



The Spanish Gas System

2023 Report



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Some published data are subject to change, as they are provisional data at the close of this report.
In the event of any discrepancy, the SL-ATR information prevails.

The Gas System has operated normally, maintaining 100% of the demand

The energy sector, and especially the natural gas sector, has continued to be one of the key players on the international scene in 2023, following the energy crisis resulting from Russia's invasion of Ukraine. **Europe faced the winter of 2022 to 2023 with success, despite** the drastic reduction of natural gas (NG) supplies from Russia. Virtually all EU states **reached full underground storage early** compared to previous years. This lack of tension in supply has also been reflected in gas prices, whose value and volatility have been significantly reduced compared to the previous year.

In 2023, the Gas System operated normally, maintaining 100% of the demand. Spain received gas from **17 different origins, demonstrating** a diversified supply. Exports via interconnections with France, Portugal and Morocco reached an all-time high of 53 TWh (+23.7% vs. 2022), with LNG ship refuelling from Spanish terminals reaching 22 TWh.

In 2023, the El Musel plant was incorporated, contributing to strengthening the security of supply both nationally and in the rest of Europe. **Spain has consolidated its position as the world's leading re-exporter of LNG for the second consecutive year**, thus guaranteeing coverage of domestic demand and strengthening the aforementioned security of supply for the rest of Europe from Spanish terminals.

The Spanish Gas System has stood out for both its high level of contracting and its high level of LNG storage. The year has been marked by competitive auctions for allocating unloading *slots* and LNG storage capacity until 2038. A total of 155,000 capacity allocation processes involved 55 traders, reflecting **a strong interest in LNG loading and unloading slots and storage services, with contracting rates close to 100%**. In terms of storage, natural gas levels in **underground storage ended the year above 90%**, reaching the EU target six months ahead of schedule.

Domestic demand for natural gas fell by 10.7% compared to the previous year, reaching 325.5 TWh. Although the industrial market recorded an increase compared to 2022, the overall decrease was mainly due to lower gas demand from combined cycle power plants, offset by an increase in renewable electricity generation, a decrease in electricity exports and lower electricity demand in Spain.

When it comes to markets, the Technical System Operator has achieved 99% efficiency in balancing actions and has reduced the cost of purchasing operating gas by 2.5%.

Finally, Enagás GTS implemented the new Guarantees of Origin System for renewable gases, which certifies the renewable origin of gas produced in Spain and covers various types of marketing.

This year has witnessed a robust and efficient Spanish Gas System, which has played a crucial role in energy security at both national and European level.

Enagás GTS has set up the Guarantee of Origin System for renewable gases, which **certifies the renewable origin of gas produced in Spain**

Key figures



Unloading slots
allocated until 2038



Countries supplying
to the System



Underground storage
capacity procurement



Renewable gas production
facilities with access
to issuance of guarantees
of origin



Average contracting
of LNG storage



Exports
by pipeline



Acquisition cost
of operating gas



Filling level of underground
storage facilities as
at 1 November



Number of loads vs. 2022



TWh in consumption
of natural gas in the industrial
market



TWh exchanged in the
MS-ATR (3 times the national
demand in 2023)



Efficiency in taking balancing
actions



Volume of slots
traded in the Secondary
Capacity Market vs. Primary
Market



Registered entities with
profile Holder of Guarantees
of Origin



Trucks loaded

1 The Gas System in Spain

- 1. 1 Procurement and Guarantees
- 1. 2 Demand
- 1. 3 Operation and Security of supply

The Spanish Gas System has stood out for both its **high level of procurement** and its **high level of LNG storage**

Procurement and Guarantees

Procurement capacity

The extraordinary levels of LNG tank storage procurement and the high filling of underground storage facilities reflect the commitment of users to the Gas System. This has made it possible to face the year with a more than solid guarantee of supply to cover not only domestic demand, but also to reinforce the security of European supply through exports via international connections (IC) and ship reloads from Spanish terminals. In fact, in 2023 Spain consolidated its position as the world's leading re-exporter of LNG for the second consecutive year.

As a result, the trading platform has repeatedly been subject to competitive auctions with multiple rounds and participants. This has been evident in the annual auctions, where **unloading and loading slots and LNG storage capacity were allocated until 2038, with the process running successfully and without any contingencies.**

The most noteworthy aspects of 2023 in the field of capacity procurement are the following:

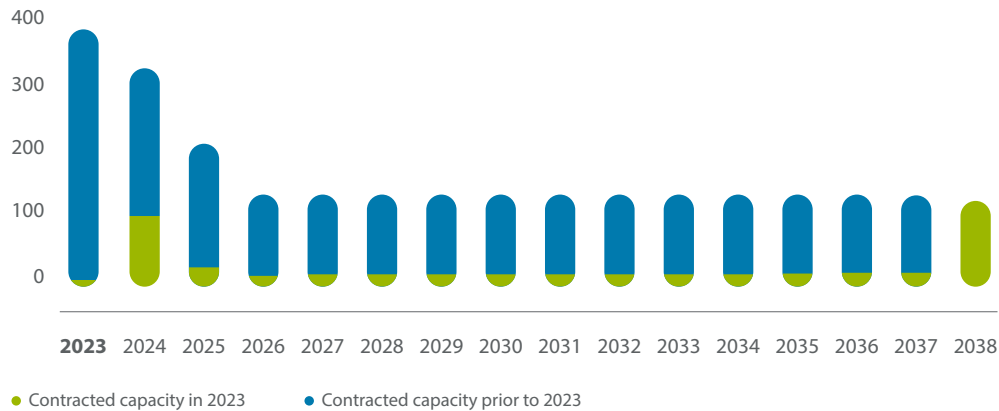
- +155,000 capacity allocation processes.
- 55 traders participating in the allocation processes.
- Great interest in the services of loading and unloading *slots*, LNG storage and underground storage, with contracting ratios close to 100%.

In the annual auctions
unloading and loading *slots*
and LNG storage capacity were
allocated until 2038

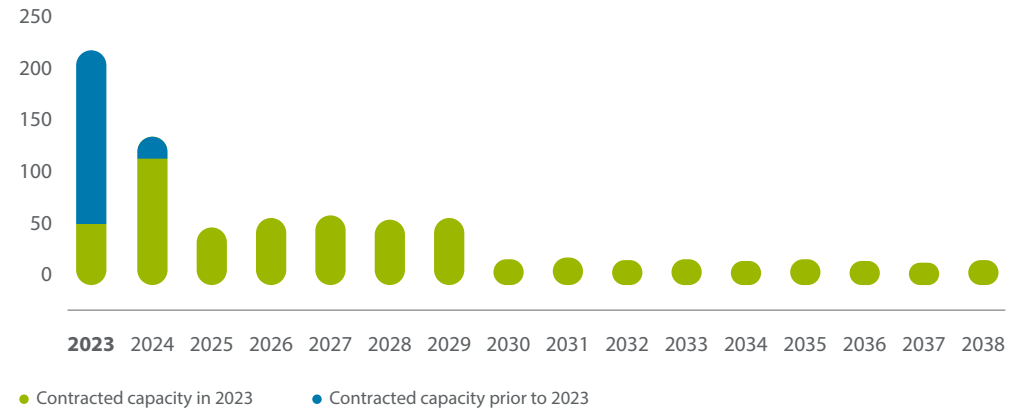
Services associated with *slots*

- During 2023, more than 500 unloading *slots* and more than 600 loading *slots* for *small scale* loads were allocated until 2038.
- In the annual auction, 422 *slots* were offered for the next 15 years, one more than in 2022. The allocation ratio was 97%, similar to that of 2022.
- The ratio of applications received to applications offered was 398%, 75% higher than the previous year.
- The model review of *slots* for LNG loading have been offered at specific docks for the first time on an annual basis.

Unloading *slots*



Loading *slots*



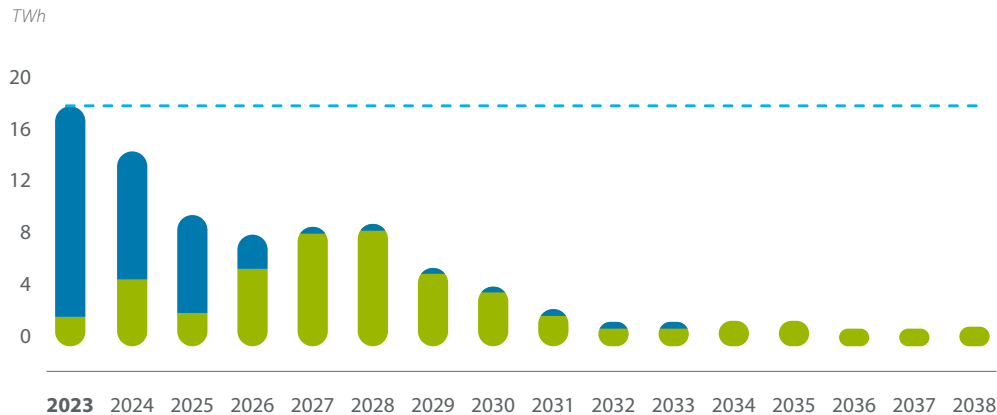
+500
Unloading slots
contracted in 2023

+600
Small scale loading slots
contracted in 2023

LNG storage facility (LNGSF)

- In 2023, capacity was allocated in each of the 15 years offered and for the first time premiums up to 2038 have been registered.
- The contracted capacity in LNGSF has reached, on average, 96% and has been contracted at 100% for approximately half of the period.
- In general terms, the requested capacity has been much higher than the offered capacity for the period from 2025 to 2029, being even higher than 1,000% for 2025.

LNGSF contracting



● Contracted capacity in 2023
 ● Contracted capacity prior to 2023
 ● Nominal capacity

Underground storage service

- Since May 2023, the annual, quarterly and monthly capacity has been fully contracted, leaving only 100 GWh of the 34,479 GWh available for contracting on a daily horizon.
- As in the case of *slots* and LNG storage services, premiums have also been recorded in the long-term allocation auctions in contrast to previous years.

For more details on the capacities contracted in the System, please refer to **Annex 1** of this chapter in the downloadable information by clicking [here](#).



For further details on the auctions of services that do not involve *slots*, please refer to **Annex 2** of this chapter in the downloadable information by clicking [here](#).



For further details on the auction of *slots*, services, please refer to **Annex 3** of this chapter in the downloadable information by clicking [here](#).

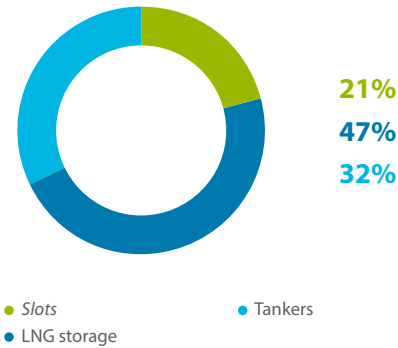


Organised secondary capacity market

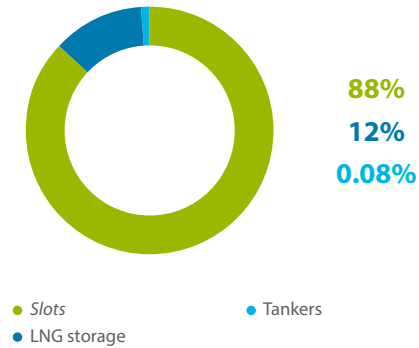
The organised secondary capacity market started in the latter part of 2022 for tanker cargo services and *unloading* slots. During 2023, LNG storage and underground storage services have been incorporated into trading.

During the year, 92 users were authorised to operate in the market, with 24 active users. The majority of bids were for sale (673), representing 77% of the total number of bids submitted. 112 transactions were matched, 23 associated with unloading *slots*, 53 for LNG storage and 36 for tanker loading. The volumes traded in these transactions relative to contracted capacity are 5%, 0.1% and 0.2%, respectively.

Number of transactions matched in the secondary market



Matched energy in the secondary market



During 2023, **LNG storage** and **underground storage services** have been incorporated into trading

Continuous improvement in contracting processes

Incorporation of new infrastructures

In 2023, the TSO has taken on the challenge of incorporating the regulated services of the El Musel terminal into the capacity offered. This terminal is subject to a special temporary regime in accordance with Order TED/578/2023, of 7 June, which establishes the technical conditions for the provision of logistics services for liquefied natural gas at the regasification terminal in the port of El Musel.

The additional supply of capacity associated with this seventh terminal applies to:

- Truck loading
- Regasification and access to PVB from the Virtual Balancing Tank (TVB)
- LNG Storage

Implementation of new anti-congestion mechanisms

They have enabled the capacity of congested services to be made available to users:

- *Oversubscription*
- UIOLI (ST and LT)

The incorporation of these new mechanisms has allowed additional capacity to come on stream on congested services, both in the loading of tanks in Barcelona, Bilbao and Sagunto, as well as on the LNGSF.

Implementation in the secondary capacity market of new services

The organised secondary capacity market has been launched as a tool to trade storage capacity in USF and LNGSF storage.

Strengthening the contracting platform

16 lines of improvement have been implemented with a focus on regulatory needs and/or user requests. In addition, a multidisciplinary team has been set up, comprising systems and business technical profiles, to follow up and monitor the capacity auctions.

Continuous communication with the sector

Eight *workshops* have been held, where all the details of the plan to reinforce the contracting platform, the implementation of new developments and other aspects of interest to users were shared with users of the system.

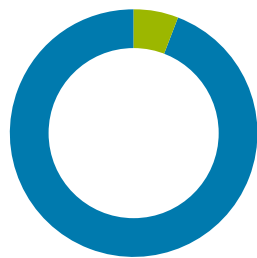
Guarantees

The Spanish Gas System establishes a system of guarantees for users to meet their obligations to pay service contract toll and royalty invoices and imbalance surcharges in accordance with the provisions of the CNMC (National Commission on Markets and Competition), ensuring that the System is reliable and economically secure.

The calculation and management of guarantees in contracting, for all products that can be contracted in the Spanish Gas System, and imbalance activities are carried out by the TSO and are notified to the affected user and to the Guarantees Manager.

The average guarantees retained in 2023 amount to a total of €708.5 M for the imbalance and contracting activities, and are broken down as shown in the graph.

Average guarantees retained



- Average imbalances
- Average contracting

Guarantees for capacity contracting

CNMC Circular 8/2019, which establishes the methodology and conditions for access and capacity allocation in the natural gas system, imposes a system of guarantees to cover possible non-payment of tolls and fees for capacity contracts.

The availability of guarantees is a prerequisite for requesting capacity, submitting a bid for an auction and concluding capacity contracts.

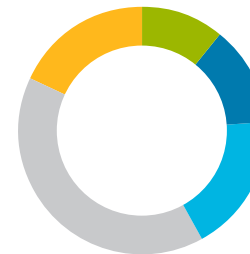
Most relevant indicators of guarantees for capacity contracting

€995.3 M
Maximum guarantees

€520.8 M
Minimum guarantees

€669.2 M
Average guarantees

Average guarantees for capacity contracting for services



- LNG storage
- Contracting of vessels
- Others
- USF
- Distribution

Guarantees for imbalances

CNMC Circular 2/2020 establishing the natural gas balancing rules imposes a guarantee scheme to cover the risk of non-payment of imbalance surcharges.

Users with a balance sheet portfolio must have collateral to cover their level of risk, which takes into account both the user's operational situation and its net debit or credit position with respect to imbalance surcharges.

Most relevant indicators of guarantees for imbalances

€119.0 M

Maximum guarantees

€29.2 M

Minimum guarantees

€39.3 M

Average guarantees

Enforcement of guarantees

The aforementioned CNMC Circulars 8/2019 and 2/2020 establish the enforcement of previously withheld guarantees in the event of non-compliance with payment obligations both for tolls and fees for contracted access services and for imbalance surcharges. The System Technical Operator is responsible for requesting the Guarantees Manager to enforce guarantees in accordance with the regulations in force in order to recover the amounts owed in the imbalance and contracting activities.

Overall, the first six months of 2023 saw the highest number of enforcements associated with a small number of subjects, with the ratio of enforced amounts being insignificant in relation to the volume of guarantees provided.

Most relevant indicators on defaults and guarantee enforcement

85

Number of defaults

€0.1 M

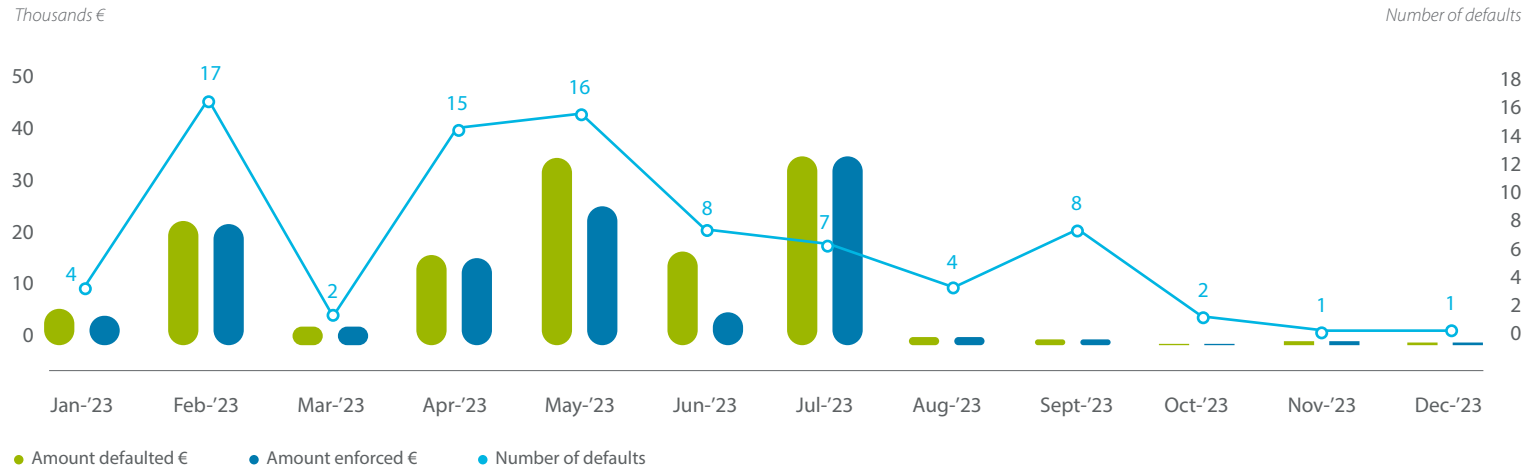
Total amount defaulted

€0.1 M

Guarantees enforced

The Spanish Gas System **establishes** a system of guarantees **for users** to meet their **obligations** to pay service contract toll invoices and imbalance surcharges

Defaults and enforcement of guarantees



Associated with the contracting activity, it was necessary to carry out 43 enforcements that affected four users and resulted in the disqualification of one of them. The amounts enforced barely total 50,000 euros and the ratio between the amounts enforced and the guarantees provided in this activity is 0.0007%.

