Offshore LNG terminals in Europe

Part 3

Spain
France
Netherlands
Italy
Belgium

2025

Content

Leading countries of LNG receiving and regasification capacity in Europe

Historically, Europe has received most of its natural gas through a network of pipelines, while only a few countries on the Iberian Peninsula, including Spain and Portugal, have imported liquefied natural gas (LNG) using offshore tankers through dedicated terminals. This approach provided these countries with a significant advantage in developing LNG infrastructure, leading to the establishment of large-scale LNG receiving and processing facilities.

However, the growing demand for this type of fuel from key players in the global energy market, such as China, Japan and South Korea, is shaping a new market environment where European nations will have to compete for favorable offers from global LNG suppliers.

Among the European leaders in developing LNG receiving capacity are countries such as Spain, the UK, France, the Netherlands, Italy and Belgium.

These countries have advanced terminals and infrastructure to efficiently handle large volumes of LNG.

Let's take a closer look at each of these markets:

- **Spain**

Spain leads Europe in the number and volume of LNG receiving terminals. Its geographical location and proximity to major gas producers in North Africa and the Middle East have made it an important hub for LNG distribution within Europe. Its terminals have high throughput capacity and can quickly adapt to changing demand conditions.

- **France**

France has several large LNG terminals located along the Atlantic coast and the Mediterranean. These facilities allow the country to diversify its gas supplies and ensure security of supply in the event of possible disruptions to traditional pipeline networks. In addition, France is actively involved in international LNG infrastructure development projects, which strengthens its position on the world market.

- **The Netherlands**

The Netherlands is known for its terminals in the port of Rotterdam, which are among the largest in Europe. This infrastructure allows the Netherlands to play an important role as a hub for gas distribution between different countries on the continent. The Netherlands is also actively developing gas recovery and storage technologies, which makes the country an attractive partner for global LNG producers.

- **Italy**

Italy has several LNG terminals located along the Adriatic and Tyrrhenian Seas. These facilities provide the country with a stable gas supply and allow it to diversify its energy sources. Italy actively cooperates with LNG producers in the Mediterranean region, which strengthens its position at the regional level.

- **Belgium**

Belgium has modern LNG terminals located in the ports of Antwerp and Zeebrugge. These facilities play a key role in supplying gas to Belgium and neighboring countries. Belgium is actively developing its gas storage and transportation infrastructure, which makes it an important player in the European LNG market.

These leading countries form the basis of the European LNG strategy and play a key role in ensuring the energy security of the entire continent.

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Let us now turn to a detailed examination of the LNG marine terminal infrastructure in these countries.

Energy hubs of the leading countries in the European LNG market.

Spain

Spain has one of the most developed networks of LNG receiving and regasification terminals in Europe, the fourth largest in the world.

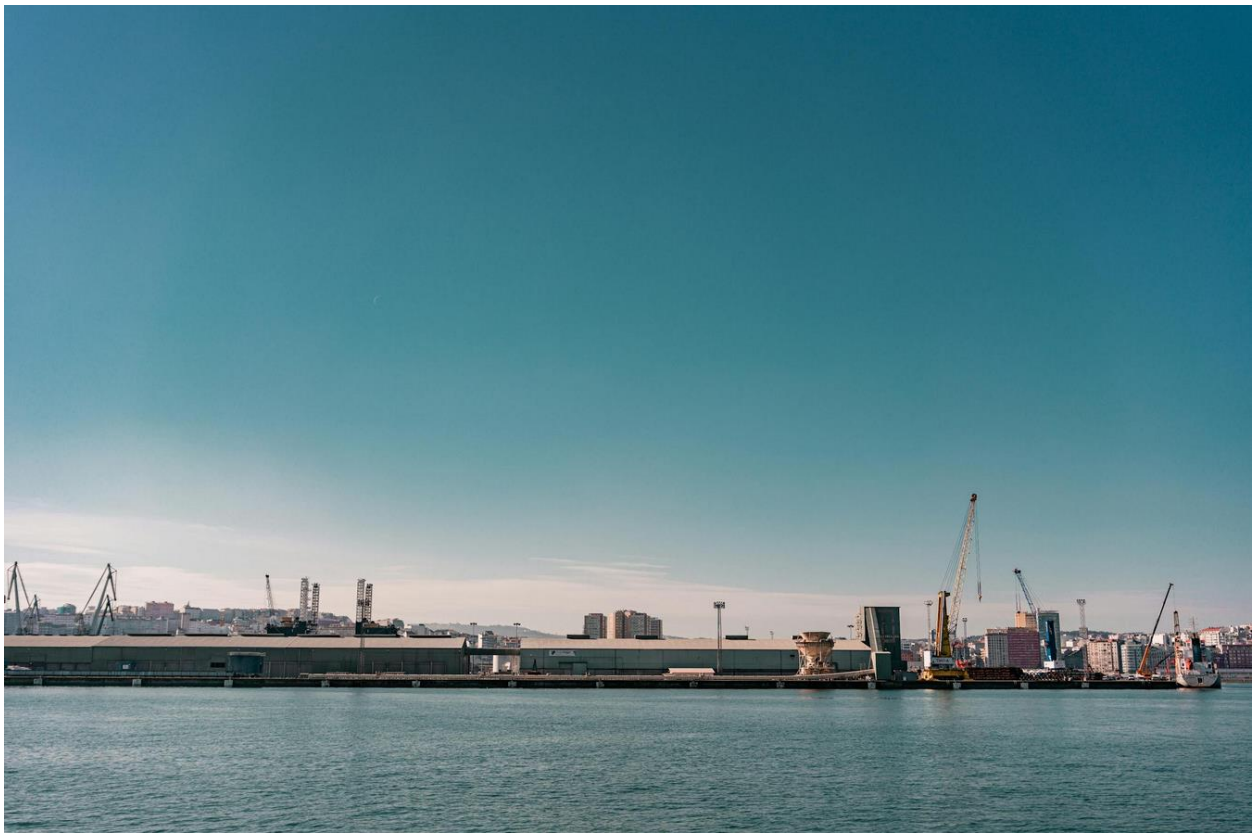
The country has a geostrategic position between the Atlantic, Cantabrian and Mediterranean basins, making it a key player in ensuring the region's energy security.

There are 7 operating LNG terminals in the country and 4 of them, in Huelva, Barcelona, Cartagena (Murcia) and Gijon, are operated by **Enagás**, the national operator of the gas transportation system.

Main LNG terminals in Spain:

- **Barcelona LNG**

The oldest terminal, commissioned in 1969, is located in Catalonia.



Owner and operator: Enagás

Terminal Characteristics

- LNG regasification capacity 17.1 billion m^3/year (11 million tons/year)
- - Regasification: 1,950,000 N m^3/h.
- - 8 Onshore LNG storage tanks
- - LNG storage capacity of 840,000 m^3.
- - Two berths and modern regasification infrastructure to cater for different size vessels
- - Minimum sea depth alongside 15 m
- - Accepts vessels with capacities from 80,000 to 266,000 m^3

Important for supplying Catalonia and exporting gas to Southern Europe.

LNG imports via Barcelona are part of Spain's diversified strategy.

Main suppliers: USA, Algeria, Nigeria, Qatar, Norway, Trinidad and Tobago, spot supplies from global markets.

Barcelona LNG's performance in 2023

Barcelona terminal handled about 25-30% of Spain's LNG imports, i.e. 17.5 billion m^3 (12 million tons of LNG), with terminal utilization of about 85-90% of capacity.

About 40% of Spanish LNG (about 28 billion m^3) came from the US, of which about 8 billion m^3 via Barcelona. Algeria accounted for about 15%, Qatar for 12%, and Nigeria for 10%.

