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Memo

Workshop II

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1. Introduction

In the introduction of the impact assessment of DK1-DE/LU countertrade models from 2018 it is stated that the resulting model should be used until 2020, and throughout the impact assessment costs for developing countertrade models were regarded as sunk cost after 2020. As such, Energinet considers it timely to again assess which countertrade model best handles the expected large volumes of countertrade in the future not only on the DK1-DE/LU border but also due to the potential need for countertrade resulting from the 70 % requirement from Regulation (EU) 2019/943 of the European Parliament and of the Council of 5 June 2019 on the internal market for electricity (the Electricity Market Regulation) Article 16. See Appendix 1 for background on the needs for countertrade, which focuses particularly on the DK1-DE/LU border which is expected to trigger the most significant countertrade volumes.

As part of the work of identifying the best setup of a countertrade model in intraday, Energinet invites all interested stakeholders (TSOs, market participants, national regulatory authorities, and other interested parties) to participate in the second of two workshops to provide input.

This memo is prepared in advance of the second workshop that will take place on 12 January 2021 and will be used as a foundation for a final report summarising the recommendation for a new countertrade model. The input from stakeholders will be considered when finalising this report.

The intraday countertrade model will be submitted for public consultation either as part of a regulatory approval process if needed, or before the final report is published.

At the first workshop held in August 2020, Energinet informed the stakeholders that the current countertrade model could not continue when Energinet and the other Nordic TSOs join the European platform for activation of mFRR, MARI. As such, a new countertrade model would be needed at the latest at this time. Energinet also presented the view that it was relevant to start work on alternative countertrade models as the demand for countertrade in the previous years has markedly elevated. Energinet presented that a continuous trading intraday model was (in principle) both possible to use today and in the future, whereas the intraday auction countertrade model and a common TSO countertrade model would only be so in the future.

No alternative models within the regulatory framework, were proposed by workshop participants during the first workshop. After the workshop a proposal was forwarded to use bids for special regulation before submitting them to MARI. According to the legal analysis by Energinet, this is not a viable option, see Appendix 2 for the full legal assessment.

2. Background for the second workshop

Energinet has planned for two workshops to give stakeholders the opportunity to provide input on the future countertrade model.

Participants in the first workshop asked Energinet to address a range of issues in the second workshop

1. With an assumed go-live of the MARI platform in Q3 2023, it was unclear why the countertrade model needed to be discussed already now, especially when all stakeholders were satisfied with the current model
2. The legal framework for new countertrade models should be presented

3. The framework from the impact assessment from 2018 should be reused (and should include "effects on market" as an evaluation criterion)
4. The timing of intraday trade in an intraday model could be relevant

Energinet addresses these inputs later in this document.

2.1 Internal developments since the first workshop

Since the first workshop Energinet has made a critical assessment of the evaluation criteria, which leads to a change of scope for the second workshop, and new information from the Nordic Balancing Model has set a stricter, ultimate deadline for a new countertrade model.

2.1.1 Critical assessment of evaluation criteria

When considering the issue regarding the reuse of the evaluation model from the 2018 impact assessment, Energinet decided to take a step back and revisit the criteria to asses if they would still, considering the experience gained with the current countertrade model, lead to a correct assessment of the effects guiding the choice of countertrade model.

The 2018 criteria were

1. System security (the imbalance risk and the lead-time risk (increasing risk considered negative))
2. Cost-effectiveness (clearing prices for the sale of countertrade energy (low price being positive) and implementation time and cost (long time and/or high cost considered negative))
3. Market access (the geographical scope of the market for the sale of countertrade energy (a large scope considered positive))
4. Effect of arbitrage (amount of speculative trading (large volumes considered negative))
5. Transparency (compliance with EU regulations and Danish law)

When assessing these criteria and their application in the 2018 impact assessment, Energinet today does not consider them suited for determining the future countertrade model. Broadly speaking, Energinet considers the criteria and their application to be in part overlapping while at the same time not addressing the key issue, market efficiency (socioeconomic welfare).

Ultimately, criteria 2-4 revolve primarily around market efficiency. It does not seem meaningful to evaluate market efficiency from four angles instead of just one. It is unclear why an impact on market efficiency through cost-effectiveness should potentially be evaluated different from an equal impact on market efficiency through arbitrage.

Based on this, Energinet has decided to combine criteria 2-4 into a single criterion, market efficiency. With respect to the criterion system security, the imbalance risk is considered the key factor. The potential countertrade models are therefore evaluated against these two criteria instead.

Any model under consideration necessarily must comply with the relevant regulations and market rules. Incompliant models are disregarded.

2.1.2 Changed scope for second workshop

The changed evaluation criteria result in a significantly different evaluation of the different countertrade models. The details of the evaluation are presented in section 3. In short, Energinet sees that an intraday model, is expected to create a significant increase in market efficiency while being associated with relatively low risks for system security. On this basis, an intraday model is now the preferred solution of Energinet.
The new evaluation makes it necessary for Energinet to explicitly clarify the scope of the second workshop. With the Energinet preference for an intraday model, the primary scope of the workshop will be on developing this model with the stakeholders.

The purpose of the second workshop is therefore three-fold:

1) To present the Energinet assement of an intraday model as the preferred solution
2) To get stakeholder input on the setup of the intraday model
3) To present and discuss the proposed timeline for implementation of an intraday model

Energinet invites all workshop participants to send written comments prior to the workshop. In particular, proposals for alternative countertrade models to be considered by Energinet should preferably be sent no later than 6 January 2021. Market participants with very detailed comments or alternative countertrade models will be asked to briefly present their input at the workshop.

