



# **NWE Day-Ahead Market Coupling Project**

**3rd Progress Report**

**March, 2013**



# CONTENTS

CONTENTS	2
1. Introduction	4
2. High level architecture of NWE Price Coupling (update)	5
2.1. Shipping arrangements for the CWE-GB interconnections and intra GB	5
2.1.1. The GB Virtual Hub and the Special Purpose Vehicle	5
2.1.2. Interactions between CCPs and Shipping Agents	6
2.1.3. CWE-GB and IntraGB Clearing and Settlement	8
2.1.4. CWE-GB and IntraGB Physical Delivery	10
2.1.5. Congestion Income Distributor function	12
2.1.6. Capacity Submission and Verification of Price Coupling Results	14
2.2. HLA GB region	15
2.2.1. GB1 (IFA Interconnector) and Intra GB Architecture	16
2.2.2. GB2 (BritNed Architecture)	19
3. Losses on DC cables in NWE Price Coupling	21
3.1. Losses modelling in PCR Algorithm	21
3.2. Impact assessment on losses	22
4. NWE Process scenarios and timings	23
4.1. Overview of the possible price coupling scenarios	23
4.2. Overview of the feasible price coupling scenarios in NWE	25
4.3. Alternative timings proposal	27
5. NWE Procedures	30
5.1. Introduction to the procedures	30
5.2. Normal procedures	30
5.3. Backup procedures	31
5.4. Fallback Procedures	31
5.5. Special Procedures	32
5.6. Other Procedures	32
6. Fallback HLA's and procedures	33
6.1. Fall back HLA for CWE	33
6.1.1. High-Level architecture overview	33
6.1.2. Systems	34
6.1.3. Information produced and exchanged	35



6.1.4.	Sequence in which information is produced and exchanged	35
6.2.	Fall back HLA for Nordic-Baltic	35
6.2.1.	High-Level architecture overview	36
6.2.2.	Systems	36
6.2.3.	Information produced and exchanged	37
6.2.4.	Sequence in which information is produced and exchanged	37
6.3.	Fallback HLA for IFA and IntraGB	37
6.3.1.	High –Level architecture overview GB1 (IFA Interconnector) Architecture	38
6.3.2.	Systems	38
6.3.3.	Information produced and exchanged	39
6.3.4.	Sequence in which information is produced and exchanged	39
6.4.	Fallback HLA for BritNed	40
7.	Rollback	40
7.1.	Roll back situations	40
7.2.	Roll back in CWE	41
7.3.	Roll back in Nordic-Baltic region	41
7.4.	Roll back for the ITVC borders	41
7.5.	Roll back in GB	42
7.6.	Regulatory framework for roll back	42
8.	Governance arrangements	43
9.	Planning update	43
9.1.	Planning of Development projects NWE is depending on	43
9.2.	Testing	43
9.2.1.	Test phases	43
9.2.2.	Test approach	44
9.2.3.	Master Test plan	44
9.2.4.	Request of SWE parties to join the NWE testing	45
9.3.	Overall target planning	46
9.4.	Communication timelines of the NWE project in context of the updated project planning	47
9.5.	New cost estimation for NWE Price Coupling	48
	Annex 1: Glossary	49
	Annex 2: Fallback flow information CWE	52
	Annex 3: NWE DA market participant consultation paper	60
	Annex 4: Test phases and their entry and exit criteria	63



## 1. Introduction

As announced when sending the 1<sup>st</sup> Progress Report, this has been followed by a second report giving a further update of the progress in the NWE Price Coupling project.

This 3<sup>rd</sup> Progress Report, following the 2<sup>nd</sup> report which was sent end of October 2012, provides a description or update of the following topics:

- Detailed high level regional functional architecture of the GB region
- Update on shipping arrangements for CWE-GB and intra-GB
- Losses on DC cables in NWE Price Coupling
- Process timings
- Normal, backup, special and other procedures
- Fall back (HLA's and procedures)
- Roll back
- New governance arrangements
- Project Planning update

Most subjects mentioned above still concern work in progress, so it is possible that changes may occur. If this is the case the NWE Final Regulatory Report will highlight these changes. Since January 2013, a NWE Day-ahead Price Coupling Report is sent on a monthly basis providing an overview on the current status of the NWE project and identifying any risks for current planning of NWE.



## 2. High level architecture of NWE Price Coupling (update)

### 2.1. Shipping arrangements for the CWE-GB interconnections and intra GB

The CWE-GB and intraGB clearing and settlement solutions are based on a cooperation between the relevant Central Counter Parties (CCPs).

The GB Region is currently linked to the CWE region through the IFA HVDC (France/England) and BritNed (Netherlands/England) HVDC interconnectors. IFA HVDC cable is jointly owned by NGIC and RTE.

NPS/ EPEX (in conjunction with their Clearing Houses Nasdaq OMX and ECC) and NGIC/RTE are responsible for designing, delivering and operating the clearing and settlement solution for IFA. The cross PX clearing and settlement solution is modeled on the arrangements currently operating in CWE between APX-ENDEX and ECC.

APX and BritNed are responsible for designing, delivering and operating the clearing and settlement solution for BritNed. The solution will to a large extent re-use the arrangements currently operating on BritNed.

APX/NPS (in conjunction with their Clearing Houses) are responsible for designing, delivering and operating the solution for intraGB. The solution will involve a Special Purpose Vehicle and the GB Virtual Hub.

#### 2.1.1. The GB Virtual Hub and the Special Purpose Vehicle

To integrate the GB market into the Price Coupling solution, new systems and/or interfaces need to be developed and/or adapted on the GB-FR and GB-NL borders (including within GB as between the two GB PXs).

In order to enable the GB market's participation in the NWE market coupling arrangements and to form a GB common reference price, NGIC tendered for a service provider to facilitate the design, development and implementation of a "GB Virtual Hub" which would be operated by the successful bidder under the terms of an operational agreement with NGIC.

The terms of NGIC's tender require the creation of a standard set of operating agreements. Those agreements shall be for both incumbent and new entrant interconnector operators seeking access to the GB market and Price Coupling solution and will preserve the roles of the individual GB market operators. As the successful bidder, NPS is responsible for designing, delivering and operating the Virtual hub, and will also work with Nasdaq OMX (its Clearing House) and with EPEX and its Clearing House ECC to facilitate the cross clearing and settlement arrangements for the France/England border through the IFA interconnector.

In order to form a GB common reference price for electricity across the two participating GB PXs (N2EX and APX Power UK), it is necessary to facilitate intra GB shipping. Nord Pool Spot as the GB Virtual Hub operator will be responsible for maintaining and operating a virtual connection with infinite capacity



between the GB PXs. This connection will enable the PCR algorithm to effect the pooling of GB liquidity between GB PXs under market coupling.

Intra-GB shipping will be implemented by means of a special purpose vehicle (SPV) making trades with volumes equaling the flows between the two GB markets as calculated by the market coupling algorithm on both markets.

Within the PCR algorithm, GB1 and GB2 hubs are linked with an infinite capacity link which forms a common reference price for GB (Price GB1 hub=Price GB2 hub).

GB1 refers to the N2EX (NPS) hub and GB2 to the APX Power UK Hub

GB market parties will continue to enjoy their usual contractual relationship with their PX.

The tasks of the GB Virtual Hub operator (NPS) include:

- The publication of the GBP-EUR foreign-exchange rate (FX Rate) for use by the GB PXs. As the currency for NWE/PCR will be Euros, the GB Virtual Hub will handle and set the day-ahead foreign-exchange rate (FX rate) for the GB region. It will distribute the day-ahead FX rate to be used by the GB PXs for order book conversion from Pound Sterling to Euro and result conversion from Euro to Pound Sterling. Settlement between internal GB CCPs / SPV will be done in Pound Sterling.
- Submission to the PCR Algorithm of 'virtual infinite capacity' between the different GB PXs (in the same bidding zone).
- Publication for transparency: Cross Zonal Capacity, and intra-GB flow (this information will also be published by the PXs).

To manage the pooling of intra-GB liquidity, the tasks of the Special Purpose Vehicle (SPV) include:

- Be responsible for posting collateral or other security with the GB PXs/CCPs depending on the applicable intra-GB exchanges resulting from the NWE market results.
- Concluding and maintaining appropriate funding arrangements in relation to such collateral and/or guarantees as may be required from time to time by the intra GB exchanges/CCPs.
- Settlement in respect of the virtual intra-GB flow between N2EX and APX in accordance with the membership agreements between the SPV and the GB PXs.

### 2.1.2. Interactions between CCPs and Shipping Agents

#### Identification of the involved parties

For each border (including virtual border between GB1 and GB2 hubs), there will be one or several designated CCPs and/or Shipping Agents responsible for performing or being involved in different functions. CCP and/or Shipping Agent are defined in the CACM NC.



Borders / Interconnectors	Capacity Holders	PX	CCP	Shipping Agent
GB-FR / IFA cable	NGIC, RTE	GB1 : N2EX FR : EPEX	GB1 : NOMX FR : ECC	
GB-NL / BritNed Cable	BritNed	NL : APX NL GB2 : APX UK	NL : APX CCP NL GB2 : APX CCP UK	BritNed
Intra GB Virtual Interconnector	-	GB1 : N2EX GB2 : APX UK	GB1: NOMX GB2: APX CCP UK	SPV

With the following definitions:

- SPV = Special Purpose Vehicle,
- APX Power UK will be referred as APX UK,
- APX Power NL as APX NL,
- APX-ENDEX Clearing BV as APX CCP NL,
- APX-ENDEX Commodities Ltd as APX CCP UK,
- N2EX (NPS) as N2EX,
- NASDAQ-OMX as NOMX

### Central Counter Parties

As defined in the ENTSO-E version of the CACM Network code delivered to ACER for opinion, a Central Counter Party means the role of entering into contracts with market participants, by novation of the contracts resulting from the Matching process and of organizing the transfer of net positions resulting from capacity allocation with other Central Counter Parties or Shipping Agents.

ECC, NOMX, APX CCP will perform the clearing and settlement activities for their relevant hub, respectively FR, GB1, GB2&NL hubs. They will act as usual as the counterparty to market participants for all their trades with regard to the financial rights and obligations arising from these trades.

With the GB Shipping Agents (depending on the border Britned and SPV), the CCPs (ECC, NOMX, APX CCP UK and APX CCP NL) will also act as counterparty to each other and will perform the clearing and settlement for the exchange of energy between the different hubs with regard to the financial rights and obligations arising from these energy exchanges. The setups for the different borders are mentioned in the following chapters.

### GB Shipping Agents



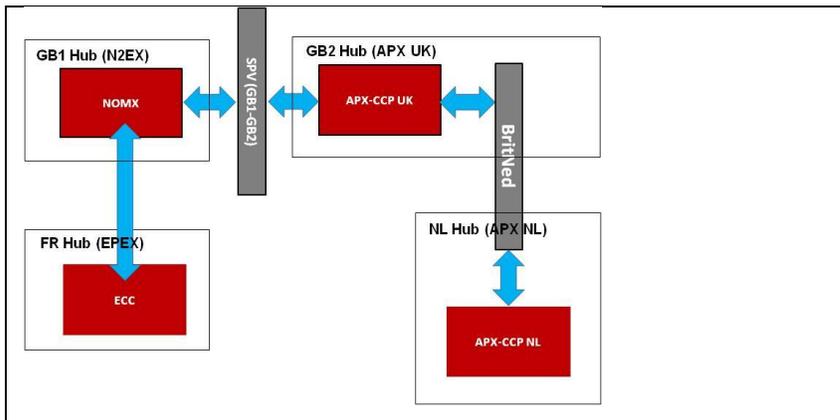
As defined in the ENTSO-E version of the CACM Network code delivered to ACER for opinion, a Shipping Agent means the role of transferring Net Position(s) between different Central Counter Parties.

SPV and BritNed will act as shipping agent by transferring the energy between the different Central Counter Parties:

- For the intraGB border: SPV with NOMX and APX CCP will manage the transacting of energy between the two GB Power Exchanges.
- For the GB/NL border : BritNed will interact with APX CCP NL and APX CCP UK to transfer the energy between GB and NL

### Overview of interactions

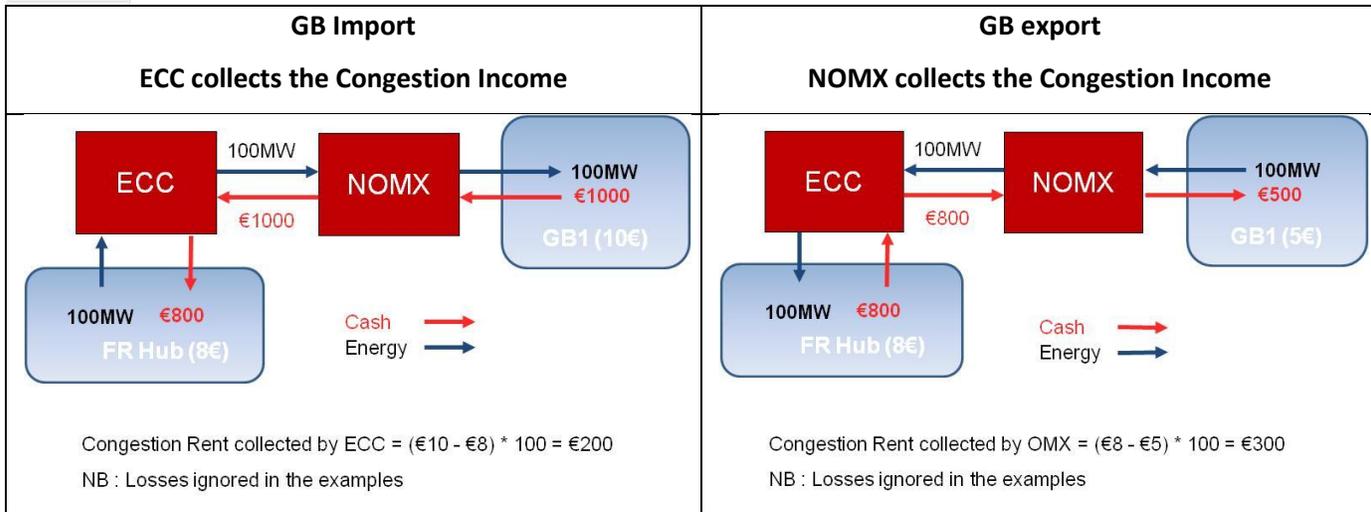
The figure hereunder summarizes the different interactions between CCPs and Shipping Agents involved within the intraGB and CWE-GB shipping solutions.



### 2.1.3. CWE-GB and IntraGB Clearing and Settlement

#### GB/FR Border

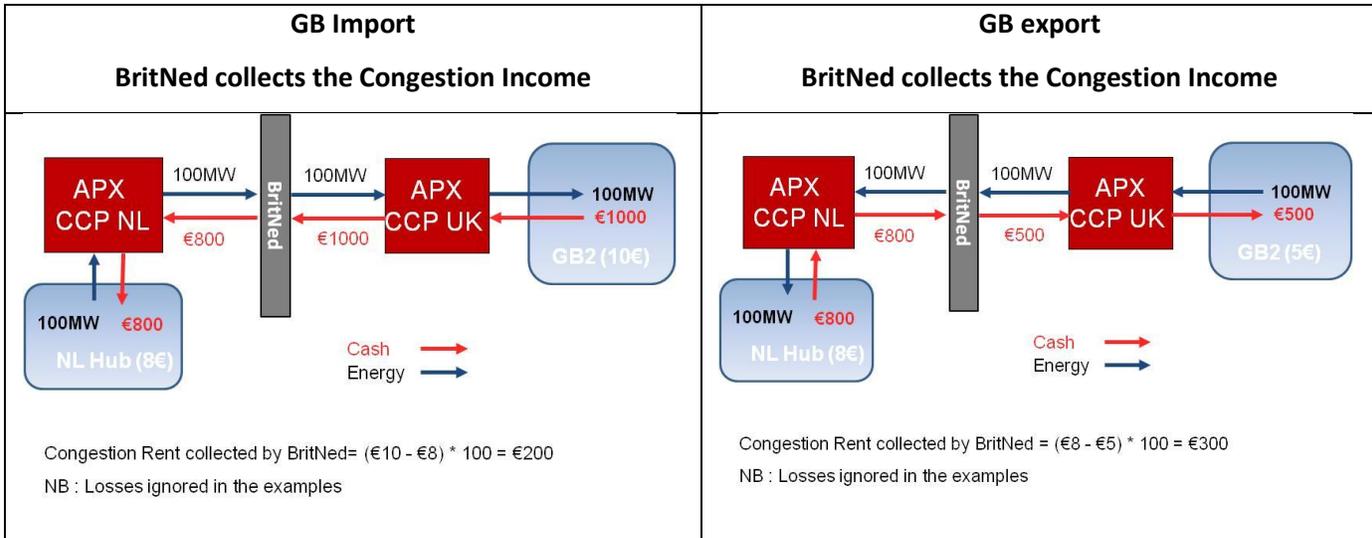
In accordance with the GB/FR Scheduled Exchanges set by the PCR algorithm, the exporting country's CCP is responsible for transferring the energy between GB and France (same principle as within CWE region). The congestion income accrues to the exporting country's CCP (ECC for GB import and NOMX for FR import):



Settlement between ECC and the NOMX will take place in € / GB1 refers to the N2EX (NPS) hub.