- **Cartagena LNG**

The terminal is located at the Escombreras dock in the Spanish province of Murcia, commissioned in 1989.

Owner and operator: Enagás

Terminal Characteristics

- LNG regasification capacity 11.8 billion m³/year (8.5 million tons/year)
- Regasification: 1,350,000 N m³/h.
- Loading rate up to 7222 m³/h
- 5 Onshore LNG storage tanks
- LNG storage tank capacity 587,000 m³
- Minimum sea depth alongside 15 m
- Accepted vessels up to 266,000 m³

One of the largest terminals, connected to the Medgaz pipeline (Algeria-Spain).

Enagás is transforming the Cartagena terminal into a multifunctional logistics complex, modernizing the infrastructure to serve small volumes of LNG, including ship bunkering and gas-to-power projects.

At year-end 2023, 8.2 billion m³ of LNG was imported through the terminal, representing about 69.5% of its capacity.

- **Huelva LNG**

The terminal is located in the southwest of the Iberian Peninsula, in Andalusia. It was commissioned in 1988.

Owner and operator: Enagás

Terminal Characteristics

- LNG regasification capacity 11.8 billion m³/year (8.5 million tons/year)
- Regasification: 1,350,000 N m³/h.
- 5 Onshore LNG storage tanks
- LNG storage capacity of 620,000 m³.
- Minimum sea depth alongside 12.5 m
- Accepted vessels from 29,500 to 266,000 m³
- Loading capacity of 50 tankers per day

The terminal supplies Andalusia and gas to Portugal.

At the end of 2023, 14.1 billion m³ of LNG was imported through the terminal.

- **Bilbao LNG (Bahía de Bizkaia Gas (BBG))**

Key terminal for the northern regions of Spain, located in the port of Bilbao, municipality of Zierbena, Biscaya. Built in 2003.

Owners: Enagás (50%), Basque Energy Board (50%)

Terminal Characteristics

- LNG regasification capacity of 8.8 billion m³/year (7 million tons/year)
- Regasification capacity is 1,000,000 Nm³/h,
- 3 LNG storage tanks
- LNG storage capacity of 450,000 m³.
- Receiving vessels up to 270,000 m³
- 4 seawater evaporators with a capacity of 200,000 Nm³
- 800 MW natural gas-fired combined cycle power plant
- Minimum sea depth alongside 20 m
- LNG tanker unloading facilities with a capacity of up to 270,000 m³
- Trunk tank loading stations that can load 15 tankers per day

The terminal is connected to European markets by the Euskadour pipeline and Spain's domestic network.

The Bilbao terminal covers up to 16% of the country's domestic natural gas needs.

In 2024, 50,887 GW·h (4.5 billion m³) of liquefied natural gas was processed through the terminal, accounting for 27% of Spain's total LNG imports in that year.

- **Musel E-Hub**

The terminal began commercial operations in August 2023 and is located in Gijon, Asturias.

Owner: Enagás (75%), Reganosa (25%)

Terminal Characteristics

- LNG regasification capacity 7 billion m^3/year (5 million tons/year)
- Regasification: 800,000 N m^3/h.
- 2 LNG storage tanks
- LNG storage tank capacity 300,000 m^3
- Receiving vessels from 50,000 to 266,000 m^3
- Seawater evaporators and auxiliary equipment and discharge arms capable of discharging 18,000 m^3 per hour
- Two tanker loading racks with a maximum capacity of 9 GW·h/day
- Minimum sea depth alongside 14.5 m
- Annual loading capacity of the plant is 10,950 tankers.

The terminal was commissioned in 2012, but immediately went into “dormant mode” in anticipation of increased demand, remaining idle until 2023.
The terminal now operates on a hybrid business model, whereby:

- Part of the storage is allocated to marketing under long-term contracts and the other part is allocated to regulated business.
- LNG tanker loading and unloading operations are carried out on an unregulated basis.

Tanker loading operations are carried out in controlled access mode.

- **Sagunto LNG Terminal**

Located in the port of Sagunto, Valencia and is a key facility for the Spanish energy sector due to its strategic location in the Mediterranean arc and proximity to producing countries in Africa and the Middle East. It has been in operation since 2006.

Owners: Enagás Transporte, Osaka Gas and Oman Oil Holdings Spain.

Operator: Saggas

Terminal Characteristics

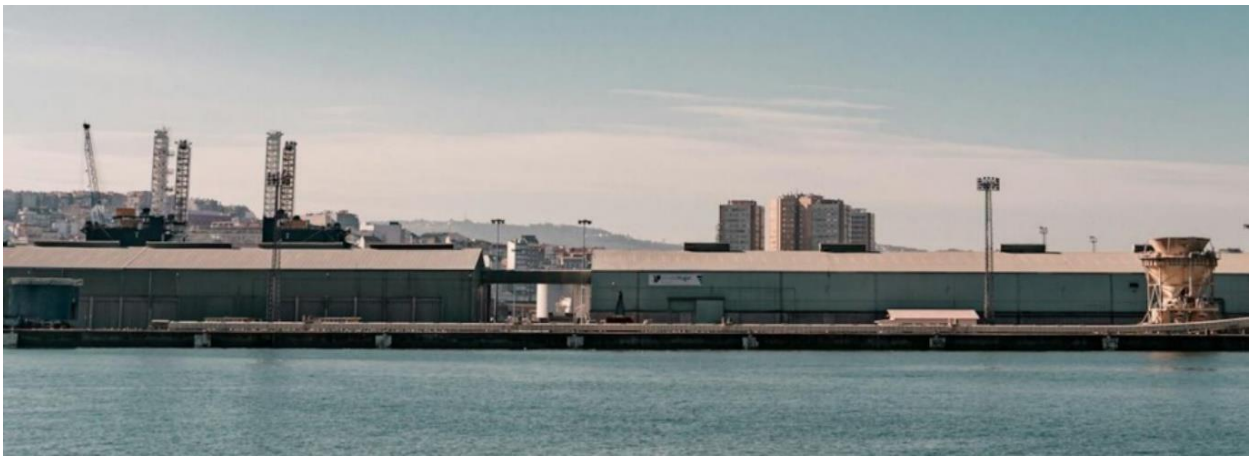
- LNG regasification capacity 8.8 billion m³/year (7 million tons/year)
- Regasification capacity 1,000,000 N m³/h
- Two types of evaporators for the regasification process: 5 seawater vaporizers with a capacity of 200,000 N m³/h each, and 1 subsea combustor with a capacity of 150,000 N m³/h.
- 4 LNG storage tanks
- Capacity of LNG storage tanks 600,000 m³.
- 3 hoses for cryogenic liquids, with a fourth hose for gas return to the ship with a maximum flow rate of 12,000 m³/h.
- Accepted vessels from 20,000 to 265,000 m³
- Dock for vessels of less than 6,500 m³ capacity³

Loading of 35 LNG tank trucks per day, 24 hours a day. Possibility to transship LNG into methane tankers with a maximum flow rate of 3,000 m³/hr.

The Sagunto LNG terminal has experienced serious underutilization problems in recent years, especially in the third quarter of 2018 when it was idle while the Barcelona terminal was operating at congestion. This is due to the overbuilding of LNG terminals in Spain and insufficient regulation of LNG capacity allocation.

Terminal performance results 2024:

Received 32 vessels with an energy equivalent of 27.297 GW·h.
Total discharged about 1,789,600 tons of LNG, loaded about 293,000 tons of LNG.



