MEMO

Date:
April 12, 2021

Author:
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SUBMISSION OF METHODOLOGY APPROVAL OF ADJUSTED COMMERCIAL BALANCE MODEL

Pursuant to section 36a (1) and 40 (1) of the Danish Act on Natural Gas Supply[1], Energinet Gas TSO (hereafter Energinet) must submit the methods that are used to calculate or establish terms and conditions for access to the transmission grid, for the approval by The Danish Energy Regulatory Authority.

In accordance with the Swedish Natural Gas Act (Naturgaslagen 2005:403) 7th chapter 1§,4-6§ the terms of the Balance Administrator Agreement shall be objective and non-discriminatory and be subject for full approval of agreement terms and conditions by the Swedish Energy Markets Inspectorate before it can enter into force.

This submission is a supplement to Energinet's market based balancing model, which was approved by the Danish Energy Regulatory Authority, now the Danish Utility Regulator, via decision on 23 September 2014[2]. The balancing model has been subject to ongoing changes, latest by the Danish Utility Regulator's decision of 17 July 2020[3].

This Submission of Methodology for Approval concerns submission of:

- Introducing system-wide within-day obligations into the current balancing model for JEZ

Energinet and Swedegas find that this supplement to the method already approved for the market based balancing model is in line with the Danish Act on Natural Gas Supply, the Swedish Natural Gas Act and the current EU Regulation and can therefore be approved by the regulatory authorities in Denmark and Sweden.

The supplement to the method will enter into force 1 October 2022.

[1] Consolidation Act nr. 126 of 6 February 2020 on natural gas supply.g

[2] Energinet.dk's new commercial balancing model – method approval: https://forsyningstilsynet.dk/gas/afgoerelser/energinetdk-s-kommercielle-balanceringsmodel

[3] Adjustments of balancing rules, due to the risk of negative gas prices: Afgørelse om gasbalancering ved negative gaspriser (forsyningstilsynet.dk)

1. Resumé

Med implementeringen af Baltic Pipe, ændres det dansk-svenske gasmarked sig fra at være primært et leveringssystem til slutkunder i Danmark og Sverige, til primært at være et transitsystem, hvor den primære flowrute forventes at gå fra Norge, igennem Danmark, og til Polen.

Baltic Pipe implementeres ikke som et separat rør, men vil være fuldt integreret med det nuværende gassystem, for at kunne udnytte den kapacitet og fleksibilitet der allerede findes bedst muligt. På den måde vil det dansk-svenske system komme til at ligne andre gassystemer i EU, såsom det Belgiske, det Tjekkiske og det Østrigske, som ligeledes også har store transitruter.

Fælles for disse lande er, at de alle har implementeret *Within-day Obligations (WDO'er)*, altså forpligtelser i løbet af gasdøgnet, som transportkunderne skal overholde. WDO'er er et redskab, som er indført i den Europæiske balancenetværkskode, netop til systemer med store transitkapaciteter, hvor store ubalancer i løbet af gasdøgnet kan bringe systemet uden for de fysiske toleranceniveauer, selvom transportkunderne balancerer på døgnet.

Kort fortalt så går WDO'er ud på at skabe økonomiske incitamenter i gasdøgnet, så den samlede ubalance ikke vokser sig for stor i én retning, i løbet af gasdøgnet. I tilfælde af, at det givne toleranceniveau (det grønne bånd) ikke overholdes samlet set, så vil Balancing Area Manageren (BAM'en) foretage såkaldte gulzonehandler på within-day markedet, som vil ramme de transportkunder, der er skyld i ubalancen umiddelbart (kaldet causerne). Dette er dybest set den primære ændring i forhold til i dag, hvor gulzonehandlerne kun påvirker ubalanceprisen i slutningen af gasdøgnet.

Ændringen af hvordan gulzonehandler indgår og påvirker markedet i løbet af gasdøgnet, som følge af indførelsen af WDO'er, kræver en række ændringer i forhold til i dag, som ligeledes anmeldes i dette papir:

- Balancevisningen i løbet af døgnet vil gå fra at være en visning af den forventede ubalance for hele døgnet (kaldet Estimated System Commercial Balance, E(SCB)), til at være en akkumuleret visning, for de timer der er gået (kaldet Accumulated System Balance, ASB)
- Det vil være nødvendigt at beregne transportkundernes akkumulerede ubalance for hver time i løbet af døgnet (Individual Accumulated Shipper Balance, IASB), og ikke kun for døgnet, for at kunne identificere, hvem der er skyld i en eventuel ubalance i en given time (causerne)
- Beregningen af IASB'en vil kræve et øget niveau af data for Joint Exit Zone (JEZ) i forhold til i dag, da aftaget vil skulle kunne estimeres relativt præcist hver time, igen for at identificere causerne rigtigt pr. time
- For transportkunder der leverer gas til slutbrugere i JEZ, vil ændringen umiddelbart medføre, at de vil skulle balancere op imod den aftagerprofil, som slutkunderne har i løbet af gasdøgnet. For at dæmmer op for de negative konsekvenser dette kan medføre for denne gruppe transportkunder, indføres redskabet *smoothing*, som delvist flader JEZ aftagerprofilen ud
- Indførelsen af WDO'er vil som sagt kræve en øget frekvens af data og vil i højere grad end i dag kræve, at data er korrekte og til stede, for at kunne identificere de rette causere i timen. I tilfælde af at data for JEZ-aftaget er fejlbehæftede, eller ikke er til stede, indføres et *No Punishment Principle (NPP)*, som skal sikre transportkunder mod JEZ imod at blive placeret forkert eller i for stor grad som causer, på grund af fejl i data.

Markedet har været involveret i udviklingen af balancemodellen igennem det sidste 1 ½ år, igennem en række User Groups, Shipper Task Force, Shippers Forum's og bilaterale møder. Denne metodeanmeldelse har efterfølgende været i høring i markedet, inden fremsendelsen til de regulatoriske enheder i Danmark (Forsyningstilsynet) og Sverige (Energimarknadsinspektionen).

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2. The submission obligation

Energinet must as transmission system operator submit the methods that are used to calculate or establish terms or conditions for access to the transmission system, cf. section 40 (1) of the Danish Act on Natural Gas Supply.

The method for Balancing Model concerns the introduction of Within Day Obligations (WDO's), and the choice of method is not specified in applicable law, including the Danish Act on Natural Gas Supply. Thus, the method requires Submission of Methodology for Approval (hereinafter the "Submission") to the Danish Utility Regulator (DUR).

2.1 The background of the submission

Energinet is responsible for the continuous physical balancing of the Danish transmission system. In the same way Swedegas is responsible for the continuous physical balancing of the Swedish transmission system. The Shippers are responsible for balancing their deliveries and offtake and thereby minimizing the need for the transmission system operators to undertake balancing actions.

With the approved method of the Danish Utility Regulator as of 23 September 2014, Energinet implemented the common European rules for balancing according to the regulation (EU) No. 312/2014 of 26 March 2014 of a network code for balancing the gas transmission system (NC BAL). The main principles in the NC BAL are that the gas balancing rules must be market based and that shippers must have the incentive to balance their own portfolios within the gas day.

Since 2014, changes have been made in the incentive structure of the balancing rules, following the development on the gas market. The latest change was implemented in August 2020 (based on the decision by the Danish Utility Regulator dated 17 July 2020) because of the risk of negative gas prices, which was not handled in the general balancing model.

Since April 2019, the Joint Balancing Zone (JBZ) has been in function, creating one balancing zone for Denmark and Sweden.

The current balancing model is in overall terms described as a daily balancing model, with no within-day restrictions. The current concept is that every hour the expected system commercial balance E(SCB) for the entire gas day is calculated, based on nominations and expected offtake in Denmark/Sweden for all hours of the gas day. However, the implementation of the Baltic Pipe Project, enabling a substantial gas flow from Norway through Denmark to Poland, will result in significant changes to the Danish transmission system, both in terms of flexibility and possible flow volumes.

One of the main consequences of this transition is that the current daily balancing model cannot absorb all possible imbalances during a gas day, even though shippers are in balance end-of-day. This means that even in a normal situation, shippers can bring the system out of its physical boundaries during a gas day, potentially jeopardizing the system integrity and security of supply, if the current daily balancing model continues without amendments.

As a consequence of this, Energinet and Swedegas, as joint Balancing Area Manager (BAM)[4] for the Joint Balancing Zone (JBZ), will implement a system-wide within-day obligation, with hourly

[4] The BAM is responsible for the commercial balancing for the Joint Balancing Zone, whereas the separate TSO's have the responsibility for the physical balance in each system

restrictions throughout the gas day, as an add on to the daily balancing system. The main benefit of choosing the system-wide within-day obligation is that the current green zone balancing system is already system wide, collecting and informing on the aggregated commercial balance position of all shippers. The balancing model is subject to approval by the Danish and Swedish Energy Regulatory authorities.

2.2 Legal framework

2.2.1 National legal framework

National legal framework According to Section 11(1) of the Danish Act on Natural Gas Supply, and as the gas transmission system operator (TSO) in Denmark, Energinet shall ensure a sufficient and an efficient transport of natural gas, including the task of preserving and maintaining of the physical balance in the gas network. As TSO in Denmark, Energinet shall contribute to ensure best possible conditions for competition on markets for natural gas trade, cf. Section 12 a(1). Energinet can include necessary costs in the prices for its activities under Act on Energinet Section 2(2) and (3), including gas transmission activities, cf. Section 37 d of the Danish Act on Natural Gas Supply and Section 2 of Executive Order No 816 of 27 June 2016.