No. of enforcements	43
No. of users affected	4
Amount enforced	€50,224
Disqualified users	1
Average enforcement rate = 0.0007%	

In relation to the daily assessment of the risk index, there have been 75 non-compliances, 83% of which have been standardised in less than 24 hours. There has been no disqualification associated with this process.

Finally, with regard to the imbalance activity, it was necessary to carry out 42 enforcements that affected nine users, without having led to any disqualification. The amounts enforced barely total 100,000 euros and the ratio between the amounts enforced and the guarantees provided in this activity is 0.0202%.

Risk level (daily frequency)

75

Non-compliances

62 (83%)

Non-compliances
recovered <24 h

No. of enforcements	42
No. of users affected	9
Amount enforced	€97,901
Disqualified users	0
Average enforcement rate = 0.0202%	

Demand

Regulatory filing

Domestic demand for natural gas has reached 325.5 TWh in 2023, which is 10.7% less than in 2022. This decrease was partially offset by higher exports and shiploads, which amounted to 75.3 TWh, 10.7% higher than the previous year.

The industrial natural gas market recorded a recovery of 3.8%, mainly concentrated in the second half of the year. Growth compared to the same period of the previous year was 22%.

Key figures

In 2023, total natural gas consumption amounted to 325.5 TWh, a decrease of 10.7% compared to the previous year. This decrease was due to lower consumption in the electricity market (-30.7%), which was characterised by an increase in renewable generation, mainly solar and hydroelectric. This is combined with lower electricity demand and lower cross-border flows due to international connections.

Conventional demand, for household, commercial and industrial consumption, has increased by 1.5% compared to the previous year, totalling 229.8 TWh. This increase is due to higher industrial consumption from the second half of 2023.

Natural gas exports and shiploads have increased by 7.3 TWh. In 2023, 75.3 TWh was reached in the international market, mainly in pipeline exports chiefly to France.

325.5 TWh

**National demand
for natural gas in 2023**

+3.8%

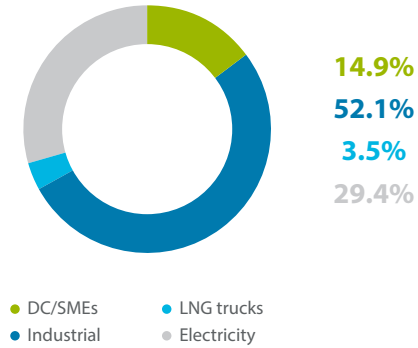
**Recovery of the industrial
natural gas market**

Demand

TWh

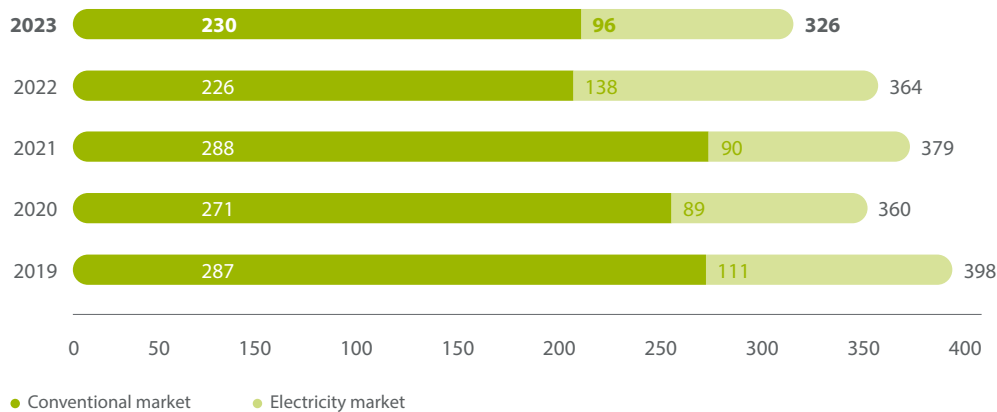
	2023	2022	2023 vs. 2022	
	Year end	Actual	TWh	%
Conventional	229.8	226.4	3.4	+1.5%
C/D + SMEs	48.6	52.2	-3.7	-7.0%
Industrial	169.7	163.5	6.2	+3.8%
LNG trucks	11.6	10.7	0.9	+8.3%
Electricity service	95.7	138.0	-42.3	-30.7%
Total national demand	325.5	364.4	-38.9	-10.7%

Natural gas demand in 2023



Annual evolution of natural gas demand

TWh/year

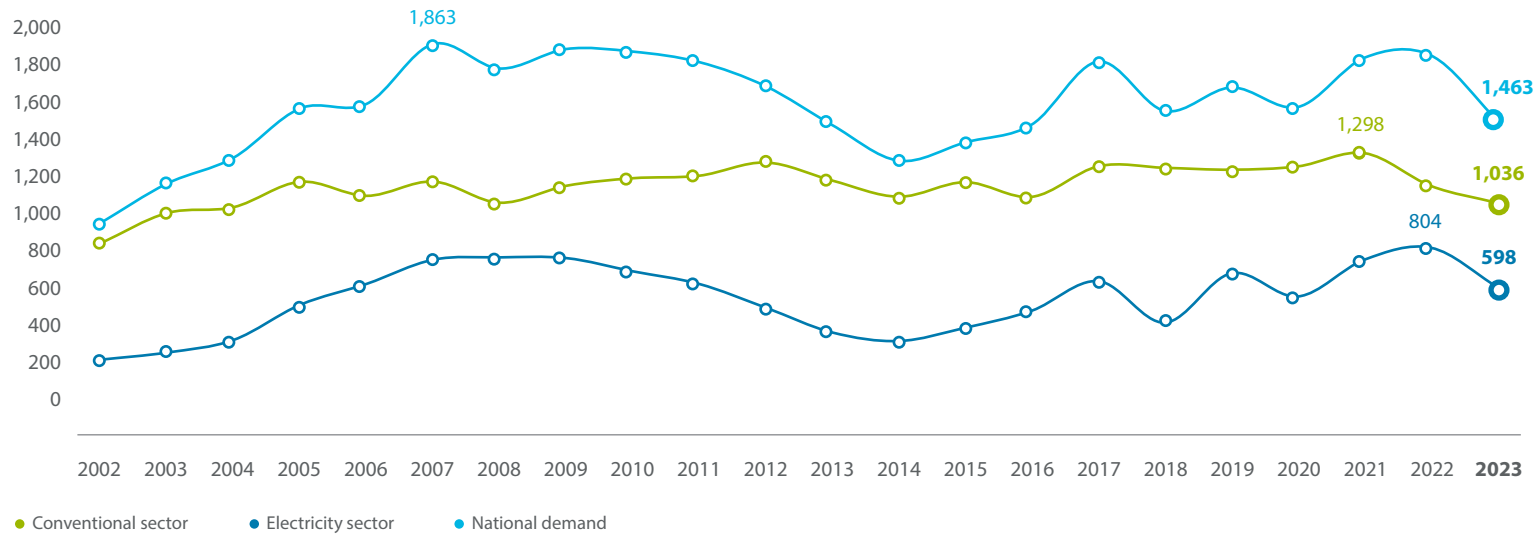


The autonomous communities that **reported the highest consumption of natural gas** were Catalonia, Andalusia, Valencia, Murcia and the Basque Country

The Autonomous Communities that reported the highest consumption of natural gas in 2023 were Catalonia, Andalusia, Murcia, Valencia and the Basque Country. Between them they account for almost half of the total consumption of natural gas in Spain.

Evolution of annual demand peaks

GWh/day



1,463 GWh/day

Total national demand

1,036 GWh/day

Conventional demand

Daily peaks reached in 2023 were:

- **Total national demand:** 1,463 GWh/day (1 March).
- **Conventional demand:** 1,036 GWh/day (1 March).
- **Electricity sector demand:** 598 GWh/day (23 August).

Conventional demand for gas

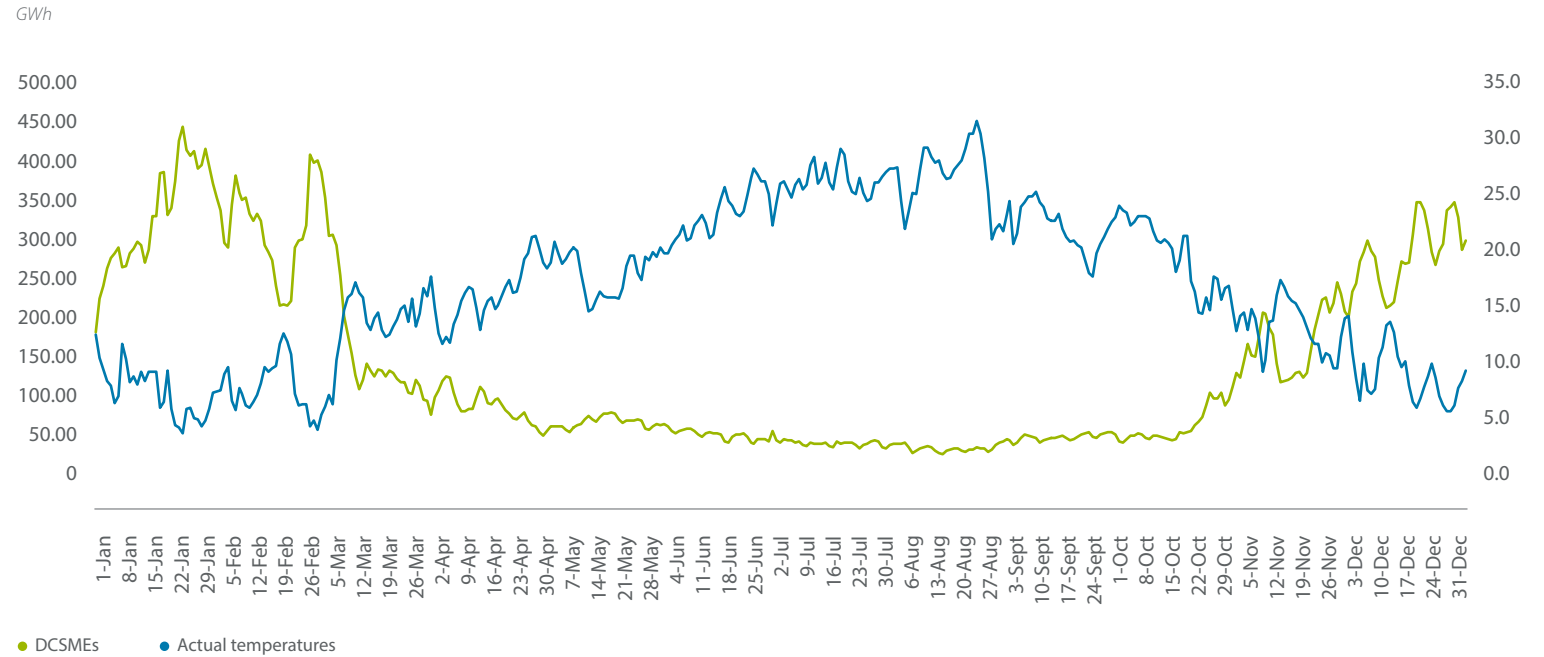
During 2023, the conventional sector recorded 229.8 TWh, 1.5% higher compared to the previous year.

This growth was mainly due to higher consumption of natural gas by the industrial market in the second half of the year, which has changed the trend in the behaviour of this market.

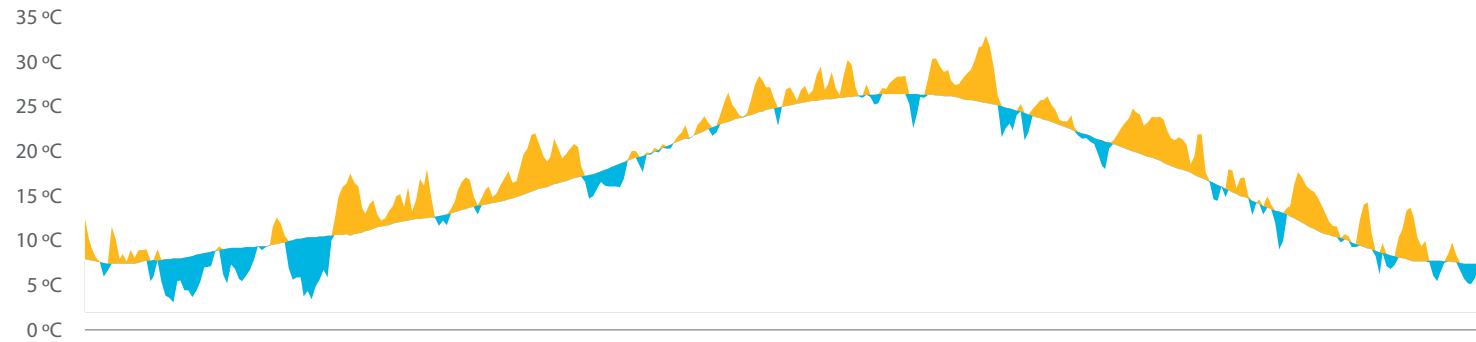
Domestic-commercial and SMEs

In 2023, demand for natural gas in the domestic-commercial and SME market fell by -3.7 TWh (-7%) compared to the previous year. This figure was mainly due to the effect of temperatures, which were warmer than in 2022.

Domestic demand - Domestic-commercial and SME sector



Reference temperature of the Gas System

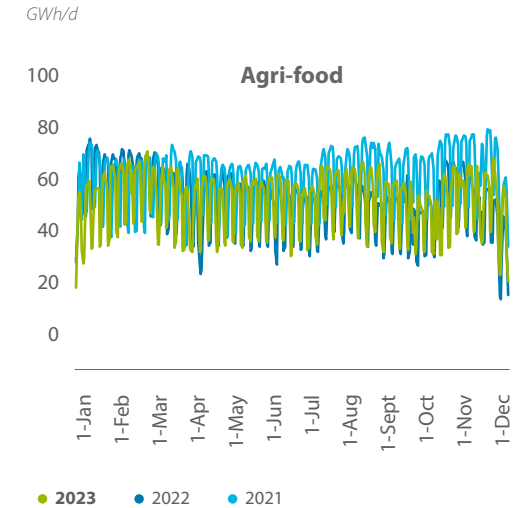
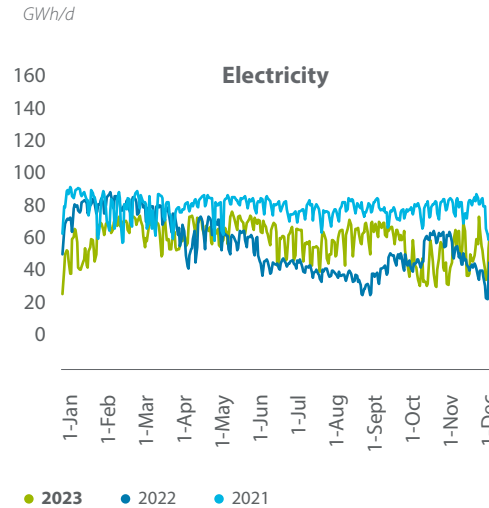
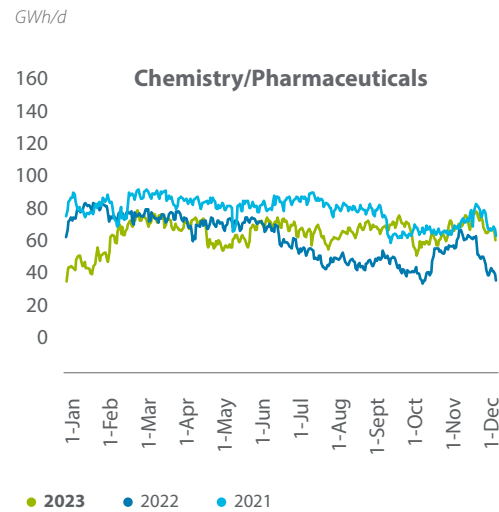
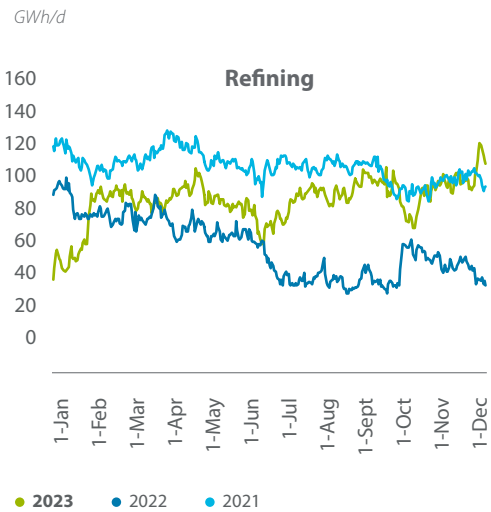


Cold/hot rating	Jan-'23	Feb-'23	Mar-'23	Apr-'23	May-'23	Jun-'23	Jul-'23	Aug-'23	Sept-'23	Oct-'23	Nov-'23	Dec-'23	2023
Σ °C for excess	23.05	7.69	73.79	63.12	32.77	34.02	39.78	66.98	29.59	72.50	53.87	34.72	531.88
Σ °C by default	-42.76	-55.00	-24.32	-3.62	-23.06	-4.22	-2.48	-16.60	-14.78	-5.76	-10.14	-19.69	-222.44
Variation	-19.72	-47.31	49.47	59.50	9.71	29.80	37.30	50.38	14.81	66.74	43.73	15.03	309.45

Industrial demand

Gas consumption in the industrial sector recorded 169.7 TWh in 2023, up 6.2 TWh compared to 2022. This increase in gas demand for the industrial market has been mainly driven by consumption in the refining sector.

