.

Figure 29: Uncontracted / over-contracted LNG volumes under REPowerEU scenario by 2030 (bcm)



Source: ACER based on data from REPowerEU and proprietary long-term contracts database.

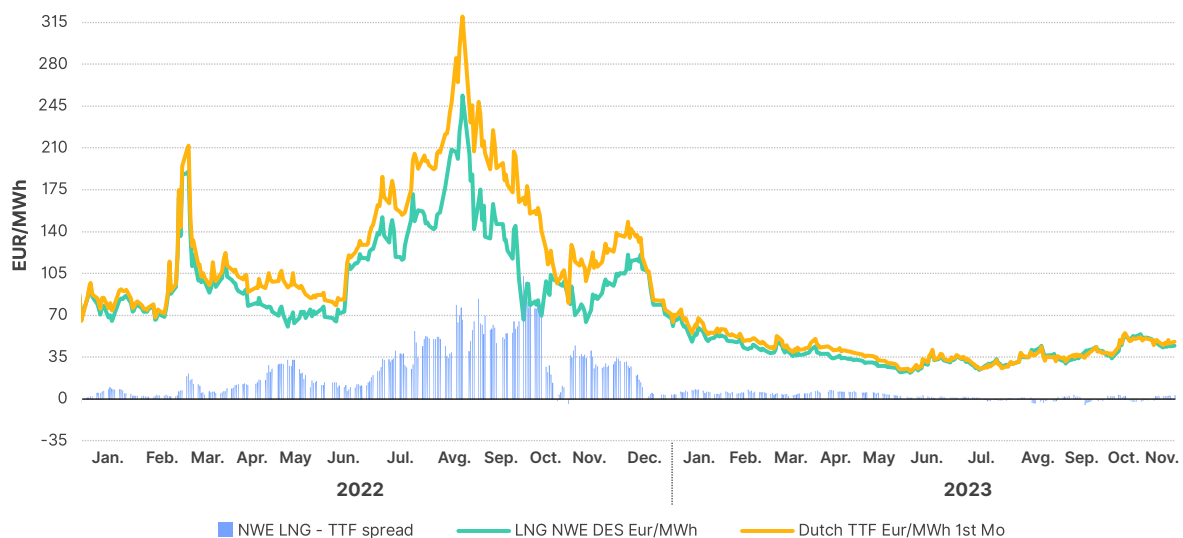
3. Functioning of the European LNG market

79 This chapter first discusses the growing importance of LNG in shaping gas price formation in European markets. It then examines LNG infrastructure evolution and the access regimes of LNG terminals and finally addresses the related regulatory considerations, aimed at safeguarding competition in a gas market highly dependent on LNG supplies.

3.1. Relationship between LNG and hub prices

80 This section delves into the evolving dynamics of price convergence between spot LNG prices and short-term hub prices in last years, highlighting the increasing role of LNG in determining the price formation in European gas hubs. The analysis starts comparing in Figure 30 the evolution of Northwest Europe LNG prices against the evolution of TTF prices. The comparison uses the prices of the TTF month-ahead product due to the compatibility of the delivery timeframe (the timeframe of spot LNG price reported data relates to a delivery period in the second half month ahead of the LNG transaction date).

Figure 30: Overview of NWE EU LNG and TTF month-ahead prices and relative spreads (EUR/MWh) – January 2022 – January 2024



Source: ACER based on data from Platts

Note: EU spot LNG price reference corresponds to Platts' LNG NWE DES prices, related to transaction terms for Delivery ex-ship at sea, with delivery in the second-half month ahead of the transaction date.

81 Figure 30 shows how the spread between the LNG prices (corresponding to price references for gas within the cargoes at sea) and TTF (corresponding to price reference for gas delivered within the Dutch system) peaked in the summer and autumn of 2022. The historically high spreads in that period were the result of the significant congestion in accessing EU Northwest markets, including through LNG terminals, amid heightened LNG demand.

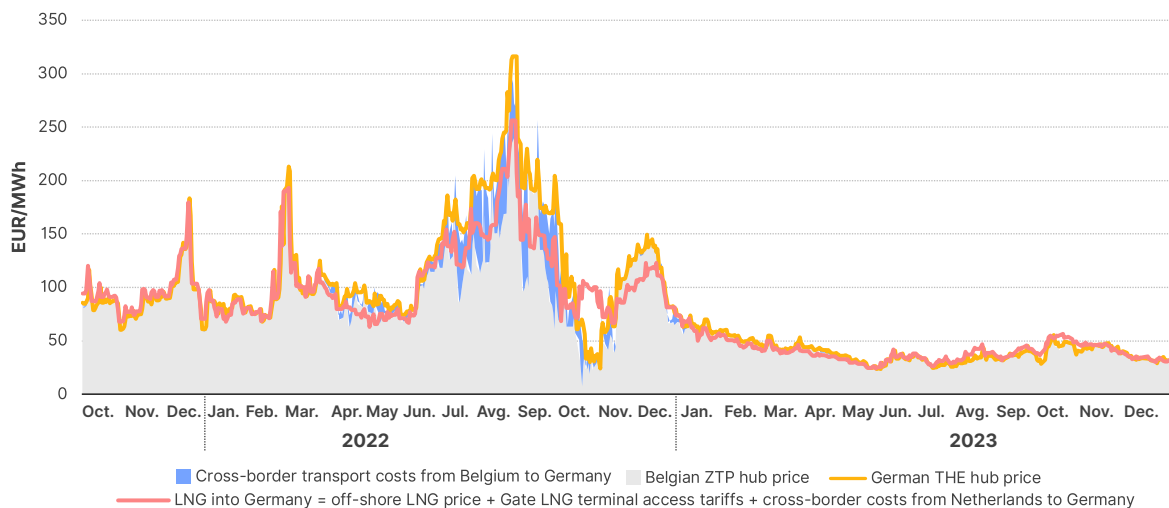
82 Two factors importantly influence the correlation between the spot LNG prices and the short-term prices of the gas transacted within hubs. Firstly, the available accessing capacity at LNG terminals, shaped by infrastructure levels and their corresponding utilization rates, is key in determining the feasibility of importing extra LNG. Secondly, the access tariffs paid for importing LNG into the system, which as it will be elaborated upon later, tend to set a reference to the price spreads formation, while can also trigger competition among terminals. These factors are intricately intertwined with other broader market fundamentals.

