Risk assessment
- The Netherlands

by
Gas Transport Services
Contents

Summary ................................................................................................................... 3

1 Introduction ............................................................................................................ 5

2 Infrastructure standard ............................................................................................. 6
   2.1 Calculation of the N-1 formula ............................................................................ 6
   2.2 Parameters for the N-1 formula .......................................................................... 6

3 Supply standard ....................................................................................................... 9
   3.1 The Netherlands applies a 1-50 standard ............................................................. 9
   3.2 Relaxing standard gives slight savings but risk is 2.5 times as high ....................... 10

4 Assessment of the risks for security of gas supply ...................................................... 11
   4.1 Volumes: gas plays a crucial role in the Dutch energy supply ............................... 11
   4.2 Capacity: ready for the future, adaptations remain necessary .............................. 15
   4.3 Actual flows .................................................................................................... 17
   4.4 The potential for physical gas flows in both directions ........................................ 17
   4.5 The availability of production and storage .......................................................... 18

5 Scenarios .............................................................................................................. 20
   5.1 Further disruption (in addition to disruption of largest infrastructure) scenario .... 20
   5.2 Groningen field disruption scenario ................................................................. 20
   5.3 Decrease in domestic production scenario ....................................................... 21
   5.4 Gas exports honoured in full despite disruption of largest infrastructure scenario ... 21
   5.5 Potential effect of Bergermeer storage facility scenario ...................................... 21
   5.6 Nord Stream disruption scenario ....................................................................... 21
   5.7 Disruption of Byelorussian and Ukrainian infrastructure on a day of exceptionally high gas demand scenario ............................................................ 21
   5.8 Disruption of Norwegian infrastructure scenario ............................................. 22
   5.9 Interaction and correlation with risks existing in other member states ............... 23
Summary

Dutch society is heavily dependent on gas. At the moment, the Netherlands is not reliant (or hardly reliant) on other countries for its gas supplies. That’s why the Dutch situation regarding security of gas supply is fundamentally different to that of the other EU countries. This situation is confirmed by a review of the standards set out in the European Security of Gas Supply Regulation.

The Dutch infrastructure standard and supply standard both amply satisfy the stated EU standard. With a result of 162% for the infrastructure standard, the Netherlands goes far beyond the required 100%. In addition, Dutch statutory standards for security of supply easily satisfy the minimum supply standard as laid down by the Regulation, without hampering the operations of the internal gas market.

In the long term, domestic production of natural gas will decline. Well-timed investments in pipelines, storage facilities, LNG installations in the Netherlands and beyond will provide the market with sufficient transport capacity to compensate for this decline in domestic supply with additional imports and opportunities for supplying flexibility. An increase in the supply of green gas and the possible production of non-conventional gas will also make an important contribution towards the availability of this commodity.
1 Introduction


To this end, the Regulation introduces measures to ensure that all member states and players on the gas market take action in advance in order to prevent potential disruptions to the gas supply and, if a disruption should occur, to overcome the consequences of this as efficiently as possible.

The Ministry of Economic Affairs, Agriculture and Innovation (EL&I) has been appointed as the national competent authority. The law provides that the Minister can ask the national gas transmission system operator Gas Transport Services (GTS) to perform the specific tasks mentioned in the Regulation partly or completely, where the ultimate responsibility remains with the Minister. In concrete terms, this relates to the risk assessment, the preventive action plan and the emergency plan. This document will deal with the risk assessment alone.

This risk assessment, making use of the requirements of the infrastructure and supply standards, contains an evaluation of the risks for the security of gas supply. The risk assessment will, in compliance with the regulation, be updated every two years in principle.
Infrastructure standard

Article 6 of the Regulation sets minimum requirements in respect of the infrastructure. The infrastructure of every member state must be capable of coping with the disruption of its single largest gas infrastructure (the so-called N-1 indicator), even during a day of exceptionally high gas demand.

