22 November 2024

Environment Statistics - Energy

2022 - 2024

NATURAL GAS CONSUMPTION IN PORTUGAL FALLS BY 28.2% AFTER THE IMPLEMENTATION OF THE EU REGULATION FOR VOLUNTARY DEMAND REDUCTION

The cumulative monthly natural gas consumption decreased by 28.2% in Portugal and 17.9% in the EU, between August 2022 and April 2024. These reductions resulted from common rules adopted by the European Commission, which set a voluntary target to reduce natural gas consumption by 15%, compared to the previous five years average for the considered months.

In addition to aiming to enhance the EU's energy supply security, the legislative initiative also sought to ensure independence from Russian fossil fuels. The impact on the EU was significant, with natural gas imports from Russia decreasing by 44.4% in 2022 compared to 2021. Nevertheless, Russia remains the EU's main supplier of natural gas (falling from 40.7% during the 2017-2021 period to 21.1% in 2022). In Portugal, the change was marginal (natural gas imports from Russia decreased from 5.0% during the 2017-2021 period to 4.3% in 2022), as the main supplier continues to be Nigeria (41.8% in 2017-2021 and 45.2% in 2022).

With the reduction in dependency on natural gas from Russia, other supplier countries have gained importance. Notably, the U.S. has gained relative weight both in Portugal (increasing from 13.0% in the 2017-2021 period to 31.7% in 2022) and in the EU (from 2.7% in the 2017-2021 period to 12.8% in 2022).

Another distinguishing factor between Portugal and the EU is the use of natural gas. In the EU, natural gas is mostly made available for final consumption (62.8%), where it is primarily used for heating (the household sector accounted for 40.6% of final natural gas consumption in 2022), whereas in Portugal, it is primarily used for new energy forms (63.3%), with natural gas allocated for final consumption mainly consumed by industry (66.4% of total final consumption of natural gas in 2022), and the household sector accounting for a much smaller share (16.4% in 2022).

CONTEXT

In May 2022, in response to the global energy crisis and the growing volatility in natural gas markets observed since the second half of 2021, which was exacerbated in February 2022 by the Russian invasion of Ukraine, the European Commission presented the REPowerEU Plan[1]. The purpose was to ensure independence from fossil fuels, particularly those imported from Russia, strengthen Europe's energy security and efficiency, diversify energy supplies, and accelerate the energy transition.

[1] [1] RepowerEU Plan

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LEGISLATIVE FRAMEWORK

In this context, in August 2022, the European Council adopted Regulation (EU) 2022/1369 for the reference period between August 1 and March 31, during the five consecutive preceding years, starting with the period from August 1, 2017, to March 31, 2018. The goal was for Member States to make every effort to reduce gas consumption by at least 15% between August 1, 2022, and March 31, 2023, compared to their average gas consumption during the reference period (from August 1 to March 31, between 2017 and 2021).

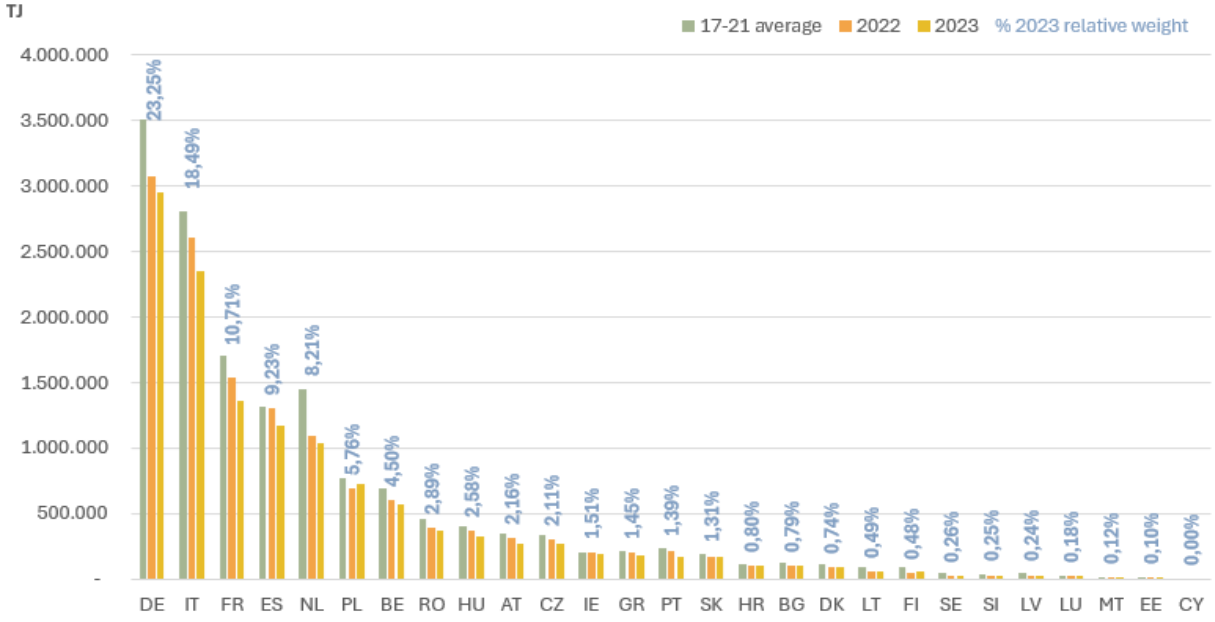
In March 2023, the Council adopted Regulation (EU) 2023/706, extending the 15% demand reduction target for another year, for the period from April 1, 2023, to March 31, 2024, compared to the average consumption during the reference period between 2017 and 2022.

