ENERGINET
Systemansvar

Energinet
Tonne Kjærsvej 65
DK-7000 Fredericia

+45 70 10 22 44
info@energinet.dk
VAT no. 39 31 49 59

Date:
November 5, 2021

MEMO

INFORMATION ABOUT GAS SUPPLY AND DEMAND 2021-2022

Table of contents

1. Background 2
2. Summary 2
3. Development since October 2020 2
3.1 Important parameters during the Tyra Redevelopment period 3
3.2 Possible supply and demand situation in 2022 3
3.3 Storage filling 4
3.3.1 Short recap of high storage withdrawal in February 2021 4
3.3.2 Storage filling primo gas year 2021-2022 5
4. What happens in Emergency 6
5. Final remarks 6

1. Background

In September 2019, Energinet Gas TSO A/S[1] (hereafter Energinet) informed the commercial players in the gas system (suppliers, shippers, and storage customers) about the possible supply and demand situation during the Tyra redevelopment. Energinet gave the information in a memo supplemented with graphic illustrations.

In October 2020, Energinet published updated information to the commercial players about the possible supply and demand situation in 2020-2022 based on mitigation initiatives and new demand assumptions. Energinet gave the information in a memo supplemented with graphic illustrations.

This memo, which is also supplemented with graphic illustrations, is a new update for the possible supply and demand situation in 2021-2022.

2. Summary

It is Energinet's assessment that Danish and Swedish consumers will continue to experience a robust supply situation until and after the reopening of the Tyra platform in June 2023. However, the gas storage filling at the beginning of the gas year in October 2021 calls for increased attention.

Most of the Danish gas production in the North Sea is closed until June 2023, leaving the system less flexible and more vulnerable to potential incidents. A long and hard winter or a cold spring could be challenging. Also, the gas price, which since summer 2021 has increased to a very high level, could be challenging. However, careful planning and focusing on the optimal use of the capacity in the system will reduce the risk of supply challenges.

Several parameters will influence the actual situation each year during the period 2021-2023 until Tyra's expected recommissioning in June 2023.

Based on the now known prerequisites the market players must still:

- prepare themselves by sufficient transport capacity and storage reservations.
- keep gas in storage to secure own obligations with special attention to the period from February to April where storage filling can be critical. Shippers are recommended to ensure that the actual total storage filling always stay above the updated Safe Storage Level[2] (hereafter SSL) until the end of the storage year in May 2022 to reduce the risk of a critical supply situation.
- consider uncertainties related to variation in demand, supply, and potential minor technical incidents.

This should be done to avoid severe long-lasting gas shortage in the transmission system which could eventually lead to crisis level Emergency and possibly even interruption of non-protected customers.

3. Development since October 2020

Compared to the supply and demand situations described in September 2019 and October 2020, the situation in 2021-2023 needs increased attention.

[1] Due to business split and fusion the new subsidiary Energinet Systemansvar A/S is now responsible for this information.

[2] https://en.energinet.dk/Gas/Tyra/Safe-storage-level

Since the memo published in October 2020, the main developments and challenges are the following:

- The reopening of the Tyra platform is planned for June 2023 as announced in the REMIT published on date November 6th, 2020.
- The Baltic Pipe (hereafter BP) and connection to Norway via Europipe II (hereafter EPII) are both in operation in October 2022. However, the firm capacity for export to Poland via BP in Q4 2022 has been recalculated as published in a REMIT on September 9th, 2021.
- The Danish Energy Agency (hereafter DEA) has published the Analysis Assumptions 2021 (hereafter AF21) with a higher projected Danish gas demand for 2022 as well as a slightly increased level of green gas production compared to the prognoses for 2022 published in the Analysis Assumption 2020.
- The absolute storage filling in Denmark is significantly lower at the start of the gas year October 1st, 2021, compared to the absolute storage filling at the start of the gas year October 1st, 2020; approx. 7.500 GWh in 2021 versus approx. 10.200 GWh in 2020. Relatively low storage fillings are also seen in other European countries.
- Similar levels of long-term firm capacity at Entry Ellund have been booked for 2022 as for 2021.
- A special seasonal capacity tariff in Ellund is still valid for October 2021 to September 2022.
- The gas price, driven by the global supply and demand, has since summer 2021 increased to a very high level.
- The general European energy market and supply situation.

