Annex 9 MDfI:

Core high-level Functional Architecture for Fallback circumstances

SDAC Market Coupling

Summary	This is the document containing the fallback High-level functional architecture and business process for Core FB MC. The document is an Annex to the MDfI document (Annex 9)	
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Version history

Version	Date	Name	Summary of Changes
0.1	22-11-2019	[redacted]	Initial version, based on the "CWE High-level Functional Architecture for Fallback circumstances in MNA context MRC Price Coupling".
0.2	17-12-2019	[redacted]	First review
0.3	10-01-2020	[redacted]	Second review
0.4	04-05-2021	[redacted]	Update – general update and new fallback option 6d included.
0.5	15-09-2021	[redacted]	Update – HLA picture updated, generic small updates / corrections.
0.6	25-01-2021	[redacted]	New decoupling deadline included (14.00 -> 14.20)
1.0	15-02-2022	[redacted]	Final version for go-live. The Fallback HLA is now an Annex of the MDfI.

[redacted]

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2 Glossary

Following terms are used in the functional architecture in the sense indicated in this glossary. It shall be avoided to use other terms to refer to the same entities.

All terms already defined in regulations, such as CACM Regulation, shall keep the same meaning in this document.

Capacity Allocation: the attribution of Cross Zonal Capacity.

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

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

CORE external borders (or "external borders"): Correspond to CORE borders different from CORE internal borders (DE/LU-AT, DE/LU-BE, FR-DE/LU, BE-FR, NL-BE, NL-DE/LU, AT-SI, HR-SI, CZ-AT, CZ-DE/LU, CZ-SK, PL-DE/LU, PL-CZ, PL-SK, SK-HU, HU-RO, HU-AT, HU-HR)

CORE TSO CS's external borders:

CORE external borders that are managed in the Core TSO CS for the pre-coupling and the validation of market coupling results:

- NO2A-NL
- NO2A-DE
- DK1-DE
- DK1-NL
- FR-ES
- IT-AT
- IT-FR
- BG-RO

HLA: High Level Architecture

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

Market Participant: an entity authorized by a NEMO to submit Orders.

Multiple NEMO Arrangements or **MNA**: national TSO document, written in accordance with article 45 of CACM Regulation and approved by national regulator, describing cross-zonal capacity allocation and other necessary arrangements in case more than one NEMO is designated and/or offers trading services in the TSO bidding zone.

NEMO Trading Hub, or **NEMO Hub**, or **Hub**, or **NTH**: combination of NEMO, active in a scheduling area, within a bidding zone.

PCR: Price Coupling of Regions is a solution which consists of a coordinated matching function commonly agreed between European NEMOs and based on a decentralized coordinated calculation with a common matching algorithmic software 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.

Scheduled exchanges, or **SEC**, or **SEC flow**: quantity or energy transferred between

- two scheduling areas;

- or two bidding zones;
- or two NEMO hubs.

3 Introduction

3.1. Contents and purpose of this document

The objective of the HLA is to ensure that all required system interfaces with the involved systems and all information flows into and out of the involved systems are identified for the Fallback situations. It is important to note that some interfaces and information flows identified are optional for individual parties to the extent that it has been identified that at least one party needs the indicated interface and information flow. It is then up to each party to decide which interfaces and information flows are actually needed at the local implementation to deliver a consistent business process.

This document focuses on fallback mechanism applied on the Core CCR as part of the Single Day Ahead Market Coupling process.

3.2. An information perspective on the solution

Among the many perspectives possible, the present document adopts one particular perspective on the Solution: that of information flows. This perspective can be labelled the information perspective. At a high level of abstraction, the document tries to answer the five questions below:

1. *Which* automated *systems* (the 'Systems') play a role in the Solution?
2. *Which* human *agents* (the 'Agents') play a role in the Solution?
3. *What information* is *produced* by any of the Systems and Agents in the Solution (only information relevant to the solution is taken into consideration)?
4. *What information* is *exchanged* between any of the Systems and Agents in the Solution (applying the same restriction as item 3)?
5. In *what sequence* is the information produced by and exchanged between the Systems and the Agents?

Other perspectives on the solution would include the following.

