Market Session

6 February 2024

Content

- Formal yearly advice to MEA regarding security of supply with minimal Groningen production;
- Basic assumptions regarding security of supply post-Groningen;
- Instructions to the market in case of a shortage of capacity of quality conversion.

Explanation advice on guaranteeing security of supply for gas year 2024/25

GTS, Wendy Docters

Content

- Regulatory framework
- Security of supply
- Recent market developments
- Planning assumptions
- Results
  - Capacity
  - Volume
- Summary

Regulatory framework

- According to current regulation, GTS has the statutory task to advise the State Secretary on the minimal needed capacity and volume from the Groningen field for the security of supply for the coming gas year.
- The State Secretary has just announced an amendment of the Gas Act and Mining Act regulating the final termination of gas extraction from the Groningen field.
- The draft act states that “from October 1, 2024, gas will no longer be extracted from the Groningen field”.

- Therefore GT wrote this advice in the knowledge that legislation relating to the permanent closure of the Groningen field is in the parliamentary process, but has not yet been completed.

Security of supply

- In the Netherlands, security of supply is defined as the situation where "end consumers of gas are supplied at the right time and in the right quality (low or high caloric) and in the required quantity, even when demand is high".
- To quantify this, we look to European regulation.
  - In this advice for the State Secretary, the necessary capacity during the winter to fulfil peak demand is discussed. The volume needed for the security of is secured by European regulation regarding the filling levels of the storages.
- In the model both domestic and foreign end consumers (depending on export from NL) are being considered.

Article 5

Infrastructure standard

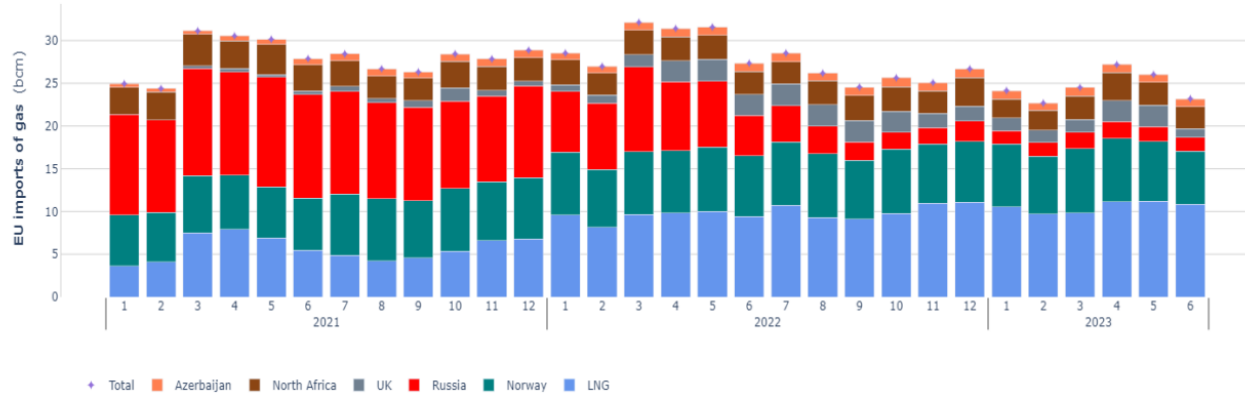
1. Each Member State or, where a Member State so provides, its competent authority shall ensure that the necessary measures are taken so that in the event of a disruption of the single largest gas infrastructure, the technical capacity of the remaining infrastructure, determined in accordance with the N – 1 formula as set out in point 2 of Annex II, is able, without prejudice to paragraph 2 of this Article, to satisfy total gas demand of the calculated area during a day of exceptionally high gas demand occurring with a statistical probability of once in 20 years. This shall be done taking into account gas consumption trends, the long-term impact of energy efficiency measures and the utilisation rates of existing infrastructure.

Recent market developments

- With the disruption from the Russian supply, import of LNG as become crucial for the security of supply within Europe.
  - Supply from LNG has doubled
  - Supply from Norway +15%

- Due to the supply shortage and high gas prices, European gas demand has decreased 10% to 15%
- The production of gas in Europe decreases steadily, at least until 2025 a tight supply of LNG.

Figure 1: Monthly EU imports of natural gas by source



Source: ENTSO-G. Bron: https://energy.ec.europa.eu/data-and-analysis/market-analysis_en

(Most important) planning assumptions

	Realistic scenario	Pessimistic scenario	Optimistic scenario
Domestic demand	Capacity and volume based on the Klimaat- and Energieverkenning 2022, with a correction of 10% on the expected volume of the RNB.		
L-gas export to Belgium, France and Germany	Winterbriefing 2024 Taskforce Monitoring L-gas Market Conversion.		
H-gas export to Germany	High export flow (based on actual flows of the last two years) from the Netherlands to Germany		2/3 of the capacity and volume from the realistic scenario per 2026/27
German H-gas caverns	Capacity based on the Winter Supply Outlook from Entsog for the availability of the German H-gas cavernes at peak demand.		
LNG	Maximum availability of Gate is assumed, including fourth tank from 2026/27, and EET until the start of gas year 2027/28.	70% of the LNG supply in the realistic scenario, both for capacity and volume.	

