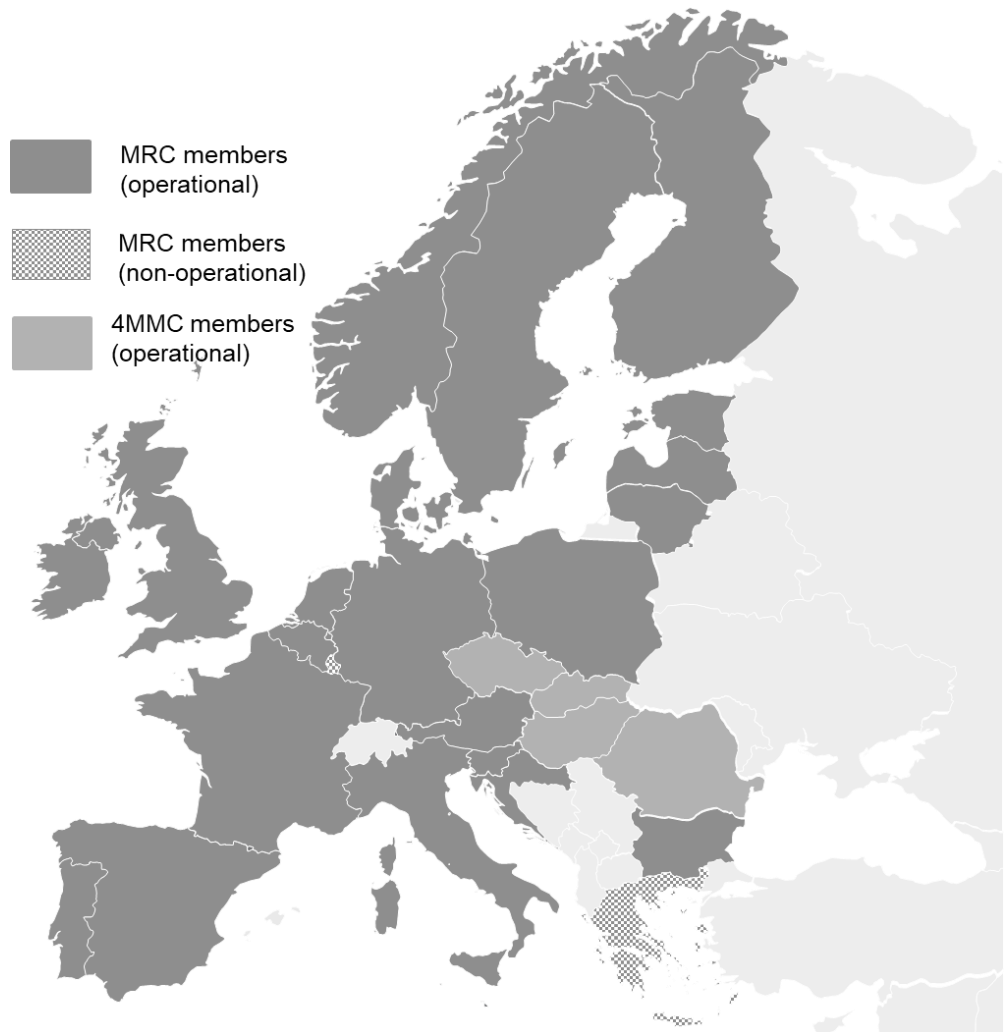



# SDAC



## SDAC report on the ‘partial decoupling’ incident of February 4th 2020

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# SDAC REPORT ON THE 'PARTIAL DECOUPLING' INCIDENT OF FEBRUARY 4TH 2020

SDAC

19 March 2020

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## EXECUTIVE SUMMARY

### Summary of the partial decoupling incident

On Tuesday, February the 4th of 2020, an incident took place in the Day Ahead Market Coupling process that led to a partial decoupling of EMCO CWE, affecting the day ahead trades for Wednesday, February the 5th in the Multi-Regional Coupling (MRC). More specifically, due to missing order books of EMCO for the CWE area, three interconnectors were decoupled. The root cause was a specific bid that could not be processed in the EMCO Local Trading System. Within hours after the incident, a fix has been developed and successfully implemented.