The chemical/pharmaceutical, electrical and agri-food sectors have also recorded year-on-year increases.

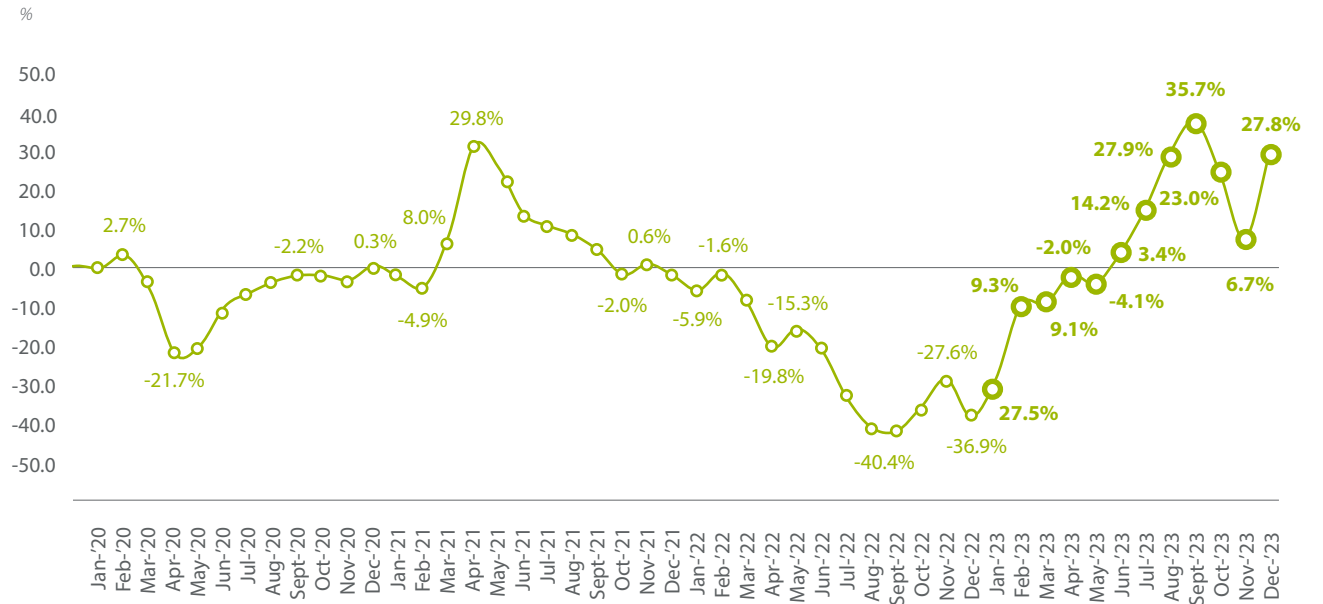


The evolution of industrial demand, as shown in the following graph on the evolution of the Large Industrial Gas Consumers Index (IGIG)¹, has shown an upward trend, intensifying in the second half of the year. During this period it recorded a 22% growth compared to the same period of the previous year.

Annual consumption of natural gas by industrial sector

TWh/year	2023	% 2023 vs. 2022
Refining	32.1	39.36%
Chemistry/Pharmaceuticals	23.1	4.55%
Electricity	20.7	4.83%
Agri-food	19.0	1.61%
Construction	18.8	-12.59%
Other industry	15.4	-3.18%
Metallurgy	12.2	-11.47%
Paper	11.8	-5.13%
Services	11.6	-3.66%
Textile	1.8	7.47%

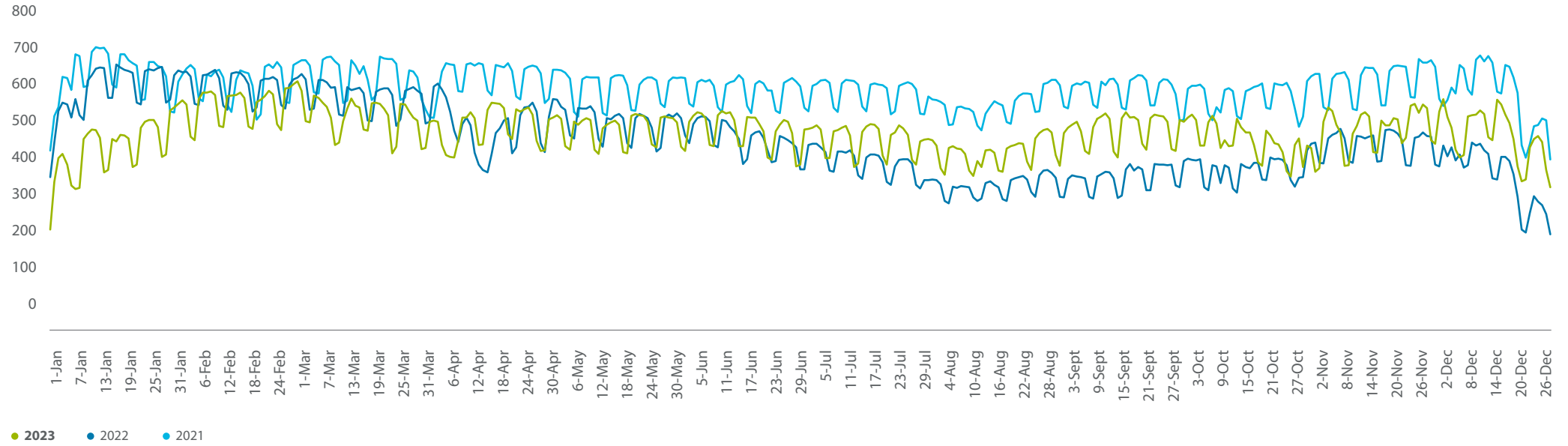
Large Gas Consumers Evolution



¹ The Large Industrial Gas Consumers Index (IGIG), which began to be published by the TSO in 2015, shows the evolution of gas consumption of the main gas-consuming industries for the ten most intensive industrial sectors in the use of this fuel.

Daily industrial demand

GWh



Tankers

Gas consumption by LNG trucks increased to 11.6 TWh/year in 2023 (40,150 trucks loaded), an increase of 0.9 TWh/year compared to 2022. Barcelona was the busiest loading plant, followed by Huelva and Cartagena.

With the incorporation of the new El Musel E-Hub Regasification Terminal in Asturias, 409 tanker loads have been carried out, for a total of 0.1 TWh of energy loaded.

→ Mugaros

1.1 TWh/year
4.0 thousand loadings
30% F_{ut}

→ Huelva

2.4 TWh/year
8.4 thousand loadings
38% F_{ut}

→ Cartagena

2.1 TWh/year
7.2 thousand loadings
32% F_{ut}

→ Barcelona

2.4 TWh/year
8.6 thousand loadings
38% F_{ut}

→ Sagunto

2.0 TWh/year
7.0 thousand loadings
52% F_{ut}

→ Bilbao

1.4 TWh/year
4.6 thousand loadings
73% F_{ut}

→ El Musel

0.1 TWh/year
0.4 thousand loadings
3% F_{ut}

National and international presence of LNG trucks

By 2023, gas in the form of LNG has been supplied to 1,090 satellite plant destinations. In addition to the national territory, the Spanish Gas System has supplied trucks to 24 destinations in France, Germany and Italy.



● Cartagena ● Sagunto ● Huelva ● Mugaros ● Bilbao ● Barcelona ● El Musel

Gas demand for mobility

Demand for natural gas in the transport sector has, as in previous years, recorded an increase in consumption. In 2023, this sector consumed 2 TWh/year more than the previous year, reaching 5.6 TWh/year, a growth of 55%.

This increase was mainly due to the growth in *bunkering*, with 1.5 TWh more than last year.

Land transportation

The annual consumption of NGV in Spain has posted an increase of 15% compared to 2022 to reach 3.6 TWh/year (1.3 truck + 2.3 TWh pipeline).

Maritime transport

Over the course of 2023, 1.92² TWh/year has been supplied for maritime transport, of which 0.51 TWh corresponds to *bunkering* supplies made in 32 *pipe-to-ship* (PTS³) and 0.9 TWh corresponds to LNG *ship-to-ship* (STS⁴) operations from supply barges. The remaining 0.53 TWh/year were supplied via LNG trucks, where 530 trucks were used in *truck-to-ship* (TTS⁵) and *multi-truck-to-ship* (MTTS⁶) operations.

² Information on STS and PTS operations provided by GASNAM.

³ PTS supplies are made directly by connecting flexible hoses from either small or large-scale LNG terminals.

⁴ If the LNG supply is carried out by another vessel, this is an STS operation.

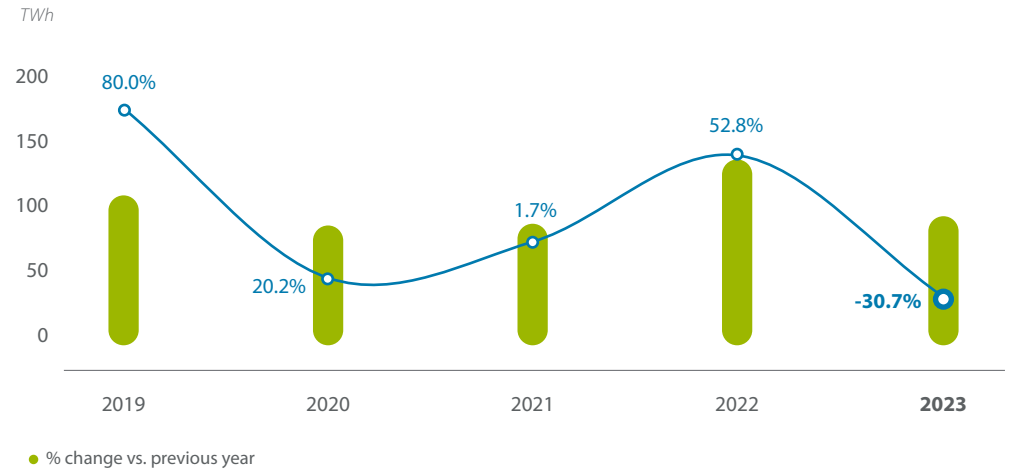
⁵ The TTS process is based on the supply of LNG to the ship from a tanker truck that is placed on the quay where the ship is berthed.

⁶ When several trucks are involved in the same LNG refuelling operation simultaneously, the process is called MTTS.

Gas demand for the electricity sector

In 2023, gas deliveries to the electricity sector reached 95.7 TWh. This figure was 30.7% lower than in 2022 due to the concurrence of three factors: an increase in renewable generation (mainly solar and hydro), a decrease in electricity demand and lower electricity exports due to international connections.

Gas deliveries for electricity generation



The demand for electricity in Spain, according to year-end data, fell by 2.5% in 2023 compared to the previous year.

Natural gas has contributed 16% of the electricity system's demand coverage, similar to the solar contribution.

The most significant variations versus the previous year have been (in order of magnitude):

- Significant increase in solar generation. In 2023, 9.8TWh more energy than in the previous year and an increase in installed capacity of almost 5 GW have been recorded.
- Significant increase in hydro generation of 7.4 TWh.
- 5.9 TWh decrease in electricity demand compared to last year.

Balance of annual electricity

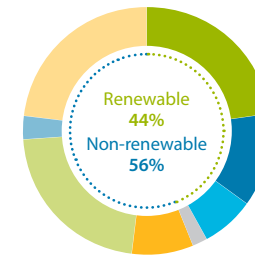
TWh (e)

	2022	2023	Δ 2023 vs. 2022	
Electricity demand	234.2	228.4	-5.9	-2.5%
Wind	59.8	61.0	1.1	+1.9%
installed power [GW]	29.5	30.1	0.5	+1.8%
% utilisation of total installed	23%	23%		
Solar	31.4	41.2	9.8	+31.1%
installed power [GW]	21.8	26.4	4.6	+21.0%
% utilisation of total installed	16%	18%		
Hydraulic	17.9	25.3	7.4	+41.1%
Other renewables	5.4	4.3	-1.1	-20.4%
CHP (cogeneration)	19.5	18.3	-1.1	-5.9%
Nuclear	55.9	53.9	-2.0	-3.6%
Coal	7.7	3.8	-3.9	-50.4%
Natural gas	60.6	39.0	-21.6	-35.7%
International balances	-19.8 export	-14.0 export	5.8	+29.5%
France	-8.8	-1.6	7.2	
Portugal	-9.3	-10.2	-1.0	
Morocco	-1.4	-1.9	-0.4	

Source: REE.

→ Corrected for labour and temperature effects -2.1%

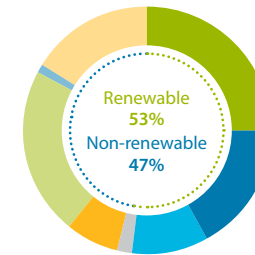
2022



23%	8%
12%	22%
7%	3%
2%	23%

● Wind ● Hydraulic ● Cogeneration ● Coal
● Solar ● Other renewables ● Nuclear ● Natural gas

2023



25%	7%
17%	22%
10%	1%
2%	16%

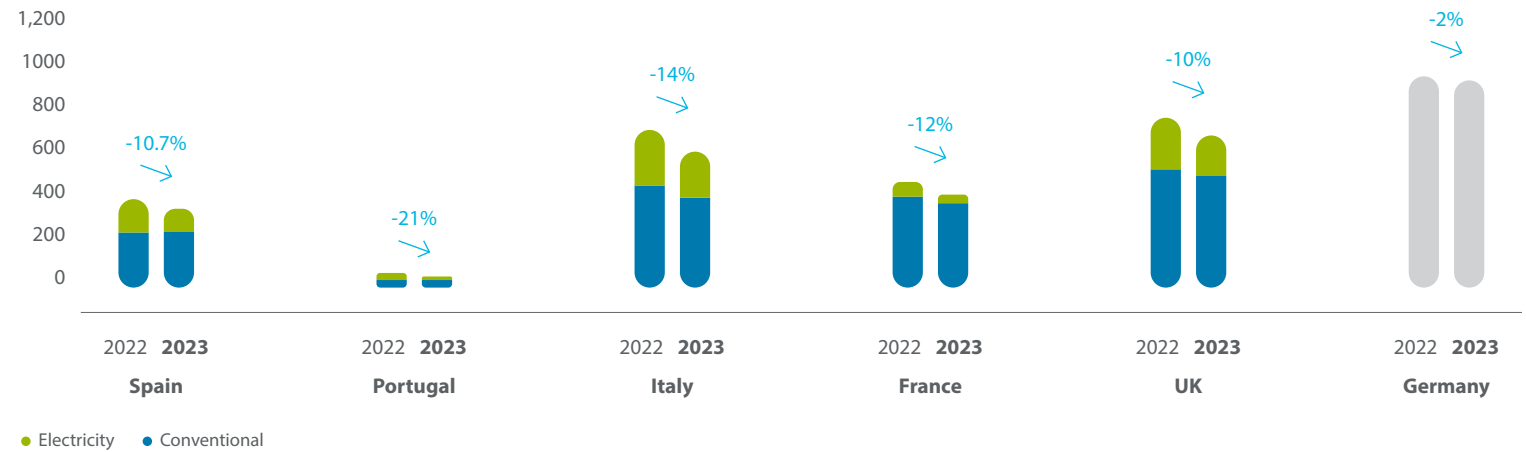
● Wind ● Hydraulic ● Cogeneration ● Coal
● Solar ● Other renewables ● Nuclear ● Natural gas

European comparison of natural gas demand

Total demand for natural gas has experienced a generalised decline that has been similar in virtually all countries, with the exception of Portugal and Germany, with the largest and smallest declines, respectively.

Total natural gas demand by country (variation 2023 vs. 2022)

TWh



Source: TSOs websites (REN, GRT Gaz, TIGF, National Grid, Snam).

The same detail of comparable conventional and electricity demand is not available for Germany.

Some data are subject to change as they are provisional.

Operation and Security of Supply

The Spanish Gas System operated normally in 2023. Availability, both technical and commercial, has been 100%, 24 hours a day, every day, always guaranteeing supply to all consumers.

Continuity, quality and security of supply

In 2023, the Technical Manager of the System has continued to guarantee the continuity, quality and security of supply, under the principles of objectivity, transparency and non-discrimination; seeking the correct operation of the System with criteria of effectiveness, efficiency, better customer service and the correct coordination between access points, storage, transport and distribution.

At the European level, Russia's invasion of Ukraine has continued to be the determining element shaping energy policy at the EU level. The European Commission has continued many of the measures already initiated in 2022 aimed at gradually reducing dependence on supplies from Russia. These measures include the following:

- Regulation (EU) 2023/706, from the Council, of 30 March 2023, amending Regulation (EU) 2022/1369. This Regulation has extended the period of application of the gas demand reduction measures until 31 March 2024.

- Council Regulation (EU) 2023/2919 of 21 December 2023 amending Regulation (EU) 2022/2576 as regards the extension of its period of application until 31 December 2023. Among the measures that have seen their application prolonged, the following stand out:
 - Joint platform for coordinated gas purchases, gaining bargaining power and improving purchasing conditions.
 - Incorporation of critical consumption for electricity generation as protected customers by virtue of solidarity.
 - Extension of solidarity mechanisms to countries with LNG terminals. Previously, solidarity mechanisms were limited to bilateral agreements between neighbouring countries connected by pipeline.
 - In addition:
 - Creation of a secondary market trading platform for LNG and underground storage (USF).
 - Increased transparency for LNG terminals and underground storage.
 - Improvements in congestion management in transmission infrastructures.
 - Introduction of demand reduction measures for protected customers.
- Regulation (EU) 2022/2576, as amended by Commission Implementing Regulation (EU) 2023/736 of 31 March 2023, concerning the definition of the technical details of the application of the market correction mechanism to derivatives linked to virtual trading venues in the Union other than the TTF. It establishes a temporary market adjustment mechanism for trading orders in TTF derivatives and derivatives linked to other virtual exchange points, in order to limit episodes of excessively high gas prices in the European Union that do not reflect world market prices.

In terms of crisis levels, as defined in European Regulation (EU) 1938/2017, ten countries remain at the “Early Warning” crisis level: Italy, Latvia, Austria, Croatia, Estonia, Denmark, the Netherlands, Sweden, and Slovenia. Germany and Finland are at the “Warning” crisis level. In the case of Finland, there has been an increase in the crisis level from “Early Warning” to “Warning”, as a consequence of the significant deterioration over a prolonged period of time (at least 5 months) caused by the incident on the Baltic connector pipeline, which connects Estonia and Finland.