26.675 GW·h total output of the terminal. Meanwhile, 21,482 GW·h shipped through the pipeline, 192,878 tons loaded on 6 vessels, 7,979 tanker trucks loaded 147,210 tons.
LNG suppliers: USA 38%, Nigeria 25.7%, Argelia 24.3%, Rusia 7.6%, Qatar 3.2%, Trinidad y Tobago 1.2%

- **Mugardos LNG Terminal**

Located in Mugardos, Ferrol Port, La Coruña, Galicia, commissioned in 2007.

Owner: Roganosa

Terminal Characteristics

- LNG regasification capacity 3.6 billion m³/year (2.8 million tons/year)
- Regasification capacity 412,800 N m³/h
- ORV and SCV vaporization technology
- 2 storage tanks
- LNG storage tanks capacity 300,000 m³
- Receiving vessels up to 260,000 m³
- Unloading operations 12,000 m3 /h and LNG loading to ships 1,000 m3 /h
- 1 berth
- Annual loading capacity - 12,775 tankers.

Earlier, three expansion projects were envisioned for the Mugardos terminal in 2020, 2022 and 2024, which have been postponed indefinitely.

Thus, Spain's total gasification capacity now stands at 68.9 billion m3/year and is the largest in the EU.

LNG terminals in Spain account for about a third of all European LNG import capacity, although utilization remains among the lowest in the region. On average over the past 15 years, these terminals have been utilized at just 34%.

This fell to 22% in 2015, and in 2023, for example, the Barcelona terminal was at 12% utilization, El Mucel at 14%, and in 2024 the Sagunto terminal was 21% utilized and Hueliva at 23% utilized.

Gas consumption by the country

Natural gas consumption in Spain is mainly on a downward trend from 2019: 364 terawatt-hours in 2022, 325.4 TW·h in 2023, 311.7 TW·h in 2024g.

The population of Spain is 48.35 million.

How the country's needs are being met:

- **Natural gas reserves:** 1 billion m³.
- **Natural gas resources:** 19 billion m³.
- **Own production.** In 2023, the country produced 540 GW·h which is less than 1% of the country's consumption.
- **LNG imports:** Spain has one of the most diversified energy supplies in the world. It received natural gas from 17 different countries in 2023 and 14 in 2024.
  LNG imported in 2023: 24.9 billion m³, in 2024 18.02 billion m³.
- **4 gas storage facilities:** 6.4 million m³ of LNG.
  Three of them are depleted gas fields: Gaviota, Serrablo and Marismas. Yela is a saline aquifer (storage in a porous medium). Marismas is owned by a subsidiary of Gas Natural Fenosa and the other three are owned by Enagás Transporte, the working gas capacities are: Gaviota, 2.7 bcm; Serrablo, 1.1 bcm; Marismas, 0.6 bcm³ and Yela, 2 bcm³**.**
- **Import pipelines:** 2 pipelines from North Africa:
  - Maghreb-Europe Gas Pipeline, connecting Spain with Algeria, carrying capacity of 13.5 billion m³ per year. Not in operation since 2021.
  - MEDGAZ - Undersea gas pipeline between Algeria and Spain, capacity 10.5 billion m³ per year.

Suppliers of LNG in 2024:

Russia 6.38 billion m³ (35%), the USA 5.37 billion m³ (30%), Algeria 2.24 billion m³ and Nigeria 2.11 billion m3 (12%), Qatar 1 billion m³ (6%), Norway 0.24 bn m³, Trinidad and Tobago 0.16 bn m³, Peru 0.1 bn m³, Angola 0.18 bn m³**.**

Exports: In 2023, Spain exported about 75.5 TW·h of natural gas and became the world leader among non-gas producing countries in terms of LNG re-export - 22.1 TW·h. The Spanish Government has been developing a new strategy to promote the use of natural gas. In addition, the export of pipeline gas to Europe through the Irun and Larro pipelines in France reached 38.2 TW·h, in Morocco - 9.5 TWh etc. countries*.

The export of natural gas to Europe in 2024 reached 34.5 TW·h. The export of natural gas to Europe in 2024 reached 34.5 TW·h. through pipelines, increasing it by 23.7%, and through the loading of ships with liquefied natural gas. The country exported to France, Morocco through the Euskador export gas pipeline connecting France with the Spanish liquefied natural gas terminal in Bilbao.

** Spain has a virtual interconnection point with France called "VIP Pirineos," which gathers the two physical interconnection points "Larrau" and "Biriatou (FR) / Irun (ES)," and a virtual interconnection point between Portugal and Spain called "VIP Ibérico," which gathers the two physical interconnection points "Valença do Minho (PT) / Tuy (ES)" and "Badajoz (ES) / Campo Maior (PT)". 10 The annual capacity of the VIP Ibérico is 4.6 bcm from Spain to Portugal and 2.6 bcm in the opposite direction. The capacity of the VIP Pirineos is 7.5 bcm in the flow from Spain to France and 5.5 bcm from France to Spain.*

Gas consumption by sector:
Industrial sector more than 50%
Electricity sector 30%
Transport sector 3.5%

France

France has 4 LNG terminals with a capacity of 39.5 billion m³: two terminals are located in the commune of Foz-sur-Mer in the south-east of the republic (department of Bush-du-Ron), the third - in the city of Saint-Nazaire in the west of the country (department of Atlantic Loire), the fourth LNG terminal is located in Dunkirk in northern France.

Elengy operates three of these LNG terminals: Montrouge-de-Bretagne on the Atlantic coast, Fos Cavaou and Foss-Tonkin on the Mediterranean.

- **Fos Cavaou LNG Terminal**

Terminal, covering an area of 80 hectares, located in the commune of Foz-sur-Mer, in the district of Est, department of Bush-du-Ron, region of Provence-Alpes-Côte d'Azur, put into operation in 2010.

Owner: Foxmax LNG - 100% дочерняя компания Elengy

Management: Elengy

Terminal characteristics

- LNG regasification capacity 8.25 bn m³ /year (5.9 mn t/year)
- Regasification capacity up to 1,000,000 N m³ /h
- 3 LNG storage tanks
- Volume of LNG storage containers 330,000 m³
- Vessels from 5000 to 267000 m³
- Minimum sea depth alongside 15 m

Fos Cavaou LNG will increase the capacity of the terminal from 8.25 billion m³ /year to 16.5 billion m³ /year, according to the expansion and optimization project.

- **Montoir-de-Bretagne LNG Terminal**

The 73-hectare terminal is located in the commune of Montrouge de Bretagne, district of Saint-Nazaire in the department of Loire-Atlantique and was commissioned in 1980.

Ownership and management: Elengy

Terminal characteristics

- LNG regasification capacity 10 bn m³ /year (7.1 mn t/year)
- Regasification capacity 1,600,000 N m³ /h
- 3 LNG storage tanks
- Volume of LNG storage tanks 360,000 m³

• Vessels from 65,000 to 267,000 m³
• Minimum sea depth alongside 15 m
• 2 docks

It is one of the largest terminals in Europe with a capacity equivalent to 1/4 of the annual gas consumption in France.
Qatar Petroleum will deliver 3 million t/g from 2020 to 2035.
All available terminal volumes are fully booked.

- **Fos Tonkin LNG Terminal**

The terminal is located in the commune of Foz-sur-Mer, in the East District, department of Bush-du-Ron, region of Provence-Alpes-Côte d'Azur and was put into operation in 1972.

Ownership and management: Elengy

Terminal characteristics

- LNG regasification capacity 1.85 billion m³ /year (1.3 million t/year)
- Regasification capacity 18 TW·h/year
- Regasification capacity up to 1 500 000 N m³ /h
- 1 storage tank of 80,000 m³
- 1 dock
- Ships from 7,500 to 75,000 m³
- Minimum sea depth alongside 12 m

Terminal is a multimodal platform with loading and reloading of LNG in road, rail and maritime transport.

