Date: 31 January 2020
Our reference: Your reference
Subject: Advice on security of supply for Groningen gas volumes and capacities required

Your Excellency,

Please find below our advice on the security of supply. The phasing out of production in the Groningen gas field is well under way. We will indicate what volumes and capacities will be required from the Groningen gas field in the 10 years ahead to safeguard the security of supply. We will also address the preconditions for the definitive closure of the Groningen gas field. Finally, we will provide an update on the current gas year. To achieve the volumes and capacities presented in this letter, it is crucial that supply and demand of gas develop in accordance with the guiding principles that we applied. Among the main principles is that a sufficient amount of high-calorific gas (H-gas) must always be available to feed our quality conversion plants. In other words, if there is not enough H-gas, a higher volume will be required from the Groningen gas field.

1) Groningen gas volume at an average temperature: required volume of 9.3 bcm\(^1\) for the next gas year and nil as from the 2022-2023 gas year in an average year

Figure 1 presents the required volume from the Groningen gas field for cold, average and warm years. This figure incorporates all the findings from our report of last October on the deployment of our resources\(^2\). Adjustments mostly concern both the domestic and the foreign market estimate of gas consumption. Both estimates have been adjusted upwards slightly to reflect the outcomes of the Climate and Energy Outlook 2019\(^3\) and the gas demand submitted to the Task force Monitoring L-Gas Market Conversion by foreign government authorities.

Despite this increased market demand of approximately 1.5 bcm relative to our previous advice\(^4\), the demand for low-calorific gas (L-gas) will decrease significantly in the years ahead. The main cause of

---

\(^{1}\) Billion cubic metres at 0 °C and atmospheric pressure.


\(^{3}\) Climate and Energy Outlook 2019, published by the Netherlands Environmental Assessment Agency (PBL) on 1 November 2019.

\(^{4}\) Final advice on measures to reduce Groningen gas production, dated 25 July 2019, our reference L 19.0026.
the reduced market demand is the phasing out of exports. Combined with the expansion of our Wieringermeer blending station, this lower market demand means that 9.3 bcm of Groningen gas will be required for the coming gas year, assuming an average annual temperature (11.8 bcm of the Groningen gas production is required for the current gas year).

Appendix 1 contains the corresponding degree days formula and the corresponding backup volume for the coming gas year (the estimated volume is 1.5 bcm).

Figure 1: Development in the required volume of Groningen gas in cold (blue), average (green) and warm (orange) years

As soon as the nitrogen plant in Zuidbroek is operational, the required volume from the Groningen gas field will be nil at an average annual temperature as from the 2022-2023 gas year. A limited volume (<0.5 bcm) will only be required in case of a cold year, to safeguard the security of supply up to and including the 2024-2025 gas year. In addition, we have conducted a sensitivity analysis on the basis of a number of cases (see Appendix 1 for a description of the cases and the corresponding results). This analysis shows that, in the years ahead, the largest impact on the required production of Groningen gas will come from the cases in which part of our nitrogen backup is deployed, the quality of the gas supplied and the timely completion of the Zuidbroek nitrogen plant. In subsequent years, the largest impact comes from the case involving the conversion of imports/exports abroad.

2) Groningen gas capacity: on standby for cold years and failures at nitrogen plants or storage systems from 2022-2023, realistic bandwidth for the closure of the Groningen gas field between mid-2025 and mid-2028

A minimum capacity of 4.6 million m³/hour from the Groningen gas field will need to be available during the coming gas year to ensure the availability of sufficient resources to safeguard the security of supply in case of a high market demand (once every 20 years) combined with failures at the largest source, UGS Norg.
Apart from the fact that this requirement is included in the European Regulation\textsuperscript{5}, it is crucial for the security of supply to take possible failures into account, since virtually all of the L-gas market will depend on the availability of quality conversion plants from 2022 onwards. A disruption in the supply of foreign gas may occur as well, such as from Norway or Russia. Such situations are conceivable and have occurred a number of times within recent memory.

The Groningen gas field only has to supply capacity in case of cold spells or failures from the 2022-2023 gas year onwards. Approximately 2.1 million m\textsuperscript{3}/hour of capacity needs to be on standby for this purpose, compared with the 5.7 million m\textsuperscript{3}/hour that needs to be operational during the current gas year. In other words, the required capacity will decrease within a couple of years to approximately a third of the capacity currently required.

\begin{figure}[h]
\centering
\includegraphics[width=\textwidth]{figure2.png}
\caption{Development in the required capacity of Groningen gas}
\end{figure}

Figure 2 depicts the moment of transition between these two modi operandi (production and standby) of the Groningen gas field as a vertical grey line. The commissioning of the new Zuidbroek nitrogen plant and the conversion abroad will rapidly reduce the required standby capacity until mid-2026, when the gas field can be closed in accordance with the base scenario. This standby capacity will only be drawn on in case of a cold spell combined with failures. The corresponding additional volume as a result of the minimum flow required to scale up the field quickly is currently estimated as negligible for the 2022-2023 gas year and beyond. This scenario will be investigated further in conjunction with the Nederlandse Aardolie Maatschappij (NAM) over the period ahead.

