# L-Gas Market Conversion Review

**Winter Briefing 2024**

**Task Force Monitoring L-Gas Market Conversion**

Ministry of Economic Affairs and Climate Policy

# Foreword

This is the ninth edition of the report monitoring the conversion of the low calorific gas (L-gas) markets in Belgium, France, Germany and the Netherlands in order to reduce demand for Groningen gas. This report concentrates on the progress of the conversion programmes in the different countries. Special focus will be on the conversions planned in Gas Year (GY) 2023/24, since the conversion programmes are expected to reach their highest levels of conversion so far.

The report is compiled by the Task Force Monitoring L-gas Market Conversion, consisting of government representatives, representatives of transmission system operators (TSOs) and energy market regulators from Belgium, France, Germany and the Netherlands, and an observer from the European Commission. The activities of the Task Force are supported by the General Secretariat of the Benelux Union. The report is published twice a year: a Winter and a Summer briefing. The Netherlands will use this report to inform the Dutch Parliament on the progress of reducing the demand for Groningen gas.

# Executive summary

The government of the Netherlands announced in March 2018 its decision to terminate natural gas production from the Groningen field as soon as possible, in order to guarantee safety in the area of Groningen against the risk of earthquakes resulting from natural gas extraction. In this process, security of supply is taken into account.

Household appliances in the Netherlands still depend on gas that has the same specifications as gas produced from the Groningen field (with a maximum Wobbe of 44.4 MJ/$m^3$), while households in Germany, France and Belgium depend on gas with a slightly higher quality (L-gas, with a maximum Wobbe of 46.5 MJ/$m^3$). In GY 2023/24 the decision was made not to allow production from the Groningen field, only in exceptional circumstances. Without gas from the Groningen field, so called "pseudo gas" is needed to secure supply in the G/L-gas market region. For the Netherlands, pseudo G-gas should be produced. This is obtained via conversion: nitrogen is added to high calorific gas (H-gas) in order to bring down the Wobbe-value until it meets the upper Wobbe-limits of the G-gas specifications (44.4 MJ/$m^3$). This gas quality is stored in the Dutch G-gas storages. Pseudo L-gas can be produced by either the same process (adding nitrogen to H-gas to bring the Wobbe-value down until it meets the upper Wobbe-limits of the L-gas specifications, which is 46.5 MJ/$m^3$) or by adding H-gas to pseudo G-gas until the same upper Wobbe-limit of the L-gas specifications is reached (enrichment). By closing the Groningen field, the entire G- and L-gas market is supplied by H-gas and nitrogen.

Pseudo L-gas is exported to neighbouring markets in Belgium, France and Germany, where it serves dedicated L-gas consumers. As a result of the Groningen phase out, the transmission system operators of Belgium, France and Germany have made arrangements to undertake extensive conversion programmes to reduce L-gas supply from the Netherlands. By GY 2029/30, imports of L-gas will be reduced to nearly zero.

The current report aims to monitor the progress in the L-gas conversion programmes in Belgium, France and Germany and the activities in the Netherlands to reduce the consumption of pseudo G- and L-gas. It provides an important part of the analysis needed by the Ministry of Economic Affairs and Climate Policy to decide on the permanent termination of the Groningen production and to meet the requirements of the resolution of the Dutch Parliament to be informed twice a year about the progress in reducing the demand for Groningen gas.

Overall, it can be concluded that the L-gas market conversion is progressing well. Total consumption of Dutch L-gas declined by 23% (85 TWh) from 374 TWh in GY 2021/22 to 289 TWh in GY 2022/23. The reduction in L-gas consumption was driven by climatological factors, the high gas prices and the continued implementation of the market conversion programmes in the respective L-gas markets. In GY 2022/23, 1,047,000 gas connections and appliances have been converted. As a result, the estimated L-gas demand reduction of the GY 2022/23 conversions totaled to 40.8 TWh, with 26.0 TWh taking place in Germany, 5.8 TWh in Belgium, 9.0 TWh in France and 0 in the Netherlands[1]. In GY 2023/24, just over 1,100,000 gas connections and appliances are expected to be converted, the highest number of the market conversion programmes so far. The estimated volume effect of the GY 2023/24 conversions (40.4 TWh) is similar to the volume effect of the conversions in GY 2022/23.

In the upcoming years until GY 2029/30, combined L-gas exports from the Netherlands to Belgium, France and Germany are expected to be reduced at an average rate of approximately 10% per year due to the conversion programmes[2]. Consequently, L-gas demand met with imports from the Netherlands is expected to fall to 0 in Belgium by GY 2024/25, to 0 in France by GY 2029/30 and to 0.3 TWh in Germany[3] by GY 2029/30 both in an average and cold GY[4].

Under the current market conditions, the Task Force does not foresee any possibilities to further accelerate the conversion process. Currently, all efforts are aiming at achieving the agreed demand reductions for the coming years. To meet this declining L-gas demand against an even faster decreasing Groningen production, there is a crucial role for the production of pseudo G/L-gas. The Netherlands increased the production of pseudo G/L-gas by expanding the nitrogen blending capacity at the Wieringermeer conversion facility from 215,000 to 295,000 $m^3$/h starting from December 2019. This translated into an additional 48.9 TWh of pseudo G/L-gas production

[1] Contrary to the surrounding L-gas consuming countries, the Netherlands have decided not to enter into a large scale operation to convert the G-gas demand in H-gas. Instead, a new nitrogen facility has been built which, together with the already existing nitrogen facilities and some underground storage facilities, will be able to provide enough G-gas to meet Dutch and foreign L-gas demand in the years to come.
[2] GTS (2017), Netwerk Ontwikkelingsplan 2017.
[3] Please note that the remaining demand in the gas year 2029/30 (0.3 TWh / 100.000 kWh/h) is given by a regional grid in Germany, that can only be supplied via the Netherlands (Haanrade / Thyssengas).
[4] In the case of Belgium and France, the demand profile for a cold GY has been calculated based on 1995-96 temperature profile by GTS as stated in the Dutch Gas Act for the L-gas supply-demand balance of this briefing. In the case of Belgium, the preferred national approach is to consider the year 1962-63 as a cold year profile. The French regulation approach is requiring to work with a 2% risk cold GY (using Lille weather data); leading to a demand profile national reference shared with the French stakeholders, about 2% above the GTS's figures. The preferred national approach both in the case of Belgium and France are reflected in Figure 2.5 and in the tables 2.2 and 2.3 of the Annex.

capability. Moreover, a new nitrogen plant at Zuidbroek with a capacity of 180,000 $m^3/h$ $N_2$, which translates into an additional pseudo G- and L-gas production with a maximum of 97 TWh, is operational since GY 2023/24.

This means that with expanded nitrogen capacities operational, the security of L-gas supply is becoming intimately linked to the deliverability of H-gas into the Netherlands. During GY 2022/23 the supply of piped H-gas from Russia to Northwest-Europe diminished and eventually stopped. Since then, approximately a third of the supply of H-gas has to come from other sources. The main source for H-gas is now Liquified Natural Gas (LNG), supplied through existing terminals in the United Kingdom, Belgium and the Netherlands. Since these terminals do not have enough capacity to replace former piped Russian supply, additional LNG-import facilities are developed in the Netherlands, Germany and France. An extension of the regas capacity at the LNG terminal of Zeebrugge (Belgium) is ongoing. These projects are in different stages of development and contribute mainly to a mid-term solution. Although on the short term, the demand supply balance is being kept by a decline in the European gas demand due to a combination of high prices and sustainability measures, there is still a risk of H-gas shortages. This means that there is a possibility there may not be enough H-gas supply for both the H-gas market demand and full usage of the conversion facilities for the production of the still needed amounts of pseudo G/L-gas.

The Dutch State Secretary, responsible for the phase out of the Groningen production, did set the cap for Groningen production in GY 2023/24 at 0 TWh for both an average and a cold year. This means that under normal conditions, no production from the Groningen field is allowed. GTS showed[5] that capacity on the field is needed to fill demand in case of exceptional situations. The decree provides the possibility to temporarily switch a number of Groningen production locations to the pilot light, so that the capacity is available in case of disruption of supply with a total capacity comparable to gas storage Norg. In line with this decree, two of the production locations were started by the NAM in the beginning of January[6].

