

GAS BALANCING

JBZ EVALUATION

Joint evaluation by Swedegas and Energinet of the Joint Balancing Zone (JBZ) for gas between Sweden and Denmark

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Explanation of front page:

The figure on the front page shows the Joint Balancing Zone (JBZ) covering Sweden and Denmark. The points listed are the points in the JBZ that are to be balanced. RES stands for Renewable Energy Source e.g., biomethane.

1. Introduction

On the 1 April 2019 Swedegas and Energinet created the Joint Balancing Zone (JBZ), which is the balancing zone for gas covering both Sweden and Denmark.

This followed the approval from the Swedish and Danish regulators. For Sweden the Swedish Energy Markets Inspectorate (Energimarknadsinspektionen or Ei) approved the methodology on 28 March 2019. For Denmark the Danish Utility Regulator (Forsyningstilsynet) approved the methodology on 28 March 2019, "Afgørelse om en fælles balancezone (Joint Balancing Zone) for Danmark og Sverige¹".

In the regulatory approval was a request that Swedegas and Energinet carried out an analysis of JBZ after two years of operation to assess the market effect of JBZ and the gains / disadvantages of JBZ. This analysis should be carried out in cooperation with market participants

Due to the request from the regulators Swedegas and Energinet carry out this evaluation with input from the market via a joint user group on the 26 March 2021 which was followed by a consultation period ending the 14 April 2021.

2. Background

What was the rationale behind the JBZ? Sweden had derogation from the EU network code on balancing (NC BAL) until 1 April 2019. A new balancing system was therefore needed in Sweden. Denmark had implemented a balancing system according to the European network code NC BAL. The Danish balancing system had been mentioned as a good example in "ACER Report on the Implementation of the Balancing Network"² from November 2016. A pragmatic solution was to create the JBZ between Sweden and Denmark. In this way should shippers, that are active in both markets, only be in balance in one system rather than two systems. A larger balancing system is a benefit for both Sweden and Denmark.

What was the regulatory framework behind the JBZ? Creating larger balancing zones is also in line with the European Union Agency for the Cooperation of Energy Regulators (ACER) Gas Target Model³. ACER is an independent body intended to foster the integration and completion of the European Internal Energy Market for electricity and natural gas. ACER original Gas Target Model from 2011 was updated in 2015. Here was stated (page 14):

"It is crucial that the right structural framework exists to allow functioning gas markets to emerge. The European gas market will consist of interconnected entry-exit zones with virtual trading points (...), with the size of each zone being as large as the existing infrastructure allows (...). As a general rule, entry-exit zones should not be defined on the basis of national boundaries, but based on physical realities and market needs."

In June 2017 Swedish and Danish regulators published a Joint Danish-Swedish self-evaluation of the national gas-wholesale market titled "European Gas Target Model Self-Evaluation by DERA and Ei"⁴. The JBZ is here listed under the headline market reforms - recommendations (page 8).

Swedegas and Energinet created the Joint Balancing Zone (JBZ) on the 1 April 2019. This evaluation looks at the development in the JBZ for the two years it has been in operation.

¹ <https://forsyningstilsynet.dk/gas/afgoerelser/forsyningstilsynet-metodegodkender-joint-balancing-zone-ibz-en-faelles-balanceringsmodel-for-danmark-og-sverige>

² https://documents.acer.europa.eu/Official_documents/Acts_of_the_Agency/Publication/ACER%20Report%20on%20the%20implementation%20of%20the%20Balancing%20Network%20Code.pdf

³ <https://www.acer.europa.eu/Events/Presentation-of-ACER-Gas-Target-Model-/Documents/European%20Gas%20Target%20Model%20Review%20and%20Update.pdf>

⁴ <https://forsyningstilsynet.dk/aktuelt/publikationer/gasmarkedet/joint-danish-swedish-self-evaluation-of-the-national-gas-wholesale-market>

3. Analyses and Conclusions

The topics that have been identified during the evaluation have been:

1. Liquidity at the gas exchange (ETF)
2. Increased transparency by introducing a separate Balancing Charge
3. Simplified daily capacity optimisation
4. More balancing responsible in Sweden
5. Increased Security of Supply via a higher pressure in the Swedish gas system

These five topics are described in this chapter.

