gasunie
transport services

His Excellency the Minister for
Climate and Energy Policy
Mr R.A.A. Jetten MA and
His Excellency the State Secretary for the
Extractive Industries
Dr J.A. Vijlbrief
PO Box 20401
2500 EK THE HAGUE

Gasunie Transport Services B.V.
PO BOX 181
9700 AD Groningen
Concourslaan 17
T +31 50 521 22 55
E info@gastransport.nl
Commercial register Groningen 02084889
www.gasunietransportservices.com

Date
26 May 2023

Direct line

Our reference
L 23.0289

Your reference

Subject
Analysis of current gas market situation and security of supply for the next gas year

Excellencies,

Last July, GTS published the study "A year without Russian gas"("Een jaar zonder Russisch gas"). We would like to inform you that this study has been updated and is now entitled "Security of supply in the Netherlands without Russian gas" ("Leveringszekerheid in Nederland zonder Russisch gas"). Where in our previous study the total loss of Russian gas supplies was only still a scenario, this is now the reality. And given the current geopolitical situation, we expect this to remain the reality for the coming years.

The government has also announced its intention to close the Groningen field this year or next year at the latest. The anticipated draft decree will possibly contain the provisional decision in favour of complete closure. This letter is therefore to provide you with some considerations on the risks we see relating to security of supply and the measures that are possible to mitigate these risks. This includes discussing whether the Groningen field might still have a role in guarding against these risks.

The situation on the gas market

Until recently, Russia supplied approximately one-third of Northwest Europe's H-gas supply. The loss of a source of this magnitude caused physical scarcity and major turmoil on the gas market. This led to unprecedentedly high gas prices in the middle of last year with significant economic and social consequences. Trade and industry were affected by demand destruction due to production stoppages, high energy prices led to social and financial problems for households and families. High gas prices therefore caused a sharp fall in gas demand.

Some of the lost supply has been replaced by additional Liquified Natural Gas (LNG) via existing terminals in Belgium, the Netherlands, and Great Britain. New initiatives have also emerged on the supply side, such as the EemsEnergy Terminal in the Netherlands and LNG terminals in Willemshaven, Brünsbuttel and Lubmin in Germany. So far, these developments have not been sufficient to replace the entire Russian supply.

Whereas in the past the availability of nitrogen was a determining factor for how quickly use of the Groningen field could be stopped, the availability of gas in general is now crucial.

A mild winter and price-driven reduction in demand have provided for relatively well-filled gas storage facilities

Last winter saw relatively mild temperatures and low gas demand due to high prices and sustainable practices. This has meant that there has been relatively little use of Dutch seasonal storage facilities needed to guarantee security of supply over the past winter. As a result, Dutch seasonal storage facilities were still approximately 60% full after the winter. This is much more than the previous gas year, when only around 20% of the total working volume of the seasonal storage facilities was still available. Starting from this position, it seems possible that additional measures would not be required to meet the Dutch filling target of 90% of total working volume of the seasonal storage facilities[1] in order to guarantee security of supply for the next gas year. This is in line with our previous analyses and the conclusions from the study "A year without Russian gas".

Statutory task to provide advice on security of supply

Pursuant to the Dutch Gas Act, GTS advises the minister on the quantity of gas required, and the corresponding capacity from the Groningen field, necessary to ensure security of supply. In accordance with its statutory obligation, GTS performs this task in a manner such that it makes every effort towards ensuring gas production from the Groningen field is minimised and comes to an end completely as soon as possible[2].
For this purpose, security of supply is defined as a situation where "end consumers are supplied with gas at the right time and at the right quality (low- or high-calorific) and with the required quantity, even when demand is high" [3]. All end consumers, both businesses and households, may assume that security of supply is guaranteed under normal circumstances. Rules are in place to secure gas supplies for certain groups but this only applies in the event of an emergency[4]. This means that the starting point for our analyses is to supply all demand.