Yearly in January, GTS provides advice to the State Secretary on the needed Groningen capacity and volume for the security of supply for the upcoming gas year. This year Dutch Parliament is set to review a law proposed by the Ministry of Economic Affairs and Climate Policy concerning the permanent closure of the Groningen field by October 1st 2024. The January 2024 analysis of GTS shows that without the Groningen field, the Netherlands does not comply with the European infrastructure norm for the next gas year, which means that there is not sufficient capacity available to satisfy total gas demand in the event of a disruption of the single largest gas infrastructure during a day of exceptionally high gas demand. After the next gas year this potential shortage is projected to be minimal. Furthermore the analysis shows that after an exceptionally cold winter the seasonal storages cannot be refilled to the required filling level of 90% necessary to ensure security of supply for the next gas year in case of a subsequent exceptionally cold winter. Without the Groningen field there are a no short-term supply solutions available for complying with the European infrastructure norm and for fully refilling the seasonal storages after a cold winter. These risks will decline with each subsequent gas year as L-gas demand will continue to be reduced.

Throughout the market conversion period, the role of enrichment has declined in line with the decreasing Groningen production. With the decision to stop production from the Groningen field, the security of supply in the L- and G-gas region relies on the nitrogen blending facilities and the supply of H-gas through the next GYs. The market conversion in Germany, Belgium and France and the activities in the Netherlands to reduce the consumption of G- and L-gas, will contribute to the security of gas supply to consumers in all markets.

[5] For more detail see the advice from GTS dated 26th of May 2023, entitled *Analyse stand van zaken op de gasmarkt en leveringszekerheid in het volgende gasjaar*

[6] https://open.overheid.nl/documenten/aad78f28-a021-4435-9274-a50e458b93ab/file

# 1. Introduction

The government of the Netherlands announced in March 2018 its decision to terminate natural gas production from the Groningen field as soon as possible, in order to guarantee safety in the area of Groningen against the risk of earthquakes resulting from natural gas extraction. In this process, security of supply was taken into account.

The initial schedule for production phase-out - which aimed for termination in 2030 at the latest - was revised in 2019 following the adjusted advice of the Dutch State Supervision of the Mines after an earthquake occurred on May 22. In GY 2022/23 a new phase of the usage of the Groningen field was entered. The Groningen field was expected to be needed in the case of cold weather in combination of disruption of capacity of a size comparable to the largest single source. In order to guarantee the availability of the capacity when needed, the production locations of the Groningen field needed to be on the pilot light, producing a minimum flow. In GY 2023/24, the need for the capacity on the Groningen in the exceptional situation of cold weather and the disruption of supply had not changed[7]. This was accommodated in the decree for GY 2023/24. Here the conditional extraction level of the Groningen field was set to zero, which means that there is still the opportunity to use the existing production location to extract gas, but in exceptional situations. This includes switching to the pilot light to be able to respond to the case of disruption of a source in the case of cold weather. With no planned production from the Groningen field, the G-gas demand from the Netherlands is met using pseudo G-gas. For the dedicated L-gas consumers from the neighbouring markets in Belgium, France and Germany, nitrogen blending (H-gas mixed with nitrogen) or enrichment (pseudo G-gas mixed with H-gas) is used to produce L-gas.

Hence, the decision to terminate Groningen production has consequences in terms of adaptation for the Dutch domestic gas market, but also for import markets in Belgium, France and Germany. The four countries have been working together on the phasing-out of G- and L-gas consumption since 2012, which was initially motivated by the natural decline of the Groningen field. Belgium, France and Germany have developed and are implementing concrete plans to have their consumers of L-gas converted to other sources of energy, most notably H-gas, by 2030.

The Dutch Parliament adopted a resolution which requires the Ministry of Economic Affairs and Climate Policy to report twice a year on concrete measures to reduce the demand for Groningen gas and their foreseen impact[8]. In this report, explicit attention has to be given to measures within and with regard to neighbouring countries. Moreover, the claimed reductions should be substantiated with actual data and options should be investigated to accelerate the reduction of the demand. In order to fulfil this requirement, the Netherlands proposed to establish a Task Force on Gas Market Conversion Monitoring within the framework of the Pentalateral Gas Platform. The authorities of Belgium, France and Germany concurred with this proposal.

The current report aims to monitor the progress in L-gas conversion in Belgium, France and Germany and the activities in the Netherlands to reduce the consumption of G-gas. It provides the analysis needed by the Ministry of Economic Affairs and Climate Policy to decide on the allowed Groningen production and to meet the requirements of the resolution of the Dutch Parliament. It also creates a dedicated platform through the Task Force to further improve transparency and mutual understanding among the involved countries, and enables to share options to accelerate the conversion, without prejudice to national operators and end users. During the previous years, it has served as a platform to monitor and discuss developments related to COVID-19 and its impact on the market conversion planning. The Netherlands has used the information received during these meetings to inform their Parliament on 21st February, 8th April, 19th June, 21st September 2020, 11th February, 16th April, 25th June 2021, 14th March, 26th September 2022, 6th March and most recently 27th October 2023.

The current report provides an update on the progress of the conversion programs, with a focus on the planned conversions through the GY 2023/24.

[7] For more details see the advice from GTS dated 31st January 2023, entitled *Advies Benodigde Groningencapaciteiten en - volumes ten behoeve van leveringszekerheid voor gasjaar 2023/2024* or the advice from GTS dated the 26th of May 2023, entitled *Analyse stand van zaken op de gasmarkt en leveringszekerheid in het volgende gasjaar*

[8] The Parliament's resolution followed the decision made by the Dutch Council of State on July 3rd, 2019, which annulled the Ministry of Economic Affairs and Climate Policy's decision on the allowed Groningen production in the Gas Year 2018/19. The Council of State concluded that it was not sufficiently motivated why the demand for Groningen gas could not be reduced faster than foreseen. The Council of State not only referred to Dutch demand but also to exports. According to the Council of State it was not sufficiently clear what the Ministry meant with his statement that he is in dialogue with neighbouring countries to reduce their demand and what actions he undertakes to accelerate the reduction of exports of Groningen gas.

# 2. L-gas market conversion volume

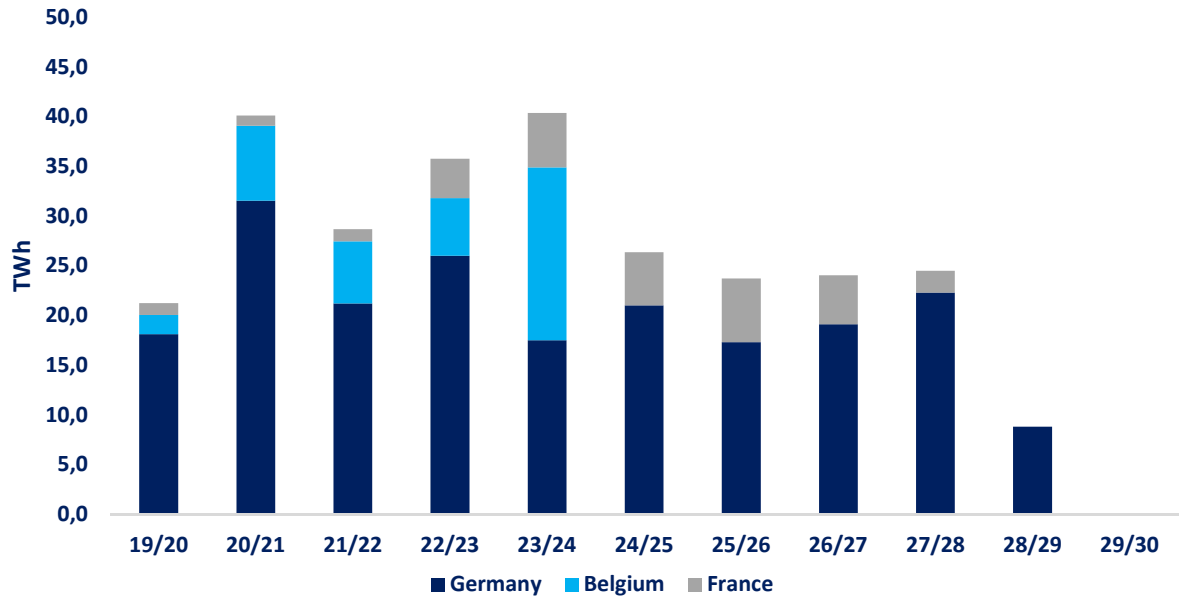
The gas infrastructure operators of Belgium, France and Germany have made arrangements to undertake extensive conversion programmes, mainly switching L-gas consumers to H-gas, to reduce the L-gas supply from the Netherlands: by GY 2029/30, their imports of L-gas will be reduced to close to zero.