3.1 Liquidity at the gas exchange (ETF)

Observations

Figure 1 and 2 show the gas volumes traded on the exchange (ETF) for the four years from April 2017 to March 2021. In the first figure are the volumes aggregated on a 12-month basis from 1 April to 31 March. The date 1 April is chosen in order to separate between before and after the introduction of JBZ. The volumes on ETF were higher in the two years before JBZ was introduced, than they were in the two years after JBZ. The second figure shows the same data as in the first figure, but as a timeline.

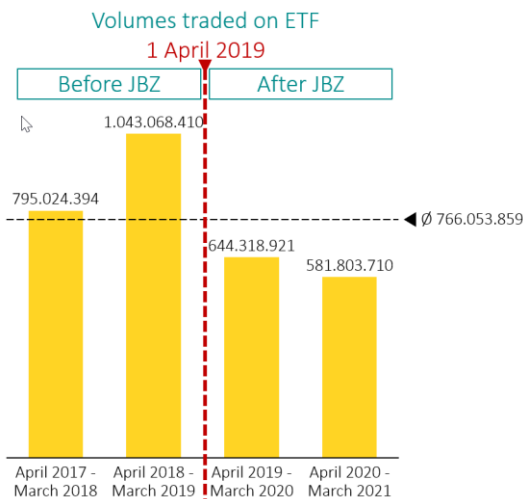


Figure 1, Development in the ETF liquidity, on a yearly basis

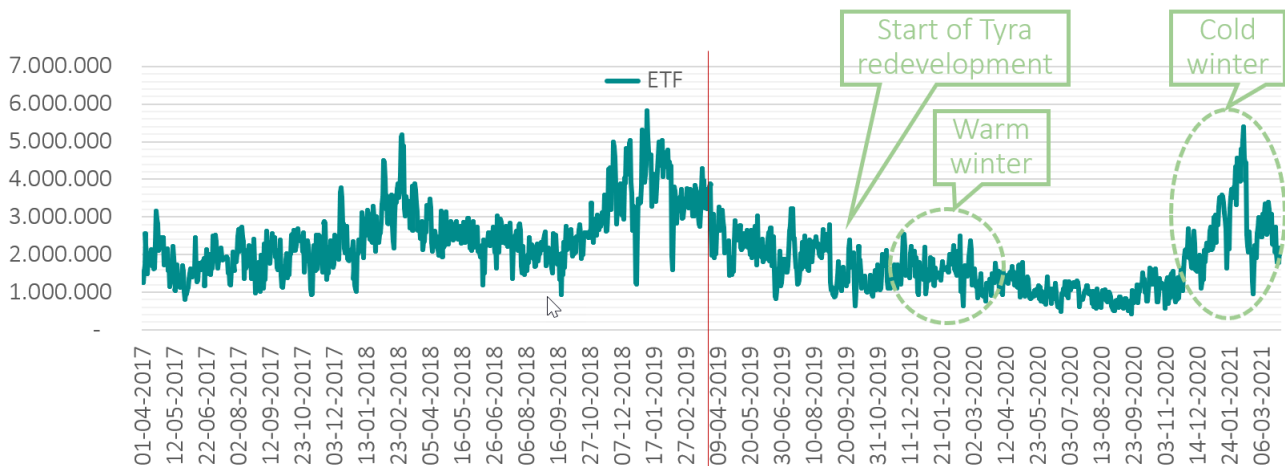


Figure 2, Development in the ETF liquidity

Analysis

Prior to the introduction of the JBZ there was as an expectation that this would lead to an increase in ETF volumes. This expectation was based on the historic observation of the liquidity at ETF, that increased after the introduction of the balancing model in Denmark in 2014. This increasing trend was expected to continue after the introduction JBZ. Why has there then been a decrease in ETF volumes?