Following the partial decoupling of EMCO CWE from MRC, Shadow auctions for cross-zonal capacity were run for three interconnectors by JAO. Shadow auction results were sent to market participants. For the three impacted interconnectors, i.e. DK2-DE (Kontek), DK1-NL (COBRA cable), and SE4-DE (Baltic cable), fallbacks were triggered in line with the procedures. More specifically, for DK2-DE (Kontek) and DK1-NL (COBRA cable) Shadow auctions were held and for SE4-DE (Baltic cable) the capacity was given back to the owners.

Due to confusion regarding the impacted interconnector to GB, erroneously Shadow auctions were also triggered for IFA1, although IFA1 was not decoupled. Therefore, the auction results for IFA1 were cancelled. The only interconnector to GB that would have been impacted, concerns FR-GB1A (ElecLink), but for this interconnector there is no capacity offered to the market yet.

The local auctions run by EMCO for the CWE region were at the end cancelled due to the technical issue with their local trading system.

Although this partial decoupling did not lead to any grid security issues anywhere in Europe, this incident caused a disruption of the Day Ahead Market within the Multi-Regional Coupling and processes on market parties and TSOs' side. Here, it has to be pointed out that no bidding zones have been decoupled.

### Preliminary findings

The MRC procedures in place to manage the cases for partial decoupling, have been properly applied and proved successful in retaining the coupling among the bidding zones not involved in the issue. There were some confusions regarding the procedures on a regional level.

The decoupling event did not affect 4M MC (4M Market Coupling), which is not yet coupled with MRC, and did not induce major impacts on market prices or security of operations in 4M MC.

The communication related to the partial decoupling led to confusion on whether shadow auctions had to be triggered for IFA1. Besides the erroneously triggered shadow auctions for IFA1, shadow auction process and the subsequent update of the bids were executed in line with the procedures.

When comparing the impact of a decoupling of a NEMO within a market area where one or multiple NEMOs are active, it can be concluded that Multi NEMO Arrangements (MNAs) have limited the impact in the Multi-Regional Coupling.

### **Lessons learnt and recommended follow up actions**

The probability that a similar incident will happen again is low.

Due to the Multi NEMO Arrangement (MNA) that has been implemented in CWE in July 2019, the impact of this incident was limited as other remaining NEMOs (namely EPEX and EXAA) stayed coupled.

In order to secure that all parties, especially the Market Participants, know exactly what to do in case of a decoupling incident, Market Participants will be invited for a joint training session of NEMOs, TSOs, and JAO.

Given that for interconnectors, often a distinction is made between technical (i.e. without capacity) and commercial (i.e. with actual capacity) Go-Lives, there is an intermediary phase where interconnectors are already included in the procedures and (optionally) messaging, although these interconnectors are not of relevance yet for the market. Since this can lead to confusion in operations regarding inclusion in messaging and activation of fallbacks, the time between technical (i.e. without capacity) and commercial (i.e. with actual capacity) Go-Lives has to be limited to a short period.

NEMOs and TSOs will investigate the robustness of the procedures at the different levels (European, regional, and local) and their consistency for specific types of incidents and the actual impact of the incident.

## THE MAIN REPORT

### 1 Introduction

On Tuesday, February the 4th of 2020, an incident took place in the Day Ahead Market Coupling process that led to a partial decoupling of EMCO in CWE, affecting the day ahead trades for Wednesday, February the 5th in the Multi-Regional Coupling (MRC). More specifically, due to missing order books of EMCO for the CWE area, three interconnectors were decoupled. The root cause was a specific bid that could not be processed in the EMCO Local Trading System.

Since the Go-live of the NWE Market Coupling on February the 4th of 2014, that is after almost 2200 market coupling sessions, this is the second incident that has led to a partial decoupling.

Although this did not lead to any grid security issues anywhere in Europe, the incident caused a disruption of the European Day Ahead Market within the Multi-Regional Coupling and processes on market parties and TSOs' side.

This report is structured as follows. In Chapter 2, the Single Day-ahead Coupling (SDAC) is described. In Chapter 3, the normal operational process as covered in the operational procedures and the fallback measures in place are described together with their timings. In Chapter 4, a description of the partial decoupling event, including the chronological course of events, and the root cause are presented. In Chapter 5, the actual handling of the incident is evaluated. Finally, in Chapter 6, the lessons learnt and recommendations are presented.