Modelling the capacity balance 2024/25

To safeguard the security of gas supply in line with European regulation[1], capacity is required:

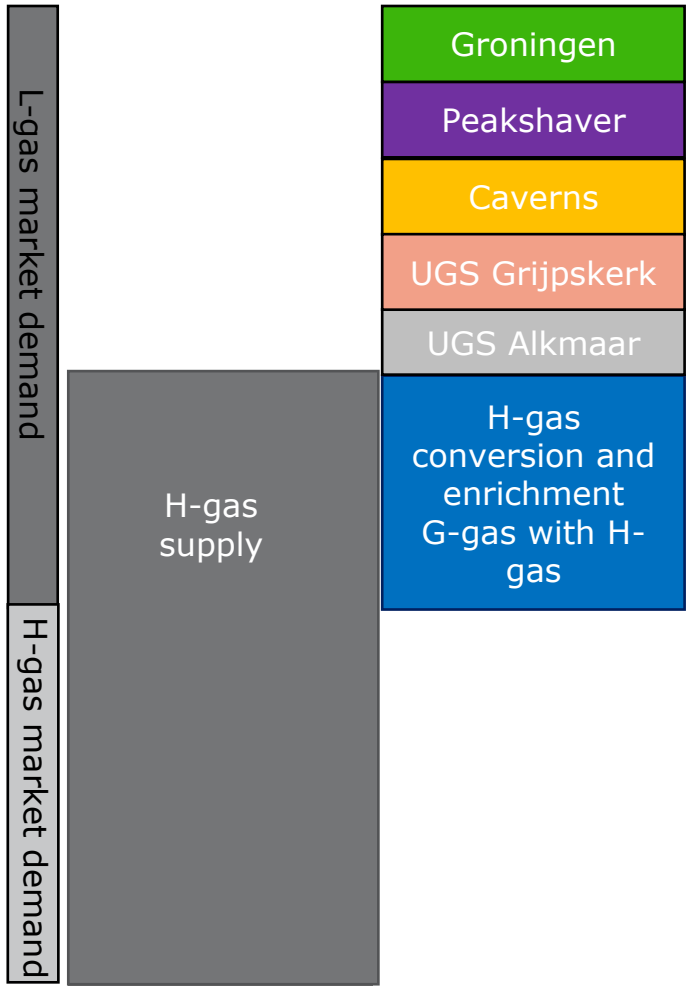
- the regulation states that there must be sufficient capacity to fulfill an exceptionally high gas demand occurring with a statistical probability of once in 20 years in the event of a disruption of the single largest gas infrastructure.

Assumptions:

- Single largest infrastructure (capacity) = UGS Norg
- Once in 20 years is translated to a daily average effective temperature

Method

- Determine the market capacity demand, for H- and L-gas at the calculated temperature
- Use all facilities at the available capacity (excluding Norg)
- Determine whether there is a gap or not.



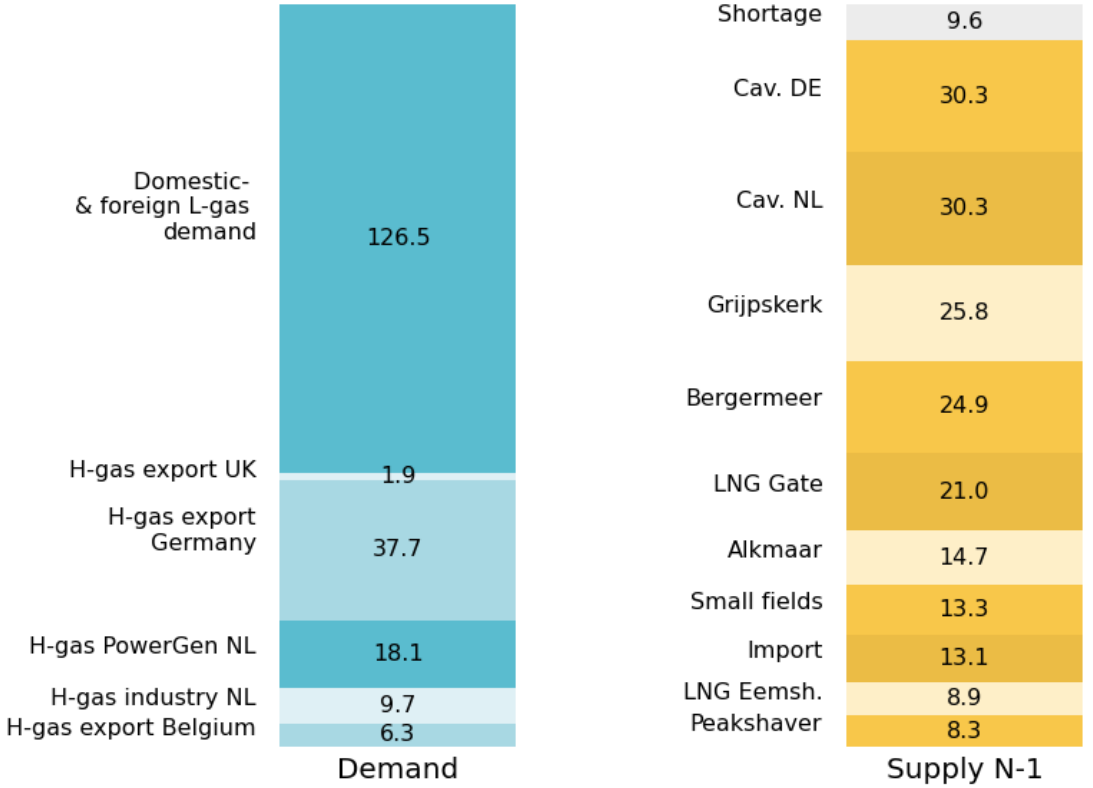
[1] in line with European Regulation 2017/1938, article 5

Results capacity balance 2024/25

For gas year 2024/25 a capacity shortage could be expected.