Economists like to say: “Ceteris paribus” or “all other things being equal”. However, all other things have – not – been equal, e.g. as highlighted in Figure 2 and listed here:

- Tyra redevelopment has significantly changed the gas flows and by this also the commercial dynamics – resulted in reduced volumes on ETF
- Warm winter 2019/20 reduced the volumes
- Cold winter 2020/21 saw an increased the volumes

In addition to this, during the user group the participants also mentioned other reasons for why the volumes had fallen on ETF:

1. Fewer yellow zone trades were highlighted by one participant at the user group
 - Energinets view on the reduced need for yellow zone trades is that the upstream gas production from the North Sea has historically had unplanned variations e.g., due to technical reasons. Some of these upstream variations resulted in Shippers not being in balance in transmission system and required Energinet to perform yellow zone trades. In other words, imbalance in the upstream production system was imported to the transmission system. During the Tyra redevelopment are no such imbalances moved from the upstream system to the transmission system and we therefore see a fall in the yellow zone trades. When the Tyra redevelopment is finalised, there is a risk that imbalances in the upstream gas production system will spill over to the transmission system again. However, as the Tyra platform will be all new, there is an expectation for a more stable production.
2. Perception of risk on the ETF, as a consequence of the Tyra redevelopment
 - The view was put forward that the Tyra redevelopment has led to significant changes in the gas flows and by this also the commercial dynamics. The stop in the gas flows from the Tyra platform has reduced the volumes and increase the perception risk on the EFT and herby also reduced the volumes traded on the ETF.
3. Lower cost of doing bilateral trade (GTF) compared to exchange trades (ETF)
 - The view was put forward that it was less costly to do bilateral trades (GTF) compared to using the exchange. This is also believed to reduce the volumes on the ETF.

Conclusion on liquidity

The objective was to increase liquidity at the gas exchange (ETF).

The conclusion is that the liquidity at the gas exchange (ETF) did not increase after the introduction of JBZ. The reasons for this include:

- Structural changes in the gas supply (Tyra redevelopment) have led to changes in the physical and commercial gas flows, incl. the use of ETF by the shippers and for yellow zone trades by the TSO.
- First winter after JBZ was warm. The normal increase at the exchange during the heating season did not materialise in the winter season 2019/20.

In the future there will be new structural changes that can lead to an increase in the liquidity at the gas exchange (ETF), e.g.:

- Baltic Pipe is planned to flow gas from 1 October 2022
- The finalisation of the Tyra redevelopment is planned for the 1 Jun 2023.

3.2 Increased transparency by introducing a separate Balancing Charge

Indirect balancing costs are covered by the Balancing Charge

The indirect balancing costs are the costs necessary to establish a system that enables the TSO to follow the individual shippers/BAs balance in JBZ. These costs mainly consist of IT-systems and the employees necessary to develop and operate the commercial balancing market.

The indirect balancing costs, which until the introduction of JBZ were included in the variable commodity charge, have now been charged separately by a new tariff called 'Balancing Charge', which in 2020 was set at 0,00019 DKK/kWh. The total yearly indirect balancing costs is at 6,3 M DKK a year.