### GB/NL Border

In accordance with the GB/NL Scheduled Exchanges set by the PCR algorithm, BritNed is responsible for transferring the energy between GB and Netherlands acting as Shipping Agent (same principle as within current BritNed CWE embedded solution). The settlement link is between APX CCP and BritNed and the congestion income always accrues to BritNed (whatever the direction).

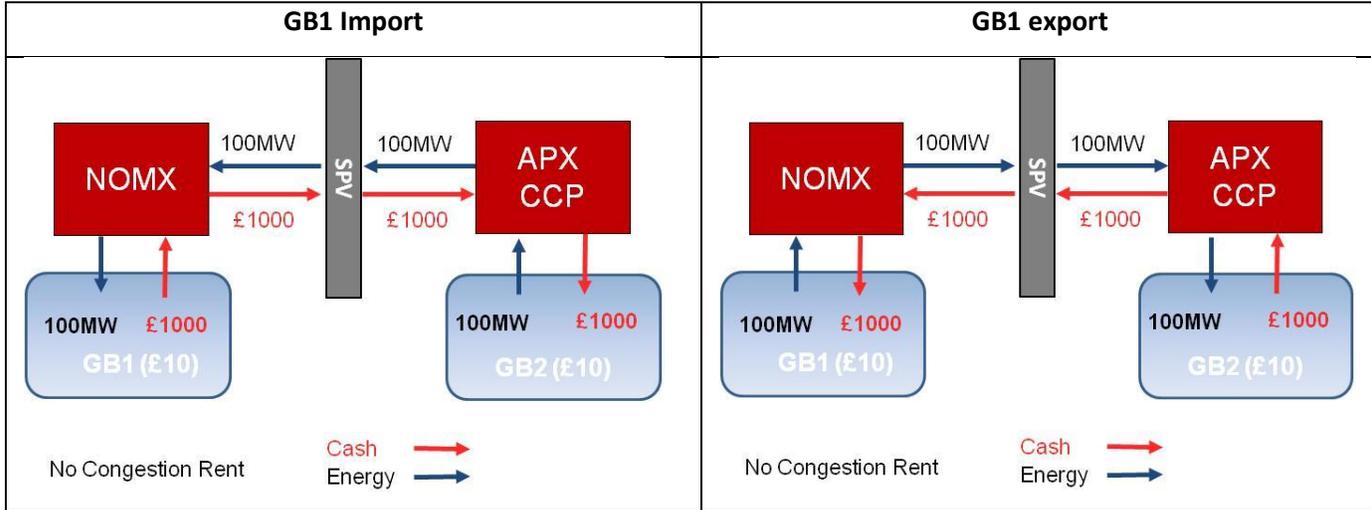


Settlement between BritNed and APX CCP NL will take place in €. Settlement between BritNed and APX CCP UK will take place in GBP. GB2 refers to the APX UK hub



## IntraGB

In accordance with the intraGB Scheduled Exchanges set by the PCR algorithm (Scheduled Exchanges on the infinite virtual capacity), SPV is responsible for transferring the energy between the two GB hubs (GB1 and GB2) acting as an intra GB Shipping Agent. The settlement link is between SPV&NOMX and SPV&APX CCP. There is no congestion income for intra GB exchanges.



Settlement between the different actors will be done in Pound Sterling.

### 2.1.4. CWE-GB and IntraGB Physical Delivery

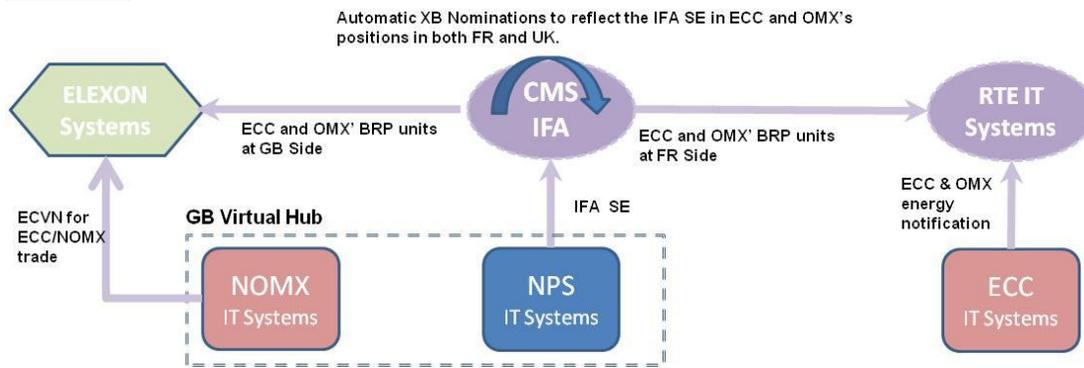
The different exchanges of energy between the CCPs and the Shipping Agents which result from the Scheduled Exchange (SE) between CWE-GB and IntraGB are notified to the national TSOs in order to balance their position in each hub.

Verification process of the SE is ignored in this chapter to simplify the diagrams.

### GB/FR Border

The exporting country's CCP is responsible for transferring the energy between GB and France:

- ECC when the SE on IFA cable is from FR to GB
- NOMX when the SE is from GB to FR.



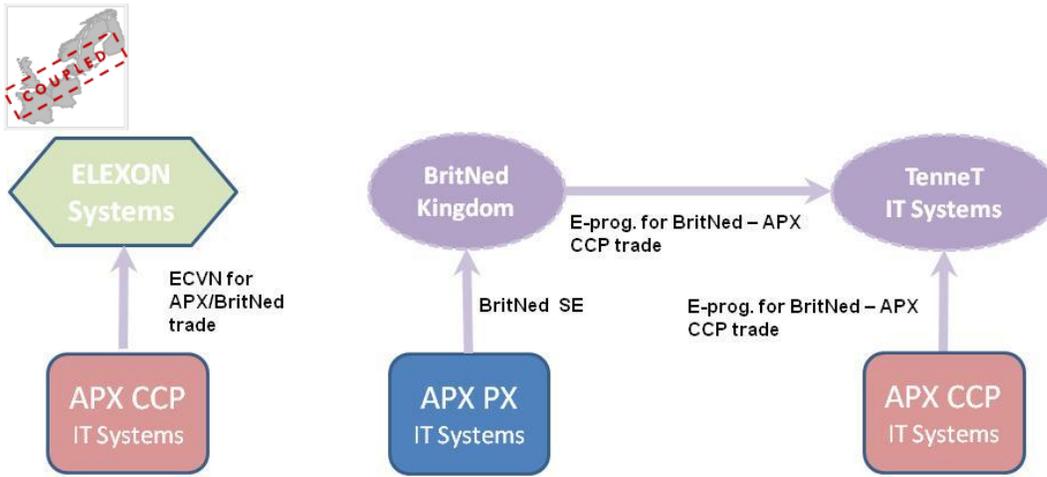
The notification of the IFA SE involves several systems/steps:

- TSOs post coupling system CMS IFA (jointly owned by RTE/NGIC) is a single point of cross border nomination. The IFA SE (received from NPS IT systems) is automatically reflected by CMS IFA (on behalf of ECC and NOMX) into cross border nominations at each side of the cable for both ECC and NOMX.
- The cross border nominations at each side of the cable for both ECC and NOMX are reflected within ECC and NOMX's BRP units by the CMS IFA and flow to ELEXON systems on GB side and RTE systems on French side via the existing links and arrangements.
- NOMX's systems: on GB side, parties (NOMX/ECC) are required to inform ELEXON of the volume of electricity that they are buying or selling. This is done by submitting an Energy Contract Volume Notification (ECVN), which is a contract between two Balancing and Settlement Code (BSC) Parties stating who is buying/selling the electricity and the volume of electricity being traded. BSC Parties must appoint an ECVN Agent (ECVNA) to submit the ECVN on behalf of them and their counterparties. It is assumed here that NOMX will be the ECVNA.
- ECC's systems: on FR side, on a daily basis, ECC is in charge to inform RTE of the volume of energy (sell or buy orders) exchanged in the French Hub. Both ECC and NOMX transactions on the French Hub regarding the shipping processes will be included within this current operational activity.

NOMX and ECC will act as a Balancing Responsible Party (BRP) in France and GB.

### GB/NL Border

BritNed is responsible for transferring the energy between GB and Netherlands acting as Shipping Agent (same principle as within current BritNed CWE embedded solution). BritNed will interface with APX CCP on each side.



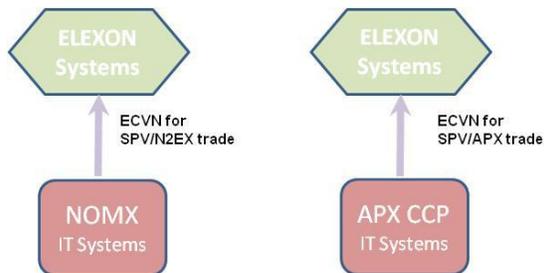
On GB side: being APX CCP's party for the ECVN, BritNed acts as a Shipping Agent for the delivery of energy from/ in GB. APX CCP is the ECVN Agent and submits energy information to Elexon. The ECVN submitted by APX CCP balances the BritNed's error account flow (the metered flow on BritNed is automatically credited to BritNed's error account by Elexon).

On NL side: being APX CCP's party for the E-Programme (and vice versa), BritNed acts as a Shipping Agent for the delivery of energy from/in NL. Both APX-CCP and BritNed inform TenneT about the transactions between themselves as PRP. In NL, parties authorised by TenneT (so called Programme Responsible Parties or PRPs for short) inform TenneT on a daily basis about the transactions with other PRPs that they have planned for the next day. The sum of all transactions entered into by each PRP is called the Energy Programme or E-Programme.

BritNed and APX CCP act as a Balancing Responsible Party (BRP) in NL and GB.

### Intra GB

SPV is responsible for transferring the energy between the two GB hubs (GB1 and GB2) acting as an intra GB Shipping Agent. The settlement link is between SPV&NOMX and SPV&APX CCP. NOMX and APX CCP will therefore act as ECVN Agents for intra GB trades with the SPV for their respective hubs (ie GB1 and GB2). The trade with APX CCP in GB2 Hub will balance the SPV's position resulting from the trade with NOMX in GB1 Hub (and vice versa).



$$ECVN (N2EX/SPV) + ECVN (APX CCP/SPV) = 0$$

### 2.1.5. Congestion Income Distributor function

Borders / Interconnectors	Capacity Holders	Congestion income distributor
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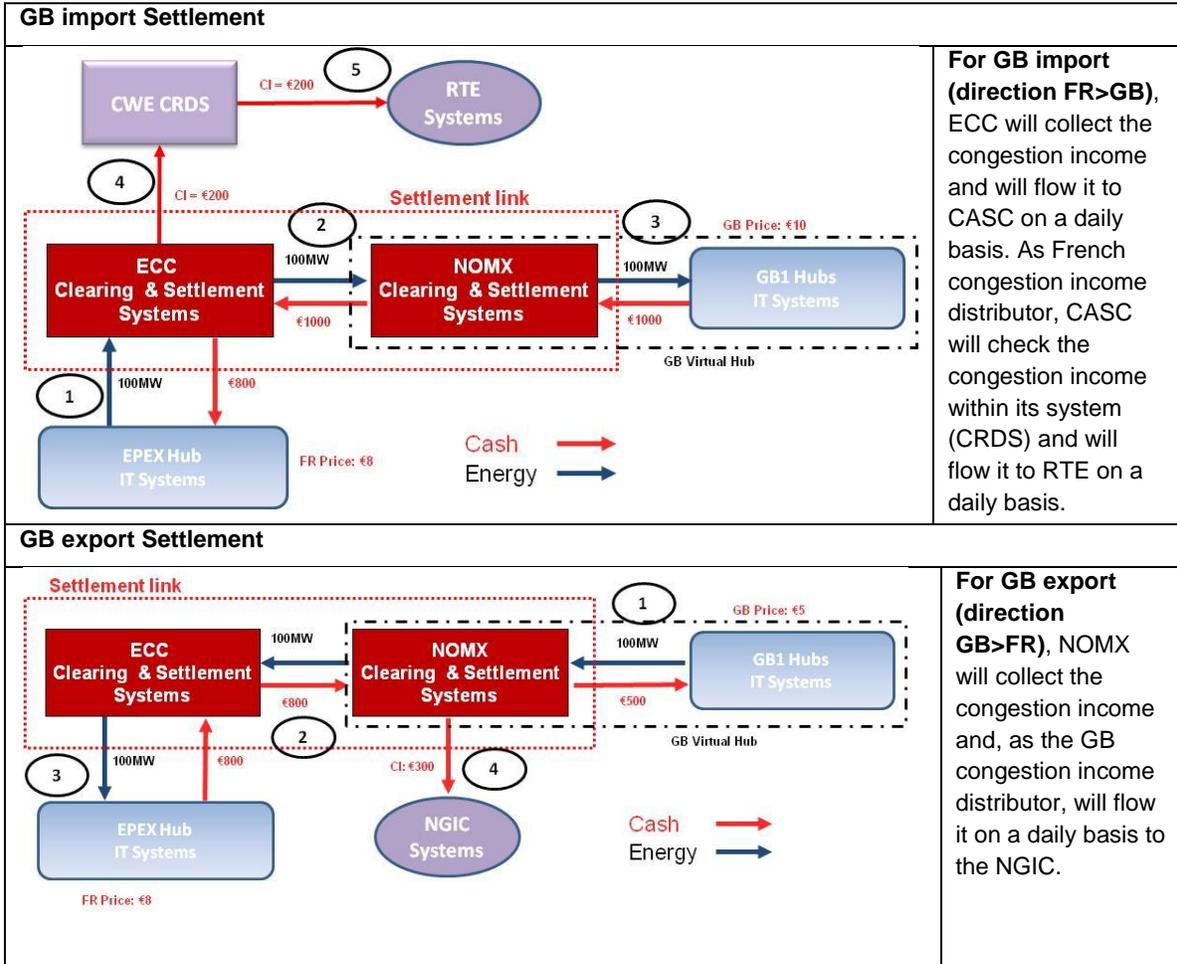


FR-GB / IFA cable	NGIC, RTE	FR to GB direction: CASC GB to FR direction : GB Virtual Hub
NL-GB / BritNed Cable	BritNed	Not Applicable (Shipping Agent)
<b>Intra GB</b> Virtual Interconnector	NR	Not Applicable (same price, no congestion income)

- BritNed, acting as a Shipping Agent will directly collect its own congestion income for the GB/NL Border (as currently done within its CWE embedded solution),
- There is no congestion income for IntraGB since the two hubs GB1&GB2 are linked by the virtual infinite capacity which can't be congested,
- The congestion income distributor function is therefore only relevant for FR/GB border. It will be performed on French side by CASC (for the direction FR to GB) and on GB Side by the GB Virtual Hub (for the direction GB to FR).

Applying the same principle as for the GB/FR border, where the exporting country's CCP is responsible for transferring energy between France and GB:

- the congestion income will accrue to ECC for GB import,
- the congestion income will accrue to NOMX for GB export.



RTE/NGIC will perform between themselves a final reconciliation of the congestion income within the existing contractual arrangements.

### 2.1.6. Capacity Submission and Verification of Price Coupling Results

	IFA	BritNed	Virtual intraGB Interconnector
<b>Cross Zonal Capacity and Allocation Collection</b>	GB Virtual Hub	APX NL/UK	GB Virtual Hub
<b>Verification of the relevant Price Coupling Results</b>	GB Virtual Hub	APX NL/UK	GB Virtual Hub
<b>Sending of the Price Coupling Results to the TSOs</b>	GB Virtual Hub	APX NL/UK	-



The Price Coupling Results for the Virtual intraGB Interconnector will be distributed by the PMB to both APX UK and NPS(N2EX). For further details please refer to the GB HLA (both IFA and BritNed part).

## 2.2. HLA GB region

This chapter contains the high-level functional architecture and business process with the current design assumption.

This chapter is divided into two sections:

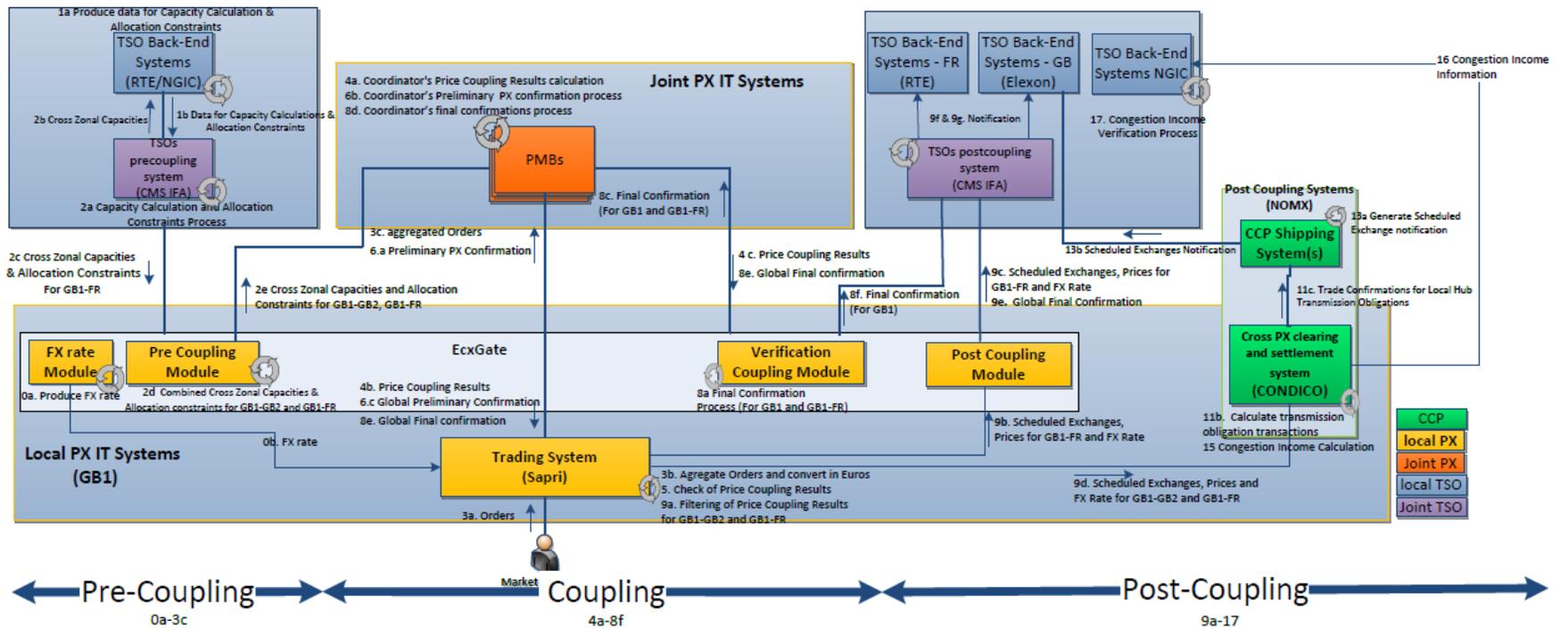
- GB1 (IFA Interconnector) and Intra GB Architecture
- GB2 (BritNed) Architecture

The high-level architecture overview shown below is explained in the following sections of this chapter which are devoted to:

- The system components shown,
- The Agents shown,
- The information produced and exchanged,
- A glossary, explaining the terms used in the diagram and the remaining text of this chapter.