2.1.3 Stricter ultimate deadline for new countertrade model

In the Nordic Balancing Model, an optimization activation function (Nordic AOF) is expected to be implemented in Q4 2022. The Nordic AOF will closely mirror the MARI platform leaving very little time after the optimization cycle to activate bids. Continuing the current special regulation model after go-live of the Nordic AOF would all-else-equal imply that all activation with respect to special regulation would need to be processed in this very short timeframe. From an operational perspective this is an unacceptable risk, especially given the very significant countertrade volumes seen today.

It could perhaps be possible to implement IT changes that would allow continuation of the special regulation model also under the Nordic AOF (pay-as-bid settlement above the marginal price). Such changes would, however, be sunk cost since it would nonetheless be necessary to transition to a different countertrade model at the go-live of MARI. Given the position of Energinet on the preferred option of an intraday model, the necessary costs associated with a continuation of the special regulation model beyond the go-live of the Nordic AOF turns this date into a hard deadline for the phaseout of the special regulation model. As such, Energinet still aims for a phaseout before the go-live of the Nordic AOF.

This adds further details to the regulatory and market framework of the countertrade model. However, given Energinets preference to shift to an intraday countertrade model due to the market inefficiency of the current special regulation model, the regulatory and market framework is less important than assumed earlier when the special regulation model was expected to continue for longer. See Appendix 1 for a full description of the dependencies to the market development and regulatory framework.

Figure 1 below shows the relevant countertrade models discussed in section 4 of this paper.

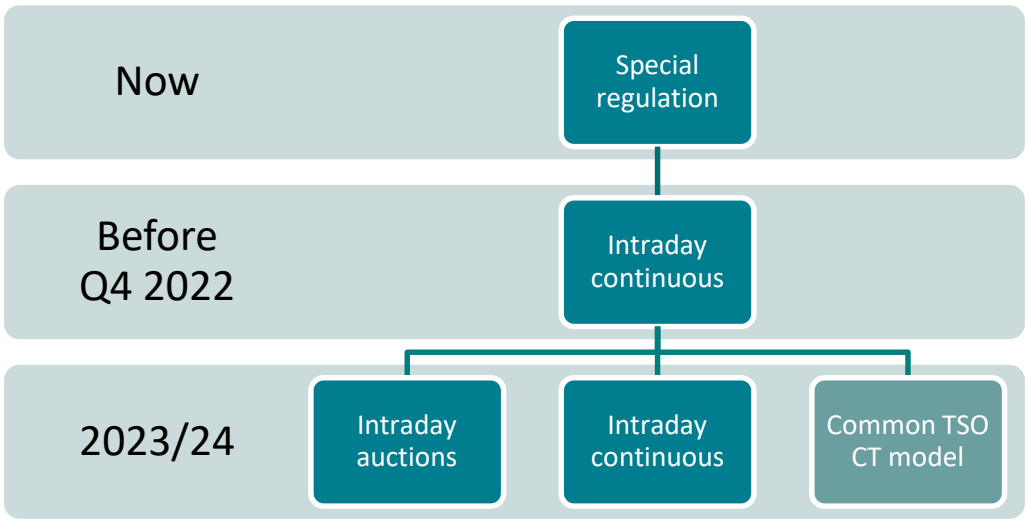


Figure 1 - Overview of possible countertrading models, of which the Common TSO CT model is considered a back-up model in case intraday solutions leads to big disadvantages, cf. section 4.3

3. Energinet preference for an intraday model

As described in the introductory section, Energinet prefers an intraday model. This section outlines the underlying reasoning for this preference.

Throughout this memo, countertrade on the DK1-DE/LU border is used as an example. This exemplifies countertrade needs known well in advance of the operational hour. Countertrade needs will also arise close to the operational hour meaning that not all countertrade will necessarily be handled in an intraday model. Similarly, countertrade needs may arise hours before the gate closure time of the intraday market but still long after countertrade needs "well in advance" of the operational hour. These will typically be less predictable than today's DK1-DE/LU countertrade and are not the focus of this memo. A more in-depth discussion of these different types of countertrade will be provided in the final assessment of the future countertrade model.

3.1 Improved market efficiency due to higher transparency in the intraday market

Both the special regulation model and the (continuous) intraday model are characterised by market inefficiency due to the pay-as-bid settlement applied. This type of settlement incentivises speculative bidding, i.e. market participants bid higher than their marginal bid cost to increase their profit, which leads to the risk that bids with higher actual costs are chosen over bids with lower costs.

However, in the special regulation model there is no disclosure of marginal prices. Based on a decision from the Danish NRA the only publicly available price information is the average settlement prices that Energinet publishes with a delay of three months. All else equal this introduces a market inefficiency in the special regulation model, which is not present in the intraday model where maximum, minimum, and average prices are published.

3.2 Improved market efficiency due to market expansion

The most fundamental argument in favour of an intraday model is that it is a socioeconomically superior model. In the current "special regulation" model, the supply of downregulation is limited to the supply in DK1 and, to the extent available cross-zonal capacity on the DK1-DK2 interconnector allows it, also in DK2.

The supply of downward regulation consists of running generation units offering to reduce generation and consumers offering to increase load. For generators the marginal cost of supplying downward regulation equals their alternative costs, for thermal power plants primarily fuel costs, for wind power plants primarily loss of subsidy payment. For consumers, the marginal cost of supplying downward regulation is the cost of additional consumption, for an electric boiler tariff costs minus the value of generated heat.