The 15% reduction was based on a pessimistic scenario calculated by the European Commission, assuming a complete cutoff of natural gas supply from Russia before or during an exceptionally cold winter. In this context, the EU could face a supply deficit of up to 45 billion cubic meters (bcm) of natural gas, representing approximately 15% of the average gas consumption by Member States between August and March.

NATURAL GAS CONSUMPTION IN THE EU

The top five natural gas consumers in the EU between 2017 and 2023 were Germany, Italy, France, Spain, and the Netherlands, accounting for 69.9% of the total EU consumption in 2023. Portugal, ranked 14th in the EU, has shown a relatively constant share of total natural gas consumption (averaging 1.6% of the total EU in the 2017-2022 period), with a slight decrease in 2023 (1.4% of the total EU).

Figure 1 – Relative weight and total consumption of natural gas of Member States (2017-2021-average, 2022-anual, 2023-anual)*



* - Ordering done by descending value of natural gas consumption in 2023

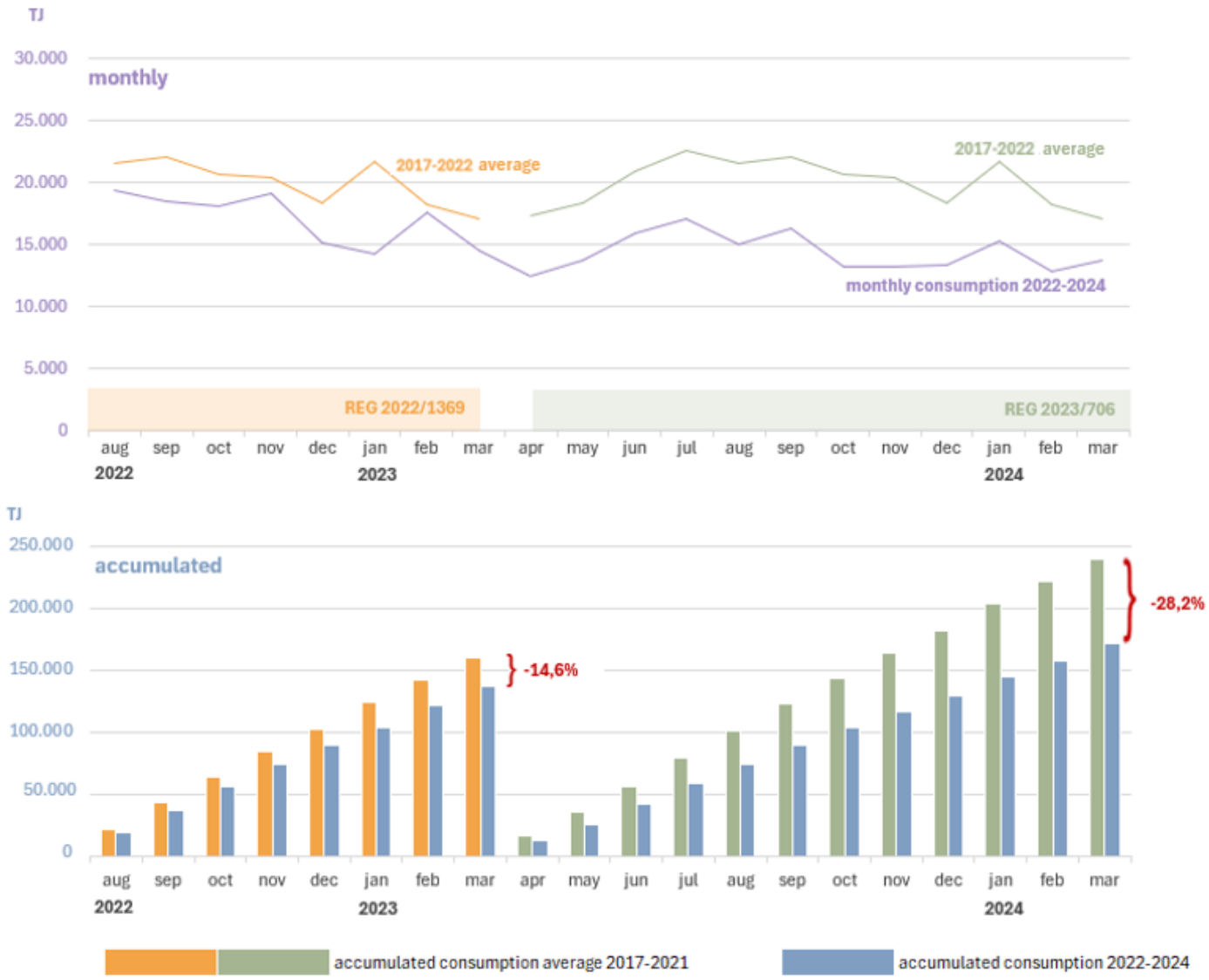
Source: Eurostat- Inland consumption – observed (transmitted by the National Statistical Institutes of the Member States)