3.1 Important parameters during the Tyra Redevelopment period

The redevelopment of the Tyra platform has been postponed from January 2023 until June 2023.

The actual situation for 2022-2023 will depend on several important parameters. The first three points mentioned below are the sole responsibility of the commercial players, whereas the last three points should be considered by the commercial players:

1. The actions/reservations and the risk acceptance by commercial players of a possible Emergency crisis declaration from Energinet and possible need for interruption of customers.
2. The booked capacity and the actual storage filling every year must be sufficient to secure supply of Denmark and Sweden until end of storage year in May 2022.
3. Shippers' capacity bookings in northern Germany (GUD and OGE capacities on PRISMA) and the utilization of these combined with the use of storage capacity.
4. Actual weather in late winter and spring 2022.
5. Possible variation in consumption in Denmark and Sweden compared to AF21 from the DEA.
6. Performance of critical assets (Stenlille storage facility, Egtved compressor station, transmission system in northern Germany).

3.2 Possible supply and demand situation in 2022

From October 2019 and until commissioning of the connection to Norway via EPII, gas to Denmark and Sweden has been and will be supplied from South Arne, biogas (RES), Germany and

storage facilities in Lille Torup and Stenlille. Only Germany and the storage facilities can deliver the necessary flexibility, and Germany is the main source of gas.

Based on AF21 from the DEA, a possible supply and demand picture for 2022 is illustrated in figure 1 below. A further assumption for the drawn supply situation is that the total storage filling by the beginning and end of each month in Q1 will stay above the published SSL curve.

In October 2022, import from Norway via the connection to EPII and export to Poland via BP are introduced into the Danish system. In the possible supply picture below, the expected amounts transported in EPII and BP are based on AF21 following the expected firm capacity announced in the REMIT published on September 9th, 2021. Note that in AF21, no import from EPII to Denmark and Sweden is assumed.

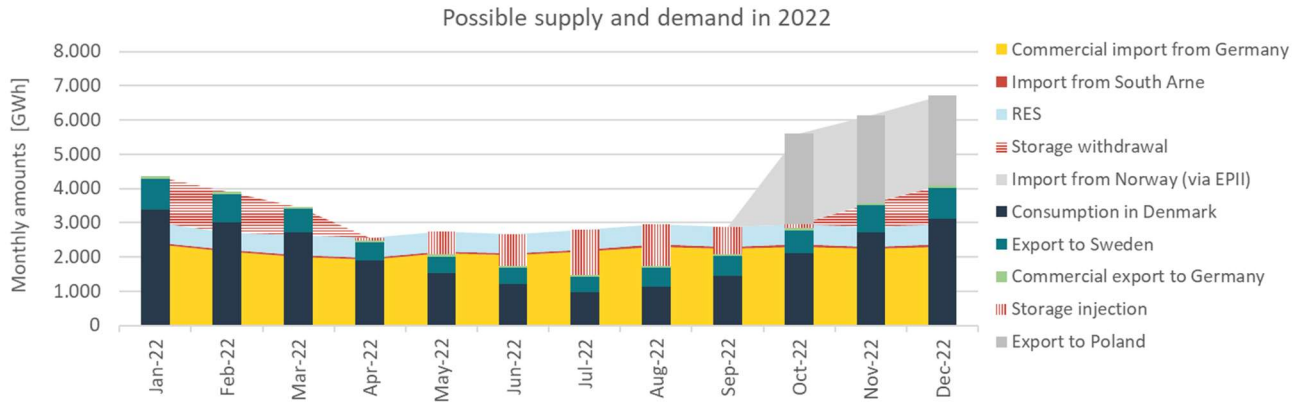

Figure 1 *Possible monthly supply and demand situation. The bars indicate expected monthly demand, whereas the areas indicate a supply combination that for each month fulfill the demand. The annual numbers are based on AF21 from the DEA.*

3.3 Storage filling

As already mentioned, Energinet has updated the SSL curve for the current gas year. The updated SSL curve is available on the Energinet Homepage where also the basic assumptions and further information behind the calculation of the curve can be found.

