Reliable Sustainable Connected

SUPPORTING PAPER FOR THE ELECTRICITY BALANCING NETWORK CODE

24 APRIL 2013

WORKING DRAFT V0.9

THIS EARLY WORK-IN PROGRESS DOCUMENT IS SUBJECT TO AMENDMENTS

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1 PURPOSE AND OBJECTIVES OF THIS DOCUMENT

1.1 PURPOSE OF THE DOCUMENT

This document has been developed by the European Network of Transmission System Operators for Electricity (ENTSO-E) to accompany the consultation of the Electricity Balancing Network Code (NC EB) and should be read in conjunction with that document.

The document has been developed in recognition of the fact that the NC EB, which will become a legally binding document after comitology, inevitably cannot provide the level of explanation which some parties may desire. Therefore, this document aims to provide interested parties with the background information and explanation for the requirements specified in the NC EB, and outlines the steps that follow.

1.2 STRUCTURE OF THE DOCUMENT

The supporting paper is structured within the framework for all market related Network Codes supporting papers as follows:

Section 1 Purpose and Objectives.

Section 2 Procedural Aspects – introduces the legal framework within which the market–related Network Codes have been developed, as well as the next steps in the process.

Section 3 Scope, Structure and Approach to Drafting of the Network Codes – explains the approach, which ENTSO-E has taken to develop the Network Codes, outlines some of the challenges and opportunities ahead of System Operation as well as concepts used in the NC EB.

Section 4 Relationship between NC EB and Framework Guidelines – explains the relationship between the NC EB and the Framework Guidelines on Electricity Balancing (FG EB).

Section 5 NC EB: Objectives, Requirements – focuses on the objectives of the NC EB by topic, and on an article by article basis, split into the three mains parts of the Network Code, procurement, settlement and capacity reservation, identifying the roles, responsibilities, functions and characteristics of the respective sections. Choices that have been made within the NC EB are justified in this section.

Section 6 Added Value of the NC EB – describes how the NC EB adds value to the harmonised, coordinated Balancing Market across Europe.

Section 7 Responses and next steps – describes how stakeholders can participate in the Network Code process, and timescales going forward.

Section 8 Links to relevant documents.

1.3 LEGAL STATUS OF THE DOCUMENT

This document accompanies the NC EB, but is provided for information only and therefore it has no binding legal status.

1.4 RESPONDING TO THE CONSULTATION

Responses to the public consultation on the NC EB are requested by the dates agreed once the consultation is launched. All responses should be submitted electronically via the ENTSO-E consultation tool, explained at https://www.entsoe.eu/resources/consultations/.

2 PROCEDURAL ASPECTS

2.1 INTRODUCTION

This section provides an overview of the procedural aspects of the Network Codes' development. It explains the legal framework within which Network Codes are developed and focuses on ENTSO-E's legally defined roles and responsibilities. It also explains the next steps in the process of developing the NC EB.

2.2 THE FRAMEWORK FOR DEVELOPING NETWORK CODES

The NC EB has been developed in accordance with the process established within the Third Energy Package, in particular in Regulation (EC) 714/2009. The Third Package legislation establishes ENTSO-E and the Agency for the Cooperation of Energy Regulators (ACER) and gives them clear obligations in developing Network Codes. This is shown in Figure 1.

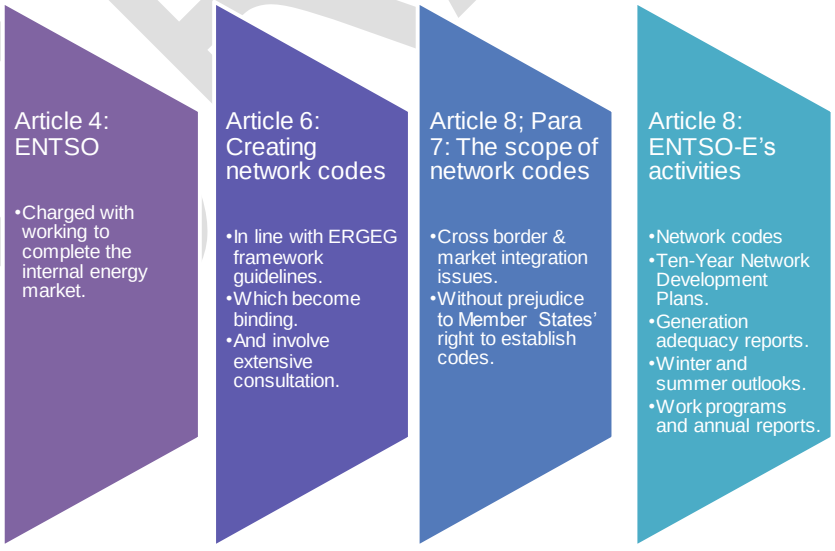

Figure 1: ENTSO-E's legal role in Network Code development according to Regulation (EC) 714/2009.

Moreover, Regulation (EC) 714/2009 creates a process for developing Network Codes involving ACER, ENTSO-E and the European Commission, as shown in Figure 2below.

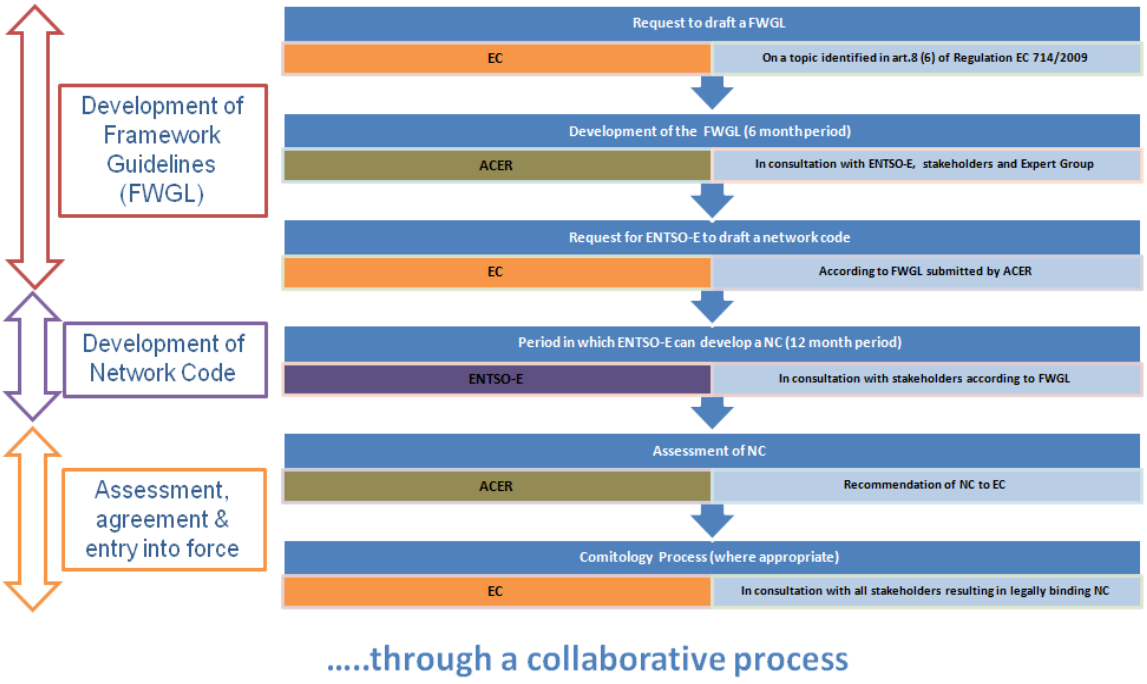

Figure 2: Network Codes' Development Process

The NC EB has been developed by ENTSO-E to meet the requirements of the Framework Guidelines on Electricity Balancing[1] published by ACER on 18September 2012. ACER has also conducted an Initial Impact Assessment associated with its consultation on its draft EB FG in September 2012[2].

ENTSO-E was formally requested by the European Commission to begin the development of the NC EB on 1January 2013. The deadline for the delivery of the code to ACER is 1January 2014.

2.3 NEXT STEPS IN THE PROCESS

During the public consultation period the NC EB Drafting Team encourages stakeholders and involved parties to submit comments and to provide proposals for addressing any concerns they have with the current draft to the public consultation tool, available on ENTSO-E webpage https://www.entsoe.eu/resources/consultations/. To supplement the public consultation and enable direct questions and discussion which shall promote understanding of the network code and ensure targeted comments in the public consultation, ENTSO-E is holding a public stakeholder workshop. ENTSO-E will carefully consider all comments which are provided and will update the Network Code in light of them. The way in which the NC EB Drafting Team intends to finally amend the code will be outlined in the another Public Stakeholder Workshop on the NC EB planned for the middle of October 2013. Following agreement and approval within ENTSO-E, the Network Code will be submitted to ACER in line with the defined deadline of 1January 2014.