NATURAL GAS DEMAND REDUCTION

As a result of the application of Regulation (EU) 2022/1369, from August 2022 to March 2023, the voluntary reduction in natural gas consumption in the EU was 17.6% in energy units (TJ) compared to the reference period. In Portugal, the decrease during the same period was 14.6%.

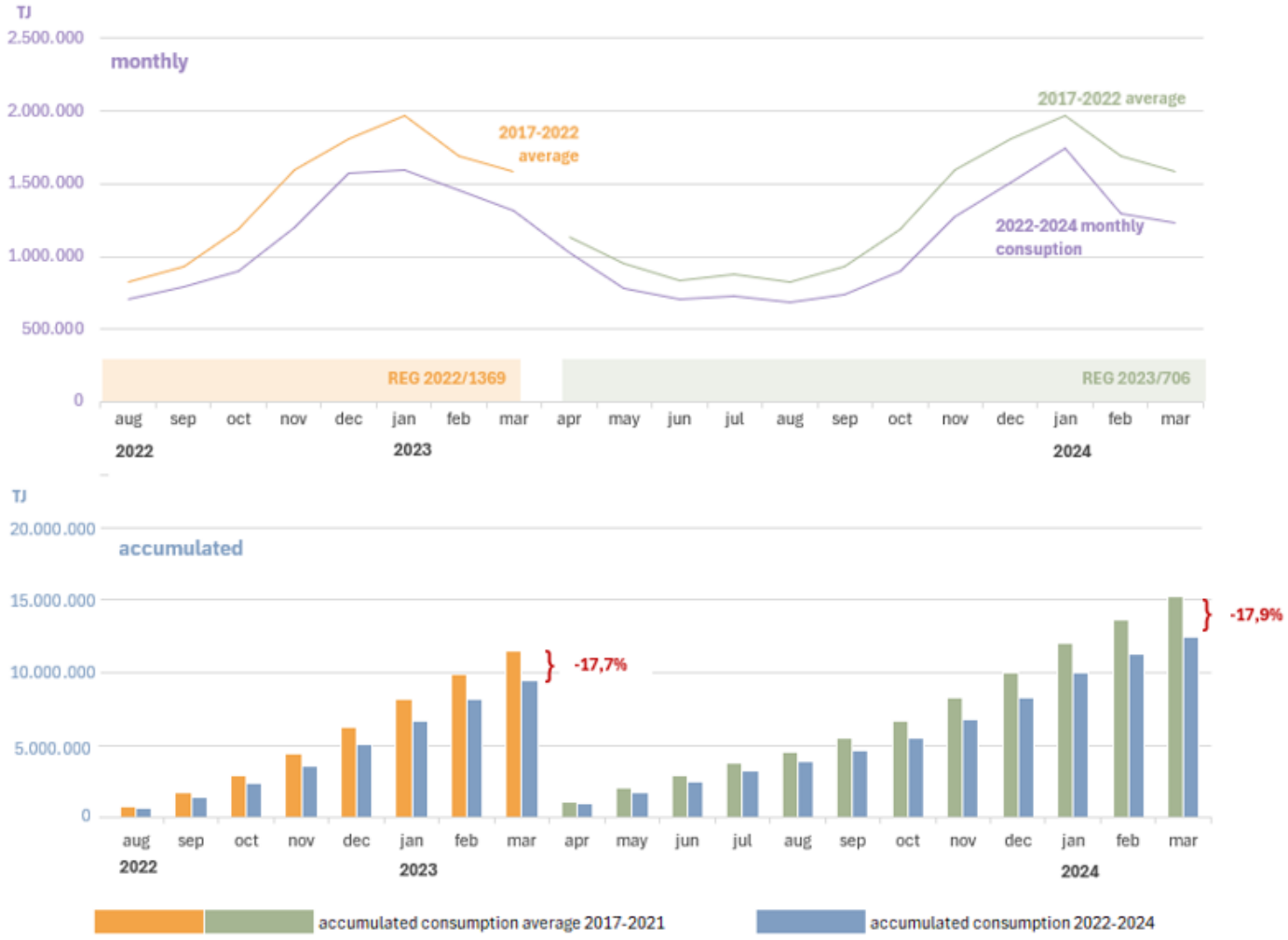
After the period covered by Regulation (EU) 2023/706 (April 2023-March 2024), the cumulative monthly natural gas consumption in Portugal decreased by 28.2% compared to the average reference period (April 2017- March 2022), while the EU saw a reduction of 17.9%.