Energinet expects the marginal costs of these three technologies to lie in the range of -50 – 150 DKK/MWh. The socioeconomic marginal cost is most likely around 0 DKK/MWh (downward regulating wind power where the only socioeconomic effect is the reduced operating cost, which can be considered negligible). The realized average prices for special regulation in the range of -200 to -150 DKK/MWh indicate that the least competitive technology is being activated in the current model.

In an intraday model, market participants in all uncongested bidding zones relative to DK1 will be able to participate which implies a significant expansion of supply, especially from the Nordic bidding zones. This expansion of the market to handle countertrading would allow the generators with marginal costs at or just below the day-ahead price to supply downward regulation instead of only generators in DK1 (and possibly DK2).

Figure 2 below shows a scatter plot of the hourly sum of downward regulation across all Nordic bidding zones and the average price for down regulation across all Nordic bidding zones for 2020 until December 18.

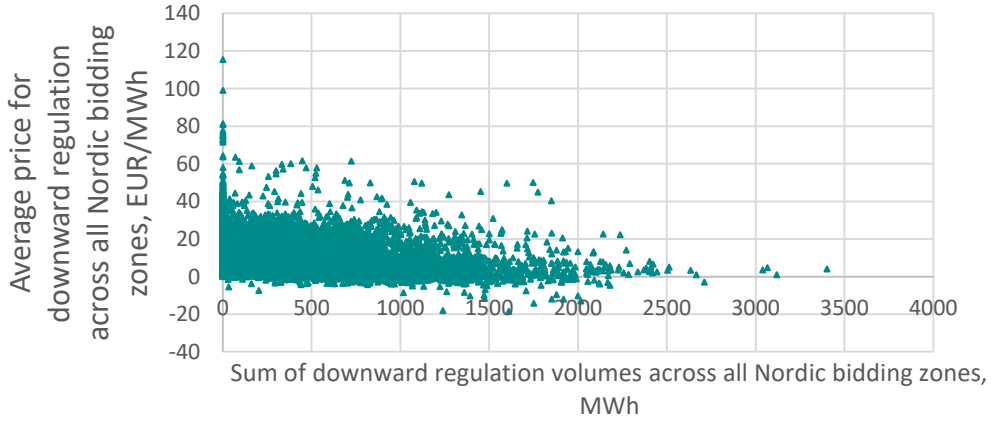


Figure 2 - Sum of hourly down regulation vs. average price for down regulation across all Nordic bidding zones for 2020 (preliminary data)

Electricity prices in the Nordic bidding zones have been extremely low in 2020. Despite this, downward regulation prices have been negative less than 5 % of the time. The 1 % percentile value is -2,3 EUR/MWH, while the 10 % percentile value is 1,3 EUR/MWh. From the figure it is clear that even the hours with the largest downward regulation volumes have not resulted in prices for downward regulation matching those realized for special regulation in Denmark on average (-30 to -25 EUR/MWh).

With day-ahead prices in hours with special regulation in 2020 averaging roughly 35 EUR/MWh in DK1, the Danish special regulation spread of roughly 60 EUR/MWh could perhaps be reduced to a spread between the day-ahead price and the intraday price of perhaps only 20-40 EUR/MWh (speculative guess from Energinet at this stage) if the countertrading volumes were moved to the intraday market (the intraday spread). The result would be a significant increase in socioeconomic efficiency in the overall power system.

All else equal, this market efficiency will impact the downward regulation price, potentially very significantly given the large countertrading volumes on the DK1-DE/LU border since the downward regulation volumes available to the regulating power market would tend to be equivalently reduced leading, leaving only more expensive units to offer downward regulation in that market timeframe. Assuming backward propagation of the balancing energy price, the intraday price would (roughly) equal the price for downward regulation. This would, however, make speculation much more profitable which would tend to balance this downward pressure on the price for downward regulation in hours with a Nordic energy surplus. Speculation in the intraday model is discussed in the next section.

3.3 Speculation in the intraday model

A change from the current "special regulation" model to an intraday model would not only increase supply due to supply from other bidding zones, the change would also allow new market participants to buy the countertrade energy. The regulating power market requires market participants to alter the physics of the system after activation. As such, a BRP for consumption cannot offer downward regulation based on under scheduling of his/her demand just as a BRP for trade cannot participate in the regulating power market. No such restrictions apply to the intraday market where all types of market participants can trade freely only limited by REMIT rules for market manipulation and local TSO regulations.

3.3.1 Socioeconomic effect of speculation

Speculation can ultimately ensure that the day-ahead result will more closely match the optimal physical dispatch, potentially reducing commitment costs such as e.g. start-up costs, leading to improved system efficiency. This is reflected in both the day-ahead and the balancing energy price.

If an intraday model lead to a significant drop in the balancing energy price in hours with a Nordic energy surplus, there would exist a large intraday spread (as defined in section 3.2). Speculators would realize this and place sales bids in the day-ahead market below the expected day-ahead price, and similarly place purchase bids in the intraday market above the expected intraday price (or the expected price for downward regulation). This would reduce the effect of an intraday model on the price for downward regulation. In a perfect market, the price spread would disappear fully. In reality, the price spread should be reduced to reflect the perceived risk of the speculation.

3.3.2 Legal and regulatory evaluation of speculation

Energinet regulations do not disallow market participants to engage in speculative trade, for example selling energy day-ahead or intraday without being able to actually supply it, or selling energy day-ahead with the intention to balance themselves by buying energy intraday.