The SSL curve indicates the security of supply level and gives information to the commercial players about the actual filling of gas compared to the "safe filling" of gas in the storage facilities in Denmark. This section will briefly touch upon the relatively high storage withdrawal rate in the beginning of 2021 relative to the SSL curve slope, as well as the updated SSL for the current gas year and the actual storage filling situation in October 2021.

3.3.1 Short recap of high storage withdrawal in February 2021

In February 2021, Denmark experienced particularly cold weather, with the average daily temperature in the two-week period from February 3rd to February 16th reaching as low as -4,2°C. For comparison, the mean temperature for the same period in a statically average year is 1.3 °C, whereas it is -0.9°C in a statistically cold year (20-year event).

The exceptionally cold temperatures caused high storage withdrawal rates with which, the storage filling dropped at a significantly stronger pace than the slope of the calculated SSL curve for that period. This is evident from the figure below.

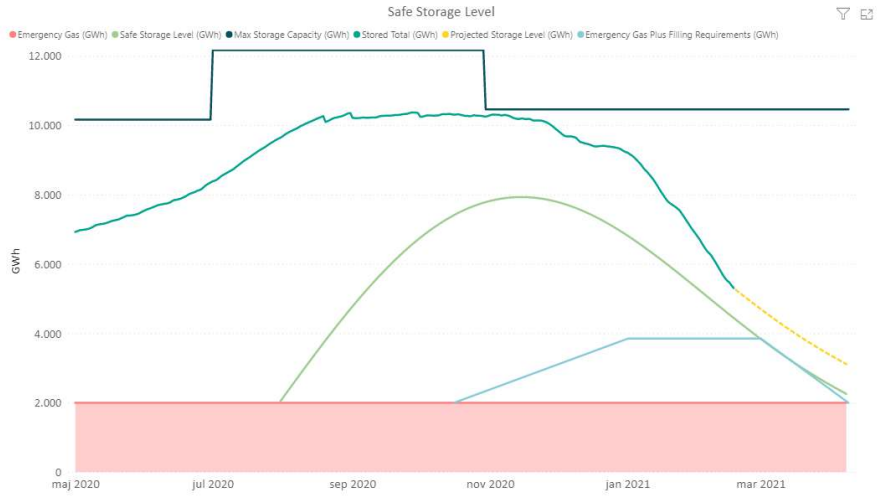

Figure 2 *SSL (green), filling requirements (light blue) and storage filling (turquoise) as of February 2021.*

If storage withdrawal rates during the beginning and middle of February had continued into March, it was estimated that the storage filling would reach the SSL and filling requirements in the middle of March, jeopardizing the security of supply for the rest of the storage year.

By the end of February and beginning of March, the temperatures increased to levels above or near the statistical average. Consequently, the pace of storage withdrawal decreased. This left the storage filling comfortably above the SSL by the end of the storage year ultimo April 2021.

3.3.2 Storage filling primo gas year 2021-2022

This year, the absolute storage filling is significantly lower at the start of the gas year in October 2021, compared to the absolute storage filling at the start of the gas year in October 2020. This is evident from the updated SSL curve and storage filling as of October 2021 shown below.