Figure 2 – Monthly and accumulated natural gas consumption in Portugal during the periods covered by European legislation for voluntary gas consumption reduction.



Source: Eurostat - Inland consumption – observed (transmitted by DGEG)

Figure 3 – Monthly and accumulated natural gas consumption in the EU during the periods covered by European legislation for voluntary gas consumption reduction.



Source: Eurostat - Inland consumption – observed (transmitted by the National Statistical Institutes of the Member States)

NATURAL GAS CONSUMPTION PROFILE

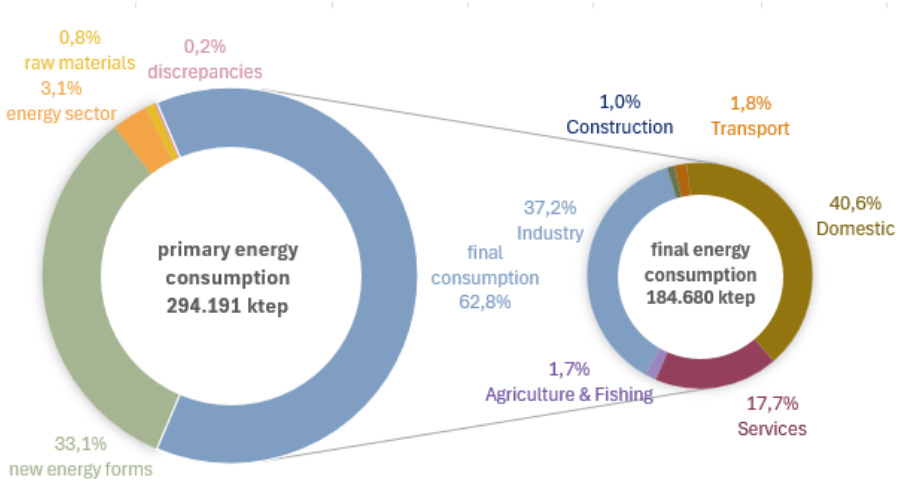
The national energy matrix reported for 2022 shows that natural gas accounted for 22.6% of total energy consumption (22.3% in the EU), being mainly used for heat and electricity production, industrial activities, and transportation.

In Portugal, total natural gas consumption was 4,822 ktoe in 2022, for a total primary energy consumption of 21,315 ktoe, representing a reduction of 3.1% compared to the previous year and an 11.3% decrease compared to 2017 (5,438 ktoe), when the downward trend in the consumption of this fuel began.

At the EU level, in 2022, natural gas consumption was 294,191 ktoe, out of a total primary energy consumption of 1,319,568 ktoe, representing a reduction of 13.2% compared to 2021 (339,112 ktoe) and 11.1% compared to 2017 (330,992 ktoe).