A cold winter in gas year 2023/2024 – volume analysis

Despite the relatively mild winters of recent years, GTS's analyses must also include calculations for cold winter scenarios. In January our analysis showed[5] that, if we have a cold year with relatively significant use of the gas storage facilities in the winter of gas year 2023/2024, additional measures may be necessary during the summer of 2024 to get the gas storage facilities sufficiently filled again to guarantee security of supply for the next gas year (2024/2025). The gas storage facilities can become depleted due to, for example, an extended period of cold weather, traders and producers injecting less gas or because gas storage facilities are being used for commercial reasons. The analysis in January was based on the substantially changed situation in supply and demand as a result of Russian gas no longer being available.

[1] According to commitment made during budget discussions held by Ministry of Economic Affairs and Climate Policy on 22 and 23 November 2022
[2] See article 10a paragraph 1 and under q in conjunction with article 10a paragraph 14 Dutch Gas Act
[3] Explanatory Memorandum to the bill to amend the Gas Act and the Mining Act to minimise gas extraction from the Groningen field, paragraph 2.1
[4] Reference to article 11 of the EU Security of Gas Supply Regulation 2017/1938
[5] https://www.rijksoverheid.nl/onderwerpen/gas/documenten/publicaties/2023/02/03/toelichting-bij-update-gasleveringszekerheid, Recommendations regarding required Groningen capacities and volumes for security of supply for gas year 2023/24, dated 31 January 2023, our reference L 23.0046

The underlying planning assumptions are continuously monitored and adjustments are incorporated into updates to the security of supply analysis, such as this one. We do assume here that all gas storage facilities in the Netherlands and Germany are available to store relatively high pipeline and LNG supplies in summer. This allows the storage facilities to provide for high demand from households during winter. We expect nitrogen plant Zuidbroek II to be available from the beginning of the next gas year and that availability of nitrogen is not a bottleneck for security of supply.

We assume low market demand again for gas year 2023/2024, comparable to actuals for the current gas year. Although gas prices have fallen significantly over recent months, they are still at a much higher level than the long-term average of the last decade. Nor are any new supplies emerging that will make a substantial contribution for the coming gas year. Dutch LNG terminals on the Maasvlakte and in Eemshaven are operating at full capacity and the supply from Belgium, the United Kingdom and Norway is already relatively high. With regards to the supply from the small fields or from the North Sea, no increase is expected from either of those sources. There will continue to be some scarcity as a result.

This means that additional gas supplies in the Netherlands can only be created in two ways: fewer gas exports or more gas imports via existing routes. On the import side, we see that more gas came from Belgium last winter. This has resulted in an adjustment for imports from Belgium for gas year 2023/2024. On the other side, we are also seeing that actual H-gas exports to Germany are higher than anticipated, despite Germany's plans regarding LNG and the first working terminals there. These developments may result in lower offtake of high-calorific gas from the Netherlands from gas year 2024/2025 on. LNG intake via the operational floating German LNG terminals is currently limited (around 80 TWh annually at the moment) and additional gas is required from the Netherlands for Germany and for transit flows to other countries. To this end, trading parties have committed themselves for several years to import gas via Dutch LNG terminals so that they can serve customers in Germany, the Czech Republic or Austria in addition to Dutch customers. We have updated the analysis to reflect this. Other assumptions are virtually the same as the assumptions of the study forming the basis for our recommendation of 31 January 2023[6].

Our analysis confirms the conclusions of our previous recommendation. If the winter of gas year 2023/2024 has an average temperature profile, the seasonal gas storage facilities can be filled to 75% without using the Groningen field and without additional measures. If the current five clusters remain available and produce the minimum flow according to current regulations, a fill rate of up to 90% is possible without additional measures.
But after a cold winter – and the probability of a cold winter is of course lower than the probability of an average winter – the gas storage facilities will be almost empty by April 2024. It will then not be possible to refill the gas storage facilities sufficiently in the summer of 2024 to the proposed level of 90% that the Netherlands – at least in the current gas year – is aiming for to guarantee security of supply for the following, possibly cold, winter, without additional measures.