83 As referred, the high demand for LNG to offset Russian gas supply and replenish storage stocks, coupled with congestion at LNG terminals and pipelines, significantly elevated the difference between spot EU LNG prices and EU hub prices across the second half of 2022. As Figure 30 shows, the spreads

exceeded 35 EUR/MWh during most days from end-July to mid-October 2022, with that scenario triggering concerted regulatory actions eventually⁴⁰.

- 84 Congestion of both LNG terminals and pipelines was highest in the Northwest European region. That scenario generally allowed capacity holders of Northwest LNG terminals to increase the selling prices for their gas offerings within TTF or the German THE hub. LNG supplies were in competition with gas import prices from neighbouring hubs when determining the selling prices at European hubs. This process occurred amidst congested capacities and involved high premiums being paid to secure capacities concurrently.
- 85 In establishing the selling price levels at hubs, LNG suppliers engaged in an interactive process, in competition and reference to the prices of the gas imports from neighbouring hubs, with concurrently congested capacities and strong premia paid to secure capacities. Figure 31 aims to illustrate these developments, comparing the prices at the German THE hub against the modelled bids of gas suppliers flowing gas from the Belgian ZTP hub and LNG from Dutch Gate into Germany. The assessment is based on referential hub and spot LNG daily prices and the transportation costs across both considered routes.

Figure 31: Comparison of the German THE day-ahead price vs gas sourcing from Belgian ZTP and NWE LNG sourcing from Gate Terminal –(EUR/MWh) - October 2021 - January 2024



Source: ACER based on data from Platts and PRISMA.

Note. The sourcing costs from Belgium are built as the sum of the ZTP day-ahead price plus daily pipeline transportation costs from ZTP to THE, including auction premia, while the sourcing cost from LNG are built as the offshore NWE LNG price, plus a proxy of the access costs at Gate LNG plus (yearly to align to Gate) transportation costs from TTF to THE.

- 86 Since the beginning of 2023, price convergence between LNG and TTF prices started to gradually strengthen. In recent months, spreads tend to fall in the range between 2 EUR/MWh and 3 EUR/MWh, a price difference closely aligned to the LNG system access tariffs⁴¹. The enhanced availability of LNG regasification capacity, together with reduced gas demand and the overall more positive EU gas market supply-demand fundamentals explain the improved price convergence. Spreads are expected to remain stable or even move closer, if EU LNG regasification capacity continues to increase. Indeed, situations when the spreads revert (i.e., TTF front-month prices are at a discount to spot DES NWE LNG prices)

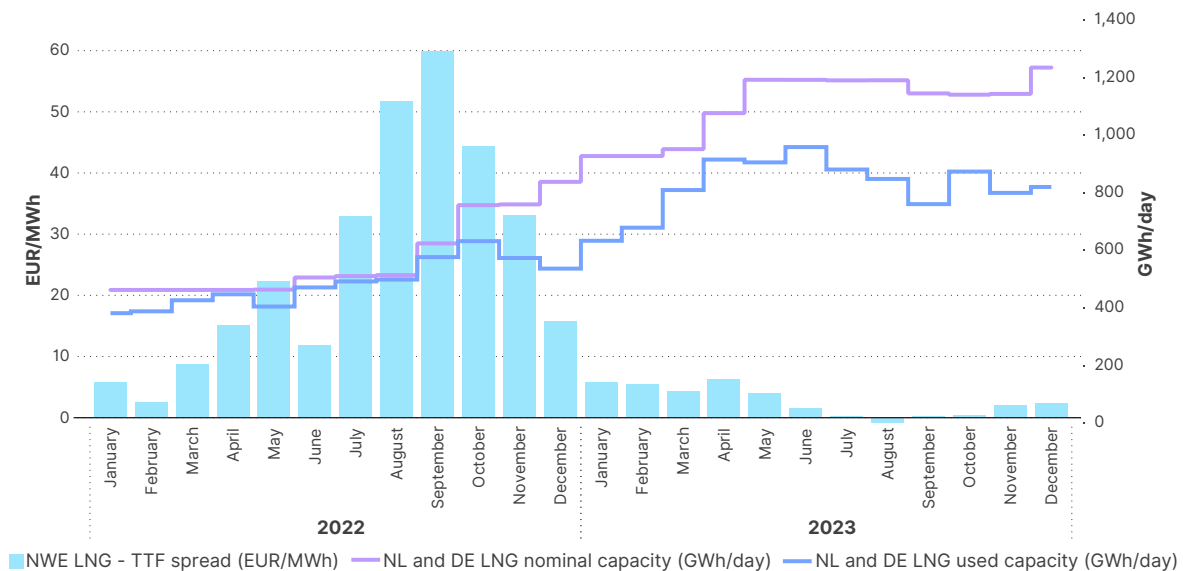
40 The decoupling between LNG and VTP prices was indeed one of the considerations taken to promote the ACER's LNG price benchmark, to add further transparency to the price differential between the price of LNG negotiated at the sea and the price at which this LNG will be sold within the VTP. In turn, and in relation to that, The MCM Regulation established that a price cap would be established if two market events would occur simultaneously. On the one hand, that TTF month-ahead price exceed 180 EUR/MWh for three working days, but also, importantly, that the TTF month-ahead price is 35 EUR/MWh higher than a reference price for EU LNG for the same three working days.

41 As discussed in next section, those tariffs are assessed as the sum of the terminal bundled-service tariffs plus system access fees from the LNG plant.

had been frequent in the past, when the EU acted as last resort balancing market⁴² (i.e., see the negative spread values across most of 2021), but also observed more recently in certain periods, under specific market circumstances⁴³.