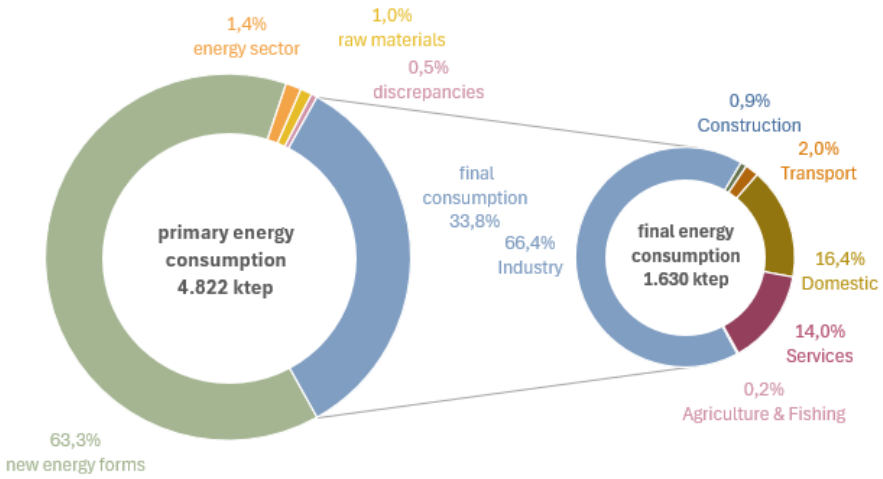
In terms of annual consumption patterns, the use of natural gas in the EU as a heating energy source shows pronounced seasonality, with the month of highest consumption (January) recording more than twice (2.5 times) the consumption in the lowest month (August) during the 2017-2022 period. In Portugal, during the same period, this range was much less pronounced (the month of highest consumption, July, recorded consumption 1.3 times higher than March). This smaller variation is due to the fact that the seasonal consumption pattern in Portugal is not linked to heating periods, and there is even a reversal in the profile compared to the EU average, where gas consumption increases during colder months. This difference stems from the type of use of natural gas, which in the EU is mostly directed towards final consumption (62.8% in 2022), mainly for heating (the household sector was responsible for 40.6% of final natural gas consumption in 2022), while in Portugal, natural gas is mostly used for new forms of energy (63.3% in 2022), and the natural gas available for final consumption is primarily consumed by industry (66.4% of total final natural gas consumption in 2022), with the household sector accounting for a much smaller share (16.4% in 2022).

Figure 4 – Annual breakdown of natural gas consumption in the EU in terms of primary energy and final energy consumption (2022)



Source: Eurostat - Simplified energy balances (transmitted by the National Statistical Institutes of the Member States)

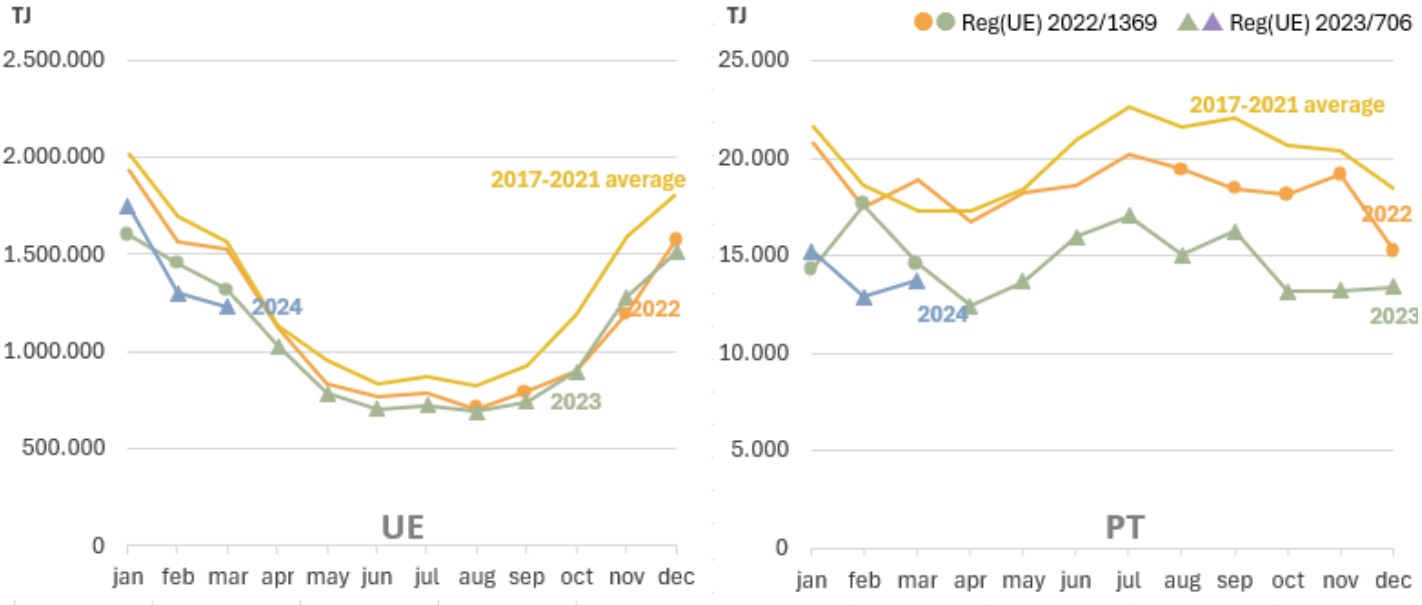
Figure 5 – Annual breakdown of natural gas consumption in Portugal in terms of primary energy and final energy consumption (2022)