- The legal and governance perspective (concerned with roles and responsibilities, ownership, decision making and legal entities).
- The algorithmic perspective (concerned with the rules applied in the calculation of the market coupling result and other pieces of information).
- The IT perspective (concerned with the design and development of the Systems and the interfaces between them).
- The operational perspective (concerned with the procedures followed to operate the Systems).

These perspectives are not unrelated to the information perspective, but they are different. This document isn't concerned with them directly.

4 Core High-level functional architecture and business process

This chapter contains the Core high-level functional architecture and business processes for the Fallback situations.

Business processes on external borders which involve Core systems (owned by TSOs, NEMOs) are also included in this HLA.

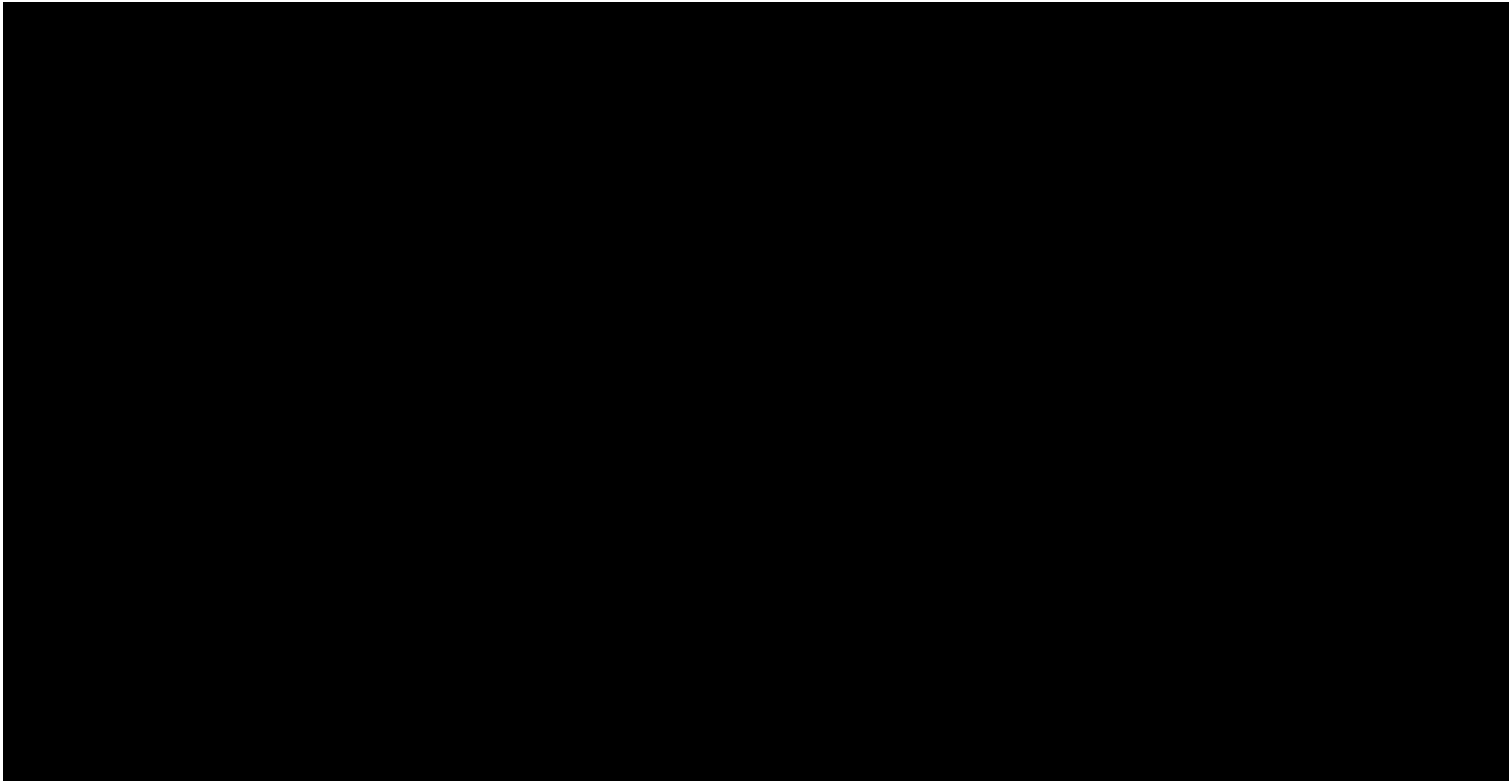
4.1. Fallback scenarios and scope of this document