- 87 To relate the relevance of LNG terminals' capacity and tariff factors over LNG-hubs' price spread formation, Figure 32 offers an overview of the evolution of these two elements over the last three years in the Dutch and German market. Specifically, the figure shows the evolution of spot LNG prices and TTF month-ahead spreads, in conjunction with the evolution of LNG capacity for the sum of the Dutch and German terminals. The dotted line then indicates the referential tariffs across Gate LNG and into the Dutch system. The analysis, as previously discussed, shows that spreads reached highs during the summer and autumn of 2022, when the terminal utilization rates approached nominal capacity, leading to congested access. Following the entry in operation of first the Eems Energy terminal in the Netherlands in October 2022, and then of Wilhelmshaven, Brunsbüttel and Lubmin terminals in Germany across the first half of 2023 that alleviated congestion and increased available capacity, the LNG-hub price spreads began to decline. While several additional fundamentals contributed to the decrease in prices, the correlation between higher LNG capacity accessing levels and lower LNG-hub spreads unveils a certain causal relationship.

Figure 32: Overview of North West Europe LNG and TTF month-ahead price difference (EUR/MWh), Netherlands and Germany nominal and used LNG send-out capacity (GWh/day) - January 2022 - December 2023



Source: ACER based on data from Platts and GIE.

3.2. EU LNG infrastructure and related access regimes

- 88 As the EU heightens its reliance on LNG, safeguarding the competitiveness and integration levels of the market is crucial. This emphasizes the importance of improving the fairness and transparency in the access terms to LNG terminals, to prevent any hindrance to healthy competition. This section discusses various regulatory aspects and their implications over market competition.

42 Europe had historically acted as the global LNG balancing market, before shifting from end-2021 into a strong price competitor. The EU offers the world's largest LNG regasification capacity subject to third-party access which is also able to reload LNG volumes from the import terminals to the LNG tankers. In addition, it hosts extensive underground storage facilities and offers significant flexibility to accommodate gas volumes, thanks to its significant ability to switch between gas and coal power generation. This unique framework had positioned Europe as the global market of last resort, enabling the redirection of LNG shipments to other markets when they offer better prices or conversely, the attraction of larger LNG volumes during periods of abundant supply (hence explaining the discount price between LNG indexes and TTF). Further assisting this role, the most liquid EU hubs have provided robust price signals for LNG pricing and granted shippers access to effective hedging instruments.

43 For example, the increased LNG regasification capacity, which eases access to EU gas systems and curbs the ability of LNG terminals' capacity rights holders to sell spot LNG at high premiums in EU gas hubs, together with other contributing factors related to the evolution of prompt and mid-curve EU hub product prices and of Asian spot LNG resulted in August 2023, in reverted spreads. As a result, those EU buyers willing to procure spot LNG have been in need to pay a premium to TTF prompt prices, to encourage LNG suppliers to deliver the gas into the EU and mitigating any inclination to postpone shipments or redirect cargoes toward Asian markets

3.2.1. LNG terminals' access conditions and roles

- 89 The regulatory framework applicable to EU LNG infrastructure varies across Member States, and possibly between the individual terminals within a given Member State. The main differential aspect relates first to the access regime, and then to the procedures for allocating capacity products, the type and extent of the offered capacity products, the tariffs for the different services and the application of congestion management rules.
- 90 The different rules at each gas system or terminal result from a confluence of factors including infrastructure investment drivers, the terminal's structural role in the market, regulatory perspectives of the jurisdiction, and the prevailing conditions at the time of investment. Historically, most of the legacy terminals developed along the past years and decades aimed to accommodate the growth of natural gas demand in EU markets and contribute to the policy objectives of promoting supply diversification and competition. This, generally, resulted in national regulators fostering third party access regimes (primarily established during the gradual liberalization of the market in the 1990s and 2000s, in parallel to the unbundling of historical integrated supply-chain operations).
- 91 Linked to that, the terminals were incorporated in the national systems regulated asset bases, with the objective to mitigate the investment risks by ensuring secured revenue recovery with tariffs set through regulated procedures. The third-party character of these terminals aimed at promoting competition by safeguarding non-discriminatory access and by preventing the abuse of market power by the capacity owners or operators of LNG terminals. Regulated regimes typically entail regulatory oversight, establishing and enforcing rules for capacity allocation, and imposing transparency obligations. Nonetheless, the detailed capacity accessing conditions can vary between EU jurisdictions, and, despite some improvements, the harmonisation of the access conditions has been historically limited at EU level. CEER reports have consistently analysed those aspects and the type and evolution of these access regimes.
- 92 In turn, the terminals subject to negotiated access regimes – this is, terminals exempted from granting third party access – provided market parties with greater flexibility to promote investments and reach agreements on access terms through direct negotiations between operators/promoters and users. Those agreements included capacity assignment, tariffs aspects and other commercial considerations. This approach acknowledges that the LNG market is diverse, and that investment promotion and capacity allocation can vary based on specific circumstances, with LNG promoters and users taking also higher own risks.
- 93 Negotiated terminals were not so frequent historically, with Gate Dutch, French Dunkerque and Italian Porto Levante being the three ones until end- 2021, together with various terminals in the UK. However, as a result of the 2022 crisis and the pressing need to secure a rapid commitment to back the financial cases of the new LNG terminals exempted access regimes became more dominant.
- 94 As previously discussed, the rationale for selecting a regulatory approach depends on a multitude of factors, including the policy objectives of the jurisdiction when promoting the investment in the terminal. Indeed, these policy objectives were significantly impacted from mid-2022 by the urgent need to secure supply and reduce dependence on Russian gas. The [Table 2](#) in the Annex seeks to correlate various of these factors, aiming at identifying discernible patterns. The findings would indicate that negotiated access regimes were initially granted to LNG projects contributing to diversify gas supply options, at markets already exhibiting reasonable competition levels. And then, since 2022, negotiated regimes have been tied to urgent security needs and the imperative to rapidly develop infrastructure. The technical features of the infrastructure seem to play an important role. Floating Storage Regasification Units are typically operated under negotiated regimes, as they tend these pieces of infrastructure tend to be leased on a shorter-term contract basis, which may reduce the rational to include them in the regulated asset basis.
- 95 While both regulated and exempted access regimes are valid options, the second decision can only be granted under certain conditions. In essence, the criteria entail that the infrastructure wouldn't have been developed if the usual third-party rules would apply. The EC is responsible for verifying that the conditions to grant an exemption are met. If they are not met, the EC may ask the national authorities to

amend or withdraw the exemptions⁴⁴. The tariff access conditions are also a relevant element as it will be further elaborated below.