Differences with respect to the estimate of capacity for 2023/24:

- Contribution of the German caverns at Oude Statenzijl at peak demand.
- The gas demand occurring with a statistical probability of one in the twenty years is now translated to a effective mean 24 hour temperature of -14°C (instead of -15,5°C) based on a KNMI study.
- Phasing out and decline of the L-gas demand

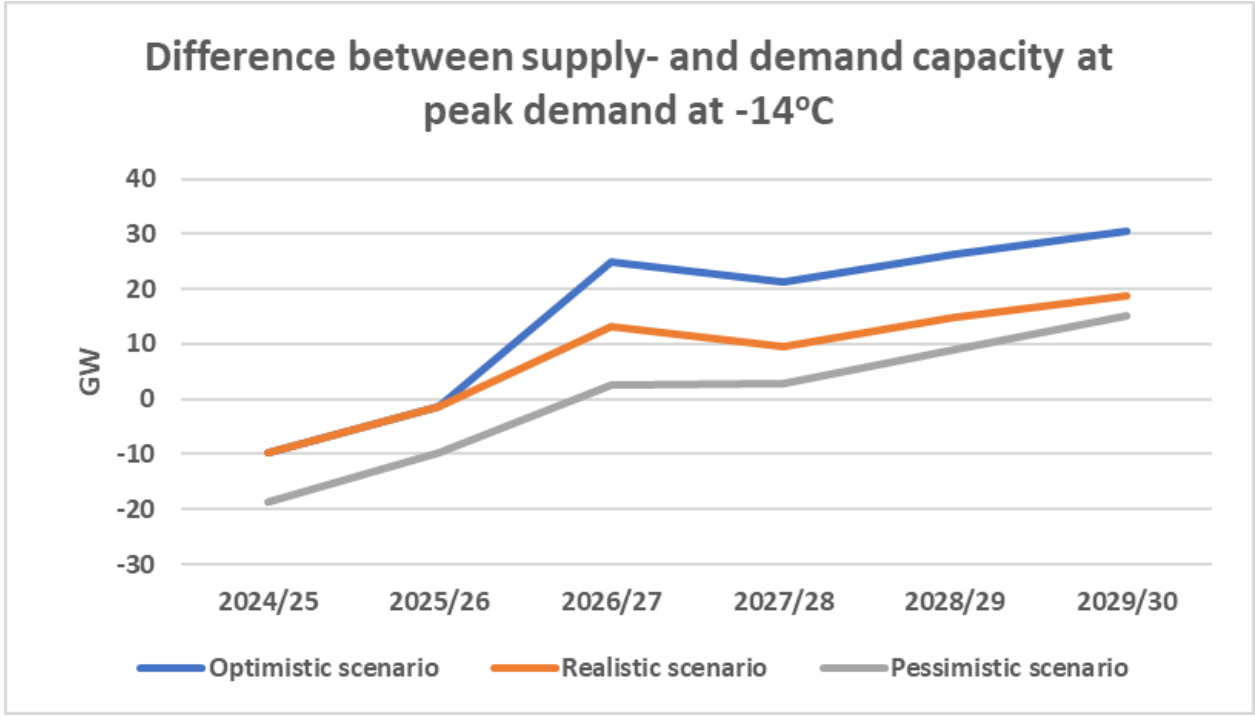


Results capacity balance 2024/25 and further

All three the sensitivity scenario's show a capacity shortages for the first two gas years.

Possible measures:

- Capacity on the Groningen field
  - Amendment Gas Act
- More supply through the existing infrastructure
  - Not plausible at times of peak demand
- Demand reduction due to market forces or further agreements with neighbouring countries
- Measures from the Bescherm- en Herstelplan Gas

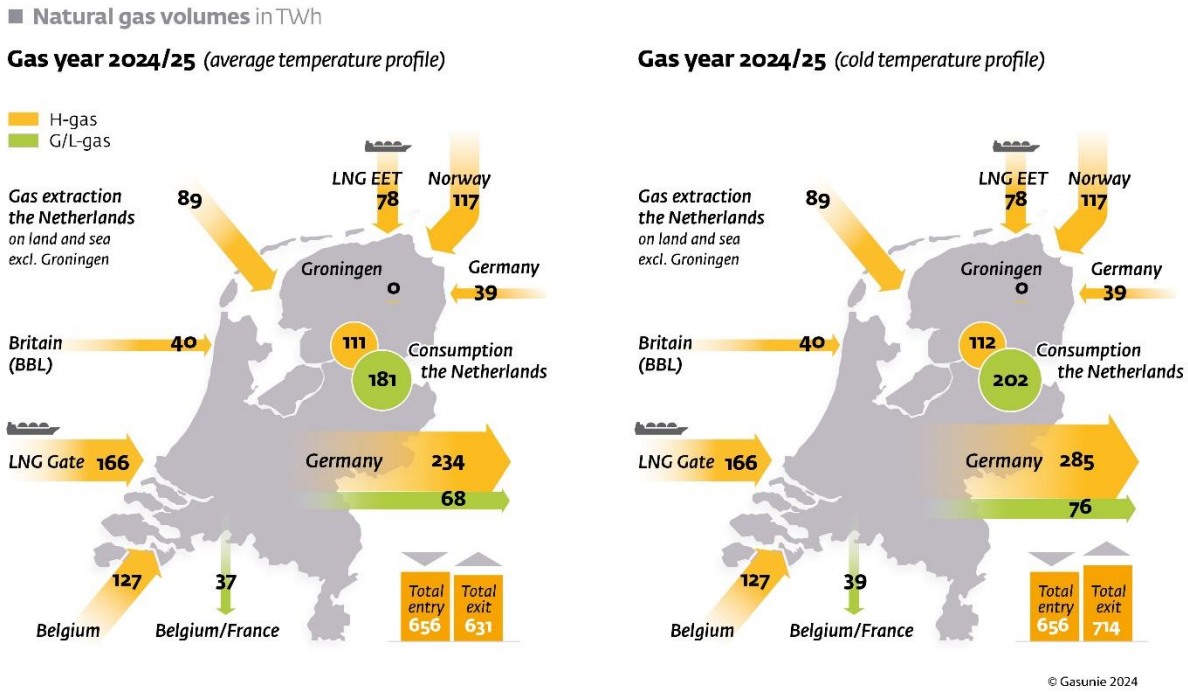


Results volume balance 2024/25

If the gas years follows a **warm or average** temperature profile and the gas storages are hardly used during the winter, there is sufficient supply in the summer to fill the gas storages to at leat 90% at the end of gas year.

If the gas years follows a **cold** temperature profile and the gas storages are relatively empty at the end of the winter, there is not sufficient supply in the summer to fill the gas storages to at leat 90% at the end of gas year.