[redacted]

[redacted]

[redacted]

4.1.1. Summary



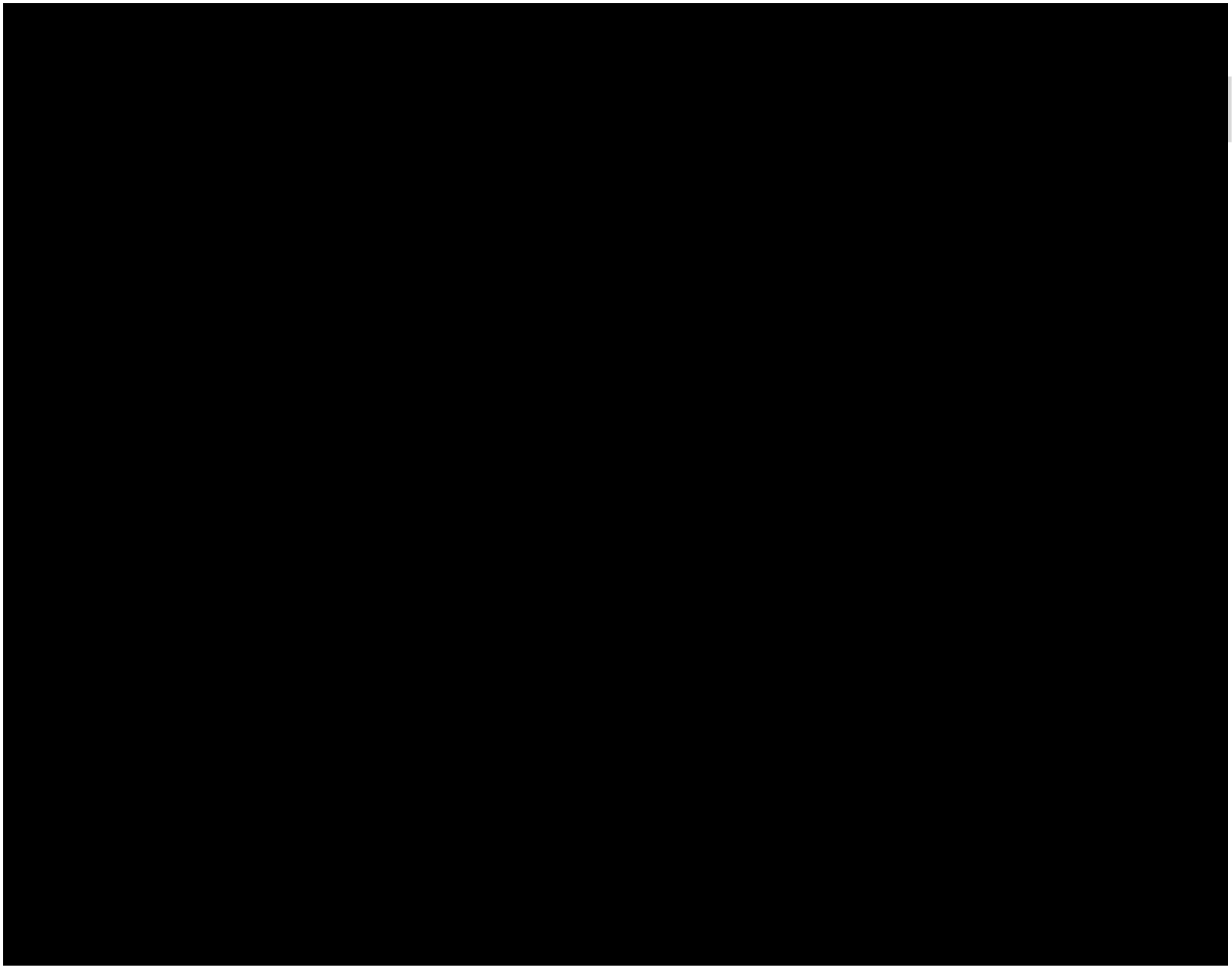
[redacted]

4.2. High-Level architecture overview

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

- The System shown;
- The Processes shown
- The Agents shown;
- The information produced and exchanged;
- The indicative sequence in which the information is produced and exchanged.