## 2.2.1. GB1 (IFA Interconnector) and Intra GB Architecture





## Systems

The list of systems below reflects the current high level IFA and Intra GB design assumptions.

In the architecture diagram, the system components further called Price Coupling Components that are expected to play a role in the Price Coupling are indicated with rectangles. In the information perspective, a System can be thought of as a set of information processing functions, which can be considered a separate entity. The systems in this chapter consist of the number of systems that must be available for the PC in NWE.

The following Systems are distinguished.

- The TSO Back End Systems:
  - Pre-Coupling stage: RTE/NGIC will be providing (manually) the required IFA interconnector capability (i.e. the maximum technical availability) and Allocation Constraints to the TSO Pre-Coupling System CMS IFA (see TSO Pre Coupling systems bullet). Apart from this the RTE Back End systems will receive the Cross Zonal Capacities once calculated in the TSO Pre Coupling System.
  - Post-Coupling stage: for the purposes of the balancing and settlement, the notifications of the Scheduled Exchanges from the CCPs will be received in RTE Back End systems for French side and Elexon systems for GB one. For the purposes of the congestion income management for the direction GB to FR, the congestion income information will be received in the NGIC Back End systems.
- The TSO Pre-Coupling System: the existing TSOs Pre Coupling System for GB1-FR will be adapted to allow the exchanges of data with the local PX IT Systems in accordance with the PCR Architecture solution. CMS IFA (Capacity and Management System) will be the TSO Pre-Coupling system. The CMS IFA is jointly owned and operated by RTE and NGIC and produces in a coordinated way the Cross Zonal Capacities and Allocation Constraints (loss factor, ramping constraints). Apart from this the CMS IFA will be providing the Cross Zonal Capacities once calculated to RTE Back End Systems.
- The Local PX IT Systems: This consists of 3 components :
  - EcxGate: EcxGate is a system, currently used at NPS for sending and receiving EDIFACT (Electronic Data Interchange For Administration, Commerce and Transport) messages and xml-messages toward Nordic TSO's Pre-Coupling or Post Coupling systems. Interface at EcxGate will communicate both on WEB Service (Integration with TSO Systems) and to FTP-Server (Integration with PX Systems).The EcxGate system is divided in 4 modules.
    - FX Rate Module: this module will each day collect a primary currency rate from a bank, to be used to convert Orders from £ to Euro and vice versa and to recalculate prices resulting from the Price Coupling Results from Euro to £. The FX Rate Module shall distribute the currency rate to APX/GB on a daily basis.
    - Pre Coupling Module: this module will collect Cross Zonal Capacities and Allocation Constraints from CMS IFA and will also create the virtual interconnector capacities data between the 2 GB Bidding Zone. These 2 sets of data will be integrated to one common file (Capacity merge, adding values and header update) for sending to PMB.



- Verification Coupling Module: this module will receive the Price Coupling Results from PMB. When receiving the Price Coupling Results, this module will do (on behalf of RTE/NGIC) the verification (check) for flows on IFA and intra-GB interconnectors against CZCs and Allocation Constraints.
  - Post Coupling Module: this module will send the relevant Price Coupling Results to the TSO Post Coupling system (CMS IFA) and other Post Coupling Systems
- Trading Systems: The Trading System collects the Orders from the Market Participants for GB1 region and provides them the Individual Results. The Trading Systems used by the PXs involved (N2X) are represented as Sapri Trading System'. The PX will do a portfolio allocation and send an acknowledgement file back to PMB if result is completed or not. PX will also send the Preliminary PX confirmation after the validations.
  - Cross PX Clearing and Settlement System: The CONDICO system is currently used at N2EX for settlement and notification by NOMX (acting as CCP for N2EX) in the GB1 Market. CONDICO will do the cross clearing via the SPV for intraGB (between GB1-GB2) and ECC (acting as CCP of EPEX) for the GB/FR border, settlement to all participants, including calculation of congestion income, hedging cost and notification to Elexon. This include communication interface to Bank for payment.
- The TSOs Post Coupling System: the existing TSOs Post Coupling System for IFA will be adapted to allow the exchanges of data with the Post Coupling Module of the ExGate. CMS IFA will be the TSOs Post-Coupling System. This system receives the relevant Price Coupling Results for IFA (the FR/GB Prices and IFA Scheduled Exchanges).
  - The CCP shipping system: NOMX will handle the shipping system in the CONDICO, and perform clearing, settlement, payment and notification (for intraGB and for the direction GB to FR). For intra-GB trades/flow it will be a SPV company (Special Purpose Vehicle) that will be a member on both N2EX and APX-GB. The SPV will only transfer money between exchanges for cross-clearing and schedules in opposite direction for intraGB shipping. It is not a part of the diagram, since in practice SPV behaves as a normal member.

Please note that the CWE Architecture (as already communicated in the previous report) also includes some steps for the IFA Interconnector regarding the post coupling phase, in particular for the sending of the Scheduled Exchanges from the CWE TSO Common system to EPEX/ECC for the IFA shipping process between ECC and NOMX.





## Systems

The list of systems below reflects the current high level BritNed and Intra GB design assumptions.

In the architecture diagram, the system components further called Price Coupling Components that are expected to play a role in the Price Coupling are indicated with rectangles. These components are adapted to existing to the Price Coupling.

In the information perspective, a System can be thought of as a set of information processing functions, which can be considered a separate entity. The systems in this chapter consist of the number of systems that must be available for the PC in NWE.

The following Systems are distinguished.

- The TSO Back End Systems:
  - Pre-Coupling stage: BritNed will be providing the required BritNed interconnector capability and Allocation Constraints to the TSO Pre-Coupling System Kingdom (see TSO Pre Coupling systems bullet). BritNed will receive Cross Zonal Capacities notification once it has been calculated by the Kingdom system.
  - Post-Coupling stage: For the purposes of the balancing and settlement, the notifications of the Scheduled Exchanges from the CCPs will be received in TenneT Back End systems for Dutch side and Elexon systems for GB one .
- The TSO Pre Coupling Systems: The existing TSOs Pre Coupling Systems and processes for the BritNed cable will remain, for the greater part, unchanged.
  - BritNed interconnector: BritNed Kingdom system will be the TSO Pre-Coupling system. The BritNed Kingdom system produces in a coordinated way the Cross Zonal Capacities and Allocation Constraints (loss factor and flow tariff).
- The Local PX IT Systems consists of:
  - Pre-Coupling Module is the APX Market Coupling Connector (MCC) system used to receive the Cross Zonal Capacities and Allocation Constraints from BritNed and send them to the Broker-module within the PMB system
  - The APX Trading system (Eurolight UK) collects the Orders from the Market Participants for the GB2 Bidding Zone and provides them the Individual Results.
  - Eurolight UK will also perform portfolio allocation on the PMB coordinator's results and send an acknowledgement message back to PMB if result is completed or not. Eurolight UK will also send the Preliminary PX confirmation after the validations.
  - Post-Coupling Module is also the APX Market Coupling Connector (MCC) systems. This module will handle the preparation and delivery of the BritNed formatted results message. It will also guarantee that all APX's local post processing systems receive the coordinator's results and the global confirmation messages.
  - Settlement and CCP System are handled via a combination of APX's Cross PX clearing and settlement system XPCS system and Eurolight UK. The services provided by these systems include the splitting of the GB2 position, the assignment of part of the GB2 position to the Special Purpose Vehicle (SPV) that performs GB-GB shipping and the nomination to Elexon of the SPV and BritNed positions as part of the nomination of the entire market.



### 3. Losses on DC cables in NWE Price Coupling

The NWE TSOs have informed the NRA's that answering the questions received from the NRA's regarding losses is not possible before the end of February 2013 due to time constraints and lack of simulation tools. However, high level draft answers have already been presented to the NRA's during the IG meeting of 20 February 2013.

The full report on losses will be delivered by mid-April 2013.

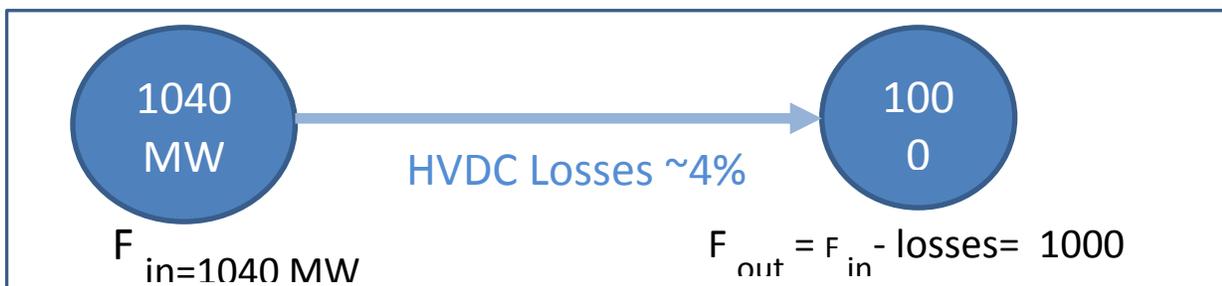
#### 3.1. Losses modelling in PCR Algorithm

The PCR Algorithm will allocate the daily cross border capacities in respect of the Cross Zonal Capacity and Allocations Constraints as provided by the TSOs during the pre-coupling stage. Allocations Constraints include (but are not limited) to transmission losses. Activation of Allocations Constraints on a specific border is subject to approval of relevant national NRAs.

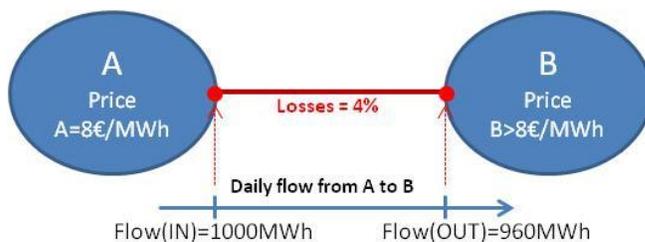
The following chapter describes the high level principle of the effects of the activation of losses on the daily flows and prices.

##### Possibility for the algorithm

- Linear losses are allowed, i.e. the losses are a fixed percentage of the flow as specified by the relevant TSOs.



Considering the following situation where two Bidding Zones are only linked by one interconnector where losses on such interconnector have been activated in the PCR Algorithm, the following properties (on both daily flow and prices) can be underlined:



##### Flow and prices numerical values



$\text{Flow(OUT)} = \text{Flow(IN)} * (1 - \text{Losses}) \rightarrow \text{Flow(OUT)} = 1000 * (1 - 4\%) = 960 \text{ MWh}$

If the interconnector is uncongested then

- $\text{Price B} * (1 - \text{Losses}) = \text{Price A} \rightarrow \text{Price B} = 8.33 \text{ €/MWh}$
- no congestion income for this exchange ( $960 * 8.33 - 1000 * 8 = 0$ )

If the interconnector is congested then

- $\text{Price B} * (1 - \text{Losses}) > \text{Price A} \rightarrow \text{Price B} > 8.33 \text{ €/MWh}$
- Congestion income for this exchange

We can therefore consider the following general principles for such situation:

### Flow Properties

- $\text{Flow(out)} = \text{Flow(in)} * (1 - \text{Losses})$

### Price Properties

- $\text{Price to} (1 - \text{losses}) - \text{Price from} = 0$  when no congestion (no congestion rent),
- $\text{Price to} (1 - \text{losses}) - \text{Price from} > 0$  when line is congested (congestion rent)

For further details, please refer to the full report on losses.

## 3.2. Impact assessment on losses

Following simulations have been agreed between TSO and PXs:

- Run #1 – No losses at all - The output is the reference result in terms of social welfare, prices and flow pattern
- Run #2 – Harmonised Loss Factor (say 2%) on all existing DC cables (harmonized case) / No loss on AC interconnectors
- Run #3 – Individual Loss Factor on all existing DC cables / No loss on AC interconnectors
- Run #4 – Individual Loss Factor on some DC cables (BritNed, IFA and Baltic) / No loss on AC interconnectors
- Run #5 – Harmonised Loss Factor in some DC cables (BritNed, IFA and Baltic) / No loss on AC interconnectors

### Indicators:

- Overall social welfare and breakdown of welfare to individual countries for consumer and producer surplus. Congestion revenue per border. Results compared to reference case (Run 1, which excludes any losses)
- Interconnector flows (commercial flows as calculated by the algorithm) compared to reference case.
- Market clearing prices compared to reference case



## 4. NWE Process scenarios and timings

### 4.1. Overview of the possible price coupling scenarios

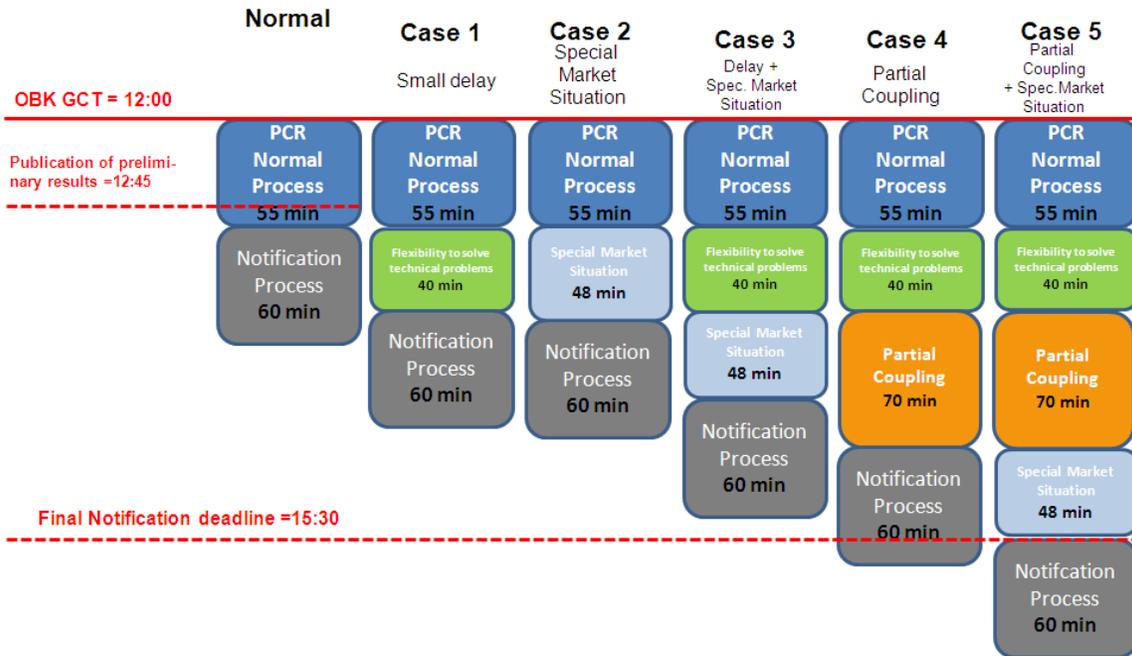
The NWE project, in cooperation with PCR, has established a list of all possible operational scenarios in NWE and a list with all feasible scenarios.