- Shortages can run up to ~60 TWh in a realistisc scenario.

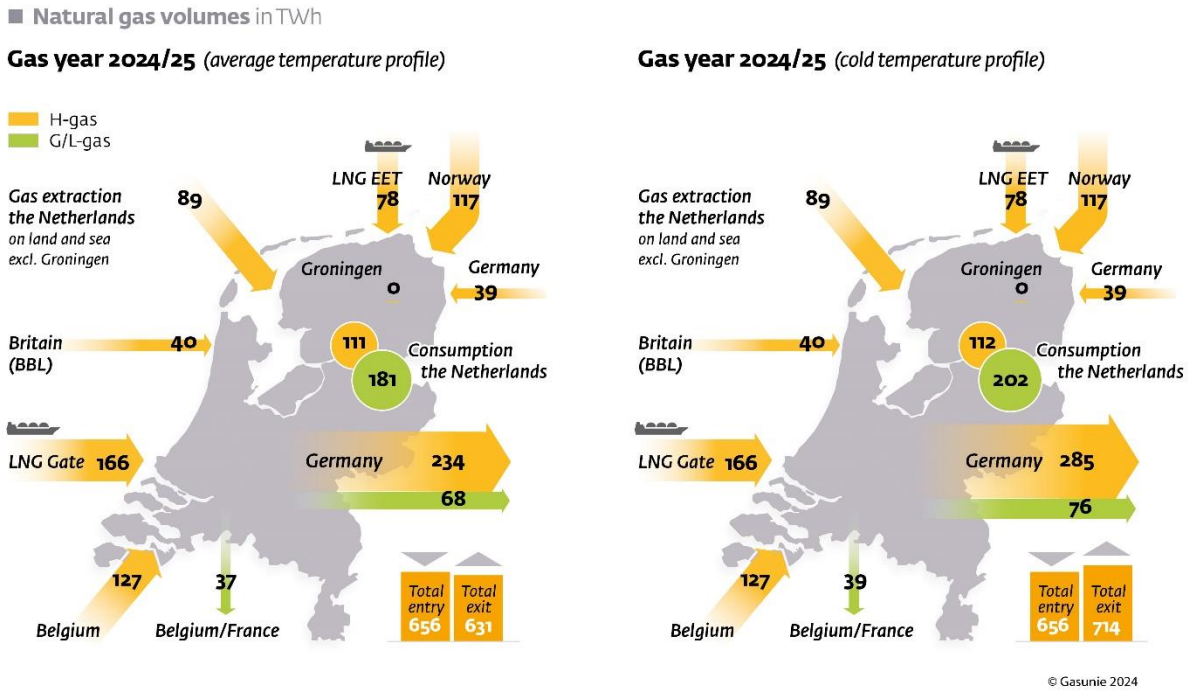


Results volume balance 2024/25

A possible volume shortage in the summer of 2025 is a not an “acute” problem.

Possible measures:

- In the short term, solutions must be sought in the demand reduction.
- In the (mid)long term it is necessary to create additional supply in, for example LNG terminals.



Summary

- The European infrastructure norm is not met the coming two gas years
  - Potential shortages are less then outlined in our previous (2023) advice to the State Secretary due to (i) an adjustment of the temperature corresponding with the gas demand occurring with a statistical probability of once in twenty years, (ii) the expected contribution of German H-gas caverns at peak demand, and (iii) decline and phasing out of the L-gas demand.
  - Mitigation measures should be available in hours.

- In the coming years, insufficient supply is expected to fill the gas storages to a filling level of 90% when the storages are relatively empty after a cold winter.
  - On short term only demand reduction during the summer is possible as a possible measure.
  - On mid(long) term, additional supply should be considered, for example LNG-terminals.

Basic assumptions regarding security of supply post-Groningen

GTS, Sybren de Jong

Security of supply, how it was organised

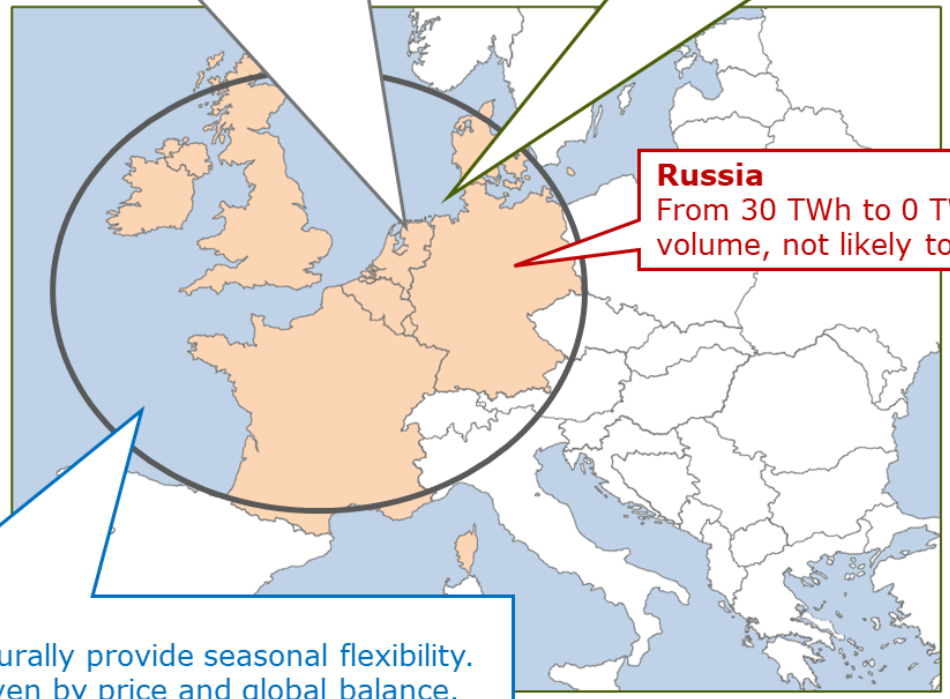
- Based on market responsibility and TTF, as a liquid trading market
- Facilitated by the gas roundabout, as source for diverse supply
- Ample availability of gas storage facilities
- A peak supply task GTS for protected customers, in case of low temperatures
- And finally, the Groningen field