- **Dunkerque LNG Terminal**

Terminal is located on 56 hectares in the western port of Dunkirk, commissioned in 2016.

Ownership and management:

61% owned by a consortium that includes the gas infrastructure group Fluxys, Axa Investment Managers - Real Assets acting on behalf of its clients, and Crédit Agricole Assurances, a 39% owned by Korean investors consortium led by IPM Group in collaboration with Samsung Asset Management.

Operator: Gaz-Opale, 51% subsidiary of Dunkerque LNG and 49% Belgian group Fluxys.

Terminal characteristics

- LNG regasification capacity 13 bn m³ /year (9.3 mn t/year)
- Capacity - 176 vessels per year
- 3 LNG storage tanks
- Volume of storage tanks 600,000 m³
- 10 open evaporators (ORV)
- Receiving vessels 267,000 m 3
- Minimum sea depth alongside 19 m
- 2 dock
- Directly linked to two markets - French and Belgian - through two separate pipelines.

The terminal accounts for about 20-25% of annual natural gas consumption in France.

Results 2023 Dunkerque LNG Terminal

127 tankers accepted, 124 TW·h LNG unloaded, 0.3 TW·h shipped.

Country's needs

According to statistical data, France has consumed 30-40 billion m³ per year in recent years. This is the case for France.

In 2023, France has impeached 30.7 billion. m³ generated through liquefied natural gas terminals, which made up a significant share of the country's total natural gas consumption of 33.9 billion m³.

French population 68.29 million people.

How the country's needs are met:

- **Natural gas reserves:** 1 billion m^3
- **Natural gas resources:** 64 billion m^3
- **Own production:** negligible - 663TJ in 2023.
- **Imports:** 31.44 bn. m^3 (2023).

  - **Imports of LNG:** 30.7 billion m^3 (2023), 25.34 billion m^3 (2024).
  - **16 underground gas storage facilities** with a total capacity of about 13 billion m^3 (130 TW·h) Of this total, 100 TW·h are operated by Storengy, a subsidiary of Engie which has 14 gas storage facilities in France.
  - **Pipeline gas** from Norway 16 bn. m^3 (2024)

According to the International Energy Agency (IEA) France's supply of natural gas in 2023 amounted to 1,226,003 TJ, equivalent to 31.44 billion. m^3.

With this 6.9% of deliveries - 12 950 billion. m^3 of this fuel the country exported to other European countries after regasification.

LNG suppliers in 2023: USA (43% from 13.2 billion m^3); Algeria (18.2% from 5.6 billion m^3); Russia (15.6% from 4.8 billion m^3); Qatar (7.5% from 2.3 billion m^3); Angola (2.9% from 0.9 billion m^3); Nigeria (almost 2% from 0.6 billion m^3); Peru and Trinidad and Tobago (about 1.3%, or 0.4 bn. m^3 for each of these two countries).

In France, natural gas consumption fell by 20% between 2021 and 2023.

This significant decline is due to a number of factors, including price increases and energy efficiency initiatives.

According to data of the Ministry of Environmental Transition, in 2023 the share of natural gas was 13.5% of the total volume of the country's primary energy consumption (or 18% of the final energy consumption).

Gas consumption by sector:

Industrial sector more than 36%
Residential sector 37.2%
Commercial and public services 21.2%
Transport sector 1.3%

The Netherlands

There are 2 LNG terminals in the country with a capacity of 24 billion m^3, in Emshaven and Rotterdam.

- **Gate terminal Rotterdam**

Import terminal on the Maaswlakte river in Rotterdam has been supplying natural gas to the Netherlands and North-West Europe since 2011.

Ownership and management: голландские Gasunie и Royal Vopak.

Terminal characteristics

- CNG regasification capacity 12 bn. m^3 /year
- 3 LNG storage tanks
- Volume of storage tanks 540,000 m^3
- 3 loading ramps for tankers and an area where LNG is converted into natural gas
- Vessels accepted 266,000 m^3
- Minimum sea depth alongside 14.5/10 m
- 3 docks

Fourth LNG storage tank of 180,000 m^3 and additional regasification capacity of 4 billion m^3 per year is currently under construction.

Construction of the LNG storage tank is expected to be completed in the second half of 2026. After completion of all target projects at the Gate terminal, the total regasification capacity of the terminal will be 20 bn. m³ /year.

The entire fixed capacity of the terminal is reserved until October 1, 2036. Since October 1, 2036, 9 billion m3 of fixed capacity has been reserved. As of 1 October 2039, 6 billion m3 of installed capacity has been reserved. After 1 October 2046, no capacity reserves are made.

Terminal at full load can provide a third of the country's consumption.

- **FSRU EemsEnergyTerminal**

LNG terminal in the port of Emshaven (Groening) consists of two floating FSRU Exmar S188 and Golar Igloo, a total capacity of approximately 8 billion m³ per year. Built in 2022.

Ownership and management: Dutch Gasunie and Vopak 50%.

Terminal characteristics

• LNG regasification capacity 8 bn. m³ /year
• Vessels accepted 266,000 m³
• Connected to the country's underground gas network
• 1 dock

Initially, it was planned that EemsEnergyTerminal would run until the end of 2027, but market participants' interest in importing liquefied natural gas in the near future is now being assessed. This cooperation is necessary to keep the terminal operational after 2027. A final decision on this matter is expected later this year. In addition, an increase in capacity to 10 billion cubic meters per year and the expansion of capabilities through the construction of a hydrogen import terminal and the creation of a CO2 transport hub at the port of Emshaven are being considered.

The Czech Republic leased part of the capacity of the LNG terminal in Emshaven until 2027. The Republic can store there 3 billion m³ of liquefied gas, which provides a third of the country's annual needs.

Terminal covers about 25% of the total annual demand for gas in the Netherlands.

Population of the Netherlands 17.88 million people.

Country's needs

The country's needs are decreasing every year. At a peak in 2010, gas consumption in the Netherlands was more than 53 billion m³. In 2021, it reached 40 billion m³.

In 2022, 2023, 2024 gas consumption in the Netherlands was about the same at 30 billion m³.

At present, about 75 per cent of the Netherlands' gas needs are met by imports.

In 2021, the Netherlands imported 8 billion m³ of LNG, in 2022 imports rose to 16.6 billion m³, and in 2023 - 20 billion m³, in 2024 - 21 billion. m³.

The supply of natural gas, including production and imports less gas, which is exported or stored in 2023 was 918,207 TJ, equivalent to 23.544 billion. m³.

How the country's needs are met

- **Own natural gas production:** 9.1 billion m³ /year (2023)
- **Underground gas storage facilities** with a total capacity of about 14.7 billion m³

Largest HPC: Bergemeer 4.1 billion m³, Alkmar 3.6 billion m³, Grypskerk 2 billion m³ and Norg 7 billion m³.

- **Imports:** 1,202,708 TJ/30.84 billion m³ through:

o Imports of LNG: 21 billion. m³ (2023), 18.64 billion. m³ (2024)

o Pipelines 12 thousand kilometers of pipelines are used to transport gas to Germany, Belgium, Great Britain. Thus, exports to Germany increased by 9% to more than 15 billion m³ in 2022 compared to 2021, taking into account flows at the Bocholc, Bocholc-Fechow, Hanrad, Tegelen, Zewenar, Dinkperlo and Winterswijk sites.

In the opposite direction, in 2023, Germany delivered 35.53 TW·h of gas**.**

Export:

Exports to neighbouring countries amounted to 598 962 TJ/15.36 bn m³.

Suppliers of LNG in 2024.