[6] Recommendations regarding required Groningen capacities and volumes for security of supply for gas year 2023/24, dated 31 January 2023, our reference L 23.0046

This is broadly in line with the conclusions drawn by ENTSOG in its *Summer Outlook* for Europe[7].

After a cold winter, the storage facilities will be able to be filled to about half their collective working volume during the filling season months (April – September). The Netherlands will then start gas year 2024/2025 with half-filled gas storage facilities. Our expectation is that this could meet the requirements for an average winter in that gas year. Any winter that is colder than average could lead to security of supply problems.

Possible measures

The risk that must be mitigated by measures is a structural volume shortage during the summer of 2024. This is not an "acute" problem, but a risk that slowly materialises during the winter months and that can be anticipated. This means there is more scope for political decision-making on possible solutions.

To prevent this situation, you can look at demand-side and supply-side measures. Based on projected summer demand and whether it is possible to bring gas to the Netherlands, there is the potential to store approximately 50 TWh in the summer. Reducing demand by up to 60 TWh (approximately) would also be required to bring the fill rate of the storage facilities to 90% if the storage facilities are empty in spring after a cold winter (fill rate of 20% and below). Demand can be reduced by, for example, shutting down industries for a longer period or agreeing with neighbouring countries to reduce exports. The required volume for security of supply, approximately 60 TWh, corresponds to around 75% of the annual volume used by Dutch industries (parties directly connected to our network) or around 20% of exports abroad.

Additional supply could come from the Groningen field, the five currently operational production sites having (more than) sufficient capacity to fill the gas storage facilities up to 90%. The clusters do not need to be directly available to cover the volume shortfall, they can have a longer start-up time (and therefore produce less or no minimum flow).

A cold day in gas year 2023/2024 – capacity analysis

As well as analysing gas storage facility trends (volume analysis) our study on security of supply also contains a capacity analysis. In the capacity analysis we look at the physical balance between demand and supply on days and at times of peak demand or sudden gas supply failures.

To determine the capacity required for security of supply, we look at gas demand on a cold day. European legislation[8] prescribes that this relates to a temperature that occurs with a statistical probability of once every twenty years; for the Netherlands an effective daily average temperature[9] of -15.5°C.

[7] ENTSOG Summer Supply Outlook 2023 with Winter 2023/24 overview, dated 5 April 2023, document number SO0045-23

[8] In accordance with Regulation (EU) 2017/1938, article 5

[9] The effective temperature (T_{eff}) is equal to the temperature minus the daily average wind speed (V) expressed in metres per second divided by 1.5 ($T_{eff} = T - (V/1.5)$)

That does not mean that the thermometer then reads -15.5°C: an average daily temperature of -8.5°C combined with wind force 5 also results in an effective daily average temperature of -15.5°C. European legislation also requires failure of the largest source to be taken into account.

This so-called N-1 formula ensures a system that is sufficiently robust to cope with plant failures – which happen more frequently in extreme temperatures. Applying this type of formula means coping not only with the failure of the largest source (the Norg facility in the Netherlands); other sources (or a combination of sources) can also be affected by breakdowns. Gas storage facilities Bergermeer and Grijpskerk have approximately 80% of the capacity of Norg; Gate Terminal around 65%. The breakdown of one of these plants or of several smaller sources could cause almost as many problems for gas transport as the failure of Norg. At lower temperatures, we see that failures are more frequent but also last longer, due to freezing conditions and other problems that occur in extreme temperatures and poor accessibility to be able to resolve problems.

In January we showed that several scenarios are conceivable in which the full Groningen field production capacity available last winter (43 GWh/h) would be needed to supply all end consumers with gas. For example, this is the case if the largest source (in our analysis this is gas storage facility Norg) suddenly broke down on a cold day in the winter of gas year 2023/2024[10].