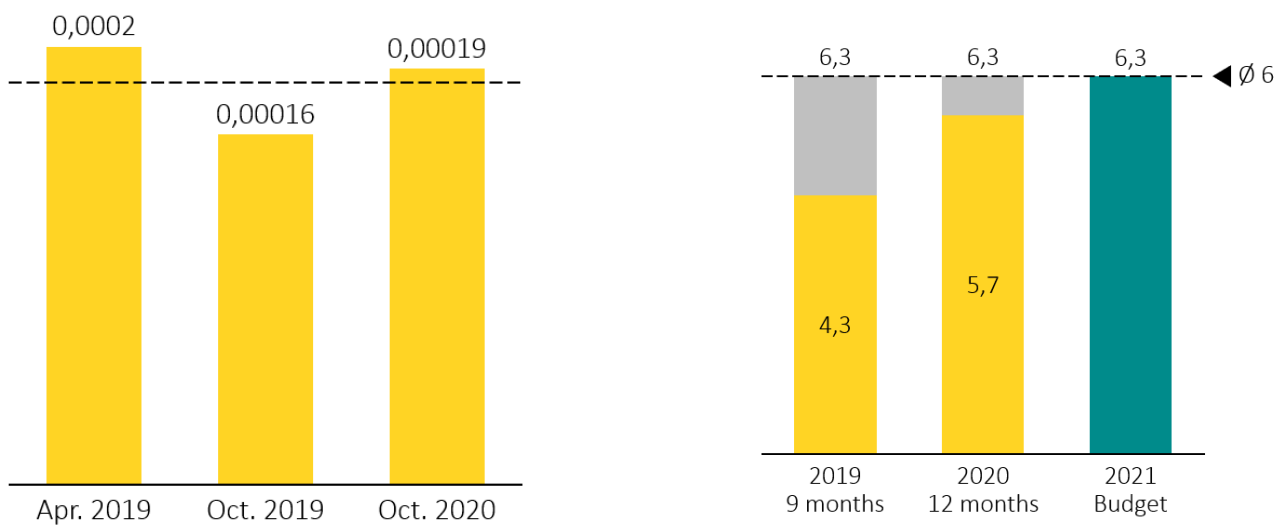


Figure 3, Balancing Charge, in DKK/kWh and in total revenue in M DKK

Commercial Balancing

A separate and transparent account for commercial energy balancing in JBZ was established. The commercial balancing included cash-out (end of day) and yellow zone trades.

The commercial balancing economy is cost-neutral over time. Figure 4 shows how the commercial balancing has changed on a monthly basis (yellow bars). It also shows that the accumulated result (green line) has moved from -5 M DKK in September 2019, to +2 M DKK in the beginning of 2021, to around -1 MDKK on 31 March 2021.

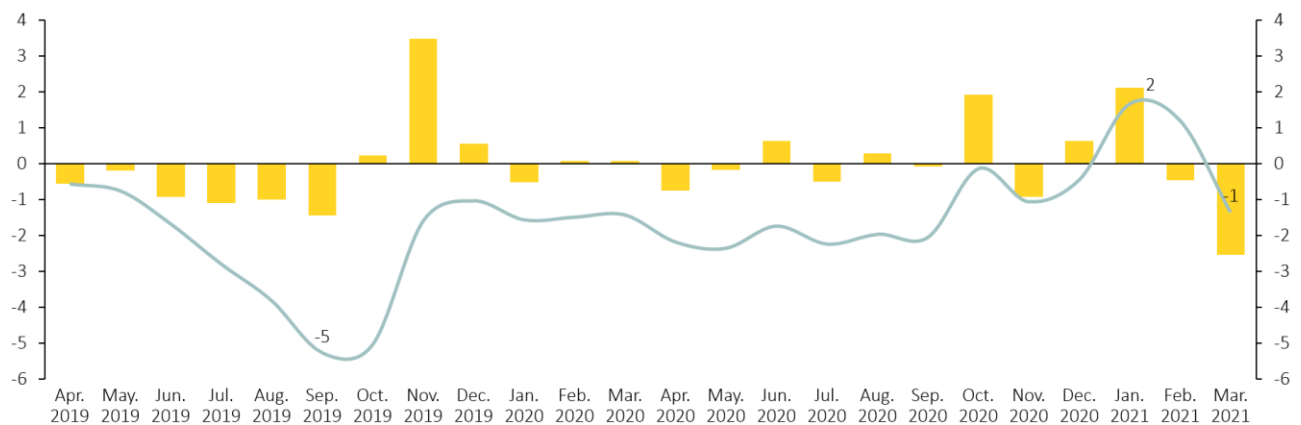


Figure 4, Commercial balancing is cost neutral

Conclusion on transparency and balancing costs

The objective was to increase transparency by introducing a separate Balancing Charge

The conclusion is that transparency has increased as:

- The size of the Balancing Charge is on the transmission tariffs data sheet
- The yearly indirect balancing costs are now published and are at 6,3 MDKK
- The Commercial Balancing is kept as cost neutral at around zero, just as before JBZ

3.3 Simplify daily capacity optimisation

Shippers can optimise their capacity products via the standard products shown in Figure 5.

