



ENTSOG WINTER SUPPLY REVIEW

2024/2025

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Executive Summary

ENTSOG has completed the review of the adequacy of the European gas infrastructure for the last winter season, from October 2024 to March 2025. ENSOG's Seasonal Reviews aim at understanding the development of the demand and supply in the previous seasons and the identification of general trends not analysed at national or regional level.

Winter Supply Reviews contribute to building a basis for the assumptions considered in the Winter Supply Outlook. Such knowledge is also factored in the recurrent TYNDP process to ensure a consistent approach over the gas system development across ENSOG reports, and is used for the creation of ENSOG maps.

The key findings of this review are:

- Comparing this assessment with the previous Winter 2023/2024, the total gas demand values during winter 2024/25 increased by 7.2% in the EU, primarily driven by colder temperatures and lower wind power generation output.
- Natural gas used for power generation increased during the Winter 2024/25 period due to lower wind and hydro power production. Gas-fired power plants were crucial in providing adequacy to the power system.
- Pipeline gas supplied by Russia dropped by around 20% in comparison with the Winter 2023/24. Caspian gas supply to Europe also decreased by 20% year on year and Norway supply decreased by 6%. LNG remained at similar levels to the previous winter.
- National Production has decreased, following the general trend of the previous years by declining around 20 TWh in Europe, down to 375 TWh/ ~34 bcm.
- Storage levels in Europe increased until late October 2024, reaching levels of 95% after which time withdrawals commenced and levels went down to 34%, due to a high utilisation of 694.5 TWh/ ~63 bcm during Winter 2024/25.
- The sum of all the import flows to Europe together with the National Production decreased by around 5% and the higher demand was satisfied by using gas in the storages.
- Prices in the European hubs followed an upward trend from October 2024 to February 2025 and decreased in March 2025 to levels noted in Winter 2023/2024.

Detailed data for the cross-border flows is available on the [ENTSOG Transparency Platform](#).

Disclaimer: the source of data, if not indicated otherwise, is from ENSOG members.

Introduction

This review is published on a voluntary basis and aims at providing an overview of the demand and supply situation during the Winter season 2024/25. The report transparently outlines the internal analysis carried out by ENTSOG for the purpose of developing the seasonal Supply Outlooks as well as the Union-wide TYNDP.

The report aims to provide an overview of European trends that are not assessed at national or regional level and used as a basis for future reports. This report should not be seen as a direct review of previous Seasonal Outlooks, as outlook reports do not aim to provide a forecast, but to assess infrastructure resilience in view of actual past trends.

Regarding European dynamics, the report highlights the wide heterogeneity of national demand profiles and supply sources. These differences are linked among others to physical rationales such as climate, demand breakdown or production fields flexibility for example.

ENTSOG welcomes stakeholders' feedback on this seasonal analysis as the support to a deeper understanding of the market dynamics influencing the gas infrastructure usage. Such inputs serve as a basis for the R&D activities, supporting the continuous improvement of analytical approaches and modelling techniques for future deliverables.

Seasonal and Market Overview

Different events on the European gas market caused fluctuations in the supply and demand balance from October 2024 till end of March 2025. The major ones were:

- Gas prices reflected a general upward trend until February despite of the high European gas storage stocks.
- Russian gas imports to Europe declined by about 20% at the beginning of the year, following the cessation of gas transit via Ukraine on January 1, 2025.
- Russian pipeline exports to Europe during winter were supplied via TurkStream, the only remaining supply route left.
- Norway exports of gas to Northwest Europe started 2025 slightly below the previous year but were still in line with the five-year average. Unplanned maintenance disruptions were minimal.
- LNG, as a whole, remained as the main gas supply for Europe in the Winter 2024/25.
- Norway confirmed to be Europe's top gas provider in Winter 2024/25, covering around 25% of demand.

The new infrastructure commissioned last year before or during Winter 2024/25 was:

Table 1 - Newly commissioned infrastructure in Winter 2024/25

Country	Project Name	Start date	Capacity
Germany	Mukran LNG	September 2024	13.5 bcm/y
Greece	Alexandroupolis LNG	October 2024	5.5 bcm/y
Poland	Świnoujście LNG (expansion)	December 2024	8.3 bcm/y (+ 2.2 bcm/y)
Belgium	Zeebrugge LNG (expansion)	January 2025	8.1 bcm/y (+ 1.8 bcm/y)
Slovakia	Hungary-Slovakia Interconnector	January 2025	3.5 bcm/y (+ 0.9 bcm/y)

Gas Prices at European hubs

The following graphs show the evolution of gas prices in Europe during Winter 2024/25.

European wholesale gas prices fluctuated between 41 €/MWh and 53 €/MWh over the October 2024 – March 2025 period.

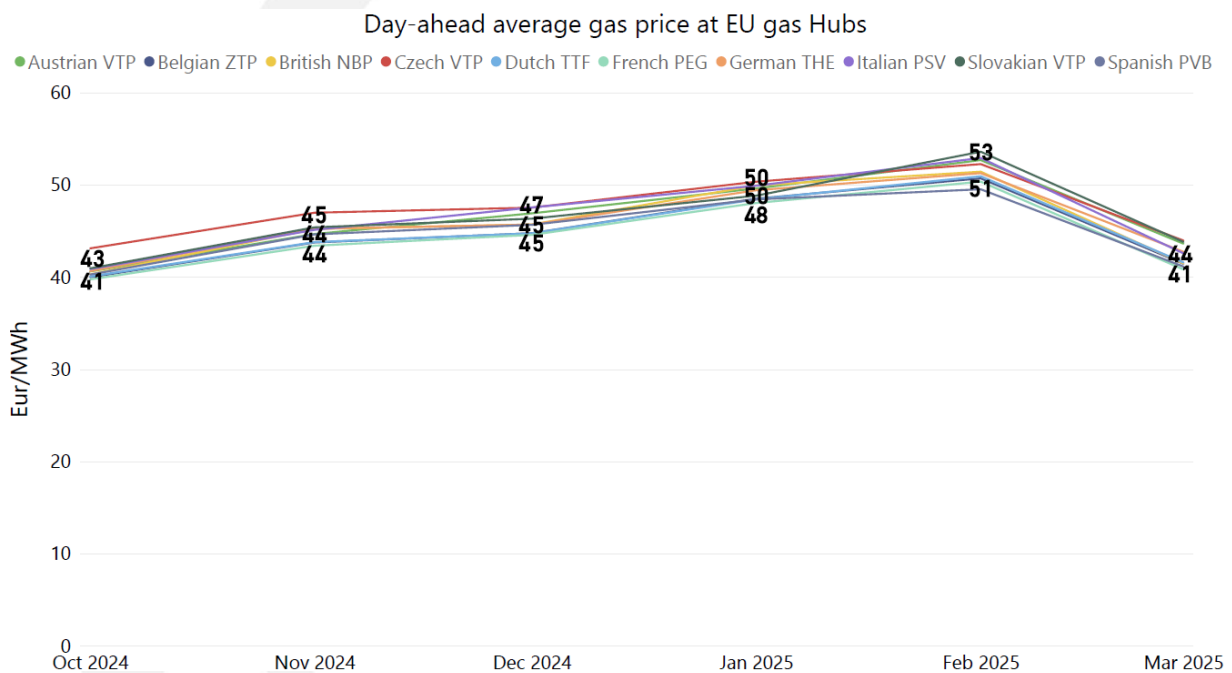


Figure 1 - Day-ahead average gas price at EU Hubs¹. Winter 2024/25

Figure 1 displays the evolution of the day-ahead average prices for the different European gas hubs. The graph shows how the European hubs followed a similar trend and reacted all winter months in the same direction, increasing until February 2025 and declining in March 2025.

¹ Source: Platts, Bloomberg

Demand

Total gas demand values increased in Winter 2024/25 vs Winter 2023/24 by around 7.2% (2327 TWh vs. 2170 TWh) in the EU and 7.2% (2801 TWh vs. 2614 TWh) also in Europe. The higher demand is mainly driven by the colder temperatures and lower wind power output during Winter 2024/25.

The countries with the highest demand increase percentage were Greece, Hungary, Austria, and Czech Republic. On the other hand, Sweden, Finland and Estonia observed the biggest reduction on the gas consumption year on year during the winter season. **Figure 2** below represents the percentage demand change in the Winter 2024/25 for the EU countries compared to the previous winter.

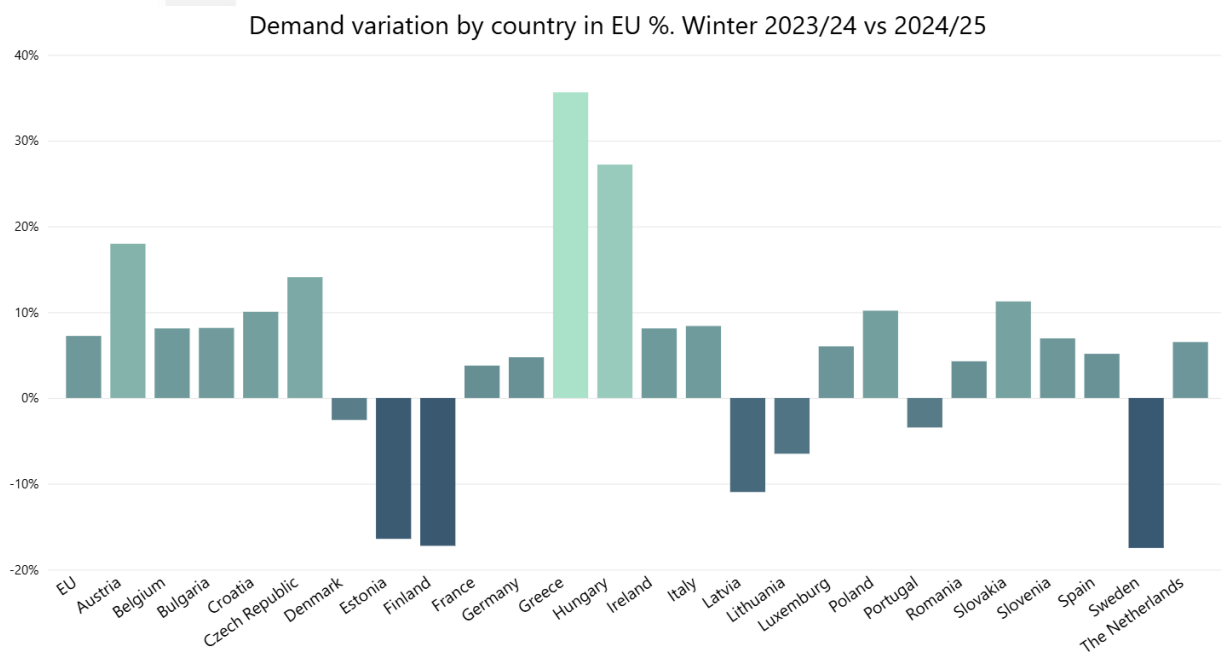


Figure 2 - Total gas demand by country. Winter 2023/24 vs Winter 2024/25

Figure 3 shows gas demand for power by country and **Figure 4** shows the comparison of historical gas demand values in Europe between winters from 2020/21.²