Both the realised number of gas installations or consumers that are converted and the corresponding volumes are important to consider. In this report, countries supply data for each.

The current report provides an update on the progress of the conversion programmes, with a special focus on the conversions through GY 2023/24. Just over 1,100,000 gas connections and appliances are expected to be converted in GY 2023/24, the highest number through the market conversion programmes so far.

The estimated volume effect of the 2023/24 conversions (40.4 TWh) is approximately similar to the volume effect of the conversions in GY 2022/23.

**Figure 2.0.1 Volume effect of actual and planned conversions between GY 2019/20 and GY 2029/30 (TWh, based on average temperatures)**.




## 2.1 Germany

**Legislative changes and conversion costs**

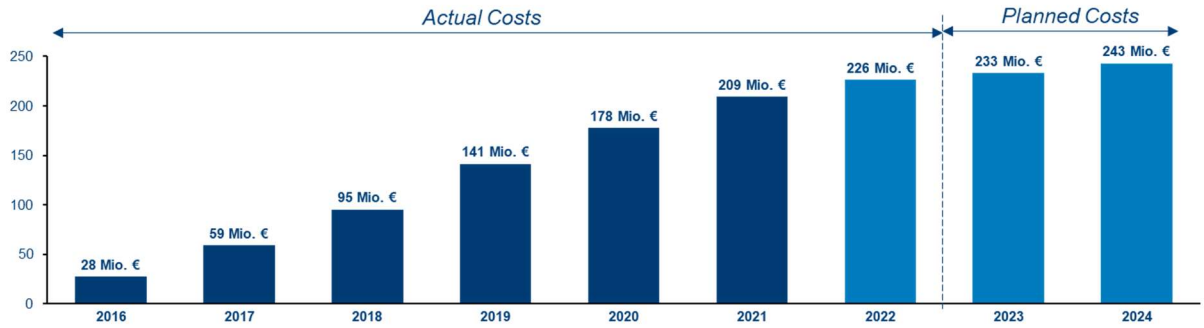
In order to implement the market conversion in Germany some 5.5 million gas appliances need a physical adaptation. A sophisticated timetable for the conversion process was put into place in 2014 and legal changes have been introduced. As of 2017, the Energy Industry Act (EnWG) had been revised substantially in order to serve as the basis for the market conversion from L- to H-gas. § 19a of the Energy Industry Act clarifies since that the legal responsibility for the process lies with the transmission system operators and that the necessary costs of adaptation of gas appliances are socialised (as an integral part of the gas grid fee). In addition, at a later stage the Energy Industry Act was amended concerning access to the German L-gas grid in order not to provide substantial amounts of L-gas to new customers.

The total costs for the conversion from L- to H-gas in Germany are estimated at approximately €4.3 billion. The conversion costs can be split into two different cost categories: (1) costs for adapting the customers' appliances from L- to H-gas and (2) costs for grid expansion.

The costs for adapting the customers appliances from L- to H-gas are reimbursed. The reimbursement only refers to the adaption and not the replacement of appliances. Customers with installations that cannot be adapted from L- to H-gas and have to be replaced are entitled to receive a lump sum of up to € 600 under certain circumstances.

The actual costs for the adaption of appliances from the years 2016 – 2022 and the planned costs for the years 2023 – 2024 are displayed in the illustration below, altogether totaling to approximately € 1.4 billion.

**Figure 2.1.1. Actual and planned costs for the adaption of appliances, 2016-24 (€ million)**




The respective costs are financed by a "market conversion levy" that is paid on top of the TSO transport tariffs. Estimates for the cumulated market conversion levy until 2029 see costs of roughly € 2.3 billion.

Costs for grid expansion on TSO and DSO level are not included in the market conversion levy described above. TSO costs for grid expansion related to L- to H-gas conversion amount to another € 2 billion and are financed by the regular transport fees.

**Conversions from 2015 to 2023**

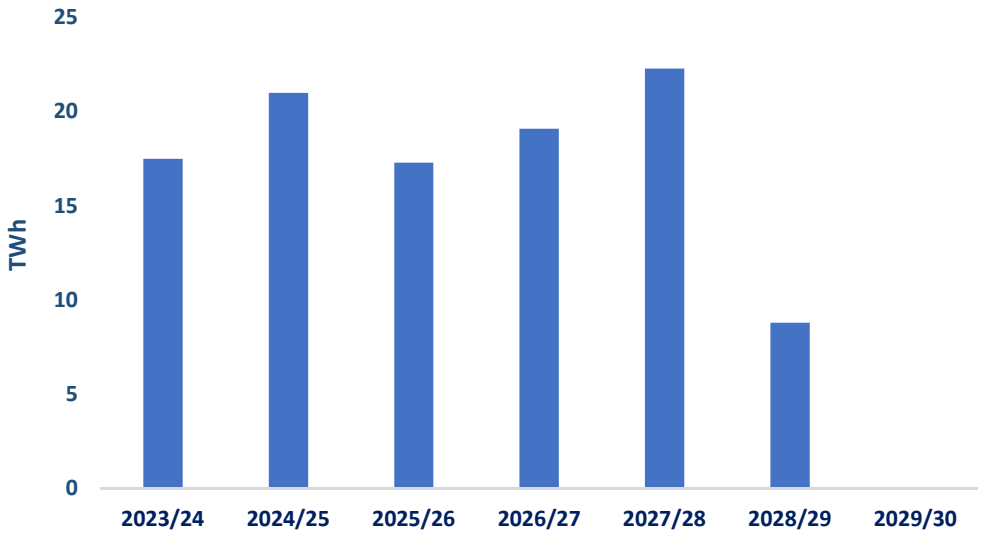
Approximately 2,600,000 appliances have been converted from L- to H-gas in the years 2015 – 2023, which amounts to almost 50% of the overall conversions.

During the years 2015 – 2018, several early conversions have been implemented ahead of the scheduled dates for conversion. Furthermore, the German TSOs have accelerated the planning for the consecutive years repeatedly. The conversions realised between 2015 and 2018 account for a capacity of 4.6 GWh/h and a yearly volume of 28 TWh. More than half of this volume accounted to conversions ahead of schedule, which served to bring down demand for Groningen gas earlier. As the advanced changes had been made years before the due date, they continue to be a relief for the Groningen production in the years to come.

In 2023, 552,000 installations were converted with an estimated volume effect of 26 TWh (average year). Concerning L-gas storages, two conversions took place in 2023:

- In April 2023, one of the L-gas storages in Epe has been partially converted to H-gas. A working gas volume of approximately 2 TWh has been shifted towards the H-gas system.
- The storage Huntorf is now totally converted to H-gas. This is the reason for the decrease of working gas at the UGS EWE-Zone L down to approx. 6 TWh. The storage zone UGS EWE-Zone L formerly included the storage of Nüttermoor L and Huntorf.

**Figure 2.1.2. Estimated volume effect of actual and planned conversions between GY 2023/24 and GY 2029/30 (TWh, based on average temperatures)**.



**Conversions in 2024**

In 2024, 516,000 installations are to be converted leading to an estimated volume effect of 17.5 TWh. The 2024 conversions are located in North Rhine-Westphalia and Lower Saxony and include major cities as Cologne and Hannover, that are partially converted in 2024.