2.1 Calculation of the N-1 formula

The following formula should be applied in order to ascertain whether the Netherlands satisfies the standard:

\[
N - 1 [\%] = \frac{EP_m + P_m + S_m + ING_m - I_m}{D_{max}} \times 100, \quad N - 1 \geq 100 \%
\]

The calculation set out below proves that the Netherlands, at 162%, lies far above 100%. This result corresponds to earlier calculations carried out by the Commission.\(^1\) Details about values of parameters used are given in paragraph 2.2.

\[
N - 1 [\%] = \frac{165 + 635 + 37 - 64}{476} \times 100 = 162\%
\]

2.2 Parameters for the N-1 formula

The Regulation describes how the parameters of the formula should be calculated (see grey text in boxes). This paragraph describes which Dutch value goes with which parameter, together with a short description of how the value is determined. Because the Regulation does not clearly describe in which specific unit (calorific value) the values should be given, in this document the values are recorded in both millions (or billions) m\(^3\) (n; 35.17) per day (Groningen equivalent) and in units of energy, GWh/d.\(^2\) This latter value makes it easier to compare risk assessments of different countries.

January 2012 has been chosen as the reference date. The values of the parameters are equal to those data published in the ENTSOG Ten Year Network Development Plan 2011-2020 (TYNDP) for 2012. In addition to this the value for the technical capacity of the single largest gas infrastructure is given. This is not published separately in the TYNDP.

The parameters make no distinction between Groningen gas and high-calorific gas because this distinction is no longer of relevance due to the provisions for quality conversion.

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\(^2\) 1 GWh = 102,360 m\(^3\) (n;35.17). Values are rounded off.
Demand-side definition

\(D_{\text{max}}\) — the total daily gas demand (in millions \(m^3\) per day) of the calculated area during a day of exceptionally high gas demand occurring with a statistical probability of once in 20 years.

On the basis of the Decision in Relation to Security of Supply Pursuant to the Gas Act, in the Netherlands the operator of the national gas transport network is responsible for reserving volume and capacity to cover the extra gas demand from small consumers during extremely cold days (see also chapter 3). GTS recalculates annually the total expected daily gas demand in the Netherlands for the coming years, taking account of the above-mentioned peak circumstances. GTS plans its network on the basis of this peak scenario. The Netherlands has gas quality conversion and so one calculation is made for the whole gas market. Demand-side measures are not applied in the Netherlands and are therefore not included in the \(D_{\text{max}}\) calculation.

\[
D_{\text{max}} = 476 \text{ mcm (n; 35.17)/d} \\
(D_{\text{max}} = 4,648 \text{ GWh/d})
\]

Supply-side definitions

\(E_P \text{ m}\) — the technical capacity of entry points (in million \(m^3\) per day) other than production, LNG and storage facilities covered by \(P \text{ m}\), \(S \text{ m}\) and LNG \(m\): the sum of the technical capacity of all border entry points capable of supplying gas to the calculated area.

The Dutch transport network is directly connected to four European countries. Gas can be both exported and imported via connections with Belgium and this also applies to the connections with Germany.

Gas can only be exported via the connection with the United Kingdom and gas can only be imported via the connection with Norway.

The table below gives an overview of the maximal border capacity between the Netherlands and neighbouring countries. It also provides supplementary details to article 9(1)(e) of the Regulation.

<table>
<thead>
<tr>
<th>Country</th>
<th>Entry</th>
<th>Exit</th>
<th>Source</th>
</tr>
</thead>
<tbody>
<tr>
<td>Belgium</td>
<td>38 mcm (n; 35.17)/d</td>
<td>114 mcm (n; 35.17)/d</td>
<td></td>
</tr>
<tr>
<td></td>
<td>(373 GWh/d)</td>
<td>(1109 GWh/d)</td>
<td>GTS' statement as included in ENTSOG's Ten Year Network Development Plan 2011-2020</td>
</tr>
<tr>
<td>Germany</td>
<td>43 mcm (n; 35.17)/d</td>
<td>188 mcm (n; 35.17)/d</td>
<td></td>
</tr>
<tr>
<td></td>
<td>(417 GWh/d)</td>
<td>(1838 GWh/d)</td>
<td></td>
</tr>
<tr>
<td>Norway</td>
<td>84 mcm (n; 35.17)/d</td>
<td>0 mcm (n; 35.17)/d</td>
<td></td>
</tr>
<tr>
<td></td>
<td>(823 GWh/d)</td>
<td>(0 GWh/d)</td>
<td></td>
</tr>
<tr>
<td>United Kingdom</td>
<td>0 mcm (n; 35.17)/d</td>
<td>46 mcm (n; 35.17)/d</td>
<td></td>
</tr>
<tr>
<td></td>
<td>(0 GWh/d)</td>
<td>(449 GWh/d)</td>
<td></td>
</tr>
</tbody>
</table>
In the Netherlands gas is produced from the Groningen field and from a large number of small fields. The small fields are situated partly on the mainland and partly on the Dutch part of the North Sea. This gas is fed into the transport network via offshore collecting pipes at a number of points, of which the most important are situated in the north of Groningen and in North Holland. In order to supplement this production, gas storage facilities have been built over the last few years which are designed to complement the production at times of high market demand.