In accordance with the Swedish Natural Gas Act (Naturgaslagen 2005:403) 7th chapter 1§,4-6§ the terms of the Balance Administrator Agreement shall be objective and non-discriminatory and be subject for full approval of agreement terms and conditions by the Swedish Energy Markets Inspectorate before it can enter into force.

2.2.2 European legal framework

European legal framework According to Regulation No 715/2009 and in particular Article 6(11) and Article 8(6)(j) thereof, the European Commission may adopt network codes concerning balancing rules. On this basis, Regulation No 312/2014 is issued to establish the network code on gas balancing of transmission networks.

Pursuant to section 36a (1) and 40 (1) of the Danish Act on Natural Gas Supply, Energinet must submit the methods that are used to calculate or establish terms and conditions for access to the transmission grid, for the approval by The Danish Energy Regulatory Authority.

According to REGULATION (EC) No 715/2009 OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL of 13 July 2009 on conditions for access to the natural gas transmission networks and repealing Regulation (EC) No 1775/2005 balancing rules shall be designed in a fair, nondiscriminatory and transparent manner and shall be based on objective criteria. Balancing rules shall reflect genuine system needs taking into account the resources available to the transmission system operator. Balancing rules shall be market-based, cf. article 21. Imbalance charges shall be cost-reflective to the extent possible, whilst providing appropriate incentives on network users to balance their input and off-take of gas. They shall avoid cross-subsidisation between network users and shall not hamper the entry of new market entrants.

Any calculation methodology for imbalance charges as well as the final tariffs shall be made public by the competent authorities or the transmission system operator, as appropriate.

According to Regulation No 715/2009, Article 6(11) and Article 8(6)(j), the European Commission may adopt network codes concerning balancing rules. On this basis Regulation No

312/2014 is issued to establish the network code on gas balancing of transmission networks (NC BAL).

According to Article 4(1) of NC BAL the network users shall be responsible to balance their balancing portfolios in order to minimize the need for transmission system operators to undertake balancing actions set out under the NC BAL. Balancing rules established in accordance with NC BAL shall reflect genuine system needs, taking into account the resources available to transmission system operators and shall provide incentives for network users to balance their balancing portfolios efficiently.

Within day obligations are governed by NC BAL, chapter VI. A transmission system operator is only entitled to apply within day obligations in order to incentivize network users to manage their within day positions in view of ensuring the system integrity of its transmission network and minimizing its need to undertake balancing actions, cf. Article 24 (1). Where the transmission system operator is required to provide information to network users to enable them to manage their exposures associated with within day positions, it shall be provided to them regularly. Where applicable, this information shall be provided upon a request submitted by each network user once.

Types of within day obligations are described in Article 25. In addition, Article 26 sets a number of requirements for within day obligations. These requirements and the fulfillment thereof are described in part 6 below.

The national regulatory authority shall take and publish a motivated decision within six months following the receipt of the complete recommendation document. In deciding whether to approve the proposed within day obligation, the national regulatory authority shall assess whether this within day obligation meets the criteria set out in Article 26(2), cf. Article 27(1). Before taking the motivated decision, the national regulatory authority shall consult with the national regulatory authorities of adjacent Member States and take account of their opinions. The adjacent national regulatory authority(-ies) may seek an opinion from the Agency in accordance with Article 7(4) of Regulation (EC) No 713/2009 on the decision referred to in paragraph 1, cf. Article 27(2).

3. Submission of method

The system-wide within-day concept will consist of the following elements (in comparison to today's model):

- A **green zone** like what is known in today's balancing model, but illustrating an accumulated hourly tolerance, where todays balancing model illustrates an end-of day tolerance
- An **Accumulated System Balance (ASB)** published every hour, that illustrates the accumulated balance of all shippers for all previous hours of the gas day, where the E(SCB) in the current model illustrates the expected balance position end of day for all shippers
- An **Individual Accumulated Shipper Balance (IASB)** calculated every hour that is a calculation of the accumulated balance position of each shipper for all previous hours of the gas day
- A direct **TSO trade response** after every hour of the gas day, when the ASB is outside the tolerance level the difference between the ABS position and the green zone limit

is traded. The traded volume is allocated pro-rata to the portfolios of all causers in that exact hour.

This document contains 6 new concepts, which are referred to throughout the document, all related to the function of the adjusted balancing model:

- Concept 1: System-wide within-day obligations (ASB & IASB)
- Concept 2: Data method
- Concept 3: Smoothing
- Concept 4: Helper-causer function
- Concept 5: Cash-out end-of-day
- Concept 6: Data quality and No Punishment Principle

3.1 Concept 1: System-wide within-day obligations

In the following the rationale and description of the system-wide within-day obligations are described.

3.1.1 Rationale behind the concept

The current balancing model[5] is in overall terms described as a daily balancing model, with no within-day restrictions. The current concept is that every hour the expected system commercial balance (E(SCB)) for the entire gas day is calculated, based on nominations and expected offtake in Denmark/Sweden for all hours of the gas day.

The main rationale behind the current daily balancing model with no added restrictions, is the characteristics and parameters of the current physical system. In short, there are no commercial flow scenarios or situations, that cannot be handled in the physical system within-day, and thus there is no need for restricting shippers in their daily input-offtake during the gas day.

The balancing model has been subject to a number of additions and amendments since it was first implemented in October 2014, but the overall method has not been changed.

The implementation of the Baltic Pipe Project, enabling a gas flow from Norway through Denmark to Poland, will result in significant changes to the Danish transmission system, both in terms of flexibility and possible flow volumes.

One of the main consequences of this transition is that the daily balancing model cannot absorb all possible imbalances during a gas day, even though shippers are in balance end-of-day. This means that even in a normal situation, shippers can bring the system out of its physical boundaries during a gas day, potentially jeopardizing the system integrity, if the current daily balancing model continues without amendments.

This issue is well-known in other EU countries, and has been for many years, also before the Balancing Network Code was developed. TSO's such as Net4gas (Czech Republic), Gas Connect Austria and Fluxys (Belgium) are all characterized as transit systems, where the dominant flow directly enters and exits the system, and where the volumes for the domestic market is significantly lower than the transit volumes.

The Balancing Network Code includes clauses on within-day obligations, which were especially added, to accommodate the potential large imbalance challenges of transit systems during a

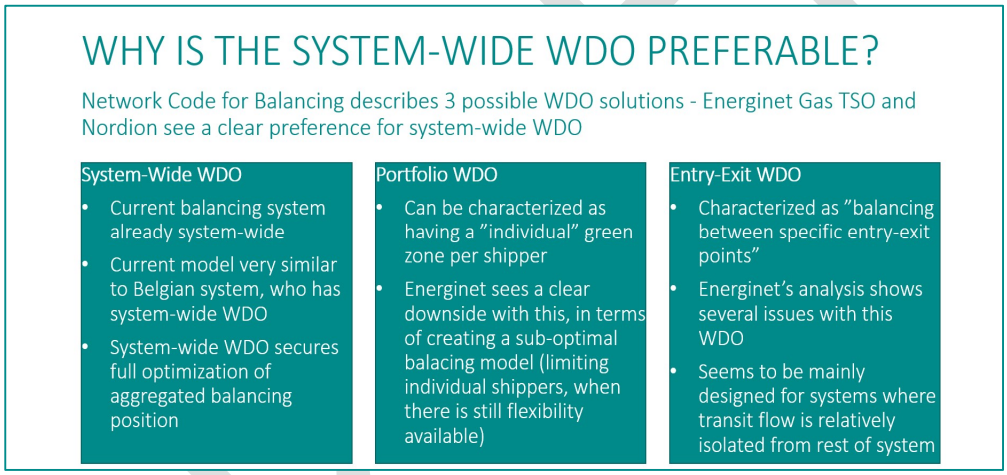
[5] Overall method implemented as of 1 October 2014

gas day, where the daily balancing timeframe is not sufficient in all normal flow scenarios. For the same reason, the 3 systems mentioned above have all implemented within-day obligations as add-on to the daily balancing regime.

For Energinet and Swedegas as BAM this gives a clear reasoning for including within-day obligations in the future balancing model system when the Baltic Pipe commences; the transit flow will potentially challenge the system integrity within-day, and within-day obligations is the specific mean to mitigate such a challenge.

Energinet and Swedegas will implement a system-wide within-day obligation[6], with hourly obligations throughout the gas day. As described in the figure below, there are a number of benefits in choosing the system-wide WDO:

- The current balancing system is already system-wide, so the system-wide WDO will require less changes than the two other possibilities.
- The current Danish-Swedish balancing model is very similar to the Belgian model, who has system-wide WDO's implemented.
- The system-wide approach secures the full optimization of the flexibility, and that the BAM only intervenes, when the aggregated balance is outside the limits.
- The Baltic Pipe is not implemented as a separate pipeline but will be fully integrated into the Danish transmission system.



Rationale for implementing system-wide Within-day Obligation, in comparison to other WDO possibilities in NC BAL. See also Q&A in Appendix 2 for further description.