**Figure 2.1.3. Conversion areas in 2024**

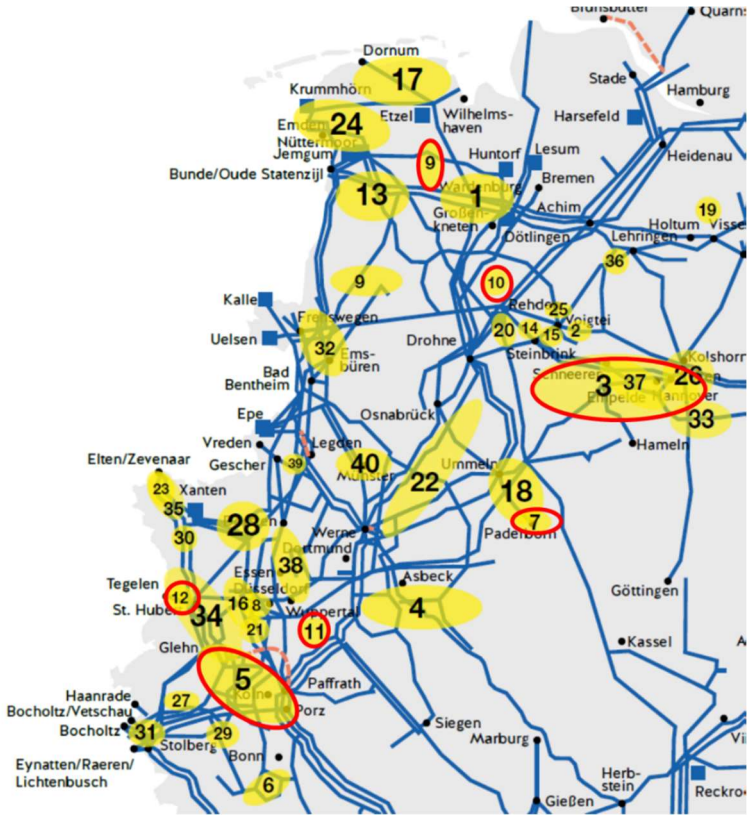



**Table 2.1.1 Market conversion in Germany in 2024**

| Nr. | Conversion Area | TSO | # of installations |
|---|---|---|---|
| 7 | Paderborn | Gascade / OGE | 7,000 |
| 9 | EWE-Zone Teil V | GTG | 122,000 |
| 10 | Rehden - Bassum | Nowega | 7,000 |
| 11 | Bergisches Land | OGE | 67,000 |
| 3 | Drohne - Ahlten | OGE | 166,000 |
| 12 | Kaldenkirchen | OGE | 25,000 |
| 5 | Köln – Dormagen | OGE / TG | 122,000 |

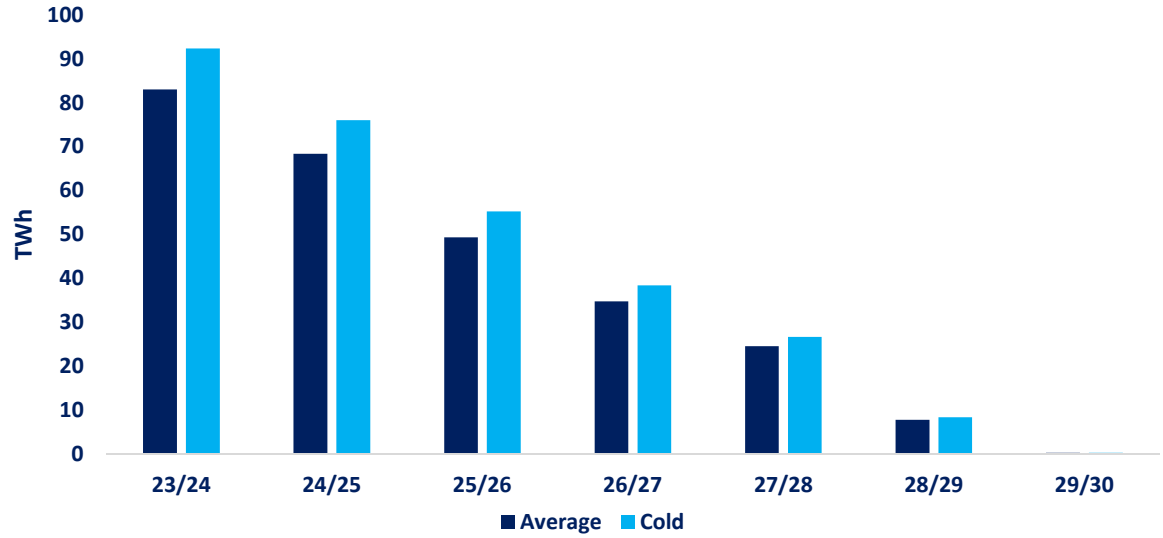
**Conversions until GY 2029/30**

In Germany, approximately 2.2 million gas appliances will still need to be converted between GY 2024/25 and GY 2028/29, translating into a total volume of 89 TWh.

Consequently, L-gas imports from the Netherlands to Germany are expected to fall to 0.3 TWh by GY 2029/30, both in an average and cold GY.

The conversion planning as presented in the winter briefing has contains only minor changes compared to the previous planning due to further progress in the planning between TSOs and DSOs.

**Figure 2.1.4 Germany's consumers demand for L-gas from the Netherlands between GYY 2023/24 and GY 2029/30 (TWh, for average and cold GYs)**




## 2.2 France

**Conversion of the French L-gas network[9]**

In 2018, almost 1.3 million of French gas consumers were supplied with L-gas, for a total volume of 43.4 TWh/y. All these consumers have to be converted to H-gas before GY 2029/30.

Since 2015, the French legal and regulatory framework has been adapted to carry out the conversion of the L-gas network. Costs incurred by the TSO and the DSOs for the conversion of the L-gas networks are covered through transmission and distribution tariffs and are estimated to amount to approximately € 800 million.

**Conversions from 2018 to 2023**

A pilot project was carried out between 2018 and 2020 to test the conversion process of the gas network. Approximately 68,000 customers have been converted from L- to H-gas during this period accounting for an annual volume of 1 TWh/y.

In 2021, two sectors with 54,000 customers and, in 2022, three sectors with 122,000 customers have been converted accounting respectively for an annual volume of 1.2 TWh/y and 4 TWh/y under average weather conditions.

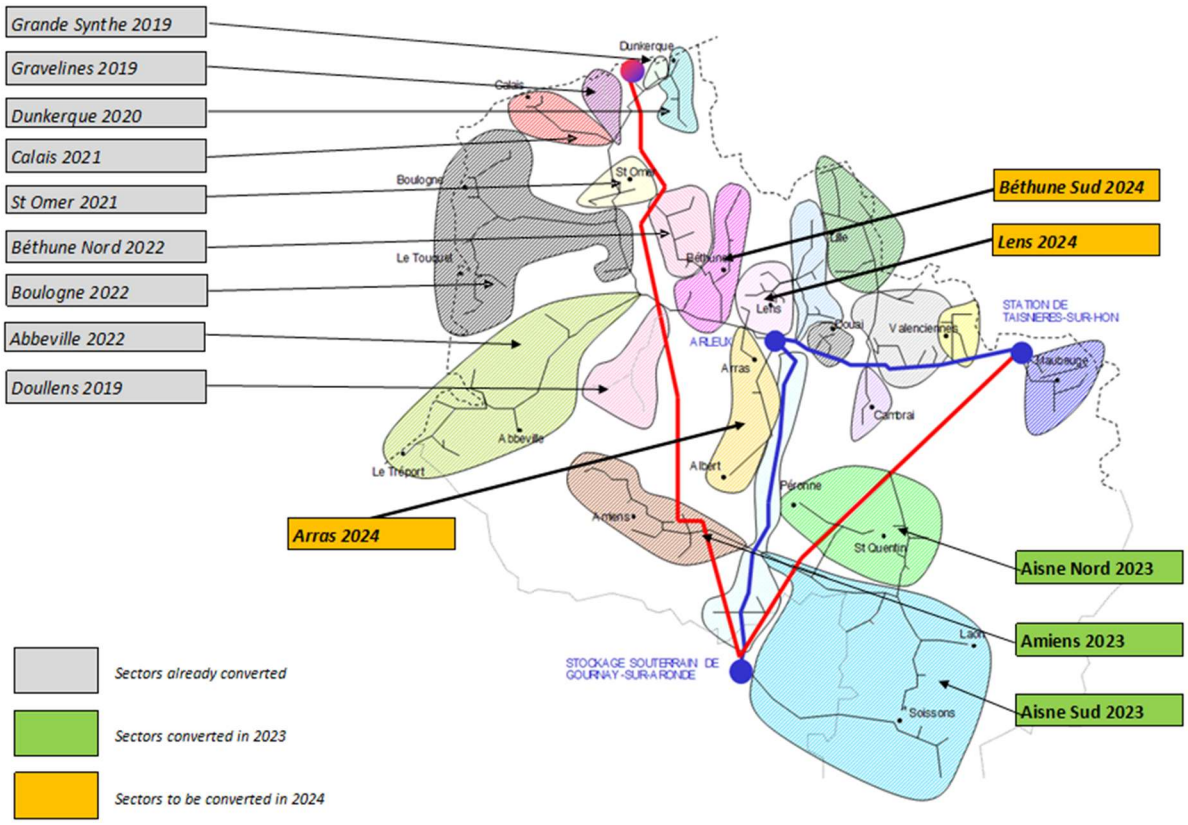
In 2023, the conversion concerned three sectors for a total amount of 177,000 customers and an estimated annual volume of 9 TWh/y.