² Gas to power data is available for all countries except for Poland

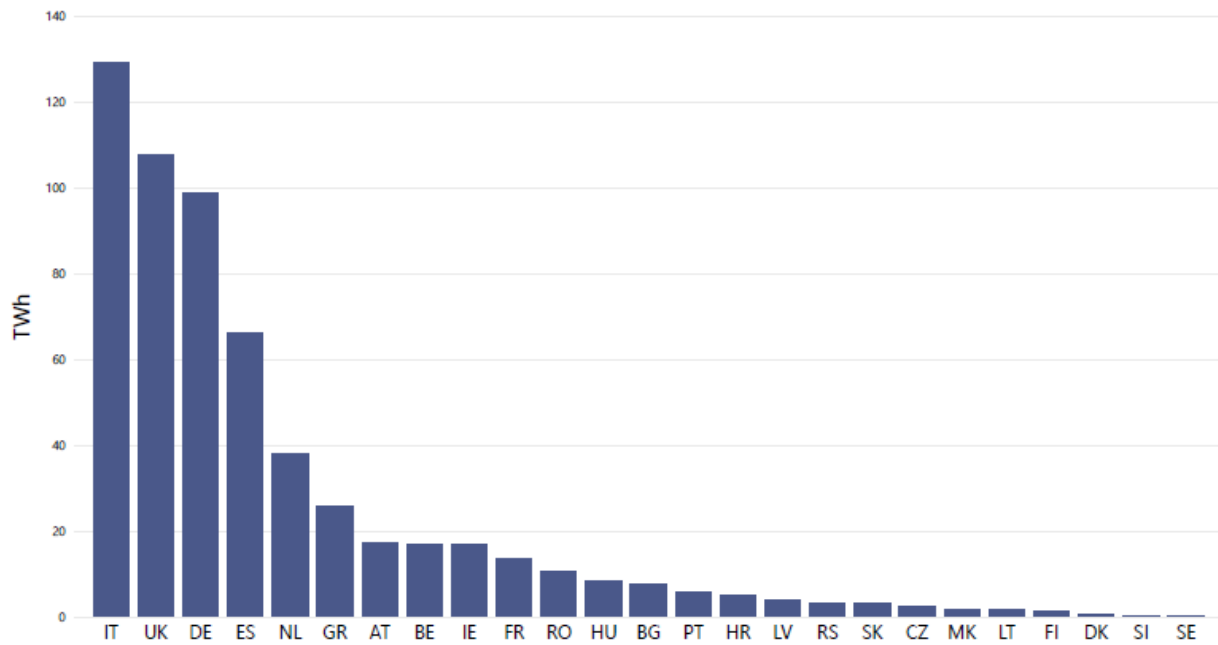


Figure 3 - Gas demand for power by country. Winter 2024/25

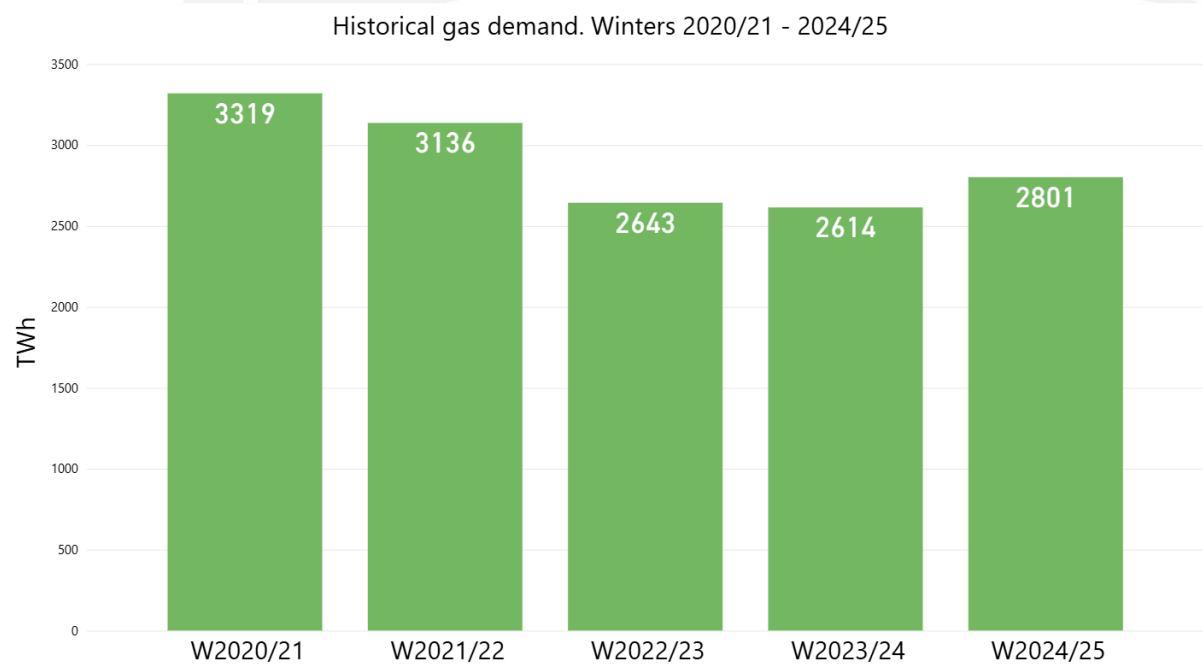


Figure 4 - Historical gas demand. Winter 2020/21 - Winter 2024/25

The accompanying **Table 2** shows the values of demand per country and the sum of total demand considering the EU countries and the available total demand values of all Europe.

Table 2 – Demand per country. Winter 2023/24 vs 2024/25³

Country	Demand W2023/24, TWh	Demand W2024/25, TWh	Difference, %
Austria	48.59	57.33	17.97%
Belgium	93.42	100.99	8.11%
Bosnia and Herzegovina	1.32	1.53	15.73%
Bulgaria	15.90	17.20	8.16%
Croatia	15.81	17.40	10.05%
Czech Republic	48.76	55.62	14.08%
Denmark	14.62	14.25	-2.56%
Estonia	2.83	2.37	-16.42%
Finland	9.25	7.65	-17.23%
France	253.85	263.43	3.77%
Germany	548.90	574.96	4.75%
Greece	29.06	39.42	35.63%
Hungary	59.79	76.06	27.20%
Ireland	27.74	29.99	8.11%
Italy	391.43	424.28	8.39%
Latvia	7.07	6.29	-10.96%
Lithuania	11.11	10.39	-6.50%
Luxembourg	4.31	4.57	6.02%
North Macedonia	2.25	2.27	0.92%
Poland	117.42	129.37	10.17%
Portugal	21.58	20.83	-3.44%
Romania	69.13	72.09	4.28%
Slovakia	31.04	34.54	11.25%
Slovenia	5.61	6.00	6.95%
Spain	163.59	172.01	5.15%
Sweden	4.15	3.42	-17.48%
Switzerland	20.75	22.15	6.78%
The Netherlands	175.15	186.56	6.52%
United Kingdom	419.36	448.44	6.93%
EU	2,170.11	2,327.02	7.23%
Europe	2,613.79	2,801.41	7.18%