USA 68% - 12.81 billion m³, Russia 10% - 1.8 billion m³, Algeria 0.19 billion m³, Norway 1.24 billion m³, Nigeria 0.2 billion m3., Trinidad and Tobago 0.83 bn m³, Peru 1.15 bn m³, Angola 0.18 bn m³, other 0.22 bn m³.

Gas consumption by sector:

Industrial sector more than 29%
Residential sector 33.6%
Commercial and public services 15.1
Transport sector 0.4 %

Italy

Currently 4 regasification terminals are in operation in Italy and 1 is being prepared for operation:

- Panigaglia (La Spezia) LNG Terminal (Panigaglia shore plant)
- Porto Levante LNG Terminal
- FSRU OLT Offshore LNG Toscana near Livorno
- FSRU Italis LNG Piombino
- FSRU BW Singapore near Ravenna (arrived in March 2025.)

Today, LNG accounts for about 25% of total gas consumption in the country. With the commissioning of BW Singapore, the total internal regasification capacity will reach 28 billion m^3.

Consider in more detail the Italian LNG capacity.

- **Panigaglia (La Spezia) LNG Terminal**

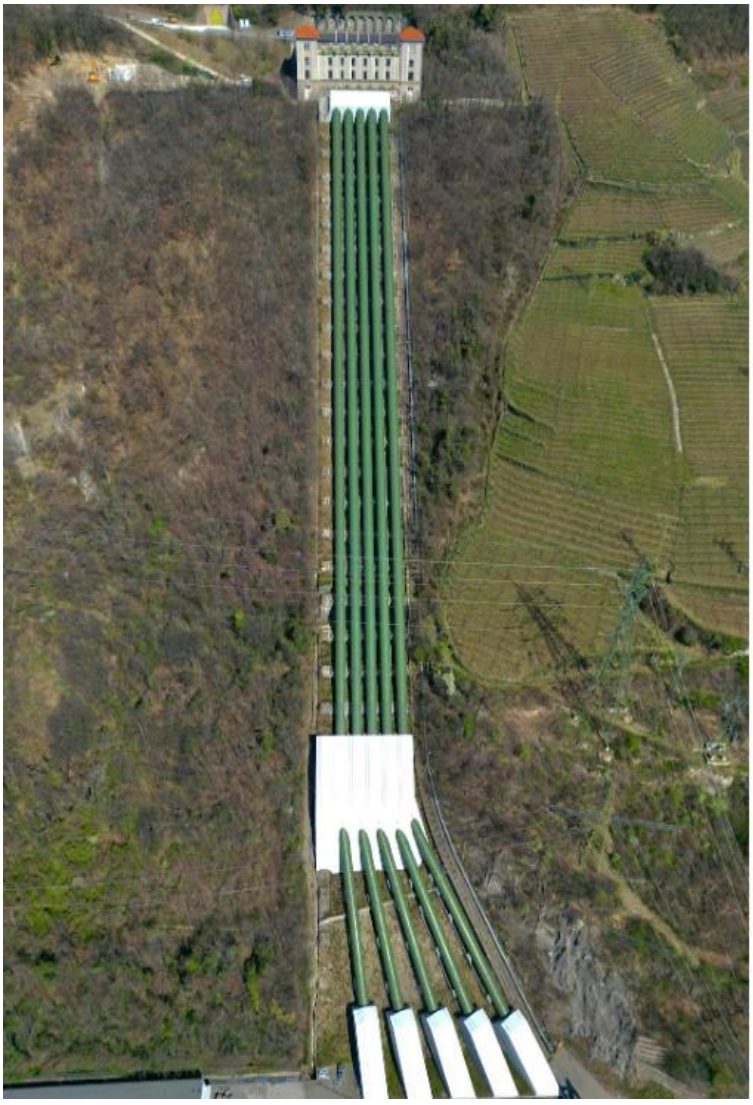
The CNG coastal facility, located in Fezzano-di-Porto-Venere in the north-western Italian region of Liguria, has been in operation since 1971.

Ownership and management: GNL Italia SpA, daughter of Snam (Italian company, operator of the gas transport system of Italy)

Terminal characteristics

- LNG regasification capacity 3.4 billion m³ /year
- Onshore type
- 2 storage tanks with a total capacity of 200,000 m³
- Receiving vessels 70,000 m³
- 1 dock
- Minimum sea depth alongside 10.0 m

- **Porto Levante LNG Terminal**



Terminal located on the coast of the province of Rovigo, Italy, in the Adriatic Sea 15 km from Porto Viro in the Veneto region, operated since 2009.

Ownership and management: Adriatic LNG (VTTI 70%, Snam 30%)

Terminal characteristics

• LNG regasification capacity 9 billion m³ /year

• 2 storage tanks with a total capacity of 500,000 m 3

• Receiving vessels 216,000 m³
• 1 dock

• Minimum sea depth alongside 27.0 m

• Connected by pipeline to the measuring station in Cavalleri

- **FSRU OLT Offshore LNG Toscana**

The ship regasification terminal docked 22 km from the coast of Tuscany in the province of Livorno between Pisa and Livorno, has been operating since 2014, was created from a converted former gas tanker «Golar Frost».

Ownership: First State Investments (a subsidiary of Mitsubishi UFJ Financial Group, through First Sentier Investors Ltd) (48.24%), Snam (49.07%), Golar LNG (2.69%)

Management: OLT Offshore LNG Toscana SpA

Terminal characteristics

- CNG regasification capacity 5 bn. m³ /year
- 4 storage tanks with a total capacity of 137 500 m 3
- Receiving vessels 180,000 m³
- Minimum sea depth alongside 113 m

The regasification capacity of the terminal is fully booked until 2027. FSRU Italis LNG (Piombino)

- **FSRU Italis LNG Piombino**

Floating terminal for the import of liquefied natural gas, located in the port of Piombino, operating since 2023. Ship Italis LNG (renamed from Golar Tundra).

FSRU will remain in its original place at the port of Piombino for the first three years of operation, after which it will move offshore.