Things have changed since then

Recent developments: less volume and less flexibility
Gas storage became increasingly important for security of supply

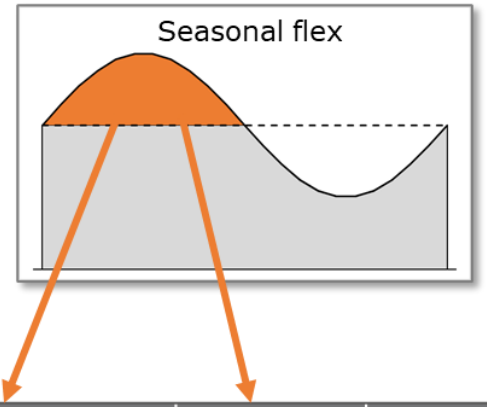
European Production
From 65 TWh to 10 TWh flex volume, mainly to diminishing Groningen production.

Norway
From 50 TWh to 25 TWh flex volume. Further decrease is expected.



Russia
From 30 TWh to 0 TWh flex volume, not likely to return

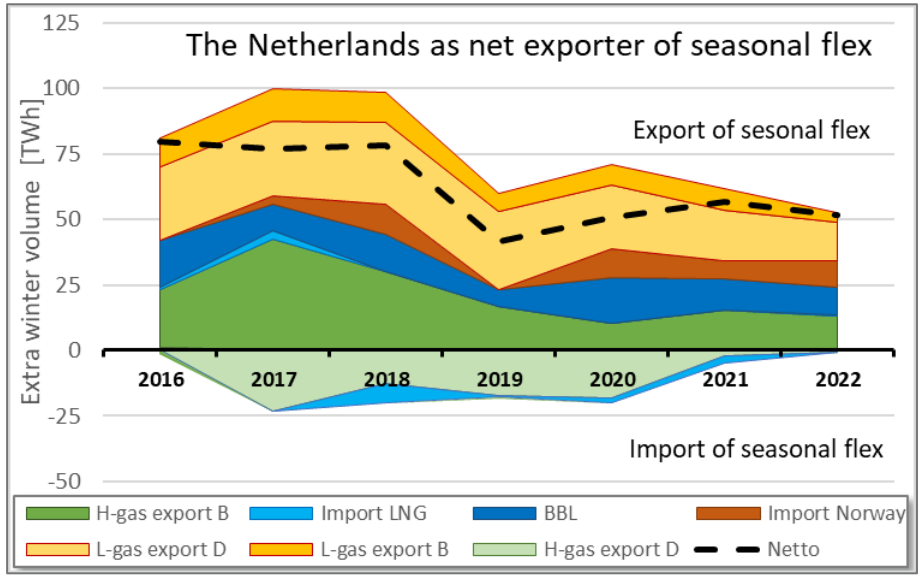
LNG
Does not naturally provide seasonal flexibility. Supply is driven by price and global balance.

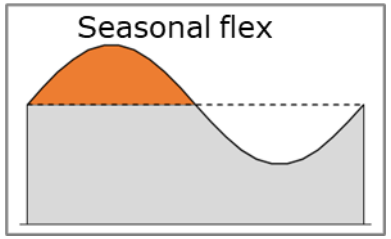


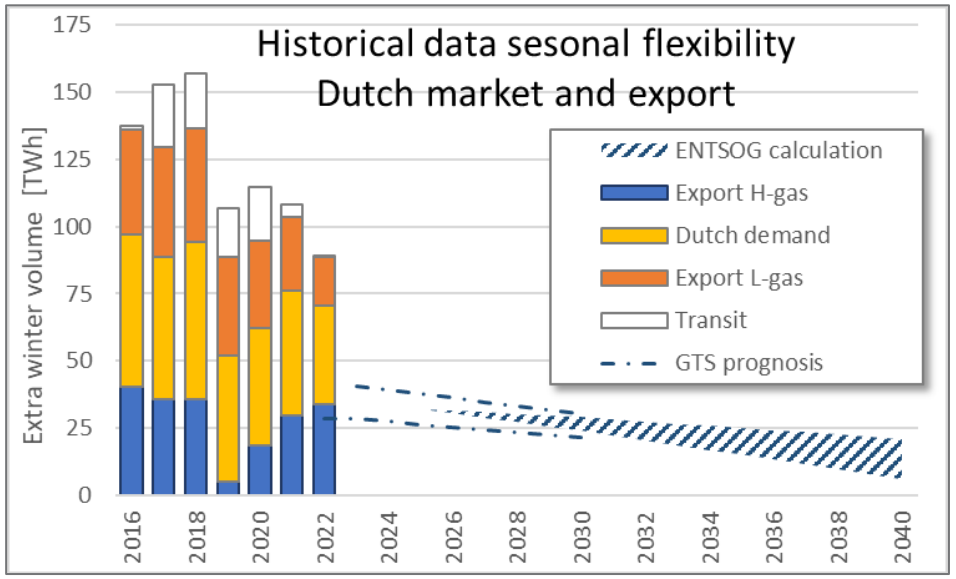
	Gas year 2017/2018	Currently	Reduction
Noway	50 TWh	25	-25 TWh
Russia	30 TWh	0	-30 TWh
EU production	65 TWh	10	-55 TWh
LNG	0 TWh	0	0 TWh
		Total:	**-110 TWh**

Important to realise, the Netherlands is a net importer of gas but a net *exporter* of seasonal flexibility

- The market for seasonal flexibility is an international market
- The Netherlands is a net exporter of flexibility
- Recent years show a net export of flexible winter volume of about 30 TWh via the H-gas system







European gas supply standard, article 6.1

- Security of gas supply: end users are supplied at the right time, in the right quality and in the required quantity, even when demand is high
- In a European context, with the Netherlands as a net importer of gas, but a net exporter of flexibility
- Article 6 of the European SoS-Regulation (2017/1938) describes measures with respect to a gas supply standard to safeguard security of supply

Article 6

Gas supply standard

1. The competent authority shall require the natural gas undertakings that it identifies, to take measures to ensure the gas supply to the protected customers of the Member State in each of the following cases:

(a) extreme temperatures during a 7-day peak period occurring with a statistical probability of once in 20 years;

(b) any period of 30 days of exceptionally high gas demand, occurring with a statistical probability of once in 20 years;

(c) for a period of 30 days in the case of disruption of the single largest gas infrastructure under average winter conditions.