Following constraints were taken into account:

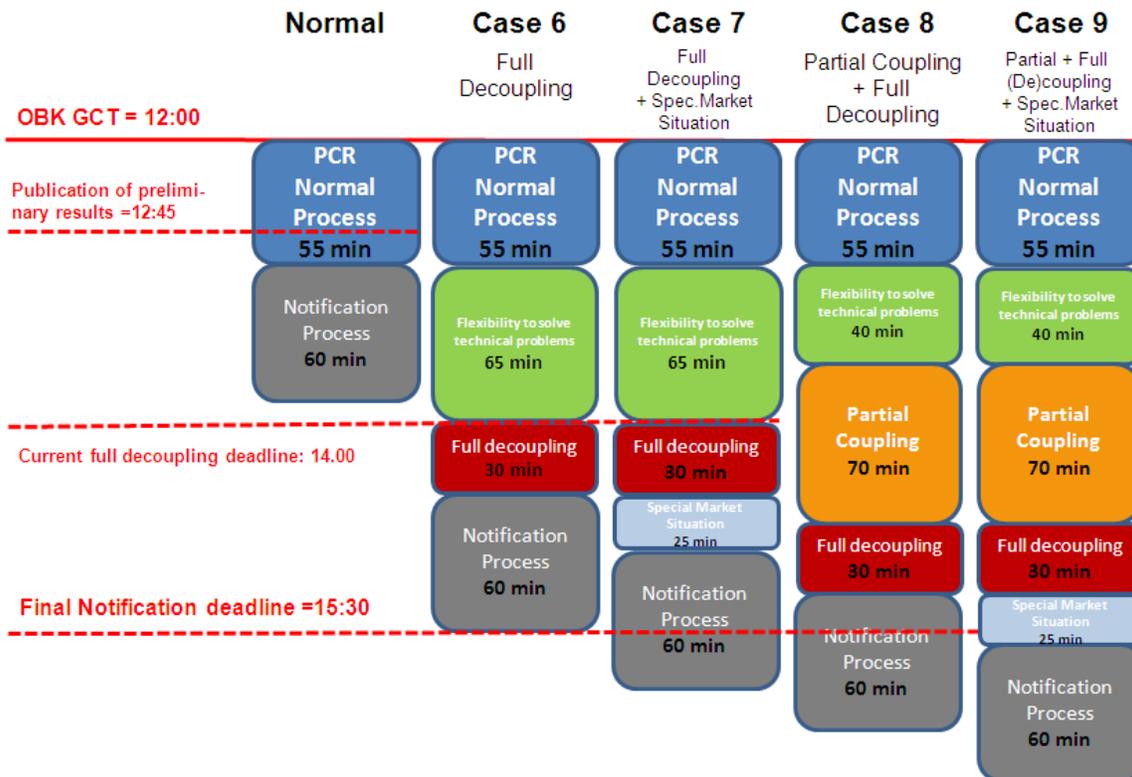
- 1) Gate Closure Time of the Order books (OBKs) at the PXs of 12:00h CET
- 2) PCR expected process timings (for normal processes and partial coupling processes)
- 3) Notification process time, following the publishing of the confirmed NWE results, for CCPs and market participants of 1 hour as currently needed in CWE (and CWE-Nordic shadow auctions). The notification process includes local and cross border trading, generation and consumption notifications to the TSOs
- 4) Time allowance for technical problem solving
- 5) Time allowance for special market procedures such as handing of curtailment situations via a second auction used by CWE PXs or the NPS-applied regulated routines that include peak load capacity (production/load) reserves activation in several countries.
- 6) Time allowance for partial/full decoupling (this includes : re-opening of Order books, closure of Order books, recalculation and publication of (local PX market) results)
- 7) Final notification deadline in CWE of 15:30h. This is the latest starting point for the security assessment processes which are fixed in ENTSO-E's Operational Handbook and apply to all Continental European TSOs. TSOs consider that a change of this deadline will be very complex and has very low probability to be able to be moved at all in short or mid-term future.

The following 2 pictures show the possible operational scenarios with the timings of the processes.

All timings in this document refer to CET Timings.



Picture 1: Possible operational scenarios, not all feasible within the current deadlines.



Picture 2: Possible operational scenarios, not all feasible within the current deadlines.

Explanation of certain aspects of the pictures 1 and 2 above

- In the current CWE Market Coupling and volume coupling with the Nordic-Baltic Region the possible partial coupling scenarios as foreseen in NWE do not exist (except for the case where



there is no volume coupling between CWE and the Nordic-Baltic Region and the ITVC interconnectors are decoupled). There is a full decoupling scenario (case 6) where partial coupling is not an option with the decoupling deadline at 14:00h, as in CWE today. This is also the reason why in this scenario 65 minutes of flexibility to solve technical problems is shown, because PXs will continue trying to solve the issue until this deadline. However, even in today's CWE/ITVC solution, there is the risk that if a special routine is required after a decoupling (Case 7), the notification period is less than 60 min (given the 15:30 deadline).

- The picture shows processes run by the NWE Power Exchanges. In case of partial coupling or full decoupling the shadow auctions for the decoupled interconnectors organized by CASC or the explicit auctions organized for the IFA cable are run in parallel with the processes above, so that the results of these explicit auctions can immediately be published when partial coupling or full decoupling is confirmed.
- If procedures for Special Market Situations must be run in coupled mode the process takes at least 48 minutes (and in worst case scenario possibly up to 75 minutes) due to the fact that the recalculation is done in coupled mode by the PCR algorithm for all NWE areas. When a procedure for a Special Market Situation is run after a full decoupling, less time is needed (25 minutes) because it only concerns a local auction (NWE areas are not coupled to each other).
- In case of partial coupling, the order books of all NWE PXs will be re-opened for about 15 minutes, after which the NWE Price calculation process is run again (55 minutes), which is why this process takes 70 minutes. Full decoupling, on the other hand, is a process run locally by each PX and can be handled in a shorter time frame (30 minutes).

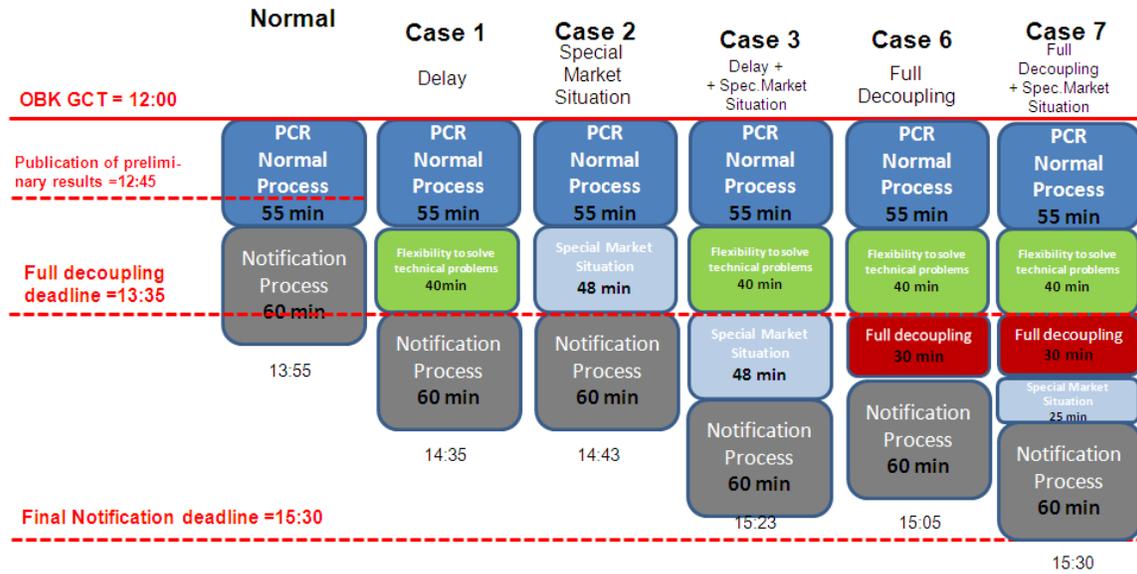
Conclusion drawn from the pictures above

The Normal case where the preliminary results are published at approx. 12:45, together with Case 1, 2 and 3 remain perfectly within the deadlines.

However in the rare cases that NWE can only partially couple or needs to fully decouple there are some scenarios as shown in the pictures above that exceed the CWE final notification deadline of 15:30.

#### 4.2. Overview of the feasible price coupling scenarios in NWE

The NWE Price Coupling project has concluded that, taking into account the 7 aforementioned conditions, only the six scenarios and timings depicted in following picture are feasible in NWE at go-live:

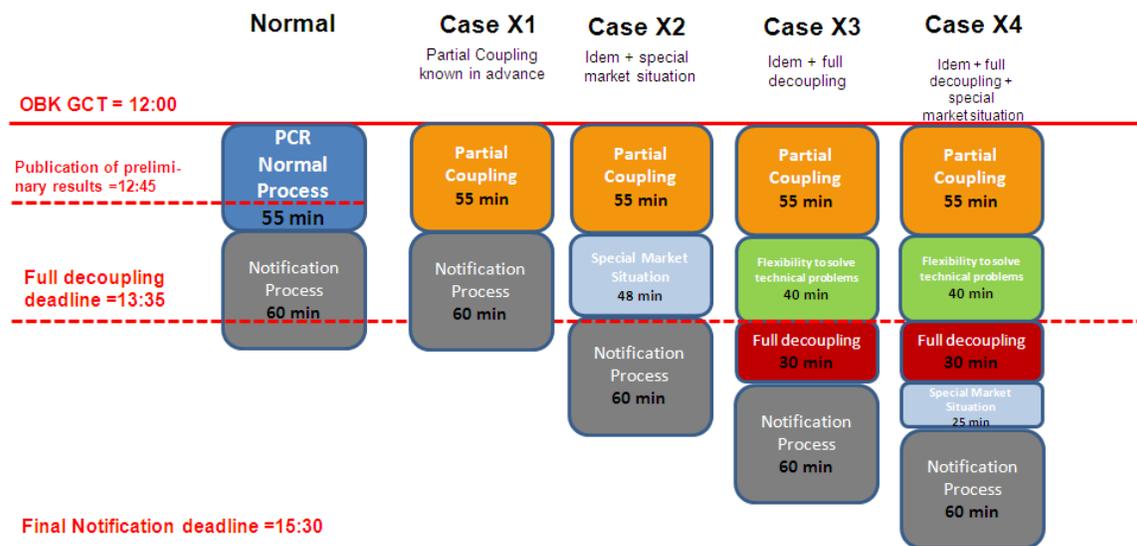


Picture 3: Feasible NWE operational scenarios at NWE go-live

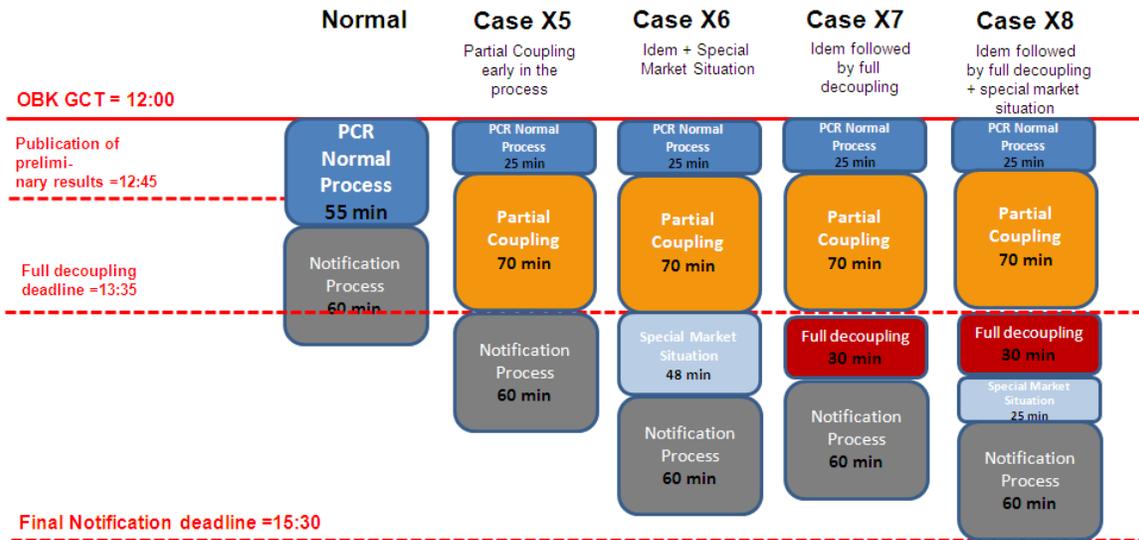
The flexibility for technical problem solving in cases 6 and 7 has been reduced from 65 min to 40 min in order to be able to accept a possible Special Market Situation after full decoupling before the final notification deadline of 15:30 (case 7).

Partial coupling is only possible in the event that it is known either (1) before the daily process starts, or (2) during the pre-coupling phase (e.g. CZC for a particular border not delivered) as depicted in picture 4, or (3) if the issue (e.g. a power exchange cannot deliver its order books) is known early in the normal process (see picture 5).

The feasible partial coupling scenarios are depicted in the figures below:



Picture 4: Feasible NWE operational scenarios at NWE go-live (partial decoupling known in advance)



Picture 5: Feasible NWE operational scenarios at NWE go-live (partial coupling known early in the process)

### 4.3. Alternative timings proposal

Looking at the feasible scenarios, the deadline for announcing full decoupling ends up at 13:35h. The decoupling deadline is established by applying the “smallest common denominator rule” on the full set of feasible scenarios, which yields 13:35. This is earlier than today in CWE (14:00h); it indicates a higher risk of decoupling. Alternatively, if we would keep the deadline of 14:00h the possibility to perform a second auction within CWE would in some cases cease to exist. The experience of CWE decoupling in March 2011 showed that this is not acceptable for some countries.

The CWE Power Exchanges estimate from experience that by allowing 55 minutes rather than 40 minutes for technical problem solving, the decoupling risk may be reduced by up to 50%.

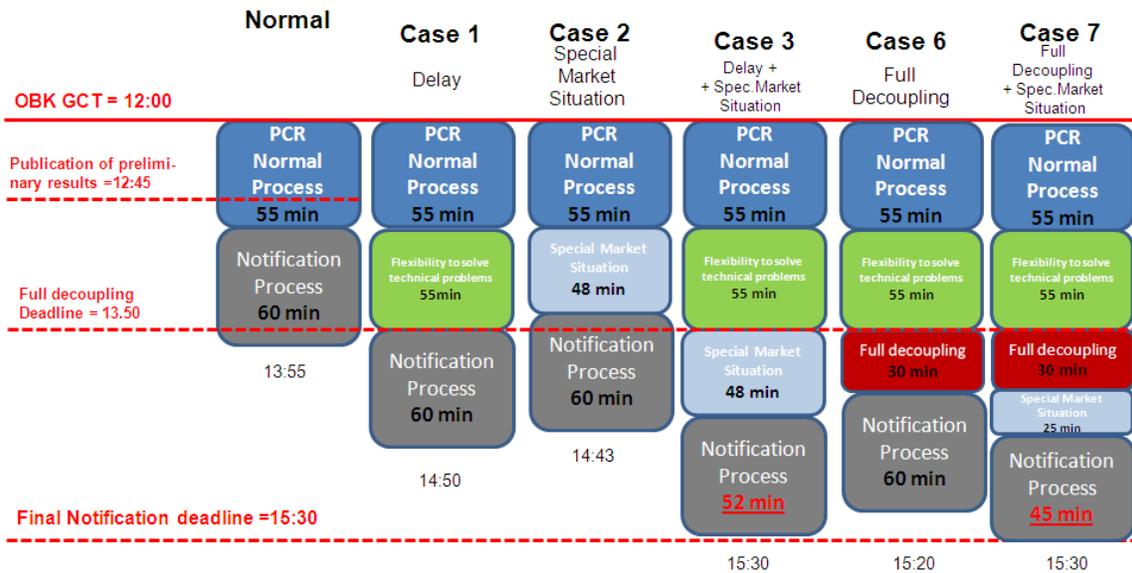
Therefore the NWE parties propose the following alternative timings for the period following NWE go-live:

- The maximum time slot for technical problem solving flexibility to be set at 55 minutes rather than 40 minutes
- The deadline for decoupling will to be set at 13:50h.