**Conversions in 2024**

In 2024, three sectors with 212,000 customers are to be converted accounting for an annual volume of 5.5 TWh/y under average weather conditions. As of December 2023, all conversion activities are on track.

**Map 2.2.1 Market conversions in France in 2019-2024**

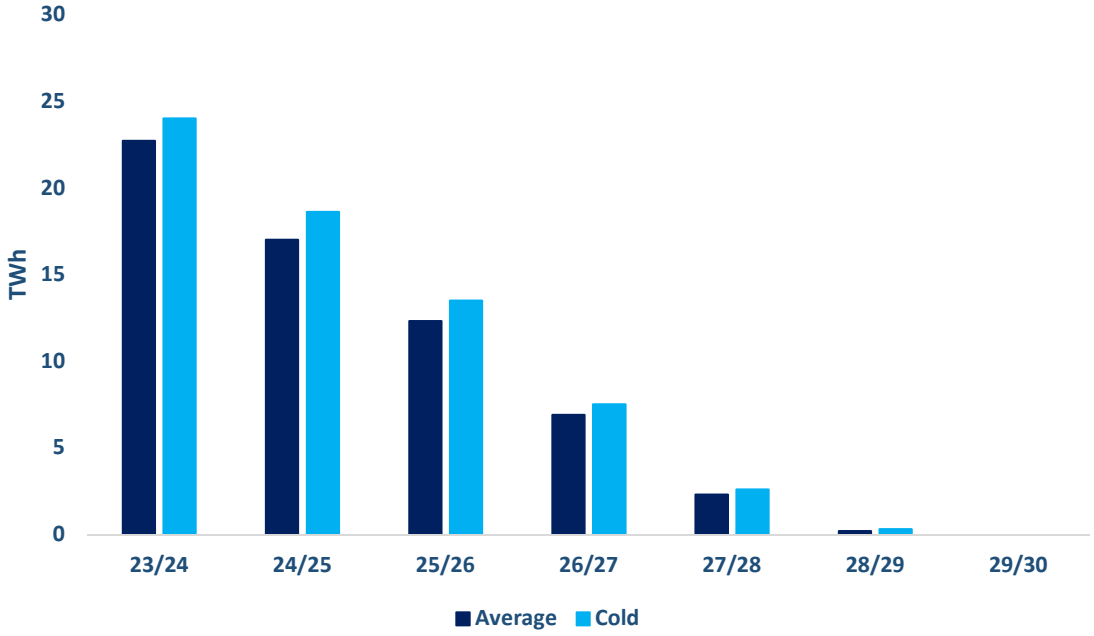
[9] For further details: 'Winter Report 2021' and 'Winter Report 2022' of the Task Force Monitoring L-Gas Market Conversion.




**Conversions until GY 2029/30**

In France, over 0.9 million of gas consumers will need to be converted between GY 2024/25 and GY 2029/30. Consequently, L-gas imports from the Netherlands to France are expected to fall to 0 by GY 2029/30.

**Figure 2.2.1 France's consumers demand for L-gas from the Netherlands between GY 2023/24 and GY 2029/30 (TWh, for average and cold GYs)**




## 2.3 Belgium

**Conversions in 2023**

In 2023, around 365,000 connections were converted translating into a volume of 5.81 TWh under average weather conditions. The conversion has been executed on June 1st, 2023.

**Remainder of the conversion**

The successful completion of the L/H conversion phases to date led the Belgian gas network operators (TSO and DSOs) to identify ways of converting larger L-gas market areas to H-gas each year, thereby reducing the total duration of the conversion program. The final validated indicative planning foresees that the Belgian L/H-conversion should be completed on September 1st, 2024 (instead of June 1st, 2029, as previously planned).

This optimization of the conversion planning is the result of a joint analysis by the Belgian TSO and DSOs, whereby individual conversion areas have been grouped, resulting in efficiency gains. This was made possible by the previous conversion phases, whereby the network operators acquired positive experience and confidence in the feasibility in such a scheme. Essentially two changes have been brought to the conversion planning:

- The L-gas areas of Antwerp, which were due to be converted in 2028 and 2029, have been carried out in 2023.
- The L-gas areas previously planned for conversion in 2025, 2026 and 2027 are now scheduled in 2024.

### Migrations on June 1st, 2024

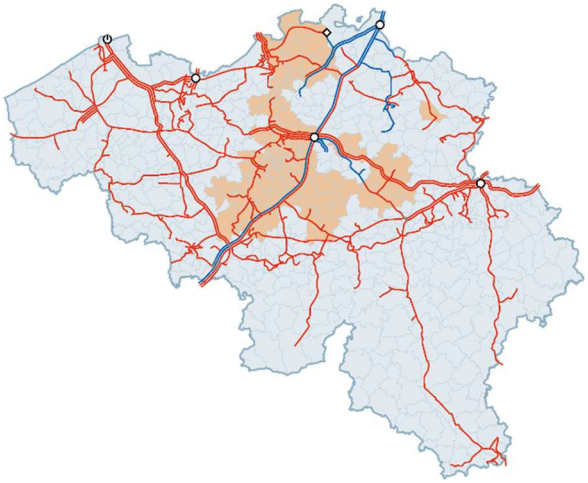
**Municpialties to be converted in Flanders : network DSO FLUVIUS**

Beersel, Dilbeek*, Drogenbos, Galmaarden, Halle, Herne, Lennik*, Linkebeek, Pepingen, Sint-Genesius-Rode, int-Pieters-Leeuw

**Municpialties to be converted in Flanders : network DSO ORES**

Braine-l'Alleud, Braine-le-Chateau, Enghien, Ittre, Nivelles, Tubize, Waterloo

**Map 2.3.1 Indicative market conversion in Belgium on June 1st, 2024**



## Migrations on September 1st, 2024

**Municpialties to be converted in Flanders : network DSO FLUVIUS**

Aarschot, Antwerpen*, Arendonk, Baarle-Hertog, Balen, Beerse, Begijnendijk, Bekkevoort, Beringen, Berlaar, Bertem*, Bierbeek, Boechout, Bonheiden, Boutersem, Brecht*, Dessel, Diest, Duffel, Geel, Glabbeek*, Grobbendonk, Haacht*, Halen, Ham, Heist-Op-Den-Berg, Herent, Herentals, Herenthout, Herk-De-Stad, Herselt, Heusden-Zolder, Hoegaarden, Holsbeek*, Hoogstraten, Houthalen-Helchteren*, Hove*, Hulshout, Kasterlee, Keerbergen, Kontich, Kortenaken, Laakdal, Landen*, Leuven, Lier, Lille, Lint, Linter*, Lummen, Malle*, Mechelen*, Meerhout, Merksplas, Mol, Nijlen, Olen, Oud-Heverlee, Oud-Turnhout, Putte, Ravels, Retie, Rijkevorsel, Rotselaar, Scherpenheuvel-Zichem, Sint-Katelijne-Waver, Tessenderlo, Tielt-Winge*, Tienen, Tremelo, Turnhout, Vosselaar, Westerlo, Wuustwezel*