At national level, and in this environment of high volatility in international energy markets, the Spanish Gas System has enjoyed a high level of supply diversification. Spain has received natural gas from 17 different origins thanks to the regasification terminals, which position our country as a strategic entry point for LNG within Europe.

In addition, Spain has contributed to the security of supply of the rest of Europe by sending gas, both through interconnections and by reloading LNG carriers to other countries.

In this respect, it is worth highlighting the incorporation of the El Musel terminal as a reinforcement of European security of supply. This enables an additional contribution to the entries to the Gas System, if the Competent Authority for security of supply deems it necessary, in the event of an Exceptional Operation Situation (EOS) or declaration of one of the crisis levels defined in EU Regulation 1938/2017. The commissioning of this regasification plant is measure 72 of the More Energy Security Plan (Plan +SE), approved in October 2022, which includes a series of measures aimed at providing greater security in terms of energy prices for households and the Spanish economy as a whole, as well as contributing to increasing the European Union’s security of supply.

Exports through interconnections with France have broken several records in 2023:

- Daily record on 17 May 2023, with an export flow of 260 GWh/d, 98% of the nominal capacity of the interconnection.
- Monthly record in April 2023, reaching an export flow of 6.5 TWh/month.
- Annual record in 2023, reaching values of 37 TWh/year.

In total, through interconnections with France, Portugal and Morocco, exports have reached 53 TWh, a new historic record.

LNG ship refuelling from Spanish terminals has reached 22 TWh, making Spain the non-producing country that has re-exported the most LNG in the world in 2023. This is evidenced by the 157 loads (+26% vs. 2022) carried out during the year at Spanish regasification terminals. Many of them have been destined for other EU countries, such as Italy or Germany.

Natural gas levels in underground storage have ended the year above 90%. The 90% filling target, established by Regulation (EU) 2022/1032, set for 1 November 2023, was achieved by Spain 6 months ahead of the established date, with full filling reached for the first time in history, in August.

The regasification terminals have had average tank filling levels of 67%, similar to the previous year.

On the other hand, in 2023, a total of 299 LNG unloadings were carried out at the Spanish regasification terminals as a whole.

157

Loadings carried out during the year
in Spanish regasification terminals

+26%

Increase in the number of LNG re-export
operations vs. 2022

Operating Notes

Seven Operating Notes have been published during 2023, in the following order:

- Exceptional operation situation –level 0– cold wave (20/01/2023).
- Minimum level of operational buffer stocks of users (02/02/2023).
- Exceptional operating situation -level 0 -unavailability of the Euskadour Compression Station (09/02/2023).
- Exceptional operation situation –level 0– cold wave (24/02/2023).
- Start of commissioning of the Musel E-Hub Regasification Terminal, first unloading (15/06/2023).
- Pajares bypass - maintenance on the León-Oviedo gas pipeline (27/10/2023).
- System technique derived from Ciarán and Elisa storms (16/11/2023).

NG and LNG supplies

In 2023, natural gas supplies reached 397,897 GWh.

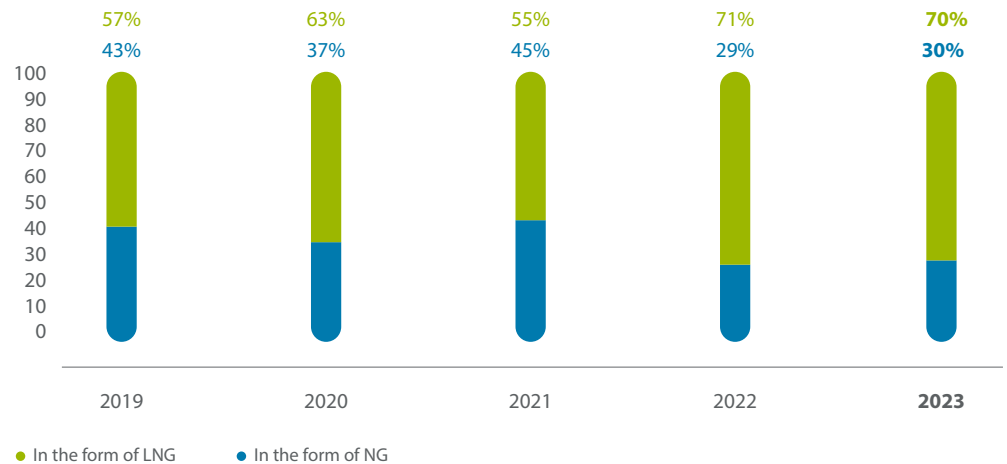
For the fifth consecutive year, supplies in the form of liquefied natural gas (LNG) have exceeded those of natural gas (NG). The entry of LNG has accounted for 70% of the gas supply for the Spanish Gas System. In 2023, LNG has been received from 17 different origins, with the United States leading the way.

Inputs to the Spanish Gas System

Inputs in the form of NG accounted for 119,895 GWh.

LNG supply, meanwhile, reached 278,002 GWh.

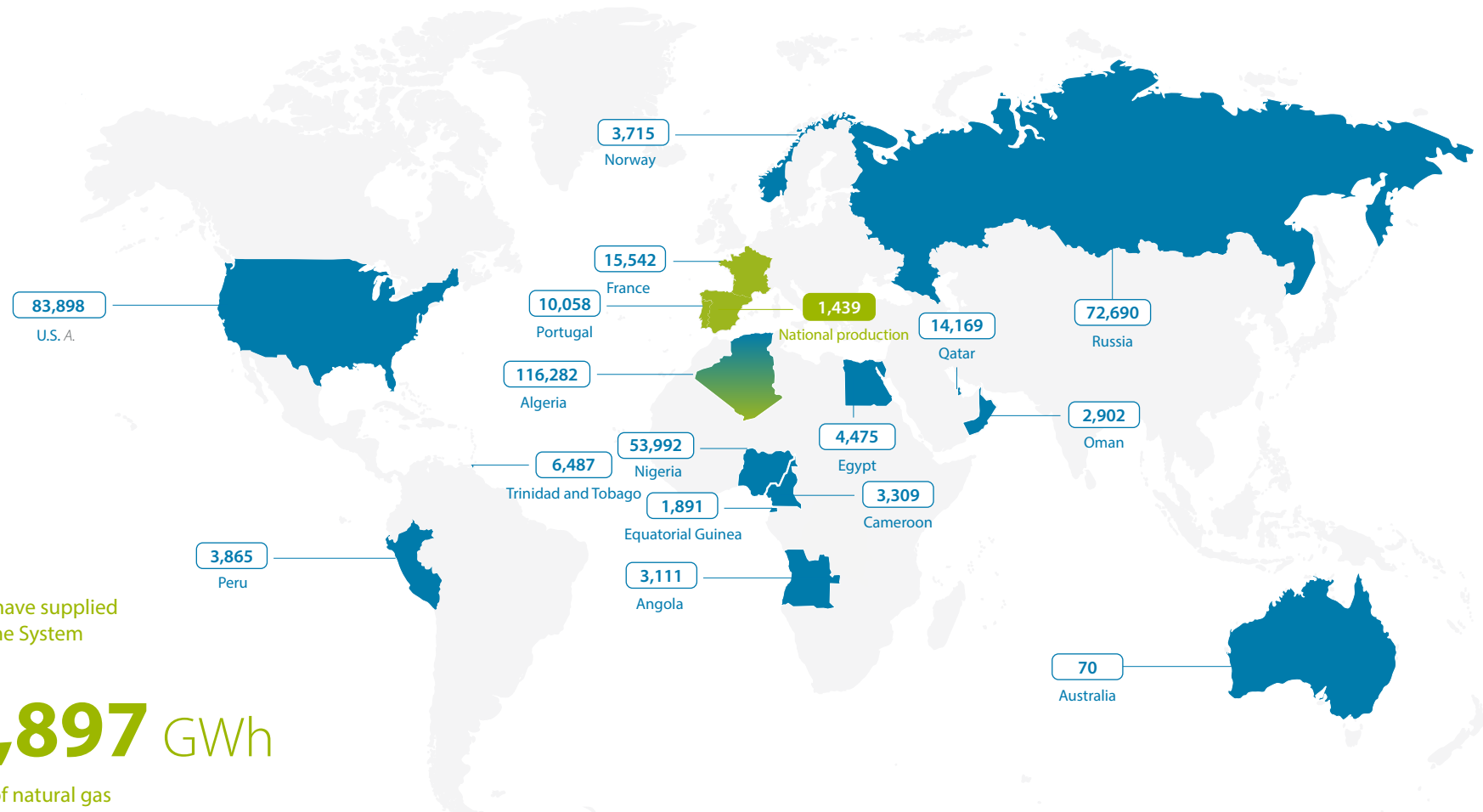
Supplies evolution



Origin of supplies

GWh

- NG
- LNG
- NG and LNG



17

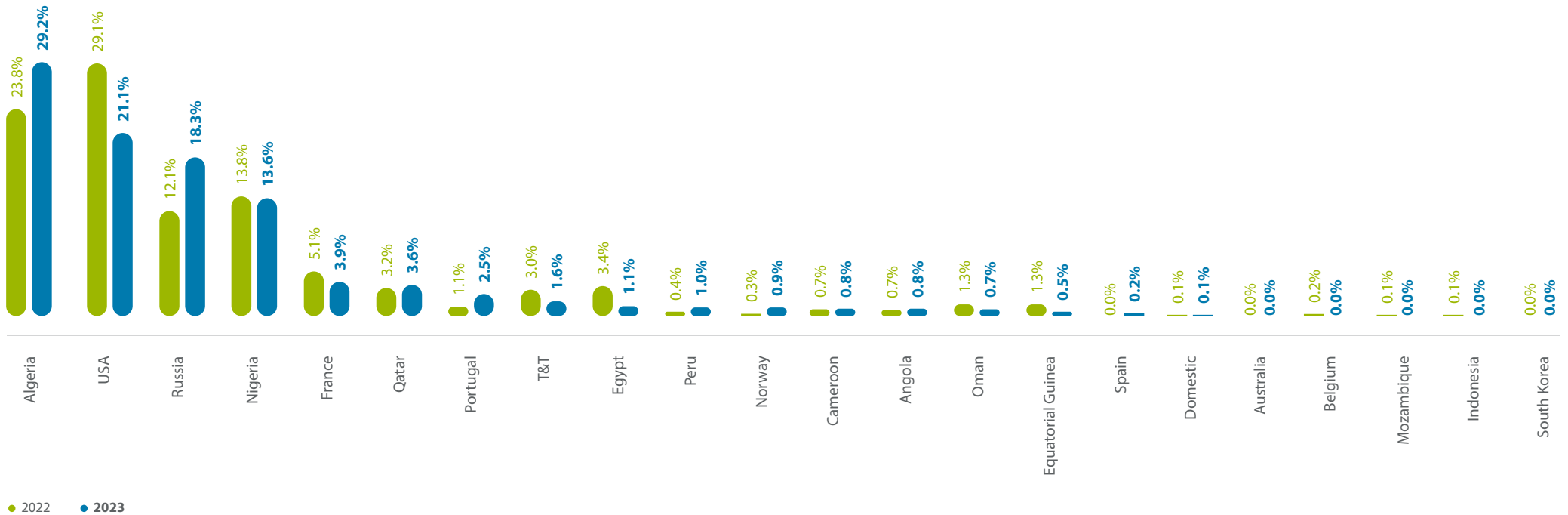
Countries that have supplied
natural gas to the System

397,897 GWh

Total supplies of natural gas

In the supply portfolio, Algeria has established itself as the main supplier to the Spanish Gas System, accounting for practically 29.2% of supplies in 2023, followed by the USA, with 21.1%.

Percentage of diversification of procurement

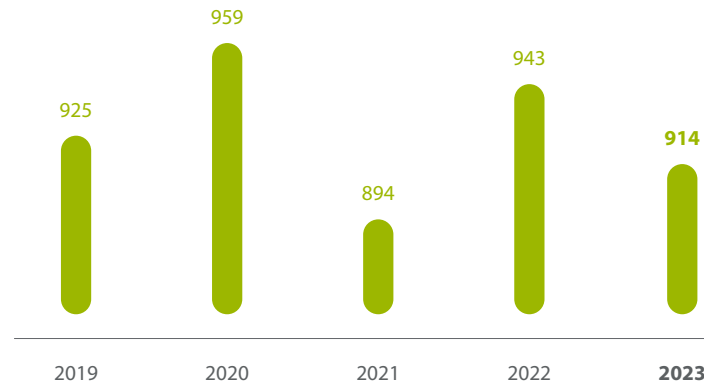


Number of LNG vessel unloadings

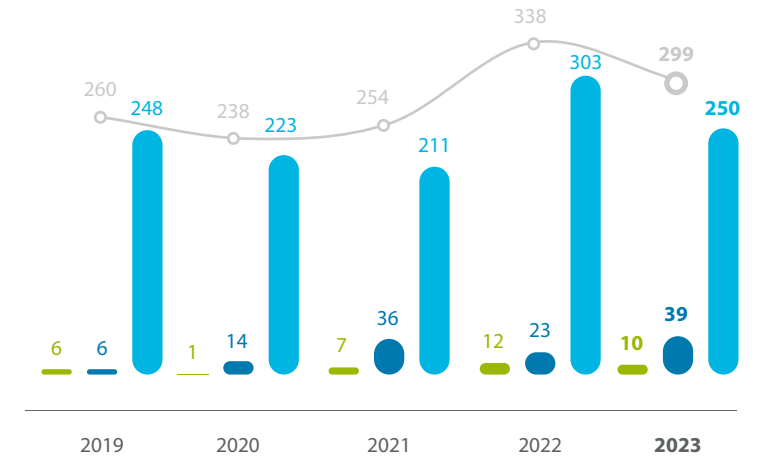
	2022	2023
Barcelona Plant	58	49
Huelva Plant	68	49
Cartagena Plant	61	51
Bilbao Plant	65	63
Sagunto Plant	58	56
Mugardos Plant	28	29
El Musel terminal	–	2
Total	338	299

Evolution of average volume: Unloaded LNG

Σ GWh total vessels / Total number of vessels



Evolution of the number of vessels unloaded



299

Vessels unloaded
in the System

As for the average volume unloaded per vessel in 2023, the figure reached 914 GWh, slightly lower than in 2022, due to the increase in unloadings of medium-sized vessels.

- Small vessels
- Medium-sized vessels
- Large vessels
- Total vessels

Unloading by origins and regasification plants

In 2023, each regasification terminal with regulated access has received gas from at least five different countries, which has helped to strengthen the security of the System.

The terminal with the highest number of downloads was Bilbao Regasification Terminal, followed by Sagunto and Cartagena.

By origin, the USA was the country that received the highest number of loads, with 87 methane tankers.

Unloading by origins and regasification terminals

No. unloadings

	Angola	Algeria	Australia	Cameroon	Egypt	Spain	United States	France	Equatorial Guinea	Nigeria	Norway	Oman	Peru	Qatar	Russia	Trinidad	Total	Average size unloaded (GWh)
Barcelona	1	8			1		11	1		6		2		15	4		49	880
Huelva		1					21			18					8	1	49	952
Cartagena	1	10			3		19			10			2	1	2	3	51	824
Bilbao		1		3			13		1	9	4		2		28	2	63	1,010
Sagunto	1	14	1		1	1	14		1	15		1			5	2	56	810
Mugardos		1					7			1					20		29	1,029
Musel							2										2	990
Total	3	35	1	3	5	1	87	1	2	59	4	3	4	16	67	8	299	914
Average size unloaded (GWh)	1,037	612	70	1,103	895	927	902	1,089	946	915	929	967	966	886	1,085	811	914	

Natural gas connections

The supply in the form of NG in 2023 has accumulated almost 120 TWh.

International connections

GWh

	2022			2023		
	Balance	Inputs	Outputs	Balance	Inputs	Outputs
IC North African	99,070	100,952	1,881.8	85,401	94,872	9,471
Pyrenees VIP	-13,824	21,546	35,370	-22,926	14,453	37,379
Iberia VIP	-1,185	4,688	5,873	3,582	10,058	6,476
Domestic	471	471	-	512	512	-
Total	84,533	127,657	43,125	66,569	119,895	53,326

120 TWh

Supply in the form
of NG

Regasification terminals

Spain continues to lead Europe in terms of the number of LNG infrastructures and LNG vaporisation and storage capacity.

The facilities maintain their characteristics and technical capabilities. The Spanish Gas System has a total of 27 storage tanks, with nine berths and a capacity for methane tankers of up to 270,000 m³.

Spain is the European country with the most **LNG terminals, vaporisation capacity and LNG storage** in Europe

Single Tank Model

2023 was the third full year in which the pooled tank model has been in place. This has made commercial management easier for users and provided greater flexibility and liquidity to the Spanish regasification terminal system.

Technical characteristics of the regasification terminals

Regasification terminal	Maximum vaporisation capacity (Nm ³ /h)	LNG storage		Truck loading capacity		Berths	
		No. of tanks	m ³ LNG	GWh/day	No. of berths	m ³ LNG	
Barcelona	1,950,000	6	760,000	17	2	266,000	
Huelva	1,350,000	5	619,500	17	1	175,000	
Cartagena	1,350,000	5	587,000	17	2	266,000	
Bilbao	800,000	3	450,000	5	1	270,000	
Sagunto	1,000,000	4	600,000	11	1	266,000	
Mugardos	412,800	2	300,000	11	1	266,000	
El Musel	800,000	2	130,000	9	1	266,000	
Total	7,662,800	27	3,446,500	87	9	Up to 270,000	

Production at regasification plants.

In 2023, inflows from regasification terminals to the System totalled 259,410 GWh. In this regard, it is worth noting the 8% increase in truck loadings compared to 2022.

Average daily production at the regasification terminals reached 679 GWh/day and average contracting was 756 GWh/day.

In terms of stocks in tanks, the annual average has been 67%, occasionally reaching 90%.

In 2023, the average use of contracting capacity has risen to 90%.