Measure 1: Filling targets and filling trajectory for gas storages to secure winter volume

- Filling targets according to annex in Commission implementing regulation (EU) 2023/2633
- For the Netherlands (for 2024):
  - 1st of February 43%
  - 1st of May 30%
  - 1st of July 50%
  - 1st of September 68%
  - 1st of November 90%
- Filling targets are in place through 2025
- Provisional advise to maintain the filling obligation after 2025

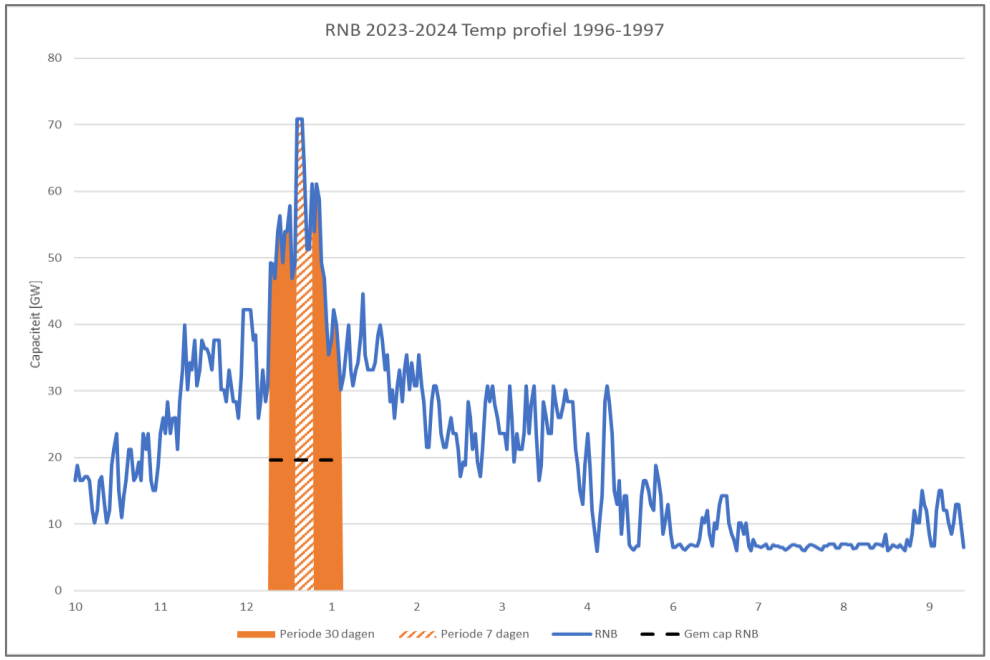
ANNEX

Filling trajectory with intermediate targets and filling target for 2024 for Member States with underground gas storage facilities[1]

Member State	1 February intermediate target	1 May intermediate target	1 July intermediate target	1 September intermediate target	1 November filling target
AT	50%	40%	58%	72%	90%
BE	30%	5%	40%	78%	90%
BG	52%	33%	55%	77%	90%
CZ	40%	25%	30%	60%	90%
DE	45%	10%	30%	65%	90%
DK	45%	40%	60%	80%	90%
ES	59%	60%	66%	80%	90%
FR	41%	11%	39%	81%	90%
HR	46%	29%	51%	83%	90%
HU	51%	37%	65%	86%	90%
IT	45%	36%	54%	72%	90%
LV	45%	41%	63%	90%	90%
NL	43%	30%	50%	68%	90%
PL	50%	35%	60%	80%	90%
PT	70%	70%	80%	80%	90%
RO	40%	41%	65%	85%	90%
SE	59%	30%	61%	79%	90%
SK	45%	20%	27%	67%	90%

Measure 2: Stored volume for high gas demand (1 in 20) to ensure gas supply for protected customers

- To meet obligation 6.1 a & b
  - 6.1 a: extreme temperatures during a 7-day peak period
  - 6.1 b: any period of 30 days of exceptional high gas demand
- Volume 30 days is likely to cover volume 7 days
- Stored volume is volume above base load supply
- Volume should be in storage as of 1st of November
- Volume must remain in storage until the 1st of February, unless a situation 6.1 a or b occurs



Details to be determined

Measure 3: Stored volume to compensate for the disruption of the single largest gas infrastructure to ensure gas supply for protected customers

- To meet obligation 6.1 c
- For a period of 30 days in case of disruption of single largest gas infrastructure under average winter conditions
- E.g. disruption of supply from the Gate LNG terminal
- Volume must remain in storage until an emergency occurs

- Question remains whether we want to be prepared for larger or longer-term outages?