**Map 2.3.2 Indicative market conversion in Belgium on September 1st, 2024**

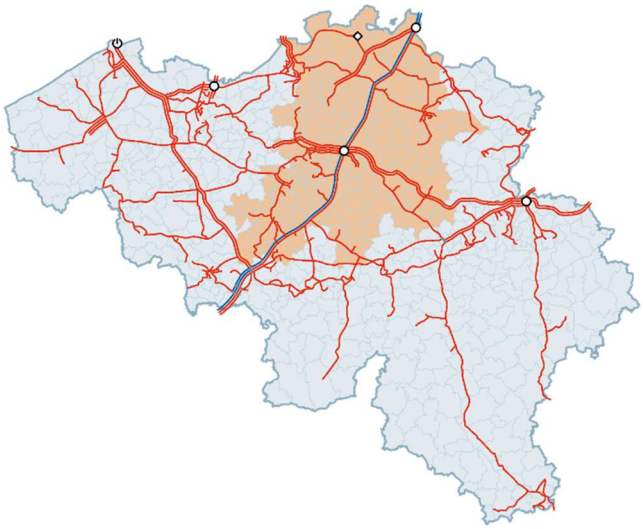
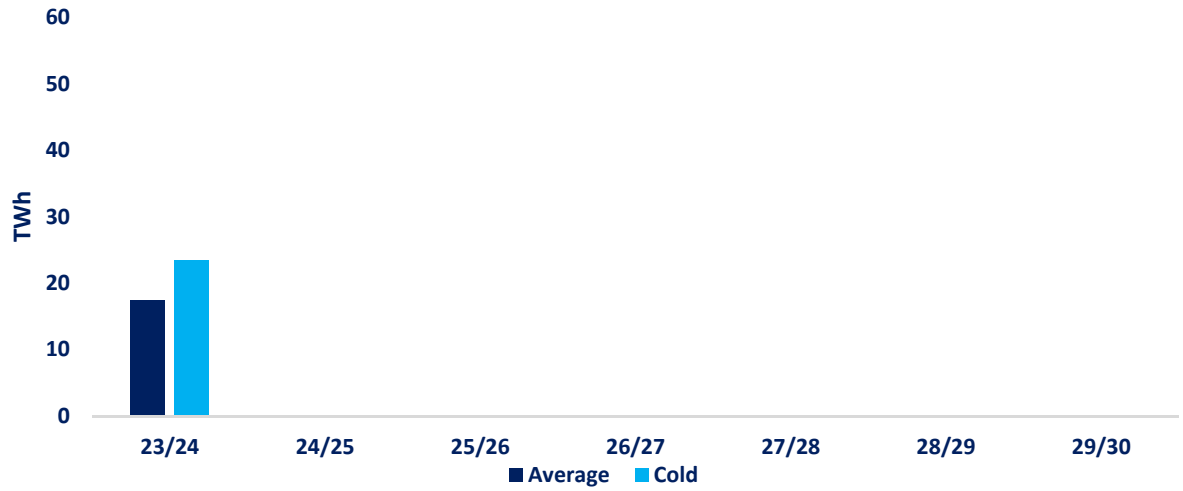


**Figure 2.3.1 Belgium's consumers demand for L-gas from the Netherlands between GY 2023/24 and GY 2029/30 (TWh, for average and cold GYs)**




## 2.4 The Netherlands

Contrary to the surrounding L-gas consuming countries, the Netherlands have decided not to enter into a large scale operation to convert the G-gas demand in H-gas. Instead, a new nitrogen facility has been built which, together with the already existing nitrogen facilities and some underground storage facilities, will be able to provide enough G-gas to meet Dutch and foreign L-gas demand in the years to come. For more details, please refer to Chapter 3 of the Report.

In the Netherlands, further G-gas demand has been limited by adapting the legislative framework. The Dutch Gas Act has been adapted to prevent future G-gas consumption growth by prohibiting the connection of newly built houses and buildings to the gas grid. Additional new legislation concerning the conversion of industrial customers (adopted on June 20, 2020) specifies that industrial customers consuming more than 100 million cubic meters of L-gas in two of the gas years 2016/17, 207/18 or 2018/19, are not allowed to use L-gas anymore after October 2022. Therefore, Dutch demand for L-gas is expected to decrease by approximately ~30 TWh, equating to the consumption of the nine largest users. Five of these nine users have already stopped their offtake of L-gas and converted to other sources of energy. The remaining four industrial users have been and will be granted a temporary exemption from the ban by the Ministry of Economic Affairs and Climate Policy. This exemption holds until their planned conversion in the upcoming years.

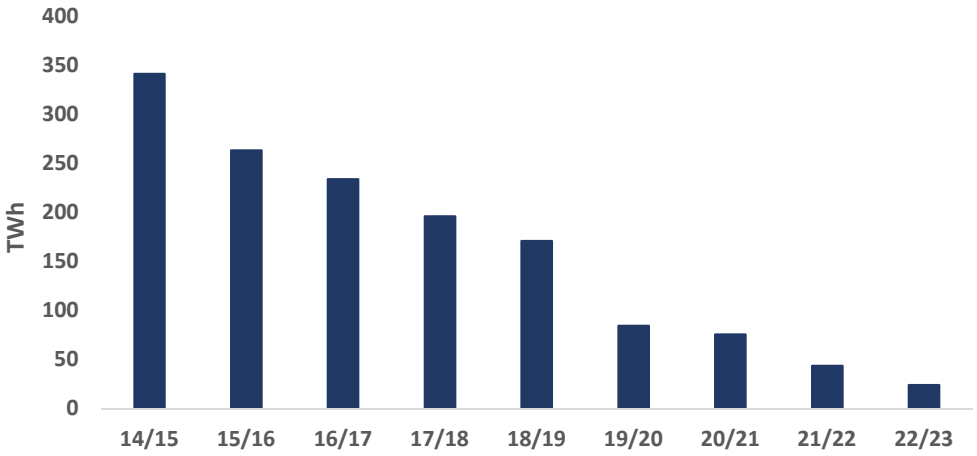
In addition, steps are being taken to phase-out natural gas from the Dutch energy system between now and 2050. This follows the Paris Agreement on Climate Change and the Dutch Climate Agreement.

# 3. L-gas production

### 3.1 L-gas production in the Netherlands for the period GY 2014/15 – GY 2029/30

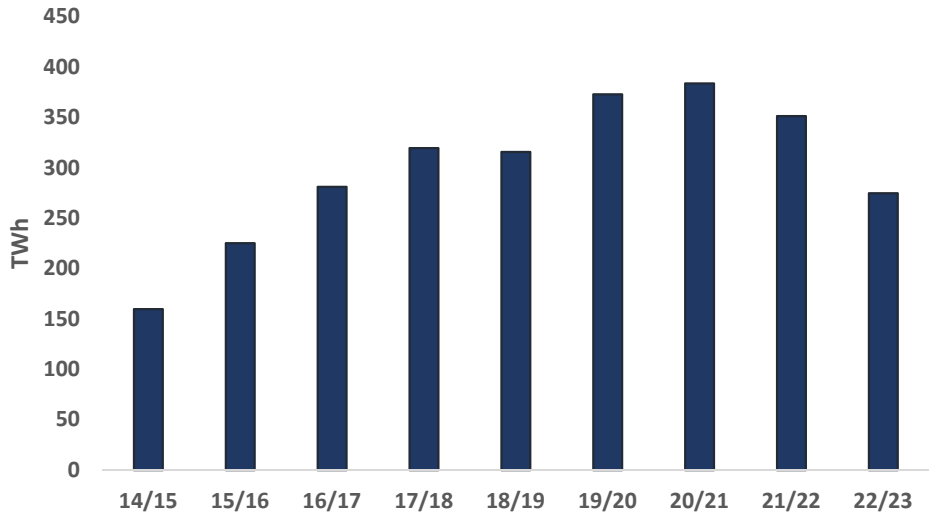
Following an increasing number of earthquakes in the province of Groningen, linked to the natural gas extraction in the area, the Dutch authorities have imposed successive caps on Groningen's gas production starting from GY 2014/15. This trend continued through to GY 2022/23, as Groningen gas production was at its lowest point at 24 TWh.

**Figure 3.1.1. Production from the Groningen field between GY 2014/15 and GY 2022/23 (TWh)**




In line with the declining natural G-gas production from the Netherlands, falling more steeply than the demand reduction, the share of pseudo L-gas in total Dutch L-gas production grew to ~92% of the total demand in GY 2022/23.