Source: DGEG -BEN 2022

In terms of monthly natural gas consumption reported in 2022, 2023, and up until March 2024, the EU recorded values below the average for the period 2017-2021. In Portugal, the evolution of monthly natural gas consumption has shown a decrease over the last two years compared to the average for the period from 2017 to 2021, with the only exception being March 2022, prior to the entry into force of the Regulation on coordinated measures to reduce natural gas demand.

Figure 6 - Monthly natural gas consumption in the EU and in Portugal. (2022, 2023, 2024 and 2017-2021 average)



Source: Eurostat - Inland consumption – observed (transmitted by the National Statistical Institutes of the Member States)

The response to the voluntary reduction of natural gas demand was positive in both the EU and Portugal, although at different rates. In 2022, the reduction in natural gas consumption in Portugal, compared to the 2017-2021 average, was 8.3%, while the reduction was more pronounced in the EU, which recorded an 11.2% decrease. In 2023, the sharper reduction occurred in Portugal (26.3%, compared to -17.5% in the EU). The available information for 2024 indicates that this trend continues.

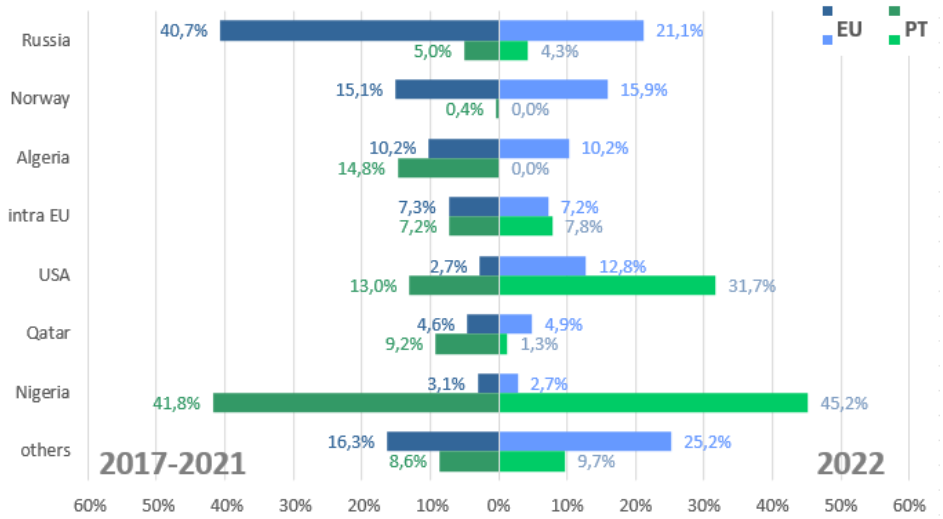
ENERGY DEPENDENCE, NATURAL GAS IMPORTS AND EXPORTS

Both Portugal and the EU rely on natural gas imports to meet their energy consumption needs (97.6% for the EU and 104.0% for Portugal in 2022[2]). However, the main suppliers of natural gas in each case differ, and the level of dependence on gas from Russia is also distinct. While the EU's main supplier remains Russia, even after the introduction of voluntary measures to reduce consumption of this fuel and the search for new suppliers (accounting for 21.1% of total gas imports in 2022, down from an average of 40.7% in 2017-2021), in Portugal, the main supplier is Nigeria, providing 45.2% of the total imported gas during the same period (an average of 41.6% in 2017-2021).

Russia remained the EU's main supplier of natural gas in 2022, despite a 44.4% reduction in imports compared to 2021. In the same period, imports from the USA increased significantly (+161,5%), making it the third-largest supplier of natural gas to the EU.