The total value is shown here in accordance with the data in the TYNDP.

\[
P_m \text{ and } S_m = 635 \text{ mcm (n; 35.17)/d} \\
(P_m \text{ and } S_m = 6,207 \text{ GWh/d})
\]

From September 2011, the Netherlands has the potential to supply gas to the market via an LNG terminal, the GATE terminal on the Maasvlakte in Rotterdam.

\[
LNG_m = 37 \text{ mcm (n; 35.17)/d} \\
(LNG_m = 365 \text{ GWh/d})
\]

Based on information available to GTS it is established that the Grijpskerk storage facility is the Netherlands’ single largest gas infrastructure with the largest capacity. A more detailed description of this is given in chapter 5.

\[
I_m = 64 \text{ mcm (n; 35.17)/d} \\
(I_m = 629 \text{ GWh/d})
\]
3 Supply standard

3.1 The Netherlands applies a 1-50 standard

Article 8 of the Regulation sets minimum requirements in respect of the supply standard. In the Netherlands, standards for the infrastructure and security of supply have been laid down via the 'Gas Act' and the 'Decision Security of Supply Gas Act' since 2004. The Dutch standard is stricter than the minimum standard laid down in Regulation 994/2010. Other member states also apply stricter standards.

On the basis of the Decision, the Dutch national transport operator is statutorily responsible for both the capacity and volumes that are necessary in order to be able to supply the small consumers market in the Netherlands where temperatures are between -9°C and -17°C (so-called peak supply). Suppliers of small consumers are also set standard requirements, amongst others through the "Decision license for delivering gas supply to small consumers".

The European standard of 1:20 years can be translated for the Netherlands into a temperature of -15.5°C (a national average effective daily temperature of -15.5°C prevails on the coldest day in a period of 7 or 30 days in the Netherlands). The existing Dutch standard for infrastructure and security of supply under peak circumstances is related to a situation occurring when there is an average daily temperature of -17°C, corresponding to a probability of once every 50 years.

Where extreme temperatures are concerned, the European supply standard is restricted to a 7-day peak period and to any period of 30 days of exceptionally high gas demand. In the Netherlands this is met by the Dutch standard which is based on a 1:50 winter and the associated daily temperature distribution. This determines the temperature and demand limits of the 7 and 30 days periods mentioned above. This is laid down in the "Decision Security of Supply Gas Act". This decision also contains general clauses in case a supplier does not meet its obligations. In such a case GTS has a coordinating task to make sure that the customers of the non-compliant supplier continue to receive. Non-compliance of a supplier does not imply shortage of gas, therefore can be solved by the marker. In this way these customers can choose a new supplier within a reasonable time without an interruption in their gas supply.