ACER is then expected to assess the NC EB to ensure it complies with the FG EB and will make a recommendation to the European Commission. When the European Commission agrees with the ACER recommendation, the European Commission can conduct the Comitology process which will eventually transform the NC EB into a legally binding integral component of the Regulation (EC) 714/2009.

3 SCOPE, STRUCTURE AND APPROACH TO DRAFTING THE NC EB

3.1 BACKGROUND

ENTSO-E has drafted the NC EB to define the rules for commercial and operational provision of system Balancing and the Balancing rules including network-related power reserve rules, with the objective of contributing to non-discrimination, effective competition, completion and efficient functioning of the internal market in electricity and cross-border trade and security of supply. It provides benefits for customers, permits the participation of Demand Response, supports the achievement of the EU's targets for penetration of renewable generation as well as ensuring the optimal management and coordinated operation of the European electricity transmission network.

3.2 GUIDING PRINCIPLES OF NC EB

The guiding principles of the NC EB are for integration, coordination and harmonisation of the Balancing regimes in order to facilitate electricity trade within the EU in compliance with the Electricity Regulation (EC) 714/2009 and Directive 2009/72/EC. These principles are essential for the Transmission System Operators (TSOs) both within and across Synchronous Areas to efficiently manage their responsibilities and provide Balancing tools in the most efficient and coordinated way.

System Balancing is a highly complex task, which requires TSOs to take actions to ensure that electricity demand and supply are equalled in real-time in order to preserve the operational security of the system. In an integrated Cross Border Balancing Market, TSOs balance the system in a coordinated way in order to use the most efficient Balancing resources, taking into account operational security limits both within and across Synchronous Areas. As such, the main goal of the NC EB is to achieve a harmonised and coordinated set of procurement, capacity reservation and settlement rules.

Consistent with the FG EB, the NC EB defines the high level principles of the models that are subject to TSOs proposals after entry into force of the Network Code (i.e. pricing method, Balancing Energy products, target model for Automatic FRR). For the purpose of the development of the European Balancing Market, the NC EB foresees the coordination of Balancing activities initially on a regional level moving towards a European level. The NC EB foresees a process for progressive development of the European Balancing market where market efficiency and system security issues are considered and in compliance with relevant Network Codes and the intentions in the FG EB. ENTSO-E has considered that the harmonisation of Balancing Markets is not a target in itself, but rather that progressive harmonisation should be pursued in areas where it continues to provide benefits to customers and power system security. This is illustrated in the NC EB's approach to cross-border issues, through the use of the Coordinated Balancing Area within which the Common Merit Order concept will apply, to foster the ambitious targets of market integration as set forth by FG EB.

3.3 BACKGROUND TO NC EB

The structure of the NC EB is based on the three major sections of the FG EB namely:

(1) Procurement of Balancing Services,

(2) Reservation and use of Cross Zonal Capacity for Balancing and

(3) Imbalance Settlement.

In Balancing, the TSOs need to ensure that they will always be able to activate sufficient amount of energy to balance the deviations between supply and demand in real time. This defines the concept of "Balancing Energy", which is provided by the Balancing Service Providers (BSPs) that are able to meet the necessary technical requirements to deliver this service. Balancing can be provided by a wide range of technologies including small-scale generation, demand resources, renewables resources and intermittent resources. The NC EB does not refer to any technology type and therefore provides opportunities for all potential sources of Balancing which fosters competition among all sources of Balancing and thus maximises the Social Welfare gain. As TSOs are faced with the risk that they will not have enough offers for Balancing Energy from BSPs in real time, they hedge this uncertainty by securing in advance sufficient amount of power capacity available in their LFC Area.

An option which gives the TSOs the possibility to activate the certain amount of Balancing Energy within a certain timeframe is referred to as "Balancing Reserve". It is typically defined as the available generation or demand capacity which can be activated either automatically or manually to balance the system in real time. The TSOs usually check and/or conclude contracts to guarantee they have access to these Balancing Reserves ahead of real time.

The Balancing Energy in real time can thus be provided by the Balancing resources, which were secured in advance as Balancing Reserves, or by other Balancing resources that are offering Balancing Energy on a voluntary basis, subject to their availability in real time.

3.3.1 Procurement and Types of Reserve (Chapter 3 NC EB)

The Balancing of the electricity system is fundamental to both the efficient functioning of markets and to maintaining system security across Europe. Taking into account the very different Balancing Market designs that exist today and the lack of consensus on the common Balancing Market, regional integration provides an opportunity to gain experience before starting a pan-European project. The progressive development of regional Balancing Markets should be capable of being achieved more quickly than a leap to a single solution.

ENTSO-E considers that the NC EB should set out an incremental, regional based, approach in the development of a European Balancing Market, taking into account the timeline defined in the FG EB.

In order to deal with disturbances, system operation involves three types of Balancing Reserves which are part of a sequential process based on successive layers of control, and these are shown schematically in Figure 3:

1. Frequency Containment Reserve (FCR);
2. Frequency Restoration Reserve (FRR); and
3. Replacement Reserve (RR).

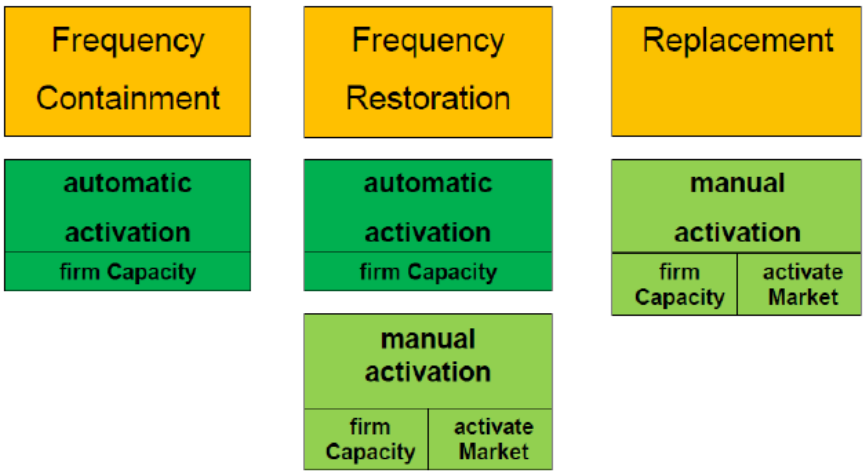

Figure 3: Three Types of Reserve and Sourcing [2]

The FG EB requires a standardisation of Balancing products. To this end, the NC EB lists the standard characteristics which define Balancing Energy and Balancing Reserve products. These standard characteristics are the minimum set of characteristics required to define the products.

It requires that all TSOs prepare a common proposal for standard Balancing Energy and Balancing Reserve products which includes detailed specifications of their characteristics.

It also outlines a process to define, review and update the list of Standard Products, which includes a public consultation with stakeholders. The process also foresees that this proposal from all TSOs is submitted to ACER and to all National Regulatory Authorities (NRAs) no later than one year after entry into force of the NC EB.

In this context a differentiation between standard and detailed characteristics has been made to be included to the proposal for Balancing Energy and Balancing Reserve products, while the detailed characteristics will be finally specified in the actual product definition one year after the entry into force of the NC EB.

The standard characteristics are the minimum set of product attributes that would allow for its exchange through a Common Merit Order List (CMO). Besides this, standard characteristics should seek to minimise the number of Common Merit Order Lists so as to maximise the liquidity of Balancing Markets. In other words, it could be somehow possible to exchange, through a Common Merit Order List, products that are not fully harmonised provided these products are able to meet the minimum standard characteristics. Further details on the characteristics of Standard Products are shown in Section 5.

3.3.2 Reservation and Use of Cross Zonal Capacity (Chapter 4 NC EB)

To ensure the availability of Balancing Services procured outside the domestic LFC Area, TSOs require the ability to reserve capacity on Interconnectors. Cross Zonal Capacities are limited and capacity will be allocated through the guidance set-out in NC CACM. It is considered that there is room for improving competition by means of Cross Border Balancing exchanges. TSOs are permitted under the FG EB to use Cross Zonal Capacity if the socially economic benefits can be justified. This section of the NC EB deals with the methodologies by which provisions of Cross Zonal Capacity may be implemented, and the principles associated with this.

3.3.3 Settlement Rules and Imbalance Responsibility (Chapter 5 NC EB)

In a liberalised market, the market players also have an implicit responsibility to balance the system through the balance responsibility of market participants, the so called “Balancing Responsible Parties” BRPs. In this respect, the BRPs are financially responsible for keeping their own position (sum of their injections, withdrawals and trades) balanced over a given timeframe – the Imbalance Settlement Period. The remaining short and long energy positions in real time are described as the BRPs’ negative and positive Imbalances respectively.