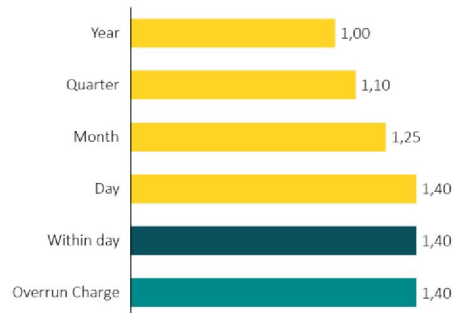


Figure 5, Capacity products and their relative costs

The introduction of JBZ also gave the shippers *increased flexibility* to the Swedish market in form of:

- Overrun charges (automatic delivery of capacity allocations, when needed)
- Flexible deadlines for booking capacities
- And it also became possible to pool capacities for gas used in Sweden and Denmark

As shown in Figure 6 and Figure 7, when it comes to Day and Within day capacity there has been a significant fall in demand for these products in Sweden, after the introduction of JEZ. It should be noted that while the green line only contains capacity products sold at Dragør i.e. to Sweden, the yellow line contains capacity products sold at JBZ i.e. both Sweden and Denmark. It is the introduction of the overrun charge (a daily capacity product) to Swedish market that has changed the shippers booking behaviour.

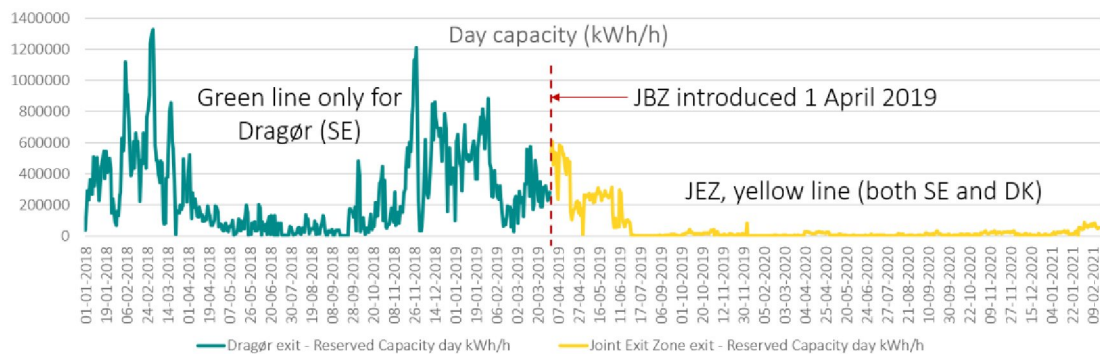


Figure 6: Day capacity reserved before and after the introduction of JBZ

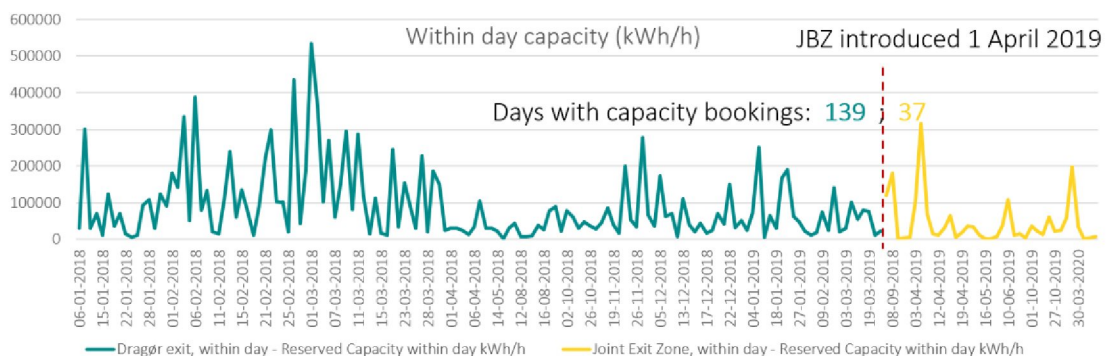


Figure 7: Within day capacity reserved before and after the introduction of JBZ

Conclusion on capacity optimisation

The objective was to simplify daily capacity optimisation.

The conclusion is that the introduction of the Overrun Charge has led to less use of daily and within day optimization, as this is easier for the Shipper. Other benefits from introducing the JEZ are more flexible deadlines for capacity booking for the Swedish market and the possibility to pool capacities for gas used in Sweden and Denmark.

3.4 More balancing responsible in Sweden

The number of balancing responsible has increased in Sweden after the introduction of JBZ. The figure shows that the number of balancing responsible in Sweden was five in 2019 and had increased by three with the introduction of JBZ. There are now eight balancing responsible in Sweden.