It should be noted that the implementation of the EU's voluntary measures to reduce natural gas consumption did not significantly alter the main origin of national imports in Portugal, nor did it substantially affect the share of imports from Russia (5.0% of the total in 2017-2021 compared to 4.3% in 2022 and 7.5% in 2023). In absolute terms, there was a 54.6% reduction in natural gas imports from Russia by Portugal from 2021 to 2023, which was not reflected in the relative share due to variations in imports from other sources, notably the United States and Nigeria.

Figure 7 – Relative weight of natural gas imports in the EU and Portugal, by the most representative countries of origin (2021, 2022)



* "others" includes less representative or unspecified countries

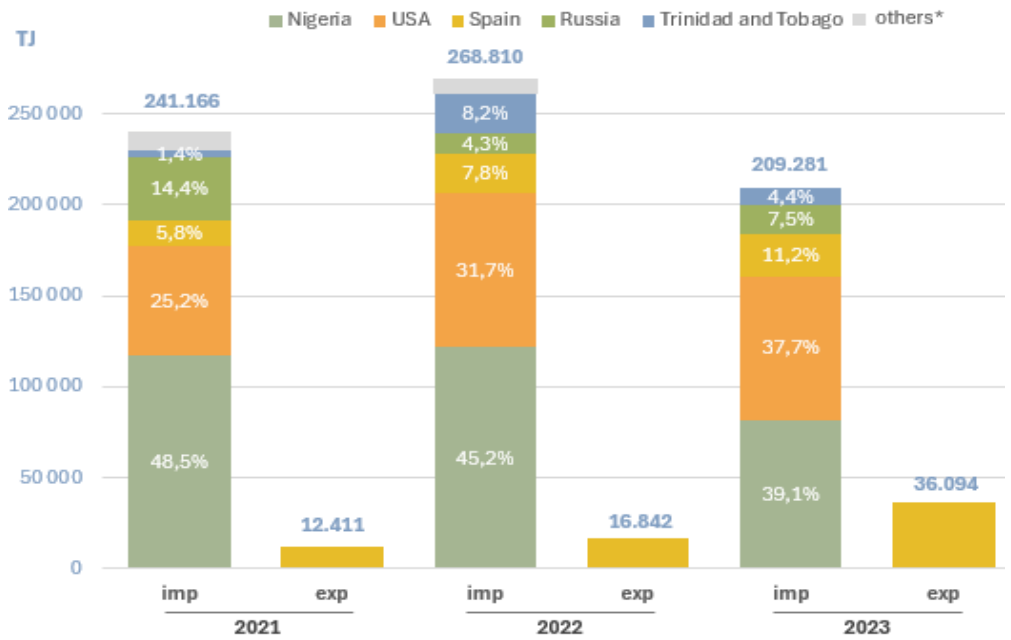
Source: INE I.P., Eurostat

[2] Source: Eurostat - Energy imports dependency

The increase in the relative share of national imports of natural gas from the USA between 2021 and 2022, despite a reduction in absolute quantities, was due to the greater decrease in natural gas imports from Nigeria in absolute terms, when compared to the increase in imports from the USA.

On the other hand, all national exports of natural gas are destined for Spain. In 2023, Portugal exported 17.2% of the total imports of the same year (6.3% in 2022 and 5.1% in 2021). In absolute terms, natural gas exports to Spain increased by 190.8% in 2023 compared to 2021.

Figure 8 – Relative weight of national natural gas imports and exports by the most representative countries of origin/destination (2021-2023)



* 'Others' includes less representative countries in terms of import origins: Germany, Algeria, Qatar, Ethiopia, Finland, Equatorial Guinea.
Source: INE, I.P.

STORAGE

Natural gas storage plays a crucial role in energy security and stable energy supply in the EU.