## 2 Single Day-ahead Coupling (SDAC)

The aim of Single Day-ahead Coupling (SDAC) is to create a single pan European cross zonal day-ahead electricity market. An integrated day-ahead market increases the overall efficiency of trading by promoting effective competition, increasing liquidity and enabling a more efficient utilisation of the generation resources across Europe.

SDAC allocates scarce cross-border transmission capacity in the most efficient way by coupling wholesale electricity markets from different regions through a common algorithm, simultaneously taking into account cross-border transmission constraints thereby maximising social welfare.

SDAC is an initiative between the Nominated Electricity Market Operators (NEMOs) and Transmission System Operators (TSOs) which – in the framework of CACM implementation – enables cross-border trading across Europe via implicit auctions for delivery of power for the following day.

Significant progress has been achieved in the establishment of a pan-European Single Day-Ahead Coupling in recent years, thanks to early implementation initiatives and pilot projects. SDAC relies on the Price Coupling of Regions (PCR) solution developed by a group of power exchanges. At this stage, the SDAC is in an interim phase during which two parallel market couplings co-exist, i.e., the Multi Regional Coupling (MRC) and the 4M Market Coupling (4M MC). These couplings are considered on an equal basis as jointly forming, for this interim period, the Single Day-Ahead Coupling in implementation of CACM. In the enduring stage MRC and 4M MC shall be coupled.

See for more information the following websites:

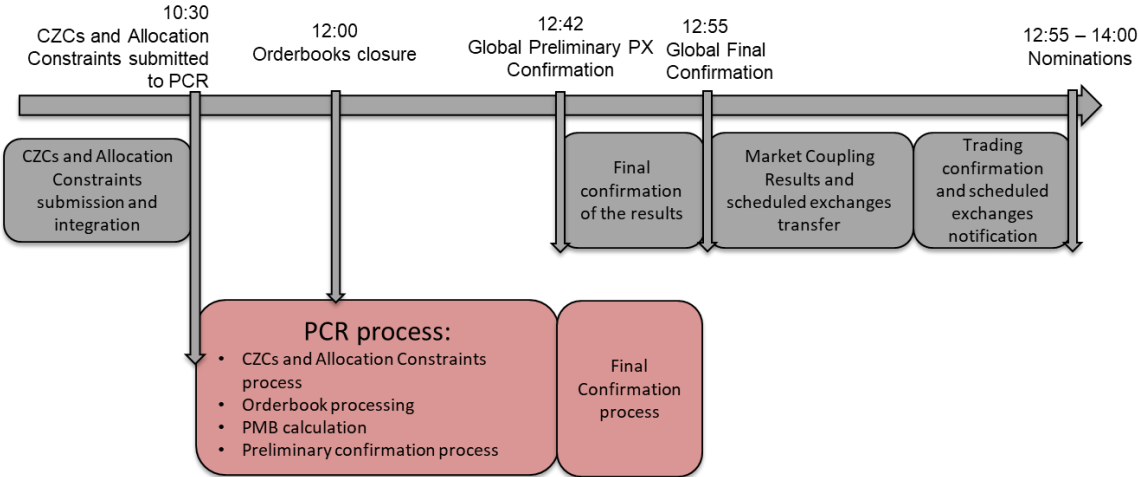
- ENTSO-E: [www.entsoe.eu](http://www.entsoe.eu)
- NEMO Committee: [www.nemo-committee.eu](http://www.nemo-committee.eu)

### 3 Operational process and timings as described in the operational procedures

In order to understand the effect of the issue that triggered the chain of events that finally led to a partial decoupling of EMCO in CWE, in this chapter the normal process is briefly described together with the timings. Subsequently, the measures in place to handle a partial decoupling are described.

#### 3.1 Normal process and timings

In the below Figure, the regular operational process is visualized.



To start with, the TSOs provide cross border interconnector capacities to PCR through the PMB (PCR Matcher Broker) and Market Participants make bids for buying and selling through the Local Trading System of their PX(s).