Depending on the state of the system, an imbalance charge is imposed per Imbalance Settlement Period on the BRPs that are not in balance. This defines the Imbalance Settlement which is a core element of Balancing Markets. It typically aims at recovering the costs of Balancing the system and may include incentives for the market to reduce Imbalances – e.g. with references to the wholesale market design – while transferring the financial risk of Imbalances to BRPs.

The NC EB describes the general objectives of Imbalance Settlement, and defines Imbalance Settlement rules that support competition among market participants by creating a level-playing field without discrimination. Specifically in respect of the Imbalance Settlement Period, the NC EB describes marginal pricing as the methodology. In the marginal pricing scheme it is only possible to apply a single marginal or double marginal pricing mechanism.

With regard to Cross Zonal Capacity management, in a pay-as-cleared pricing mechanism the occurrence of equal Imbalance Prices within uncongested areas will increase. As consequence BRPs might tend to balance themselves out over the uncongested area and not per LFC Area. A pay-as-cleared price will reflect the highest activation price for the uncongested area and not for the LFC Area; as a consequence the Imbalance Prices of LFC Area does not necessary reflect the imbalance situation of the LFC Area.

For specific Balancing products for which there is no requirement to be offered within the Common Merit Order List no harmonisation is required. The NC EB stipulates that all activated Balancing Energy on the Common Merit Order List will be delivered in a Firm way to the borders. Each TSO should decide on their own in conjunction with the provisions within the NC EB whether additional incentives are required to make sure that the requested Balancing Energy situated in its LFC Area is correctly delivered by the BSP. There will be various Coordinated Balancing Areas, the procurement processes might differ between them and may be applied in several ways. The NC EB does not stipulate a harmonisation of the settlement rules/process across Coordinated Balancing Areas.

3.4 LEVEL OF DETAIL

The NC EB describes the principles and rules by which a harmonised and coordinated European Balancing Market can be developed. The timescales within which the NC EB has to be drafted do not permit the necessary analysis and cooperation required for the NC EB to specify exact details on, for example, Standard Products, or the implementation strategy for Automatic FRR. These details, consistent with the FG EB are referred to TSO groupings that will be organised by ENTSO-E after entry into force of the NC EB.

The NC EB provides minimum standards, principles and requirements related to Electricity Balancing. The level of detail matches the purpose of the NC EB: harmonising Balancing arrangements, methodologies for coordination, roles and responsibilities of TSOs, BSPs and BRPs as well as to enable and ensure adequate exchange of necessary information in order to future proof the system for integrating innovative technologies and sustainable energy sources, operate the system in a safe,

secure, effective and efficient manner and applying the same principles and procedures for different systems to establish a wider level playing field for market participants.

In order to achieve the necessary level of European harmonisation, allowing at the same more detailed provisions at the regional / national level where necessary, and with the view of drafting market based Network Codes that are open for future developments and new applications, an approach focusing on pan-European view and most widely applicable requirements has been pursued throughout all the development phases.

Thus, the requirements have been drafted considering a period from entry into force in 2014/2015 to the outlying requirement of the FG EB of six years after entry into force as the timescales for implementation. Consequently building up a coherent legal mechanism, devising and building the IT systems necessary and appointing the necessary agents for change, with the appropriate balance between level of detail and flexibility, which focuses on what-to-do, not so much how-to-do.

3.5 FIELD OF APPLICABILITY OF THE NC EB

The NC EB is applicable to all European TSOs that fall under the requirements of the 3rd package and all BRPs and BSPs.

Specifically the Framework Guidelines States *"The Network Code on Electricity Balancing shall take precedence over relevant national frameworks (legislation, regulation, codes, standards, etc.) for cross-border and market integration issues and national frameworks shall be adapted to the extent necessary, to ensure proper implementation at the national level".*

3.6 INTERACTION WITH OTHER NETWORK CODES

3.6.1 Interaction with Network Code on Load Frequency Control and Reserves (NCLFC&R)

The Network Code on Load Frequency Control and Reserves prescribes cooperation between TSOs to keep frequency criteria of the Synchronous Area. It determines volumes and distribution of reserves to ensure operational security as well as technical requirements for the safe exchange and sharing of reserves and their cross-border activation. Generally, parameters of frequency quality criteria refer to Synchronous Areas and are further broken down into requirements for LFC Areas. Figure 4 illustrates.

The NC LFC&R further introduces an Area Hierarchy and defines among others: FRR, RR, cross-border FRR, cross-border RR and Imbalance Netting. NC LFC&R foresees exchanging and sharing FRR and RR within defined limits if there is available transmission capacity but does not say explicitly to what transmission capacities it refers. If cross-border products (exchanged or shared) are not available, the operational security of the LFC Area must still be ensured. The pan-European Balancing Mechanism as defined in NC EB must stick to the technical limits defined in the NC LFC&R.

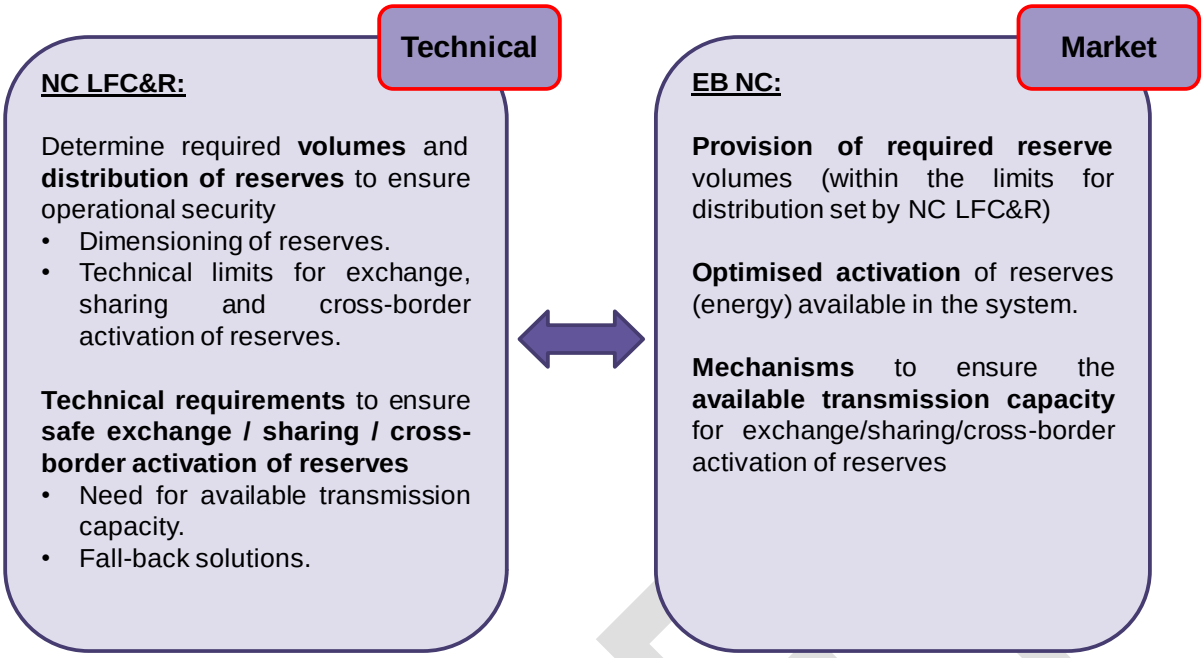

Figure 4:NCLFC&R andNCEB Code Interaction

3.6.2 Links to the Network Code on Capacity Allocation and Congestion Management (NC CACM)

The NC CACM Network Code on Capacity Allocation and Congestion Management defines Bidding Zones as a measure to manage congestions and to efficiently allocate scarce transmission capacities between Bidding Zones. It covers Day-Ahead (DA) and Intraday (ID) timeframes and defines rules for trading energy implicitly including transmission capacities. NC CACM. The NC CACM defines two methodologies for transmission capacity calculations: the flow-based approach and the coordinated Net Transfer Capacity (NTC) approach, and indicates flow based as the preferred solution. The NC CACM foresees that already allocated Cross Zonal Capacity shall be taken into account in calculating Cross Zonal Capacities for Day Ahead and Intra-Day timeframes.

Reservation of transmission capacities for Balancing Services has been handled with a similar approach. The FG EB states that TSOs are obliged to justify and receive approval of NRAs to reserve any transmission capacities. This therefore means that reservation of transmission capacities between Bidding Zones in the same LFC Area also requires NRA approval. Based on both NC EB and on the NC CACM, the Reliability Margin should not be used to reserve transmission capacities for exchanging reserves or for Balancing Energy between Bidding Zones and/or LFC Areas, except for FCR. This is further reinforced in the NC EB.

The NC CACM foresees the introduction of common maximum and minimum prices and addresses transmission capacity Firmness issues and also states that the Intra-Day Gate Closure Time shall be at the maximum one hour prior to the start of the relevant Market Time Period.