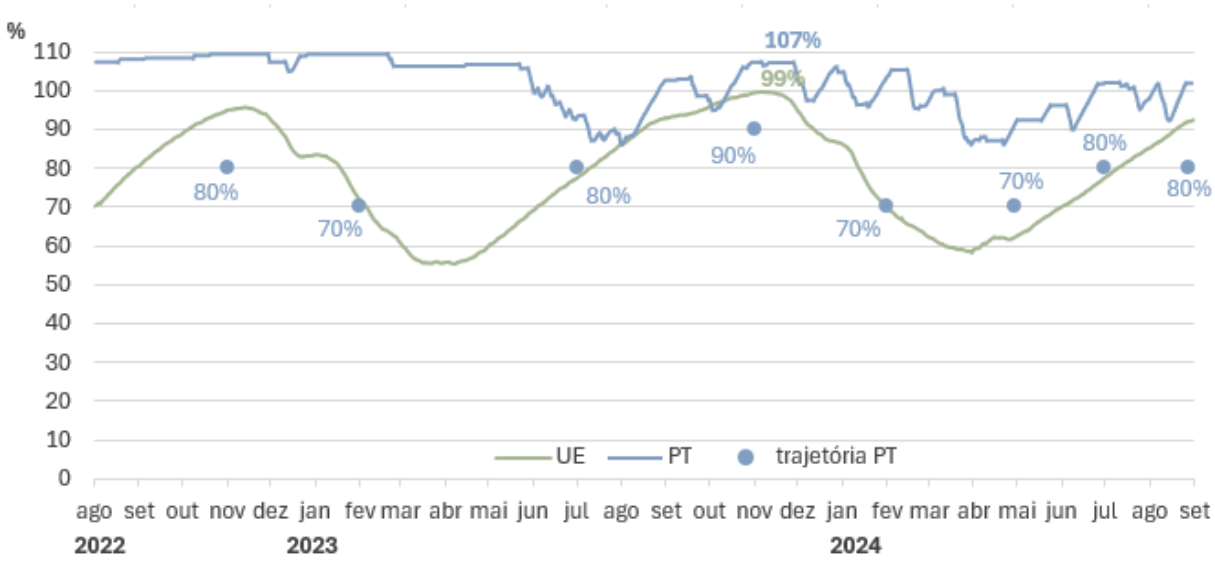
In June 2022, the European Commission set filling trajectories[3] with intermediate targets for underground gas storage facilities to ensure a storage target of 90% of capacity in each Member State by November 1 of each year. Intermediate targets are set for the months of February, May, July, and September for each Member State. The trajectories and targets are set annually, with the latest updates made in November 2023[4].

Portugal has consistently exceeded the minimum defined storage trajectory limits, reaching a storage rate of 107.3% on November 1, 2023, which represents 3.83 TWh at the Carriço Underground Storage Facility. At the EU level, on the same

[3] COMMISSION IMPLEMENTING REGULATION (EU) 2022/1032
[4] COMMISSION IMPLEMENTING REGULATION (EU) 2023/2633

date, the storage rate was 99.4% of the total capacity of all Member States, equivalent to 1,133 TWh, also above the minimum limit set for the date. By 2024, Member States had already achieved the natural gas storage target for November two months earlier, reaching a storage level of 92.44% (1,056 TWh) by August 31. Portugal, which has the second smallest storage capacity in the EU (3.57 TWh), had secured reserves at 101.72% of its capacity (3.63 TWh) on the same date.

Figure 9 – Natural gas storage and trajectories in Portugal and EU (2022, 2023 e 2024)



Source: AGSI

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SUMMARY OF INDICATORS AND RESULTS – NATURAL GAS

	UE			PT		
Consumption	**ktep**	**TJ**	**bcm**	**ktep**	**TJ**	**bcm**
2017	370 308	15 504 060	404 655	5 942	248 780	6 206
2018	357 316	14 960 098	390 581	5 511	230 743	5 748
2019	373 052	15 618 927	407 392	5 841	244 569	6 027
2020	362 188	15 164 079	395 858	5 787	242 282	5 987
2021	377 878	15 820 993	412 358	5 568	233 118	5 762
2022	327 037	13 692 384	355 684	5 284	221 239	5 493
2023	303 774	12 718 399	330 152	4 219	176 636	4 413
Import	**ktep**	**TJ**	**bcm**	**ktep**	**TJ**	**bcm**
2017	356 492	14 925 597	389 058	5 797	242 689	6 275
2018	331 080	13 861 665	362 339	5 708	238 992	5 818
2019	370 828	15 525 823	405 428	6 071	254 174	6 069
2020	333 014	13 942 625	362 008	5 794	242 596	5 920
2021	345 044	14 446 292	374 503	5 760	241 166	5 727
2022	372 928	15 613 751	405 620	6 420	268 810	5 803
2023	n.d.	n.d.	n.d.	4 999	209 281	n.d.
Export	**ktep**	**TJ**	**bcm**	**ktep**	**TJ**	**bcm**
2017				n.d.	n.d.	n.d.
2018				3	129	
2019				149	6 221	
2020				159	6 667	
2021				296	12 411	
2022				402	16 842	
2023				862	36 094	

Methodological Note: The above analysis was conducted based on energy values (TJ and TWh), from which all the presented percentage results are derived.

Measuring units:

ktoe - kiloton of oil equivalent

TJ – Terajoule

bcm - Billion cubic metres of natural gas

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