Also, when Energinet first implemented the current green zone model, it was very much inspired by the balancing systems in the Netherlands (GTS) and Belgium (Fluxys). Energinet implemented a similar model, but without including the system-wide within-day obligation, which is common in both systems, as this was not required given the parameters of the Danish physical system at the time. Instead, the Estimated System Commercial Balance was implemented, to create the system wide daily balance.

3.1.2 Description of the concept

As in the current model, the green zone for the relevant gas day is calculated in the beginning of the gas day, at 06:45. The ASB is calculated and forwarded the first time at 07:05, for the first hour of the gas-day, based on the balance position for all shippers in the first hour. The second ASB is calculated shortly after 08:00, based on the accumulated balance position for all

[6] Balancing Network Code, Article 25 (1)

shippers in the first 2 hours of the gas day (position hour 1 + position hour 2). This continues every hour throughout the gas day, until the gas day ends at 06:00, where the ASB will include the full imbalance for the whole gas day (position hour 1 + position hour 2 +….position hour 24).

If the ASB is outside the green zone in any hour of the gas day, the BAM will notify the market, and will make a within-day trade during the following hour. The volume traded is equal to the difference between the ASB position and the relevant green zone limit, and the traded volume is then allocated pro-rata towards all shippers who are imbalanced in the same direction (who are causers), at the marginal trade price in that specific hour.

This means that the BAM can trade after each of the 24 hours during the gas day, the first time after hour 06:00-07:00, and the last time after hour 05:00-06:00.

At the end of the gas day, the BAM will cash-out all shippers as today. If the final ASB for the gas day (hour 05:00-06:00) ends outside the green zone, the volume between ASB position and the yellow zone limit will be traded in the same way as for all other hours of the gas day. After this last possible ASB trade and allocation of causers the remaining commercial imbalance will be equal to the System Commercial Balance (SCB), also known in the current model. The SCB will be cashed out the same way as in the current model. This means that the SCB will end within the green zone and adjustment step 2 is no longer needed. The adjustment step 2 is replaced by the trade response possibility by the BAM in the last hours of the gas day.

3.1.2.1 Accumulated System Balance (ASB)

The accumulated system balance (ASB) is a calculation of the accumulated and aggregated balance position of all shippers after each hour during the gas day.
The ASB is defined as:

- ASB = $\sum_{h=1}^{x} Entry$ - $\sum_{h=1}^{x} Exit$ - $\sum_{h=1}^{x} JEZ$ - $\sum_{h=1}^{x-1} CAP$ + $\sum_{h=1}^{x} SAP$,

; where data for Entry and Exit is known every hour via confirmed nominations, while JEZ is calculated every hour via MR data (city-gate flow) and directly connected sites in Denmark and Sweden. The data in CAP (Causer Allocation Point) is allocation of gas bought from (+) or sold to (-) causers due to ASB trades. The data in SAP (Smoothing Allocation Point) is a smoothing profile that will smooth the allocation per hour towards JEZ.

When ASB is long in yellow zone BAM will trade (sell). The sold volume will be bought from the causers and allocated to them at CAP (+, positive value).

When ASB is short in yellow zone BAM will trade (buy). The bought volume will be sold to the causers and allocated to them at CAP (-, negative value).

For the CAP point data is including hours up until and including hour x-1. For all other points data is including hours up until and including hour x.

The ASB will be calculated and published in the green zone view, the first time after the first hour in the gas day is finished (at 07:05) and is then published after every hour throughout the gas day, 24 times in total (23/25 times regarding daylight saving changes).

3.1.2.2 Individual Accumulated System Balance

The Individual Accumulated Shipper Balance (IASB) is a calculation of the accumulated balance position of each shipper after each hour during the gas day. The IASB is calculated to determine the accumulated imbalance of each Shipper and to be able to define who are helpers and causers in the specific hours during the gas day.

The IASB is defined as:

IASB = $\sum_{h=1}^{x} Entry\,(i)$ - $\sum_{h=1}^{x} Exit(i)$ - $\sum_{h=1}^{x} JEZ(i)$ - $\sum_{h=1}^{x} CAP(i)$ + $\sum_{h=1}^{x} SAP(i)$,

; where i is an individual shipper, and where Entry and Exit is known every hour via the shipper's confirmed nominations (including GTF and ETF); JEZ is calculated based on MR data, data for directly connected sites and data from the Danish and Swedish DSO's. CAP is the allocation of gas to/from the shipper as a causer due to ASB trades in hours up until and including hour x. SAP is the allocation of the individual smoothing profile that allocates gas to/from the shipper in hours up until and including hour x.

The IASB must be calculated and forwarded first time after the first hour of the gas day (at 07:40) and is then calculated and forwarded at XX:40 during every hour throughout the gas day, 24 times in total (23/25 times regarding daylight saving changes). The IASB is individual classified data and is forwarded to each shipper exclusively.

3.2 Concept 2: Data method

In the following, the rationale and description of the data method is described.

3.2.1 Rationale behind the concept

In the current model, data for the offtake at daily metered sites (DMS) and for the non-daily metered market (nDMS) for Denmark and Sweden is forwarded to the shippers 5 times during the gas day. With the WDO model, it will be necessary to determine the offtake every hour, to calculate the IASB per shipper, and thereby determine who are helpers and causers each hour.

Energinet and Swedegas have first assessed the possibility of estimating the hours in between the current within-day data deliveries 5 times a day, to test if the current level of data would be sufficient, when implementing a WDO model. The assessment showed that especially the first part of gas day is very difficult to predict, as the first DMS data is delivered around 13:30. The assessment also showed difficulty in predicting the hours without within-day data.

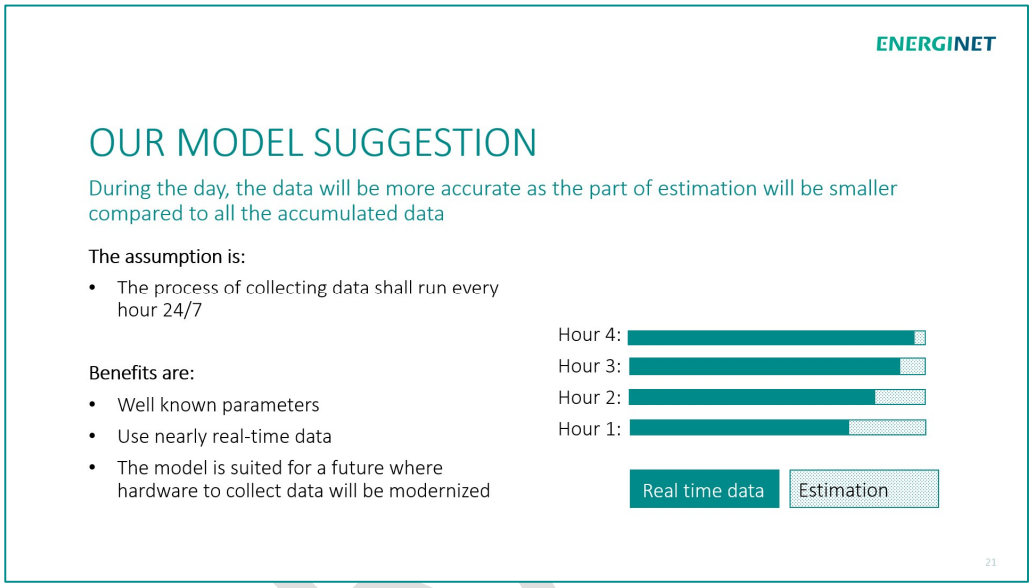
It was evaluated by Energinet and Swedegas that the current data level would not be sufficient, in supporting the WDO model, as most hours during the gas day would be hard to predict, especially regarding the hours before the first within-day data delivery.

During the Shipper Task Force meetings, Energinet and Swedegas presented the assessment of the current data level, and two alternative models, which have been developed and analyzed in cooperation with the Danish DSO Evida[7]. Based on the analysis by Energinet, Swedegas and Evida, and discussions at the Shipper Task Force, it was concluded to continue with a collection method, where as much data as possible is collected from the total group of DMS meters in Denmark and Sweden every hour.

[7] Slides and minutes from the Shipper Task Force can be found here: Developing the gas balancing model for implementation in 2022 | Energinet

The data method is described in more detail in 3.2.2 below. In short, the method is based on a significantly increased data collection frequency, where the DSO's in Denmark and Sweden will go from collection and delivery of DMS data 5 times a day, to continuous collection and delivery of DMS data 24 times a day (every hour).

Data is forwarded to the TSO's/BAM every hour at XX:20, but the DSO's continues the collection of data for the rest of the hour, as not all DMS meters can be collected in 20 minutes. The meters that are not collected will be estimated by the metering responsible party (DSO for DMS and TSO for MR). As the balancing position from hour to hour during the gas day is an accumulation of previous hours, the balance position during the gas day will be more and more accurate based on actual DMS and MR measurements, and less on estimates, for every hour we move forward into the gas day (see illustration below):



Details on the suggested data model

The DMS and MR data will be used to calculate the nDMS estimate, as a residual of the actual offtake minus the DMS data. The calculated nDMS estimate will be allocated to the shippers according to previous market shares.

To conclude, the collection of offtake data in the Joint Exit Zone (JEZ) will increase significantly, to support shippers in balancing their portfolio during the gas day in the WDO model, and to determine the correct helpers and causers in the specific hours, where the BAM must perform a yellow zone trade (see point 3.4 below).