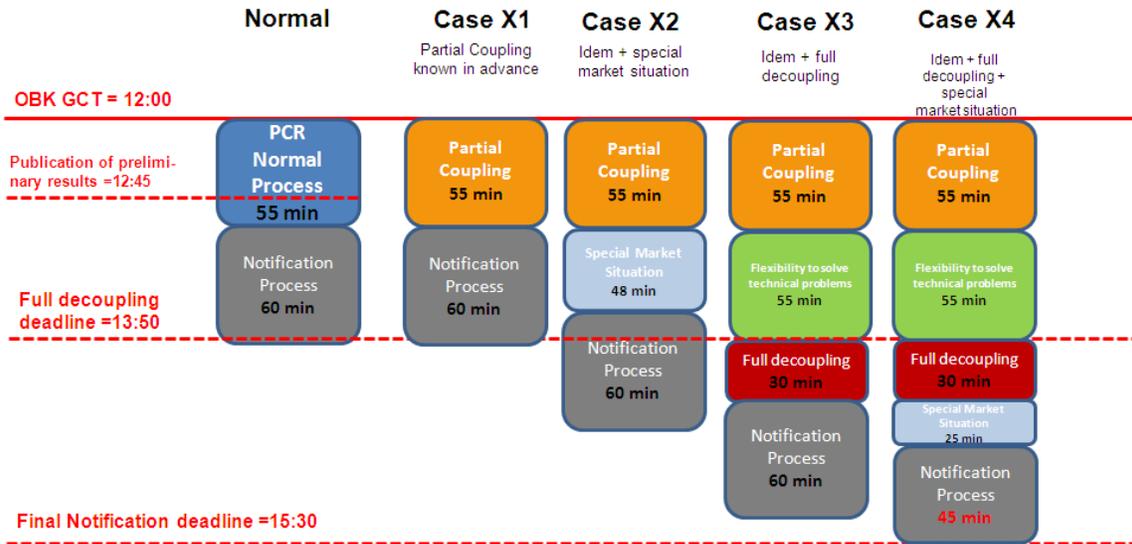
The following 3 pictures (picture 6, 7 and 8) show the effect of these procedures, proposed at NWE go-live, in the different scenarios. The key impact is to reduce the potential time for notifications in some scenarios with a particular combination of events:



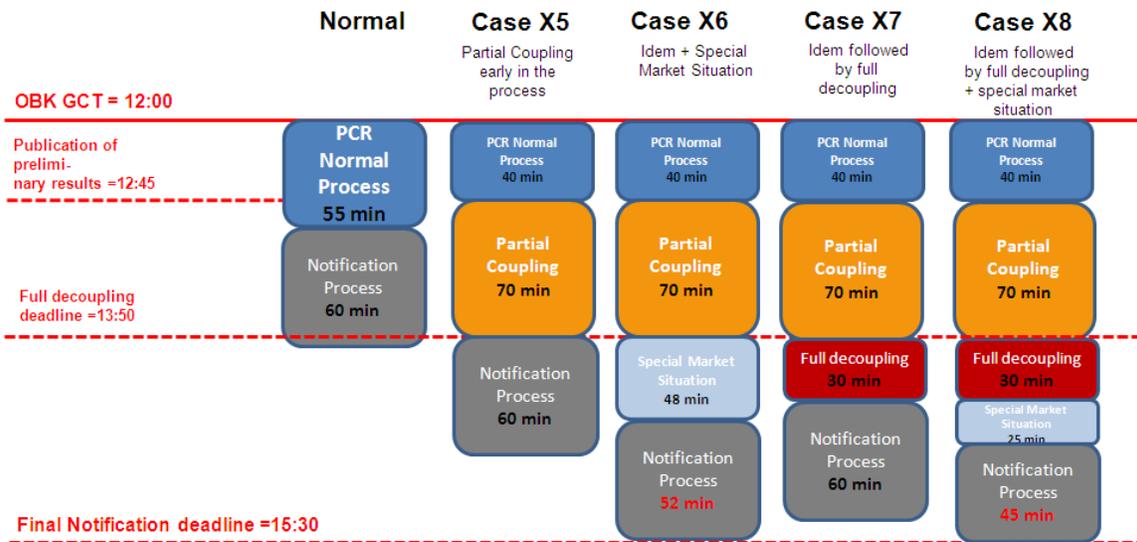
- If the coupling completes just ahead of the cut-off time at 13:50 and following this special routines are required in the NWE region, the nomination time will be reduced to 52 min in CWE (Case 3);
- If the coupling is abandoned at 13:50 leading to a full decoupling and following this special routines are required in the CWE region (i.e. second auction), the nomination time will be reduced to 45 min in CWE (Case 7);
- If the full NWE coupling is replaced by a partial coupling and this partial coupling is abandoned at 13:50 leading to a full decoupling and following this special routines are required in the CWE region (i.e. second auction), the nomination time will be reduced to 45 min in CWE (Case X4 and X8);
- If the full NWE coupling is replaced by a partial coupling and the coupling completes just ahead of the cut-off time at 13:50 and following this special routines are required in the NWE region, the nomination time will be reduced to 52 min in CWE (Case X6).



Picture 6: Alternative proposal - Feasible operational scenarios at NWE go-live if shorter notification process is accepted in rare market situations.



Picture 7: Alternative proposal - Feasible operational scenarios at NWE go-live (partial coupling known in advance) if shorter notification process is accepted in rare market situations



Picture 8: Alternative proposal - Feasible operational scenarios at NWE go-live (partial coupling known early in the process) if shorter notification process is accepted in rare market situations.

The possibility of introducing the above mentioned timings is currently subject to a market consultation . The questionnaire can be found in Annex 1.

The information in this chapter was also communicated to the NRA's during the IG meeting of February 20, 2013.



## 5. NWE Procedures

### 5.1. Introduction to the procedures

The NWE Price Coupling process is a phased process (pre-coupling, coupling, post-coupling) for which a number of procedures have been created and shall be applied. Execution of each phase requires the application of procedures in order to ensure coordination of the actions needed to perform by all the parties involved in NWE Price Coupling.

The NWE procedures are split into several categories:

- Normal procedures (NWE\_NOR\_XX)
- Backup procedures (NWE\_BUP\_XX)
- Fallback procedures (NWE\_FAL\_XX) (are further described in chapter 6)
- Special Procedures (NWE\_SPE\_XX)
- Other procedures (NWE\_OTH\_XX)

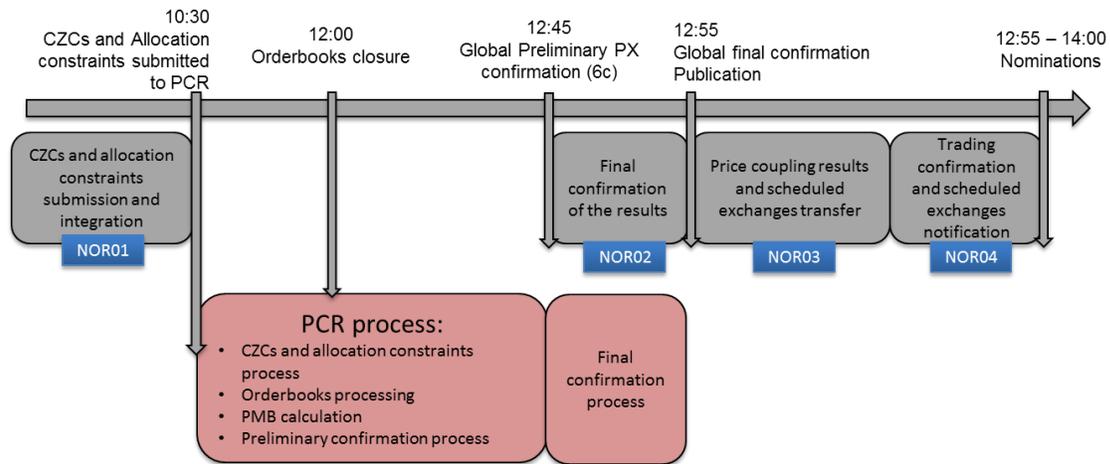
The following picture gives an overview when the different procedures (except of special and other procedures) are applied.

- The Target Time is the time limit in production for completing a normal procedure on a day to day basis. Completion of a normal procedure is generally performed before that time.
- The Latest Fallback time is the time limit for triggering the fall back procedure i.e. prepare the decoupling.
- The Decoupling Deadline is the time limit defined as critical for NWE Price Coupling, meaning that after this time limit the NWE Price Coupling cannot be performed and relevant bidding zones and/or interconnectors are decoupled (capacity is not allocated via the NWE Price Coupling solution)

### 5.2. Normal procedures

During each phase of the price coupling process, a number of common procedures will be operated under normal conditions. These procedures are called the Normal procedures (NWE\_NOR\_XX) and describe per phase the actions to be performed by NWE parties in a clear weather scenario.

The normal procedures are based on the generic NWE HLA which was communicated in the 2<sup>nd</sup> progress report.



Following normal procedures have been established on NWE level in coordination with the PCR project to assure alignment and compliance.

- NWE\_NOR\_01: Cross Zonal Capacities Submission and Allocation Constraints Submission and Integration
- NWE\_NOR\_02: Final Confirmation of the Results
- NWE\_NOR\_03: Price Coupling Results and Scheduled Exchanges Transfer
- NWE\_NOR\_04: Trading Confirmation and Scheduled Exchanges Notification

It is the contractual responsibility of the parties in NWE to adapt regional and/or local procedures to be compliant with the NWE procedures.

The timings of NWE procedures will be confirmed after the testing phases of PCR and the simulation testing phase in NWE.

### 5.3. Backup procedures

Backup procedures (NWE\_BUP\_XX) describe the backup actions that are available in order to overcome specific technical issues. Ideally the backup procedure should be triggered once the target time associated to a normal process step cannot be met or is foreseen not to be met during the performance of the Normal Procedure.

Backup procedures are available for all steps in the process in order to allow the continuation of NWE Price Coupling also in case of some technical hurdles which can be solved via pre-prepared measures. Following are the backup procedures that have been established on NWE level:

- NWE\_BUP\_01: Cross-Zonal Capacities and Allocation Constraints Submission
- NWE\_BUP\_02: Final Confirmation of the Results

### 5.4. Fallback Procedures

In the event of a fall back situation the Fallback Procedures (NWE\_FAL\_XX) for partial coupling or full decoupling are triggered.



Following fall-back procedures are established on NWE level:

- NWE\_FAL\_01: Incident Management
- NWE\_FAL\_02: Full decoupling

The fallback procedure can be split into two parts:

- Preparation of the decoupling: incident committee is triggered and actions are taken to prepare either the partial coupling or the full decoupling in case the issue could not be solved before the latest fallback time
- Decoupling of the relevant interconnectors from the NWE Price Coupling process:
  - Capacities are allocated via explicit auctions for the decoupled interconnectors and set to 0 within the NWE market coupling process
  - Order books are reopened and a second price calculation is launched

Within NWE, several fallback scenarios exist, applying either to one, several or to all NWE interconnectors internal to a region or between regions.

The fallback procedures are still under review in the project and therefore not attached at this stage. Additional other procedures might still be added.

## 5.5. Special Procedures

Special Procedures (NWE\_SPE\_XX) are executed when exceptional situations occur in the market requiring specific measures to be taken. (e.g. thresholds reached, price peaks).

Following are the special procedures that have been established on NWE level:

- NWE\_SPE\_01: Impact of CWE second auctions
- NWE\_SPE\_02: Impact of thresholds Nordic-Baltic reached
- NWE\_SPE\_03: Impact of thresholds GB reached

These Special Procedures are still under review in the project and therefore not attached at this stage. Additional special procedures might still be added.

## 5.6. Other Procedures

The Other Procedures (NWE\_OTH\_XX) are related to certain planned specific situations which need to be managed by a formalized procedure (clock change for example) and for any other subject that needs a common approach on NWE level.

Following are the other procedures that have been established on NWE level:

- NWE\_OTH\_01: Procedures Reading Instructions
- NWE\_OTH\_02: Market Communication
- NWE\_OTH\_03: Long Clock Change
- NWE\_OTH\_04: NWE Procedures Glossary
- NWE\_OTH\_05: Change Control procedure



The Other Procedures are still under review in the project and therefore not attached at this stage. Additional other procedures might still be added.

## 6. Fallback HLA's and procedures

A fall-back situation occurs when the NWE price coupling has not given price coupling results at the time limit to trigger the fall back to full decoupling. Each region within the NWE price coupling has assured a fall back solution which can be used in such cases in order to guarantee CZCs allocation for day-ahead. The fall-back solution for the different regions and borders is described in the fall-back HLA's.

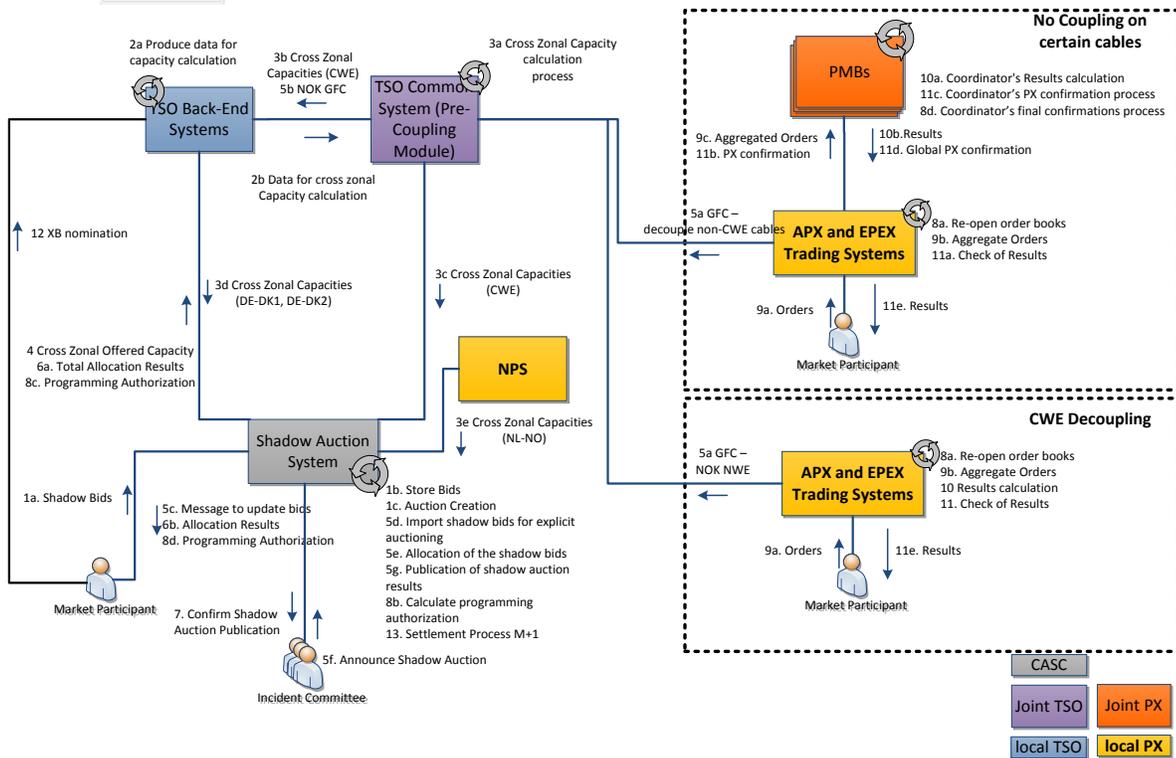
The high-level fall-back architecture overview shown below is based upon mainly the CWE systems and is explained in the following sections of this chapter which are devoted to:

- The system components shown,
- The Agents shown,
- The information produced and exchanged,
- The indicative sequence in which the information is produced and exchanged,
- A glossary, explaining the terms used in the diagram and the remaining text of this chapter.

### 6.1. Fall back HLA for CWE

This chapter contains the CWE high-level fallback functional architecture and business process under the current NWE design assumption. NL-NO, DE-DK2, DE-DK1 Business processes which involve CWE systems (owned by TSOs, CASC, PXs, CCPs) are also included in this HLA as well as in the Nordic-Baltic HLA.

#### 6.1.1. High-Level architecture overview



An Agent is a non-automated entity interacting with one or more Systems and is represented in the diagram as abstract human figures.

The 'Market Participant' Agent represents the Shadow auction and PX members.

### 6.1.2. Systems

The list of systems below reflects the current generic NWE design assumption, with a focus on CWE systems.

In the architecture diagram, the system components further called Market Coupling Components that are expected to play a role in the Market Coupling are indicated with rectangles. These systems may either be existing systems adapted to the Market Coupling or systems to be newly built.

In the information perspective, a System can be thought of as a set of functions for which it is convenient to consider as a separate entity.

The following Systems are distinguished:

- **The TSO Back End Systems:** The back-end systems of the TSOs involved in the individual areas are grouped together as the 'TSO Back-End Systems'.
- **The TSOs Pre Coupling System:** is the CWE TSO Common System (pre coupling module) which produces the Cross Zonal Capacities currently under ATC methodology. It is expected that the CWE region will move towards a Flow-Based methodology soon after the NWE PC launch. However, ATC will be used for shadow auctions.



- **The PX IT Systems** consists of the Trading system that collects the Orders from the Market Participants for each Bidding Zone of CWE region and provides them the Individual Results. The Trading Systems used by the PXs involved (APX and EPEX) are represented as the 'APX or EPEX Trading System'.
- **The Joint PX IT Systems**: Refer to the description in the NWE HLA where it is described in detail.
- **The Verification Systems** are not used in the fallback HLA.
- **The Post Coupling systems** are not used in the fallback HLA
- **Shadow Auction System** The Shadow Auction System is a part of the EXAU platform, owned by CASC and used to perform Explicit daily Auctions on all CWE borders and NL-NO, DE-DK1, DE-DK2. A subset of these borders can be presently selected and, if needed, daily explicit auctions can be performed only on these borders.

Systems are interconnected via Interfaces. Each Interface serves one or more information flows. The different information flows are defined in 6.1.1 with an indicative sequence.

### 6.1.3. Information produced and exchanged

The information produced and exchanged is represented in the diagram by arrows with a label. The small arrows point in the direction of the information flow. The circular arrows indicate information produced in processes internal to a System. The label indicates the contents of the piece of information transferred or produced. The sequence of production and transfer of information is shown in section 6.1.1 of this document. The numbering of the information flows doesn't necessarily respect the sequence of the actions.

The real frequency, timing and sequences are being defined in the procedures.

It should be stressed that only flows of information are shown in the diagram. Other flows, like energy and financial flows, are not taken into account.

### 6.1.4. Sequence in which information is produced and exchanged

The numbering of the information flows doesn't always respect the indicative sequence of the actions.