3.6.3 Links to Network Code on Operational Security (NCOS)

The Network Code on Operational Security defines the TSO's responsibility for system security. The Responsibility Area is in most cases equal to the LFC Area. An essential input for ensuring system

security is detailed analysis based on accurate data, contained in the Common Grid Model, to properly reflect situations in the system.

At the interface between NC OS and NC EB, analysis is required to provide that exchanging of reserves is compatible with operational security limits. Balancing actions are taken close to real time, therefore in the NC EB mention has been made of the need to ensure that any transactions in this timeframe are always technically feasible (i.e. shall be compatible with operational security limits).

Remedial actions used/considered after the Day Ahead and Intra-Day time frame may use the same resources as are available for Balancing, and this risk has been noted.

3.6.4 Links to the Network Code on Operational Planning & Scheduling (NC OP&S)

The Network Code on Operational Planning and Scheduling refers to NC EB and NCLFC&R in the area of exchanging of reserves. It requires that Significant Grid Users and DSOs provide information on available Balancing Services, but details of the requirements should be defined in the NC on Requirements for Grid Connection. The NC OP&S foresees the establishment of a TSO-platform for the exchange of relevant data between TSOs.

3.7 CLARIFICATION ON CONCEPTS USED WITHIN THE NC EB

3.7.1 Definitions

The definitions used in this NC EB supporting document are the same as those used in the NC EB itself.

3.7.2 Coordinated Balancing Area

The NC EB introduces the concept of the Coordinated Balancing Area (CoBA) as a vehicle to reaching the target model in the timeframe defined by the FG EB. Every TSO is obliged to cooperate with one or more TSOs in a Coordinated Balancing Area by exchanging one (or more) Standard Product(s).

The Coordinated Balancing Area concept is central to the phased approach of reaching the FG EB targets. It provides for early cooperation between TSOs while allowing prudent flexibility. TSOs as well as all Balancing market parties shall gain experience of how cooperation in Balancing can achieve the highest benefit. This experience then supports the further evolvement of a pan-European Balancing market. As time passes the level of cooperation within a Coordinated Balancing Area and between neighbouring Coordinated Balancing Area s will increase; neighbouring Coordinated Balancing Area will merge; and finally all Coordinated Balancing Areas will merge to reach the FG EB target of a single pan-European Common Merit Order list.

While the exchange of one (or more) Standard Products is compulsory within a Coordinated Balancing Area from the beginning, Sharing and exchange of Balancing Reserves is not mandatory but an option. Coordinated Balancing Area s for Balancing Reserves can be smaller than those for Balancing Energy (if established).

More detailed information on Coordinated Balancing Area is contained in Article 10 – Coordinated Balancing Area.

3.7.3 Procurement of Balancing Energy and Common Merit Order list (CMO)

The regulatory requirement for Balancing Energy is that the exchange of Balancing Energy must eventually be based on a TSO-TSO model with an associated Common Merit Order list (CMO). These regulatory requirements are more specific than those for the exchange of Balancing Reserves.

The criteria for the procurement of Balancing Energy within a Coordinated Balancing Area are:

(a) Definitions for each Balancing Energy Standard Product are consistent;

(b) Procurement is based on Balancing Reserve bids which have already been accepted and on additional Balancing Energy bids;

(c) Pricing methods are a harmonised;

(d) Cross-border balancing gate closure times are harmonised;

(e) Balancing Energy bids must have a cross-border capacity allocation which was either available after Intraday or reserved previously; and

(f) The size of the Balancing Reserves should be not affected by cross-border exchange (respect NC LFC&R).

There is a phased approach on how to achieve a European wide exchange of Balancing Energy. This approach is to allow coordination on a regional basis first (thus the development of the Coordinated Balancing Area concept), followed by a merging of these regional initiatives. Each region should thus be mindful of the developments in other regions and should follow a similar structure so that wider coordination can easily be achieved later.

The section on procurement of Balancing Energy describes the actions which occur ahead of real-time and which are needed to build the Common Merit Order list (CMO). The procurement of Balancing Energy is then followed by the activation of Balancing Energy which is the real-time action to deliver actual contracted Balancing Energy (in one direction or the other). The procurement of Balancing Energy precedes the procurement of Balancing Reserve procurement.

There are a number of steps involved in the procurement of Balancing Energy. Balancing Energy bids can be placed either on a local or regional TSO procurement platform by both providers of contracted Balancing Reserves or Balancing Service Providers who have no contracted reserves (e.g. demand, renewable generation units, variable and smaller generation units). These Balancing Energy bids can be updated until gate closure time. After cross border Intraday gate closure time and before cross border balancing gate closure time the Balancing Service Providers can continue to change their Balancing Energy bids which were previously submitted. After the cross border balancing gate closure time (Real time minus one hour) their Balancing Energy bids are firm. The TSO procurement platform sends the Balancing Energy bids with the corresponding energy price to the common bid collection function (in case of multiple Balancing Energy procurement platforms) which then builds the Common Merit Order list (CMO). This CMO is part of the input for the central Activation Optimisation Function. A confirmation is sent back to the local tendering system. This process establishes the need for a harmonised pricing method which may be either marginal pricing or pay-as-bid.

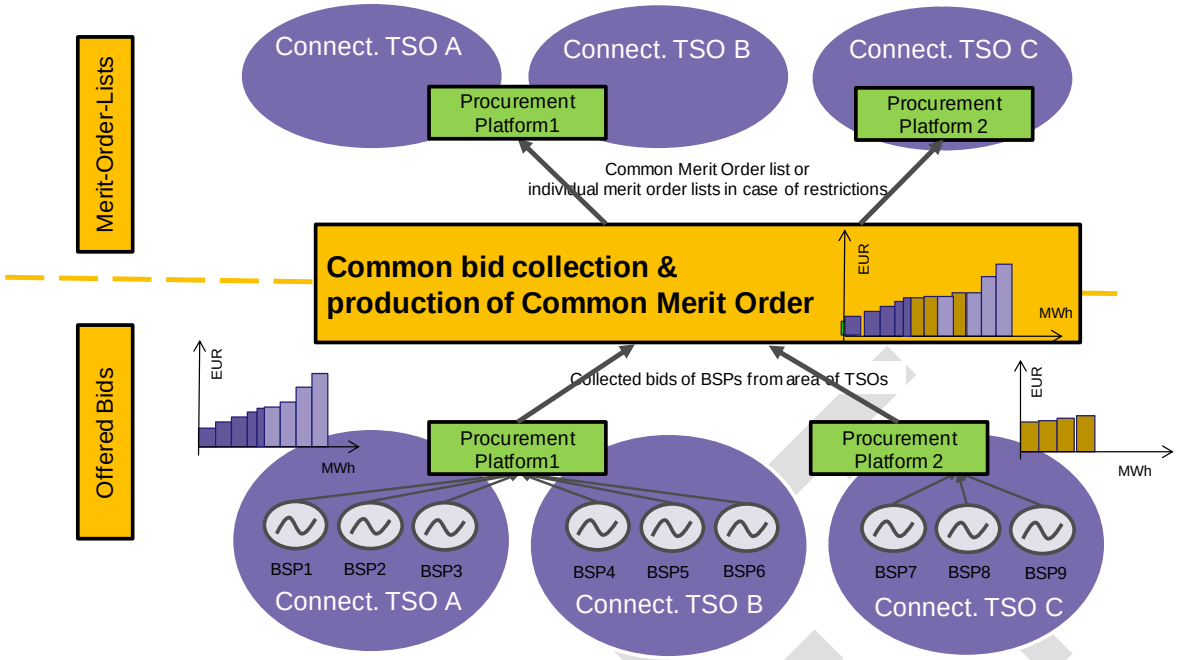

Figure 5: Procurement of Balancing Energy with CMO – Example for Coordinated Balancing Area with 3 TSOs

In Figure 6 TSO C has a local TSO procurement platform which sends Balancing Energy bids to the common bid collection function. TSO A and TSO B operate a regional TSO procurement platform which combines Balancing Energy bids from the TSOs and sends the combined Balancing Energy bids to the common bid collection function. The Common Merit Order list (CMO) is then produced which shows TSO C's Balancing Energy bids slotted in with the combined Balancing Energy bids from the other two TSOs in merit order. The results of the process are then returned to the local and regional TSO procurement platforms.

3.7.4 Activation Optimisation Function

The Activation Optimisation Function is central to the process of the activation of Balancing Energy.

In order to enable the cross border exchange of Balancing Energy, the activation of Balancing Energy has to be coordinated by a common function. This function, known as the Activation Optimisation Function, determines the minimum cost of activation of the incoming balancing request while respecting some capacity and operational restrictions. The Activation Optimisation Function is responsible for using the Activation Optimisation Algorithm which itself is developed by the TSOs. The activation itself is done by the controlling units of the respective TSOs. This activation is automatically done for FRR automatic or manually done for both FRR manual and RR. In order to implement this activation process robust communication procedures are required between the common function and the controlling units/operators.