Details to be determined

Schematic representation of the various elements

- Filling trajectory of gas storages based on EU regulation (2023/2633)
  Provisional advise to maintain the filling obligation after 2025

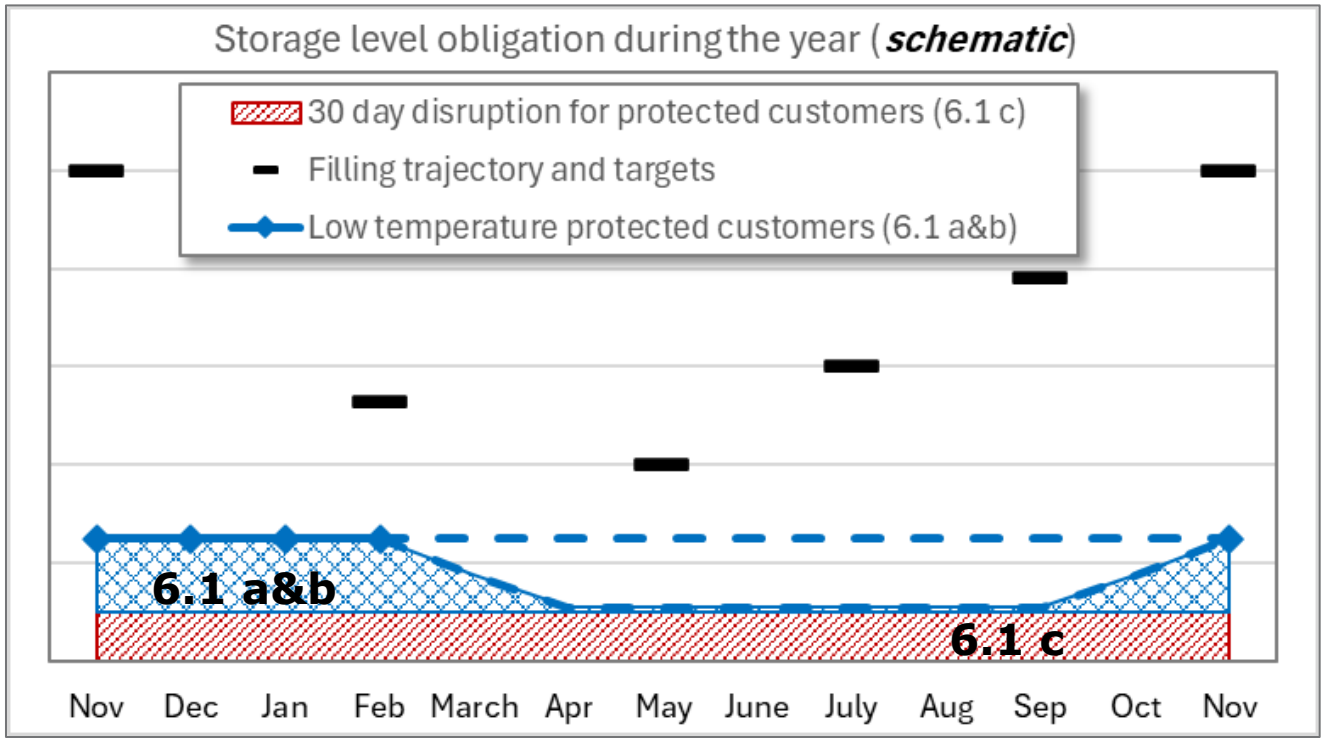
As part of this

- Reserved volume, to cover 6.1 a&b available until February 1

In addition

- Reserved volume to cover 6.1 c

Market remains responsible for filling, but filling level is monitored



Instructions to the market in case of shortage of capacity of quality conversion

Market session

6 February 2024

Henk Wolting, Asset Management, Planning Gastransport

Content

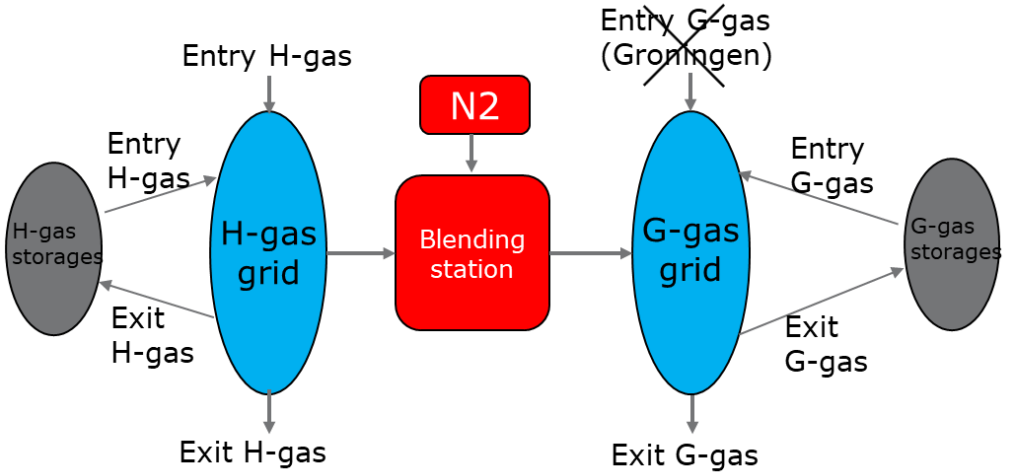
- Why now on the agenda?
- What is quality conversion?
- Situations of shortage of conversion capacity
- Applicable regulation: Transport code Gas LNB
- What kind of instruction is effective
- Chosen option: G-gas solution
- How does it work
- View on the future

Why now on the agenda

- Currently, in case of shortage of quality conversion capacity instructions are mostly given to GasTerra
- Groningen field is (de facto) closed
- GasTerra ceases to exist by the end of 2026