To complement the previous analysis – at -15.5°C and loss of capacity equal to the largest source – we looked at the temperature from which use of the first Groningen field production site is required to guarantee security of supply. In doing so we are again assuming failure of the largest source. Our analysis shows, that for gas year 2023/2024, additional measures such as rapid reduction in demand or production from the Groningen field are required from approximately -6.5°C to guarantee security of supply. These are effective daily average temperatures that occur regularly in our winters: statistics show that every winter it is -6.5°C or colder for four days but in the last decade there were only two winters where it was actually -6.5°C or colder for several days[11]. This -6.5°C also relates to the effective temperature; temperatures just below freezing and wind force 5 also result in an effective temperature of -6.5°C.

On such a cold day, we expect all available sources, such as imports from LNG terminals and border points, production from small fields and gas storage facilities, to be used to meet gas demand. However GTS still foresees that if the largest source fails, gas demand on that day will be greater than supply[12]. If demand is not brought down, the system will not be in balance: more gas will be taken from the grid than is fed in. GTS will try to resolve the imbalance by feeding additional gas into the network.

[10] Recommendations regarding required Groningen capacities and volumes for security of supply for gas year 2023/24, dated 31 January 2023, our reference L 23.0046

[11] According to KNMI, the last cold snap was in 2012. A cold snap is a continuous period of at least five ice days (the maximum temperature remains below 0°C). During this period, the minimum temperature must be below -10°C (severe frost) on at least three days. The lowest temperature then was -18.9°C. https://weerstatistieken.nl/de-bilt/koudegolven

[12] We have clarified what is meant by an effective daily average temperature of -15,5°C in our recommendation of January (Recommendations regarding required Groningen capacities and volumes for security of supply for gas year 2023/24, dated 31 January 2023, our reference L 23.0046)

This can be done by buying gas on the exchange or designating parties who are to bring in additional gas. Expectations (and also assumptions on which our analyses are based) are, however, that all parties are already feeding in maximum gas, so these measures will have little impact.

Possible measures

On a cold day, with the failure of a resource equivalent to the largest source, our network can quickly become depleted, in a matter of hours. In this scenario, GTS will ask the Ministry of Economic Affairs and Climate Policy to declare an emergency, which will enable the Gas Protection and Recovery Plan[13] to be implemented. This emergency plan consists of several measures:

- One of the measures in the Protection and Recovery Plan is to reduce demand by encouraging industries to 'switch off'. If this can be achieved within a few hours, it may be enough to restore the current imbalance if the difference between supply and demand is small.
  However, the current plan does not provide for the impact of a sudden industrial shutdown, because the assumption was that the Groningen field could be used for this purpose (the so-called back-up volume). This will allow time to prepare parties for the emergency situation and subsequent shutdowns.
- Unlike industry, the proportion of households consuming energy during peak demand is very high, so a measure that reduces the consumption of this category could make a major contribution. Reduction of gas consumption by protected customers is part of the Gas Protection and Recovery Plan (measure 10). However, it is uncertain whether appealing to households to save gas will trigger a large-scale, rapid reduction in demand. The Gas Protection and Recovery Plan also mentions that this measure could have "major disruptive consequences".
- As an alternative or complementary measure, countries receiving gas via the Netherlands could be asked, in advance, to agree to reduce gas flows. Given the complexity of such agreements and the concerns – these gas flows are also necessary in other countries for security of supply – we anticipate that implementation would take several months.
- If the difference between supply and demand cannot be restored with the abovementioned measures from the Protection and Recovery Plan, including shutting down industry, the transport network may become so out of balance that GTS is forced to switch off one or more subnetworks to keep the rest of the network operational. This emergency measure involves switching off an entire section of the network, including protected end consumers, such as households, hospitals, nursing homes and the like. Gas is different to electricity in that safety issues have to be considered when restoring supply. This makes the process is much more complex and time-consuming than it is for electricity.

[13] https://www.rijksoverheid.nl/documenten/publicaties/2019/10/04/bescherm-en-herstelplan-gas

We do not believe that the emergency plan measures, as they stand, are suitable for resolving acute security of supply problems quickly. If adjustments are made, it may be possible that these or supplementary measures can fulfil the role currently fulfilled by the Groningen field.