In the event of a disruption of the single largest gas infrastructure under average winter conditions, the European minimum supply standard mentions a period of thirty days. There is no mention of 'peak circumstances.' In the Netherlands, this type of situation is met by the

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3 the order in Council of 13 April 2004, laying down regulations regarding provisions in connection with security of supply (Decision Security of Supply the Gas Act)
4 Staatsblad nr. 234, volume 2003, Decision of 2 Junie2002, Decision license for delivering gas to small consumers
5 Regulation 994/2010 article 8(1)(a) and (b)
a) extreme temperatures during a 7- day peak period occurring with a statistical probability of once in 20 years;
b) any period of at least 30 days of exceptionally high gas demand, occurring with a statistical probability of once in 20 years;
standard requirements expected of suppliers to small consumers. These requirements focus on the obligation to supply gas and on the organisational, financial and technical qualities of the suppliers.7

3.2 Relaxing standard gives slight savings but risk is 2.5 times as high

The Dutch standard relates to a temperature observation dating from 1987. On 14 January 1987, the effective daily temperature in de Bilt was -17.7°C (de Bilt is the place where this temperature must be measured according to the Decision in Relation to Security of Supply Pursuant to the Gas Act). In addition to the fact that an effective daily temperature of -17°C is an actual assumption, the standard applied by the Netherlands has to be considered in connection with the crucial role played by gas in the Dutch energy supply (see chapter 4). In the Netherlands, 96% of the households are connected to gas.

A relaxing of the standard and the associated reduction in costs relate particularly to production and transport capacity (entry and exit capacity) and not to volume, because this is limited in quantity.

A relaxing of the 1:50 standard in the Netherlands will result in peak capacity demand falling by around 0.55 million m3/h (a peak demand of around 19 million m3/h applies for the Netherlands as a whole). Implementation of a relaxed standard (= applying the 1:20 standard) will result in the inability to supply a population greater than that of Amsterdam if a 1:50 occurrence takes place.

When a quantity of production and transport capacity amounting to 0.55 million m3/h does not need to be reserved by GTS, cost savings for small consumers come to around €4 per connection per year8. This is around 0.5% of a household’s annual gas bill. Relaxing the supply standard achieves an annual saving to the gas bill of around 0.5% but the risk of an extensive disruption to the gas supply is 2.5 times as high. The total volume of gas involved however is very limited, an order of magnitude of 10 million m3 on a yearly basis. This is approximately 0.01% of the annual volume of gas transported through the Dutch network and consequently, given this relatively low volume, presents no hindrance to the internal European market.

Also the reserved transport capacity that can be made available to the market if the standard should be lowered is very limited since the capacity applied for this purpose was created specifically for this purpose. The source (i.e. temporary production facility) is the LNG peak shaver belonging to GTS/Gasunie on the Maasvlakte. This plays a role both in the supply of gas and in the saving of transport capacity. The latter lies in the fact that the LNG peak shaver is situated close to the market which also means shorter transport distances, which is necessary when market demand is very high. Account was taken of the design of the pipeline network at the time. The LNG peak shaver can only be used to a very limited extent due to the limited capacity of the tanks. Sufficient to guarantee security of supply when temperatures are very low but insufficient to provide additional transport capacity when temperatures are higher. In other words: relaxing the standard and not making maximal use of the LNG peak shaver will not release any capacity for the market.

7 Article 43 and following of the Gas Act.
8 The amount of €4 is calculated as follows. For reserving the transmission capacity for a period of 3 months, this 0.55 million m3/hour corresponds to a reduction of €2.2 per household. This is based on 2010 transmission tariffs. Contracting capacity in storage facilities corresponds to a reduction of €1.3 per household. This amount is based on concrete tenders by parties for storage capacity during winter 2009/2010.
4 Assessment of the risks for security of gas supply

This chapter discusses, by paragraph, the relevant national and regional circumstances, as prescribed in article 9(1)(b) of the Regulation. The most recently available data from public sources have been used for input.

4.1 Volumes: gas plays a crucial role in the Dutch energy supply

Natural gas is the most important energy source in the Netherlands. Moreover, in the Netherlands, 96% of households are connected to the gas supply. In comparison, this percentage is 82% in the United Kingdom, 42% in Germany and 55% in Belgium. The figure shown below illustrates the high gas consumption per person for the population of the Netherlands.