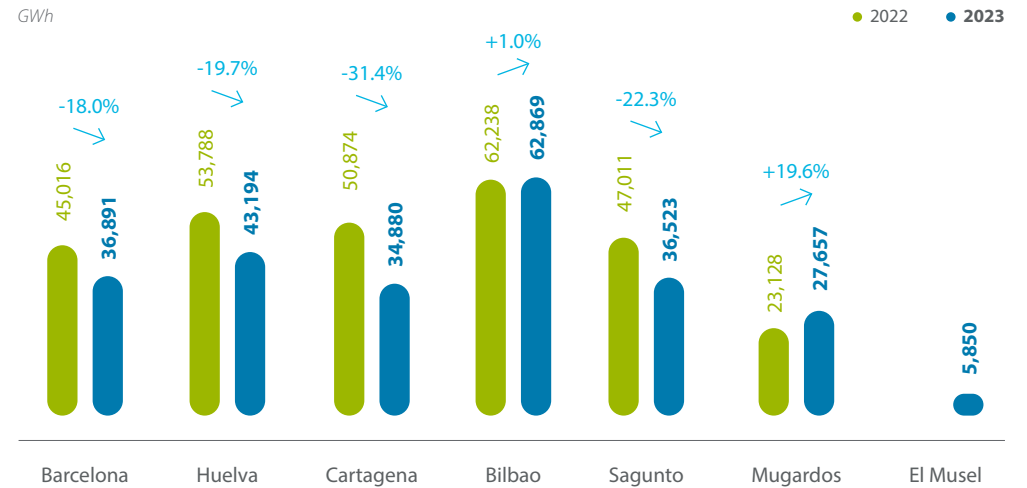
679 GWh/day

Average daily production
in 2023 at the regasification terminals

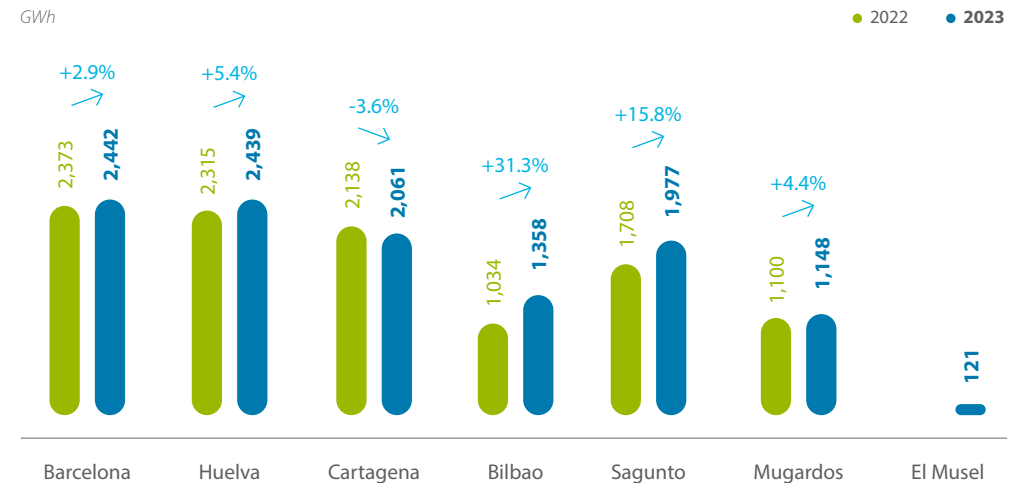
11,546 GWh

Loader via trucks
in 2023 (+8% compared to 2022)

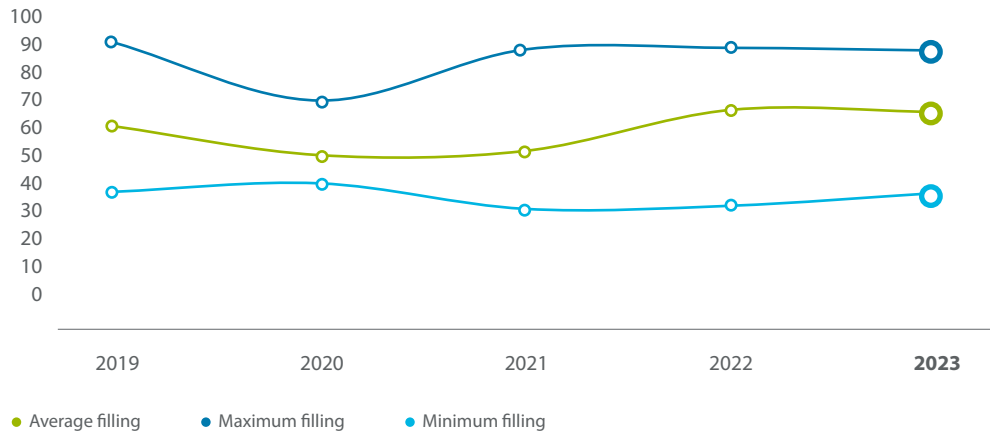
Regasification evolution



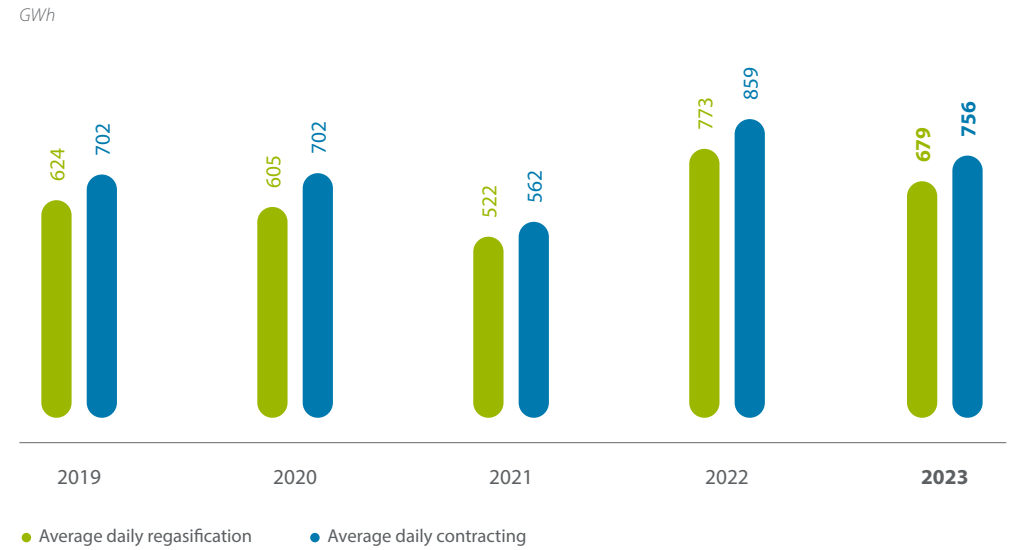
Truck loading evolution



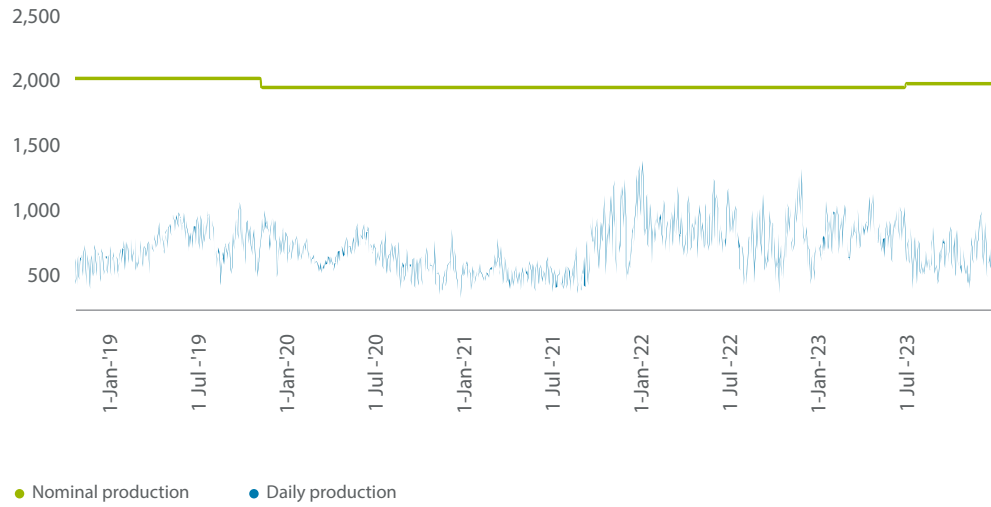
Evolution of total stock in tanks (2009 - 2023)



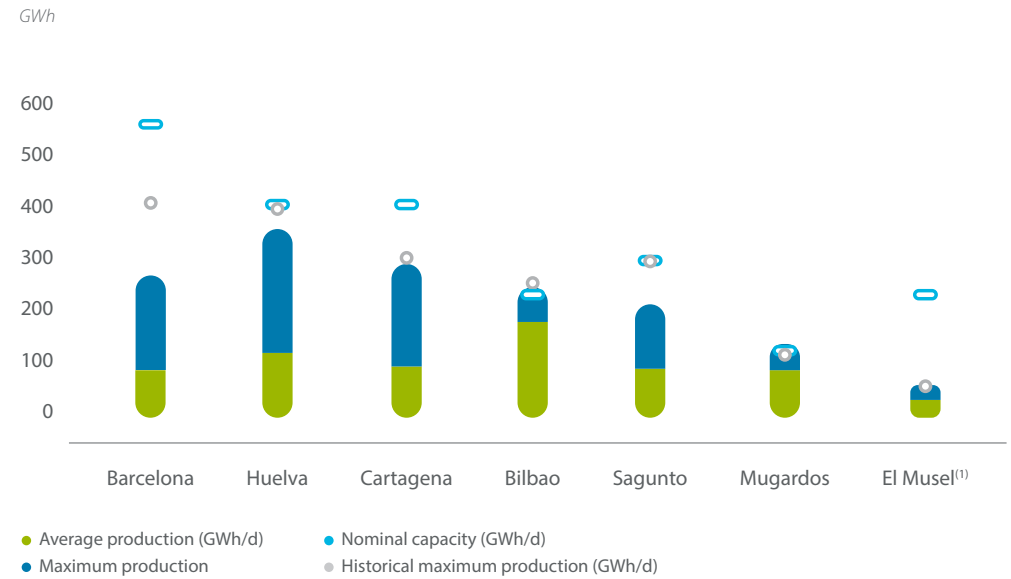
Evolution of average regasification and contracting in the terminals



Nominal and daily production evolution



Productions and capacities by regasification terminals



⁽¹⁾ Issuance subject to the stipulations of order TED/578/2023.

Vessel loading at regasification terminals

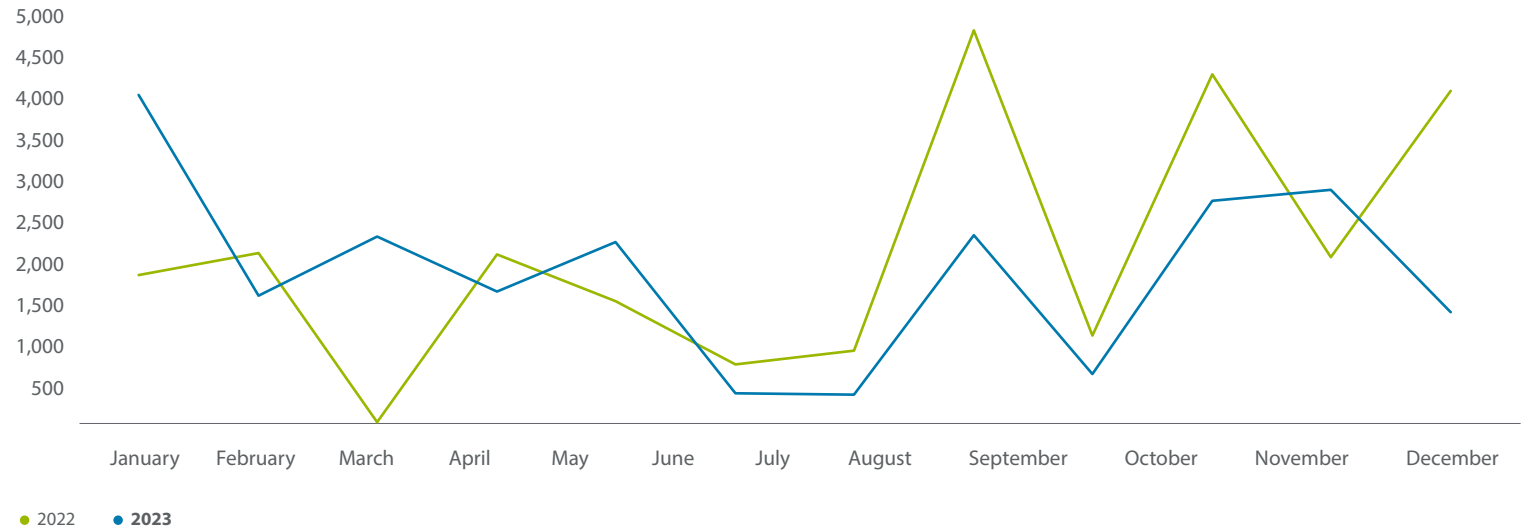
In 2023, outflows from regasification plants in the form of vessel loadings have totalled 21,973 GWh, with part of these unloadings contributing to security of supply at European level.

21,973 GWh

Outputs from regasification terminals
in the form of vessel loading

Evolution of vessel loading

GWh



Tanker loading at regasification plants

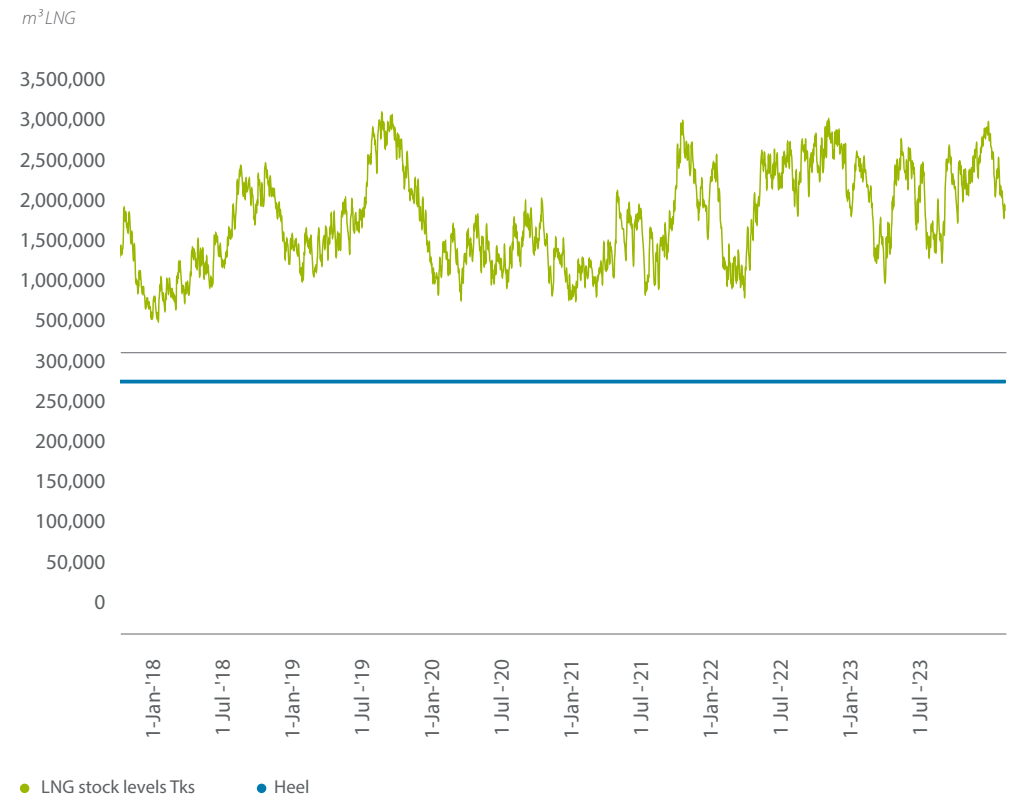
In 2023, the volume of tanks managed was 11,546 GWh, 8.2% more than in 2022. The most notable increase was observed at the Bilbao Terminal, with a 31.3% more than in 2022.

Tanker loading at regasification plants

Plant	2022	2023			
	Total GWh	Total GWh	Δ o/2022	Max. daily GWh/day	Δ o/2022
Barcelona	2,373	2,442	+2.9%	15	+6.8%
Huelva	2,315	2,439	+5.4%	11	-3.4%
Cartagena	2,138	2,061	-3.6%	13	-12.2%
Bilbao	1,034	1,358	+31.3%	6	+14.3%
Sagunto	1,708	1,977	+15.8%	10	-5.8%
Mugarodos	1,100	1,148	+4.4%	6	-7.9%
El Musel		121	+100.0%	3	
Total	10,668	11,546	+8.2%	61	

Stocks at terminals

Evolution of stocks at terminals



For average tank stock levels, please refer to **Annex 2** of this chapter in the downloadable information by clicking [here](#).



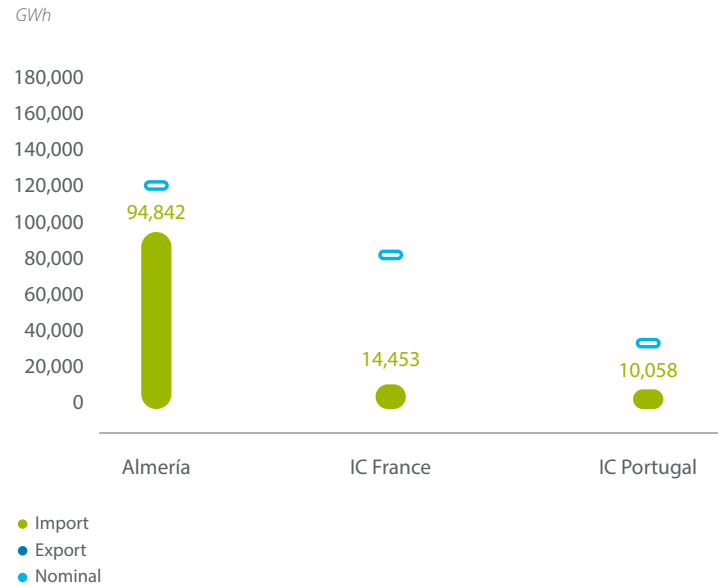
International connections

In 2023, the Gas System received 119,383 GWh of natural gas through international connections (IC). Exports amounted to 53,326 GWh, 24% higher than the previous year.