The information produced and exchanged is represented in the diagrams by arrows with a label. The label indicates the contents of the piece of information transferred or produced. The sequence of production and transfer of information is further detailed in §3.4. The arrows are numbered accordingly.
It should be stressed that only flows of information are shown in the diagram and that some of them may be optional. Other flows, like energy and financial flows, are not taken into account.



4.3. Systems

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

The Systems distinguished are logical or virtual systems. This means, they do not necessarily correspond to single software applications or to dedicated computer hardware. The latter entities belong to the IT perspective. In the information perspective, a System can be thought of as a set of information manipulation functions it is convenient to consider as a separate entity.
Systems are interconnected via Interfaces. Each Interface serves one or more information flows. The different information flows are defined in §4.5.3.

The following Systems are distinguished:

[redacted]

[redacted]

[redacted]

4.4. Agents

The Agents are represented in the diagram as abstract human figures.

Just like the Systems are abstract systems, the Agents distinguished are logical or virtual agents. An Agent is a non-automated[2] entity interacting with one or more Systems or other Agents in the information perspective on the Solution. An Agent is distinguished according to the role he plays. For instance, one human being could appear in the architecture as two different Agents (for instance, 'Operator' and 'Operations Manager' – a distinction not relevant in our solution, but possibly relevant in other solutions). Conversely, hundreds of human beings appear as a single agent ('Market Participant').

The following Agents are distinguished:

[redacted]

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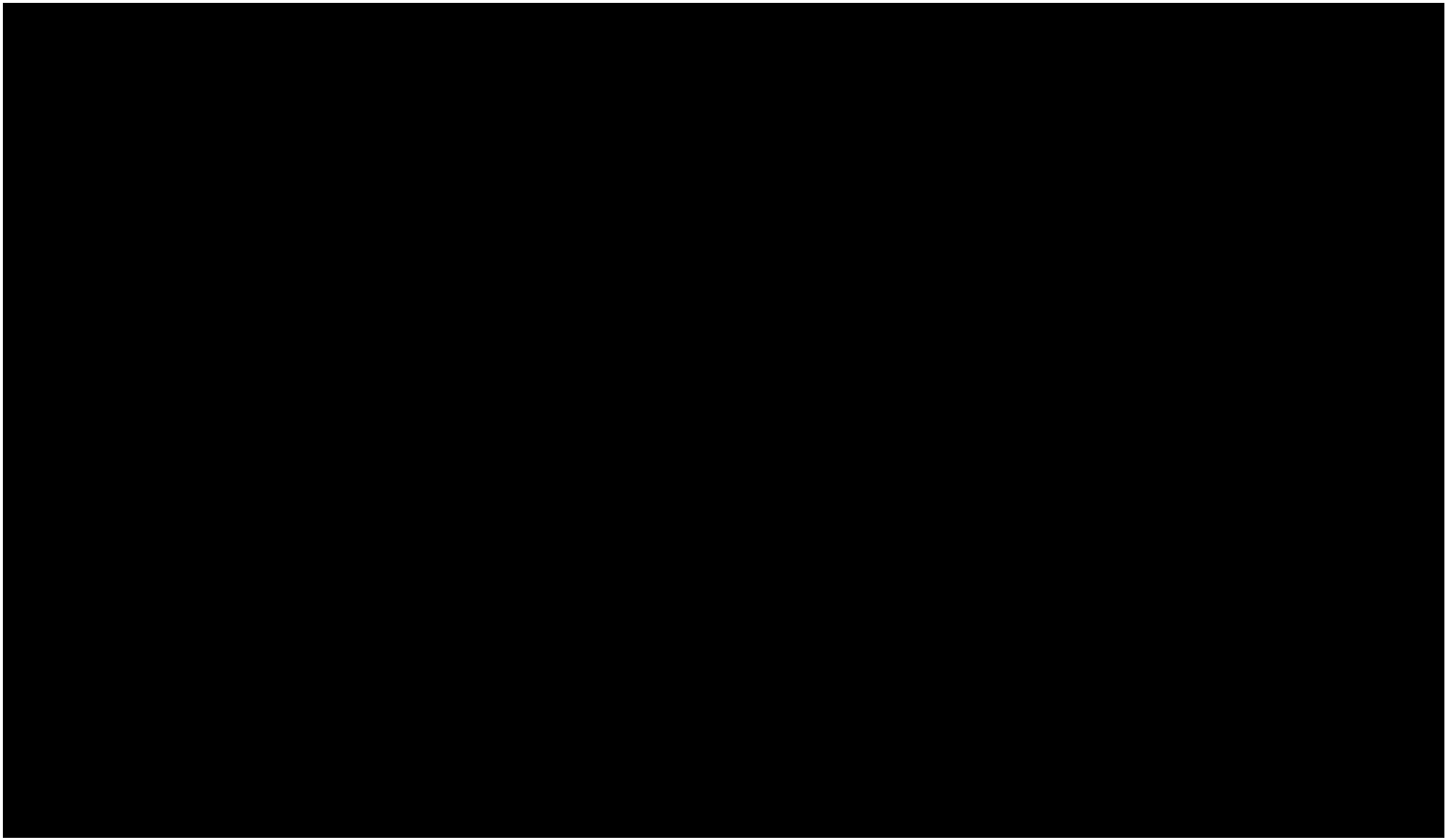