³ Demand data was not adjusted for temperature corrections

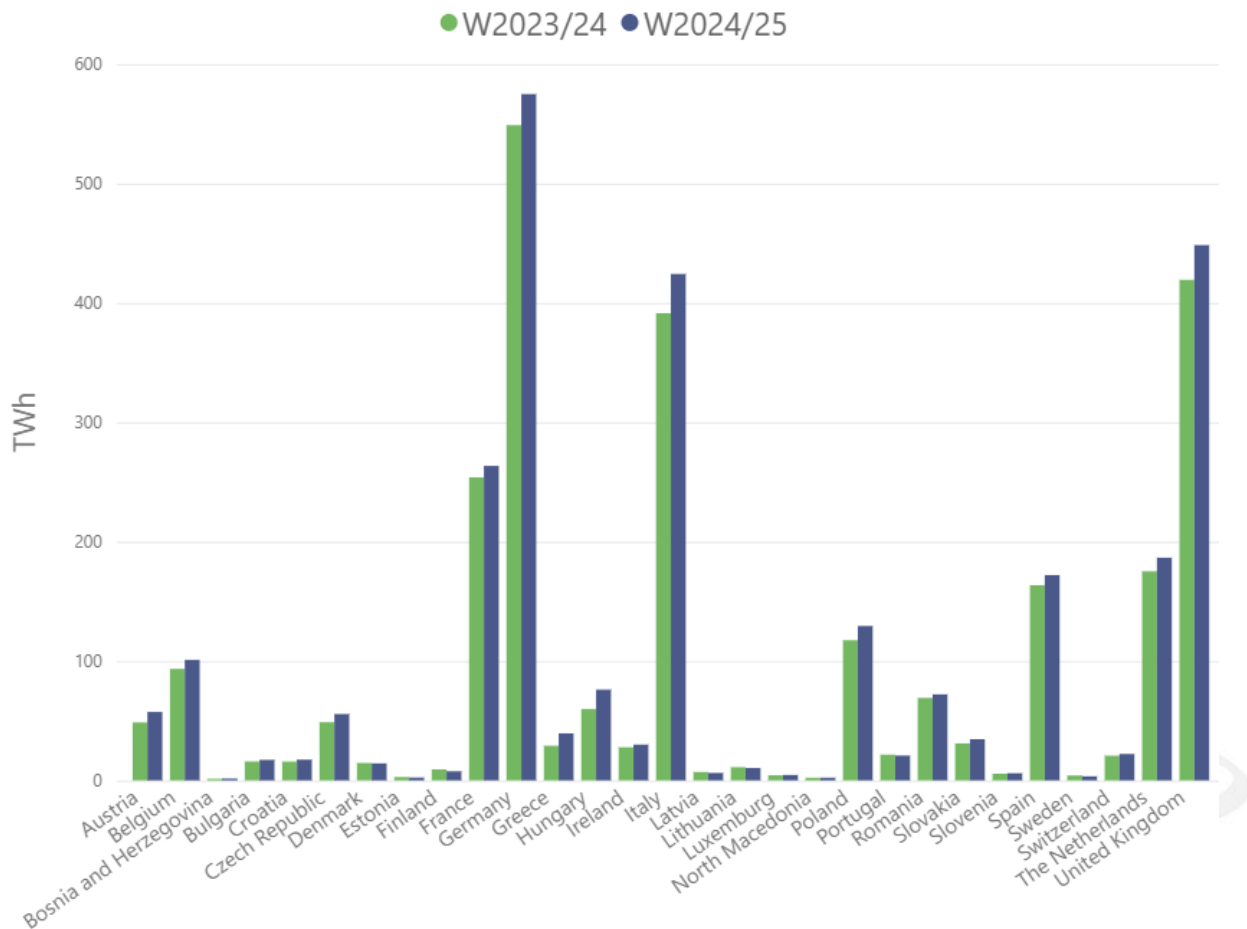


Figure 5 - Winter Demand Comparison. Winter 2023/24 vs Winter 2024/25

- **Peak gas demand Winter 2024/25**

The Peak one-day total demand was reached on 20th January 2025. The highest 14-day demand period was noted in January 2025, as shown in **Table 3**.

Table 3 – Peak demand and 14-day Peak demand. Winter 2024/25

14-day Peak period	09/01/2025 to 22/01/2025	Peak day period	20/01/2025
14-day Peak Demand	20,765 GWh/d	Peak Demand	23,284 GWh/d

- **Peak demand evolution**

Figures 6 and 7 show the daily peak demand and the average daily demand for the highest 14-day demand period. Peak demand, differently to the seasonal demand, decreased across Europe in

Winter 2024/25. The daily peak demand and the average daily demand for the highest 14-day demand period were reduced by 5% and 2% respectively compared to the previous winter.

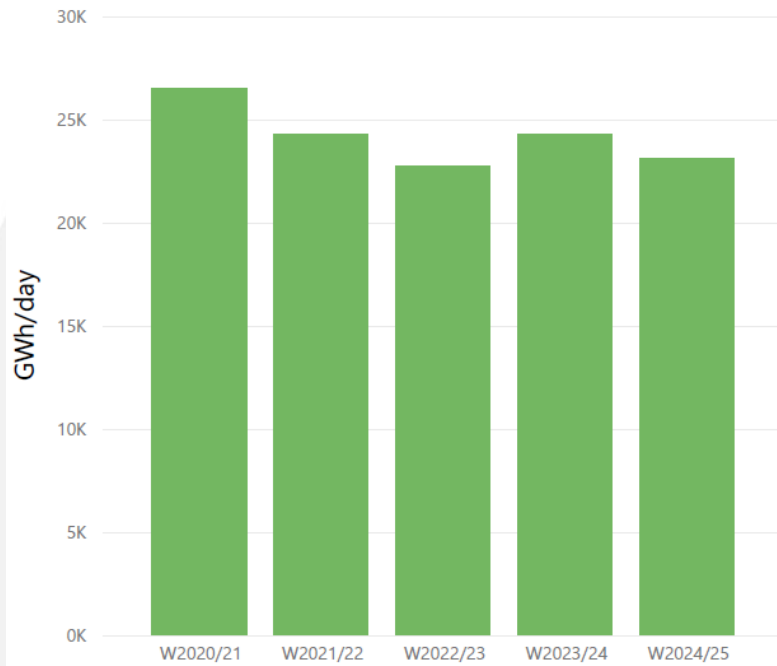


Figure 6 - Peak Demand. Winter 2020/21 - Winter 2024/25

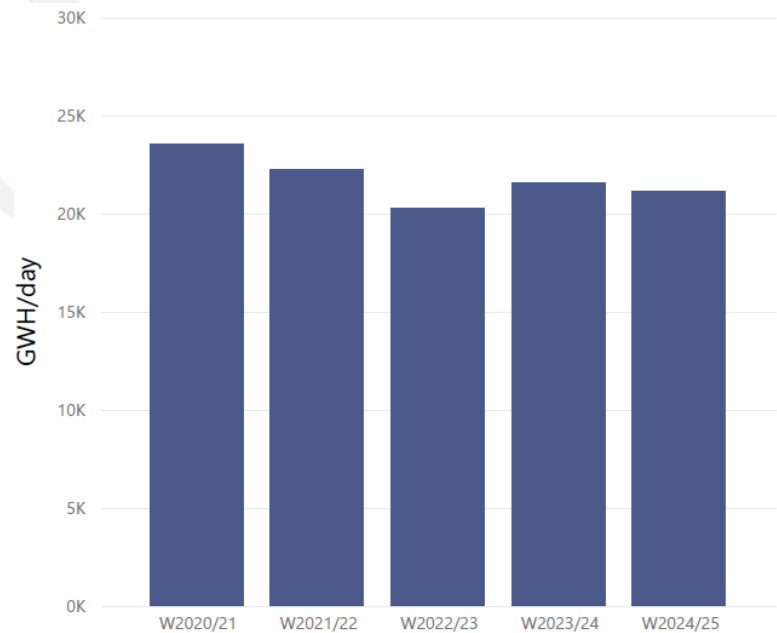


Figure 7 - 14-day peak demand evolution. Winter 2020/21 - Winter 2024/25

- Country detail

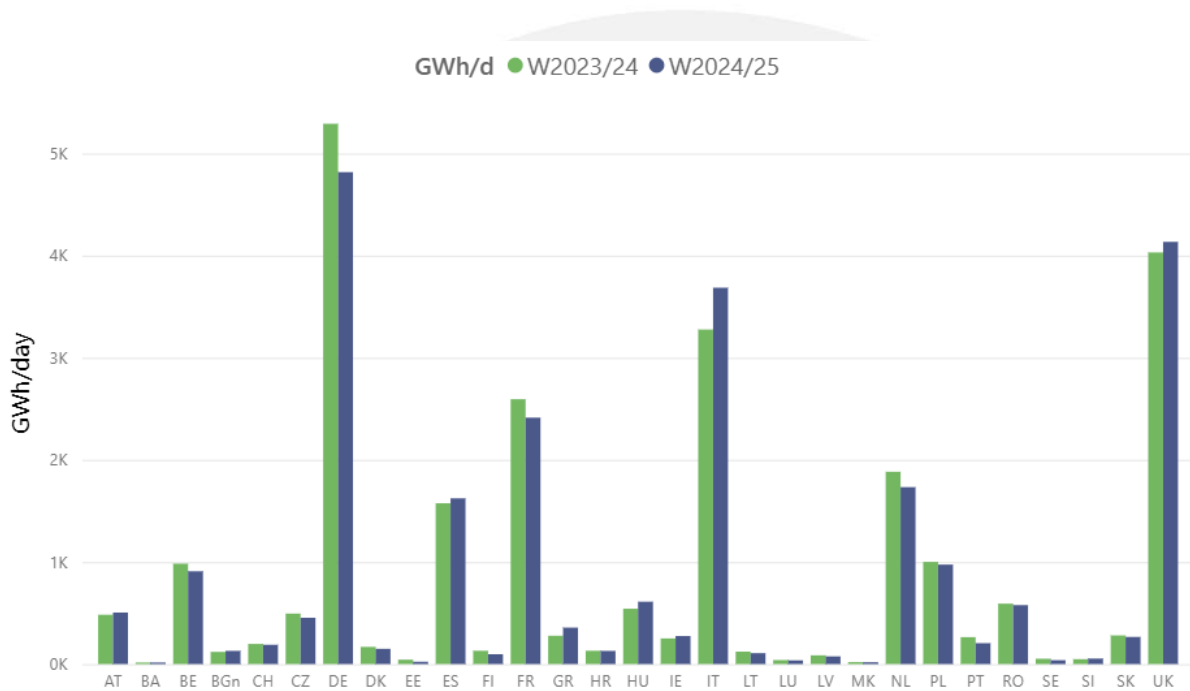


Figure 8 - Max Peak Demand. Winter 2023/24 vs 2024/25

The evolution of gas peak demand at country level shows a decreasing trend in almost all the countries, when compared with the previous winter season, except for Italy, Spain, United Kingdom, Hungary, Austria, Greece, Ireland and Bulgaria.

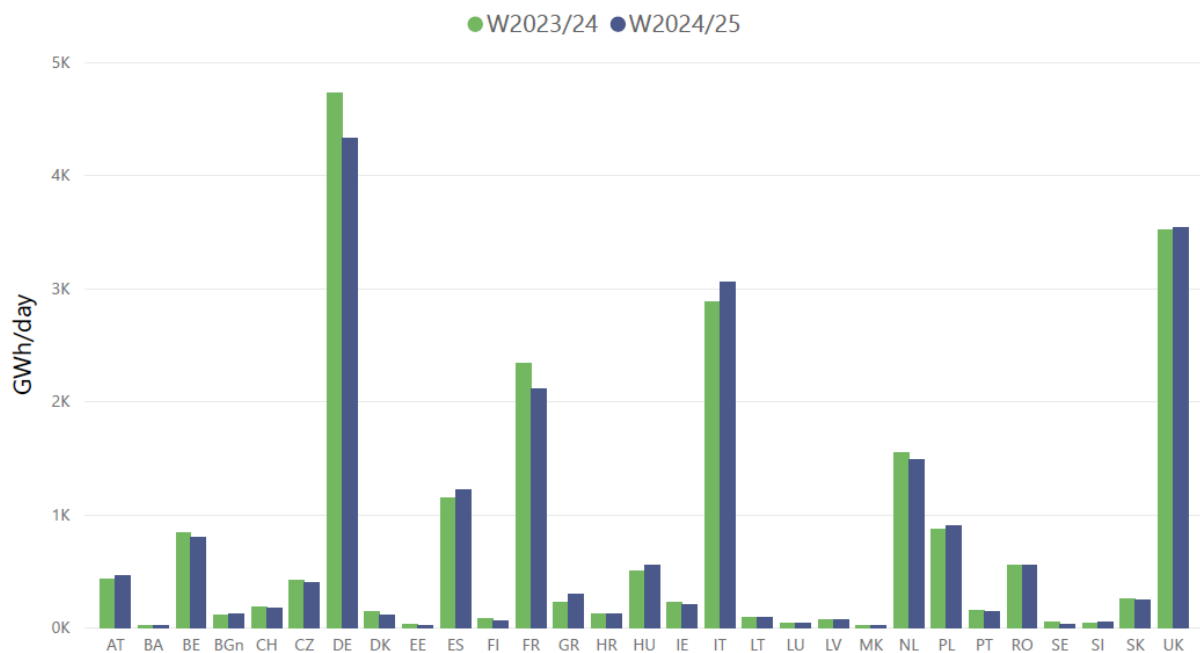


Figure 9 - Max 14 days Peak. Winter 2023/24 vs Winter 2024/25

Similarly to the daily peak demand, **Figure 9** shows that, for most countries, the 14-day high demand level went down in comparison to the previous winter season except for Italy, United Kingdom, Spain, Hungary, Austria, Greece, Poland and Bulgaria.