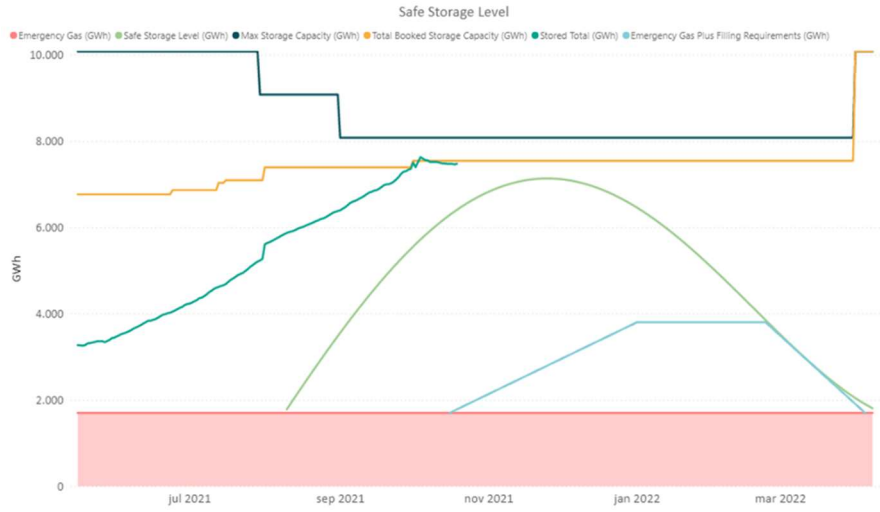

Figure 3 *SSL (green), filling requirements (light blue) and storage filling (turquoise) as of October 2021.*

As of October 2021, the stored gas amounts and booked capacities are well above the SSL. Hence, with a high gas supply from Germany through Ellund as well as a constant delivery from the South Arne pipeline and expected biogas production, the supply situation is expected to be

secure even in case of a statistically cold winter. However, players should be aware that one or several very cold days might be challenging if the needed capacity is not reserved.

Hence, the relatively low storage filling in Denmark together with relatively low storage fillings in other European countries indicate that a late and extremely cold winter, as seen in February 2021, can be critical for the supply situation in Q1 of 2022, as both gas supply from storage facilities and high supply from Germany are necessary to supply the Danish and Swedish consumption during a cold season.

4. What happens in Emergency

According to the EU Regulation concerning security of gas supply[3], three crisis levels exist: Early warning, Alert and Emergency.

If the Danish gas transmission system reaches a critical gas shortage, it will be necessary to declare Emergency. The declaration of Emergency allows access to the Emergency storage volumes and other non-market-based instruments such as possible interruption of non-protected customers. Note that in case of a force majeure situation, the price for gas from the Emergency storage is the highest Day-ahead index on the Danish and German markets since May 1st, 2021.

If crisis level Emergency is declared, it might lead to different consequences depending on the actual incident:

- Emergency for shorter periods and use of Energinet emergency storage. No interruption of customers.
- Emergency for 30 days or more with full or partly interruption of all non-protected customers in Denmark (25% of the market) and Sweden (98% of the market).

Energinet will adapt actions to the level required by the actual incident.

Energinet's stored volume reservation (emergency gas) is based on EU requirements and is reserved for emergency purposes. According to the regulation it must be secured that the protected customers can be supplied with gas for a period of at least 30 days in long term incidents. In 2021/2022 Energinet has reserved approximately 1.700 GWh in Emergency storage from Gas Storage Denmark and an additional 2.100 GWh filling requirements from storage customers. The reserved storage volumes can secure sufficient storage withdrawal capacity to handle three consecutive days of extraordinary high demand in Denmark (occurring with a statistical probability of once in 20 years) during short term technical incidents ("hydraulic incidents").

5. Final remarks

It is Energinet's assessment that Danish and Swedish consumers will continue to experience a robust supply situation until and after the reopening of the Tyra platform in June 2023. However, the gas storage filling at the beginning of the gas year in October 2021 calls for increased attention.

Based on the now known prerequisites we encourage the commercial players to prepare themselves through sufficient transport capacity and storage reservations. The commercial

[3] REGULATION (EU) 2017/1938 OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL of 25 October 2017 concerning measures to safeguard the security of gas supply and repealing Regulation (EU) No 994/2010

players must consider uncertainties and act prudently to safeguard the security of supply. This is especially paramount in February to April when severe gas shortages in the transmission system could lead to crisis level Emergency and possible interruption of non-protected customers. The development in the gas demand and supply should be closely followed by all commercial players in the Danish gas market.