3.2.2 Description of the concept

The DSO's will collect as much DMS data as possible in the first 20 minutes of an hour, starting with the largest and most unpredictable end-consumers. As not all meters can be collected during the first 20 minutes, the offtakes from each of the non-collected meters are estimated, and the total expected value (metered and estimated) per shipper is forwarded to the TSO's (Energinet and Swedegas) and then to the BAM.

The collection of data and the calculation of the IASB is based in the following timeline:

- The DSO's in Denmark and Sweden are continuously collecting measured data for the DMS costumers and RES productions.

- Every hour at XX:20, the BAM receives the DMS and RES data from Denmark and Sweden. The data is a mixture of collected measurements and estimations of non-collected measurements for the gas day until XX:00, per shipper
- Between XX:20 and XX:40, the BAM calculates the IASB per shipper, based on input data from all relevant input points, where all data is for all previous hours of the gas day.
- At XX:40, the BAM forwards the IASB to the individual shippers, where all input data are accumulated from all previous hours of the gas day.

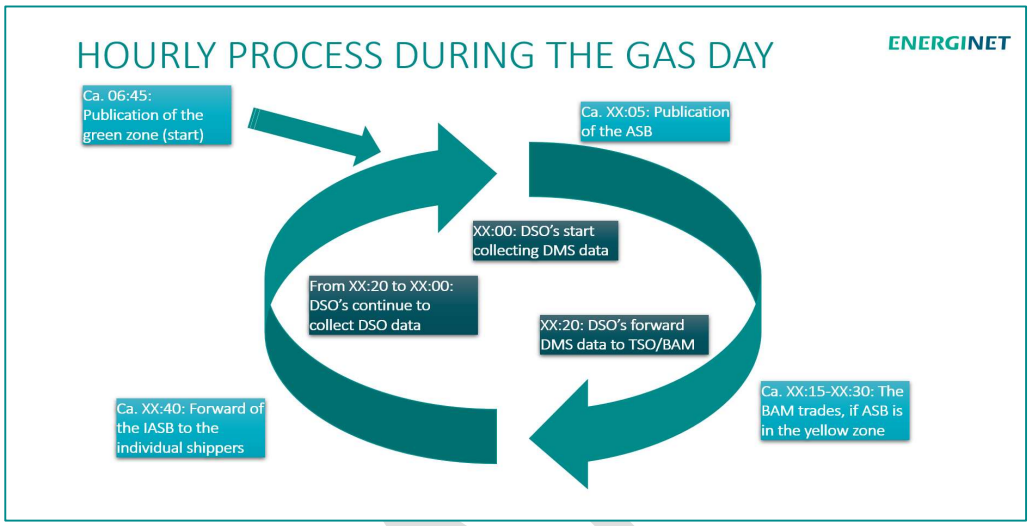


Illustration of hourly process

The Danish and Swedish DSO's are continuously collecting DMS/RES data. 20 minutes past every hour during the gas day (first time D 07:20 and last time D+1 06:20) the DSO's will send DMS/RES portfolio data to the BAM. To prepare this the DSO's will calculate the portfolios for each shipper from collected DMS/RES data and estimates for non-collected DMS/RES data.

nDMS portfolios in Denmark is calculated by the Danish TSO and then forwarded to the BAM. For the Swedish system nDMS portfolios is forwarded by Swedegas to the BAM.

3.3 Concept 3: Smoothing

In the following, the rationale and description of smoothing is described.

3.3.1 Rationale behind the concept

The offtake in the end-consumer market in Denmark and Sweden (JEZ) is, to some extent, a predictable profile, where the consumption of gas is higher especially in the beginning of the gas day, and lower during the night. This means that a shipper delivering gas to the end-consumer market will (ceteris paribus) have a shortage in the accumulated balance (IASB) during the whole gas day but may end up more or less balanced end-of-day. In today's balance model the shippers towards active in JEZ can enter the gas with a flat profile, without considering daily profile, as the E(SCB) always takes into account the full balancing of the gas day.

With the introduction of the within-day obligations, shippers towards JEZ will need to take the daily profile in the JEZ into account, as IASB will include the actual accumulated offtake up to present hour. This means that also the entry flow will need to be profiled in order to balance during the gas day. This is not the case today and will potentially incur extra costs for shippers towards JEZ, in terms of increased tariff costs for entry capacity, in order to deliver the profile

during the gas day. The green zone flexibility can to some extent be used to “flatten out” the profile, but this also includes a risk to these shippers, in case the ASB reaches the yellow zone.

Also, it is given that shippers toward the JEZ do not have the possibility to precisely balance their portfolio, as the offtake can never be exactly predicted.

To partly neutralize the downsides, Energinet and Swedegas suggests introducing smoothing as a new concept to the balancing model. Smoothing is a concept used in other WDO markets (such as in Belgium), to flatten out the natural demand profile, which becomes a factor because of the WDO. By introducing smoothing, some of the flexibility that would normally be part of the green zone, will be allocated directly to the part of the market that need to nominate a profiled input-offtake. This is not the case for shippers at all other points, where nomination = allocation, and therefore can be fully optimized in terms of balancing.

3.3.2 Description of the concept

For Shippers with JEZ portfolios, the BAM will perform a smoothing mechanism before the IASB is calculated, to flatten out the natural JEZ demand profile during the gas day. As illustrated in the graph below, this means that the variation due to the expected JEZ offtake profile, resulting the shipper being short during the gas day, everything else being equal, is “smoothed out” to some extent. The shipper is “allocated” a smoothing profile to compensate high-offtake during the day and less during night: The JEZ offtake profile and the smoothing profile together will result in a smoothed offtake profile:

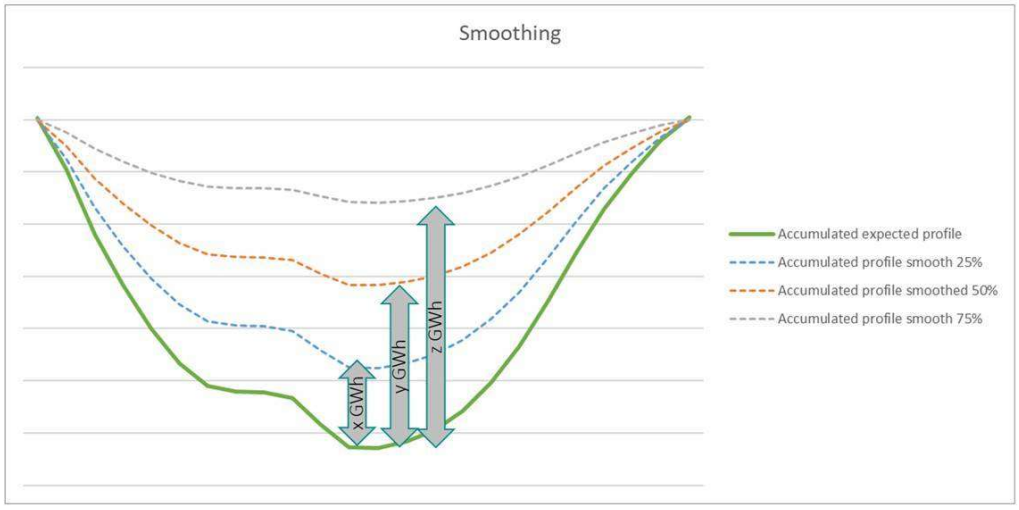
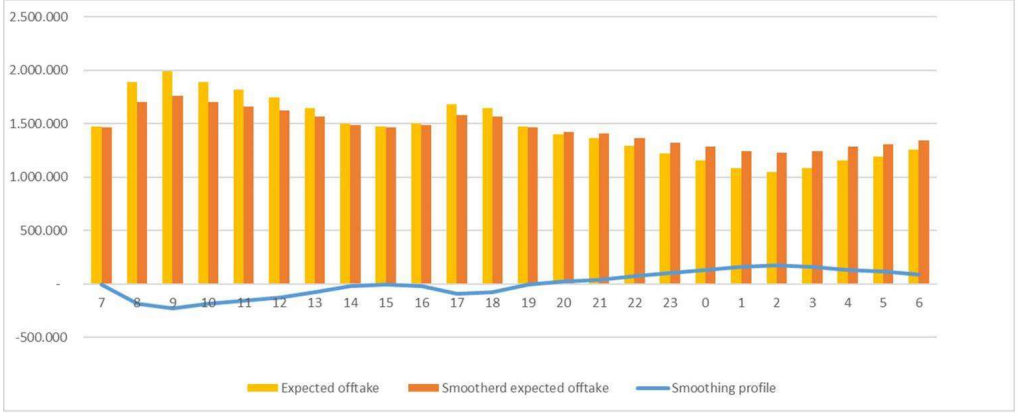


Illustration of smoothing model

An example of how the smoothing model flattens out the JEZ profile can be seen below:



Example of smoothed JEZ profile

The smoothing profile is calculated by the BAM and distributed to JEZ shippers before the gas day (via allocation) according to market shares and has the purpose (to some extent) to "flatten out" the natural offtake profile in JEZ.