- **Simultaneity**

To measure the simultaneity between the peak days in different countries, the “Un-simultaneous Peak” is described as the sum of the peak day demands of the individual countries having occurred un-simultaneously:

- The European Peak Simultaneity (EPS)

- $EPS = \text{European Peak Demand} / \text{Un-simultaneous Peak} (\%)$

- The simultaneity of an individual country in the European peak day (CPS)

- $CPS = \text{Country demand on the European peak day} / \text{Country peak demand} (\%)$

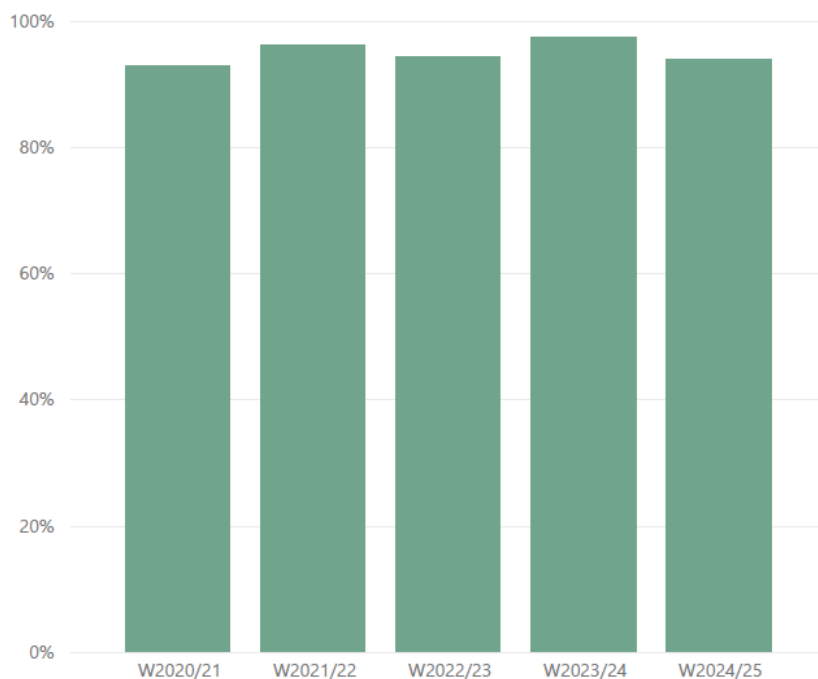


Figure 10 - The European peak simultaneity. Winter 2020/21 - Winter 2024/25

The European peak simultaneity during the peak day on 20 January 2025 was 94%.

Table 4 - Peak demand and the European peak simultaneity. Winter 2020/21 - Winter 2024/25

Winter	Day	Peak Demand (GWh/d)	EU Peak Simultaneity (%)
W2020/21	12/02/2021	26,503	93%
W2021/22	25/01/2022	24,242	96%
W2022/23	13/12/2022	22,420	94%
W2023/24	10/01/2024	24,287	97%
W2024/25	20/01/2025	23,284	94%

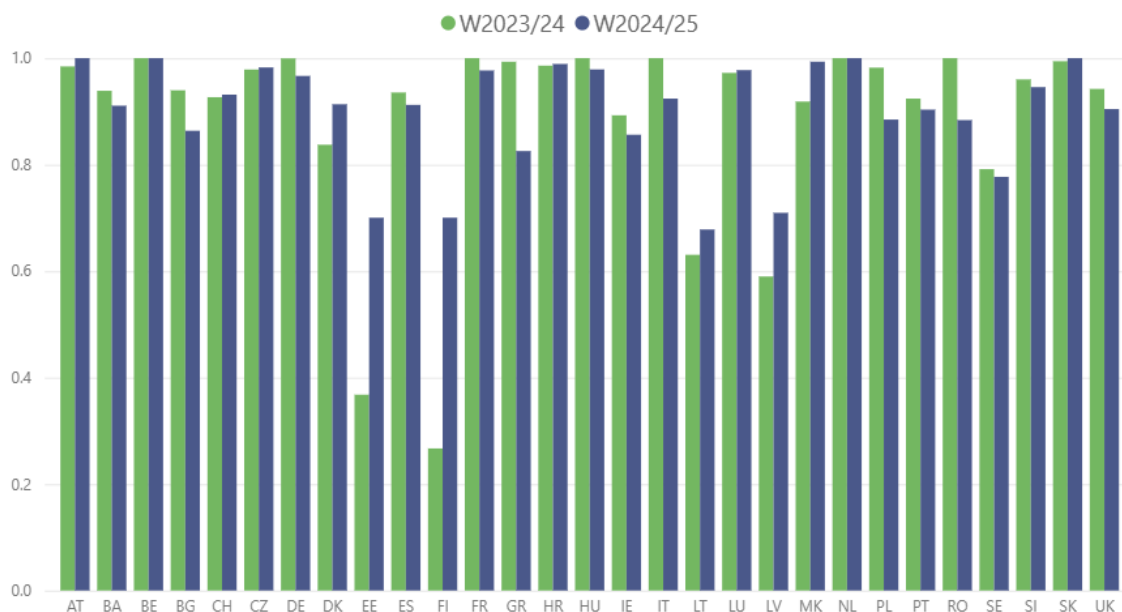


Figure 11 - Simultaneity of the highest single day. Winter 2023/24 vs Winter 2024/25

> Seasonal electricity power generation (TWh_e)⁴

Total electricity demand during Winter 2024/25 was 1508 TWh_e which is 3% lower than Winter 2023/24 according to combined ENTSO-E Transparency Platform (EU data) and the Official Energy Statistics of GOV.UK for United Kingdom data.

Compared with Winter 2023/24, power generation from natural gas increased by 22 TWh_e, while the generation from hard coal and lignite increased by 3 TWh_e.⁴

⁴ Source: ENTSG elaboration based on ENTSO-E Transparency Platform data and National Grid ESO data.

⁴ The natural gas demand to achieve this electricity production is higher in thermal terms due to the gas-fired power plants' efficiency factor.

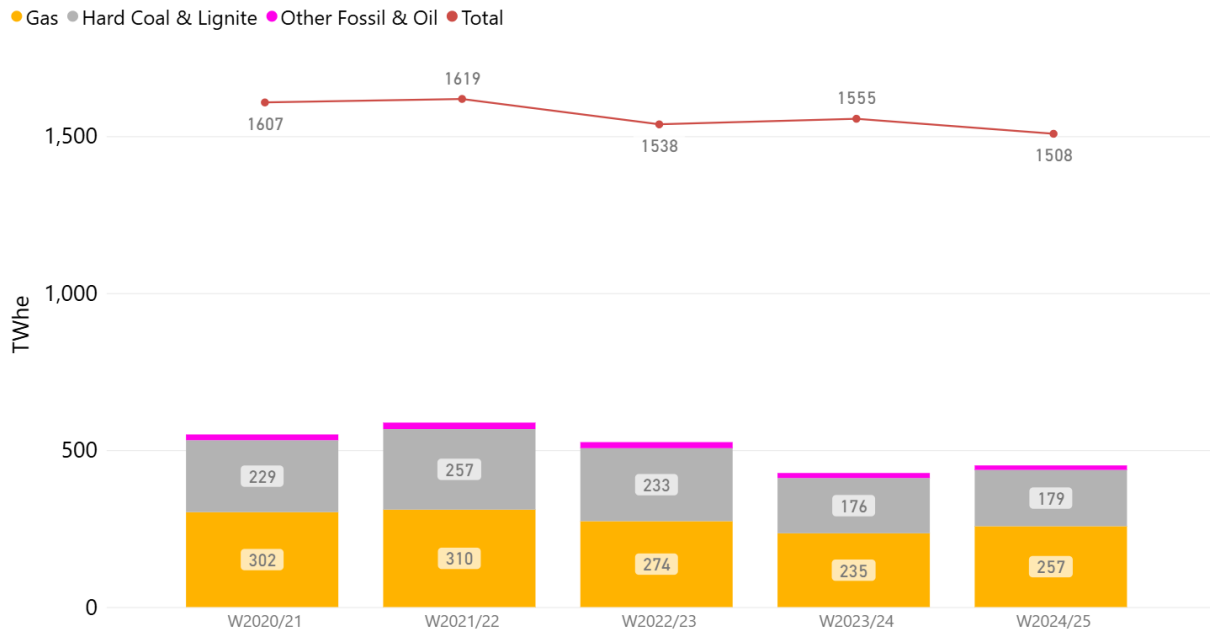
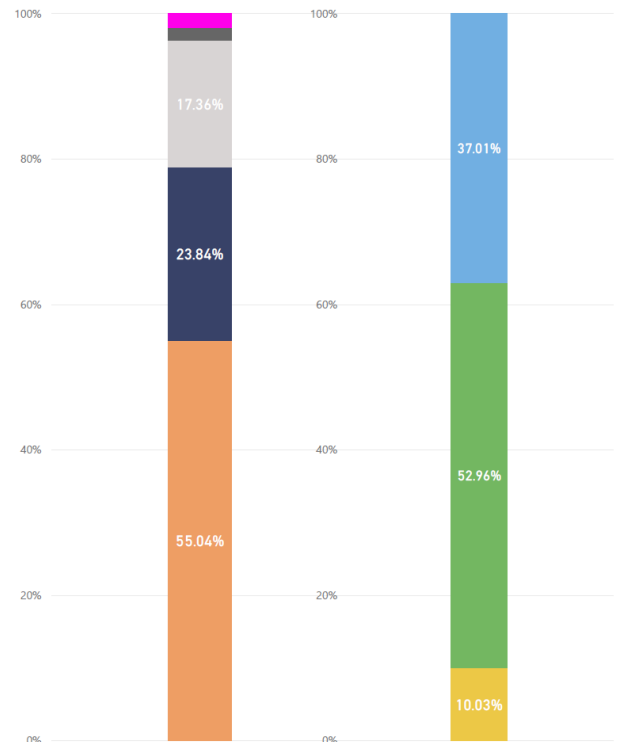
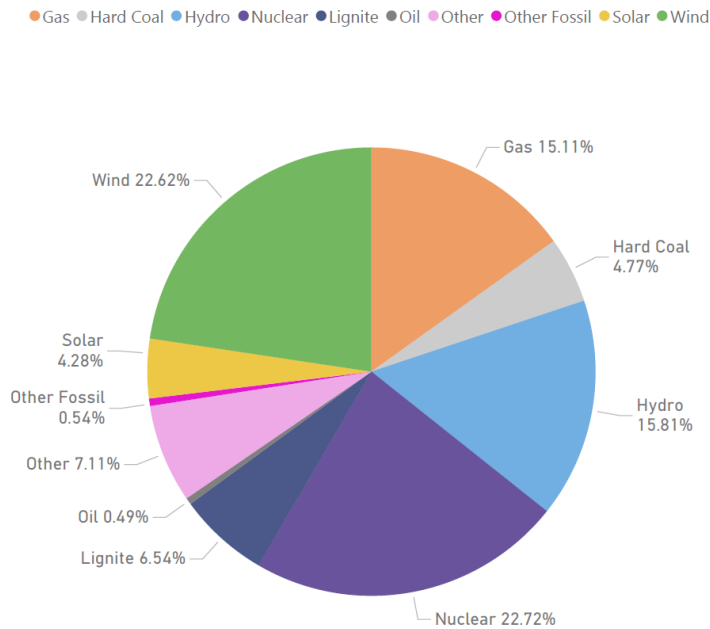