More specifications as the responsibilities, the format and the interfaces are defined in the HLA Implementation details

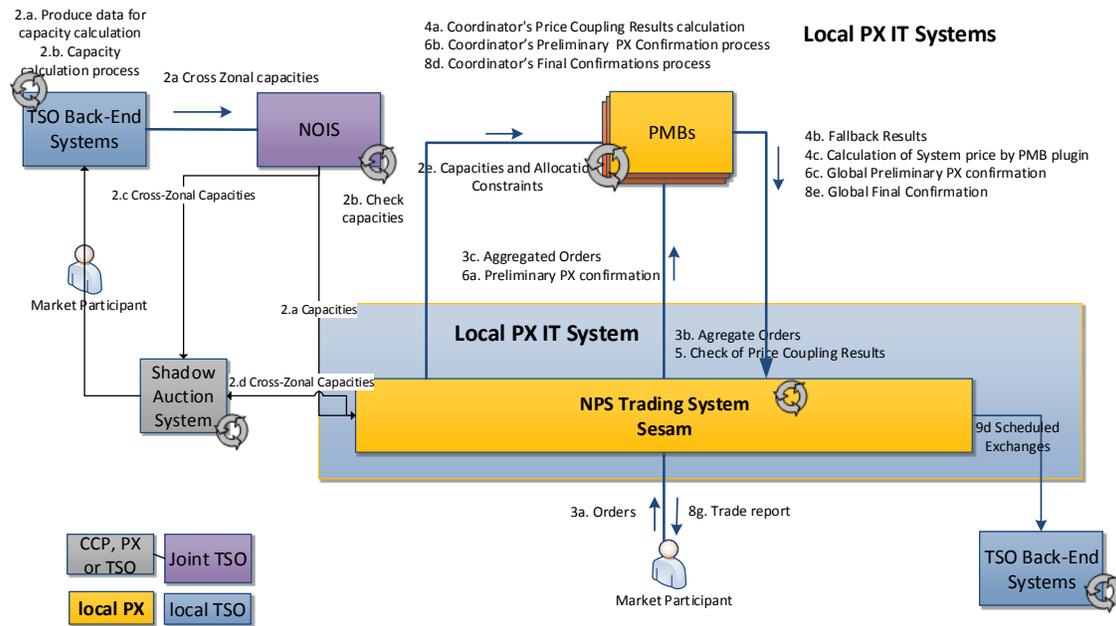
## 6.2. Fall back HLA for Nordic-Baltic

This chapter contains the high-level functional architecture (HLA) and business process, with the current NWE HLA design assumptions as basis, for the Nordic-Baltic region in a fallback situation.

Minor adjustments made in the processes and modules may appear before go-live of NWE Price Coupling.



## 6.2.1. High-Level architecture overview



In addition but outside the explicit Nordic-Baltic scope there will be shadow auction on DK1-DE, DK2-DE and NorNed interconnectors in line with what is described in the CWE fallback architecture enabling utilization of the ATC on these interconnectors also in a fallback scenario.

## 6.2.2. Systems

The list of systems below reflects the current design assumptions.

In the architecture diagram, the system components further called Fallback solution components that are expected to play a role in the local fallback solution are indicated with rectangles. These components may either be systems used in NWE Price Coupling or systems dedicated for the fallback solution.

The following Systems are distinguished and relevant in Nordic-Baltic context.

- **The TSO Back End Systems:** The back-end systems of the TSOs involved in the individual areas are grouped together as the 'TSO Back-End Systems'.
- **Local PX IT systems:** NPS Local PX IT Systems includes the following functions related to the NWE Price Coupling:
  - **The NPS PX Trading System (TS) SESAM:** It collects the Orders from the Market Participants from all Bidding Zones within NPS Elspot Market, and aggregated and anonymized Orders from PolPX Polish spot market, and provides the Elspot Members with their Individual Results and PolPX with aggregated results for Poland. Also it aggregates and sends in anonymized form all the Orders to the local PMB



system. Sesam is also responsible for converting Orders received in currencies other than EUR in to EUR before submitted to the PMB, and likewise after the calculation via PMB is finished converting the results back to the given non-EUR currencies.

The Sesam system and linked modules are also responsible for allocation of volumes to portfolios and checking of the local fallback results.

- o **PMB:** This consists of the PMB (PCR Matcher/Broker) and embeds the PCR Algorithm and is linked with relevant NPS PX IT Systems. NPS will in a fallback situation use a different configuration allowing for calculation of Nordic and Baltic results without any connection to other PX's.
- **Shadow Auction System** The Shadow Auction System is a part of the EXAU platform, owned by CASC and used to perform Explicit daily Auctions on all CWE borders and NL-NO, DE-DK1, DE-DK2. A subset of these borders can be presently selected and, if needed, daily explicit auctions can be performed only on these borders.

### 6.2.3. Information produced and exchanged

The information produced and exchanged is represented in the diagram by arrows with a label. The small arrows point in the direction of the information flow. The circular arrows indicate information produced in processes internal to a System. The label indicates the contents of the piece of information transferred or produced. The sequence of production and transfer of information is shown in section 6.2.1 of this document. The numbering of the information flows doesn't necessarily respect the sequence of the actions.

The real frequency, timing and sequences are being defined in the procedures.

It should be stressed that only flows of information are shown in the diagram. Other flows, like energy and financial flows, are not taken into account.

### 6.2.4. Sequence in which information is produced and exchanged

The numbering of the information flows doesn't always respect the indicative sequence of the actions.

More specifications as the responsibilities, the format and the interfaces are defined in the implementation details (separate documents).

## 6.3. Fallback HLA for IFA and IntraGB

This chapter contains the IFA high-level fallback functional architecture and business process under the current design assumption.

Please note: no fallback required for Intra-GB capacity. GB1 and GB2 should endeavour to remain coupled as far as it is reasonable to do so through the infinite intra-GB link. However, if it is not

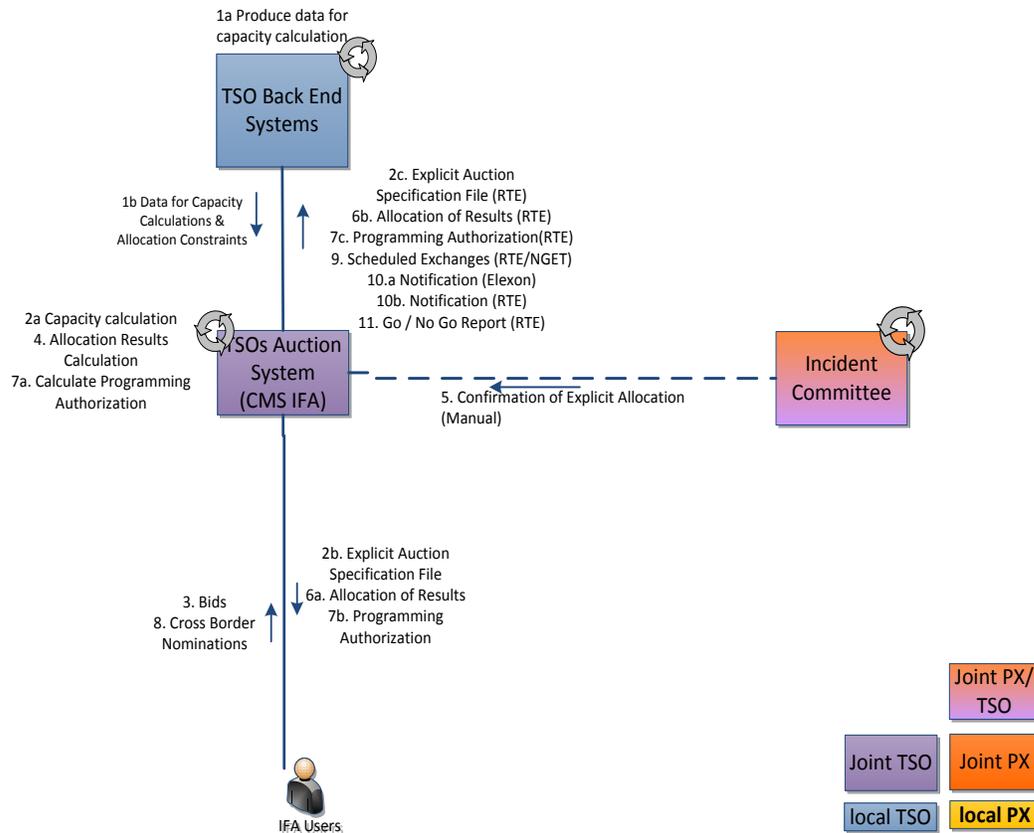


possible to remain coupled, GB1 and GB2 may have to split and the individual PXs will settle at their own separate non-identical prices.

### 6.3.1. High –Level architecture overview GB1 (IFA Interconnector) Architecture

The high-level fallback architecture overview shown below is based upon mainly the GB1 systems and is explained in the following sections of this chapter which are devoted to:

- The system components shown,
- The Agents shown,
- The information produced and exchanged,
- The indicative sequence in which the information is produced and exchanged,
- A glossary, explaining the terms used in the diagram and the remaining text of this chapter.



An Agent is a non-automated entity interacting with one or more Systems and is represented in the diagram as abstract human figures.

### 6.3.2. Systems

The list of systems below reflects the current generic GB1 design assumption, with a focus on IFA systems.



In the architecture diagram, the system components further called Market Coupling Components that are expected to play a role in the Market Coupling are indicated with rectangles. These systems may either be existing systems adapted to the Market Coupling or systems to be newly built.

In the information perspective, a System can be thought of as a set of functions for which it is convenient to consider as a separate entity.

The following Systems are distinguished:

- **The TSO Back End Systems:** The back-end systems of the TSOs involved in the individual areas are grouped together as the 'TSO Back-End Systems'.
- **The TSOs Auction System:** is the TSO Common System (CMS IFA) which produces the Cross Zonal Capacities currently under ATC methodology.
- **The PX IT Systems** are not used in the fallback HLA.
- **The Joint PX IT Systems:** Refer to the description in the NWE HLA where it is described in detail.

Systems are interconnected via Interfaces. Each Interface serves one or more information flows. The different information flows are defined in 6.3.1 with an indicative sequence.

### 6.3.3. Information produced and exchanged

The information produced and exchanged is represented in the diagram by arrows with a label. The small arrows point in the direction of the information flow. The circular arrows indicate information produced in processes internal to a System. The label indicates the contents of the piece of information transferred or produced. The sequence of production and transfer of information is shown in section 6.3.1 of this document. The numbering of the information flows doesn't necessarily respect the sequence of the actions.

The real frequency, timing and sequences are being defined in the procedures.

It should be stressed that only flows of information are shown in the diagram. Other flows, like energy and financial flows, are not taken into account.

The diagram also has dotted line which indicates a manual instruction to carry out a specific task.

### 6.3.4. Sequence in which information is produced and exchanged

The numbering of the information flows doesn't always respect the indicative sequence of the actions.

More specifications as the responsibilities, the format and the interfaces are defined in the HLA Implementation details



#### 6.4. Fallback HLA for BritNed

The Fallback HLA for BritNed will be delivered to the NRA's in the next reporting.

## 7. Rollback

The launch of price coupling in NWE, comprising the CWE, Nordic-Baltic region and GB, is a major change including the introduction of new and/or adapted systems and new operational procedures. Even when tested thoroughly, there is always a risk of failure when switching from the current systems to NWE price coupling on the launch day itself as well as during the first period after the launch. In order to mitigate this risk, the NWE parties will keep possible roll back options as a backup available for two months after launch of NWE Price Coupling. The roll back should be operational for a maximum period of 6 months in case the roll back has been activated within the two months period. Roll back is defined as the switch back from the NWE price coupling infrastructure to the current CWE, Nordic-Baltic, ITVC and GB infrastructure.

### 7.1. Roll back situations

Triggering the roll back solution will be a NWE JSC decision. The rare situations in which roll back will be applied:

An Incident Committee with NWE and PCR members has decided for full decoupling due to an incident regarding the PCR PMB system or due to non-functioning or malfunctioning of the PCR Algorithm (e.g. no market results or unacceptable market results) and the capacity is auctioned via the fall back options in the 3 regions.

- During the investigation it becomes apparent:
  - that the incident is found but cannot be resolved instantly or within an acceptable period of time or
  - that the incident is not found / cannot be reproduced and therefore the period to solve the issue is unknown and
  - that the risk to continue with the PCR algorithm with the possibility to regularly having to decouple is estimated too high

After such a decision of the NWE JSC, the NWE parties need at least 3 working days for the technical aspects of the roll back, i.e. re-activate the roll back systems or roll back to pre-NWE version of system/software, test the connections and run a couple of test scenarios. Each party will prepare procedures and checklists for such internal roll back situation before the launch and will make sure that the procedures are known internally. The NWE project will only monitor this task.

During the interim period necessary to re-activate the roll back solutions (at least 3 days) fall back solutions will be used in the 3 regions.

The roll back systems will continue to function until the re-launch of NWE Price Coupling, which will be decided by the NWE JSC for a maximum period of time of six months after the decision of rollback has been taken.



In the same way, with regards to the contractual framework, all parties must establish a framework which allows for suspension/re-activation of the current contracts in case of roll back.

## 7.2. Roll back in CWE

In CWE all parties will roll back to the situation currently running in the CWE region, meaning that the PXs and the TSOs will roll back to the CWE Price Coupling solution, CASC will roll back to the current version of the TSO Common system (meaning the roll back site will be re-activated) and the TSOs will roll back to their current versions of systems now running in CWE.

All interfaces between TSOs, between PXs, and between TSOs and PXs must be re-established in case of roll back.

In case the CWE PXs introduce new products when launching NWE price coupling, then these products will be de-activated in case of roll back.

The current CWE checklists and operational procedures will be re-activated 'as is' in case of roll back.

## 7.3. Roll back in Nordic-Baltic region

Most TSOs in the Nordic-Baltic region have no or minimal changes for the NWE price coupling launch and will therefore be able to roll back to the current versions or keep the latest version if this version is compatible with the pre NWE situation.

NPS will roll back to its current market splitting system.

Interfaces between NPS and the TSOs will remain in place.

The current Nordic-Baltic checklists and operational procedures will be re-activated 'as is' in case of roll back.

## 7.4. Roll back for the ITVC borders

In order to facilitate the roll back for the ITVC borders, all systems and interfaces of EMCC must remain in place during the roll back period of 2 months. The roll back period is the period starting at NWE go-live during which the roll back can be activated.

EMCC will not continue to receive the data (CZC, allocation constraints and order books) from TSOs and PXs during the roll back period, but all PXs and TSOs involved must be able to re-establish all the connections with EMCC and the sending/receiving of information.



Additionally other interfaces between TSO's, between PXs and between TSO's and PXs for the ITVC borders, if any, must be re-established in case of roll back.

The current ITVC checklists and operational procedures will be re-activated 'as is' in case of roll back.

## 7.5. Roll back in GB

Roll back for GB is organized as follows:

- Intra GB: There is no need for a roll back intra GB in a technical sense, since there is no current solution
- IFA cable: The roll back for IFA is going back to the explicit auctions currently in place. This is also the fall back solution, therefore IFA will continue in fall back mode until NWE is re-launched
- BritNed cable: Roll back for BritNed is the re-activation of the current embedded solution for BritNed in CWE.

## 7.6. Regulatory framework for roll back

It is the responsibility of all parties individually to make sure that rollback solutions are embedded in the regulatory framework. The NWE project will only monitor this task.



## 8. Governance arrangements

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## 9. Planning update

### 9.1. Planning of Development projects NWE is depending on

The NWE Price Coupling project is depending on following development projects.

1. PCR (the PMB system with the PCR algorithm embedded).
2. The GB virtual hub implementation in GB.
3. The implementation of the physical and financial settlement for the CWE-Nordic interconnections.
4. The implementation of the physical and financial settlement for the GB – CWE interconnections and within GB (between the two GB bidding zones).
5. Regional systems –adaptations needed for pre- and post-coupling.

The NWE Price Coupling project monitors progress of these projects and reports on monitoring to the NWE JSC.

### 9.2. Testing

The testing approach has slightly changed since last reporting and the reporting in the NWE Stakeholder Forum on 26 September 2012.

#### 9.2.1. Test phases

The testing will now be split into 3 phases:

- Phase 1: Local testing
- Phase 2: Entrance testing to NWE
- Phase 3: NWE testing (NWE integration and simulation testing)

More in detail:

During Phase 1 the parties will handle each their local (single, bilateral or multi-party) testing in parallel. These tests of new developments (see development projects mentioned under 9.1), changes in sub-processes (e.g. capacity submission, shipping etc.) will be performed without the PMB system. During



this same period PMB will be tested by the PCR project. Parties must also update their local procedures during these tests, if applicable.

During the 2<sup>nd</sup> phase (5 weeks) selected test scenarios will be tested to make sure systems are ready to start the NWE testing. These selected scenarios include the testing of all the technical connections between the NWE test systems along with the full PCR architecture as well as test scenarios for the daily run of coupling session and some fall back scenarios. The next phase of testing cannot start before one normal day and one fallback can be fully performed. The delivery of all infrastructures is a prerequisite for this phase.

At the end of this phase we have an NWE test architecture which is ready for NWE integration testing.

During the 3<sup>rd</sup> phase we will perform the remaining NWE integration tests (further tests with more detailed scenarios) and simulation tests as announced in earlier reporting. After successful finalization of this phase the market participant tests can be organized.

More detailed on the testing criteria of phase 2 and 3 can be found in Annex 4.

### 9.2.2. Test approach

Reason for this approach is the fact that we minimize the dependencies in testing. We follow the principle that:

- Tests are always carried out in the smallest set of parties possible
- The NWE level procedures must set the boundaries to the lower levels

This approach has following advantages

- Parallelization of all local implementation
- No dependency between deliveries for the local test step (especially PMB)
- Ensures all participants readiness before beginning integration test i.e. reduces risks of common tests failure due to insufficient local testing

Parties have established of list of which tests can already be performed in the first phase of local testing. These tests will be signed off for readiness by the individual parties involved.