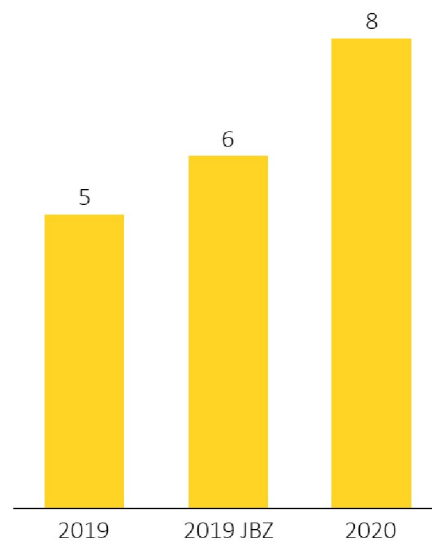


Figure 8: Growth in number of balancing responsible in Sweden after JBZ

Conclusion on balancing responsible in Sweden

The objective was to attract more balancing responsible to Sweden.

The conclusion is that this objective has been reached as the number of balancing responsible in Sweden has grown from 5 to 8.

3.5 Increased Security of Supply via a higher pressure in the Swedish gas system

The opening of the valve in Dragør instantly created a higher pressure in the Swedish transmission system. The figure below shows the increase in the average pressure in the Swedish transmission system. The figure also shows some short-term falls in the pressure level. This is due to technical maintenance.

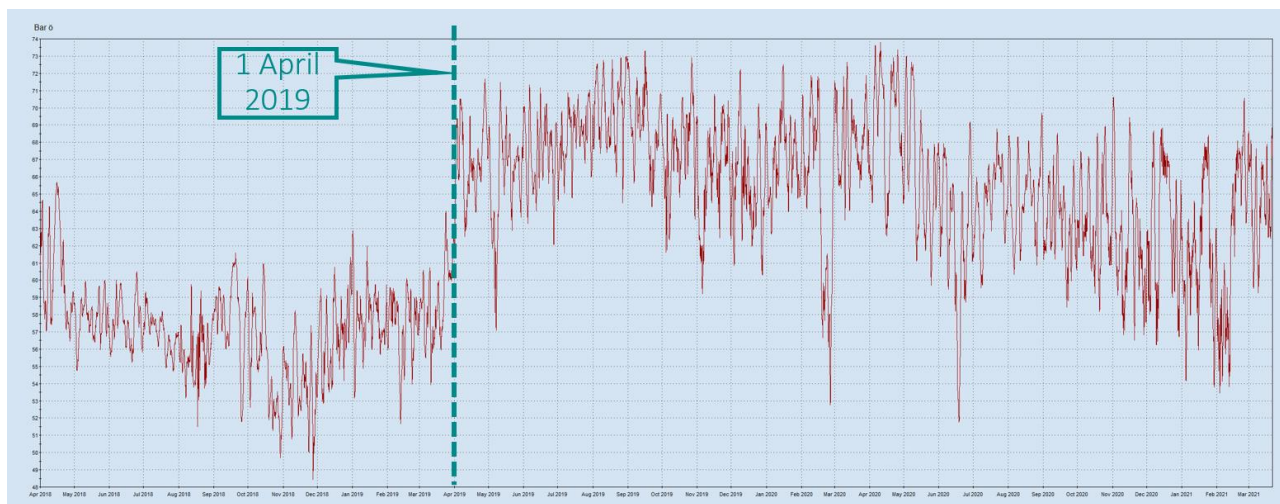


Figure 9: Opening of the valve in Dragør 1 April 2019 instantly created a higher pressure

Conclusion on increased security of supply

The objective was to Increased Security of Supply, via a higher pressure in the Swedish gas system.

The conclusion is that the opening of the valve in Dragør 1 April 2019 instantly created a higher pressure in the Swedish gas system. A higher pressure means that more gas is in the joint Swedish and Danish transmission systems in form of linepack. If e.g., short term supply disruptions occur or technical challenges arise, then the system is now more robust to handle such disruptions. The means that the security of supply has increased.