Figure 12 - Historical electricity power generation in Europe. Winter 2020/21 - Winter 2024/25

Figure 13 below shows the electricity generation mix in the Winter 2023/24 and Winter 2024/25. The share of natural gas in the electricity mix increased by 2% in Winter 2024/25. Weak wind speeds in Europe reduced wind power generation, driving higher gas-fired power output, with the additional demand met in part through increased storage withdrawals.

The contribution of renewable sources (Hydro, wind and solar energy) in the total mix of electricity generation in Winter 2024/25 accounted for around 39% of the total generation in Europe, which is 3% lower in comparison with the previous winter season.

Electricity generation mix Winter 2023/24



Electricity generation mix Winter 2024/25

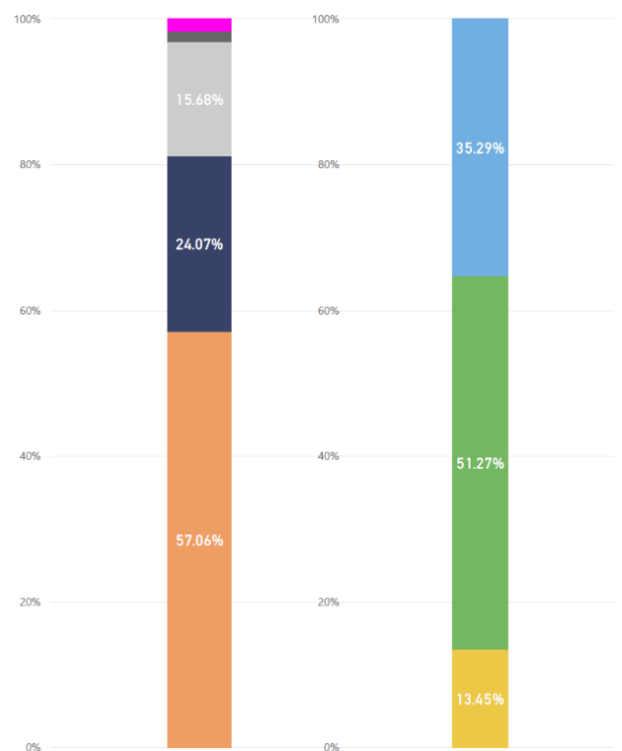
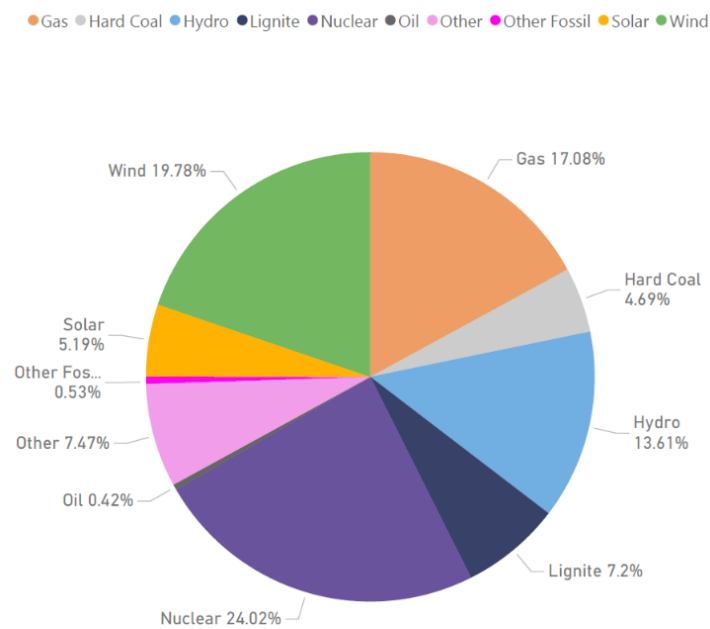


Figure 13 - Electricity power generation mix. Winter 2023/24 vs Winter 2024/25

Figure 14 below shows the historical Electricity Generation mix between 2020 and 2025 for the EU and the UK.

From these figures it can be noted an increase in nuclear and gas generation for 2024/25 but lower hydro and wind in comparison with 2023/24 data.

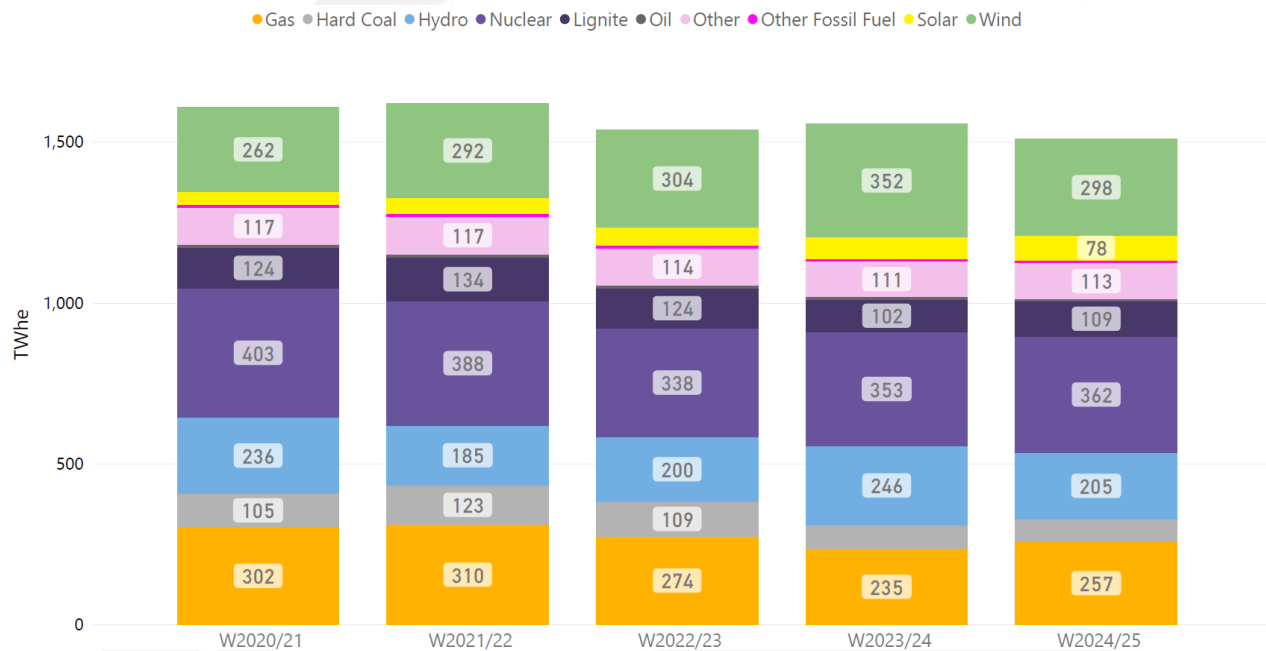


Figure 14 - Historical Electricity Generation mix. Winter 2020/21 - Winter 2024/25

Supply

> European seasonal gas supply

Figure 15 is a representation of the aggregated gas supply in Europe during Winter 2024/25, i.e., October 2024 to March 2025. In the beginning of the Winter 2024/25, net injection continued till November, followed by a prolonged period of net withdrawal lasting until the end of March. This occurred alongside the cancellation of the main Russian gas transit route,

resulting in a total decline of 20% in the imported volumes from Russia compared to the previous winter (167 TWh vs. 136 TWh).