The steps involved in the activation of Balancing Energy are as follows:

1. TSOs send their requirements to the Activation Optimisation Function.
2. After the cross border balancing gate closure time, the Activation Optimisation Function calculates the most efficient activation taking the following into account:

(a) Common Merit Order list containing all energy bids.

(b) Available cross-border capacity either available after Intraday or reserved previously.

(c) Network stability constraints.

(d) Balancing requirements of the TSOs.

(e) Imbalance netting potential.

3. Activation Optimisation Function sends the individual activation amounts (as a correction signal) to each responsible TSO (connecting TSO).

4. The connecting TSO activates the successful Balancing Energy bids (via a phone call or automatically by activation system such as a MOL-Server or local controller).

5. Balancing Energy is exchanged through commercial schedules or virtual tie-lines.

6. Balancing Energy is settled between the providers and the TSOs involved.

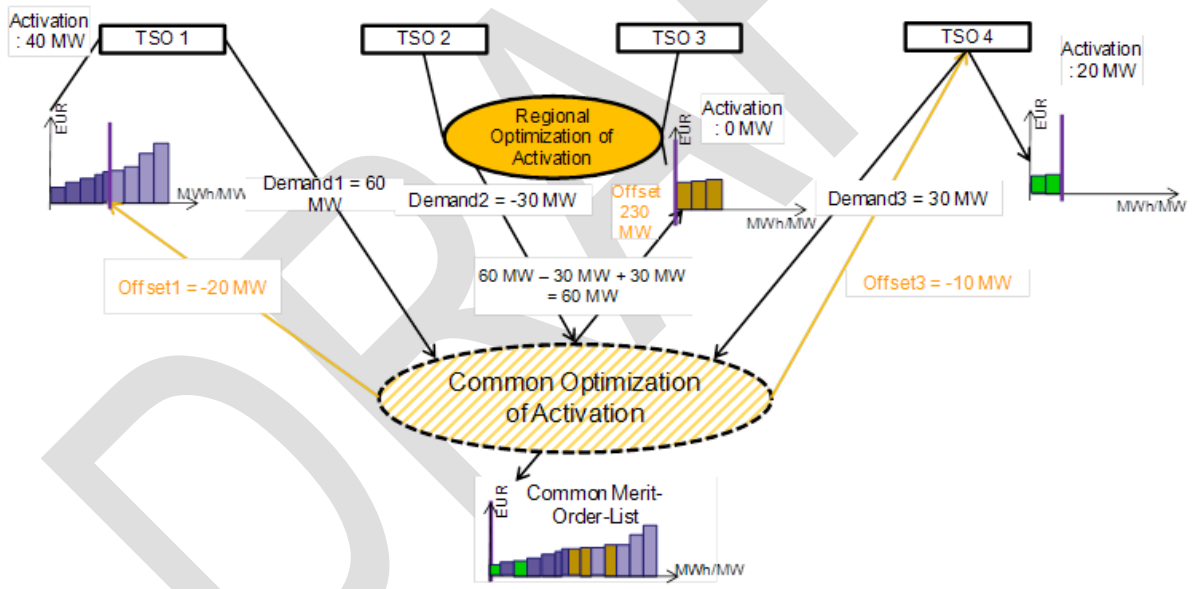

Figure 6: Example of the Activation Model

In the above Figure 6, there are four TSOs involved. Each TSO sends their Balancing Energy requirements to the common Activation Optimisation Function. TSO 1 has a requirement for 60 MW. TSO 2 and TSO 3 operate on a regional basis and have a combined surplus of 30 MW. TSO 4 has a requirement for 30 MW. Each TSO also sends their Balancing Energy bids to the common bid collection function which produces a Common Merit Order list (TSO 1 and TSO 3 have combined their Balancing Energy bids on a regional basis before submitting them to the common bid collection function). The common Activation Optimisation Function calculates the cross border balancing activation volumes and TSO 1 and TSO 4 receive 20 MW and 10 MW of Balancing Energy respectively, all of which comes from the TSO 2/3 Balancing Energy bids. The remainder of TSO 1 and TSO 4 Balancing Energy demand is sourced from their own Balancing Service Providers. Each

TSO then instructs the activation of Balancing Energy accordingly – TSO 1 and TSO 4 activate 40 MW and 20 MW of Balancing Energy respectively.

3.7.5 Application of NC EB to Central Dispatch Systems

The NC EB takes into account the regional specificities of different electricity market designs. In particular it takes into account the parallel existence of central dispatch and self-dispatch arrangements of European electricity markets.

In general, self-dispatch is a dispatch arrangement where resources determine a desired dispatch position for themselves based on their own economic criteria to provide commercial independence within a market. The dispatch determination may or may not have a requirement to have a balanced position with demand. The physical dispatch can be either carried out by the resource directly, tracking their desired output nomination or by following dispatch instructions from the TSO which have been determined based on resources' nominations. In either case, if the TSO requires it, the resources will have to follow instruction to maintain system security.

In general, central dispatch is a dispatch arrangement where the TSO determines the dispatch values and issues instructions directly to resources. The TSO determines the dispatch instructions based on prices and technical parameters provided by the resources, as well as whole network model. The typical objective for the dispatching process (or unit commitment process) is the minimisation of energy delivery cost to meet system demand as forecasted by the TSO while complying with operational security requirements. The main distinguishing feature of Central Dispatch Systems is that balancing, congestion management and reserve procurement are performed simultaneously in an integrated process. This can involve dispatch instructions being issued many hours ahead of real time, to start up units, to real time instructions for dispatching on-line units.

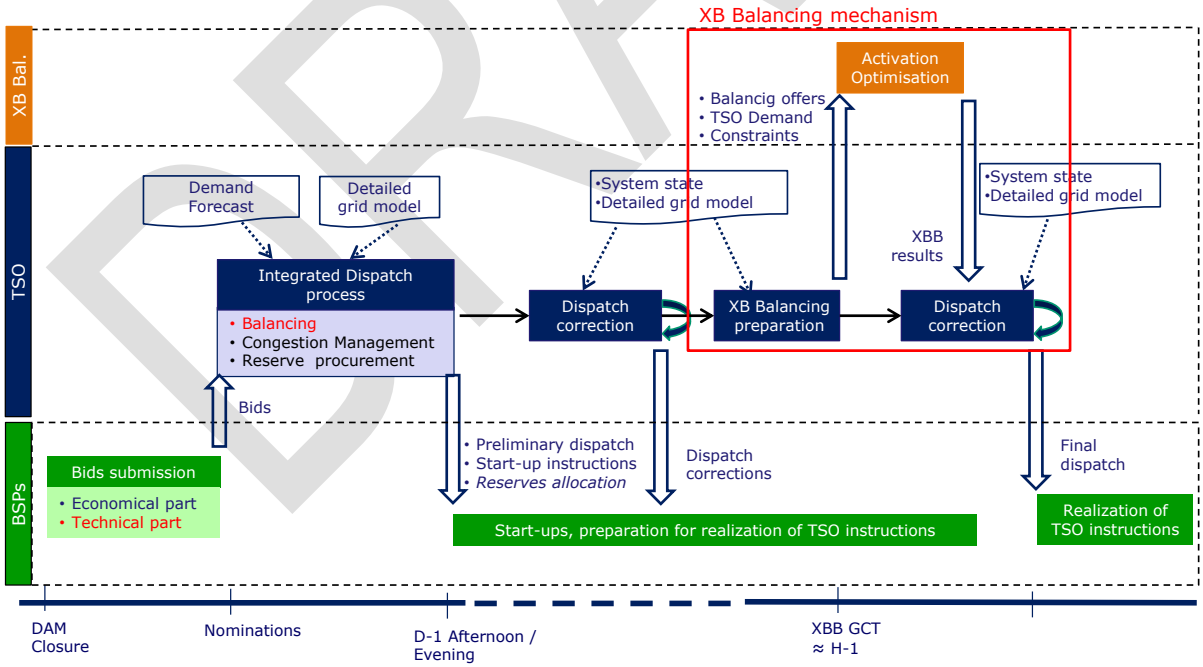

Figure 7 Balancing in a Central Dispatch System

Figure 7 illustrates Balancing in a Central Dispatch System. The Balancing Service Providers submit commercial and technical bids to the TSO. The TSOs take these bids into account along with demand

forecast and system conditions to produce an operational schedule which incorporates balancing, reserve and congestion management restrictions. The TSO issues preliminary dispatch indications including synchronisation instructions and reserve allocation. Closer to real time the TSO issues dispatch instruction which may be adjusted from earlier indications to allow for changes to forecast data and system state. The TSO then considers cross border products which may result in economic exchange of balancing products which in turn require a further adjustment to the BSPs' positions as dispatched by the TSO.