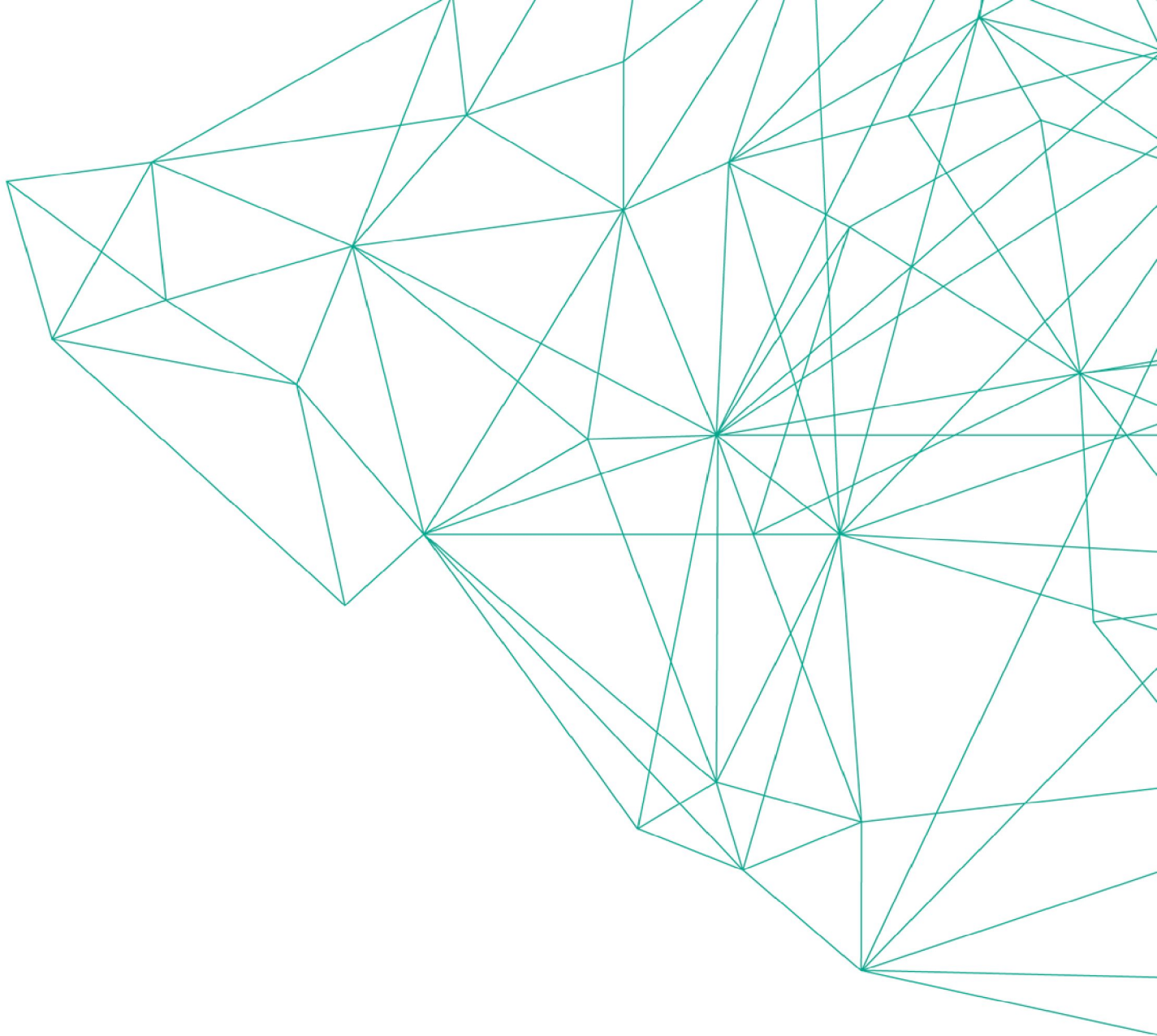
4. Consultation

On the 1 April 2021 the JBZ had been in operation for two years. Swedegas and Energinet carried out this evaluation with input from the market via:

- **User group** on the 26 March 2021:
 - Joint user group for both Sweden and Denmark
 - Online via TEAMS
 - The presentation, which is attached as Appendix 1, gave the findings which also are shown in this evaluation and was the basis for questions and discussions.
- **Consultation period** was to the 14 April 2021. Swedegas and Energinet have not received any responses to the consultation.

Appendix 1

Presentation used at the User Group on evaluation of the Joint Balancing Zone



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