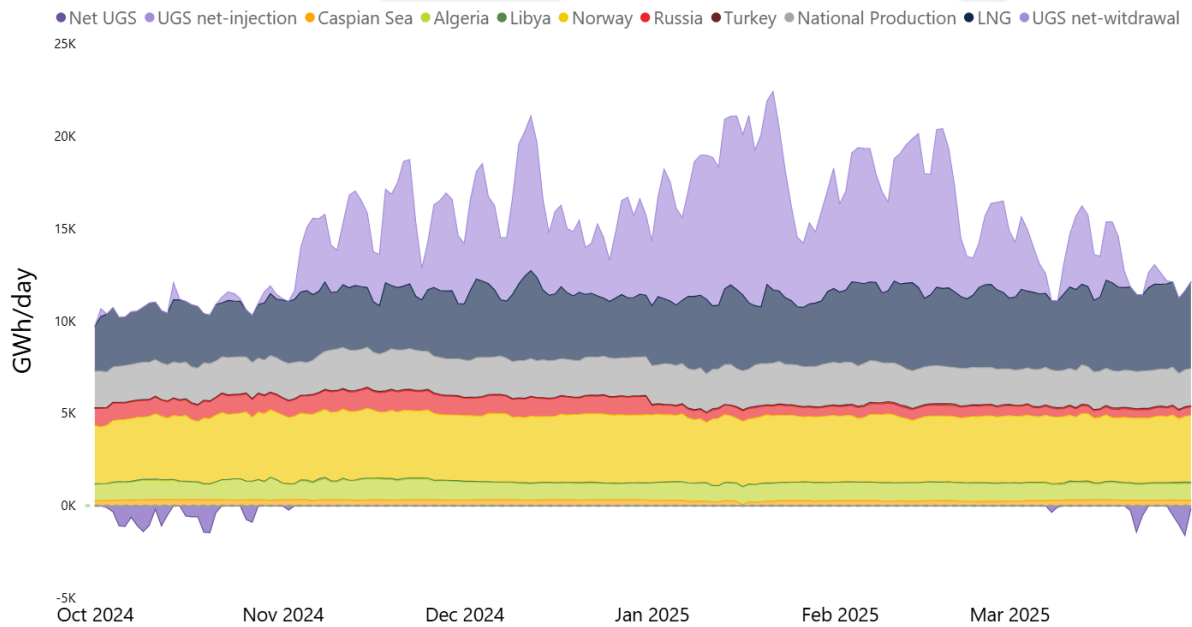


Figure 15 - Supply profile. Winter 2024/25

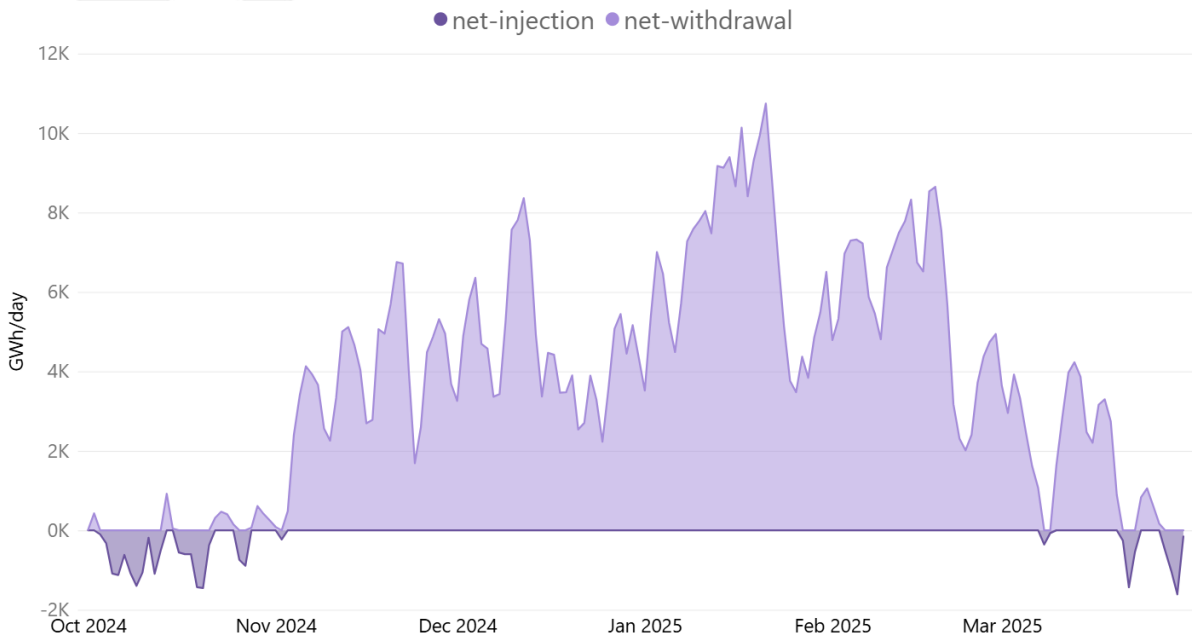


Figure 16 - Net underground gas storage profile. Winter 2024/25

Figure 17 illustrates the Russian pipeline gas supply over time, with a sharp decline in 2025, resulting in a 20% decrease compared with the previous winter season, following the halt of gas transit through Ukraine on 1 January 2025.

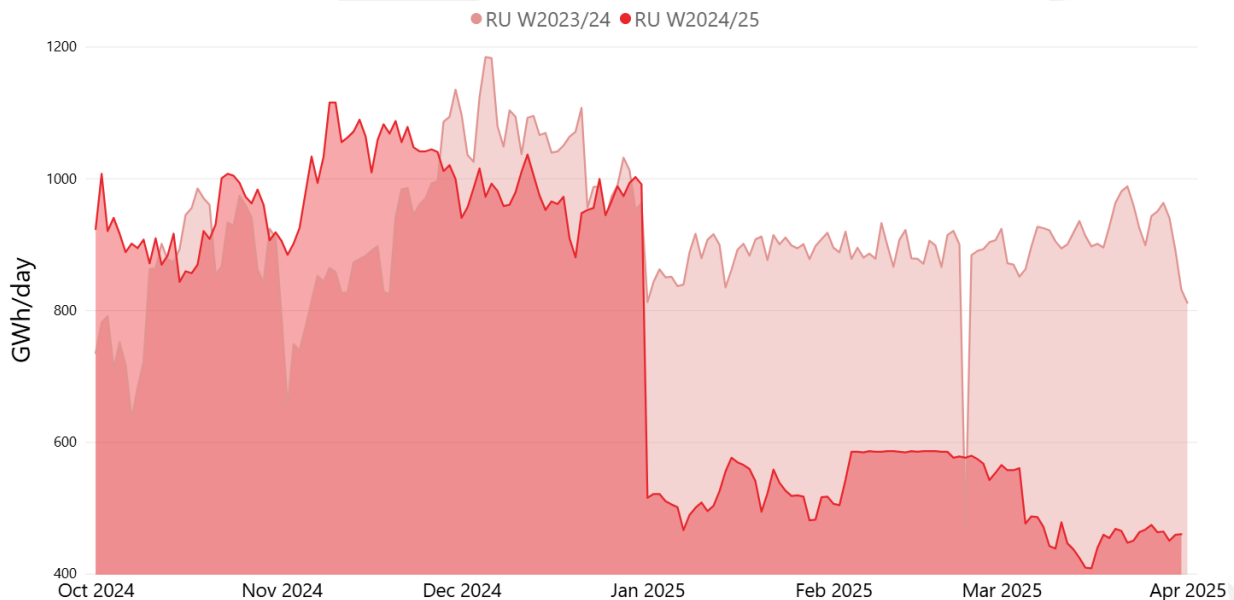


Figure 17 - Russian pipeline supply. Winter 2024/25

Figure 18 shows the total LNG import into European countries. Total LNG imports decreased by almost 12% in Europe in comparison with Winter 2023/24. The most notable changes were observed in Greece, with the commissioning of Alexandroupolis LNG and an increase of around 80%, and in Finland, decreasing their LNG imports by almost 60%.

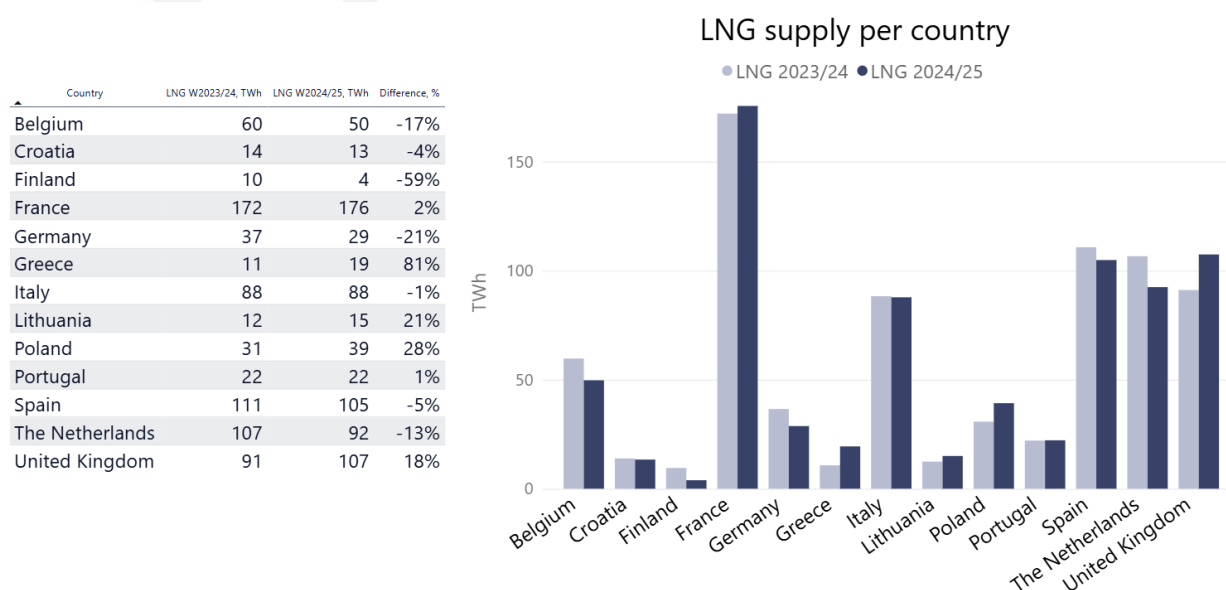


Figure 18 - LNG supply per country. Winter 2023/24 vs Winter 2024/25

Figure 19 presents the total seasonal supply per import source in Winter 2023/24 and Winter 2024/25. Russia's pipeline imports decreased by approximately 20%, Norwegian imports declined slightly, around 5%, LNG imports remained very similar compared with Winter 2023/24 and supply from Algeria increased by 9%.