3.8 DUE TO THE NATURE OF THE DISPATCH ARRANGEMENTS, THE NC

EB provides for TSOs of Central Dispatch Systems to propose amendments to the rules for updating Balancing Energy bids such as requiring bids before start of local integrated dispatch process and limiting the possibilities to change submitted bids due to on-going dispatch process whereby only the availability of a generating unit can be updated. The NC EB also entitles TSOs of Central Dispatch Systems to convert bids submitted by BSPs before submitting them into common procurement or activation. This allows TSOs to reflect their previous actions, current system state, technical availability of bids and real cost of their activation in submitted by them cross-border balancing bids. There are no special arrangements for Central Dispatch Systems in Imbalance Settlement.

Working with Stakeholders & Involved Parties

Through the Comitology process, the NC EB as all Network Codes becomes legally binding, and brings concrete implications for all participants in Electricity Balancing across Europe. As such, ENTSO-E has recognised the importance of engaging with stakeholders at an early stage, involving all interested parties at the earliest possible phases in the development of the NC EB in an open and transparent manner.

ENTSO-E's stakeholder involvement comprises several public stakeholder workshops before, during and after public consultation, as well as a series of meetings with the Electricity Balancing Stakeholder Group (EBSAG). This is shown in Figure 7 to the right. Ad-hoc meetings and exchange of views with all interested parties are set up as necessary. Information on both public stakeholder workshops and EBSAG meetings can be found on the ENTSO-E website (https://www.entsoe.eu/major-projects/network-code-development/electricity-balancing/).

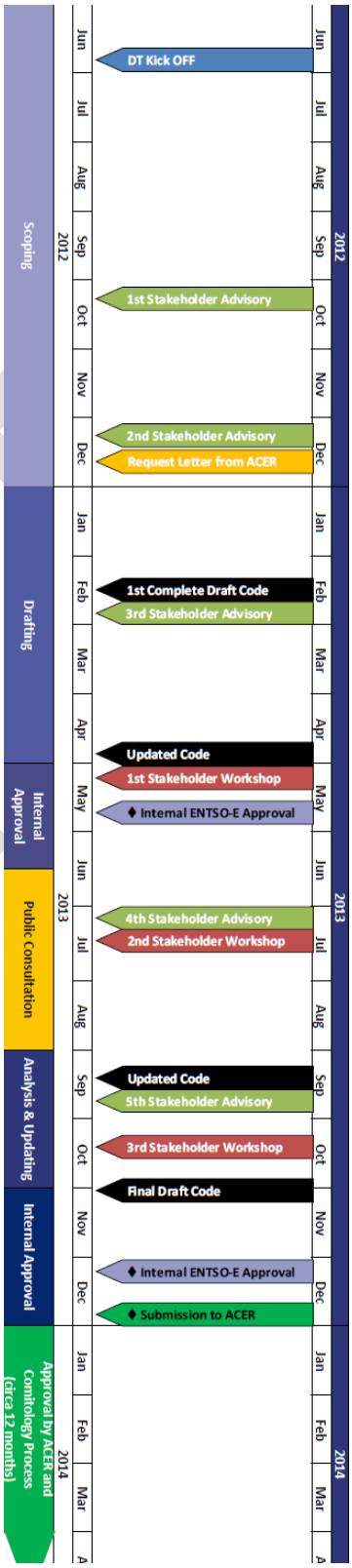

Figure 7: Stakeholder involvement during drafting of NC EB

4 FRAMEWORK GUIDELINES

4.1 INTRODUCTION

During 2011 and 2012 ENTSO-E and its Working Group on Ancillary Services (WGAS) had numerous interactions with ACER in their development process of the Framework Guideline on Electricity Balancing (FG EB). Concerns and proposals for amendments were put forward in ENTSO-E's response to the consultation on the FG EB.

The final version of the FG EB is was published in September 2012 and the roadmap of the integration of the European Electricity Balancing Market is prescribed in that document to follow a step-wise approach as indicated in Figure 8 below.

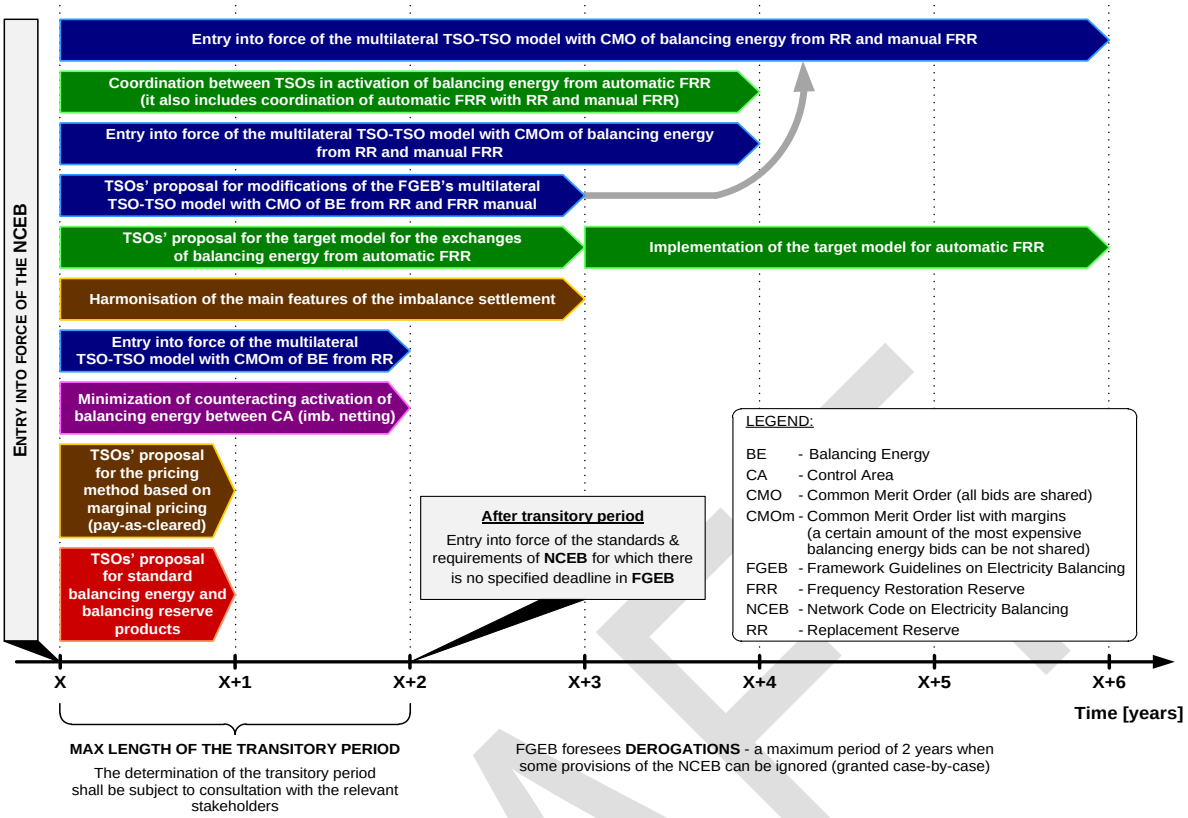

Figure 8:Entry into force of the NC EB

4.2 RELATIONSHIP BETWEEN NETWORK CODE & FRAMEWORK GUIDELINES

The NC EB sets the basis for an integrated, harmonised and coordinated Balancing Market, and identifies three major areas:

- Procurement of Balancing Services
- Balance responsibility and Imbalance Settlement
- Reservation of Capacity

The requirements described in the NC EB have been formulated in line with the Framework Guidelines, with the aim of developing on a regional and step-wise basis after the transitory period for the necessary levels of integration and harmonisation of Balancing Markets.

4.3 DEVIATIONS AND OMISSIONS

In developing the NC EB, there are a limited number of areas where an alternative approach has been chosen in the NC EB to that set out in the Framework Guidelines. These areas and an explanation of the deviation are provided below:

4.3.1 Maximum limit of Imbalance Settlement Period

Chapter 5.3 of the Framework Guidelines states that *ENTSO-E shall carry out a cost-benefit analysis on whether the imbalance settlement period shall be harmonised across Europe and report its results to the Agency. The imbalance settlement period shall not exceed 30 minutes. However, in case a TSO provides a detailed cost-benefit analysis to its NRA, the NRA may decide to have a longer imbalance settlement period.*

The NC EB establishes a step-by-step process for the harmonization of the Imbalance Settlement Period and describes some criteria on which to base the Cost-Benefit Analysis (for example, Imbalance Settlement Period will have to be consistent with the Market Time Period andwill have to take the resolution of the metering devices into account). As a departure from the Framework Guidelines, the NC EB leaves the Imbalance Settlement Period open and does not restrict it to 30 minutes or less.

In order to perform a comprehensive Cost-Benefit Analysis, the approach followed by the NC EB has been not to limit for the value of the Imbalance Settlement Period (30 minutes). This allows for a broader review of all the possible advantages and shortcomings as well taking into account all the current values of the Imbalance Settlement Period across Europe (e.g. 15 minutes, 30 minutes, 60 minutes). The intention of this approach is to be able to assess all aspects of the Imbalance Settlement Period to optimise the solution across Europe.