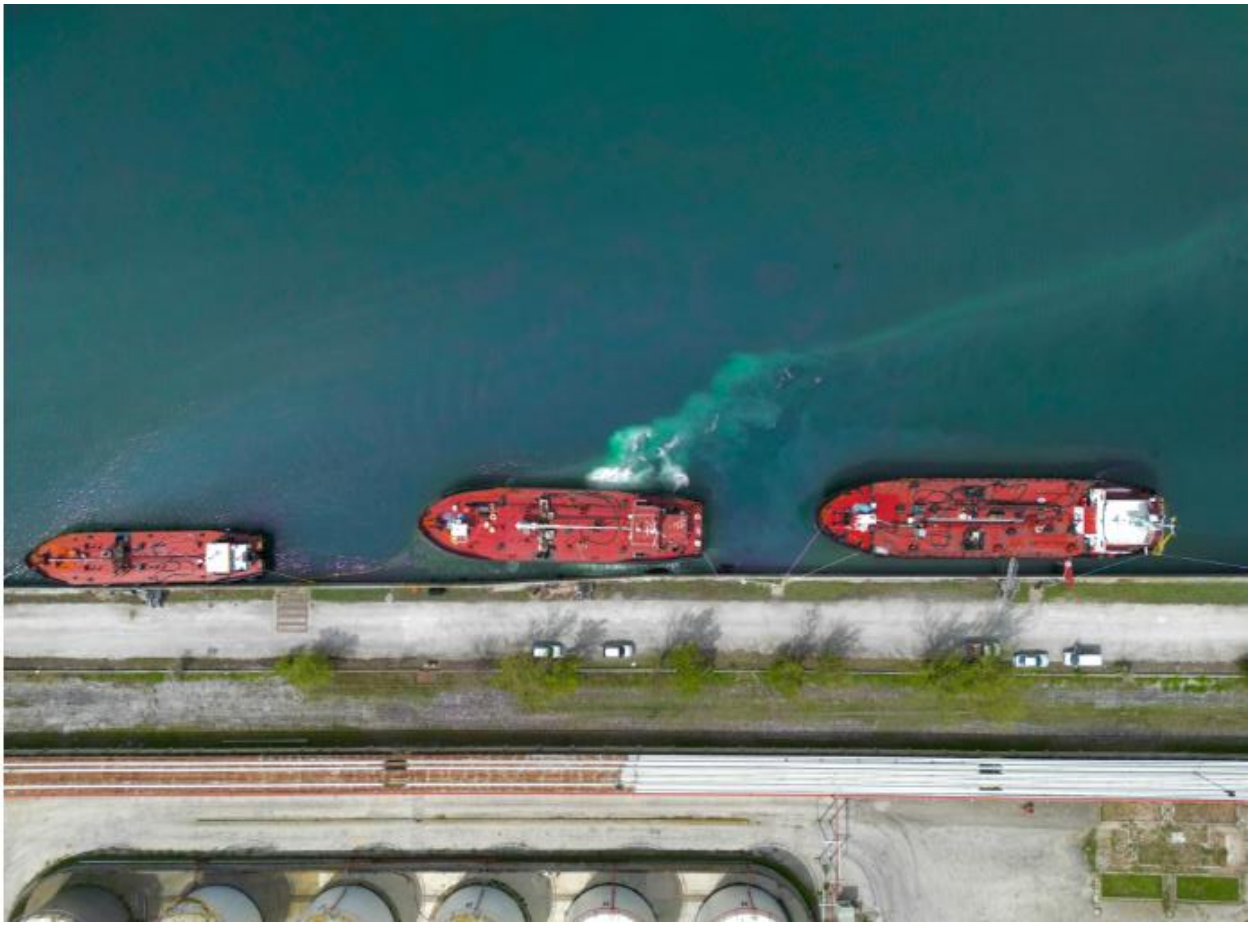
Operator: FSRU Italia
Ownership: Snam

Terminal characteristics

- Vessel 293 meters long and 40 meters wide
- CNG regasification capacity 5 bn. m³ /year
- Volume 170,000 m³
- Receiving vessels 180,000 m³
- Minimum sea depth alongside 113 m

For the transportation of gas from the ship to the national gas pipeline network, a new pipeline with a length of about 9 km was built.
At the end of December 2024, the terminal accepted 50 batches of LNG from its start in July 2023.

- **FSRU BW Singapore**



The BW Singapore Liquid Natural Gas Storage, Regasification and Shipping Floating Terminal docked to the former Petra marine platform 8 km off the coast of Ravenna (Italy) on 4 March 2025. and ready for operation.

Owner and operator: Snam
Terminal characteristics

- BW Singapore 292.57 meters long, 43.4 meters wide
- CNG regasification capacity 5 bn. m³ /year
- Storage capacity of about 170,000 m³

The terminal will be operational in 2025 after completion of the relevant approval and regulatory process and completion of the necessary mooring and connection to the transport network.

Population of Italy 58.99 million people.

Country's needs

Italian gas consumption of 71 billion m³

How the country's needs are met

- **Own natural gas production:** 93,469 TJ/2.4 bn m³
- **Underground gas storage facilities:** 20 billion m³
- **Imports:** 2,119,557 TJ/ 54.35 billion m³ (2023)
  - **Pipeline:** The import takes place through six connection points of 33,384 km of total import capacity of 360 million m³ per day.
  - **Tarvisio receives gas** from Austria via the Trans Austria Gas pipeline (capacity 38.5 bn. m³), Algerian gas is supplied to Mazara del Vallo via the Transmed submarine pipeline (capacity 35.9 bn. m³).
  - **Gries Pass imports gas** from Switzerland (capacity 14.3 bn. m³), Gela from Libya via the Greenstream pipeline (capacity 15.3 bn. m³).
  - **The Gorizia connection** with Slovenia has a relatively small capacity of return flow for imports to Italy and is rarely used for imports, while Melendunjo in the south-east imports Azerbaijani gas via the Trans-Satriatic Pipeline (capacity 14.3 bn. m³).
  - **LNG imports:** 14.39 billion m³ (2024)

According to IEEFA, the utilization rate of Italy's LNG terminals was: 18% Tuscany FSRU, 23% Panigalia, which could lead to an average regasification capacity utilization of 30% by 2030.

Suppliers of LNG in 2024:

Qatar 6.47 bn m^3 - 45%, USA 5.02 bn m^3 - 35%, Algeria 1.85 bn m^3- 13%, Russia 0.09 bn m^3, Trinidad and Tobago 0.02 bn m^3, Angola 0.28 bn m^3, Egypt 0.08 bn m^3, Spain 0.2 bn m^3, other 0.19 bn m^3.

Gas consumption by sector:

Industrial sector more than 31.7%
Residential sector 43.1%
Commercial and public services 18.6%
Transport sector 3.3%

Belgium

Liquefied natural gas is supplied to one of the largest LNG terminals in Europe and the only one in the country, Zeebrugge. Also, in the port of Antwerp, FlexFueler 002, owned by Fluxys and Titan LNG, which supplies LNG as a marine fuel, has been commissioned since 2021.

- **Zeebrugge LNG**

Terminal located in the port of Zeebrugge, Bruges County, West Flanders province, commissioned in 1987.

Ownership and management: Fluxys Belgium

Terminal characteristics

- LNG regasification capacity 9 billion m³ /year
- Max. regasification capacity 197 TW·h/y
- Max. unloading rate 14.000 m³ /h
- Total storage capacity 566,000 m³
- Vessels up to 266,000 m³
- Minimum sea depth alongside 13 m
- 2 dock
- Number of truck loading stations - 2
- Connected to the main import pipelines and gas pipeline network of Belgium (ZTP)
- Indirect access to the other markets: France (TRF) The Netherlands (TTF) United Kingdom (NBP) Germany (THE)*

** The Dunkirk - Zeebrugge bi-directional gas pipeline with an annual capacity of 8 billion m3 was launched in 2016, connecting French Dunkerque to the Zeebrugge terminal and providing access to the gas markets of Germany, the Netherlands and the UK.*

Terminal Suppliers annually processes 124.4 TW·h of liquefied natural gas, of which 78.4 TW·h, according to the storage and trans-shipment contract concluded before 2039*, comes from Rossi. Half of this volume is exported to Asia, and the rest is distributed through the Fluxys network serving Belgian consumers and customers in neighbouring countries, especially Germany.