*Based on data from Oxford University, BP Statistical Review, KEMA and the report entitled Energy in the Netherlands 2011

Energy in the Netherlands is a publication of de Energiezaak in collaboration with the branch organisations Energie-Nederland, the association of energy companies in the Netherlands and Netbeheer Nederland, the association of energy network operators in the Netherlands. Arnhem, August 2011

Source: Energy in the Netherlands 2011
Gas will continue to be an important energy source in the Netherlands, certainly until 2030. As shown in the figure below, Dutch gas demand will display steady growth until this date. The gas distribution companies (including the small consumer market) and large industries will continue to be the main gas customers. The Dutch gas demand (volumes) forecast below assumes a normal winter.

One important reason for the steady growth in gas demand is the role that gas plays in a sustainable energy supply. Natural gas is the cleanest fossil fuel and will, in the future, be supplemented increasingly by green gas volumes.

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Electricity is mainly generated in the Netherlands through gas-fired power plants, as shown in the figure below. The proportion of electricity generation through gas-fired power plants in the Netherlands is high compared to other European countries. In addition to this, almost a quarter of electric productive capacity set up in the Netherlands consists of gas-fired CHP installations.\textsuperscript{12} Because gas-fired power plants can, quite simply, produce more (or, on the other hand, less) electricity, they are also extremely suitable for providing reserve capacity for wind and solar energy.

\textsuperscript{12} Energy in the Netherlands, 2011
The Netherlands is the largest gas producer within the EU (paragraph 4.5 contains a forecast for natural gas production in the Netherlands). The Netherlands also imports and exports large volumes of gas. The Netherlands itself consumes around 40% of the total volume of gas that flows through the country annually.

*Source: Energy in the Netherlands 2011*
From the figures ‘Dutch Gas Demand’ and ‘Gas Production in the Netherlands’ (see chapter 4.5) follows a perspective through to 2030. Domestic consumption will increase steadily and domestic production will decline. More volumes will have to be imported. How much more volume also depends on the transit flows through the Netherlands. We can refer to the market information included in the report ‘The Security of Gas Supply’ with regard to future imports and exports of volumes of natural gas. This shows that the market still needs to contract additional volumes in order to be able to continue to meet Dutch gas demand in the long term. Perhaps market participants are relying on the ample supply of gas on the Dutch spot market, the TTF, whether or not via the exchange APX-ENDEX.

4.2 Capacity: ready for the future, adaptations remain necessary

The gas transport network (capacity) is continually adapted in order to ensure that the network is organised in such a way that transport requirements can be met. Reports about the condition of the Dutch transport network and the requirement for transport capacity are made regularly in the Dutch network operators’ Quality and Capacity Documents. This statutory obligation ensures that the risks and capacities of the Dutch transport network are monitored and that necessary investments are reported. Transport requirements change over the course of time. Of course, this is dependent on the position of gas on the northwest European market. However, one important reason for adapting the transport network is the fact that domestic gas production is falling and that replacement (additional) volumes must be imported and, consequently, border points must be extended. That means that new entry capacity and the underlying infrastructure must be realised. This also gives rise to the need for supplementary storage capacity.

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After 2020, renewable energy sources (volumes) will play a greater part in the European energy supply. As yet, this volume-substitution has had a very limited effect on the demand for gas transport capacity. After all, the very nature of wind and solar energy involves the need for a back-up capacity (especially gas).

The figure below is a reflection of the anticipated trend in the demand for and the supply of transport capacity in the Dutch high-pressure network. It can be inferred from this figure that further adaptations to the Dutch network are expected.

![Graph showing capacity GTS network vs. time]

*Source: GTS, The Security of Gas Supply 2011*

The important part that gas will play in the supply of energy at times of peak demand and/or the failure of intermittent energy sources (wind and sun) means that, even if there is a possible stagnant market demand for gas volumes in the Netherlands, the demand for capacity may increase. Already the peak demand for gas is 10 times greater than the peak demand for electricity. From the figure below it can be inferred that the Dutch network of pipelines, storage facilities and an LNG terminal can supply 10 times as much energy to the domestic market than the existing Dutch electricity grid.