3.2.2. Concentration of terminal capacities

- 96 Differences in access conditions can result in varying concentration levels at terminals. Typically, terminals with exempted access regimes tend to present higher concentration levels. This is due to fewer users backing the specific projects' investments, resulting in a more sustained capacity acquisition over extended periods and often involving the parallel signing of longer-term strategic gas supply agreements⁴⁵. However, regulated terminals can also exhibit notable concentration levels. The overall concentration level hinges on the project specifics, the considerations and expectations taken to back the financial investment and the number and type of companies interested in supplying LNG to the specific market.
- 97 In the intricate and investment-intensive LNG industry, high concentration at terminal access isn't necessarily worrying, particularly if the market linked to this infrastructure maintains a competitive and commercially accessible environment. However, heightened concentration at terminals may excessively limit competition and alternative gas suppliers end up encountering difficulties in importing LNG across terminals as well as in sourcing gas at hubs. Despite alternative LNG suppliers' potential expertise and eagerness to enter an LNG market, they can find themselves at a disadvantage if this coincides with limited trading volumes at hubs or significantly higher prices at hubs compared to what they could secure when sourcing LNG by themselves. In a regulated investment scenario, securing significant capacity through long-term contracts is beneficial for minimizing the risk of future cost uncertainties. Therefore, from the perspective of safeguarding final consumers against stranded assets, such actions are more justified.
- 98 Analysing data reported under REMIT, ACER has initially mapped the concentration and the length of the capacity products booked at selected of EU LNG terminals. The findings indicate that in most terminals concentration is notably high today, with a few suppliers holding the majority or all of capacity for long periods. The Spanish virtual LNG system showcases the lowest concentration levels and the higher availability of short-term capacity, while in most of the new plants built after 2022, the sum of the capacity rights of the three main companies (i.e., CR3 ratio) is above 90%. This highlights potential risks to sustained competition in the linked gas markets, as LNG supplies increasingly gain significance.
- 99 Access regime in exempted LNG terminals requires particular attention even though some conditions and regulations apply⁴⁶. High concentration at LNG terminals may hinder competition, especially when the dominant players have a strong market power and competitors face difficulties to find competitive LNG or piped gas sourcing alternatives.
- 100 The type of capacity products in operation is a crucial factor when assessing concentration. Currently, most capacity at both legacy and most recent terminals is extensively booked primarily through long-term products, typically exceeding a duration of 5 years. Longer bookings contribute to financial stability – hence limiting the stranded risks for future consumers in regulated systems – and offer reliability for long-term gas portfolio contracting. However, they may limit the ability to attract short-term cargoes from alternative players on short notice⁴⁷. Indeed, short-term products enabling market participants to optimize their portfolios with spot cargoes and frequently attracting additional users, is exclusively available through secondary markets at many terminals. This secondary accessibility is not readily available to all potential users, while it can be also difficult to coordinate the accessing from the terminal into the system. Moreover, the reallocation of unused capacity in the secondary market, while promoted, may still pose difficulties.

44 [Five conditions](#) nominally apply: 1. the investment must improve security of supply and boost competition in the gas market. 2. the investment could not go ahead without the exemption due to the level of risk. 3. the infrastructure must be owned by a legally separate firm from the TSO in whose system it will operate, 4. users of the infrastructure must pay for access, 5. the exemption does not harm the functioning of the EU's internal gas market or the transmission system to which the infrastructure is linked.

45 In certain cases, such as in the UK terminals but also in Continental ones, the users related to portfolio aggregators or LNG producers (e.g., Qatar) accessing the terminals and selling the gas directly at the tanks or at the linked hub.

46 E.g. obligation to apply a UIOLI principle facilitating a secondary market, or maximum capacity share that can be allocated to a dominant player.

47 Note that short-term capacity has a certain connotation. While it commonly relates to slots in the month period to allocate spot, is also would be considered in various terminal to assignments below one year of duration.

101 Again, while allocating specific capacity for short-term products provides flexibility and helps to attract new participants, trade-offs exist. The LNG business is and will be of a higher complexity than pipelines capacity contracting and gas procurement at hubs (both offering standardised short-term products). Therefore, while capacities can be allocated on longer periods, efficient congestion management procedures are imperative to make unused capacities available in the secondary market. The Hydrogen and Decarbonised Package Regulation has added additional provision on the subject, in view of the need to make available unused capacity at transparent platforms to maximise LNG deliveries⁴⁸.