At 12:00, the local order books are closed and submitted to the PMB, which subsequently starts the calculation with EUPHEMIA. The results of this calculation are subsequently shared and validated. After that the results are confirmed by the PXs and TSOs.

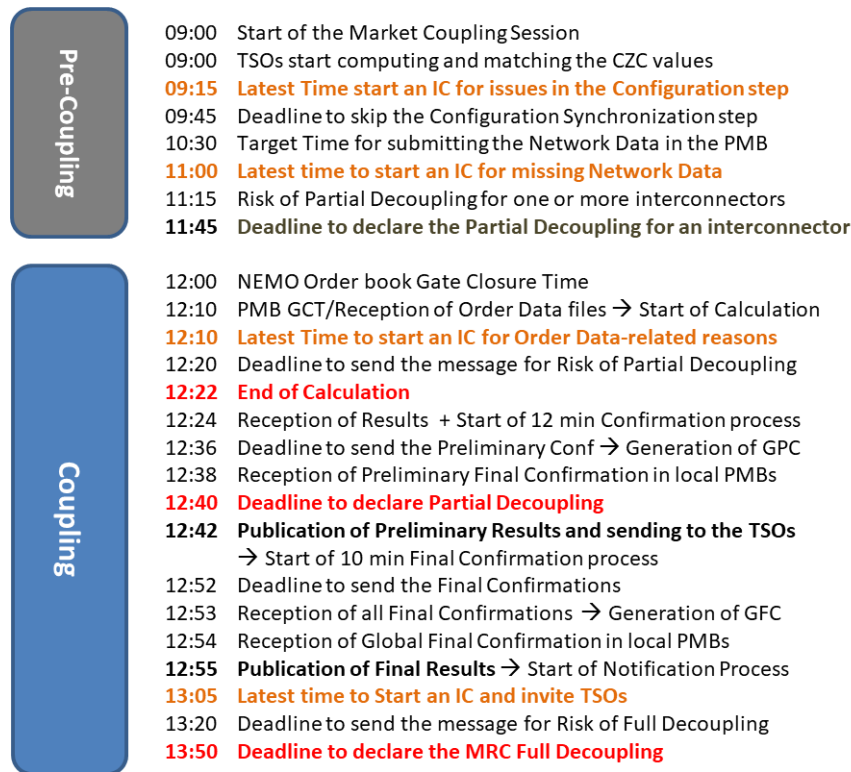
After the global final confirmation of the results, the market coupling results and scheduled exchanges are transferred and the trading confirmations and the scheduled exchanges notifications are given.



## 3.2 Fallback process and timings

In order to handle issues in operations, there are backup procedures. These provide workarounds for issues that do not lead to exceeding the critical deadlines for the different process steps. When these backup procedures do not suffice, there are fallback measures in place to limit the negative impact on the market.

In the below Figure, the timings for the operational process are shown and the deadline for declaring a Partial Decoupling is shown.



### 3.2.1 Shadow auction process

Shadow auctions are the fallback measure in place to handle a situation where the capacity of interconnectors cannot be allocated in the normal Market Coupling process. Market participants have the possibility to place default bids and provide (updates of) bids through dedicated platforms (e.g. JAO's website) to obtain capacity until 12:30. The results of this auction are published as soon as possible after the partial decoupling has been declared (normally between 12:40 and 12:45) and represents the allocated capacity. Once this phase is terminated, the market participants can adjust their power bids in the different markets normally between 12:50 and 13:00 to take into account the results of this shadow auction.

Once the market coupling process has run, participants can nominate the capacity allocated through shadow auctions. These nominations done towards TSOs are then matched among the TSOs border by border.

### 3.2.2 Local auctions

In case the issues are so severe that the coupling cannot be completed for the whole Multi Regional Coupling, it can be decided to partially or fully decouple. The NEMO(s) in the decoupled bidding zone(s) can then perform a local auction that enables trading within the individual zone(s).

## 4 Description of the partial decoupling event

On Tuesday, February the 4th of 2020, EMCO experienced a technical issue causing a chain of events that finally led to partial decoupling of EMCO in CWE.