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4.3 Actual flows

<table>
<thead>
<tr>
<th>Actual flows between NL and neighbouring countries</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Belgium</strong></td>
</tr>
<tr>
<td>To/via Belgium</td>
</tr>
<tr>
<td>From/via Belgium</td>
</tr>
<tr>
<td><strong>Germany</strong></td>
</tr>
<tr>
<td>To/via Germany</td>
</tr>
<tr>
<td>From/via Germany</td>
</tr>
<tr>
<td><strong>Norway</strong></td>
</tr>
<tr>
<td>To Norway</td>
</tr>
<tr>
<td>From Norway</td>
</tr>
<tr>
<td><strong>United Kingdom</strong></td>
</tr>
<tr>
<td>To UK</td>
</tr>
<tr>
<td>From UK</td>
</tr>
</tbody>
</table>

Source: based on GTS data physical gas balance 2010

4.4 The potential for physical gas flows in both directions

Article 7 of the Regulation states that, for each cross-border interconnection between member states, transmission system operators shall, not later than 3 March 2012, submit to their member states a proposal for capacity in the reverse direction or a request for an exemption from the obligation to enable bi-directional capacity.

L-gas border points are connection points to production facilities in the Netherlands. The regions underlying these exit points in the neighbouring countries have no supply (or almost no local supply). The Emden border points are the points at which the Netherlands imports Norwegian gas. These are connected to Norwegian production locations. Physical reverse flow (H-gas) is already possible between the Netherlands and Germany and the Netherlands and Belgium. It emerged from recent market consultations (Open Seasons) that there is no requirement for additional capacity at these border points.

Virtual reverse flow with the United Kingdom is possible via the BBL. A consultation round has taken place regarding whether the market needs full reverse flow at this border point.
Further consultations will take place due to the limited response to this first set of consultations. The outcome of this will either result in enabling capacity in the reverse direction or in a request for an exemption from the obligation to enable this bi-directional capacity.

4.5 The availability of production and storage

Source: TNO Gas Production Forecast 2001-2035- Annual Review 2010 (publication June 2011)
To this day, indigenous gas production plays an important role in compensating for fluctuations in northwest European market demand. The decline in gas production in northwest Europe is causing a decrease in the availability of this natural flexibility. Storage facilities are playing an increasingly greater part in order to compensate for this declining production flexibility. What’s more, an important distinction must be made between storage facilities that can provide supplies for summer-winter variations and those that can absorb relatively short peaks in the gas demand. Depleted gas fields (DGF) are extremely suitable for absorbing seasonal fluctuations. Salt caverns are often used for shorter peaks, but can, when having a large storage volume, also be used to balance out seasonal supply and demand.
5 Scenarios

Article 9(1)(c) of the Regulation states that, in the assessment of the risks affecting the security of gas supply, various scenarios shall be examined and the probable consequences assessed. In running through the scenarios, parameters such as exceptionally high gas demand or supply disruption, such as disruption of the main transmission infrastructure, storage facilities or LNG terminals and disruption of supplies from third country suppliers may be applied. Exceptionally high gas demand is the standard starting point for the scenarios set out below.

The Dutch high-pressure network is very robust. All the main subsystems in this network are equipped with a reserve system (redundancy, also known as N+1 subsystems). If very high availability is required (for critical functions) then a whole system performs redundantly (in duplicate) and independently or there is another system elsewhere in the gas transport network that can take over the function (a back-up system). If a disaster should occur at the dispatching center in Groningen, then ‘control’ of the network is also possible from another (classified) location in the Netherlands. In connection with the (increasing) use of electrically-powered compressors, large-scale power failures can have consequences for the production and transport of (and the demand for) gas. The way in which electricity and gas are interwoven is included in the scenario dealing with the disruption of the Groningen field (5.2).

5.1 Further disruption (in addition to disruption of largest infrastructure) scenario

The starting point for the N-1 formula is the disruption of the single largest gas infrastructure with the greatest capacity. It is not possible to worsen the scenario by choosing an alternative separate infrastructure (border point, storage facility, production point or LNG terminal) to the Grijpskerk storage facility.

Suppose the only LNG terminal in the Netherlands fails at the same time as Grijpskerk, then the result of the N-1 standard comes out at 147%.