From external legal experts, Energinet has received an evaluation of the legality of speculative trading in relation to market manipulation under the REMIT regulation. The evaluation indicates that speculation in itself does not constitute market manipulation since speculation does not necessarily put the speculator at an unfair advantage compared to other market participants. The evaluation only labels speculation as market manipulation to the extent that a market participant is exploiting a dominating position, using inside information, or is misleading the market to subsequently gain from it. Energinet interprets the evaluation to imply that speculation should generally aim to create a profit for the speculator by reducing market efficiency to be labelled market manipulation under REMIT. Speculative trading, however, although its purpose of course is to provide the speculator with a profit, generally increases market efficiency. In the case of countertrading, speculative trading is expected to lead to increased price convergence between the day-ahead and intraday price, which is generally considered an improvement in market efficiency.

3.3.3 Imbalance risks in the intraday timeframe due to speculation

Speculative market participants will introduce new risks to the countertrade model. If the countertrade energy is insufficient to balance the total speculative sales in the day-ahead market, speculators will increase the need for upwards flexibility, either in the intraday or the balancing energy market leaving less flexibility for handling other system imbalances.

The incentive for speculation depends on the expected gains from speculation. Speculators would not be competitive in the market if they attempt to gain more than the intraday spread described in section 3.2, so the expected gains are capped by this spread. As described earlier, this spread is expected to already be significantly reduced - before speculation is considered - due to the market expansion.

Energinet expects that speculation will drive down this intraday spread to match the perceived speculative risk. Since speculators – like all other market participants - are subject to imbalance settlement, speculators imposing large risks on the power system are also imposing large imbalance settlement risks on themselves. Energinet considers this alignment of incentives to highly mitigate the risk associated with speculation such that the risk most likely will be small.

3.4 Other arguments relevant to the preference

The current levels of countertrade result in a reduction of wind generation in Denmark in excess of 1 TWh for 2020 making it more difficult for Denmark to reach the political goal of wind generation surpassing a 49.5 % share of total electricity demand in 2020 (according the 2012 Energy Agreement[1]) and the national ambitions towards future carbon neutrality. Based on the narrowing of the special regulation spread by the expansion of the market and speculation, Energinet expects wind generation to be competitive in an intraday model only under special circumstances, such as limited access to the Nordic bidding zones, limited speculation and unexpected countertrade. As such, Energinet expects an intraday model to only have a minor impact on the realisation of political goals related to generation of renewable energy. This is not a deciding argument for Energinet, but further substantiates the Energinet preference for an intraday model.

Energinet recognizes that Danish suppliers of special regulation benefit from the current model. This benefit, however, comes at a significant efficiency cost in a Nordic/regional per-

[1] https://ens.dk/sites/ens.dk/files/EnergiKlimapolitik/faktaark_2_energi_og_klimapolitiske_maal.pdf

spective which conflicts with the general cost reduction purpose of the integration of the European power system. For this primary reason Energinet strongly prefers a shift to an intraday model as soon as possible from a regulatory and implementation perspective.

4. An intraday model

4.1 The continuous intraday model

Today's intraday market model is a continuous trading intraday model. In the continuous intraday model, Energinet offers to sell the energy received through countertrade in the DK1 intraday market.

The intraday market will then match the sell order from Energinet with buy orders from market participants, matching first with the highest buy price and then continue to match until the sell order from Energinet is fully executed or the price of the next buy offer is below the price of the Energinet sell order. The trade price of matched bids is the matched bid price that already was in the market when the other matched bid was submitted.

4.1.1 Parameters of the continuous intraday model

There are in principle infinite possibilities for implementing the continuous intraday model. The total countertrade volume for each hour needs to be bid into the market, which can happen as a single bid in just one hour (market time unit), e.g. at 16.00 for the next day or it can be spread across multiple hours. The possibilities are many. This is the question of timing. Also, the bids need to be accompanied by a bid sell price. This can in principle be anything. These are the key parameters of a continuous intraday model.

To ensure competitive pricing of the countertrade energy, transparency about the key parameters is extremely important since this allows market participants to best set their bid volumes and prices, and also ensure that there can no doubt that Energinet does not gain from inside information on the countertrade volumes and bid sell prices.

The focus on transparency is strongly related to the pricing rules in the intraday market, where the trade price for matched bids is determined by the matched bid that was already in the market when the other matched bid was submitted to the market. When Energinet is transparent about its timing, market players know that they will need to submit bids the Energinet bid submission to increase their chances of being matched. As such trade prices will be set not by the Energinet sell bid but rather by the buy bid price from market participants.

A competitive (low) sell bid price from Energinet will make it very attractive for market participants to place buy bids and thereby ensure that enough buy bids will be available so the full countertrade volume can be sold. Energinet expects that competition will ensure competitive pricing in the market as described in section 3.2 and 4.1.1. As such, the exact bid price from Energinet is not expected to actually impact the trade price.

Energinet is leaning towards "early" submission of a sales bid of the full countertrade volume at a very low bid sell price but has at this stage not settled on specific parameters and therefore welcomes views from market participants. At the workshop Energinet will present different possibilities.

4.1.2 Transitional period

Transitioning from the current countertrade model to an intraday model involves significant risk for the secure operation of the Danish power system. Existing market participants in the countertrade model need to adapt to the new countertrade model and to the entry of new market participants, and new market participants in the countertrade model need to familiarize themselves with the dynamics of the market. This increases the risk that that speculative trades increase the need for upwards flexibility in the power system to maintain the system balance as described in section 3.