The smoothing profile is calculated based on the following principles:

- Before the gas day a forecast of the whole JEZ's relative hourly distribution is generated.
- Before the gas day a maximal smoothed value (S-max) is decided. The S-max will be fixed for a period e.g., for a month or a season at a time
- The absolute smoothing method will decrease the size of the green zone by S-max (1-to-1)
- Based on these inputs, a smoothing profile is generated, that smoothes S-max when the accumulated offtake is expected to be highest (typically in the middle of the gas day)
- The smoothing profile is distributed per shipper active in JEZ, based on the market shares
- The individual shippers smoothing profile is then added to the shippers' balance per hour throughout the gas day, e.g., at a predefined point.

3.4 Concept 4: Helper-Causer function

In the following, the rationale and the concept behind the helper-causer model is described.

3.4.1 The rationale behind the concept

In the current model, the E(SCB) is an estimation of the expected daily imbalance position for the full gas day, calculated every hour. In case the E(SCB) is in the yellow zone, the BAM may trade, thereby creating a possible price signal for the shippers being in imbalance in the same direction (long or short) to change their position during the gas day, as the marginal price from all trades in the direction in question will be used as cash-out price for all shippers having an imbalance in the same direction.

There are two main characteristics that are worth noticing in terms of the current model:

- Shippers who are "causing" the expected end-of-day balance to be outside the green zone during the gas day, are not directly penalized at that point in time, and can avoid the penalty by changing position for the rest of the gas day
- This also means that shippers do not necessarily take action to avoid the E(SCB) to go out of the green zone, and might even wait for a price signal, before changing position. Thus, the current model does allow for taking "speculative" balancing positions during the gas day, that does not necessarily end up in a large imbalance end-of-day

As described under 3.1.1 above, Energinet and Swedegas will need to introduce within-day obligations, to ensure that shippers also balance their portfolio during the gas day. The helper-causer function is what makes the within-day obligation work in practice and is therefore an integrated part of the overall concept.

The main difference between the current E(SCB) model and the helper-causer model is that in the helper-causer model, there will be an immediate effect, when the ASB is outside the green zone, where the shippers causing the ASB to be outside the green zone in that specific direction, will be "bought-in" in that exact hour. And because of this immediate effect the helper-

causer model is expected to have preventive reaction from the shipper to prevent becoming causer and thereby helping the system before reaching the yellow zone.

This means that the within-day obligation will work in practice, by incentivizing shippers not to reach the yellow zone during the gas day, through an immediate action towards the causers. The helpers in the same hour will not be met by any action, as their position will not change.

3.4.2 Description of the concept

As described above, the ASB must be calculated every hour, and is published right after the gas hour ends in the green zone view. If the ASB is in the yellow zone, the BAM will trade in the within-day market a volume equal to or slightly higher (lowest amount possible to trade on platform is 1 MW) than the difference between the ASB position and the relevant green zone limit, and the traded volume is then allocated pro-rata towards all shippers who are imbalanced in the same direction (who are causers), at the marginal trade price in that specific hour illustrated below):

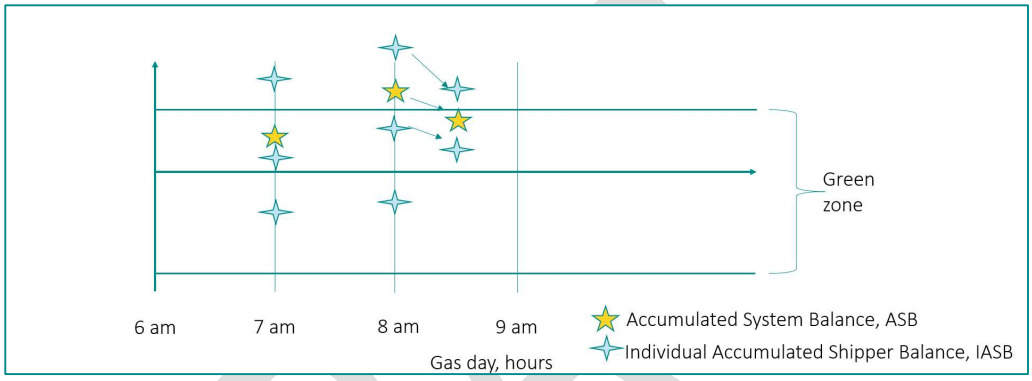


Illustration of Helper-Causer concept

The full traded volume will be included in the next published ASB. This is done via allocation of the traded volume to causers in the same hour as where the ASB was in yellow zone – it is allocated at the new CAP point. If the ASB is in yellow zone at 13:00 (ASB published 13:05), then the BAM will trade the amount on the exchange and allocate it to the causers (IASB) in the hour 12:00 to 13:00. Because the causers are allocated on the CAP point after the publishment of ASB these allocations will first be visible and included in the next calculation of ASB.

This also has the consequence that the ASB value that was causing a yellow zone trade can only be (re)calculated later on (for presentations and other purposes) by taking into account the allocation on CAP for that specific hour. The BAM will handle the ETF lead time (3 hours plus running hour) and the rest-of-day delivery. Because of the lead-time, yellow zone within-day trades made after 02:00 a.m, will be traded for the next gas day. This means that the gas is not delivered before the next gas day but will still be allocated to the causer in that specific hour.

The anticipated timeline for the yellow zone trades is as follows:

- At XX:05, the ASB is calculated and published (first time D 07:05 and last time D+1 06:05)
- If the ASB is outside the green zone, the shippers market participants will be notified at the same time (via text, mail and/or other)
- Between XX:15 and XX.30, the BAM performs the trades
- At XX:40 the full traded amount is allocated to the causers, and is thereby fully included in the IASB which is then sent to the respective shippers

- At XX:40, the marginal price of all trades for that specific hour is published on the same website page as where the green zone overview is
- At the next XX:05, the traded amount will be included in the ASB

The trading process can be performed between 0 and 24 times a day (23/25 times regarding daylight saving changes). Each hourly trade will be issued to the relevant shippers (causers) via the balancing invoice. The yellow zone trades are "closed" after the balancing invoicing after the month and are not subject to 1st and 2nd correction rounds.

Calculation of ASB and IASB is done right after the hour and recalculation will not be performed. This means that trades and CAP-allocations of causers made during the gas day will not be changed.

3.5 Concept 5: Cash-out end-of-day

In the following, the rationale and concept of cash out is described.

3.5.1 The rationale behind the concept

The general cash-out concept will continue as today, in accordance with NC BAL. However, as described in 3.4.2 above, the trading in the yellow zone will be possible in all hours throughout the gas day, including the last hour of the gas day, whereas the last trading window in the current model ends at 23:15.

A consequence of the extended trading hours is that the adjustment step 2 price and method is removed from the balancing model. The adjustment step 2 price was included in the original balancing method from 2014, to compensate for the lack of trading windows during night[8]. Thus, the function of the adjustment step 2 is to give incentive to keep the system balance during night, also if no marginal price was set during the gas day.

As Energinet and Swedegas now introduce trading at night, and also trade the last hour of the gas day, the rationale and function of the adjustment step 2 is gone. By removing the adjustment step 2 from the balancing model, the pricing function in terms of cash-out will be easier and simpler, operating with just 2 possible balancing prices instead of 3 (either adjustment price or marginal price, see description below).

3.5.2 Description of the concept

As today, all shippers are fully cashed out to zero end-of-day. The cash out is performed after the last possible yellow zone trade and possible allocation of causers on CAP for the last hour of the gas day. The cash-out amount for each shipper is calculated from the shipper imbalance in the end of the gas day. The end-of-day shipper position is subject to change in the valid allocation after the month and in the correction rounds, which is not the case for the IASB during the gas day. To distinguish, the end-of-day balance is named Individual Shipper Commercial Balance (ISCB).

The following prices are used for cash-out:

- For shippers that are long end-of-day, the BAM buys the gas at the lowest price of:
    - The neutral gas price minus a small adjustment (today 0.5 per cent), or

[8] Energinet.dk's new commercial balancing model – method approval: https://forsyningstilsynet.dk/gas/afgoerelser/energinetdk-s-kommercielle-balanceringsmodel

    - The lowest marginal price of all the BAM's yellow zone trades during the gas day in the long direction (if any)
- For shippers that are short end-of-day, the BAM sells the gas at the highest price of:
    - The neutral gas price plus a small adjustment (today 0.5 per cent), or
    - The highest marginal price of all the BAM's yellow zone trades during the gas day in the short direction (if any)

The marginal cash-out prices (long and short) will be published and updated during the gas day.

As the new model include possible trade in every hour throughout the gas day, the adjustment step 2 will be deleted, as this was implemented as a replacement for the lack of trading at night in the current balancing model, as described above.

3.6 Concept 6: Data quality and No Punishment Principle

In the following, the rationale and concept of the No Punishment Principle is described

3.6.1 Rationale behind the concept

The introduction of the WDO model relies on a certain data quality on the JEZ offtake, to determine the right helpers and causers every hour during the gas day, both in terms of data from DSO's in Denmark and Sweden, but also data on the TSO level. If the data quality is poor or if the required data is not delivered in time, this may impact on who are helpers and causers, and at which magnitude. It may also impact the general daily balancing for shippers delivering towards JEZ.

In short, if the data that the BAM forwards to the market does not live up to a certain quality, shippers towards the JEZ may be unfairly punished for imbalances they did not cause themselves, e.g., because they were misplaced as causers, or because they were following misguiding data.

Energinet and Swedegas are working closely together with the Danish and Swedish DSO´s to ensure a high level of data quality and data security, which includes assessment of the current measurement and communication equipment, and possible need for investments in new equipment. It also includes assessment of needed control mechanisms, to ensure that e.g., IT failures are reported and handled ASAP, and fallback data mechanisms that ensure that fallback data and procedures are in place, in case of wrong or missing data.