### 9.2.3. Master Test plan

The NWE project has established a Master Test plan which defines the approach, the activities and the deliverables the NWE parties have agreed upon for the overall testing. It further states the pre-conditions, the assumptions, detailed descriptions of the test phases as summarized under 9.2.1 including entry and exit criteria for each phase.

The Master Test plan also describes the organization of the NWE parties during the testing, how the testing is documented and reported and how change control is handled.



The final acceptance criteria for go-live, for testing, but also for the project in general are also attached to this Master test plan.

#### 9.2.4. Request of SWE parties to join the NWE testing

In January 2013 the NWE Price Coupling project has received a request from the SWE parties to join the NWE testing. The NWE parties have responded positively to this request under certain conditions. The most important condition is that the SWE parties comply with the NWE Master Test plan, meaning that the SWE parties are subject to the same criteria as the NWE parties and join the testing in the same way as the NWE parties, e.g. adherence to the organization, activities etc.

It has already been agreed between the parties that the NWE testing cannot be blocked by issues at the SWE side.

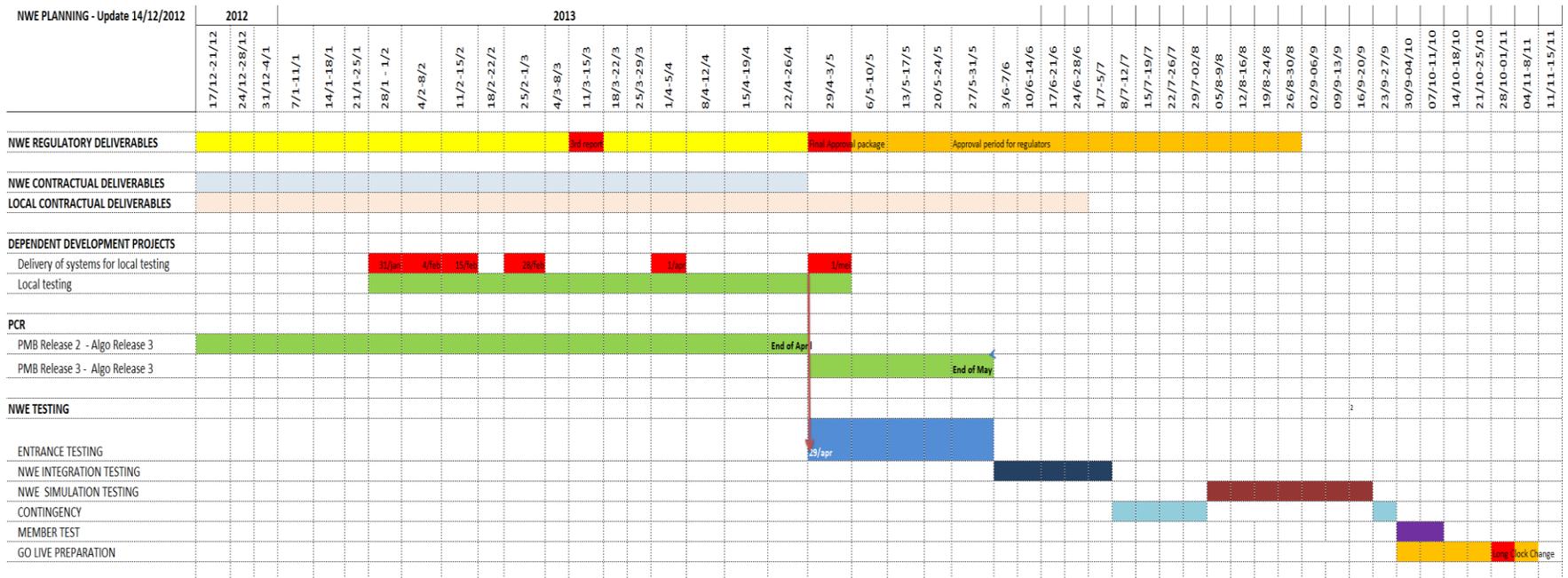
The first official meeting with SWE regarding their integration in the NWE testing is foreseen in the first half of March 2013. Since some of the SWE parties are also part of NWE and PCR and since there is a strong cooperation between the PCR and NWE projects, parties do not foresee particular issues in this respect.

The joining of SWE in the testing has however some impact. Some scenarios need to be tested in the NWE topology only and in the combined NWE-SWE topology, meaning that the number of test days need to be increased. These additional test days will be taken from the contingency test days.



### 9.3. Overall target planning

The overall target planning now looks as follows:





The successful and timely implementation of the NWE Price Coupling solution is subject to the:

- Timely delivery of **all** the separate development projects NWE Price Coupling is depending on
- Successful finalization of the local tests in phase 1
- Successful finalization of the tests of the basic integration scenarios in phase 2
- Successful finalization of integration and simulation testing in phase 3
- Successful finalization of the member test
- Timely reception of all necessary regulatory approvals

If any of the above steps takes more time than estimated or cannot be successfully finalized, this will have an impact on the planning.

#### 9.4. Communication timelines of the NWE project in context of the updated project planning

##### Communication towards regulators

Following this 3<sup>rd</sup> Progress Report, a Final Regulatory Report will be sent out in April/May 2013. This Report will be part of an Approval Package comprising all relevant documentation for the local approval processes. This documentation excluding confidential information can be further used by the NWE parties for the local consultation phase toward market participants.

In addition to the Progress Reports, a Monthly Progress Report has been sent out to provide a concise summary of the current status of the project on a monthly basis.

##### Communication towards market participants

The NWE external communication plan towards market participants includes the following actions:

- The market participants have been asked for input on the timing of the procedures in March 2013. ANWE Joint Declaration providing information on the current status of the NWE project and describing the publication of all relevant NWE information was published on 18 February 2013 on the websites of all the project parties.
- Publication of all relevant documentation online on the CASC website for TSOs and PX' individual websites for PXs. The following documents will be published in the beginning of March:
  - Slides from 1st Stakeholder Forum 2012 in Brussels (that have been already published on TSOs and ACER website in September 2012)
  - Q&A regularly updated based on new information and replies to stakeholders enquiries
  - 1st and 2nd Progress Report (excluding any confidential information)
  - Monthly Progress Report to NRAs
- Organization of the 2nd Stakeholder Forum
- Press conference in the aftermath of the Stakeholder Forum

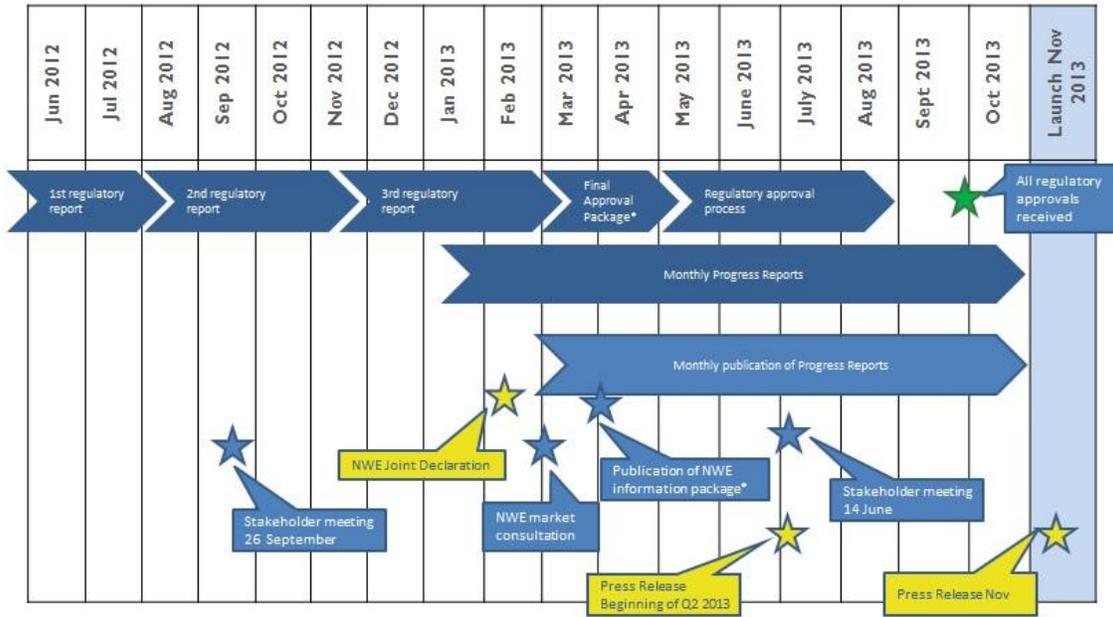


Figure 1 Communication timelines of the NWE project

### 9.5. New cost estimation for NWE Price Coupling

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## Annex 1: Glossary

**Aggregated Order Information:** set of all relevant data representing all Orders received by a Power Exchange for a given day.

**Allocation Constraints:** the constraints as specified by the TSO that the Price Coupling of Regions algorithm shall respect in the Day Ahead market. Allocation Constraints may include, (but shall not be limited to): operational security constraints, ramping constraints, transmission losses.

**Agent:** a non-automated entity interacting with one or more systems and is represented in the diagram as abstract human figures.

**Bidding Zone:** the largest geographical area within which Market Participants are able to exchange energy without Capacity Allocation.

**BRP:** Balance Responsible Party

**BSC:** Balancing and Settlement Code

**Capacity Allocation:** the attribution of Cross Zonal Capacity.

**CCP:** Central Counter Party.

**CGDA:** ENTSO-E Coordination Group for the implementation of the European Day-Ahead Market Coupling.

**CID:** Congestion Income Distribution

**Congestion Income:** the revenues received by System Operators as a result of Capacity Allocation in the Day Ahead markets;

**Cross Zonal Capacity:** the capability of the interconnected electricity transmission network to accommodate energy transfer between Bidding Zones. It can be expressed either as NTC value or flow based parameters, and takes into account operational security constraints;

**CSA:** Cross Zonal Schedule Agent

**CZC:** Cross Zonal Capacity

**Day Ahead Market:** the market timeframe where commercial transactions are executed the day prior to the day of delivery of traded products.

**Day-Ahead Operations Agreement (DAOA):** a contract between the NWE parties which defines the roles and responsibilities for the NWE Price Coupling solution.

**DST:** Daylight Saving Time

**EPC:** European Price Coupling.



**ECVN:** Energy Contract Volume Notification

**ECVNA:** Energy Contract Volume Notification Agent

**Elxon:** service provider for NGIC that receives the hourly physical notifications

**Full decoupling:** full suspension of the NWE Market Coupling for the duration of at least one day i.e. the DA cross-border capacities on the internal CWE borders, on the 2 UK-CWE and 4 CWE-Nordic interconnectors (except for Baltic Cable) are allocated via Shadow Explicit Auctions and the day-ahead electricity auction is afterwards performed by the local Power Exchange - for example, NPS for the Price Coupled Nordic-Baltic market

**FX:** Foreign Exchange

**GB Virtual Hub project:** the project awarded to NPS by NGIC to implement the GB virtual hub.

**HLA: High Level Architecture**

**Individual Results:** For each Market Time Period, price of each Bidding Zone and allocated quantities of a Market Participant.

**Interim Tight Volume Coupling (ITVC):** Solution to allocate capacity on cables between CWE and Nordic countries via volume coupling before the introduction of NWE Price Coupling. Although obsolete with the introduction of NWE PC, the term is used in this document to refer to the following interconnectors: DK1-DE, DK2-DE, Baltic Cable and NorNed.

**Market Participant:** an entity authorized by a Power Exchange to submit Orders.

**Market Time Period:** is the time span(s) for delivery of energy used in the Day Ahead and Intraday Market;

**NGIC:** National Grid Interconnectors Limited

**Notification process:** the process of sending the local and cross border trading and generation and consumption notifications to the TSOs. (local notifications are not mandatory for every TSO in NWE)

**NP:** Net Position

**NPS:** Nord Pool Spot.

**Orders:** an intention to purchase or sell energy expressed by a Market Participant through a market platform subject to a certain number of execution conditions as determined by the rules governing that market platform. The Order may refer to several Market Time Periods but shall refer only to a single Bidding Zone.

**Partial coupling:** any scenario where one or more bidding areas and/or interconnectors are temporary not participating in NWE Market Coupling while the remaining bidding areas/interconnectors still participate in NWE Market Coupling. The DA capacities for the non-participating interconnectors are allocated in fallback mode.



**PMB:** PCR Matcher and Broker.

**Power Exchange or 'PX':** the entity which collects and delivers Orders.

**PCR:** Price Coupling of Regions is a solution which consists of a coordinated matching function commonly agreed between European power exchanges and based on a decentralized coordinated calculation with a common matching algorithmic software (enhanced version of Cosmos) taking into account in particular the Cross Zonal Capacities and Allocation Constraints.

**Price Coupling Results:** the Net Positions, the Scheduled Exchanges and the price of each Bidding Zone calculated by the PCR.

**Net Position:** the netted sum of electricity exports and imports for each Market Time Period for a given Bidding Zone.

**SA:** Shipping Agent

**Scheduled Exchange:** The transfer scheduled between Bidding Zones, for each Market Time Period and for a given direction.

**SLA:** Service Level Agreement

**SE:** Scheduled Exchange

**SEC:** Schedule Exchange Calculator

**Second auction:** a second auction can be requested by the CWE PXs if the market results do not remain within the result boundaries defined in their respective trading rules, i.e. always when max/min price is reached that causes curtailment on purchase or sales side, and also if prices are reached that are higher or lower than predefined limits even though not max/min.

**Special Market Situation:** is a market situation which requires specific measures, such as for example handling of max price curtailment situations by either calling a second auction as used by CWE PXs or the NPS fully regulated special routine that among others includes peak load (production/load) capacity activation.

**SO:** System Operator

**TCO:** Trade Confirmation



## Annex 2: Fallback flow information CWE

Some of the following steps are under the responsibility of the PCR (i.e. processes via or linked to PMB/algorithm) and are described below in grey for information purposes.

Flow Nb	Info	Produced by	From	To	Predecessor	Format	Communication
1a	Shadow Bids		Market Participant	Shadow Auction System		ECAN Bid Document	UI or webservice
1b	Store Bids	Shadow Auction System					
1c	Auction Creation	Shadow Auction System					
2a	Produce data for capacity calculation	TSO Back-End Systems					
2b	Data for cross zonal capacity calculation		TSO Back-End Systems	CWE TSO Common System (pre coupling module)	2a	Capacity Document (xml)	ECP
3a	Cross Zonal Capacity calculation process	CWE TSO Common system (pre coupling module)			2b		
3b	Cross Zonal Capacities (CWE)		CWE TSO Common System (pre coupling module)	TSO Back-End Systems	2a	Capacity Document (xml)	ECP
3c	Cross Zonal Capacities (CWE)		CWE TSO Common System (pre coupling module)	Shadow Auction System	3a	Capacity Document (xml)	ECP
3d	Cross Zonal Capacities (DE-DK1, DE-DK2)		TSO Back-End Systems	Shadow Auction System	3c	Capacity Document (xml)	e-mail
3e	Cross Zonal Capacities (NL-NO)		NPS	Shadow Auction System	3c	Capacity Document (xml)	e-mail
4	Cross Zonal Offered Capacity		Shadow Auction System	TSO Back-End Systems	3c,3d	Capacity Document (xml)	Email



5a	Global Final Confirmation – with decoupled non-CWE cables		APX and EPEX Trading Systems	TSO Common System			ECP
5b	Global Final Confirmation NOK		TSO Common System	TSO Back-End Systems	5a		ECP
5c	Message to update Bids		Shadow Auction System Operator	Market Participant	5a		email
5d	Import shadow bids for explicit auctioning	Shadow Auction System			1a		
5e	Allocation of shadow bids	Shadow Auction System			5a		
5f	Announce Shadow Auction		Incident Committee	Shadow Auction System Operator			
5g	Publication of Shadow Auction Results				5f		
6a	Total Allocation Results		Shadow Auction System	TSO Back-End Systems	5f		Email
6b	Allocation Results		Shadow Auction System	Market Participant	5f		Email
7	Confirm Shadow Auction Publication		Shadow Auction System	Incident Committee		No file, just information in an email	Email
8a	Re-open order books	APX and EPEX Trading Systems					
8b	Calculate Programming Authorization	Shadow Auction System					
8c	Programming Authorization		Shadow Auction System	TSO Back-End Systems	8a	Rights Document	email



8d	Programming Authorization		Shadow Auction System	Market Participant	8a	Rights Document	email
9a	Orders		Market Participant	APX and EPEX trading Systems	8c		
9b	Aggregate orders	APX and EPEX Trading Systems			9a		
9c	Aggregated Orders		APX and EPEX Trading Systems	PMBs	9b		Local Web Interface
(10)	Results Calculation	APX and EPEX Trading Systems					
10a	Coordinator's Results Calculation	PMB			9c		
10b	Results		PMB	APX and EPEX Trading Systems	10a		Local Web Interface
11a	Check of Results	APX and EPEX Trading Systems			10b		
11b	PX Confirmation		APX and EPEX Trading Systems	PMB	11a		Local Web Interface
11c	Coordinator's PX Confirmation process	PMB			11b		
11d	Global PX confirmation		PMB	APX and EPEX Trading Systems	11c		Local Web Interface
11e	Results		APX and EPEX Trading Systems	Market Participant			
12	XB Nomination		Market Participant	TSO Back-End Systems	8d		
13	Settlement Process M+1	Shadow Auction System					



## Fall back flow information Nordic – Baltic region

Some of the following steps are under the responsibility of the PCR (i.e. processes via or linked to PMB/algorithm) and are described below in grey for information purposes