To mitigate this risk, Energinet foresees that a transitional period is needed which will phase in the continuous intraday model during which the share of countertrade being traded in the intraday timeframe is gradually increased. There could be a transition phase of 1-3 months for market participants and Energinet to adapt to the new countertrade model. Energinet welcomes views on such a transitional period from market participants.

4.1.3 Implementation of the continuous intraday model

For Energinet to implement the continuous intraday model the key issues are to have the regulatory setup in place and to enable the bid submission into the intraday market.

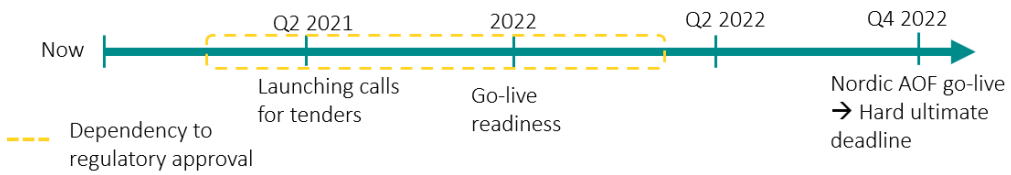
The regulatory setup is discussed in Appendix 2 and therefore not dealt with further here. To enable bid submission into the intraday market, either Energinet needs to submit bids or a third party needs to do it on behalf of Energinet. In the case of a third party, it is crucial that this role does not provide the third party with any advantage in the intraday market.

As such the third party should have the same access to the same information about the countertrade as other market participants regarding timing and pricing. This is also strongly related to the transparency requirements as described in section 4.1.1. In practice a tender is needed to determine which third party will be responsible.

The implementation costs are expected to be low for both market participants and Energinet.

The implementation timeline depends mainly on whether the intraday model requires regulatory approval. Energinet does not see that countertrade by using an already existing market fall under The Danish Electricity Supply Act Article 73 a (1) or Article 76. As such, Energinet does not see any legal obligations to apply for regulatory approval of a new intraday countertrade model in the current regulation. However, Energinet has asked for regulatory guidance on this topic, and is awaiting the regulatory decision.

Energinet expects to be able to launch a tender for the third-party trading task, write and implement procedural changes plus establish communication channels before 2022.



The go-live of an intraday model will start the transitional period, for which Energinet expects 1-3 months to allow market participants and Energinet to adapt to the new countertrade model. Energinet welcomes views on this timeline from market participants.

4.2 The intraday auction model

The continuous trading intraday market is expected to be developed further and supplemented by intraday auctions.

Intraday auctions are currently being developed by all TSOs following ACER's Decision from 24 January 2019 on Intraday cross-zonal capacity pricing methodology[2]. Intraday auctions will introduce an auction market similar to the day-ahead market where hourly buy and sell bids are matched for the auction period, i.e. all or the remaining hours of the full delivery day depending on the timing of the auctions.

The intraday auction design is expected to be finalised by the first quarter of 2021, after which the design must be approved by the NRAs. As the last step, the technical solution must be developed, tested and implemented. The design for intraday auctions is based on the single day-ahead market coupling model with implicit capacity allocation and marginal pricing and is expected to be fully implemented by 1 January 2023. Once implemented, intraday auctions must be held before the opening of continuous cross-zonal intraday market.

Intraday auctions are expected to be held three times a day, in line with the opening of the intraday market at 15:00, again at 22:00, and finally at 10:00 on the day of operation. The first two auctions are open for bids for the whole delivery day, whereas the auction on the day of operation is open for the last 12 hours of the delivery day.

After implementation of intraday auctions, the continuous intraday market will still be available, only the market will be closed when an intraday auction is being held, i.e. short before and after the above times, for example between 21:45 and 22:15.

Intraday auctions will require an optimization similar to that of the day-ahead market today. The optimization will take into account already scheduled flows from the day-ahead market and the continuous intraday market as well as updated cross-zonal capacities, where TSOs will set the "physical capacity", i.e. the capacity that does not lead to expected overloads if fully used by the market. In the case of a need for countertrading on the DK1-DE/LU border in an intraday auction model, the already scheduled flow and the updated cross-zonal capacities would result in an overload on this bidding zone border which the optimisation must remove. The optimisation would therefore schedule a flow in the opposite direction. Insofar as price also in intraday auction are higher in Germany, the result would be a "counter-intuitive" flow that results in negative congestion income which the countertrade requesting TSO needs to pay.

One of the key advantages of intraday auctions is the inclusion of marginal pricing also in the intraday timeframe which will reduce the incentive to bid strategically thereby increasing socio-oeconomic welfare.

Based on the simple handling of countertrade, Energinet – at the current understanding of intraday auctions – expects that an intraday auction model to be the enduring countertrade

[2] https://www.acer.europa.eu/Official_documents/Acts_of_the_Agency/Individual%20decisions/ACER%20Decision%2001-2020%20on%20the%20Methodology%20for%20pricing%20balancing%20energy.pdf

model. However, since this cannot be realized before 2023, the continuous intraday model is needed until then. This assessment is associated with significant uncertainty at this stage as the specifics of the future intraday auction model are still under development.

4.3 Common TSO countertrade model as fallback solution in case of severe problems with an intraday model

A common TSO countertrade model was also discussed during the first workshop. A prerequisite for such a solution is support from (at least) all Nordic TSOs. Such a model would require the establishment of wholly new market which would entail significant development costs. As such, benefits from a common TSO countertrade model need to be very significant.