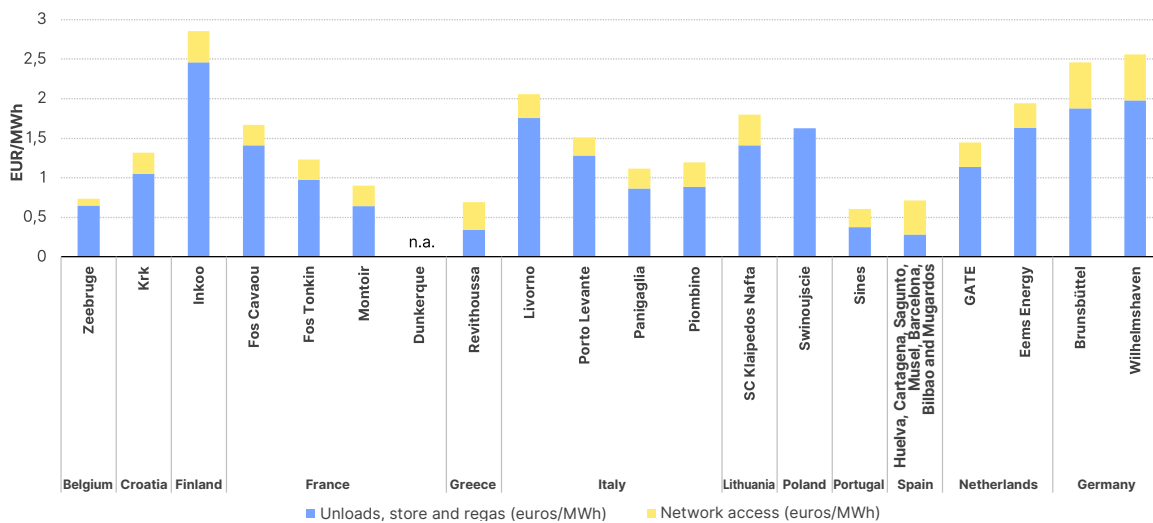
3.2.3. Overview of terminals' tariff levels

102 In an integrated EU market, where LNG infrastructure typically provides access to broad regional areas, competition among terminals is influenced by tariff levels. More competitive tariffs can attract cargoes into specific systems, resulting in turn in higher average utilisation rates. Consequently, as a rule, terminals' tariffs ought to be cost reflective to foster fair competition, notwithstanding the tariff network code allows for certain tariff reductions to induce positive externalities to the whole system⁴⁹. Overall, ensuring and substantiating the reflectivity of the tariffs of the terminals with exempted access regimes may pose a higher challenge, given the higher discretion that promoters and users may find in setting them.

103 Terminals' tariffs depend on the products and services offered. Many terminals adopt simpler structures, featuring a single tariff term — such as a fixed component term per cargo (e.g., Zeebrugge) or a variable term based on the delivered LNG volume (e.g., Klaipeda). Conversely, other terminals employ more intricate frameworks comprising both fixed and variable terms, such as in France. In these cases, a fixed term may apply to send-out capacity, while a variable term relates to the volume of gas regasified. Additionally, services may differ in terms, with tariffs varying in accordance to the products duration (i.e., shorter vs longer-terms), the allocation process (e.g., auctions with different resulting prices for the same service) or discounted prices when the service is offered as bundled or the sum of the unbundled payments.

104 While LNG tariff comparisons are complex, an approach consists in comparing the normalized cost of the bundled service, typically combining cargoes offloading, storage and regasification services, plus the access into the network. Figure 33 shows the assessment done for the year 2023, considering LNG with an energy content of 1000 GWh to be offloaded, stored, regasified and injected into the system over a period of 15 days. The assessment updates values from similar exercises and assumptions conducted by ACER and CEER in previous reports.

Figure 33: Overview of EU LNG terminals tariffs per service (EUR/MWh)



Source: ACER based on LNG System Operators and NRAs.

Note: The assessment specifically examines those costs using the tariffs for a bundled service, encompassing unloading, storage, and regasification services. The assessment is done for the second half of the year 2023 and considers LNG with an energy content of 1000 GWh to be offloaded, stored, regasified and injected into the system over a period of 15 days. The comparison considers for both LNG and system access tariffs annual contracts, normalized with a 100% load factor. When relevant, the size of the cargoes considered is 140.000 m3. The primary data source utilized is the information published by LSOs in the GLE Transparency template. Particularly, for various exempted terminals, the results are based on partial information published about concluded allocation processes, but not on firm published tariffs as they are not available.

48 See Article 10, 3, b.

49 As previous MMRs have assessed, partial or full discounts are granted to the entry points from LNG facilities into the network. To compensate the related missing revenues, NRAs propose different scaling factors at other network points.

- 105 The assessment done for 2023 results in bundled service tariffs ranging from 0.50 EUR/MWh to 2.90 EUR/MWh. The entry tariffs from LNG terminals into national transmission networks specifically range from 0 to 0.6 EUR/MWh, contingent on network tariffs methodologies and asset costs, but also on possible discounts allowed by the Tariff NC as referred above.
- 106 Indeed, several factors explain the variations in access costs. They include disparities in tariff structure and cost allocation among EU Member States, variations in terminal age, technology, size, and economies of scale, utilization levels, and regulatory decisions related to amortization periods among others. Notably, the divergent tariffs between total access systems can be attributed, in part, to the decisions of national regulatory authorities in certain member states, allowing the recovery of some system access costs from terminals from other network tariffs.