Flow Nb	Info	Produced by	From	To	Predecessor
Pre Coupling					
1a	Produce data for capacity calculation	TSO Back-End Systems	-	-	
1b	Data for capacity calculation and optionally Allocation Constraints		TSO Back-End Systems	NOIS	
2a	Capacity calculation process	NOIS	NOIS	NPS TS SESAM	
2b	Allocation Constraints calculation	NPS			
2c	Cross-zonal Capacities and Allocation constraints for Nordic-Baltic, Swe-Pol, Nordic-CWE		NOIS	Shadow Auction system	2a
2d	Cross-zonal Capacities and Allocation constraints for NoX-NL(NorNed)		NPS PX IT systems	Shadow Auction System	2c
2e	All cross-zonal Capacities and Allocation constraints	NPS	NPS TS SESAM	PMB	
3a	Orders from NPS Nordic-Baltic Elspot Market per Bidding Zone		Market Participants via SESAM Web or EDI	NPS TS SESAM	
3aa	Orders from NPS Nordic-Baltic Elspot Market per Bidding Zone after re-opening of market		Market Participants via SESAM Web or EDI	NPS TS SESAM	
3a	Aggregated and anonymized orders from PolPX Polish Spot Market		PolPX Trading/IT System	NPS TS SESAM	
3b	Aggregate Orders	NPS TS SESAM			3a



3c	Aggregated Orders		NPS TS SESAM	PMB	3b
Local fallback calculation					
4a	Local fallback Results calculation	PMB	-	-	3c,2d
4b	Local fallback Results including Zonal Prices, and Area-to-Area flows (Scheduled Exchanges) on Nordic-Baltic and SwePol.		PMB	NPS PX IT Systems	4a
4c	Calculation of Nordic System Price	PMB System Price plugin	NPS		3c,2d,and 4b
5	Check of Price Coupling Results, including portfolio allocation via Verification Module	NPS Trading System	-	-	4b
6a	Preliminary confirmation (PX) of local fallback results towards PMB	NPS Trading System		PMB	4b,4c,5
6b	NPS Preliminary PX Confirmation Process	PMB			6a
6c	Global preliminary PX confirmations		PMB	NPS PX IT systems	6b
6d	Trade Report	NPS TS SESAM	NPS TS SESAM	Market Participants SESAM Web or EDI	6c
8c	Final Confirmation		Local PX IT systems	PMB	8b
8d	Coordinator's Final Confirmations process	PMB			8c
8e	Global Final Confirmation		PMB	NPS PX IT systems	8d
Post-calculation					
9a	Price Coupling Results		NPS TS SESAM	TSO Back-end systems	



Fallback flow information IFA

FlowNb	Info	Produced by	From	To	Predecessor	Comments
1a	Produce data for Capacity Calculation	TSO Back-End Systems (RTE and NGIC)				Capacity Calculation at Mid Channel
1b	Data for Capacity Calculation		TSO Back-End Systems (RTE and NGIC)	TSOs Auction systems (CMS IFA)		Manual updates on CMS IFA
2a	Capacity Calculation	TSOs Auction systems (CMS IFA)	-	-		Calculate CZC at mid channel and generate of the Explicit Auction Specification file to be sent to IFA Users
2b	Explicit Auction Specification file		TSOs Auction systems (CMS IFA)	IFA Users		Webservices or manual downloads
2c	Explicit Auction Specification file		TSOs Auction systems (CMS IFA)	TSO Back-End Systems (RTE)		Explicit Auction Specification file to RTE
3	Bids		IFA Users	TSOs Auction systems (CMS IFA)		Webservices or manual updates
4	Allocation Results calculation	TSOs Auction systems (CMS IFA)				
5	Confirmation of explicit allocation	Incident Committee				Step optional if invoked in advance.  If during the coupling, confirmation received at the end from the



FlowN b	Info	Produced by	From	To	Prede- cessor	Comments
						NWE IC.
6a	Allocation Results		TSOs Auction systems (CMS IFA)	IFA Users		Explicit auctions results sent to the IFA Users
6b	Allocation Results		TSOs Auction systems (CMS IFA)	TSO Back-End Systems (RTE)		Daily explicit results are sent to RTE for reporting and invoicing management
7a	Calculate Programming Authorization	TSOs Auction systems (CMS IFA)				Calculate the daily rights of IFA Users based on the daily explicit allocation results
7b	Programming Authorization		TSOs Auction systems (CMS IFA)	IFA Users		Based on the daily explicit auction results, the daily ICE are sent to the IFA Users
7c	Programming Authorization		TSOs Auction systems (CMS IFA)	TSO Back-End Systems (RTE)		The daily ICE are sent to RTE for reporting
8	Cross Border nominations		IFA Users	TSOs Auction systems (CMS IFA)		IFA users submit their daily cross border nominations in the limit of the daily ICE
9	Scheduled Exchanges		TSOs Auction systems (CMS IFA)	TSO Back-End Systems (RTE/NGET)		Scheduled exchanges resulting from the previous step are sent to RTE/NGET for reporting / physical scheduling.
10a	Notification		TSOs Auction systems (CMS IFA)	TSO Back-End Systems (Elexon)		ELEXON DMV
10b	Notification		TSOs Auction systems (CMS IFA)	TSO Back-End (RTE)		RTE (DMV)
11	Go/No Go Report		TSOs Auction systems (CMS IFA)	TSO Back-End Systems (RTE)		Indicates which Daily Auction mode (Implicit or Explicit) is applied for that Contract Day





## Annex 3: NWE DA market participant consultation paper

### Questionnaire

Part 1: Questions regarding the alternative timings proposed by the NWE parties at NWE go-live (pictures 6, 7 and 8).

1. Would it be possible, in the rare case of decoupling, to reduce the current CWE internal (and CWE-Nordic shadow auction) notification process time slot of 60 minutes? (this includes local nominations, generation nominations, cross border nominations, ...), knowing that this is a way to reduce the number of unavoidable decouplings ( as can be seen in the overview above)?
  - a. No, I need 60 minutes also in the rare cases when the DA Price Coupling processes are significantly delayed in comparison with the normal process.
    - i. I need 60 minutes for all nominations
    - ii. I need 60 minutes for the generation nominations, the other nominations I can handle faster.  
Can you please motivate your answer?
  - b. Yes, I would be able to handle all my notifications faster in such rare cases, namely in
    - i. max. 45 minutes
    - ii. max. 30 minutes
    - iii. any other:

Do you have additional comments?

Part 2: Questions regarding the possible measures to extend the overall process time in the future, in order to make feasible the scenarios that are currently not feasible.

2. A possible solution to solve the timing issue, is to move the Gate Closure Time (GCT) for order book submission to an earlier moment to allow more time for the entire price coupling process, which may be needed in rare circumstances. Would you be prepared to accept an earlier order book GCT to reduce the number of inevitable decouplings? (taking into account that the publication of ATC / Flow Based values will not be earlier than 10:00 (Nordic-Baltic) and 10:30 (CWE) hrs as today)
  - a. No, it is not feasible for me to have a GCT earlier than 12.00 hrs  
Can you please motivate your answer?
  - b. Yes, it would be feasible for me to advance the GCT, namely
    - i. At 11.30 hrs
    - ii. At 11.00 hrs
    - iii. Other suggested GCT



3. If you have answered negative both on question 1 (of part 1) and on question 2 above, but the NWE parties are forced to either advance the GCT or reduce the notification process time of 60 minutes, which measure would you prefer?
  - a. Advance the GCT permanently
  - b. Reduce the notification process time of 60 minutes in rare cases.
4. Can you please motivate your answer to the previous question? For example is the choice you prefer based on a different assessment of efficiency of the day ahead price formation, cost of implementation of changes on your side, or something else that an advancement (earlier) of GCT or delay of notification can cause?
5. In order to get the complete picture of complexities surrounding this 15:30 notification deadline, the NWE project wants to know if there are negative impacts or clear advantages on market participants' side in case that the nomination deadline would be extended after 15:30. Would an extension of the CWE TSOs notification deadline be acceptable for you?
  - a. No, my internal processes are organized in such a way that all notifications must go out before 15.30 hrs.
  - b. Yes, an extension would be acceptable in rare situations
6. Another possible operational scenario involves NWE TSOs and PXs trying to keep the NWE region coupled or partially coupled as long as possible. If this however ultimately fails, there may be no day-ahead price as no time is left before the 15.30 deadline to perform nominations following a full decoupling and an isolated run of the markets. It is suggested to have the cross border capacity allocated in the intraday timescale and not have a day-ahead allocation of cross-border capacities on the CWE-UK, CWE-Nordic and possibly the internal CWE interconnectors. Would you accept having no day-ahead price in such rare case provided the cross border capacity is allocated in the intraday timescale??
  - a. Yes, in rare cases this is acceptable.
  - b. No, this is not acceptable under any circumstance
7. In relation to the previous question (6) please if possible comment on the following:
  - a. If you answered No to the question above, would you change your opinion if each PX were able to establish in some way (which would remain to be determined) day-ahead area price(s) for its own isolated market even while some of the Area-to-Area capacities linked to that market has been handed over already to Implicit Continuous Intra Day Market?
  - b. In case you have answered YES to the previous question could you describe how, when and under what conditions the capacities could be given to the implicit continuous cross border intraday market? The reason for asking is that such details



are still to be produced in case this option would be plausible to consider further in case market and regulatory support would be given for it.

8. Another scenario could be to investigate the parallelization of partial coupling and full decoupling after go-live in terms of technical and procedural feasibility. Knowing that there is no certainty whether it can be implemented after go-live, shall NWE parties start the investigation?
  - a. Yes.
  - b. No.

Please motivate your answer.

### Part 3: Questions regarding the harmonization of price caps in NWE

9. Currently min/max price caps vary across the NWE region. This could result in price differences even where there is spare transmission capacity and generation potentially being curtailed first in the country with the least restrictive limit, with the market with the lower limit still able to export. Which of the following do you prefer and why?
  1. Harmonised price caps across all NWE markets
  2. Non-harmonised caps provided that measures are taken to prevent curtailment being exported
  3. Non-harmonised caps with no special measures
10. Below you find 4 possible scenarios for future price caps in the whole NWE. Which of the scenarios do you prefer and why?
  1. Price caps as in Nordic-Baltic (-200€; +2000€)
  2. Price caps as in CWE (-3000€; + 3000€)
  3. Wider price caps than one or both of the CWE limits -3000€; + 3000€
  4. Price caps narrower than those of CWE, but different to one or both of the -200 € and +2000 € applied in Nordic-Baltic

Can you please motivate your answer?

11. What would constitute a good basis for determining cap and floor on the DA market?



## Annex 4: Test phases and their entry and exit criteria

### 1 NWE Entrance test

#### 1.1 Description

The goal of the entrance test phase is to limit risks on the performing of NWE integration tests and double-check readiness of local systems (stability, interfaces and performances) constituting the NWE chain (see list of systems involved in section APPENDIX D) before entering in NWE integration tests.

End to end tests (including shipping process and congestion income distribution) are to be run every day until each of the following scenarios can be validated. 2 key scenarios are to be run:

- Normal day
- GB decoupled from CWE and decoupled from Nordic-Baltic to test fallbacks and decoupling in PMB

Once these two scenarios can be successfully completed, scenarios identified among integration test scenarios can be run in order to use the remaining period until the beginning of integration test phase. This would allow detecting potential issues before integration tests. These scenarios will however be repeated in the integration test phase since the version of systems used will differ.

Although the provision of sign offs must be provided before the beginning of entrance tests, this phase also includes review of test sign offs based on local tests list from all parties (at the latest, if not performed earlier)

#### 1.2 Entrance Criteria

In case not all entrance criteria can be met, the project might decide to begin entrance tests anyway and evaluate the consequences on performing of the tests.

ID	Responsible party	Criteria
1	NWE parties and PCR	All local solutions have been successfully tested (as defined in the sign offs provided by local parties) in accordance with the local tests table
2	NWE parties and PCR	Test sign offs have been provided by PCR and NWE parties (as described in local tests table) and checked by test TF
3	NWE parties and PCR	Each NWE party is available for testing according to the specified planning. This includes all systems from the system table
4	NWE parties and PCR	Each NWE party can provide necessary data for testing (in line with scenario to be tested). Each test scenario should state if regular testing data is sufficient, or that production data is required to be able to perform the tests.



ID	Responsible party	Criteria
5	NWE parties and PCR	Each NWE party can provide necessary resources for testing: testers, coordination and support for correction of issues
6	NWE technical WG	NWE entrance test scenarios are reviewed and approved
7	Test coordinators for all parties in NWE test TF	NWE entrance test scripts are reviewed and approved
8	NWE Technical WG	Master Test Plan is approved by Technical WG
9	NWE procedure TF	Fallback principles are agreed (action, timings)

### 1.3 Exit Criteria

ID	Responsible party	Criteria
1	NWE test TF	All scenarios have been successfully executed against validation criteria defined
2	NWE test TF	No A1 or A2 defect present in systems (as defined in chapter 7)
3	NWE test TF	Only B or C bugs are remaining in the delivered systems and the list of these bugs have been agreed upon by the test TF.
4	NWE Technical WG	Test report reviewed and approved by Technical WG

## 2 NWE integration tests

### 2.1 Description

The goal of integration tests is to validate that the systems constituting the NWE chain meet NWE requirements in terms of functionality in an integrated price coupling environment. (i.e. can produce results according to local HLAs in any situation).

Each party from NWE shall provide test capacity and a test environment for each system. Scenarios will be run from the submission of CZCs and allocation constraints to the provision of scheduled exchanges notification (i.e. Trading Confirmation and Scheduled Exchanges Notification) for the CCPs (for part of the scenarios). Dedicated testers handle this test phase.

The list of scenarios shall cover all situations where a different functionality is activated in a system. If the same functionality is used for several procedures, only one integration test case should be defined.

### 2.2 Entrance criteria

ID	Responsible party	Criteria
1	Local parties	Any planned release has already been submitted to the change control process
2	NWE test TF	Exit criteria for entrance test have been met



ID	Responsible party	Criteria
3	NWE technical WG	NWE entrance test scenarios are reviewed and approved
4	Test coordinators for all parties in NWE test TF	NWE entrance test scripts are reviewed and approved

### 2.3 Exit criteria

ID	Responsible party	Criteria
1	NWE test TF	All scenarios have been successfully validated against validation criterions defined
2	NWE test TF	No defects category A1 or A2 present in systems (as defined in chapter 7)
3	NWE test TF	Remaining defects category B or C in systems are identified and agreed by the test TF (as defined in chapter 7)
4	NWE Technical WG	Test report reviewed and approved by Technical WG

## 3 NWE Simulation test

### 3.1 Description

The goal of simulation tests is to validate that systems constituting the NWE chain can perform the process in any situation described in NWE procedures according to the steps and timings defined in the NWE procedures. It also includes testing that the steps described in the procedures can be performed in due time even when they are not systems related (incident committee for example).

Operators/Day-to-day users of the systems shall perform simulation tests based on scripts to be provided by the test TF. Defects in the procedures shall be logged by the test TF and handed over to the procedure TF. The procedure TF shall be responsible for monitoring the correction of those defects in the procedures. The procedure TF will also inform the test TF on the status of the corrections and potential need for retesting.

The list of scenarios should cover each different situation described in the NWE procedures. The combination of different procedures should generate test cases; however it cannot cover all possible combination.

### 3.2 Entrance criteria

ID	Responsible party	Criteria
1	NWE test TF	Finalization of integration test phase
2	NWE procedure TF	NWE simulation test scripts and scenarios are finalized



ID	Responsible party	Criteria
3	NWE parties and PCR	Operators have knowledge of regional/local and NWE procedures
4	NWE procedure TF	NWE procedures must be finalized
5	NWE sub regions, parties and PCR	Each party/sub region has a complete set of local procedures finalized and in line with NWE procedures

### 3.3 Exit criteria

ID	Responsible party	Criteria
1	NWE test TF	All scenarios have been successfully validated against validation criteria defined
2	NWE test TF	No defect category A1 or A2 present in systems (as defined in chapter 7)
3	NWE test TF	Defect category B or C are identified and accepted by the test TF as defined in chapter 7 (defects to be corrected before NWE go live)
4	NWE Procedure TF	All NWE procedures are updated and approved
5	All parties	The tested and validated version of systems are ready for production
6	NWE JSC	Test report is reviewed and approved by JSC

## 4 NWE Member tests

### 4.1 Description

Member tests aim at involving market participants in the tests and demonstrating that the functionalities and procedures validated at an earlier stage are not altered when considering the submission of orders by members. They also aim at providing real conditions to members to allow them to experiment new procedures/processes for price coupling.

The process goes from submission capacity to calculation of flows. Shipping process can be excluded from the test phase.

Test cases shall focus on processes that are new and have impact on members:

- Normal day
- Full decoupling
- Partial decoupling

The role of the test TF in the member test phase is limited to drafting the list of test scenarios list. Operations teams of the NWE parties can provide input and comments to this. The Technical WG will approve it. The communication TF can support in the organization and make the letters to the participants. The coordination of the tests is a responsibility of the Testing TF.

### 4.2 Entrance criteria



ID	Responsible party	Criteria
1	NWE test TF	Simulation tests finalized successfully
2	NWE communication TF	NWE Test scripts and scenarios are reviewed and approved for member tests

#### 4.3 Exit criteria

ID	Responsible party	Criteria
1	NWE communication TF	Feedback from members was gathered and validated
2	NWE test TF	All member test scenarios successfully tested against validation criteria