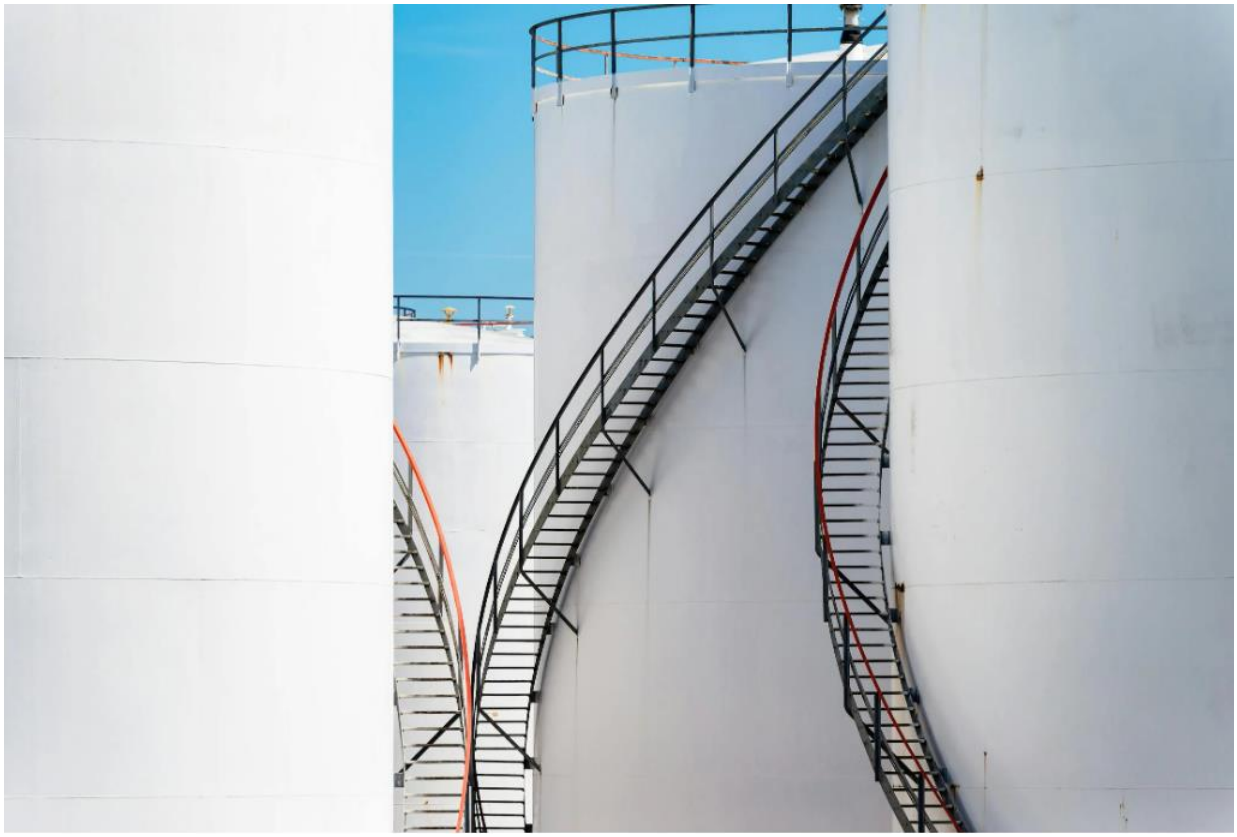
**20-year contract between Yamal Trade and Fluxys for storage and trans-shipment in the amount of up to 8 million tons/year, with construction of a container of 180 thousand. m³. On 27 March 2025, the EU ban on re-exporting Russian LNG through EU territory for deliveries to third countries comes into force.*

Qatar Petroleum booked full capacity LNG regasification at the LNG terminal in Zeebrugge until 2044.

Fluxys plans to import low-carbon hydrogen or its derivatives via the terminal in the future.

Underground gas storage facilities Loenhout

Along with the LNG terminal in Zeebrugge, Fluxys owns and operates an underground gas storage facility that serves as a giant buffer for the energy system. Storage capacity at Loenhout is 7.6 TWh, equivalent to 1.4 billion m³ or 450,000 households per year.



Loenhout maintains security of supply in Belgium and flexibility of peak consumption in cold winter months, balancing demand and supply.

Population of Belgium 11.79 million people.

Country's needs

Gas consumption in Belgium in 2023 was 13.70 billion m³, which is 5.82% less than in 2022 when it was 14.55 billion m³.

How the country's needs are met

- **Own natural gas production:** 416 TJ/10.67 bn m³
- **Underground gas storage facilities:** 0.7 bn m³
- **Imports:** 800,314 TJ/ 20.52 billion m³ (2022)

o LNG imports: 8.09 billion m³ (2024).

o the 4.1 thousand km long pipeline:

1. **Zeepipe gas pipeline from Norway:** 16 billion m³ (2024). Length 814 km. Deliveries are made from the Sleipner platform to the terminal in Zeebrugge with a capacity of 14.6 billion m³ per year. Operator is the Norwegian state-owned company Gassco AS.
2. **Interconnector Belgium-UK** 235 km from Zeebrugge terminal to British Bakton, capacity in the direction of «Belgium-UK» - 25.5 billion m³ per year, «Great Britain-Belgium» - 20.1 billion m³ per year.
3. The gas pipeline shareholders are Fluxys UK Limited - 37.6%, Gasbridge 1 B. V. (JV Fluxys Europe B. V. 50% and SNAM S.p.a. 50%) - 23.7%, Snam International B. V. - 23.7%, Fluxys Interconnector Limited - 15.0%.
4. **From the Netherlands to Belgium,** natural gas is transported through the following points: Hilvarenbeek, Gravenvoeren, Zelzate, Zandvliet and Obbicht. In the opposite direction, gas is supplied via Zelzate and Gravenvoeren.
5. **From Norway:** 16 billion m³ (2024).

Natural gas entering the Belgian gas transport system is subsequently transported in transit to GCS France (Quevy, Tasnieres, Blaregnies), Luxembourg (Bras, Petagne) and Germany by the Eynatten pipeline.

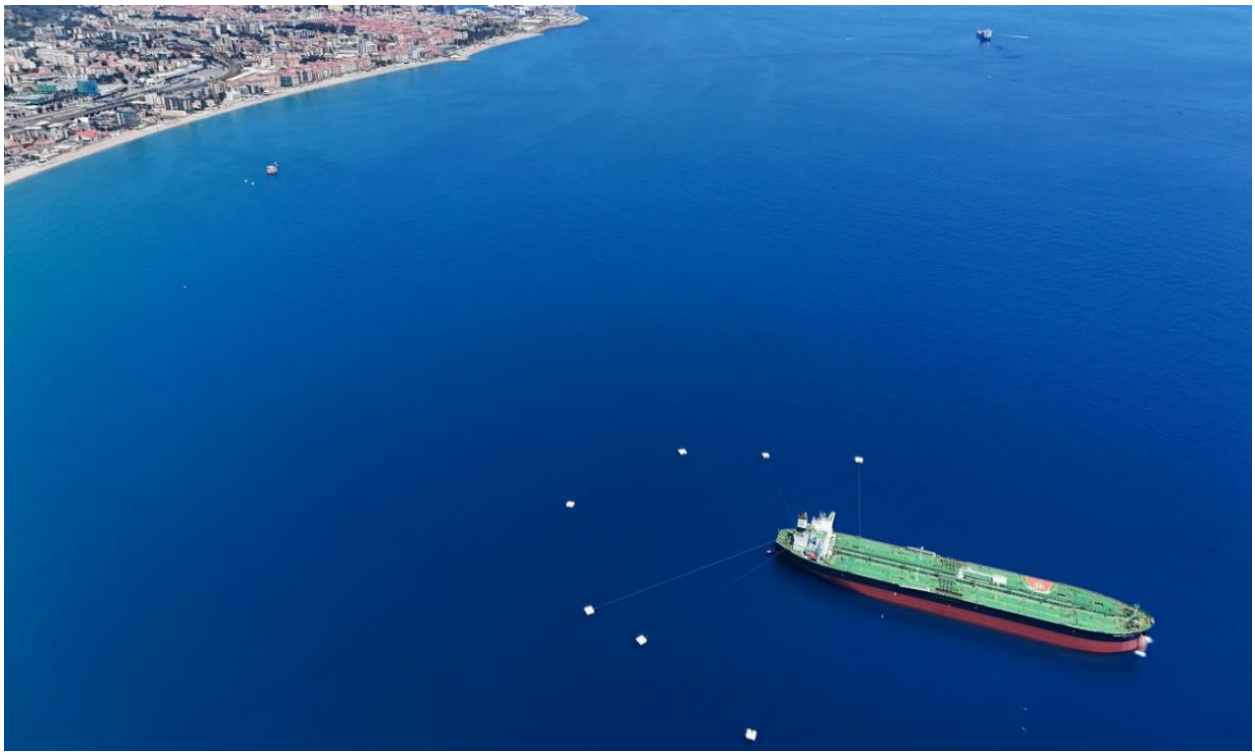
Suppliers of LNG in 2024:

Russia 3.55 billion m³ - 44%, Qatar 3.04 billion m³ - 38%, USA 1.32 billion m³ - 16%, Nigeria 0.1 billion m³, other - 0.7 billion m³.