The root cause at the beginning of the chain of events was a specific bid that could not be processed in the EMCO Local Trading System. Consequently, the CWE order book could not be created

The chain of events can be divided into two parts: one concerning the decoupling incident and the subsequent processes on MRC level (covered in Sections 4.1 until 4.4), the other concerning the local auction (covered in Section 4.5).

### 4.1 Decoupling incident

The technical issue encountered by EMCO was triggered by EMCO Local Trading System's inability to successfully aggregate the purchase and sales curves. This prevented EMCO from submitting the aggregated order book to the central market coupling process. The technical issue encountered on Tuesday 4th February was triggered by an order submitted to the day-ahead auction; the order itself was correct and the market participant made no mistake. In this case however, the order included a steep delta between purchase and sell volumes, within a small price range, and with the sell volume close to zero. At the time, these combined factors made it impossible for EMCO's system to create the aggregated purchase and sell curve which must be provided to the MRC process.

## 4.2 Detailed Timeline

In the below overview the timeline is shown.

Time	Event
12:10	EMCO informed the coordinator that it was not able to send the Order Data for the Virtual Broker (VB) EMCO-Nord Pool – CWE and an IC was immediately set up.
12:20	JAO and market participants received message [ExC_03a]: Risk of Partial Decoupling email sent by NEMOs with the indication of the decoupling NEMO.
12:36	JAO run shadow auction for the DK2-DE (Kontek) and DK1-NL (COBRA cable) interconnectors. Furthermore, due misunderstanding raised in the IC on the FR-GB borders due to the fact that for some parties there was only 1 interconnector on that border and for others there was already a second interconnector (ElecLink which is technically already in the process but commercially not – no capacity yet allocated), JAO run also shadow auction for the FR-GB (IFA1) interconnector.
12:40	EMCO asked to wait 2-3 minutes before declaring the Partial decoupling. Request was accepted, but at 12:43 the partial decoupling was declared and the relative message ExC_04 was sent. Reopening time (due to the previous experience of decoupling) agreed among all parties was set from 12:55 for exactly 10 minutes.
12:51	After internal clarifications that delayed the process, JAO publishes the shadow auction results for DK2-DE, DK1-NL, IFA1 (FR-GB)
13:00	EPEX SPOT sent the message UMM_01a “Delay in Final Market Coupling Results Publication” to all CWE Parties.
13:01	Only at this point it was discovered that wrong shadow auction were run for IFA1 and following this, JAO cancelled the IFA1 shadow auction
13:20	All NEMOs sent the message “Further Delay of the Market Coupling Session” to all External Parties.
13:45	Preliminary results were published to all parties.
13:55	Global final confirmation was received and the results were considered firm.
14:35	EMCO informed the Market that local auctions were cancelled due to their trading system technical issue.

## 4.3 Communication to the market

As part of the MRC process, the following joint communication towards the market was made:

- 12:20 Risk of partial decoupling
- 12:48-12:53 Partial Decoupling - Reopening of the order books
- 12:52-12:53 Results of shadow auction were published
- 13:10 EMCO CWE local auction: Order book reopening for local auction after Partial Decoupling
- 13:04-13:17 Delay in market coupling results publication
- 13:20-13:22 Further delay of market coupling session

#### 4.4 Impacted borders

Given that there are three NEMOs active in CWE and only one of the three was decoupled, CWE internally could stay coupled.

With respect to the CWE external borders, it currently depends on the shipping arrangements in place on that particular border, whether the border is impacted or not. Since outside CWE, the so-called Multi NEMO Arrangements (MNAs) have not been implemented yet, for each border/interconnector, a particular shipping arrangement has been organized (e.g. single shipper, dual shipper, etc.). This means that for those external borders for which the shipping is taken care of by the decoupled NEMO, the border/interconnector is decoupled.

The borders that were decoupled are the following:

- Sweden - Germany (Baltic Cable), for which the capacity was given back to the owners and not allocated in Day Ahead.
- Denmark - Germany (Kontek), for which the capacity was offered through shadow auctions (results in Annex 1).
- Denmark - Netherlands (COBRA Cable), for which the capacity was offered through shadow auctions (results in Annex 1).