4.5.2. Processes

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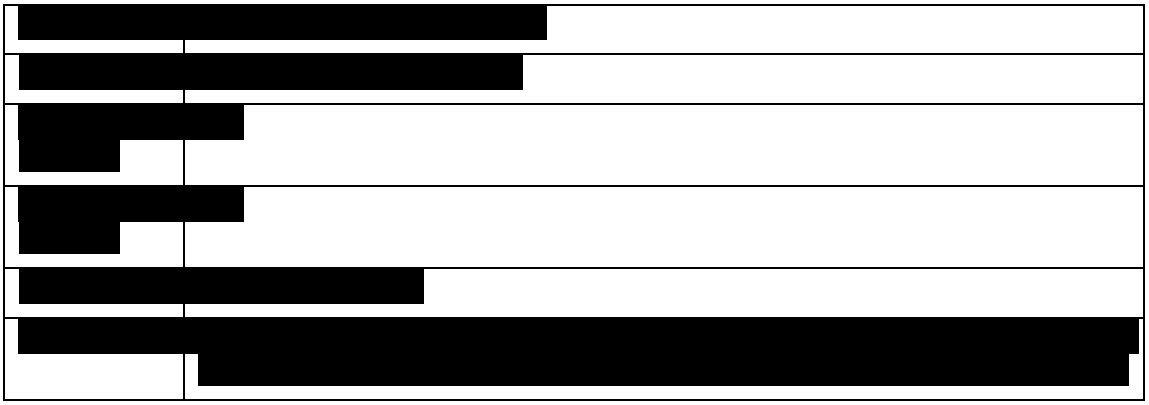
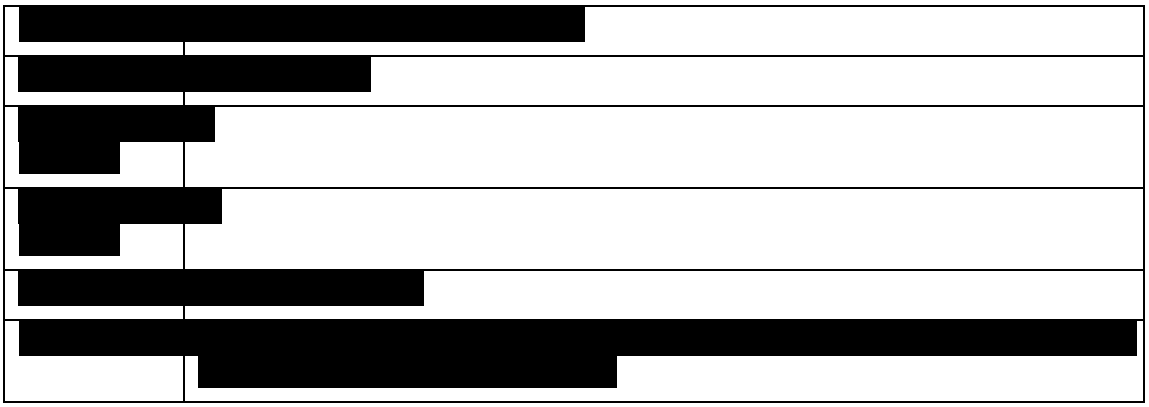
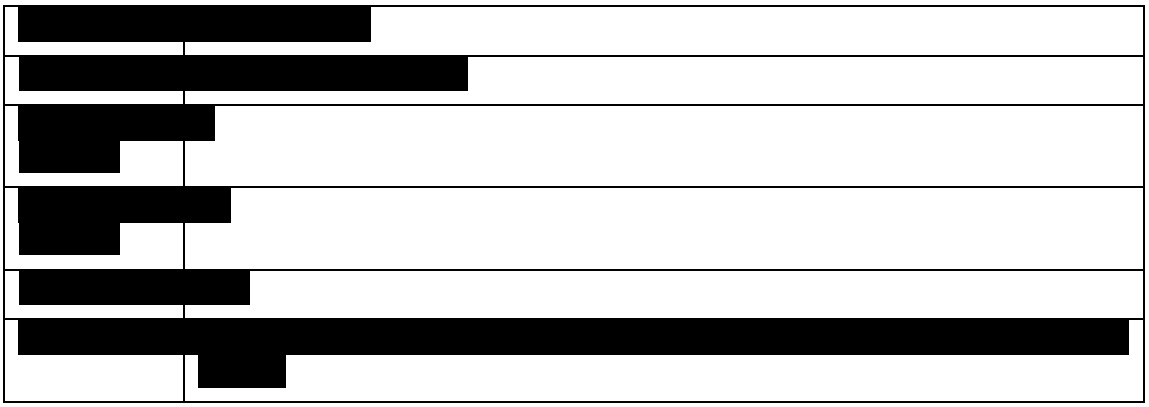
(F12) Reference Price Calculation