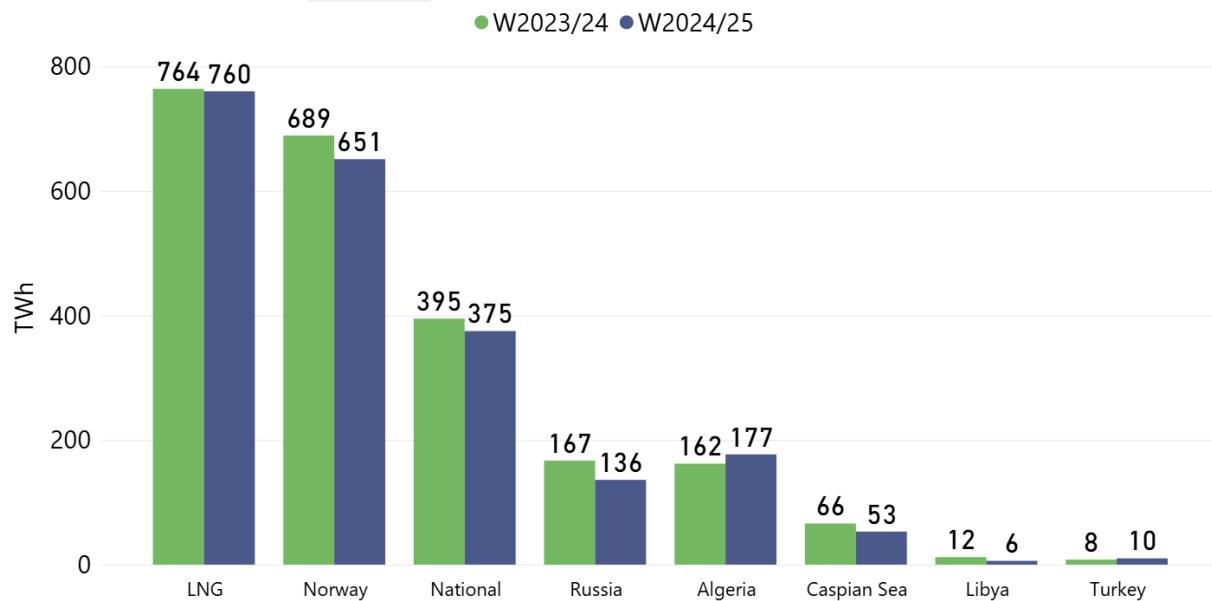


Figure 19 - Total supply by source. Winter 2023/24 vs Winter 2024/25⁵

Figure 20 presents the Winter supply mix in 2023/24 and 2024/25. The total imports in 2024/25 declined (2168 TWh in 2024/25 vs. 2263 TWh in 2023/24). Supply sources' contributions in the Winter 2024/25 were very similar to the ones in the Winter 2023/24. The highest share was LNG again with 35%, then Norway with 30%. National production remained in 17% and Algerian supply increased to 8%.

⁵ Since April 2023, flows from Turkey have been delivered through the IP Strandzha (BG) /Malkoclar (TR) route, which was previously used in the reverse direction for exports from the EU to Turkey. Since 2023, network users have been receiving gas via the Turkish gas grid from LNG terminals, which are entirely or partially operated by Turkish operator BOTAS.

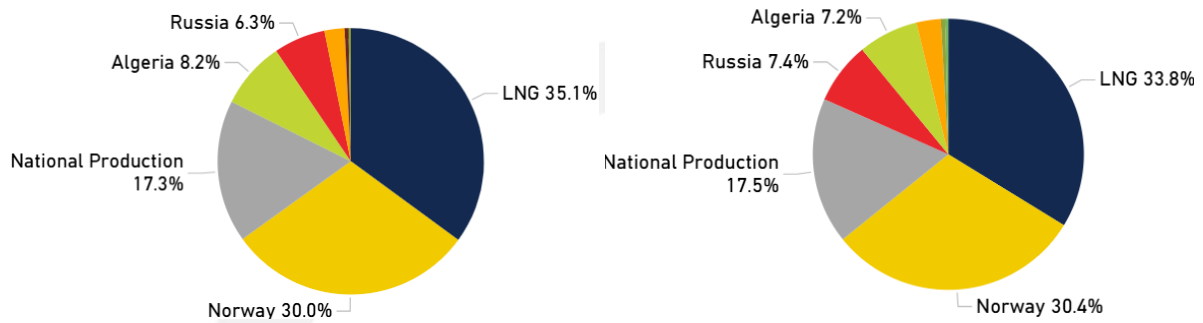


Figure 20 – Winter supply mix 2024/25 and 2023/24 comparison

The supply mix details are displayed in **Figures 21 and 22**.

Supply source	Total, TWh
LNG	760
Norway	651
National Production	375
Algeria	177
Russia	136
Caspian Sea	53
Turkey	10
Libya	6

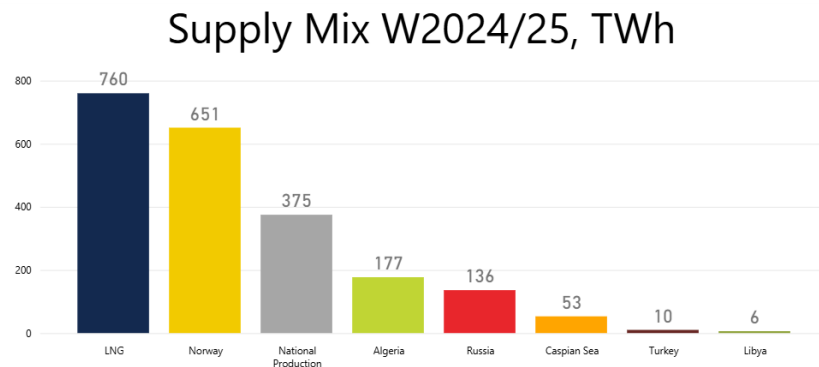


Figure 21 – Supply mix. Winter 2024/25

Supply source	Total, TWh
LNG	764
Norway	689
National Production	395
Russia	167
Algeria	162
Caspian Sea	66
Libya	12
Turkey	8

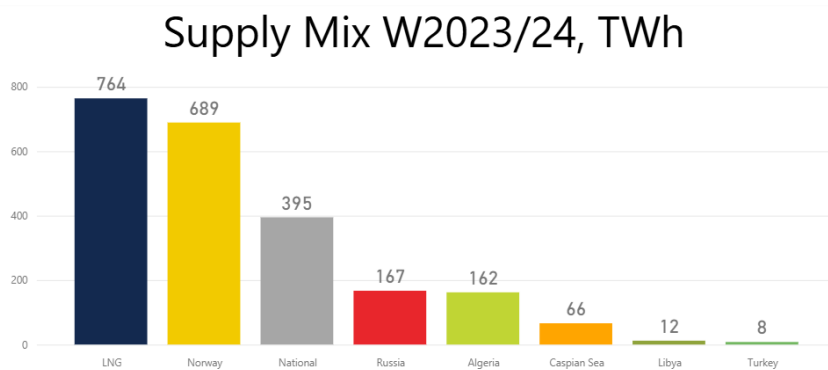


Figure 22 – Supply mix. Winter 2023/24

Figure 23 shows the historical trends of all the supply sources. Most notable changes in the trends:

- Supply from Norway has been stable over 600 TWh/ ~55 bcm since winter 2019/20.
- The decrease of Russian pipeline supply by 20% in Winter 2024/25 is the highest decline after the 80% collapse observed in winter 2022/23.
- National Production has experienced a general downward trend until this winter season 2024/25 since winter 2019/20.
- LNG supply grew significantly over several years, reaching more than 800 TWh in Winter 2022/23, before declining over the subsequent two winter seasons.
- Algerian supply has followed a declining trend for several years after which it increased by around 9% in Winter 2024/25.
- Caspian Sea supply was ramping up between winters 2019/20 and 2020/21 after which it has remained stable until the latest Winter 2024/25.

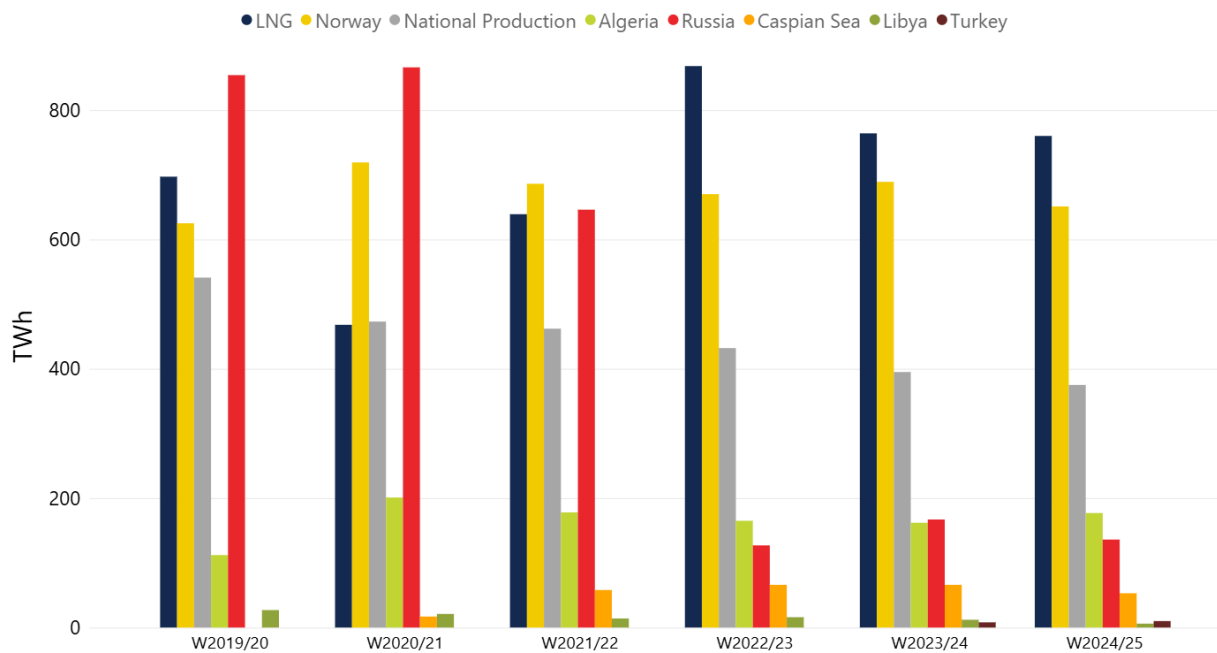


Figure 23 - Evolution of gas supplies. Winters 2019/20 – 2024/25

Figure 24 shows the exports from the EU. The total net exports to Serbia were 20 TWh, 13 TWh to Ukraine, 7 TWh to Moldova, 5 TWh to Morocco and around 2 TWh to North Macedonia.