The results of the sensitivity analysis show that the definitive closure of the field can occur one year earlier if the German caverns can be retained for the L-gas market. When halving the realisation of the conversion/export abroad, the Groningen gas field will have to be kept in production and on standby for longer. We currently expect that a realistic bandwidth within which the Groningen gas field will no longer need to act as a backup is between mid-2025 and mid-2028. As a result of this bandwidth of the required volume as well as the required capacity, we will make new, accurate

\textsuperscript{5} Regulation (EU) 2017/1938 of the European Parliament and of the Council concerning measures to safeguard the security of gas supply.
annual estimates in the coming period, estimating the moment that the volume and capacity from the Groningen gas field will no longer be required.

3) **Sufficient supply of H-gas and retention of storage systems as conditions for placing the Groningen gas field on standby and closing it**

Closing the Groningen gas field will make virtually all of the Dutch and North-West European gas market dependent on the production of pseudo L-gas, and hence the additional supply of H-gas to the Netherlands. This additional supply of H-gas to the Netherlands should consist of liquefied natural gas (LNG), the supply of additional Russian gas and the retention of the Norwegian gas supply, as the domestic production of green gas is still limited. Based on an initial analysis by ENTSOG, it has been determined that the supply capacity from Germany to the Netherlands is insufficient for the additional supply of H-gas. We have notified our fellow transmission system operators in Germany of the importance and necessity to expand the required supply capacity, as a result of which they have included additional exports to the Netherlands in the scenario analysis of their Network Development Plan. We request your active support towards your German counterpart, because otherwise the closure of the Groningen gas field is not possible without endangering the security of supply in North-West Europe. It is also necessary that the gas storage facilities take over all the required flexibility between the stable supply across the gas year and the higher gas demand in winter, which is currently supplied by the Groningen gas field.

Figure 3 shows the deployment (in percentages relative to the maximum required capacity and volume) of all L-gas storage systems for the L-gas market. The results in this figure are based on the Groningen gas field being closed as soon as possible. In other words, the necessary storage capacity (seasonal storage systems and caverns, represented by the orange line) can only decrease when no more capacity from the Groningen gas field is required. The reason is that the reduction in market demand will first be subtracted from the required capacity of Groningen gas. Only then will the reduced market demand be subtracted from the storage capacity. From the 2022-2023 gas year, which is when the Groningen gas field will produce virtually no more volume, the working gas volume required in a cold year (represented by the blue line) will decrease.

The figure has not yet taken account of the role played by these storage systems on the H-gas market. We will present our full analysis of the storage market to all market parties and other stakeholders involved by April 2020 at the latest. This presentation will also include the analyses of the need for the additional supply of H-gas capacity to safeguard the security of supply. As a result, we recommend that you do not take any irreversible decisions on closing storage systems until that moment.

---

6 High-calorific gas mixed with nitrogen and Groningen gas enriched with high-calorific gas.

7 Failures/peak conditions in an average year.

8 ENTSOG (European Network of Transmission System Operators for Gas) analysis conducted on behalf of Gasunie Transport Services (GTS).
4) Current gas year: possible decrease of production volume to 10 bcm, assuming average temperature development in the remainder of the gas year; notification based on Section 10a(11) of the Dutch Gas Act (Gaswet)\(^9\)

GTS assumed a nitrogen deployment of 100\% when calculating the required volume of Groningen gas in the estimate for the 2019-2020 gas year. An average nitrogen deployment of 109\%\(^{10}\) was achieved during the first quarter of the current gas year (October–December 2019). This means that we deployed our backup resources in this period. As a result, approximately 0.6 bcm of the Groningen gas production was saved during this time. Since we sent you our most recent advice, permission has also been granted to expand the working gas volume at UGS Norg from 5 bcm to 6 bcm. This additional working gas volume will be realised by filling UGS Norg with an additional 0.5 bcm and by using 0.5 bcm of base gas.

The reason is that the storage system will be expanded by increasing both the upper and the lower pressure boundary. This measure will ensure that the expansion of the working gas volume will save an additional 0.5 bcm of the Groningen gas production. As an additional 1.1 bcm of the Groningen gas production will consequently be saved in total\(^{11}\), the maximum production for a gas year with average temperature development could be 10.7 bcm. The first quarter of the gas year has also been approximately 10\% warmer than average (915 degree days relative to an average of 1,024). If the gas year develops as an average year from 1 January onwards, the expected production of Groningen gas will be 11.1 bcm. This figure corresponds to savings of 0.7 bcm compared with an average year.

---

\(^9\) Pursuant to Section 10a(11) of the Gas Act: 'The transmission system operator of the national gas transmission network will notify Our Minister of a prolonged and substantial deviation from the deployment of the resources and methods or of the demand for low-calorific gas relative to the estimate.'

\(^{10}\) To be retrieved via 'download stikstofrapportage ['download nitrogen report'] on the following website: https://www.gasunietransportservices.nl/en/network-operations/transportinformation/nitrogen-report.'

\(^{11}\) Status as at 31 December 2019.
Gasunie Transport Services B.V.
Date: 31 January 2019
Our reference: L 20.0014
Subject: Advice on security of supply for Groningen gas volumes and capacities required

three developments combined mean that the expected production of Groningen gas will be 10 bcm over the current gas year.

We hope that the above has provided you with sufficient information regarding the possibilities to reduce the gas production further while safeguarding the security of supply. We will continue to support this process as best we can through the maximum deployment of our resources and the timely realisation of our projects.

Yours faithfully,

B.J. Hoewers
Managing Director