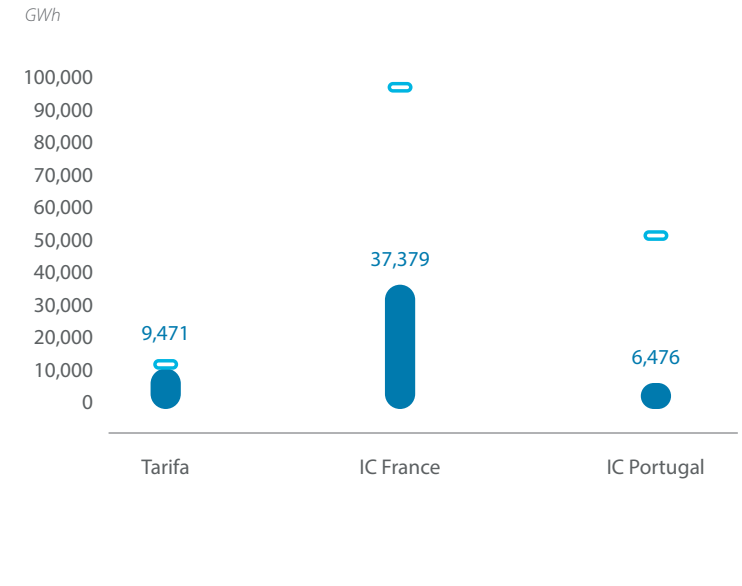
Exports through interconnections with France have broken historical records, exceeding 37,379 TWh. In total, through interconnections with France and Portugal, exports have reached 44 TWh.

2023 is the first year in which the international connection of Tarifa has maintained export flows on all days. Exports through this infrastructure have reached 9.5 TWh, with the exported gas always having a guarantee of origin certificate.

Import 2023 / nominal 2023



Export 2023 / nominal 2023



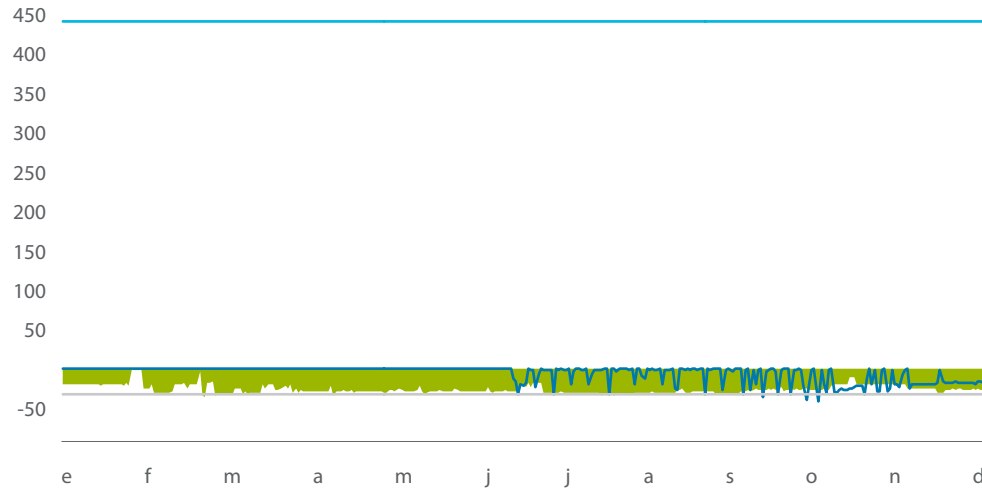
53,326 GWh

Natural gas exports
through international connections(+24% vs.
2022)

International connections with North Africa

Inputs via Tarifa

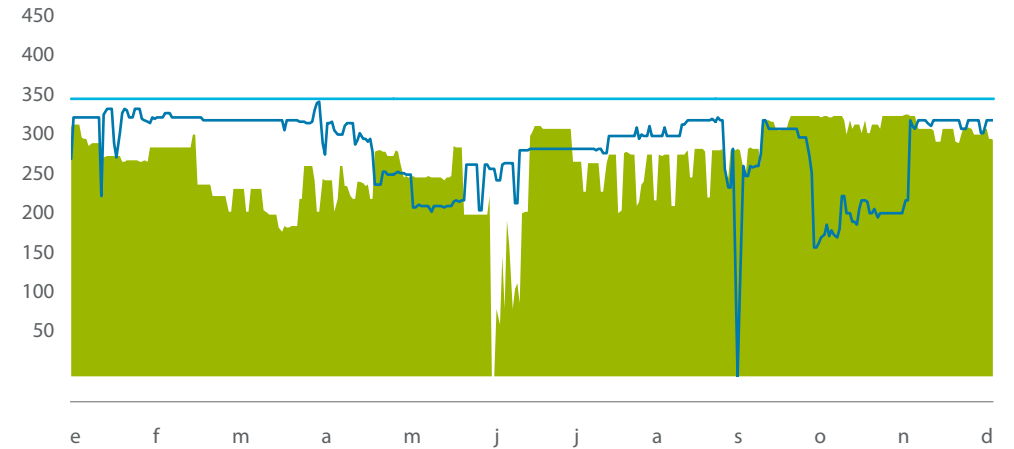
GWh/day



- 2023
- 2022
- Nominal import
- Nominal export

Inputs via Almería

GWh/day



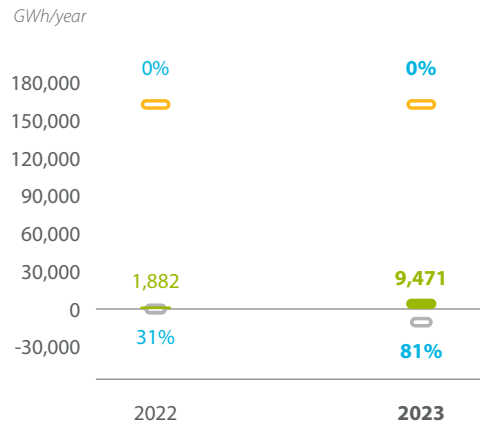
- 2023
- 2022
- Nominal

In 2023, imports through the Tarifa international connection reached 9,471 GWh. Gas imported through the Almería international connection amounted to 94,842 GWh.

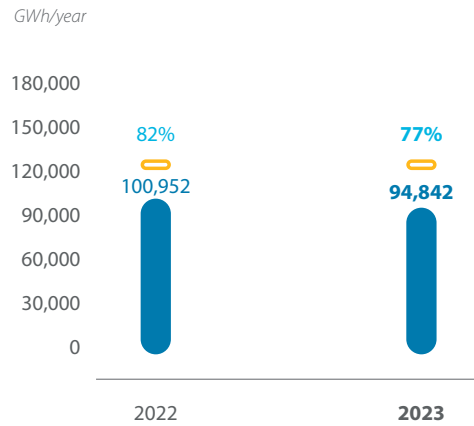
International connections with France

In 2023, natural gas exports via international connections with France have increased by 5.7% versus 2022. In turn, through this interconnection, imports have decreased by 33%.

IC Tarifa



IC Almería



- Export
- Import
- Nominal export
- % Contracting vs. nominal
- Nominal import

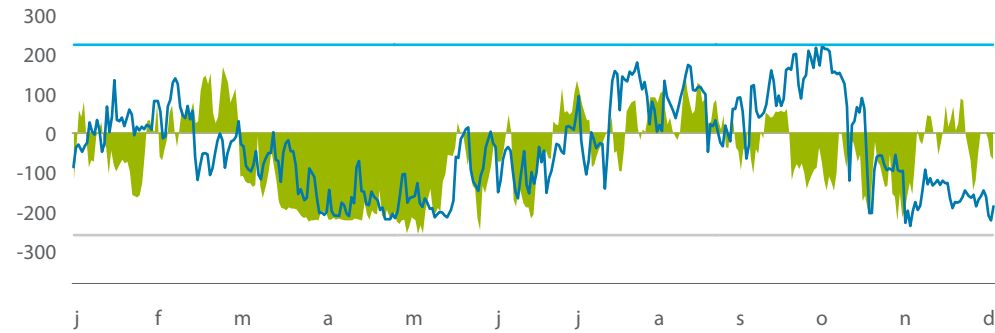
- Import
- % Contracting vs. nominal
- Nominal

+5.7%

Increase in exports
through the interconnection with
France (vs. 2022)

Physical movements - IC France

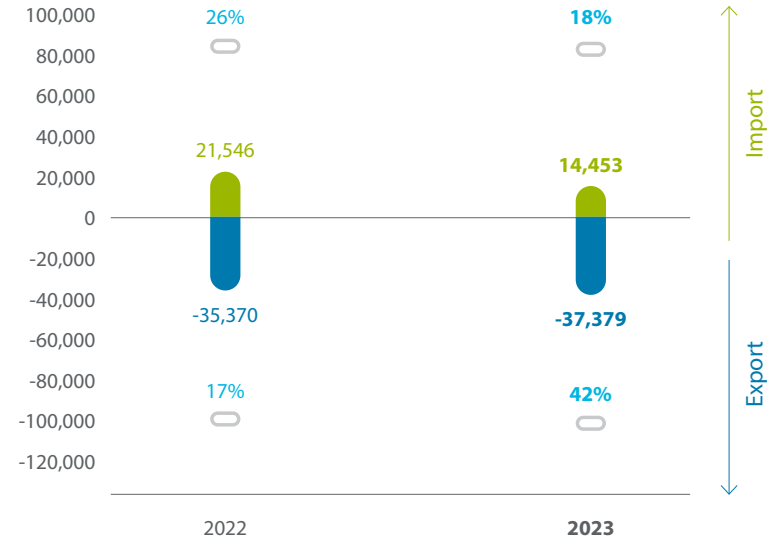
GWh/day Balance = Imp. - Exp.



- 2023
- 2022
- Nominal import
- Nominal export

Trade movements IC France

GWh/year



- Import
- Export
- Nominal export
- % utilisation

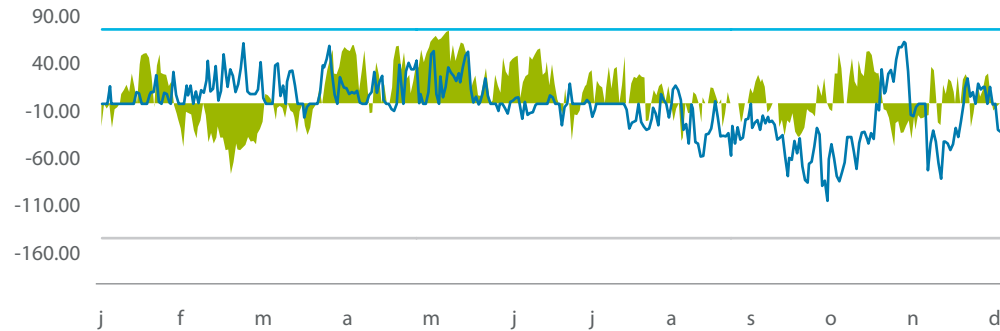
International connections with Portugal

Exports through international connections with Portugal amounted to 6,476 GWh in 2023, up 10.3% on 2022.

Imports have increased by 114.6% compared to 2022, reaching 10,058 GWh in 2023.

Physical movements - IC Portugal balance

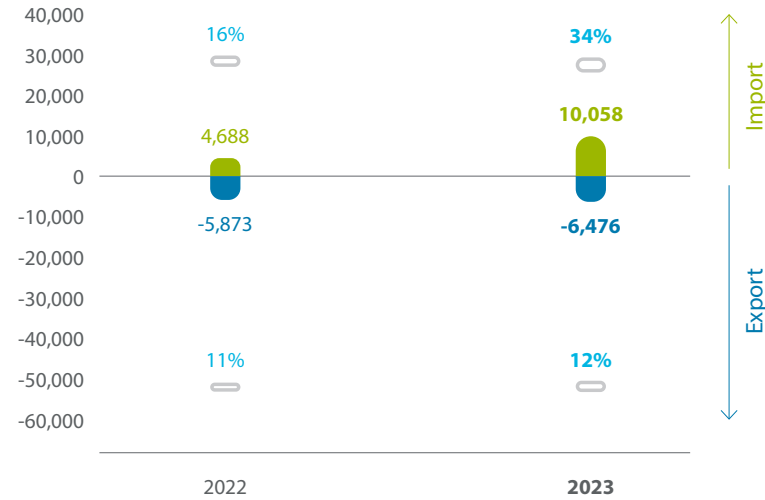
GWh/day Balance = Imp. - Exp.



- 2023
- 2022
- Nominal import
- Nominal

Commercial movements - IC Portugal

GWh/year



- Import
- Export
- Nominal export
- % utilisation

Underground storage facilities

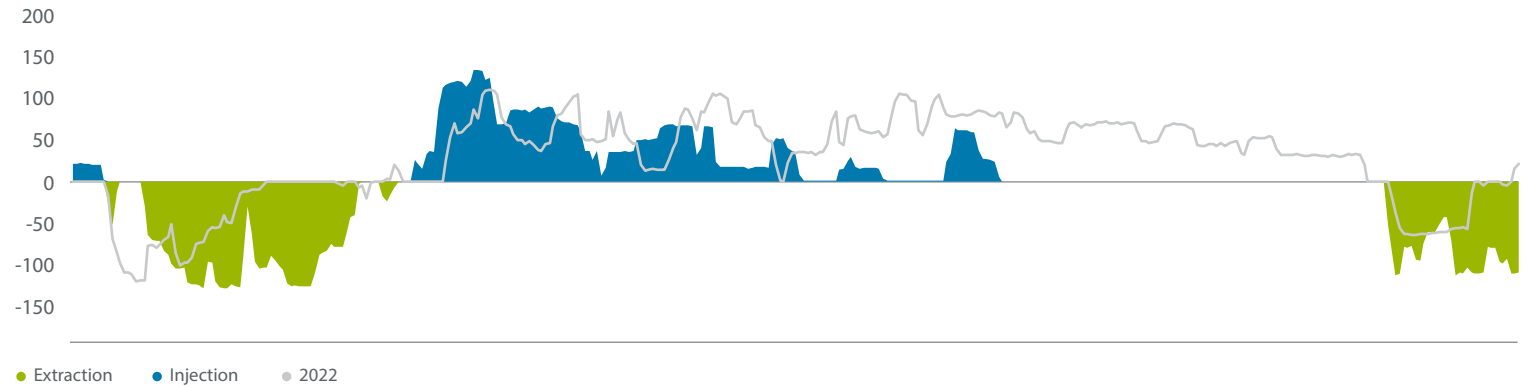
Gas injected during 2023 amounted to 7,070 GWh. Extraction, on the other hand, was 8,669 GWh.

Of the Community regulatory developments addressed in 2023, with regard to underground storage facilities (USF), Order TED/72/2023, of 26 January, which develops the procedures necessary for compliance with the obligation to maintain minimum buffer stocks of natural gas, stands out. This Order defines the methodology for calculating users' minimum operating buffer stocks in order to reach 90% of underground storage on 1 November each year.

Spain achieved this target, reaching a filling level of 100% by 1 November 2023.

Extraction / injection vs. previous year

GWh/day



100%

Filling level of storage facilities in Spain on 1 November (level required by EU regulations: 90%, achieved 6 months in advance)

7,070 GWh

Gas injected into storage

Injection/Extraction in USF

GWh

	2022	2023	2023 vs. 2022
Injection	14,575	7,070	-51%
Extraction	3,978	8,669	118%

60,230 GWh

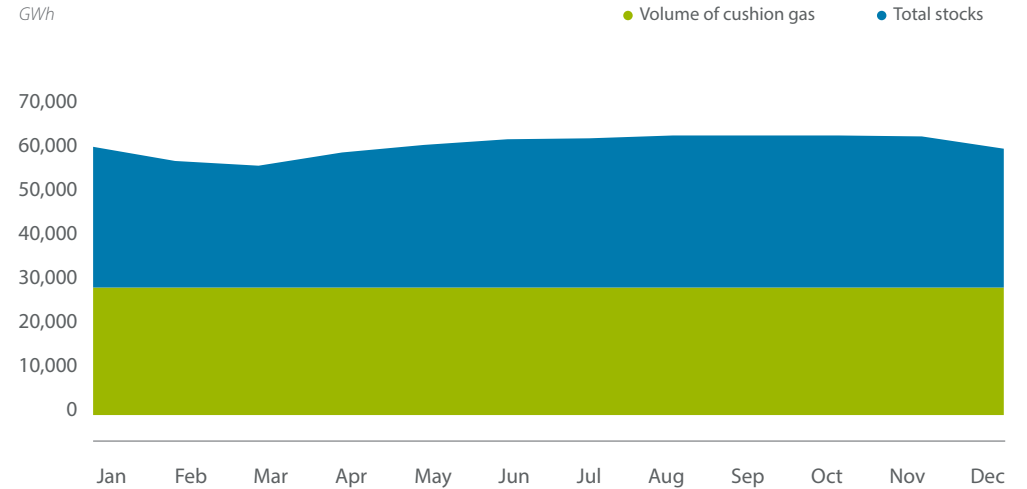
Final stocks
in underground storage

Full management of underground gas storages in 2023

		Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Working capacity	GWh	35,342	35,342	35,342	34,179	34,179	34,179	34,179	34,179	34,179	34,179	34,179	34,179
Volume of cushion gas	GWh	28,793	28,793	28,793	28,793	28,793	28,793	28,793	28,793	28,793	28,793	28,793	28,793
Initial stocks	GWh	61,804	60,721	57,567	56,495	59,521	61,169	62,382	62,701	63,306	63,308	63,309	63,048
Injection (net)	GWh/month	177	0	100	3,026	1,649	1,212	320	605	2	2	0	0
Average daily injection	GWh/day	6	0	3	101	53	40	10	20	0	0	0	0
Extraction (gross)	GWh/month	1,260	3,154	1,172	0	0	0	0	0	0	0	261	2,818
Average daily extraction	GWh/day	41	113	38	0	0	0	0	0	0	0	9	91
End stocks	GWh	60,721	57,567	56,495	59,521	61,169	62,382	62,701	63,306	63,308	63,309	63,048	60,230