With the current understanding of the possible intraday models, Energinet does not consider a common TSO countertrade model as a relevant countertrade model. To the extent that intraday models should lead to severe problems, the assessment of a common TSO countertrade model could be different. However, no such problems are currently expected, so the common TSO countertrade model is - at this stage – not considered a relevant model.

5. Conclusion

Energinet proposes a transition to a continuous intraday model as soon as the technical capability and the regulatory framework are in place. The key determinant for go-live of a continuous intraday model is the regulatory approval process. Energinet aims to have its internal go-live “readiness” in place as soon as possible, expected to be Q4 2021, to not delay the implementation of the new model

A prerequisite for the continuous intraday model is that the technical capability for Energinet to trade in the intraday market is in place. If chinese walls are erected and rules guiding the behavior on the intraday market are in place, Energinet can be active in the intraday market without conflicting with REMIT obligations. However Energinet finds that if trading in intraday was handled by a third party it would be a clearer destinction between roles, and allegations of market manipulation would be less likely. A third party is therefore currently expected to be designated through a competitive tender. Energinet invites stakeholders to provide inputs as to best set up this tender.

The key parameters of a continous intraday model are timing and bid sell price. Energinet invites stakeholders to provide inputs as to best define these parameters..

The transitional period between the current special special regulation model and the future intraday model is important to reduce the risk to system security. Energinet invites stakeholdes to provide inputs as to best set up this transitional period.

Appendix 1: Countertrade and its scope

Definition of countertrade

Countertrade is defined as a measure with the objective of relieving physical congestion between two bidding zones, where the precise generation or load pattern alteration is not predefined[3].

The scope of countertrade is only related to the activation of sufficient volumes of upward and downward regulation to relieve congestion at the border without further consideration of internal congestion. Countertrade to relieve internal congestion is conducted by TSOs in their daily operation.

The need for countertrade is based on an assessment if the results from the day-ahead market creates physical congestion in the internal grid of either Energinet or adjacent TSOs. In hours with such physical congestion, TSOs respectively activate upward regulation on one side of the congestion and activate downward regulation on the other side. The use of upward and downward regulation depends on the direction and volume of the scheduled flow. The term regulation does here not refer only the balancing energy market but also to the intraday market where downward regulation equals a TSO sale of energy.

Countertrade is legally required to maximize available capacities

Regardless of the anticipated need for countertrade on the danish borders, Energinet is legally bound to assist in countertrade, when so requested by neighbouring TSOs.

The Electricity Market Regulation Articles 16(4) and 16((8)(a)) states that countertrade are among the tools that can be applied to ensure 70% transmission capacity: Article 16(4):

> *"The maximum level of capacity of the interconnections and the transmission networks affected by cross-border capacity shall be made available to market participants complying with the safety standards of secure network operation. Countertrading and redispatch, including cross-border redispatch, shall be used to maximise available capacities to reach the minimum capacity provided for in paragraph 8. A coordinated and non-discriminatory process for cross-border remedial actions shall be applied to enable such maximisation, following the implementation of a redispatching and countertrading cost-sharing methodology"*[4].

By Q4 2022, Energinet is no longer expected to be able to do countertrade as special regulation. If an alternative countertrade model is not in place by Q4 2022, Energinet will as such neither have the means to request, nor to assist, neighbouring TSOs with countertrade requests, violating the Electricity Market Regulation, Article 16(4)[5].

As described in section 2.1.3, a technical work-around that would enable activations of balancing energy bids for countertrade purposes to be settled pay-as-bid above the marginal price, could perhaps be made. This would allow the special regulation model to continue until the go-live of Nordic participation in MARI. After MARI, however, a special regulation model would no longer be legal, cf. Appendix 2.

[3] CACM_A35.1_CCR Hansa RD+CT - Legal document for submission.pdf (entsoe.eu)

[4] https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:32019R0943&from=DA

[5] https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:32019R0943&from=DA

The 70% rule

The Electricity Market Regulation, Article 16, specifies that 70% of the capacity on TSO interconnectors must be "made available to the market", with the necessary consideration for system security. Therefore, capacities made available to the day-ahead market might create cross-zonal flows, which together with internal flows lead to flows on internal lines that exceed the safe operating capacity of the internal lines. Thus, the 70 % rule may trigger a need for countertrade after the day-ahead market closes. It is this same logic of cross-zonal flows and internal flows overloading internal lines that leads to the extensive countertrading on the DK1-DE/LU border today. The 70 % rule implies that countertrade is likely to be relevant for all borders going forward, and this wider use of countertrade needs to be taken into consideration when choosing a future model.

Therefore, the new countertrade model must be able to provide upward and downward regulation for all Energinet's borders.

Derogations to adjacent TSOs

Sweden is currently awaiting the result of a derogation from the 70% rule in 2021 for their interconnectors to: DE/LU, DK1, DK2, LT, NO1, and PL.

The Netherlands has also applied for a derogation from the 70% rule in 2021 applicable to all Dutch CNECs (Critical Network Elements with contingencies) included in the CWE and Core day-ahead capacity calculation process and to all cross-zonal HVDC cables and is currently waiting for an answer.

The Electricity Market Regulation is not Norwegian law and, therefore, Norway has not applied for a derogation. Moreover, Statnett does not expect to have issues complying with the 70% rule.

Scope of countertrade

It is difficult to assess the future scope of countertrade due to uncertainties with regard to future trading volumes, grid development, and different interpretations of the 70% rule as well as the application of mitigating measures such as derogations as mentioned above.