BE, FR, NL, PL and AT TSOs calculate the Reference price as the weighted volume average of the local price of each NEMO.

4.5.3. Information flows







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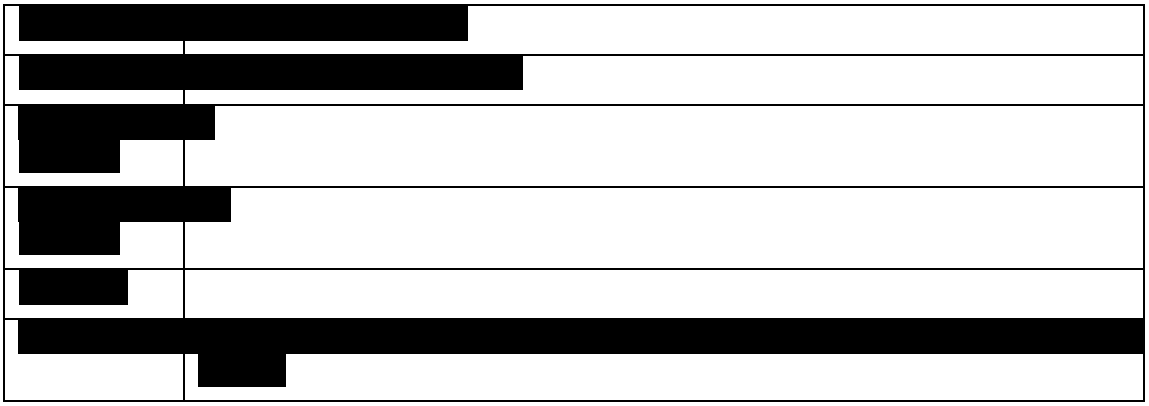