Gas consumption by sector:

Industrial sector more than 37.3%
Residential sector 31.2%
Commercial and public services 17.4%
Transport sector 1.1 %

Summary of the 3d Part



The development of the LNG market in Europe contributes not only to ensuring a stable supply of energy resources, but also to strengthening the energy independence of the countries of the region, as well as promoting environmental initiatives.

However, this is a short-term solution in the process of transforming energy systems aimed at optimizing the sustainable transition of Europe's energy infrastructure.

In 2023, gas consumption in the energy sector was significantly reduced due to the re-commissioning of French nuclear power plants and the unprecedented expansion of solar and wind power.

Industrial gas consumption remained stable low throughout the period and still shows no signs of growth, even though wholesale gas prices have fallen.

Household gas consumption is much less predictable. It is characterized by strong seasonal dynamics, reaching a peak in the winter months, and varies according to average monthly temperatures.

The EU is the largest importer of LNG in the world, which imported more than 120 billion m^3 in 2023.

France, Spain, the Netherlands, Belgium and Italy are leading LNG consumers in the EU, while the US is the largest LNG supplier in the EU, accounting for about half of total LNG imports, which have tripled since 2021.

Following the leader were Qatar, Russia, Algeria, almost equally, Nigeria, Trinidad and Tobago and others.

In 2024, the US share of European LNG deliveries decreased by 12%, rising to the same level for Russia, slightly for Algeria - 17%, Norway and Nigeria shared fourth and fifth place with 4%, other countries - 3%.

Average LNG import terminal utilization in the EU decreased from 58% in 2023 to 42% in 2024.

In 2024, Spain cut LNG imports by 28%, and Belgium by 29%.

In 2024, many LNG terminals in the European Union were operating below their full capacity, using only a small proportion of their capacities.

The occupancy rate of most of these facilities has been consistently low, reaching a maximum of 40% of their total capacity.

This situation has even affected some recently commissioned FRSU floating terminals, which were originally designed to provide additional flexibility and reliability in gas deliveries.

The EU aims to reduce greenhouse gas emissions by 55% by 2030 from 1990 levels. An important part of this strategy is to reduce the consumption of natural gas under the REPowerEU initiative to 1615 TWh by 2030.

By the end of this decade, the EU is expected to be able to meet its needs solely through domestic production and pipeline supply, rather than importing liquefied natural gas (LNG).

Moreover, if the required reduction can be maintained, the EU will completely stop using natural gas by 2035.

All these factors raise objective doubts about the need to build additional LNG terminals planned by Europe.

Nevertheless, gas now continues to play a key role in European life, especially in electricity production (particularly when there is insufficient sunlight and wind activity), residential heating, and industrial processes.

In the coming years, Spain, France, the Netherlands and other European countries will remain heavily dependent on gas imports. It is therefore critical to ensure sufficient capacity for the import of liquefied natural gas, domestic gas production

and reliable pipeline supply, including cross-border connection of networks to guarantee energy security

Glossary

Natural gas reserves are commercial reserves that are either proven or probable.

Natural gas resources are the expected total economic resources to be extracted.

Measurement units used in the survey:

Joel is the unit of energy, work and quantity of heat in the International SI system of units.

Terajool is equal to one trillion joules, 1 TJ = 10^{12} J.

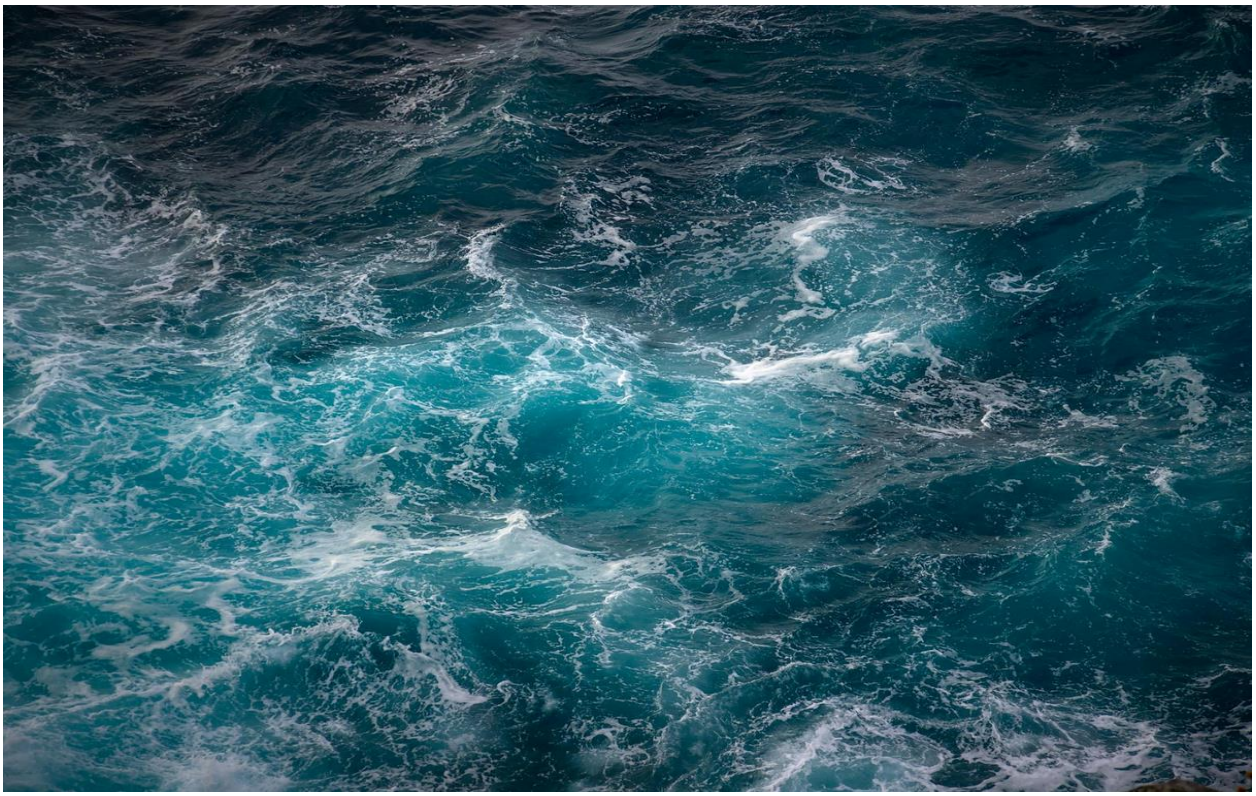
1 TJ = 0.000026538432958611 Gm3 NG (Gm3 NG - billion cubic meters of natural gas). Or, conversely, 1 Gm3 NG is equal to 37681.2 TJ.

Kilowatt·hour is the extra-system unit of energy and work measurement, and is equal to 1 kilowatt per hour of device output power.

1 kW·h = 1000 W 3600 c = 3.6 M**J** = 3,600,000 joules or 0.278 x10-6 kW·h.

1 GW·h = 1 000 000 000 W

1 TJ = 0.278 GW·h.



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