To ensure the implementation of a fair and trustworthy model, in terms of determining the right helpers and causers, and in terms of signaling the right end-of-day balances, Energinet and Swedegas will introduce a No Punishment Principle (NPP). This is to ensure that shippers towards JEZ do not pay a punishment price for imbalances that were caused because of a low level of data quality from the BAM.

3.6.2 Description of the concept

The NPP concept will be introduced for the JEZ offtake both in terms of yellow zone trades and in terms on the end-of-day balance, as described separately below.

3.6.2.1 NPP for yellow zone trades

The NPP for the yellow zone trades have the following general characteristics:

- The ASB, IASB and causer volume calculated during the gas day will not be recalculated.
- The ASB, IASB and causer volume is based on data from MR-data from TSO's and DMS-data from DSO's
- The NPP will be calculated after the month on the basis on the same calculation method and data to determine the accumulated hourly volumes on JEZ
- When MR-data and DMS-data is valid after the month, the BAM will recalculate the volumes for each shipper on JEZ and determine if causers were allocated a wrong volume during the gas day at the CAP point.
- The wrong volume will not be corrected for the ASB and IASB. The allocations on CAP point will not change.
- The NPP will have effect on the price for causer volumes, so that wrong-causer volumes will be charged with a market price (e.g., the Danish spot index price registered at EEX).
- The NPP will not be recalculated during the correction rounds and is therefore considered as final after the month.

Based on these characteristics, shippers will only pay the marginal price as causer, for volumes that is registered both on the preliminary calculation during the gas day and on the final calculation after the gas month. For all causer volumes that are only registered on the preliminary calculation during the gas day, or after the gas month, will be allocated at a market price (e.g., the Danish spot index price registered at EEX).

These principles give the following possible outcomes:

1. If causer volume on preliminary data equals causer volume on valid data = marginal trade price for full volume for that specific hour (see also case 1 in example below).
2. If causer volume on preliminary data is lower than causer volume on valid data = marginal trade price for full volume of the preliminary allocation (see also case 2 in example below).
3. If causer volume on preliminary data is higher than causer volume on valid data = Marginal price for volume on valid data and market price for the rest (see also case 3 in example below).
4. A causer based on the preliminary data that is determined as helper based on the valid data = market price for full volume (see also case 4 in example below).
5. A helper based on the preliminary data that is determined as causer based on the valid data = no causer volume.
6. A helper based on the preliminary data that is determined as helper based on the valid data = no causer volume.

The following example illustrates how the principle will work in practice:

- The ASB is in the yellow zone in this specific hour, and a shipper delivering gas to the JEZ is determined to be causer by 100 units, based on the pro-rata calculation
- The following cases illustrates what happens in the 4 first outcomes described above, where a shipper is determined as causer during the gas day:
    - **Case 1:** after the month, the shipper's JEZ volume is equal to the preliminary volume = the shipper's causer volume of 100 units is settled at the marginal price
    - **Case 2:** after the month, the shipper's JEZ volume is increased with 50 units = the shipper's causer volume of 100 units is settled at the marginal price

- Case 3: after the month, the shipper's JEZ volume is reduced with 30 units = the shipper's causer volume of 100 units is settled at the marginal price for 70 units and the market price for 30 units
- Case 4: after the month, the shipper's JEZ volume is reduced, so that the causer volume would have been reduced to 0 units = the shippers causer volume of 100 units is settled at the market price

3.6.2.2 NPP for end-of-day cash-out

The NPP for the end-of-day cash-out have the following general characteristics:

- The NPP will be calculated individually based on the difference between the shipper's preliminary JEZ volume after the gas day and final volume towards JEZ.
- The NPP for the end-of-day cash out differs from the NPP for yellow zone trades, in terms of that the total imbalance volume may change.
- The NPP will have effect on the price for cash-out volumes, so that wrong cash-out volumes will be charged at a market price.
- The NPP for the cash-out volumes is also done in the correction~~s~~ rounds and is final on the basis of the valid data after 2nd correction.

These principles give the following possible outcomes:

1. If the valid JEZ volume is higher than the preliminary JEZ volume, and the shipper is already short, then the total cash-out volume is **increased** (see case 1 below)
2. If the valid JEZ volume is higher than the preliminary JEZ volume, and the shipper is already long, then the total cash-out volume is **reduced** (see case 2 below)
    a. And if the difference is larger than the total cash-out volume, the shipper will go from being long to short (see case 2(a) below)
3. If the valid JEZ volume is lower than the preliminary JEZ volume, and the shipper is already long, then the total cash-out volume is **increased** (see case 3 below)
4. If the valid JEZ volume is lower than the preliminary JEZ volume, and the shipper is already short, then the total cash-out volume is **reduced** - (see case 4 below)
    a. And if the difference is larger than the totalcash-out volume, the shipper will go from being short, to being long. (see case 4(a) below)

The following cases illustrates how the principle will work in practice, based on the outcomes described above:

- Case 1: based on the valid JEZ volume compared with the preliminary JEZ volume the cash-out volume is increased from minus 1000 units to minus 1100 units
    - The shipper is settled at 1000 units at the relevant imbalance price (step 1 or marginal price) and 100 units at a market price
- Case 2: based on the valid JEZ volume compared with the preliminary JEZ volume the cash-out volume is reduced from plus 1000 units to plus 900 units
    - The shipper is settled at 900 units at the relevant imbalance price (step 1 or marginal price)
- Case 2(a): based on the valid JEZ volume compared with the preliminary JEZ volume the cash-out volume is reduced from plus 1000 units to minus 100 units
    - The shipper is settled at 100 units at a market price
- Case 3: based on the valid JEZ volume compared with the preliminary JEZ volume the cash-out volume is increased from plus 1000 units to plus 1100 units
    - The shipper is settled at 1000 units at the relevant imbalance price (step 1 or marginal price) and 100 units at a market price

- Case 4: based on the valid JEZ volume compared with the preliminary JEZ volume the cash-out volume is reduced from minus 1000 units to minus 900 units
    - The shipper is settled at 900 units at the relevant imbalance price (step 1 or marginal price)
- Case 4(a): based on the valid JEZ volume compared with the preliminary JEZ volume, the cash-out volume is reduced from minus 1000 units to plus 100 units
    - The shipper is settled at 100 units at a market price

4. Consequences of the method for shippers

4.1 General view

As argued throughout this application, Energinet and Swedegas sees WDO's as a necessary and correct measure to include into the balancing model, based on the changed marked characteristics due to the Baltic Pipe implementation. This of course will mean that shippers will face a new obligation to balance their portfolios within the boundaries of the green zone also during the day, which is not the case with the current model.

With the implementation of WDO's, the major change for shippers compared to today's model is that balancing actions (yellow zone trades) performed by the BAM during the gas day, will have an immediate effect on the causers in the specific hour. In a nutshell, this is what will make the obligation to balance during the gas day work in practice, by incentivizing shippers to react, before reaching the yellow zone, and thereby the intervention by the BAM.

However, it is important to notice that shippers also need to react within-day in the current model, to steer their daily balance position (via renominations and trades), also outside normal office hours. So, the introduction of WDO's does not require a new "burden" on shippers, in terms of steering their portfolio within-day, but changes when the shipper should react:

- In today's model, there is no direct consequence for shippers causing the E(SCB) to be in the yellow zone. This means that shippers most often can wait with their reaction, until after the BAM has made a trade in the yellow zone
- With WDO's, shippers will be "punished" instantly. To avoid this, shippers will have to have a more proactive approach towards balancing, reacting before the ASB reaches the yellow zone.

In terms of the balancing model, the Danish gas market took a large step in October 2014, when the NC BAL was first implemented, which included Sweden from April 2019, especially in terms of the need to take balancing actions during the gas day, which is a fundamental part of the mandatory NC BAL rules. In that sense, Energinet and Swedegas generally considers the inclusion of WDO's as a smaller change, in terms of impact for shippers´ processes, IT and staff.

To generally conclude, the introduction of WDO's is expected to affect when and how shippers will react in terms of balancing their portfolios during the gas day, but the need to react during the gas day is already an integrated part of the current balancing model.

It should also be mentioned that in overall terms the Baltic Pipe is expected to have a large positive impact on the Danish gas market, in terms of lower tariffs and increased liquidity, which should be seen in contrast to possible downsides implementing WDO's.

4.2 Consequences for different types of shippers

For shippers that do not deliver gas towards the JEZ (transit customers and traders), the inclusion of WDO's is not considered to have great impact, as shippers can control their balancing directly via renominations at the entry/exit points. WDO's might give some shippers new opportunities in terms of trading.

For shippers towards JEZ, the inclusion of WDO's will have a significant impact, both in terms of the need for data and data quality, and in terms of balancing the offtake profile during the gas day. To mitigate these consequences, Energinet and Swedegas will:

- Increase the data frequency and data quality, in corporation with the Danish and Swedish DSO's (in accordance with 3.2 above)
- Introduce smoothing, as a mean to mitigate the economical and practical downsides of the WDO's (in accordance with 3.3 above)
- Introduce a No Punishment Principle (NPP), to reduce the risk of being penalized for imbalances caused by an insufficient data quality level towards JEZ (in accordance with 3.6 above).