Closure of the Groningen field together with a daily average temperature of approximately -6.5°C – and failure of a major source – will, in our opinion, require you to implement emergency measures and, in the worst-case scenario, shutdowns. Should you choose to keep the five currently operational Groningen production sites open during gas year 2023/2024 – and you allow production from these in such a situation – then we expect that the emergency situation will occur at a lower temperature, i.e. approximately -10°C. You can provide for the -15.5°C (approx.) situation with eleven operational Groningen production sites.
The proviso is that the production sites that are, technically, closed can be quickly reactivated (within hours) when temperatures drop and might have to produce a minimum flow in winter. The minimum quantity depends on your desired production reliability and would have to be determined in cooperation with Nederlandse Aardolie Maatschappij (NAM) and GTS. As such, this analysis with updated assumptions gives no reason to revise the recommendation we made in January.

Conclusions

The situation on the gas market will remain precarious in the coming year. Our analyses therefore show that, unfortunately, in addition to reassuring viewpoints, several scenarios are also conceivable in which security of supply in terms of volume or capacity is not sufficiently certain in the coming gas year. For example, after a cold winter, it becomes problematic to get the gas storage facilities sufficiently filled again to guarantee security of supply for the following year (the volume problem) and in a short, cold period with failures equal to the largest source, the system is prone to physical imbalance (the capacity problem). In previous years, we always relied on the Groningen field in such situations, but as closing this field is now seen as desirable, other options now need to be explored and implemented.

The Gas Protection and Recovery Plan has been written for an acute emergency situation, where the Groningen field initially produces the back-up volume, as laid down in the decree, in order to give industries time to prepare for (long-term) shutdowns, for example. The emergency plan needs to be adapted to resolve situations where there are severe shortfalls and to fulfil the role that was still fulfilled by the Groningen field last winter.

Lower exports, higher imports or domestic demand reduction are, in our estimation, only plausible if supplementary agreements on these issues were made in advance.

If, instead of or in addition to agreements on demand reduction, you choose to mitigate security of supply risks by keeping production capacity available from the Groningen field, the specifications required for this "insurance role" should be investigated in more detail to achieve adequate coverage of risks with minimal production from the Groningen field.

It is not necessary to keep all production sites available with the same speed and reliability. This means that necessary minimum production can be reduced.

However, a number of production sites should be able to be available within a few hours to resolve acute problems in the event of breakdown of resources in cold conditions: the more sites that are available quickly, the smaller the security of supply risk faced by the Netherlands. With 43 GWh/h production capacity available (eleven production sites as available last winter), the risks are mitigated to -15.5°C (approx.) in accordance with the regulations.
With 20 GWh/h production capacity available (five production sites), we anticipate a problem when effective temperatures reach -10°C (approx.). If all production sites are completely closed and therefore no production capacity can be utilised, these problems could occur from a temperature of -6°C (approx.).

As explained above, keeping Groningen field production capacity available does not mean that we also require a minimum flow in accordance with the calculation rules previously set out by your ministry. It does mean that a number of clusters should remain available to be able to produce gas within a few hours in acute situations.

Measures already introduced in the areas of sustainable practices, energy savings, gas demand reduction and development of new supplies such as LNG[14], make it likely that such "insurance" or additional agreements on demand reduction will eventually no longer be required. The quicker these measures take effect, the sooner the Netherlands will be able to safeguard security of supply even without the Groningen field.

It is also crucial for gas storage facilities to be maintained to meet higher demand in winter and provide space to store gas imported in summer. New supplies are also being developed and made more sustainable in our neighbouring countries. If these foreign developments lead to a reduction in exports from the Netherlands to surrounding countries or to more imports being available for the Netherlands, these are obviously also developments relevant to our country and the desired closure of the Groningen field.

We will continue to make every effort to fulfil the requirement to extract no more natural gas from the Groningen field than necessary to guarantee security of supply and to stop extraction completely as soon as possible.

We will continue to monitor developments on the energy markets closely and provide you with information of any relevant developments.

Yours faithfully,

Bart Jan Hoevers
CEO

[14] https://www.gasunietransportservices.nl/gasmarkt/investeringsplan/investeringsplan-2022