With his uncertainty in mind, only general Energinet and TenneT needs for countertrade to comply with the 70 % rule are described in the section below.[6]

Energinet need for countertrade

Until the flow-based capacity calculation methodology is implemented on the Danish bidding zone borders, Energinet applies the following interpretation to the 70% rule:

- If Energinet offers 70% of the maximum NTC to the market on cross-zonal links, Energinet is not required to document compliance with the 70% rule on internal Critical Network Elements (CNEs).
- If Energinet does not offer 70% of the maximum NTC to the market on cross-zonal links, Energinet is required to document that 70 % of the capacity on internal CNEs has been offered to the market.

[6] In the following sections, the TenneT Germany specific countertrade needs on the DK1-DE/LU border are described by referring to the minimum capacities required on the border due to the TenneT Commitments. For all other borders, Energinet refers to the ACER MACZT report published in December 2020.

Denmark has not applied for a derogation from the 70% rule, as Energinet is currently only non-compliant in a very limited number of hours based on data from the first half of 2020, cf. Table 1, when using the above interpretation of the 70% rule.

HOURS OF NON-COMPLIANCE 1H 2020

AC Borders	Import		Export	
	Hours	% of time	Hours	% of time
DK2 – SE4	3	0,069%	0	0%
DK1 – DE/LU	0	0%	14	0,321%

DC Borders	Import		Export	
	Hours	% of time	Hours	% of time
DK1 – NO2	6	0,137%	2	0,046%
DK1 – SE3	30	0,687%	24	0,549%
DK1 – DK2	31	0,71%	31	0,71%
DK1 – NL	0	0%	0	0%
DK2-DE/LU	0	0%	0	0%

For DC borders we have in total 87 different hours where compliance cannot be documented.

*The results are based on Energinet own assessment/observations of undocumented compliance

Table 1 - Hours of non-compliance with The Electricity Market Regulation, Article 16 first half of 2020

Ideally, all hours of non-compliance on cross-zonal links should be mitigated by requesting countertrade from adjacent TSOs.

TenneT Germany need for countertrade

TenneT and Energinet have now commissioned the East Coast Project and therefore the TenneT guaranteed hourly NTC will change according to the TenneT Commitment towards DG Competition as follows: Under the principle of a linear trajectory, the TenneT Guaranteed Hourly NTC will be increased in annual, equal-sized steps, corresponding to the overall increase of the East Coast Line (575 MW)[7]. Thus, the TenneT Guaranteed Hourly NTC will increase as follows:

[7] The 575MW is determined as the difference of the starting value of 1300MW as of 1/2020 and the 1875MW in 01/2026, assuming only the east-coast reinforcement is carried out. This is slightly less than 75% availability, while the 1875MW is 75% of the 2500MW maximum NTC.

Starting date	New minimum available hourly capacity according to Commitment
01/2021	1,396 MW
01/2022	1,492 MW
01/2023	1,588 MW
01/2024	1,684 MW
01/2025	1,780 MW
01/2026	1,875 MW

Figure 3: Minimum available hourly capacity due to the finalization of the East Coast Project. The TenneT Guaranteed Hourly NTC will increase by an additional 750 MW with the future commissioning of the West Coast Line in a linear trajectory.

Note that the maximum NTC was changed from 1,500 MW in the southbound direction and 1,780 MW in the northbound direction to 2,500 MW in either direction with commissioning the joint 400 kV East Coast project.

Further note that the NTC applied to determine capacity offered is the hourly minimum of individual hourly TenneT and Energinet NTCs. The hourly TenneT NTC is still subject to daily capacity calculation that could result in any value between the TenneT Guaranteed Hourly NTC and the maximum NTC.

The Energinet NTC is not subject to minimum capacity requirements other than the 70 % rule.

In the past years, the countertrade volumes have often exceeded the volume required by the Joint Declaration and the TenneT Commitments. Energinet expects this practice to continue. The below figure shows special regulation and balance regulation in DK1 for the period 2017-2020, where the overarching activation purpose has been special regulation.

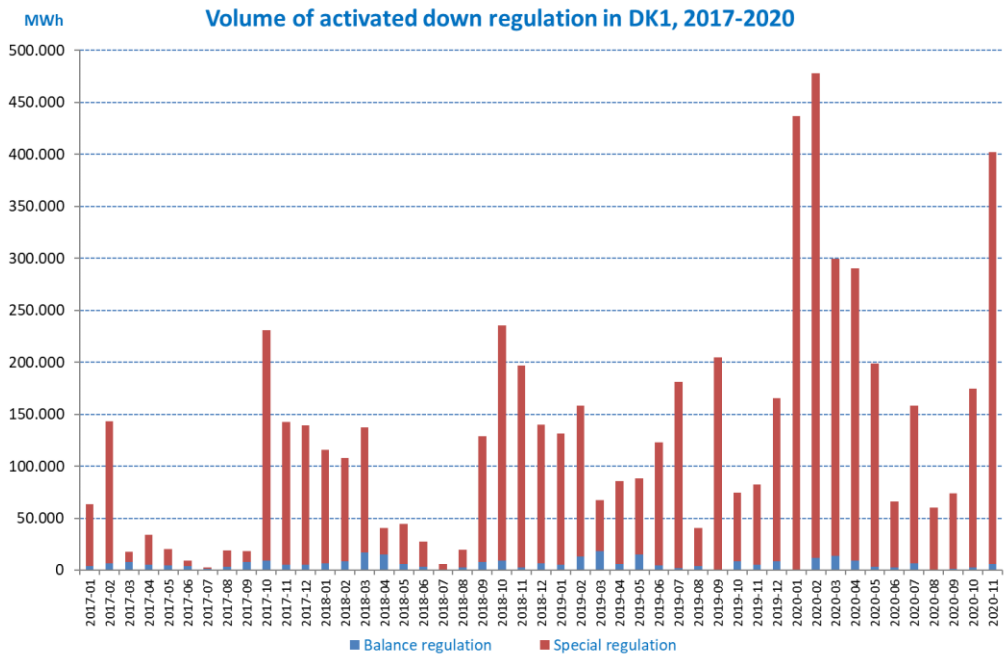


Figure 4: Downward regulation primarily due to countertrade on DK1-DE/LU border from 2017-2020