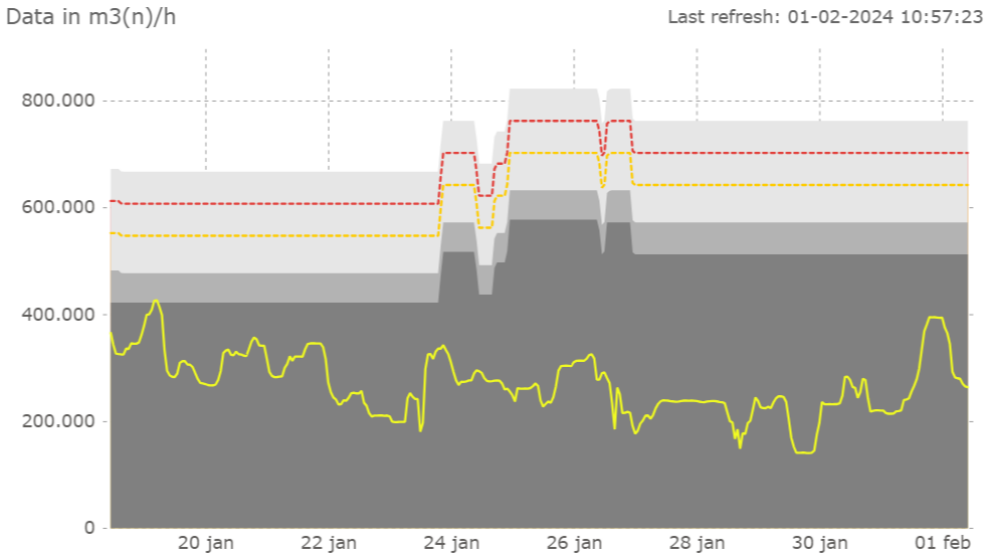
What is quality conversion

- Quality conversion is the conversion of gas with a higher calorific value (H-gas) to gas with a lower calorific value (G-gas). This is done by adding nitrogen (N_2).
- 8 m^3 H-gas + 1 m^3 N_2 = 9 m^3 G-gas
- GTS has 4 places in the network where conversion takes place. Total capacity 887,000 m^3 /h or circa 80 GWh/h G-gas.



Situations of shortage of conversion capacity

- For an up-to-date overview of the use of N_2, please see the GTS website
- When do we see a shortage of capacity of quality conversion
  - Conversion (use of N_2) is very high (above the red line)
  - So: we want to decrease the amount of conversion, but that causes a shortage in G-gas and a surplus of H-gas
- Possible causes of shortage
  - Less capacity available than expected/needed (maintenance, failures)
  - Wish of the market to use more than available; no action of the market when the warning line (orange) is passed through
- How often occurs a shortage until now?
  - Average: 3 times per year (2018 – 2023), especially in April (start of injection season)

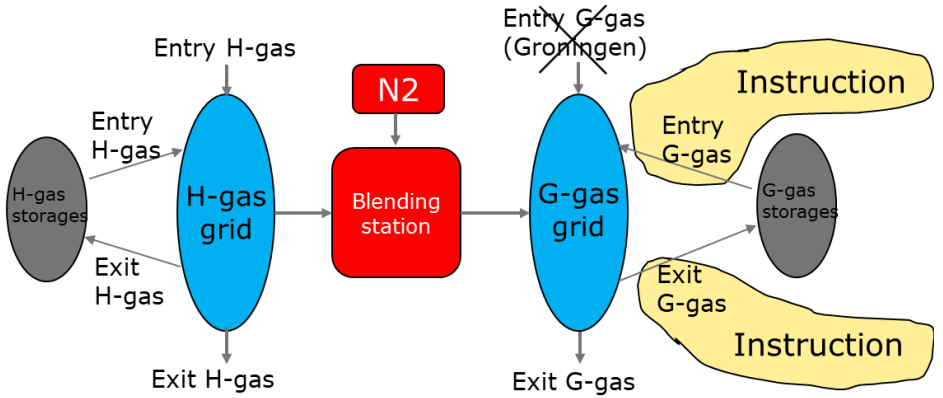


Applicable regulation: Transport code Gas LNB

- Article 4.4.6 Transport code Gas LNB
  - When more capacity of quality conversion than available is needed in order to fulfil the nominations …
  - … GTS has the right to give instructions to shippers to change their nominations in order to maintain the integrity of the grid.
  - Shippers are legally obliged to follow up the received instruction.
  - As far as possible GTS will divide the instructions pro rata over the causers of the problem.

What kind of instruction is effective

- Exit of G-gas demands mostly quality conversion and is therefore often causer
- Instructions to shippers with physical resources that can solve the problem
- Instructions must lead to:
  - More G-gas in the grid:
    - increase entry of G-gas and/or decrease exit
  - Less H-gas in the grid:
    - decrease entry of H-gas and/or increase exit
- Chosen option: instructions to shippers on G-gas storages



Solution: Instructions at G-gas storages

- Primarily: reduce injection on G-gas storages
  - Instruction to shippers who are injecting; pro rata based on nominations
  - In addition, in order to prevent ineffectiveness of given instructions: all other shippers active at G-gas storages shall be instructed that increase of injection or decrease of production is not allowed during the period of the given (initial) instruction.
- In addition, if needed: increase withdrawal on G-gas storages
  - Shippers active at G-gas storages are supposed to be able to withdraw G-gas. Instruction to these shippers; pro rata based on not used capacity per shipper (historical view).
  - In addition, in order to prevent ineffectiveness of given instructions: all other shippers active at G-gas storages shall be instructed that increase of injection or decrease of production is not allowed during the period of the given (initial) instruction.

How does it work?

- Instruction from GTS Dispatching to shippers on G-gas storages: decrease G-gas demand (or if needed) increase G-gas supply. Nominate amount (kWh/h), timeframe, network point
- Instructions are given by telecom, confirmed by email
- Shippers who receive an instruction act accordingly (obligation!)

  ⇨ More G-gas in the G-gas grid
- Shippers will react by entering less H-gas in order to maintain their balancing position (POS). So: decreasing the amount of H-gas is left to the market and not done by instructions

  ⇨ Less H-gas in the H-gas grid

View on the future

- Expectation aspects:
  - Groningen field not available: market needs probably more quality conversion
  - New N_2 plant in Zuidbroek: more capacity available (+180,000 m3/h N_2; increase from 707,000 to 887,000 m3/h)
  - Decrease of L-gas export: Decrease demand of quality conversion
  - Shippers on G-gas storages can avoid instructions by acting before instructions are given, e.g. at the moment of crossing the warning line (Remit message is sent out)
- Conclusion:
  - Bottom line: overall lower demand of conversion capacity and higher available capacity
  - Only a (very) small chance of actual shortage of capacity of quality conversion, so (very) small chance of instructions to the market

Questions?