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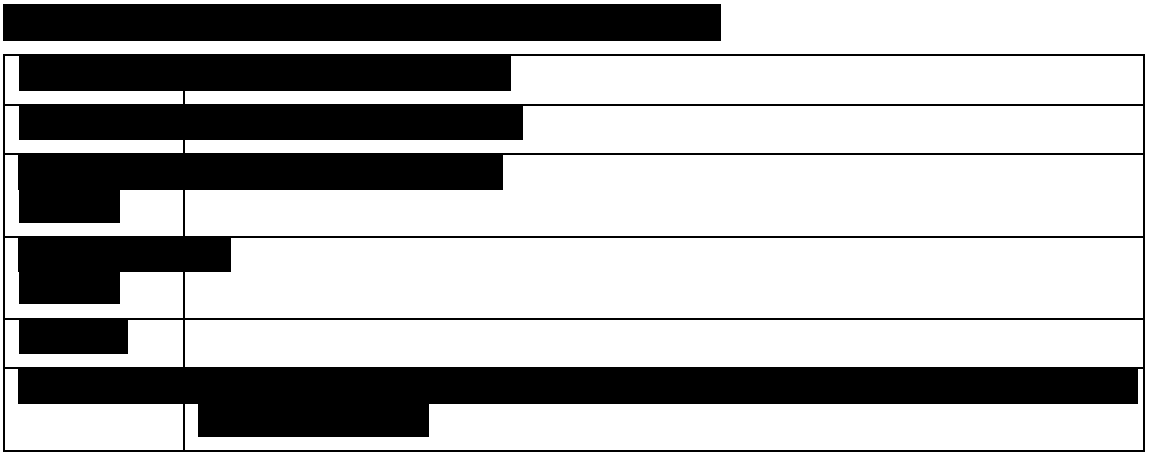

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5 Annex 1 – Core Fallback HLA overview external borders

Core External border[3]
FR-ES
FR-IT
AT-IT
NO2A-NL
NO2A-DE
DK1-NL
DK1-DE
RO-BG

[3] Only borders with implicit market coupling (in regular operations) are listed.

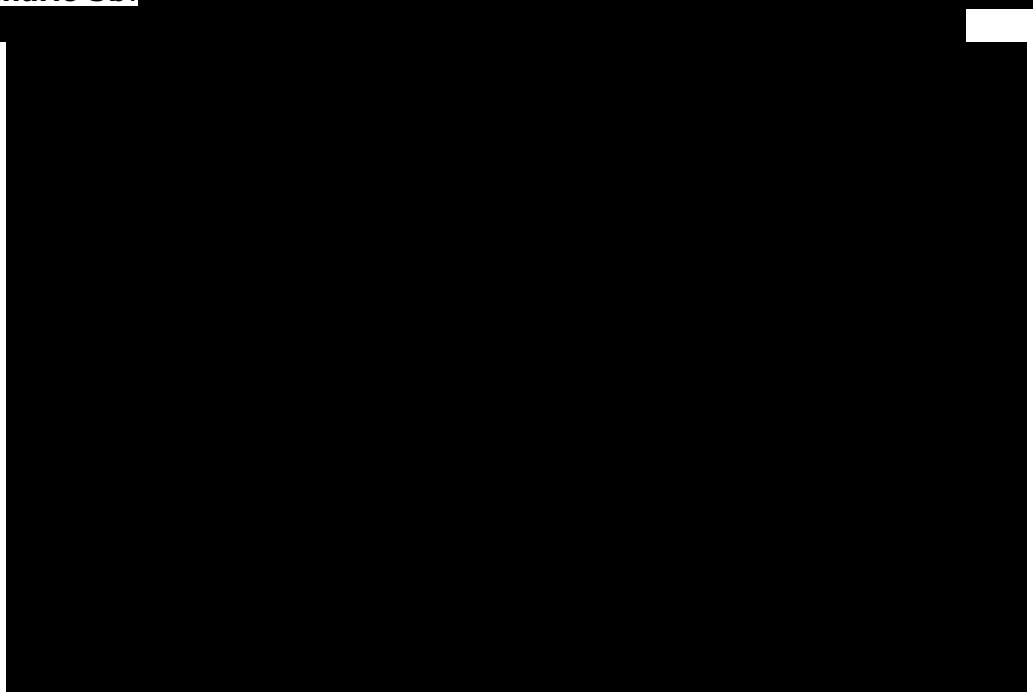
6 Annex 2 – description of partial decoupling and full decoupling cases

Scenario 1:

[4]Valid only in case of specific submission type configuration (single/double).

Scenario 3a:

Scenario 3b:



Scenario 4:

Scenario 5a:

[5]

Scenario 5b:

Scenario 5c:

Scenario 6: "