**Figure 3.1.2 Production of pseudo L-gas in the Netherlands between GY 2014/15 and GY 2022/23 (TWh)**




From a security of supply point of view,the Groningen field should only be closed when the total G- and L-gas market can be supplied by pseudo L-gas, for which sufficient H-gas and nitrogen is needed. As a consequence of the omitting Russian gas supplies ~30% of the demand of H-gas now has to come from other sources. The main source for H-gas is LNG, supplied through existing terminals in the United Kingdom, Belgium and the Netherlands. Since these terminals do not have enough capacity to replace the former Russian supply, additional LNG-import facilities are being developed in the Netherlands, Germany and France. An extension of the regas capacity at the LNG terminal of Zeebrugge (Belgium) is ongoing. These projects are in different stages of development and contribute mainly to the mid-term solution. On the short term, the demand supply balance is being kept by a decline in the European gas demand due to high prices and sustainability measures accelerated due to the high prices. There is still a risk of H-gas shortages. This means that there is a possibility that there may not be enough H-gas supply for both the H-gas market demand and full usage of the conversion facilities for the production of the still needed amounts of pseudo G- and L-gas.

The Dutch State Secretary, responsible for the phase out of the Groningen production, did set the cap for Groningen production in GY 2023/24 at 0 TWh for both an average and a cold year. This means that under normal

conditions, no production from the Groningen field is allowed. GTS showed[10] that capacity on the field is needed to fill demand in case of exceptional situations. The decree provides the possibility to temporarily switch a number of Groningen production locations to the pilot light, so that the capacity is available in case of disruption of supply with a total capacity comparable to gas storage Norg. In line with this decree, two of the production locations were started by the NAM in the beginning of January[11].

The mission of the Government of the Netherlands is to close the Groningen field as quickly as possible, taking into account security of supply. An important measure that is taken is the conversion of the gas storage Grijpskerk from an H-gas storage to an L-gas storage. This conversion of the storage was planned so that it could, when volume and capacity were sufficient, take over the back-up functionality of the Groningen field and speed up the closure of the field. Another measure is the construction of a new nitrogen plant at Zuidbroek. This nitrogen/H-gas blending facility has a capacity of 180,000 $m^3/h$ and is able to produce a maximum of 97 TWh additional pseudo L-gas. The new nitrogen plant is operational since GY 2023/24.

Yearly in January, GTS provides advice to the State Secretary on the needed Groningen capacity and volume for the security of supply for the upcoming gas year. This year Dutch Parliament is set to review a law proposed by the Ministry of Economic Affairs and Climate Policy concerning the permanent closure of the Groningen field by October 1st 2024. The January 2024 analysis of GTS shows that without the Groningen field, the Netherlands does not comply with the European infrastructure norm for the next gas year, which means that there is not sufficient capacity available to satisfy total gas demand in the event of a disruption of the single largest gas infrastructure during a day of exceptionally high gas demand. After the next gas year this potential shortage is projected to be minimal. Furthermore the analysis shows that after an exceptionally cold winter the seasonal storages cannot be refilled to the required filling level of 90% necessary to ensure security of supply for the next gas year in case of a subsequent exceptionally cold winter. Without the Groningen field there are a no short-term supply solutions available for complying with the European infrastructure norm and for fully refilling the seasonal storages after a cold winter. These risks will decline with each subsequent gas year as L-gas demand will continue to be reduced.

### 3.2 Expected L-gas production outside Netherlands for the period GY 2023/24 – GY 2029/30

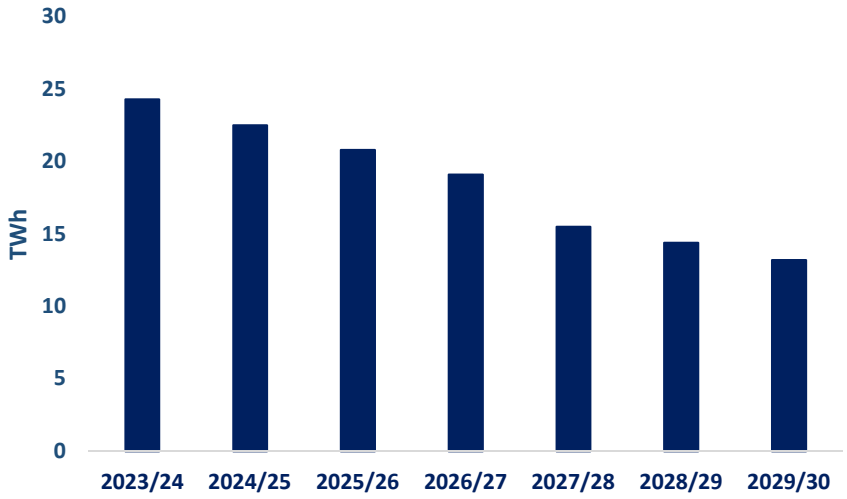
In Germany, L-gas production is expected to decrease at an annual average rate of ~15% from 24.3 TWh in GY 2022/23 to 13.2 TWh by GY 2029/30. There is one peak nitrogen/H-gas blending facility in Germany, in Rehden, supplying only limited volumes of converted L-gas. In 2021, the blending facility in Rehden was extended with a local nitrogen plant for backing the local supply demand balance.

In addition, the German TSO GTG Nord built a blending facility at the Dutch border. This facility allows for blending Dutch Groningen gas with H-gas. This blending facility is in operation since April 2021 and allows for an annual decrease of L-gas deliveries from the Netherlands up to ~5 to 6 TWh/y of the demand of GTG's cross border point Oude Statenzijl, depending on the actual amount of gas imports. In GY 2022/2023 1.3 TWh was blended. Thus, the facility is a further relief to the Groningen production. The building costs of the facility and its operational costs are borne by network users.

There is no L-gas production in Belgium and France. The French nitrogen/H-gas blending facility located at Loon Plage (near Dunkerque) designed for peak-load needs only was abandoned in 2021 as this area of GRTgaz network was converted. There is one peak nitrogen/H-gas blending facility in Lillo, Belgium, supplying only limited volumes of converted L-gas.

[10] For more detail see the advice from GTS dated 26th of May 2023, entitled *Analyse stand van zaken op de gasmarkt en leveringszekerheid in het volgende gasjaar*
[11] https://open.overheid.nl/documenten/aad78f28-a021-4435-9274-a50e458b93ab/file

**Figure 3.2.1 Indication of the L-gas production in Germany between GY 2022/23 and GY 2029/30 (TWh)**



# Annex

## Annex I: Consumers demand for L-gas from the Netherlands in the GY 2022/23 in TWh

**1.1 Consumers demand for L-gas from the Netherlands[12] in GY 2022/23 in TWh**

| GY 2022/23 | Germany | France | Belgium | Netherlands |
|---|---|---|---|---|
| **October 2022** | 7.0 | 1.8 | 1.4 | 9.5 |
| **November 2022** | 8.5 | 2.9 | 2.4 | 15.7 |
| **December 2022** | 11.4 | 4.2 | 3.6 | 24.8 |
| **January 2023** | 11.0 | 3.9 | 3.5 | 23.3 |
| **February 2023** | 8.6 | 3.2 | 3.0 | 19.9 |
| **March 2023** | 10.0 | 3.1 | 3.0 | 20.0 |
| **April 2023** | 6.8 | 2.2 | 2.3 | 14.1 |
| **May 2023** | 4.9 | 1.3 | 1.4 | 8.6 |
| **June 2023** | 2.1 | 0.9 | 0.6 | 6.4 |
| **July 2023** | 2.9 | 0.8 | 0.6 | 6.4 |
| **August 2023** | 2.9 | 0.8 | 0.7 | 6.5 |
| **September 2023** | 2.1 | 1.0 | 0.7 | 6.7 |
| **Total** | 78.2 | 26.1 | 23.2 | 161.9 |

## Annex II: Indication of the demand for L-gas from the Netherlands until GY 2029/30

**2.1 Indication of the demand for L-gas from the Netherlands in Germany until GY 2029/30 (TWh)**

| | Cold | | Average |
|---|---|---|---|
| | TWh | GWh/d | TWh |
| **2023/24** | 92.4 | 686 | 83.1 |
| **2024/25** | 76.1 | 574 | 68.4 |
| **2025/26** | 55.3 | 458 | 49.4 |
| **2026/27** | 38.4 | 343 | 34.8 |
| **2027/28** | 26.7 | 228 | 24.6 |
| **2028/29** | 8.4 | 115 | 7.8 |
| **2029/30** | 0.3[13] | 2 | 0.3 |

**2.2 Indication of the demand for L-gas from the Netherlands[14] in Belgium until GY 2029/30 (TWh)**

| | Cold | | Average |
|---|---|---|---|
| | TWh | GWh/d | TWh |
| **2023/24** | 23.4 | 156 | 17.4 |

[12] For Germany and Belgium, this accounts for imports of L-gas from the Netherlands and not total domestic demand. For France, this accounts for final consumers demand per month, not taking into account L-gas injections/withdrawals in/from Gournay storage, and L/H blending. For the Netherlands, it accounts for domestic demand.
[13] Please note that the remaining demand in the gas year 2029/30 (0.3 TWh / 100.000 kWh/h) is given by a regional grid in Germany, that can only supplied via the Netherlands (Haanrade / Thyssengas).
[14] Not taken into consideration: DSO-supplying Baarle-Hertog, a customer directly supplied by the Dutch TSO and fuel gas necessary for transmission service to remaining French market.