Stocks in USF

GWh



Gas transmission

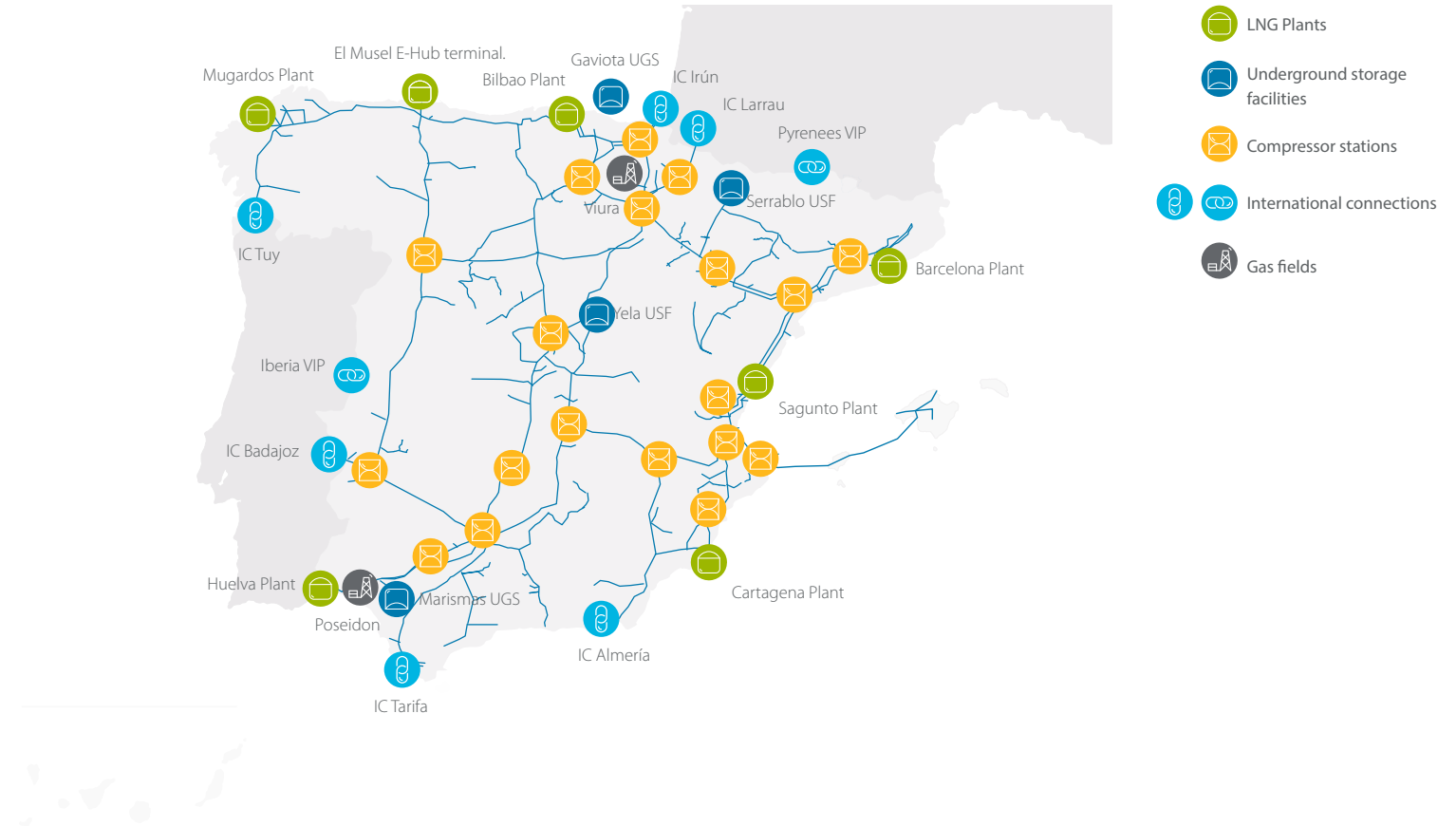
In 2023, the Spanish Gas System remained with the same infrastructures as the previous year.

The Gas System had 11,369 km of primary transport pipelines at the end of 2023, and a total of 13,361 km, including secondary pipelines.

11,369 km

Primary transmission pipelines (13,361 km, including secondary ones)

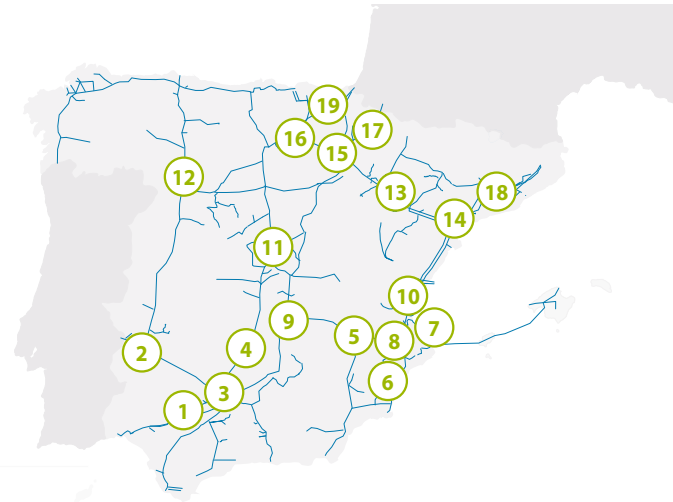
Transmission infrastructure



Compressor stations

The gas pipeline network has nineteen compressor stations (CS), as well as transmission centres, regulation and measurement stations and connection points to the network. They allow the correct primary distribution of gas throughout national territory and provide security of supply of natural gas even in situations of peak demand.

Compressor stations



- 1. Seville CS
- 2. Almodóvar CS
- 3. Córdoba CS
- 4. Almodóvar CS
- 5. Chinchilla CS
- 6. Crevillente CS
- 7. Denia CS
- 8. Montesa CS
- 9. Alcázar CS
- 10. Paterna CS
- 11. Algete CS
- 12. Coreses CS
- 13. Zaragoza CS
- 14. Tivissa CS
- 15. Villar de Arnedo CS
- 16. Haro CS
- 17. Navarra CS
- 18. Bañeras CS
- 19. Euskadour CS

Average emission gas quality in 2023

	Barcelona	Huelva	Cartagena	Bilbao	Sagunto	Mugardos	Musel	Aznalcázar Gas Field	Viura Gas Field	Valdemingómez	La Galera	Portugal Connection	France Connection	Tarifa	Almería
Molar fractions %															
Nitrogen (N ₂)	0.204	0.110	0.199	0.157	0.157	0.165	0.234	1.244	1.133	0.832	0.435	0.157	0.530	0.816	1.110
Carbon dioxide (CO ₂)	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.226	0.126	1.540	0.498	0.046	0.632	1.228	1.785
Gas quality															
H.C.V. [KWh/m ³ (n)]	11.691	11.662	11.618	11.667	11.734	11.548	11.345	11.381	11.695	10.894	11.742	11.613	11.666	11.677	11.679
H.C.V. [MJ/m ³ (n)]	42.089	41.984	41.826	42.002	42.242	41.574	40.842	40.973	42.101	39.219	42.272	41.808	41.996	42.036	42.044
Relative density	0.592	0.589	0.588	0.590	0.594	0.583	0.572	0.589	0.604	0.577	0.605	0.588	0.604	0.617	0.630

2 Markets



The GTS has **improved efficiency, both in taking balancing actions and in procuring operating gas**

The role of the TSO in the Organised Market

As established in the Balancing Circular 2/2020, the TSO is responsible for maintaining the transmission network of the Gas System within the normal operating limits by means of the so-called balancing actions in PVB, and is also responsible for management of imbalances in TVB and AVB.

In addition, according to the Resolution of 12 July 2023 of the Secretary of State for Energy, which develops the procedure for the purchase of operating gas and gas intended for minimum filling level, the TSO is responsible for making these purchases in the Organised Market.

Likewise, Order TED/72/2023, of 26 January, which develops the procedures necessary for compliance with the obligation to maintain minimum buffer stocks of natural gas, authorised the TSO to purchase natural gas destined for minimum buffer stocks on the Organised Gas Market in the event of non-compliance by users.

Regulatory filing

- 99% efficiency in taking balancing actions for *stock* maintenance of the transmission network.
- In 2023, the TSO managed 3% of the volume traded on MIBGAS.
- 7% increase in traded volume on market platforms in 2023 compared to 2022.
- 2.5% decrease in the acquisition cost of operating gas borne since 25 August following the implementation of the new regulations of the Secretary of State for Energy.
- Containment of operating costs in the application of the PVB model in 2023 compared to 2022.

99%

efficiency in taking balancing actions for the maintenance of the transmission network *stock*

2.5%

decrease in the acquisition cost of operating gas borne

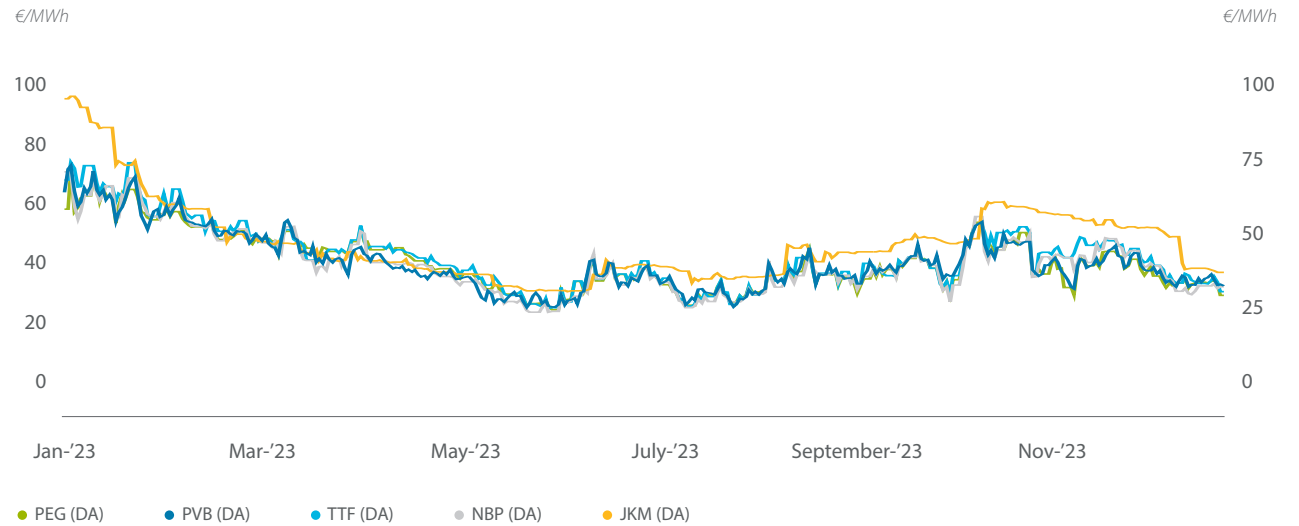
Evolution of prices in the main European hubs and Japan Korean Market (JKM)

The gas prices of the European hubs, after reaching record highs in 2022, have been on a downward trend, driven by a mild winter in 2023 and strong NG and LNG supply in Europe. Both the *spot* demand for LNG in Asia, which has been very low, as well as the EU's energy saving targets, have also contributed to the decline. Volatility has been reduced by approximately 50% in 2023 compared to 2022.

However, events such as planned and unplanned maintenance in Norway and strikes at liquefaction terminals in Australia over the summer led to some increases in the prices of *European* hubs.

The emergence of new conflicts, such as the Israeli-Palestinian war or the armed conflict in the Red Sea, have so far not seemed to influence price developments.

Evolution of prices in the main European hubs and JKM



The presence of the TSO in the Organised Market

In 2023, the TSO traded 4,087 GWh in balancing actions, 701 GWh for the purchase of operating gas and 69 GWh in the management of imbalances in TVB/AVB, which means a total of 4,857 GWh/year and represents 3% of the volume traded on the Organised Market.

Balancing actions in PVB

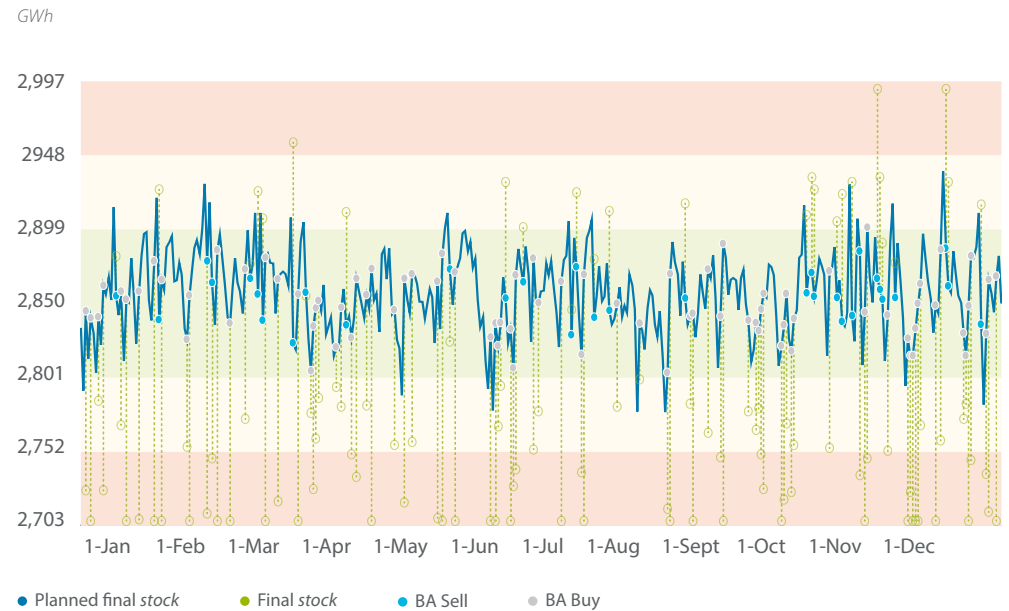
Action by means of balancing actions is an operation that the TSO must carry out in the Organised Market when it estimates that the expected gas stock in the transmission network at the end of the day is going to move away from the band of optimal values for operational functioning -green band-, with the aim of returning the stock to that band.

- **Sell-balance actions:** when the *stock* is expected to end up in the upper warning band -upper red band.
- **Buy balance actions:** when the *stock* is expected to end up in the lower warning band -lower red band.

The revenues and economic costs derived from these balancing actions, together with the costs and revenues from user imbalance settlements, are subsequently settled by the TSO.

The following figure illustrates the time distribution of balancing actions throughout the year and the evolution of the System's status, indicating the days on which the TSO went to the Organised Market.

Balancing actions and evolution of the state of the System



In 2023, 114 of the 115 balancing actions (BA) carried out by the TSO met the target of ending the gas day with the *stock* in the indifference band; only the one carried out on 8 November ended only 1 GWh above the indifference band.

The TSO carries out approximately one balancing action every three days, with a total of 115 in 2023.

114

balancing actions by the TSO met the **objective of ending the gas day with the *stock* in the indifference band**

Balancing actions (buy)

Balancing actions	83
Quantity (GWh)	2,660
Cost (€M)	113.20

Balancing actions (sell)

Balancing actions	32
Quantity (GWh)	1,427
Revenue (€M)	53.40

Management of imbalances in TVB and AVB

According to current regulations, the TSO manages imbalances in TVB/AVB, and must go to the market to buy/sell the net balance of users' imbalances within a maximum of five days of their occurrence.

- The default imbalances are practically daily, generally of a few kWh and respond to tanker loads not supplied by the users.
- Excess imbalances are sporadic and caused by the lower storage capacity available, both in tank and underground storage.

Imbalance management (buy)

Managing imbalances	123
Quantity (GWh)	28
Cost (€M)	10.90

Imbalance management (sell)

Managing imbalances	15
Quantity (GWh)	41
Revenue (€M)	6.80

Operating gas, cushion gas and heel gas

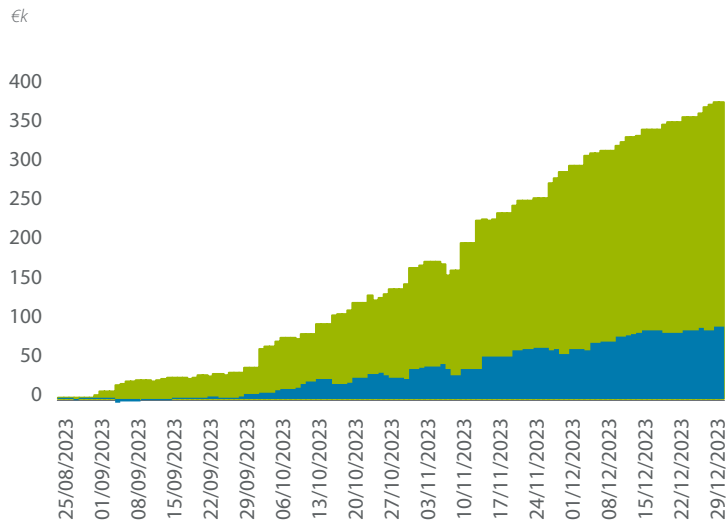
In accordance with the Resolution of 12 July 2023 of the Secretary of State for Energy, which develops the procedure for the purchase of operating gas and gas intended for minimum filling level, the TSO has extended both the products and the type of session in which it makes purchases of paid operating gas. During 2023, the TSO purchased 701 GWh of operating gas, at a cost of €27.15 M.

As established in the Resolution of 28 July 2022 of the National Markets and Competition Commission, which establishes the destination of the natural gas stocks in the Gas System's shrinkage balance account, between 6 August 2022 and 24 July 2023, 1,059 GWh (3 GWh/day) were allocated to cover the needs of operating gas paid for, reducing the gas acquisition needs for this purpose by the TSO of the Gas System.

The diversification of products and sessions in which the TSO can purchase subsidised operating gas has reduced the cost of the quantity purchased by €373,447 since 25 August 2023, the date on which the TSO began to apply this regulation, compared to the auction of the D+1 product. This change has resulted in significant savings in gas purchases.

During 2023, the TSO has not been required to turn to the market for the purchase of gas for the minimum filling level of the facilities.