3.2.4. Mechanisms to promote competition levels

- 107 The complexities inherent to LNG infrastructure investment, the diverse rationale of LNG projects and, not least, the favoured regulatory approaches at each jurisdiction can result in variability in the terminals' access regimes.
- 108 Yet, as the EU increasingly heightens its reliance on LNG, it is necessary to reflect about the mechanisms, and tools that as best practices can be implemented to safeguard fair access conditions and foster competition, while not hindering the development and efficiency of the projects. The mechanisms can be grouped around three main principles.
- 109 **Transparency:** As relevant EU regulations have established, it is important that LSOs implement transparent and consistent reporting mechanisms for operational data. Reporting shall encompass among others the terminal technical characteristics, information about the contracts related to the different services, capacity availability and utilisation statistics, tariffs levels and operational schedules. Transparency has been promoted by the GIE Transparency template⁵⁰. Yet, it should particularly extend to accessing costs and tariffs, which may not always be readily accessible at some terminals. Transparency about secondary capacity allocation procedures needs also to be fostered, particularly at those terminals that offer limited primary capacity. In that respect, the new Decarbonised Gases and Hydrogen Regulation proposed provisions establishing mandatory secondary capacity allocation platforms would be useful; exploring methods to enhance transparency and consistency regarding the release and allocation of unused primary capacity slots would prove beneficial. This is particularly relevant given that LNG market participants across Europe often operate based on similar spot trading economics and operational terms.
- 110 **Competition:** While acknowledging that project-specific factors and terminals' operational nuances require Member States to accommodate the terminal's services and capacity allocation approaches accordingly, fostering of competition can be facilitated through certain measures. For instance, avoiding the exclusive allocation of the entire capacity in the initial round should be considered. This would involve reserving capacity (e.g., 10%), at least in initial processes, to avoid a rapid market closure. It is to be pondered that short-term capacity products can lead to higher relative revenues for LSOs, so this can have also positive impacts for revenue recovery when there is ample market interest in capacity. Complementarily, consultation processes can prove very valuable in gauging interest from market participants and should be strongly considered when determining the primary capacity allocation procedures at the new terminals. Those processes can be also used to explore the interest in reserving shorter-term products. As regards of the capacity allocation mechanisms, and as the recent CEER Report highlights, market-based mechanisms such as auctions should be favoured to assign primary capacity when demand exceeds offered capacity. Auctions would help to better assess the market-interest in capacities and assign them correspondingly⁵¹. Furthermore, limiting the share or the extension of the primary capacity that can be assigned, at least in the first round, to terminal users with a dominant position - either in the terminal or the overall market - can be pondered, as this measure could increase the number of market participants, thereby enhancing competition. This approach would be particularly pertinent at those terminals linked to less liquid hubs, or overall, in less competitive markets, especially where evidence suggests that alternative LNG suppliers willing to access the system are facing difficulties to compete in the market.

50 See GIE [Transparency Template](#).

51 At non congested systems, other allocation mechanisms, such as first come first serve could also be appropriate as long as they are transparent and non-discriminatory.

111 **Flexibility:** The increasing EU reliance on spot LNG purchases, together with the irregularity of natural gas demand, underscores the importance of enhancing the operational flexibility for terminals users. Yet, this needs to be made compatible with adhering to the terminals and systems' technical boundaries. For example, the possibility to allocate unbundled products can incentivize the participation of additional market participants, enabling them to engage in LNG trading and to supply gas from terminals' without physically downloading the gas. Flexibility also relates to gas send-out patterns; a higher flexibility in regasification patterns, rather than a steady operation, should better enable the optimization of supply portfolios to meet more fluctuating demand and trading dynamics. Again, it is recognized that project-specific factors and terminals' operational features (e.g., lacking the possibility to operate regasification equipment in a modular shape, but also a tighter storage vs regasification capacity ratio) may pose challenges or make certain flexibility requirements unfeasible in various systems. Finally, the Virtual regime implemented already in some market such as in Spain, and under consideration in certain jurisdictions, is considered to add additional flexibility for the allocation of short-term slots, as well as operational benefits in terms of more flexibility in gas send-outs.

Annex I: LNG production projects under construction as of March 2024

Table 2: LNG production projects under construction as of March 2024

Country	Project	Capacity Mtons / (bcm)	Expected by
Russia	Artic LNG2 T1	6.6 / (9.0)	2024
Mexico	Fast Altamira LNG T1	1.4 / (1.9)	2024
Congo	Congo FLNG	0.6 / (0.8)	2024
Mauritania	Greater Tortue FLNG	2.5 / (3.4)	2024
US	Golden Pass T1	5.2 / (7.1)	2024
Mexico	Fast Altamira LNG T2-3	2.8 / (3.8)	2025
Canada	LNG Canada T1	7 / (9.5)	2025
US	Golden Pass T2	5.2 / (7.1)	2025
US	Plamenquines Phase 1	13.3 / (18.1)	2025
US	Calcasius Pass T13-18	3.3 / (4.5)	2025
Canada	LNG Canada T2	7 / (9.5)	2026
US	Plamenquines Phase 2	6.7 / (9.1)	2026
US	Golden Pass T3	5.2 / (7.1)	2026
Mexico	Energia Costa Azul	3.2 / (4.3)	2026
Congo	Congo FLNG 2	2.4 / (3.3)	2026
Australia	Pluto LNG 2	5 / (6.8)	2027
Qatar	Qatargas NFE T1-4	32 / (43.5)	2027
Nigeria	NLNG T7	4.2 / (5.7)	2027
Nigeria	Debottleneck T1-6	3.4 / (4.6)	2027
Mozambique	Mozambique LNG T1	6.4 / (8.7)	2027
US	Corpus Christi Stage 3 T1-3	4.5 / (6.1)	2027
US	Rio Grande LNG T1	5.4 / (7.3)	2027
Canada	Woofibre LNG	2.1 / (2.9)	2028
Malaysia	ZF LNG	2.7 / (3.7)	2028
Mozambique	Mozambique LNG T2	6.4 / (8.7)	2028
Russia	Artic LNG 2 T2	6.6 / (9.0)	2028
US	Corpus Christi Stage 3 T4-7	6.0 / (8.2)	2028
US	Rio Grande LNG T2	5.4 / (7.3)	2028
US	Port Arthur T1-2	12.0 / (16.3)	2028
US	Rio Grande LNG T3	5.4 / (7.3)	2029
Qatar	North Field Sout Project	16 / (21.8)	2030
Russia	Artic LNG 2 T3	6.6 / (9.0)	2030
Total		189 / (257 bcm)	

Annex II: Overview of terminal and system characteristics and their correlation to access regimes