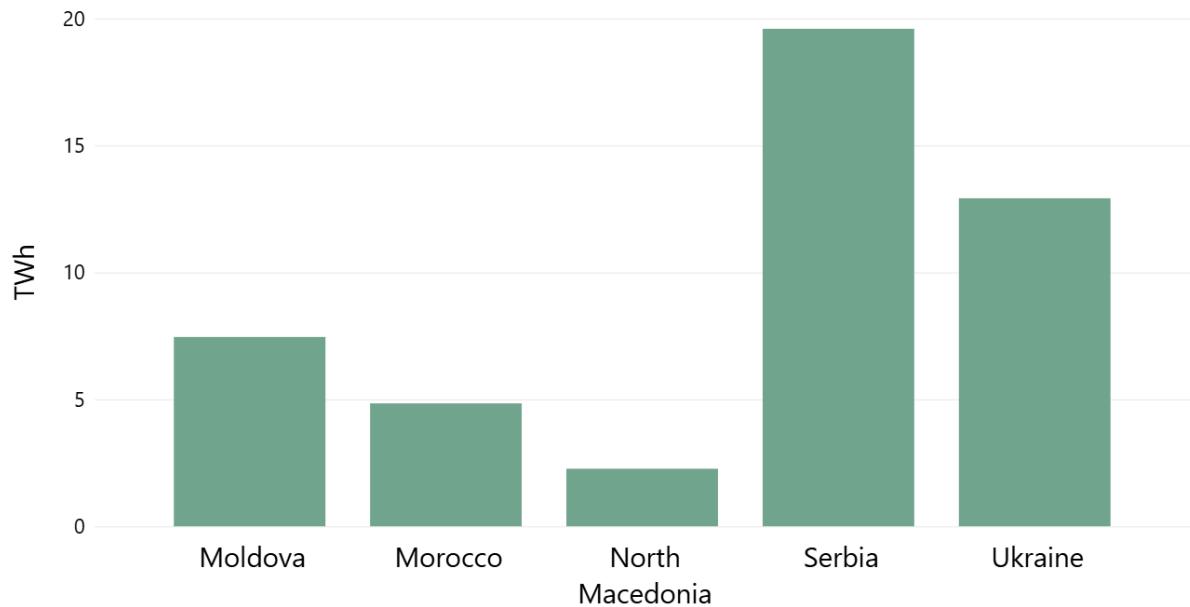


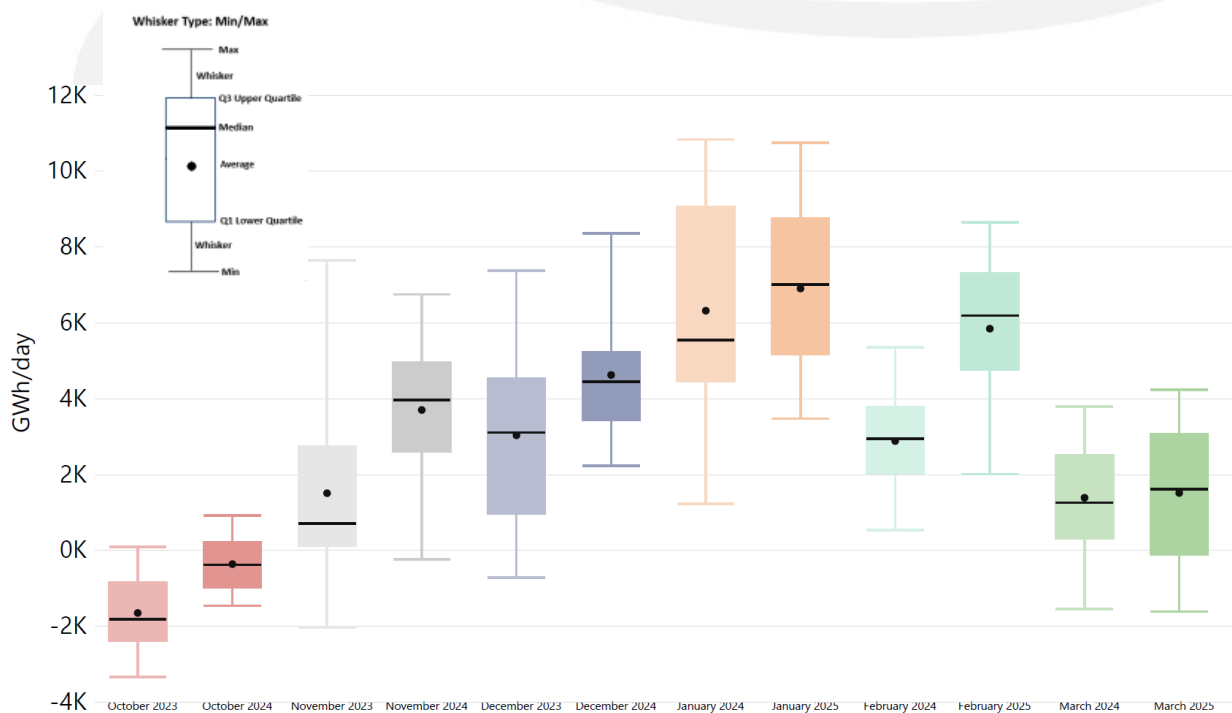
Figure 24 – Exports from the EU countries. Winter 2024/25

Underground Storages

The evolution of the injection season depends on many factors, particularly on the willingness of shippers (or other entities designated by Member States) to inject gas, and the actual amount of gas available for injection. The factors are linked to price signals such as summer/winter spread, EU and national laws stipulating mandatory injections, climatic effects on temperature-driven consumption, and economic considerations of end users.

Figure 25 provides the average net injection / withdrawal and the daily distribution ranges between the lowest and highest injection in GWh/d for the whole Europe. The most notable months with comparatively different storage distribution in Europe were October, November and February.

The box plots October, November and February show differences that were further investigated. October 2023 shows there was almost no net withdrawal whereas October 2024 was a period with some days of withdrawals. Higher withdrawal values in November 2024 were noted compared to the same month in 2023. February on the other hand shows the withdrawal range was much wider than the previous winter as February 2025 as the box plot is comparatively taller than for February 2024.



**Figure 25 - UGS daily range of net-injection and net-withdrawal per month.
Winter 2023/24 vs Winter 2024/25**

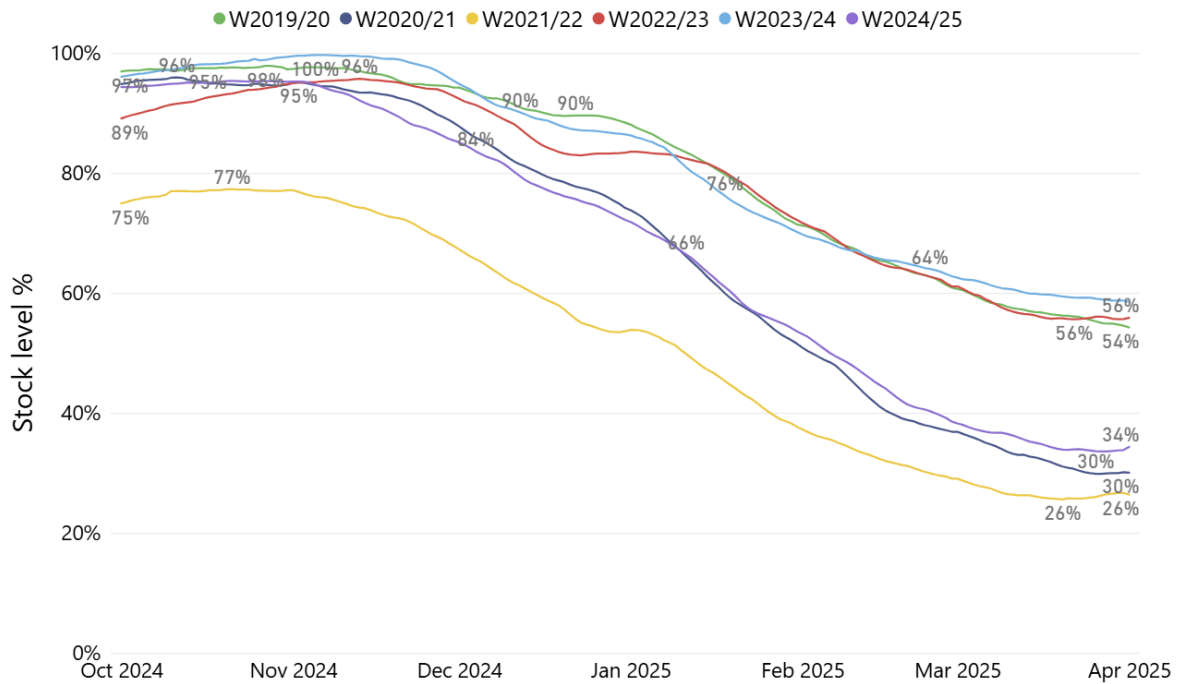


Figure 26 - Evolution of UGS stock level and UGS utilisation. Winters 2019/20 – 2024/25⁶

Figure 26 shows that storage levels during Winter 2024/25 increased its filling level till late October after which it followed a very similar trend of Winter 2020/21. Historical UGS utilization is shown in the Table 6.

Table 6 - UGS Utilisation. Winter 2011/12 – 2024/25⁶

	1-Oct (TWh)	31- Mar (TWh)	UGS Utilisation (TWh)
W11-12	601.7	331.3	270.5
W12-13	716.2	222.8	493.5
W13-14	724.1	433.4	290.7
W14-15	867.4	274.6	592.9
W15-16	838.6	364.1	474.5
W16-17	972.9	278.1	694.8
W17-18	903.8	191.1	712.7
W18-19	898.8	441.4	457.4
W19-20	1063.2	598.4	464.8
W20-21	1053.3	336.1	717.2
W21-22	832.2	291.3	540.9
W22-23	991.0	627.8	363.2
W23-24	1091.0	666.0	425.0
W24-25	1082.1	387.6	694.5

⁶ Source: AGSI+

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