Cumulative savings operating gas purchase cost borne



- Auction Price Differential D+1 VS TSO (€)
- Weighted Average Price Differential VS TSO (€)

Cumulative operating gas cost savings since August 25

Operating gas cost (€M)	€14,675,885	
Savings compared to D+1 auction price	€373,447	-2.50%
Savings compared to the weighted average price for the session	€91,097	-0.62%

€373 k

savings compared to the auction price of product D+1

Maintenance of minimum buffer stocks of natural gas

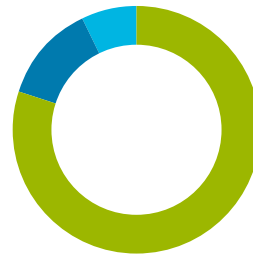
The steps taken by the TSO, in coordination with CORES and the users, have led to the latter complying with the maintenance of the minimum buffer stocks established in current legislation, avoiding the need for the TSO to resort to the Market for the subsidiary acquisition of these stocks.

MS-ATR Enagás GTS OTC Platform

In 2023, 304,950 bilateral OTC transactions were recorded on the MS-ATR platform belonging to the TSO, representing a recorded volume of 932,955 GWh. Compared to the previous year, the volume of transactions increased by 2%.

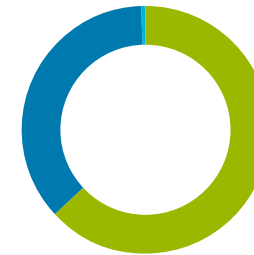
It should be noted that the volume recorded in PVB was 338,803 GWh, 104% of the System's total demand. In the case of TVB, the record of transactions totalled 590,874 GWh, representing 213% of the total annual volume unloaded at terminals.

Percentage of trading volume



- MS-ATR (OTC)
- Platforms
- Other OTC

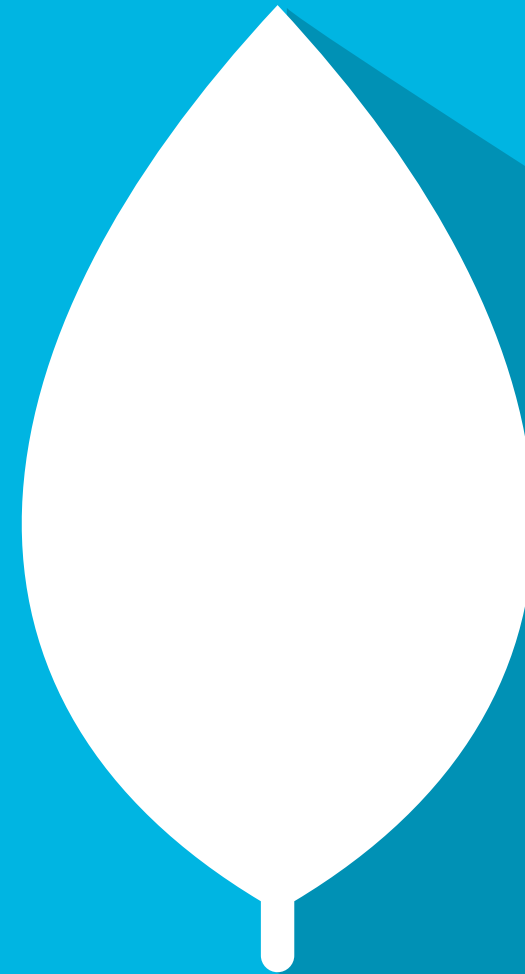
Bilateral transactions



- Virtual Balancing Tank
- Virtual Balancing Point
- Virtual Balancing Storage

3 Renewable gases

3.1 Guarantees of Origin



Enagás Technical System Operator (TSO), as the responsible entity designated by the Ministry for Ecological Transition and the Demographic Challenge, has put into operation the **new Guarantees of Origin (GoO) System for renewable gases**

Guarantees of Origin

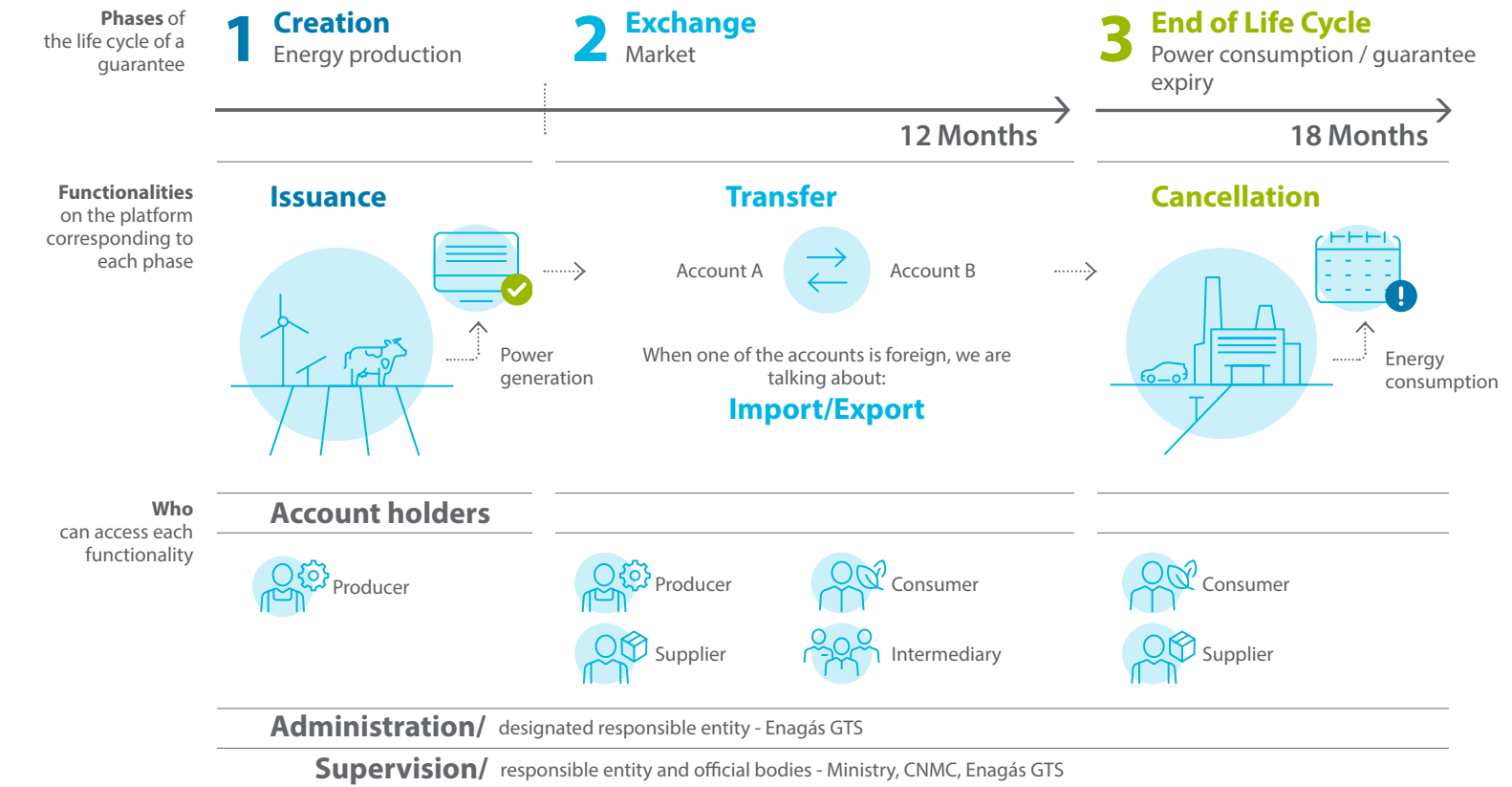
Enagás (TSO), as the responsible entity designated by the Ministry for Ecological Transition and the Demographic Challenge, has put into operation the new Guarantees of Origin (GoO) System for renewable gases in 2023.

The system already allows certifying that the gas produced in Spain is of renewable origin, characterising it with information on how and where it has been produced. The gases covered by this certification are biogas, biomethane and renewable hydrogen. In addition, the system will cover any type of marketing logistics: injection into the gas system, injection into isolated pipelines, *off-grid logistics* and even self-consumption of renewable gases.

A GoO certifies the renewable character of 1 MWh of gas, which is assigned a unique identification number. The GoO and its attributes remain unchanged throughout its life cycle, which can be up to 18 months, and in all operations that can take place on the platform: issuance, transfer, import/export and cancellation.

Main characteristics of the System of Guarantees of Origin.

This diagram summarises the phases of the life cycle of a guarantee of origin, how these phases correspond to the different functionalities in the system platform and which roles can access them.



Regulatory milestones

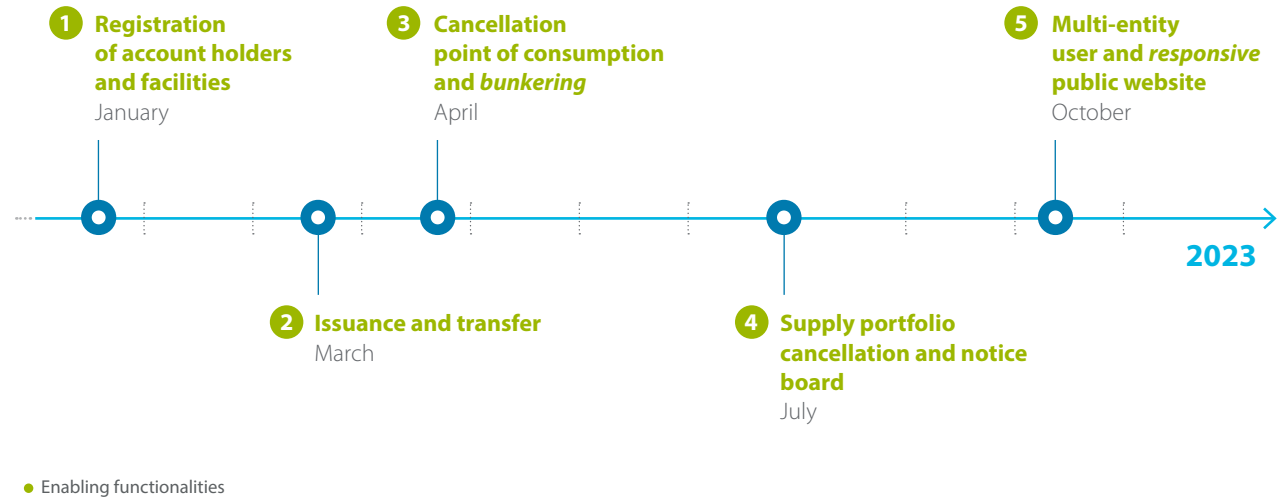
In compliance with the milestones set out in the More Energy Security Plan (Plan +SE) at the end of 2022, the implementation of the GoO System has taken place incrementally, with two key releases that have enabled basic functionalities of the IT platform:

- On **24 January 2023**: launch of the **system's register of account holders and system installations**.
- On **28 March 2023**: launch of the **issuance and transfer of GoOs**.

In addition to these two milestones, Enagás GTS has implemented other relevant functionalities, such as different types of cancellation or a notice board, in three progressive production start-ups in April, July and October.

The import and export of GoO will be possible through the platform of the *Association of Issuing Bodies (AIB)* platform, for which Enagás GTS has formalised all the administrative procedures necessary to connect to its gas scheme during 2023. These include the approval of the *Domain Protocol*, a document describing how the rules are implemented *European Energy Certificate System (EECS)* rules are implemented in each GoO registry connected to the AIB platform.

GoO System production start-up in 2023



5
Putting into production
Incremental functionalities

System monitoring

In 2023, a total of 129 entities with an account holder profile have been registered in the GoO System: 30 producers¹, 8 consumers, 23 suppliers and 73 intermediaries.

Producer holders are those that have registered at least one renewable gas production facility in the GoO System. The first facility to complete the registration process and access the issuance of GoO was the Valdemingómez Technology Park, owned by the Madrid City Council, which produces biomethane from municipal waste and injects it into the transmission network.

On the other hand, Gestcompost Pina was the first biogas production facility to register in the GoO System. The facility is located in Pina de Ebro, Zaragoza, and generates biogas for own consumption from organic waste of animal origin. Another noteworthy event was the registration of the first renewable hydrogen production facility, specifically the green hydrogen plant managed by Iberdrola in Barcelona. The green hydrogen generated at this facility, from renewable electricity, is used to supply the Transports Metropolitans de Barcelona (TMB) bus network.

Other facilities that have completed registration in the system are those linked to industrial processes in the paper and fruit sectors, which produce biogas as a result of their production process and consume it *on site*. The interest of these industries in the GoO System has derived from the recommendations on the treatment of biomass published in September 2023 by the Emissions Trading Technical Group of the Climate Change Policy Coordination Commission. The document states that for greenhouse gas emissions reporting purposes, an installation subject to emissions trading that consumes self-produced biogas must submit GoO in order to be counted with an emission factor of 0.

In total, since the launch of the system at the beginning of 2023, 33 production facilities have completed the registration. 20 of these installations are on Provisional Registration, i.e. they are not yet operational and are not eligible for GoO issuance. Four facilities are in the process of registration and are expected to complete registration by early 2024. More details about all production facilities registered in the GoO System can be found at the following [link](#).

Facilities in the final register of the GoO System

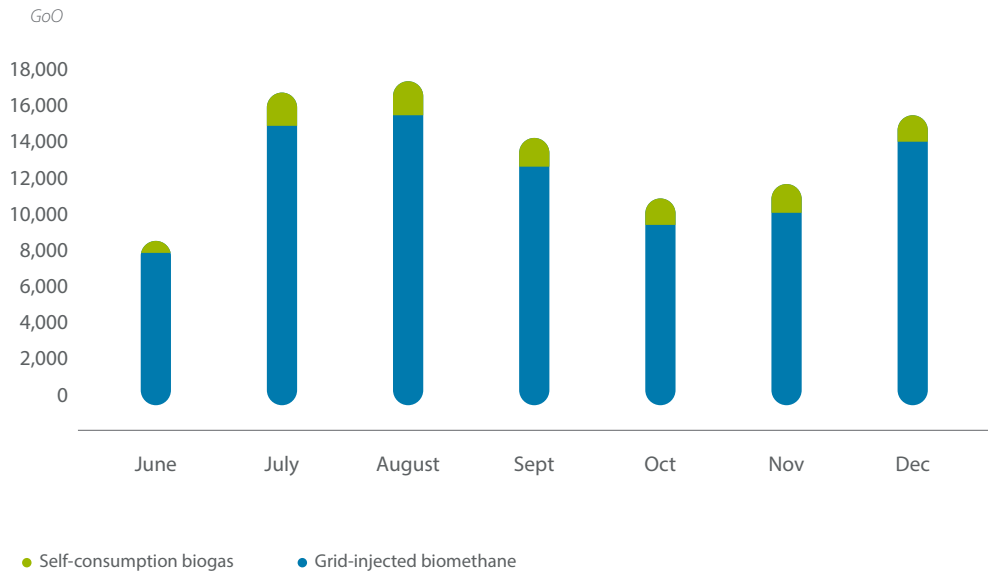
Name of the facility	Renewable gas produced	Marketing logistics
Valdemingómez Technology Park	Biomethane	Injection into the Gas System
Gestcompost Pina	Biogas	Internal consumption
Elena Biomethane Plant	Biomethane	Injection into the Gas System
Green Hydrogen Plant Barcelona	Renewable hydrogen	<i>Off-grid</i> production point
Nufri	Biogas	Internal consumption
Unión Industrial Papelera	Biogas	Internal consumption
Alier Paper and Cardboard Mill	Biogas	Internal consumption
International Paper Madrid Mill SLU	Biogas	Internal consumption
Papelera de la Alquería	Biogas	Internal consumption
Hinojosa Paper Sarrià	Biogas	Internal consumption
Papresa SL	Biogas	Internal consumption
Saica Paper El Burgo de Ebro	Biogas	Internal consumption
Saica Zaragoza	Biogas	Internal consumption

¹ 19 of the producer holders have facilities in provisional registration, so they appear on the GoO website with an intermediary sub-profile.

As for the issuance of GoO, in 2023 the system has issued a total of 95,148 GoO. Around 90% of these are biomethane for injection into the gas system, while the rest are biogas for self-consumption. Most of this gas, also 90%, has been produced from municipal waste. Other feedstocks used are bio-waste, manure, sewage sludge or landfill gas.

In terms of cancellation, 500 GoO have been redeemed in 2023 for one point of consumption, while 10,272 have been automatically redeemed as biogas for self-consumption.

Number of GoO issued in 2023 by gas type and marketing logistics



The committee of subjects of the GoO System

In compliance with the provisions of article 19.7 of Royal Decree 376/2022 of 17 May, Enagás GTS has set up a Committee of Subjects of the GoO System. The purpose of this body is to report on the functioning and management of the system, as well as to channel proposals for improvement.

The Committee is composed of full members, with voice and vote, and invited members. In addition to the Ministry for Ecological Transition and the Demographic Challenge, the full members include the National Markets and Competition Commission, Enagás GTS and the Entity Responsible for the GoO System, the holders of the GoO System, transmission and distribution companies with renewable gas injection points, operators of isolated pipelines and operators of trading platforms connected to the GoO System. Invited members, with the right to speak but not to vote, include relevant agents in the sector such as natural gas transmission and distribution companies and sectoral associations, among others.

At the end of 2022, a working group open to the entire renewable gases sector was established, which has acted as a precursor to the Committee of Subjects as the GoO System was being put in place. In September 2023, attendance at these sessions was limited to Committee members only, due to the fact that a significant number of entities were already registered in the system. Finally, elections were held in November to elect the members who have the power to vote on the Committee's decisions. The appointed members subsequently voted for the Chairman and Vice-Chairman at the December session, which marked the formal constitution of the Committee of Subjects of the GoO System.

Downloads

In this section you can download in editable format (Excel) part of the graphical content of Enagás GTS published in this report, as well as the annexes referred to.

1 The Gas System in Spain

↓ 1.1 Procurement and guarantees

- ↓ **Annex 1.** Contracted capacity
- ↓ **Annex 2.** Allocation of *slots*
- ↓ **Annex 3.** Auctions

↓ 1.2 Demand

↓ 1.3 Operation and security of supply

↓ 2 Markets

3 Renewable gases

↓ 3.1 Guarantees of Origin



Issue

Communication, Public Affairs & Investor Relations General Management
and with Enagás Investors

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