5 NC EB: OBJECTIVES, REQUIREMENTS

This section describes in more detail the structure and the content of the NC EB, and the principles on which the individual chapters have been built. The NC EB is built up as follows:

- **Purpose and objectives (outside chapter numbering)**
- **Chapter 1: General provisions (Article 1-8)**
- **Chapter 2: The Electricity Balancing System (Article 9 – 13)**
- **Chapter 3: Procurement of Balancing Services (Article 14 - 26)**
- **Chapter 4: Use, Allocation and Reservation of Cross Zonal Capacity for Balancing Reserves (Article 27 - 31)**
- **Chapter 5: Settlement (Article 32- 52)**
- **Chapter 6: Algorithm Development (Article 53- 54)**
- **Chapter 7: Reporting (Article 55)**
- **Chapter 8: Transitional Arrangements (Article 56-60)**
- **Chapter 9: Final Provisions (Article 61)**

This section aims at providing the reader the basis for understanding the requirements set in the chapters marked above of NC EB.

CHAPTER 1 – GENERAL PROVISIONS (ARTICLES 1 - 8)

Article 1 to 6

Article 1 defines the scope of this network code as well as the parties who are affected by its rules.

Article 2 – Definitions

In analogy to all European legislation, Article 2 contains the definitions required for this code. ENTSO-E is ensuring consistency with definitions used in other codes as well as other related documents and is striving to grant easy access to the full body of definitions. Terms that are already defined in other Network Codes are thus not included here.

Article 3 – Regulatory Aspects

The following principles guide the NC EB and its application:

- Non-discrimination;
- Transparency;
- Optimisation between overall efficiency and total cost for all involved parties; and
- Assignment of cost to the real originator.

Article 4 – Recovery of Costs

According to Article 4, costs arising to TSOs from the NC EB are considered as part of regulated costs. Each TSO must demonstrate with sufficient proof to its NRA that these costs are efficient, reasonable and proportionate.

Article 5 – Confidentiality Obligations

While transparency and access to relevant information is crucial to the success of a regional or pan-European Balancing market, commercially sensitive information is protected by Article 5.

Article 6 – Consultation

Article 6 specifies all items which have to be publically consulted on and contains all references to these items. References are consequently not contained in the articles wherein these items are required to be developed.

Figure 9shows stakeholder involvement, including public consultation, after the entry into force, in a generic way. During the **drafting** phase, be it by individual TSOs, groups of TSOs or other parties, stakeholder involvement may be organized as suitable to the subject and thus not regulated in the NC EB. While some topics might be drafted internally, the development of others will be accompanied by user group meetings, bilateral discussions or questionnaires. It lies in the interest of the party responsible for the drafting to include diverse views early on in the process to achieve a concept that enjoys wide acceptance for later adoption and implementation.

Once a stable draft is available, the party responsible for all items listed in Article 6 is obliged to carry out a **public consultation**, which is the core element of stakeholder involvement. Such a public consultation may be accompanied by workshops or meetings, depending on the subject at hand. The obligation for a public consultation is tied to the content developed and binds the party responsible, which may for example be a TSO or NRA or third party. Any public consultation listed here must span a time period of at least four weeks, as laid out in the FG EB. This is a minimum requirement and the consultation time period may be extended depending on the subject matter.

Comments received during the consultation must be duly considered and this consideration be made transparent. Based on these inputs, the party responsible will **amend** the concept and finalize the proposal, usually for submission to the relevant NRA for approval. Again depending on the subject in question, the party responsible may choose different methods of guaranteeing transparency, be it through publication of all comments received, a workshop will all stakeholders involved in the public consultation or other methods.

Figure 9: Stakeholder involvement

Article 7 – Regulatory Approval

Article 7 specifies the items which are to be approved by different sets of NRAs and contains all references to these items. References are consequently not contained in the articles wherein these items are required to be developed. Besides that, it details different approval periods in accordance with the FG EB, three months in the case of an individual NRA approval and six months in case where more than one NRA have to assess an item for approval in a cooperative manner. It contains timeframes for the resubmission of amended proposals, if requested by the respective NRA(s).The article contains three different requirements on how approvals have to be performed. It differentiates between items which

- are of relevance for all member countries, and have to be approved by all NRAs;
- only or predominantly affect Coordinated Balancing Areas, and are to be approved by NRAs who have jurisdiction in the area in which a Coordinated Balancing Area is established; and
- only affect the jurisdiction of one NRA, and are consequently to be approved only by that NRA.

The requirements of this article do highlight the need for cooperation between NRAs as stipulated by Regulation 713/2009.

Article 8 – Publication of Information

Transparency and readily available information will be essential to a well-functioning Balancing Market. Requirements for the publication of fundamental information relevant for Balancing are included in Article 17 of Regulation (EC) No…/.. of XXXX[1] on the submission and publication of data in electricity markets:

For their control areas, TSOs or where applicable operators of Balancing Markets, ***where such markets exist*** *shall provide the following information to the ENTSO for Electricity:*

a. *rules on Balancing including:*
   - *processes for the procurement of different types of Balancing Reserves and of Balancing Energy;*
   - *the methodology of remuneration for both the provision of reserves and activated energy for Balancing,*
   - *the methodology for calculating imbalance charge,*
   - *if applicable, a description on how Cross Border Balancing between two or more control areas is carried out and the conditions for generators and load to participate,*
b. *the amount of Balancing Reserves under contract (MW) by the TSO, specifying:*
   - *the source of reserve (generation or load),*
   - *the type of reserve (e.g. Frequency Containment Reserve, Frequency Restoration Reserve, Replacement Reserve),*
   - *the time period for which the reserves are contracted (e.g. hour, day, week, month, year, etc.).*
c. *prices paid by the TSO per type of procured Balancing Reserve and per procurement period (Currency/MW/period);*
d. *accepted aggregated offers per Balancing Time Unit, separately for each type of Balancing Reserve;*
e. *the amount of activated Balancing Energy (MW) per Balancing time unit and per type of reserve;*
f. *prices paid by the TSO for activated Balancing Energy per Balancing time unit and per type of reserve; price information shall be provided separately for up and down regulation;*
g. *Imbalance Prices per Balancing time unit;*
h. *total Imbalance Volume per Balancing time unit;*
i. *monthly financial balance of the control area, specifying:*
   - *the expenses incurred to the TSO for procuring reserves and activating Balancing Energy,*

[1] http://register.consilium.europa.eu/pdf/en/13/st06/st06003.en13.pdf

- *the net income to the TSO after settling the imbalance accounts with balance responsible parties.*
- *if applicable, information regarding Cross Control Area Balancing per Balancing time unit, specifying:*
- *the volumes of exchanged bids and offers per procurement time unit,*
- *maximum and minimum prices of exchanged bids and offers per procurement time unit,*
- *volume of Balancing Energy activated in the control areas concerned.*

Article 8 of the NC EB only covers additional items for publication.

Information must be published in a non-discriminatory manner, ensuring equal access for all parties. This will be ensured by using the central information transparency platform, established pursuant to Article 3 of Regulation (EC) No…/.. of XXXX on the submission and publication of data in electricity markets.

CHAPTER 2 - THE ELECTRICITY BALANCING SYSTEM (ARTICLES 9 - 13)

Article 9 – Agreement with TSOs not bound by this Network Code…

Article 9 – General Objectives of the Balancing Market

As part of Article 9, the objective of the first paragraph is designed to ensure that all entities that form part of, or who are stakeholders in an integrated, coordinated Balancing Market cooperate fully in the development of the systems and processes described in the code. The objectives outlined in the second paragraph correlate directly to the FG EB and are consistent with those objectives outlined in the third paragraph which oblige all parties to apply "reasonable endeavours" in implementing the NC EB.

Article 10 – Coordinated Balancing Area

The concept of Coordinated Balancing Areas (CoBA) was devised to make implementation of the NC EB possible under the timescales envisaged in the FG EB, and to ensure that the process of creating an integrated and harmonised Balancing Market is carried out in a step-by-step approach, learning from previous steps and experience rather than simply implementing a pan-European Common Merit Order List with no previous experience.