**2.3 Indication of the demand for L-gas from the Netherlands in France until GY 2029/30 (TWh)**

| | Cold | | Average |
|---|---|---|---|
| | TWh | GWh/d | TWh |
| **2023/24** | 24.8 | 162 | 22.7 |
| **2024/25** | 18.6 | 115 | 17.0 |
| **2025/26** | 13.5 | 52 | 12.3 |
| **2026/27** | 7.5 | 11 | 6.9 |
| **2027/28** | 2.6 | 4 | 2.3 |
| **2028/29** | 0.3 | 0 | 0.2 |
| **2029/30** | 0 | 0 | 0 |

**2.4 Indication of the demand for L-gas in the Netherlands until GY 2029/30 (TWh)**

| | Cold | | Average |
|---|---|---|---|
| | TWh | GWh/d | TWh |
| **2023/24** | 248 | 2917 | 213 |
| **2024/25** | 230 | 2732 | 198 |
| **2025/26** | 221 | 2677 | 190 |
| **2026/27** | 217 | 2637 | 186 |
| **2027/28** | 212 | 2601 | 182 |
| **2028/29** | 208 | 2565 | 178 |
| **2029/30** | 203 | 2529 | 174 |

## Annex III: Expected market conversion volume until GY 2029/30

**3.1 Expected market conversion volume in Germany until GY 2029/30 (TWh)**

| Gas year | Volume converted [TWh] | Number of installations [thousands] |
|---|---|---|
| **2023/24** | 17.5 | 516 |
| **2024/25** | 21.0 | 520 |
| **2025/26** | 17.3 | 516 |
| **2026/27** | 19.1 | 540 |
| **2027/28** | 22.3 | 440 |
| **2028/29** | 8.8 | 202 |
| **2029/30** | 0 | 0 |

**3.2 Expected market conversion volume in Belgium until GY 2029/30 (TWh)**

| Gas year | Volume converted [TWh] | Number of installations [thousands] |
|---|---|---|
| **2023/24** | 17.4 | 467 |
| **2024/25** | 0 | 0 |
| **2025/26** | 0 | 0 |
| **2026/27** | 0 | 0 |
| **2027/28** | 0 | 0 |
| **2028/29** | 0 | 0 |
| **2029/30** | 0 | 0 |

**3.3 Expected market conversion volume in France until GY 2029/30 (TWh)**

| Gas year | Volume converted [TWh] | Number of installations [thousands] |
|---|---|---|
| **2023/24** | 5.5 | 212 |
| **2024/25** | 5.3 | 279 |
| **2025/26** | 6.4 | 197 |
| **2026/27** | 4.9 | 183 |
| **2027/28** | 2.2 | 37 |
| **2028/29** | 0 | 0 |

## Annex IV: Expected L-gas production

**4.1 Indication of the L-gas production in the Netherlands from Groningen until GY 2023/24 (TWh)**

| Gas year | Cold | Average |
|---|---|---|
| **2023/24** | 0.0 | 0.0 |

**4.2 Indication of the L-gas production in Germany until GY 2029/30 (TWh)**

| Gas year | Cold | Average |
|---|---|---|
| **2023/24** | 24.3 | 24.3 |
| **2024/25** | 22.5 | 22.5 |
| **2025/26** | 20.8 | 20.8 |
| **2026/27** | 19.1 | 19.1 |
| **2027/28** | 15.5 | 15.5 |
| **2028/29** | 14.4 | 14.4 |
| **2029/30** | 13.2 | 13.2 |

## Annex V: L-gas storage in northwest Europe

**5.1 Working gas volume and daily withdrawal capacity of L-gas storage sites in Germany, France and the Netherlands**

| | Working gas (TWh) | Withdrawal rate (GWh/d) |
|---|---|---|
| **Germany**[15] | | |
| ***Speicherzone L-Gas (EWE)*** | 6.0 | 188 |
| ***Empelde*** | 2.2 | 74 |
| ***Epe L-Gas (RWE)*** | 2.1 | 99 |
| ***Epe L-Gas (UES)*** | 1.8 | 120 |
| **France** | | |
| ***Gournay*** | 13.0 | 248 |
| **the Netherlands** | | |
| ***EnergyStock*** | 3.0 | 252 |
| ***Norg (Langelo)*** | 59.3 | 742 |
| ***Alkmaar*** | 5.0 | 357 |
| ***Epe Nuon*** | 3.0 | 117 |
| ***Epe Eneco*** | 1.0 | 95 |
| ***Epe Innogy*** | 3.0 | 119 |
| ***Peakshaver*** | 1.0 | 312 |
| ***Grijpskerk*** | 12.0 | 620 |

**5.2 Net withdrawals (in TWh) of L-gas per country in GY 2020/21, GY 2021/22 and GY 2022/23**

| | 2020/21 | 2021/22 | 2022/23 |
|---|---|---|---|
| **The Netherlands** | 0.8 | -6.7 | -1.6 |
| **France** | 0.5 | 1.2 | 1.0 |
| **Germany** | 6.2 | -3.4 | 3.9 |

[15] Source: https://agsi.gie.eu/, 04.12.2023

## Annex VI: Climatological context

L-gas is predominantly used in the residential sector for space heating, therefore L-gas gas demand is strongly correlated with the temperature and wind. The definition of the degree days is given in the Dutch Gas Act. As stated in the Dutch Gas Act, both the temperature and wind are measured at weather station De Bilt.

The number of degree days can be calculated by

$D = \Sigma \max[(14 - Teff),0]$

Where:

D = the number of degree days

14 = heating limit (the so-called "stookgrens")

Teff = daily average effective temperature

$Teff = T - (V/1,5)$

Where:

T = daily average temperature

V = daily average wind speed

## Contributors

This report is compiled by the Netherlands Ministry of Economic Affairs and Climate Policy and Gasunie Transport Services (GTS) in close collaboration with:

| | |
|---|---|
| **Germany** | |
| Federal Ministry for Economic Affairs and Energy | Stefan Rolle, Andreas Kaiser |
| Federal Network Agency | Elena Albrecht, Andreas Müller, Jörn Mehlitz |
| TSO: Open Grid Europe | Frank Harlacher |
| TSO: Gasunie Deutschland | Thorsten Brümmer |
| TSO: Thyssengas | Dr. Thomas Hügging |
| TSO: GTG Nord | Christian Barth, Tammo Dunkhase |
| TSO: Nowega | Sebastian Koch |
| **France** | |
| Ministry for Ecological Transition | Etienne Denieul, Samir El Kanbi, Carole Mercier |
| Energy Regulatory Commission | Edith Hector |
| TSO: GRTgaz | Emmanuel Freitag |
| **Belgium** | |
| Federal Public Service Economy | Bernard Picron, Benjamin Heylen, Alexis Bossuyt |
| Commission for Electricity and Gas Regulation | Christian Cuijpers |
| TSO: Fluxys Belgium | Denis Bawin, Juan Vazquez |
| **The Netherlands** | |
| Ministry of Economic Affairs and Climate Policy | Wim van 't Hof (chairman), Stijn Uitdewilligen, Luc van der Stegen |
| Gasunie Transport Services | Anne Spijkstra, Wendy Docters, Jan de Boer, Jolmer Bos |
| Authority for Consumers & Markets | Nina Fleuren |
| **General Secretariat of the Benelux Union** | Geert Wegman |
| **European Commission** | Carmen-Magdalena Oprea |