Especially for smaller shippers towards the JEZ, these mitigations will be important, to reduce the consequences of introducing WDO's.

5. Public consultation (draft)

This draft method application is in public consultation from 12 April 2021 and until 10 May 2021 (4 weeks).

The current draft application has been developed by Energinet and Swedegas based on input from market participants. There has been an extensive dialogue with the market's participants through:

- Shippers' Forums
- A number of User Groups on the balance model 2022
- Gasmarknadsrådet (arranged by Swedegas in Sweden)
- Shipper Task Force meetings in November and December 2020, discussing the data method to support the Balancing model
- Bilateral meetings with markets participants
- Energinet and Swedegas answering questions from market participants via Q&A at Energinet's homepage

All relevant slides and minutes from User Groups and Shipper Task Force and the Q&A can be found via the following link: Developing the gas balancing model for implementation in 2022 | Energinet

This part will be further updated, after the public consultation in April/May 2021.

6. Fulfillment of NC BAL Article 24-28 (Within-day obligations)

CHAPTER VI

WITHIN DAY OBLIGATIONS

Article 24

General provisions

1. A transmission system operator is only entitled to apply within day obligations in order to incentivise network users to manage their within day position in view of ensuring the system integrity of its transmission network and minimising its need to undertake balancing actions.

- ***Energinet and Swedegas:*** *As described in 2.1 above, one of the main consequences of this transition is that the daily balancing model cannot absorb all possible imbalances during a gas day, even though shippers are in balance end-of-day. This means that even in a normal situation, shippers can potentially jeopardize the system integrity and security of supply, if the current daily balancing model continues without amendments.*
- *As a consequence of this, Energinet and Swedegas will implement a system-wide within-day obligation, with hourly restrictions throughout the gas day, as an add-on to the daily balancing system.*
- *The main benefits of choosing the system-wide within-day obligation are:*
    - *The current balancing system is already system-wide, so the system-wide WDO will require less changes than the two other possibilities.*
    - *The current Danish-Swedish balancing model is very similar to the Belgian model, who already has system-wide WDO's implemented.*
    - *The system-wide approach secures the full optimization of the flexibility, and that the BAM only intervenes, when the aggregated balance is outside the limits.*
    - *The Baltic Pipe is not implemented as a separate pipeline but will be fully integrated into the Danish transmission system.*
- *This issue is well-known in other EU countries, and has been for many years, also before the Balancing Network Code was developed. TSO's such as Net4gas (Czech Republic), Gas Connect Austria and Fluxys (Belgium) are all characterized as transit systems, where the dominant flow directly enters and exits the system, and where the volumes for the domestic market is significantly lower than the transit volumes.*
- *The Balancing Network Code includes clauses on within-day obligations, which were especially added, to accommodate the potential large imbalance challenges of transit systems during a gas day, where the daily balancing timeframe is not sufficient in all normal flow scenarios. For the same reason, the 3 systems mentioned above have all implemented within-day obligations as add-on to the daily balancing regime.*
- *For Energinet and Swedegas this gives a clear reasoning for including within-day obligations in the future balancing system when the Baltic Pipe commences; the transit flow will potentially challenge the system integrity within-day, and within-day obligations is the specific mean to mitigate such a challenge.*

2. Where the transmission system operator is required to provide information to network users to enable them to manage their exposures associated with within day positions, it shall be provided to them regularly. Where applicable, this information shall be provided upon a request submitted by each network user once.

- ***Energinet and Swedegas:*** *In accordance with part 3.2 above, Energinet and Swedegas will increase the number of within-day data updates of JEZ offtake data, from 5 times a day, to every hour during the gas day, in corporation with the Danish and Swedish distribution system operators.*
- *Energinet and Swedegas will continue to update the aggregated balancing position every hour throughout the gas day (the ASB), and single shippers are informed of their individual positions (the IASB)*

Article 25

Types of within day obligations

There are three types of within day obligations, each incentivising the network user for a specific objective as set out in this Article:

(1)System-wide within day obligation

shall be designed to provide incentives for network users to keep the transmission network within its operational limits and shall set out the following:

(a) the operational limits of the transmission network within which it has to remain;

(b)the actions the network users can undertake to keep the transmission network within the operational limits;

(c)the consequential balancing actions of the transmission system operator when the operational limits of the transmission network are approached or reached;

(d)the attribution of costs and/or revenues to the network users and/or consequences on the within day position of these network users resulting from balancing actions undertaken by the transmission system operator;

(e)the related charge which shall be based on the individual within day position of the network user.

- ***Energinet and Swedegas:***
- *(a): the green zone is informed to market participants in the beginning of each gas day*
- *(b): it is clear from the market model, which tools market participants have (within-day bookings and renominations at border points, trades, renominations at storages a.s.f.)*
- *(c): the BAM will trade in the yellow zone on the within-day market at EEX for the Danish/Swedish market area, in accordance with part 3.4 above*
- *(d): the helper-causer function and the consequence for causers when trading in the yellow zone is described in part 3.4 above*
- *(e): causers in a specific hour are met with the marginal price of all trades performed by the BAM, in accordance with part 3.4 above*

(2)Balancing portfolio within day obligation

shall be designed to incentivise network users to keep their individual position during the gas day within a pre-defined range and shall set out the following:

(a)for each balancing portfolio the range within which this balancing portfolio has to stay;

(b) how the range referred to above is determined;

(c)the consequences for network users not staying within the defined range and, where appropriate, details of how any corresponding charge is derived;

(d)the related charge which shall be based on the individual within day position of the network user.

- ***Energinet and Swedegas:*** *Non-applicable, as System Wide WDO is implemented*

(3)Entry-exit point within day obligation

shall be designed to provide incentives for network users to limit the gas flow or the gas flow variation under specific conditions at specific entry-exit points and shall set out the following:

(a) the limits in the gas flow and/or the gas flow variation;

(b)the entry and/or exit point or groups of entry and/or exit points to which such limits apply;

(c) the conditions under which such limits shall apply;

(d) the consequences of not complying with such limits.

This obligation is additional to any other agreements with final costumers containing, amongst other things, localised specific restrictions and obligations regarding the physical gas flow.

- ***Energinet and Swedegas:*** *Non-applicable, as System Wide WDO is implemented*

Article 26

Requirements for within day obligations

1. The transmission system operator may propose to the national regulatory authority a within day obligation or an amendment thereof. It may combine features of the different types described in Article 25 provided the proposal meets the criteria set out in paragraph 2. The transmission system operator's right of proposal is without prejudice to the right of the national regulatory authority to take a decision on its own initiative.

- ***Energinet and Swedegas:*** *method application to implement system wide within-day obligations as supplement to the current balancing model, in accordance with Article 25(1) above*

2. Any within day obligation shall meet the following criteria:

(a)a within day obligation and related within day charge, if any, shall not pose any undue barriers on cross-border trade and new network users entering the relevant market;

- ***Energinet and Swedegas:*** *As argued in 4.1 above, the Danish gas market took a large step in October 2014, when the NC BAL was first implemented, (included Sweden from April 2019), especially in terms of the need to take balancing actions during the gas day, which is a fundamental part of the mandatory NC BAL rules. In that sense, Energinet and Swedegas generally considers the inclusion of WDO's as a smaller change, in terms of impact for shippers´ processes, IT and staff.*
- *As discussed in 4.2 above, shippers that do not deliver gas towards the JEZ (transit customers and traders), the inclusion of WDO's is not considered to have great impact, as shippers can control their balancing directly via renominations at the entry/exit points. WDO's might give some shippers new opportunities in terms of trading. For shippers towards JEZ, the inclusion of WDO's will have a significant impact,*

both in terms of the need for data and data quality, and in terms of balancing the offtake profile during the gas day. These impacts are mitigated through the increase of data frequency, smoothing and the No Punishment Principle

- *Especially for new smaller shippers towards the JEZ, these mitigations will be important, to reduce the consequences of introducing WDO's.*

(b)a within day obligation shall only be applied where the network users are provided with adequate information before a potential within day charge is applied regarding their inputs and/or off-takes and have reasonable means to respond to manage their exposure;

- ***Energinet and Swedegas:*** *The frequency of within-day data will increase from 5 times to every hour during a gas day, both in order for the WDO to function, but also in order for shippers towards JEZ to balance their portfolio*
- *In case of wrong or missing data, Energinet and Swedegas will implement a No Punishment Principle, in line with part 3.6 above*

(c)the main costs to be incurred by the network users in relation to their balancing obligations shall relate to their position at the end of the gas day;

- ***Energinet and Swedegas:*** *The BAM will continue to cash-out all shippers end-of-day to zero.*
- *In case of yellow zone trades, the BAM will trade the amount between the ASB and the green zone and allocate the amount to the causers in that hour*
- *As the yellow zone trade is only for the amount between the ASB and the green zone, and only for causers (in accordance with part 3.4 above), whereas the cash-out is for the full imbalance amount for all shippers, the main costs incurred will be end-of-day*

(d)to the extent possible, within day charges shall be reflective of the costs of the transmission system operator for the undertaking of any associated balancing actions;

- ***Energinet and Swedegas:*** *Without the implementation of WDO, the BAM would need to implement a number of non-market-based tools, which can only be activated in an Emergency situation, and tools where only 1 or very few market participants can sell a service, which will potentially increase the costs of balancing.*
- *By using the marginal price in a specific hour as within-day charge, the BAM ensures the maximum number of buyers/sellers, and thereby reduces the risk of buying services in the market, where competition is low.*
- *Also, by using the market price traded in the specific hour must be considered as cost reflective, in terms of the cost of balancing for that specific point in time, and the cost is directly transferred to the causing shipper*

(e)a within day obligation will not result in network users being financially settled to a position of zero during the gas day;

- ***Energinet and Swedegas:*** *The within-day trade will only be applicable to the amount between the ASB and the relevant green zone limit, in accordance with part 3.4 above, which is never equal to zero. It is therefore not possible in the suggested WDO model to financially settled to zero during the gas day*

(f)the benefits of introducing a within day obligation in terms of economic and efficient operation of the transmission network outweigh any potential negative impacts thereof, including on liquidity of trades at the virtual trading point.