Country	Terminal	Project timeline	Ownership	Features	Regasification (bcm/y)	Terminal Sponsorship	TPA Regime	Capacity allocation mechanism	Year of Start-up	Investment rational	Gas hub competitiveness (ACER GTM ranking)	Share of LNG send-outs relative to final gas consumption (%)	Number of supply origins in 2023 (LNG and pipeline)
Belgium	Zeebrugge	Existing in 2022	Fluxys LNG	Onshore	14,8	Fluxys LNG	Regulated	Open Season and FCFS	1987	LNG market development	Advanced	75%	10
	Zeebrugge	Expansion	Fluxys LNG	Onshore	4.3	Fluxys LNG	Regulated	Open Season and FCFS	2024	Security of supply			
	Zeebrugge	Expansion	Fluxys LNG	Onshore	1.8	Fluxys LNG	Regulated	Open Season and FCFS	2026	Security of supply			
Croatia	Krk Island	Existing in 2022	LNG Croatia	FSRU	2,6	LNG Croatia	Regulated	FCFS	2021	LNG market development	Incipient	104%	8
	Krk Island	Expansion	LNG Croatia	FSRU	3.4	LNG Croatia	Regulated	FCFS	Oct. 2025	LNG market development			
Finland	Pori	Existing in 2022	Gasum LNG Oy	Onshore	-	Seller/ Shipper	Off - grid	Pro rata	2016	Market liberalisation and competition	Incipient	105%	5
	Inkoo	New	Floating LNG Terminal Finland Oy	FSRU	4.7	Floating LNG Terminal Finland Oy	Regulated	Pro rata	Jan. 2023	Security of supply			
France	Dunkerque	Existing in 2022	Dunkerque LNG (Fluxys)	Onshore	13,0	Seller/ Shipper	Exempted	Open Season and FCFS	2016	Security of supply	Advanced	91%	8
	Fos Cavau	Existing in 2022	Fosmax LNG (Elengy)	Onshore	8,5	TSO/ Government	Regulated	Open Season and FCFS	2010	Market liberalisation and competition			
	Fos Tonkin	Existing in 2022	Elengy	Onshore	1,5	TSO/ Government	Regulated	Open Season and FCFS	1972	LNG market development			
	Montoir-de-Bretagne	Existing in 2022	Elengy	Onshore	10,0	TSO/ Government	Regulated	Open Season and FCFS	1980	LNG market development			
	Fos Cavaou	Expansion	Fosmax LNG	Onshore	1.2	Fosmax LNG	Regulated	Open Season and FCFS	Oct. 2023	Security of supply			
	Fos Cavaou	Expansion	Fosmax LNG	Onshore	0.3	Fosmax LNG	Regulated	Open Season and FCFS	2024	Security of supply			
	Cape Ann	New	TotalEnergies LNG Services France (TELSF)	FSRU	5.0	TotalEnergies LNG Services France (TELSF)	Exempted (50%)	Open Season (for non-exempted)	Oct. 2023	Security of supply			

Country	Terminal	Project timeline	Ownership	Features	Regasification (bcm/y)	Terminal Sponsorship	TPA Regime	Capacity allocation mechanism	Year of Start-up	Investment rational	Gas hub competitiveness (ACER GTM ranking)	Share of LNG send-outs relative to final gas consumption (%)	Number of supply origins in 2023 (LNG and pipeline)
Germany	Wilhelmshaven	New	Deutsche Energy Terminal (DET)	FSRU	3.9	Deutsche Energy Terminal (DET)	Restricted TPA until 03/2024	- Maximum 90% on long-term (FCFS)	Dec. 2022	Security of supply	Advanced	9%	9
	Wilhelmshaven	New	Tree Energy Solution (TES)	FSRU	-	Tree Energy Solution (TES)	Regulated	- Minimum 10% year ahead or non-yearly (Auctions)	Q1. 2024	Security of supply			
	Wilhelmshaven	New	Deutsche GrünGas Energieversorgung GmbH (DGGEV)	Onshore	-	Deutsche GrünGas Energieversorgung GmbH (DGGEV)	Exempted		n.a.	Security of supply			
	Brunsbüttel	New	Deutsche Energy Terminal (DET)	FSRU	1.7	Deutsche Energy Terminal (DET)	Restricted TPA until 03/2024		Mar. 2023	Security of supply			
	Brunsbüttel	New	German LNG Terminal GmbH	Onshore	-	German LNG Terminal GmbH	Exempted		n.a.	Security of supply			
	Stade	New	Hanseatic Energy Hub GmbH	FSRU	-	Hanseatic Energy Hub GmbH	Regulated		Q1. 2024	Security of supply			
	Stade	New	Hanseatic Energy Hub GmbH	Onshore	-	Hanseatic Energy Hub GmbH	Exempted		Q4. 2026	Security of supply			
	Deutsche Ostsee (Lubmin)	New	Deutsche ReGas	FSRU	5.2	Deutsche ReGas	Exempted		Jan. 2023	Security of supply			
	Deutsche Ostsee (Mukran)	New	Deutsche ReGas	FSRU	8.1	Deutsche ReGas	Exempted		Dec. 2023	Security of supply			
	Deutsche Ostsee (Murkan)	Expansion	Deutsche ReGas	FSRU	1.1	Deutsche ReGas	Exempted		Oct. 2024	Security of supply			
Greece	Revithoussa	Existing in 2022	Desfa	Onshore	7,0	TSO/ Government	Regulated	Auctions	2000	LNG market development	Incipient	55%	9
	Alexandroupolis	New	Gastrade	FSRU	5.9	Gastrade	Exempted	Market mechanisms (for unreserved as long-term capacity)	Jan. 2023	Security of supply			
	Dioriga	New	Dioriga Gas	FSRU	4.4	Dioriga Gas	Exempted		Mar. 2025	Security of supply			
	Volos	New	Mediterranean Gas	FSRU	5.5	Mediterranean Gas	Exempted		Dec. 2025	Security of supply			
	Thrace	New	Gastrade	FSRU	6.4	Gastrade	Exempted		Dec. 2025	Security of supply			
	Thessaloniki	New	Elpedison	FSRU	5.1	Elpedison	Exempted		Dec. 2026	Security of supply			