The calculation shows that even if there is a disruption in Netherlands infrastructure with 2x the capacity of Grijpskerk, the result of the N-1 formula is still around 150%.

5.2 Groningen field disruption scenario

The Groningen field does not comprise one physical entry punt, but consists of various different clusters connected on a ring system. These clusters are divided into 11 independent groups for the purpose of supplying electricity.

Disruption of the group of clusters with the greatest capacity means the loss of a volume of production capacity of a maximal 45 million m³/d. This lost capacity is lower than the capacity of the Grijpskerk storage facility. The result of the N-1 formula in the event of disruption of one of the Groningen production points will simply lead to a higher percentage.
5.3 Decrease in domestic production scenario

The decrease in the production of domestic natural gas over the long term is a fact. This loss in volume can be partly compensated for by an increase in the domestic supply of green gas and possibly, in the long term, by the production of shale gas.

The Dutch and European infrastructure is already being adapted to cope with these changing circumstances. Entry at border points is being extended to allow these volume flows to increase and storage facility capacity is being extended in order to allow sufficient swing to be generated. Whether there is actually sufficient gas volume available, just as in the 'Nordstream disruption' scenario, depends on the volume contracts of shippers/traders.

5.4 Gas exports honoured in full despite disruption of largest infrastructure scenario

The N-1 formula only takes account of domestic demand (Dmax). The exit capacities at border points are not included in the N-1 formula. However, it is likely, in the event of the disruption of the largest infrastructure in the Netherlands (and under the conditions set in the N-1 formula), that it should be possible to provide for the maximal export capacity. If exports are included within Dmax (figures taken from overview of maximal border capacity in the Netherlands, chapter 2.2 parameter $EP_m$), then N-1 comes out at less than 100%.

\[
N-1 \% = \frac{165 + 635 + 37 - 64}{476 + 114 + 188 + 46} \times 100 = 94\%
\]

5.5 Potential effect of Bergermeer storage facility scenario

During the 1990s, storage facilities at Grijpskerk and Norg were developed near the Groningen field in order to keep capacity (swing) at the required level. Over the last few years, the storage facility capacity in the Netherlands has been greatly expanded and new projects are in the pipeline. If the Bergermeer storage facility is built, then the N-1 result will increase to considerably more than 170%.

Extra production capacity the size of Bergermeer would increase the percentage mentioned in 5.4 to just above 100%.

5.6 Nord Stream disruption scenario

If the Nord Stream pipeline fails, then there is sufficient infrastructure in northwest Europe to supply gas to customers via another route. This is the result of the substantially increased capacity on the northwest European market in order to be able to facilitate market operations. Whether sufficient volumes will be transported depends on the choices then made by the shippers/traders.

5.7 Disruption of Byelorussian and Ukrainian infrastructure on a day of exceptionally high gas demand scenario

ENTSOG’s Ten Year Network Development Plan analyses whether, when daily demand is very high, sufficient flexibility (physical congestion at entry points) is available at European border points to be able to counterbalance a disruption of infrastructure in Byelorussia or the
Ukraine. Flexibility means: to what extent the physical flow can still be increased within the technical capacity. As is shown from the summary from the TYNDP below, under these circumstances there are no problems foreseen regarding security of supply (based on the assumptions of the TYNDP).

Source: ENTSOG TYNDP 2011-2020

5.8 Disruption of Norwegian infrastructure scenario

ENTSOG’s Ten Year Network Development Plan analyses whether, when daily demand is very high, sufficient flexibility is available at European border points to be able to counterbalance a total disruption of Norwegian exports to the United Kingdom. This analysis shows that there are no negative consequences for the security of supply in the Netherlands from this
scenario. It has already been proved by the N-1 formula that disruption of Norwegian imports via Emden can also be compensated for in the Netherlands.

5.9 Interaction and correlation with risks existing in other member states

Article 9(1)(d) states that the interaction and correlation with risks existing in other member states must be identified. Because this is the first risk assessment to be made, GTS does not know the identified risks in the other member states. In the next risk assessment, GTS will possibly investigate in more detail the interaction with the known risks in neighbouring countries.