All other borders related to CWE remained coupled, because there are different shipping arrangements in place:

- Netherlands - Norway (NorNed cable)
- Netherlands - Great Britain (BritNed)
- Belgium - Great Britain (NemoLink)
- France - Great Britain (IFA1 cable)
- France - Spain
- France - Italy
- Austria - Italy
- Austria - Slovenia

Due to the fact that all these borders remained coupled, all CWE countries remained coupled with the rest of Europe in the normal SDAC process.

In the below Figure a visualization is given of the impacted borders.



## 4.5 EMCO Local Auction in CWE Bidding Zones

Following the partial decoupling of EMCO in CWE, EMCO manages its local processes, according to local procedures and outside the control of the wider SDAC parties.

This partial decoupling of EMCO in CWE from Multi-Regional Coupling (MRC) means that, according to the procedures, local auctions are run for each local national market area. Finally, the local auction was cancelled due to the same technical problem that triggered this incident.

## 4.6 Solution for the issue that triggered the chain of events

The technical error has been identified and a reliable fix was developed, tested, and deployed to EMCO's systems so that the specific case causing this incident will not recur. In the aftermath of the incident the anomaly that caused it has been thoroughly analyzed and a fix was developed and deployed on the same day. Measures have also

been taken to validate order input in order to ensure that similar cases will not occur again.

The EMCO Local Trading System and the Nord Pool markets have been running smoothly since.

## 5 Handling of the incident - Evaluation

In this chapter, the way that the incident was handled is evaluated.

### 5.1 Detection of the issue

The issue lying at the root of this incident was detected by EMCO and reported directly to the Market Coupling Coordinator in line with the procedures.

### 5.2 Communication between the Market Coupling Coordinator, PXs, TSOs and third parties prior to declaring a partial decoupling

In line with the procedures, GME in its role of Market Coupling Coordinator communicated with the NEMOs, TSOs and third parties. The Incident Committee was directly triggered and the PXs were invited at the right time. The invitation was subsequently correctly forwarded by the NEMOs to the TSOs and JAO (in line with the agreements between the TSOs and the NEMOs). In line with the procedures, the risk of partial decoupling message was sent.

Confusion arose due to the CWE procedures including Eleclink (FR-GB1A), which technically has gone live, but without capacity. Consequently, there is no need for running shadow auctions for Eleclink (FR-GB1A). Since IFA1 has a very similar coding (FR-GB), there was confusion about for which interconnectors shadow auctions should be run. Erroneously, it was concluded that shadow auctions had to be triggered for IFA1.

At the partial decoupling deadline of 12:40, it was jointly agreed to wait 2-3 minutes and the partial decoupling was declared at 12.43 and it was decided to reopen the order books from 12.55 to 13.05.

### 5.3 Shadow auctions

The communication and the flaws in the procedures as described in Section 5.2 led to misunderstanding and confusion in the running of the shadow auctions by JAO, which has delayed the shadow auctions process.

At around 12:35, the bid submission window for the shadow auctions was closed and the auctions were run. The slightly later bid submission window closure, which is normally at 12:30, offered the market participants a little more time.

Border / Interconnector	Shadow auction process		
	Bid submission closed (auction ran)	Auction results sent	Results published on JAO website
DK2-DE	12:36	12:51	12:52
DE-DK2	12:36	12:51	12:52
NL-DK1	12:34	12:52	12:53
DK1-NL	12:34	12:52	12:53

Due to the previously described misunderstanding, JAO could not publish the shadow auctions results directly after the partial decoupling was declared, but only 8-9 minutes after.

In addition to the two cables mentioned in the table above, erroneously shadow auctions were also triggered for IFA1 and the results were published at 12:51. At 13:01, the shadow auctions for IFA1 were cancelled. Nevertheless, the order book closure time was kept at 13:05, leaving very little time for the market to adapt to the new information.

Besides the erroneously triggered shadow auctions for IFA1, shadow auction process and the subsequent update of the bids were executed in line with the procedures.



## 6 Lessons learnt and recommended follow up actions.

### 6.1 Probability that it will happen again and comparison with single NEMO arrangement

For this particular incident, EMCO deployed a fix that makes it impossible for this kind of a situation to occur again.