- ***Energinet and Swedegas:*** *First, we do not see any negative impact of implementing the WDO model in terms of liquidity, as the BAM will continue to use the within-day market for balancing actions.*
- *Potentially, the liquidity may even increase, as the nature of the WDO may incur a different within-day behavior during the gas day, with more actions needed during the gas day by shippers*
- *Also, as described in point (d) above, Energinet and Swedegas clearly sees a benefit in introducing the WDO model, in comparison to possible non-market based or low-competitive alternatives*
- *The downside of implementing the WDO is that the market looses some of the freedom during the gas day compared to todays balancing model, with no within-day obligations, but this can potentially also increase liquidity, as shippers may need to take more balancing actions during the gas day*

3. The transmission system operator may propose different within day obligations for distinct categories of entry or exit points with the aim to provide better incentives for different categories of network users in order to avoid cross subsidies. The transmission system operator's right of proposal is without prejudice to the right of the national regulatory authority to take a decision on its own initiative.

- ***Energinet and Swedegas:*** *only application for system-wide within-day obligation*

4. The transmission system operator shall consult stakeholders, including the national regulatory authorities, the affected distribution system operators and transmission system operators in adjacent balancing zones, on any within day obligation it intends to introduce, including the methodology and assumptions used in arriving at the conclusion that it meets the criteria set out in paragraph 2.

- ***Energinet and Swedegas:*** *in general, most relevant stakeholders have been consulted through User Groups, Shipper Task Force meetings and bilateral meetings. All relevant stakeholders mentioned in this Article 26(4) are part of the draft method application consultation*

5. Following the consultation process, the transmission system operator shall produce a recommendation document which shall include the finalised proposal and an analysis of:

(a)the necessity of the within day obligation, taking into account the transmission network's characteristics and the flexibility available to the transmission system operator through purchase and sale of short term standardised products or use of balancing services in accordance with Chapter III;

- ***Energinet and Swedegas:*** *As described in part 3.1 above, and in the answer to Article 26.2 (d) above, Energinet and Swedegas sees a WDO model as a necessary measure, as the alternative measures would primarily be non-market based, and therefore only applicable in Emergency*

- *By introducing WDO's, Energinet and Swedegas ensures implementing competitive and market based measures, to give market participants the right incentives, in order to avoid crisis situations based on market behavior*
-

(b)the information available to enable network users to manage in a timely manner their within day positions;

- ***Energinet and Swedegas:*** *In general, the BAM will continue to inform market participant of their current balance position every hour throughout the gas day*
- *As described in part 3.2 above, the BAM will increase the data frequency from 5 times a day to every hour during the gas day, in terms of the single shippers JEZ offtake*

(c)the expected financial impact on network users;

- ***Energinet and Swedegas:*** *In general, the introduction of the WDO model is not expected to significantly increase the direct financial impact for shippers to balance.*
- *As described in part 4 above and in answer to 26.2 (a), the introduction of WDO's is considered a relatively small step, compared to when marked based balancing was first introduced in October 2014, in terms of the within-day operations by shippers (such as processes, IT costs, operating throughout the whole gas day).*
- *With the implementation of WDO's, there is a potential indirect negative impact for shippers transporting gas towards the JEZ, in terms of need of profiling their entry input during the gas day.*
- *This is a difference compared to the current model, where shippers towards JEZ can nominate a flat entry profile, as balancing is only end-of-day.*
- *The green zone will provide the shippers towards JEZ some flexibility in terms of their within-day profiling, but there is a potential higher cost in terms of higher tariff costs for entry capacity and/or higher costs for storage, to manage the within-day balancing position, due to the natural offtake profile in JEZ.*
- *To reduce this impact, and thereby also the potential financial impact, Energinet and Swedegas suggests the implementation of the smoothing concept, as described in part 3.3 above.*

(d)the effect on new network users entering the relevant market, including any undue negative impact thereon;

- ***Energinet and Swedegas:*** *As described in point 4 above and in answer to 26.2 (a), the introduction of WDO's is considered as a small step, compared to when marked based balancing was first introduced in October 2014, in terms of the within-day operations by shippers (such as processes, IT costs, operating throughout the whole gas day).*
- *As discussed in 4.2 above, shippers that do not deliver gas towards the JEZ (transit customers and traders), the inclusion of WDO's is not considered to have great impact, as shippers can control their balancing directly via renominations at the entry/exit points. WDO's might give some shippers new opportunities in terms of trading. For shippers towards JEZ, the inclusion of WDO's will have a significant impact, both in terms of the need for data and data quality, and in terms of balancing the offtake profile during the gas day. These impacts are mitigated through the increase of data frequency, smoothing and the No Punishment Principle*
- *Especially for new smaller shippers towards the JEZ, these mitigations will be important, to reduce the consequences of introducing*

(e)the effect on cross-border trade, including the potential impact on balancing in adjacent balancing zones;

- ***Energinet and Swedegas:*** *The Danish-Swedish balancing area and volumes will generally relatively small compared to the volumes in both future relevant adjacent balancing zones, also after Baltic Pipe is implemented (Trading Hub Europe in Germany and the Polish H-gas balancing zone).*
- *Thus, Energinet and Swedegas considers the implementation of WDO's in JBZ will have limited or no impact on the adjacent balancing zones, due to market seizes alone.*
- *Also, Energinet and Swedegas has not identified any potential negative impact on cross-border trading; the introduction of WDO's might even have a positive impact of within-day trading cross-border.*

(f)the impact on the short term wholesale gas market, including the liquidity thereof;

- ***Energinet and Swedegas:*** *The introduction of Baltic Pipe itself has the potential to have a significant positive impact on liquidity on the Danish-Swedish gas market in general.*
- *Looking isolated at WDO's this may have a positive impact on the within-day liquidity, as shippers may need to change their within-day balancing position more often than today.*

(g)the non-discriminatory nature of the within day obligation.

- ***Energinet and Swedegas:*** *In general, as it is the system-wide WDO which will be implemented, all shippers will meet the same obligations, in terms of balancing their portfolio.*
- *As today, shippers towards JEZ are a different segment when it comes to balancing, as the exact allocation of gas is not known during the gas day.*
- *All shippers within the JEZ segment are treated equally, also when the WDO's are implemented*
- *The shippers towards JEZ will experience some differences in terms of balancing within-day and in terms of profiling their entry due to WDO's, that are not relevant for other types of shippers*
- *To reduce the impact of these differences, Energinet and Swedegas will increase the frequency of within-day data (from 5 to every hour during the gas day), will introduce smoothing and No Punishment Principle*

6. The transmission system operator shall submit the recommendation document to the national regulatory authority for the approval of the proposal in accordance with the procedure set out in Article 27. In parallel, the transmission system operator shall publish this recommendation document, subject to any confidentiality obligations that it may be bound by, and send it to ENTSOG for information.

- ***Energinet and Swedegas:*** *this method application can be considered as the official recommendation document, and is published on Energinets and Swedegas websites, and has been forwarded to ENTSOG.*

Article 27

National regulatory authority decision making

1. The national regulatory authority shall take and publish a motivated decision within six months following the receipt of the complete recommendation document. In deciding whether to approve the proposed within day obligation, the national regulatory authority shall assess whether this within day obligation meets the criteria set out in Article 26(2).

- ***Energinet and Swedegas:*** *see analysis of Article 26(2) above*

2. Before taking the motivated decision the national regulatory authority shall consult with the national regulatory authorities of adjacent Member States and take account of their opinions. The adjacent national regulatory authority(-ies) may seek an opinion from the Agency in accordance with Article 7(4) of Regulation (EC) No 713/2009 on the decision referred to in paragraph 1.

- ***Energinet and Swedegas:*** *part of decision by Danish Utility Regulator and Swedish Energy Markets Inspectorate*

Article 28

Existing within day obligations

Where the transmission system operator has within day obligation(s) at the date of entry into force of this Regulation, within six months from such date this transmission system operator shall follow the process set out in Article 26(5) to (7) and shall submit the within day obligation(s) to the national regulatory authority for approval in accordance with Article 27 to continue its (their) use.

- ***Energinet and Swedegas:*** *Non-applicable, only relevant in relation to NC BAL entering into force*

7. Appendix 1: Changes to the Rules for Gas Transport

A draft version of the Rules for Gas Transport has been added Energinet's website: Developing the gas balancing model for implementation in 2022 | Energinet

This draft version only incudes anticipated changes to RfG in terms of balancing, and is not an official part of the public consultation, but for information purposes only.