Appendix 2: Legal and market framework

This appendix describes the legal and market framework for the countertrade model. With this, Energinet aims to describe the relevant legal framework that the countertrade model needs to respect and the market developments that influence the possibilities of using the special regulation model. Energinet emphasizes that this framework is not the determining factor for the Energinet preference for transitioning to an intraday model. Instead, the legal and market framework rather only places hard deadlines for when an intraday model needs to be in place.

With respect to an intraday model, Energinet is not familiar with any legal obstacles to the implementation of such a model since the intraday market is a fully established market, and several other TSOs are already today using the intraday market for countertrade. The description of the framework is therefore concerned with the possibilities for continuing the special regulation model.

The central market developments are go-live of the Nordic AOF (Q4 2022) and go-live of Nordic participation in MARI (Q3 2023) where the latter is associated with a range of legal requirements, which is not expected to be the case for the former.

As described in section 2.1.3, the go-live of the Nordic AOF in Q4 2022 would trigger IT development costs if a special regulation model should continue beyond this point in time – to the extent that it would at all be possible to do so.

With the go-live of Nordic MARI participation, however, the legal framework changes fundamentally. The methodology for pricing balancing energy and cross-zonal capacity used for the

exchange of balancing energy or operating the imbalance netting process[8] states that: *"once a TSO becomes participating TSO of a European balancing platform, the TSO shall apply the pricing proposal for standard and specific products*.". Consequently, Articles 29 and 30 in the Commission Regulation (EU) 2017/2195 of 23 November 2017 establishing a guideline on electricity balancing (EBGL) will become legally binding in Denmark once Energinet joins MARI.

According to Article 29(9) of the EBGL, a connecting TSO shall submit *"all balancing energy bids received from balancing service providers to the activation optimisation function"*. The connecting TSO is only allowed to *"modify or withhold"* bids that are either

- *"manifestly erroneous and include an unfeasible delivery volume"*
- according to Article 26 and 27 either *"specific bids"* (and not standard bids) or from a *"central dispatching model"* (neither of which apply to Danish bids)
- the TSO operates a local intraday market with a gate closure time after the MARI gate closure time where the TSO has developed *"a proposal to limit the amount of bids that is forwarded to the European platforms pursuant to Articles 19 to 21"* (which is not the case for Energinet).

Energinet interprets that this imply that Energinet can neither withhold, modify bids nor declare them unavailable to use the bids for countertrade in a special regulation model as proposed by a market participant after the first workshop, after joining MARI.

Concerning the suggested use special regulation for countertrade in the period between the Nordic AOF and MARI, where Energinet would withhold bids from the Nordic Common Merit Order List (CMOL), Statnett has informed Energinet that a solution in the form of planned Countertrade redrawing local mFRR bids before sending them to the Nordic AOF (later MARI) cannot be supported.

The Statnett position on such a solution also points in the direction of an intraday model in line with the preference of Energinet.

Article 13 in the Electricity Market Regulation and the ACER decision on pricing of balancing energy also form the legal background for the pricing of special regulation. The ACER decision stipulates that the bids in MARI contain no topological information relevant to internal congestion management making it impossible for TSOs to activate them for this purpose. As such the application of one single cross-border marginal price does not conflict with the Article 30(1)(b) of the EBGL (requiring that balancing energy bids activated for internal congestion management cannot set the balancing energy price). Therefore, all MARI activation that respect the merit order principle shall be subject to cross-border marginal pricing.

Article 29(14) in the EBGL stipulates that TSOs may declare bids submitted to MARI unavailable for activation by other TSOs *"due to operational security constraints within the connecting TSO scheduling area"* (and if the bids are restricted, i.e. located behind, internal congestion). Energinet interprets this to mean that a TSO may declare a bid unavailable if the TSO itself has a need for the bid to handle an *"operational security constraint"*, e.g. an internal congestion. This would result in a local activation which would happen outside the merit order in line with the ACER decision. This is of course only possible if the bid is somehow accompanied with topologi-

[8] https://www.acer.europa.eu/en/Electricity/MARKET-CODES/ELECTRICITY-BALANCING/07%20Pricing/Action%201%20-%20Pricing%20proposal.pdf

cal information, which can only be used for local purposes since such information is not relevant to the MARI activation optimization function. Energinet does not consider activations for countertrade relevant to “operational security constraints” since the activation does not to happen outside the merit order list but only has to respect the limited capacity towards Germany which is included in the MARI cross-zonal capacity.

In summary, Energinet finds that withholding mFRR bids from the Nordic CMOL after go-live of the Nordic AOF in Q4 2022 is not an option, and once the Nordic TSOs join MARI such a solution under MARI would not comply with EBGL requirements. Energinet therefore sees no other options intraday models exist after Q4 2022.

Energinet does not find any legal obstacles with regards to countertrading in the intraday market.