In addition, it is good to point out that due to the Multi NEMO Arrangement (MNA) that has been implemented in CWE in July 2019, the impact of this incident was limited as other remaining NEMOs (namely EPEX and EXAA) and Bidding Zone Borders stayed coupled in CWE. In the decoupling incident of June 7th 2019, the whole CWE area was decoupled and in consequence of this, all the CWE external borders. With the current MNA configuration in CWE, only some borders were affected and globally all the SDAC countries remained coupled.

It is good to point out that because of SDAC developments, operations is getting more complex and consequently the risk for incidents increases, but the impact of incidents is decreasing.

### 6.2 Timings of MRC, regional and local processes and procedures

Given the interlinkage of the different levels of procedures (MRC, 4M MC, PCR, regional and local) and the timings there in, consistency is necessary. For some processes, a certain degree flexibility to adapt to the specific situation at hand is desired.

To secure this consistency and to facilitate some flexibility, the parties

- investigated whether the deadlines for calculation of market results and for declaration of decoupling can be slightly extended to allow more time for the standard processes. It has meanwhile been agreed to assign more time to the calculation and to move the full decoupling deadline.
- investigated whether the timings of procedures on the different levels have to be further harmonized.

Since the Nordic MNA will Go-Live soon (and thereafter several others), the operational situation will get more complex. This means an increased risk of encountering complex issues. Given the complexity of certain procedures, it is recommended to:

- Investigate possibilities to simplify certain steps.
- Limit regional specificities by harmonizing processes where possible.
- Perform training of operators both in the individual organizations and at MRC level, to secure that all in operations are aware of the procedures.

### 6.3 Shadow auction and subsequent update of bids

Besides the erroneously triggered shadow auctions for IFA1, shadow auction process and the subsequent update of the bids were executed in line with the procedures.

To facilitate an efficient functioning of fallback measures in general and the shadow auctions in particular, it is recommended to:

- offer market participants to participate in SDAC/MRC trainings with the TSOs and PXs, so all can get well familiar with shadow auction processes. This will facilitate all parties including the market participants to be prepared for handling a decoupling incident.

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- evaluate in the longer term if the growing maturity of SIDC and forthcoming Intraday Auctions (IDAs) can represent a solution which fits better in the day-to-day process, as this would be replacing a fallback option with an ordinary process.

## Annex 1: Overview of the February 4th 2020 results of the shadow auctions per border

Hour	Allocated / Nominated	Border/Interconnector			
		DK2-DE	DE-DK2	DK1-NL	NL-DK1
1	Allocated	300	0	700	0
	Nominated	0	0	50	0
2	Allocated	0	300	700	0
	Nominated	0	0	50	0
3	Allocated	0	600	700	0
	Nominated	0	0	50	0
4	Allocated	0	600	700	0
	Nominated	0	0	50	0
5	Allocated	0	600	700	0
	Nominated	0	0	100	0
6	Allocated	0	600	700	0
	Nominated	0	0	150	0
7	Allocated	0	600	700	0
	Nominated	0	0	150	0
8	Allocated	0	600	700	0
	Nominated	0	0	150	0
9	Allocated	0	600	700	0
	Nominated	0	0	150	0
10	Allocated	0	600	700	0
	Nominated	0	0	150	0
11	Allocated	0	600	700	0
	Nominated	0	0	150	0
12	Allocated	0	600	700	0
	Nominated	0	0	150	0
13	Allocated	0	600	700	0
	Nominated	0	0	150	0
14	Allocated	0	600	700	0
	Nominated	0	0	150	0
15	Allocated	0	600	700	0
	Nominated	0	0	150	0
16	Allocated	0	600	700	0
	Nominated	0	0	150	0
17	Allocated	0	600	700	0
	Nominated	0	0	150	0
18	Allocated	0	600	700	0
	Nominated	0	0	150	0
19	Allocated	0	600	700	0
	Nominated	0	0	150	0
20	Allocated	0	600	700	0
	Nominated	0	0	150	0
21	Allocated	0	600	700	0
	Nominated	0	0	150	0
22	Allocated	0	600	700	0
	Nominated	0	0	150	0
23	Allocated	0	600	700	0
	Nominated	0	0	150	0
24	Allocated	0	600	700	0
	Nominated	0	0	150	0

Table: Overview of the February 4th 2020 results of the shadow auctions, per border.