Country	Terminal	Project timeline	Ownership	Features	Regasification (bcm/y)	Terminal Sponsorship	TPA Regime	Capacity allocation mechanism	Year of Start-up	Investment rational	Gas hub competitiveness (ACER GTM ranking)	Share of LNG send-outs relative to final gas consumption (%)	Number of supply origins in 2023 (LNG and pipeline)
Italy	Toscana (Livorno)	Existing in 2022	OLT Offshore LNG Toscana	FSRU	3,6	TSO/ Government	Regulated	Auctions	2013	Market liberalisation and competition	Advanced	26%	18
	Porto Levante (Rovigo)	Existing in 2022	Adriatic LNG	Offshore	9,0	Seller/ Shipper	Hybrid (71% exemp., 29% reg.)	Auctions	2009	Market liberalisation and competition			
	Panigaglia	Existing in 2022	Snam	Onshore	3,4	TSO/ Government	Regulated	Auctions	1971	LNG market development			
	Porto Levante (Rovigo)	Expansion	Adriatic LNG	Offshore	2.0	Adriatic LNG	Hybrid (71% exemp. 29% reg.)	Auctions	2022	Security of supply			
	Piombino	New	FSRU Italia	FSRU	4.6	FSRU Italia	Regulated	Auctions	Jul. 2023	Security of supply			
Lithuania	Klaipėda	Existing in 2022	Klaipėdos Nafta (KN)	FSRU	4,0	TSO/ Government	Regulated	Open Season	2014	Market liberalisation and competition	Incipient	195%	5
	Klaipėda	Expansion	Klaipėdos Nafta (KN)	FSRU	1.3	Klaipėdos Nafta (KN)	Regulated	Open Season	2027	Security of supply			
Estonia	Paldiski	New	Elering AS	FSRU	-	Elering AS	n.a.	n.a.	n.a.	Security of supply	Incipient	n.a.	5
Malta	Delimara	Existing in 2022	ElectroGas Malta	FSU	0,7	TSO/ Government	Regulated	Direct	2017	LNG market development	Incipient	78%	2
Netherlands	Gate (Rotterdam)	Existing in 2022	Gate Terminal	Onshore	12,0	Seller/ Shipper	Exempted	Open Season	2011	LNG market development	Established	72%	18
	Gate	Expansion	Gate Terminal	Onshore	4.3	Gate Terminal	Exempted	n.a.	Oct. 2026	Security of supply			
	EemsEnergyTerminal	New	EemsEnergy Terminal	FSRU	11.6	EemsEnergy Terminal	Exempted	n.a.	Sep. 2022	Security of supply			
Poland	Świnoujście	Existing in 2022	Gaz System	Onshore	6,2	TSO/ Government	Regulated	Open Season	2016	LNG market development	Emerging	33%	12
	Świnoujście	Expansion	Gaz System	Onshore	2.1	Gaz System	Regulated	Open Season	2024	Security of supply			
	Gdańsk	New	Gaz System	FSRU	6.5	Gaz System	Regulated	Open Season	2028	Security of supply			
Portugal	Sines	Existing in 2022	REN Atlântico	Onshore	7,6	TSO/ Government	Regulated	Auctions	2004	LNG market development	Incipient	116%	4

Country	Terminal	Project timeline	Ownership	Features	Regasification (bcm/y)	Terminal Sponsorship	TPA Regime	Capacity allocation mechanism	Year of Start-up	Investment rational	Gas hub competitiveness (ACER GTM ranking)	Share of LNG send-outs relative to final gas consumption (%)	Number of supply origins in 2023 (LNG and pipeline)
Spain	Barcelona	Existing in 2022	Enagás	Onshore	17,1	TSO/ Government	Regulated	Auctions	1969	LNG market development	Advanced	88%	19
	Bilbao	Existing in 2022	BBG	Onshore	7,0	TSO/ Government	Regulated	Auctions	2003	Market liberalisation and competition			
	Cartagena	Existing in 2022	Enagás	Onshore	11,8	TSO/ Government	Regulated	Auctions	1989	LNG market development			
	Huelva	Existing in 2022	Enagás	Onshore	11,8	TSO/ Government	Regulated	Auctions	1988	LNG market development			
	Mugardos	Existing in 2022	Reganosa	Onshore	3,6	TSO/ Government	Regulated	Auctions	2007	Market liberalisation and competition			
	Musel	New	Enagás	Onshore	7,5	Enagás	Regulated	Auctions	2023	Security of supply			
	Sagunto	Existing in 2022	Enagás	Onshore	8,8	TSO/ Government	Regulated	Auctions	2006	Market liberalisation and competition			
Sweden	Lysekil	Existing in 2022	Gasum LNG Oy	Onshore	-	Seller/ Shipper	Off - grid	n.a.	2014	LNG market development	Incipient	28%	3
	Nysahamn LNG	Existing in 2022	Gasum LNG Oy	Onshore	-	Seller/ Shipper	Off - grid		2011	LNG market development			
United Kingdom	Dragon	Existing in 2022	Dragon LNG	Onshore	7,6	Seller/ Shipper	Exempted	Auctions	2009	Market liberalisation and competition	Established	30%	16
	Grain LNG	Existing in 2022	National Grid	Onshore	19,5	Seller/ Shipper	Exempted	Auctions	2005	LNG market development			
	South Hook	Existing in 2022	South Hook LNG Terminal	Onshore	21,0	Seller/ Shipper	Exempted	Auctions	2009	Market liberalisation and competition			
	Grain LNG	Expansion	National Grid	Onshore	-	National Grid	Exempted	Auctions	Jul. 2025	Security of supply			

Note: LNG send-outs in the market measured as a share compared to total consumption in the Member State, including possible imports for transit. The investment rational refer to three possible options: Security of supply (linked to 2022 and 2023 needs to offset Russian supply), LNG market development (initial investments to kick-off and promote the market) and market competition and liberalisation (to keep promoting competition in more mature markets). LNG share relative to consumption may mask that substantial volumes of LNG imports in the Member State may be re-exported to neighbouring markets.

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Table 2: LNG production projects under construction as of March 202445