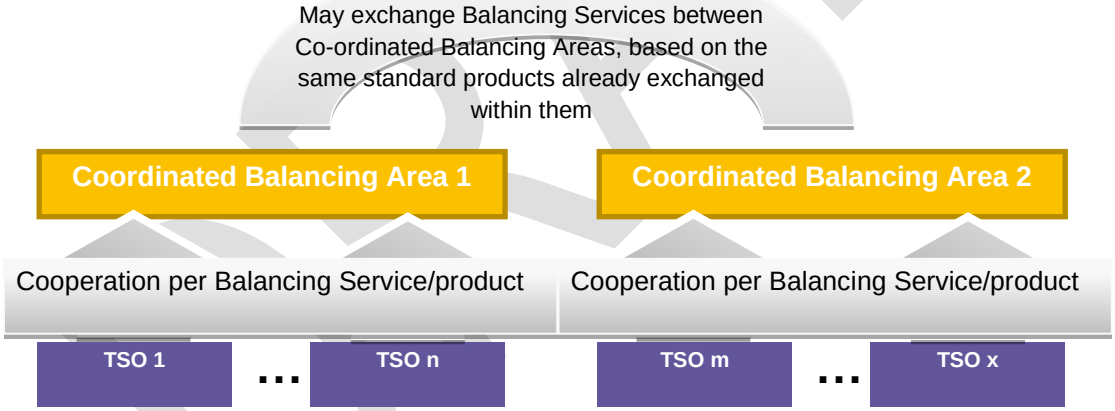

Figure 10: Model of Coordinated Balancing Areas in Electricity Balancing Code

The concept of a Coordinated Balancing Areas is implicitly linked to the definitions within the NC LFC&R for Synchronous Area, LFC Block, LFC Area and Monitoring Area. The requirements are based on the obligation to cooperate with one or more adjacent TSOs to provide an instrument for the integration of Balancing Markets, while each Coordinated Balancing Area would be based on the exchange of one or more Standard Products, as defined in the procurement and optimisation section of this document.

An overview of the concept is shown in

Figure 10. The FG EB specifies that Imbalance Netting should be obligatory and the Coordinated Balancing Area in its initial form has applied this principle. Flexibility is ensured by not specifying exactly which cooperation is to be carried out with which TSO, or that the exchange of reserves within a particular Coordinated Balancing Area is mandatory, and this is consistent with the FG EB.

Figure 11 shows the contrast between the mandatory concept of the Coordinated Balancing Area for standard Balancing Energy products and the permitted but not obligatory concept for corresponding standard Balancing Reserve products.

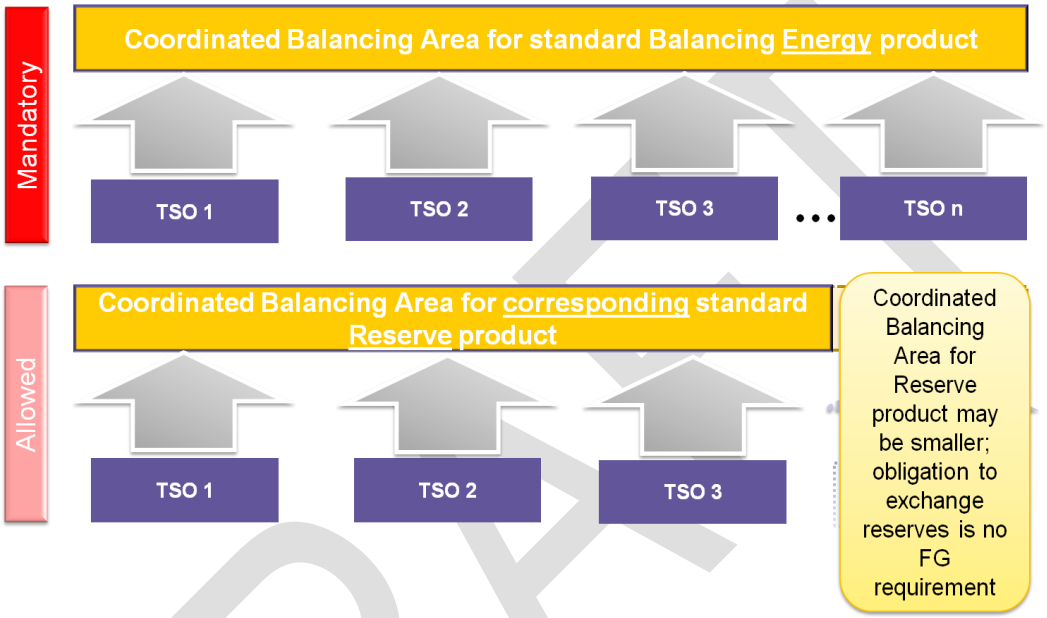

Figure 11: Area Definition in Balancing: Coordinated Balancing Area

From entry into force of the NC EB, and the formation of the first Coordinated Balancing Areas, the concept will evolve from the initial formation of Coordinated Balancing Area corresponding to adjacent borders to a single Common Merit Order and single pan-European Coordinated Balancing Area. This would bring the proposed Balancing solutions in line with the FG EB target model and create a fully integrated and coordinated Balancing market. This concept and its evolution are shown in Figure 12.

The implementation of the Coordinated Balancing Area concept balances the very ambitious targets and deadlines prescribed in the Framework Guidelines with the flexibility needed to reach these targets. The flexibility is required to make the best use of experiences being gained from current Balancing cooperation projects and also from projects which will be implemented just after the entry into force of the NC EB. This approach of learning from experience while implementing the target model is important as there is little other experience available which is of relevance. The level of cooperation between TSOs is a crucial element to successfully implementation of the Coordinated Balancing Area concept in a timely manner and thus to achieve the targets behind both the Framework Guidelines and the NC EB.

The NC EB requires all TSOs to cooperate loyally in promoting the enlargement, merging, and creation of Coordinated Balancing Areas for each Balancing product with a view to progressing to full Balancing Market integration. The process by which Coordinated Balancing Areas expand can be a mixture of the following approaches:

- **Creation**: The Coordinated Balancing Area concept allows for the creation of new Coordinated Balancing Areas where no cooperation previously existed
- **Cooperation**: Cooperation is a form of stepwise integration without prescribing the rules of cooperation between Coordinated Balancing Areas. The subsequent step after such inter-Coordinated Balancing Area cooperation would then be the merging of these Coordinated Balancing Areas.
- **Merging**: The Coordinated Balancing Area concept allows for the merging of two or more existing Coordinated Balancing Areas into a new one for a given product.
- **Enlargement**: One method to fast track the integration of Balancing Markets is to expand the arrangement of established cooperation projects beyond the borders of the TSOs involved. A TSO which is outside a Coordinated Balancing Area may join the cooperation by simply adopting the mechanisms and principles applied therein.

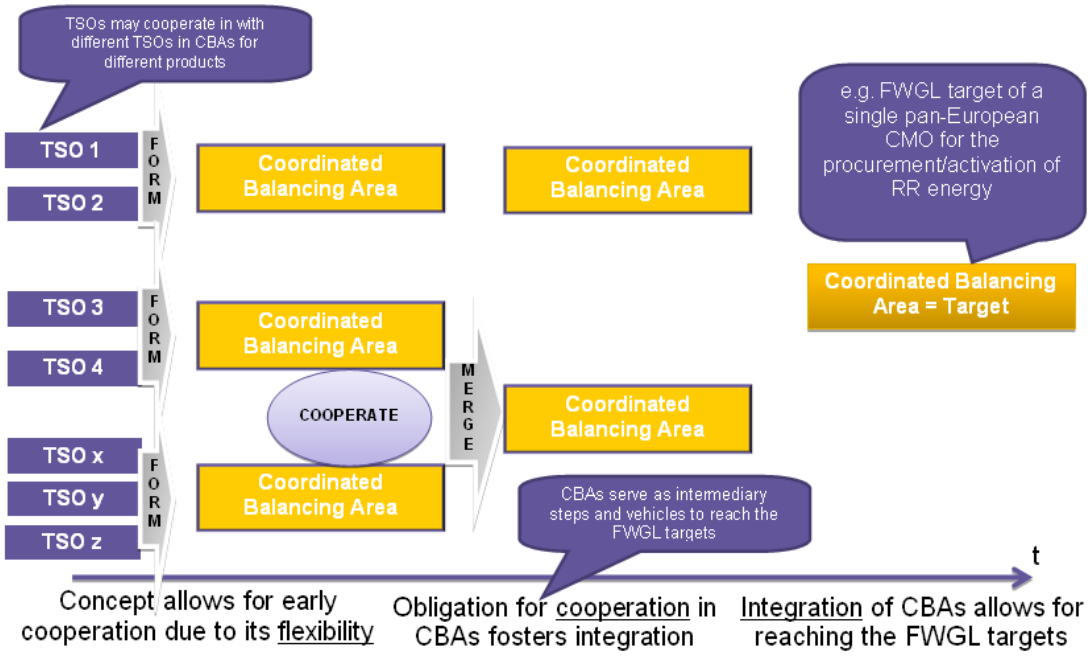

Figure 12: Evolution of the Coordinated Balancing Area concept towards FGEB target

Article 11 – Role of the Transmission System Operators

Article 11 assigns the responsibility for procurement of Balancing Services from BSPs to the national TSOs themselves (rather than any other agency or organisation), and to ensure a fair, transparent and non-discriminatory approach it prohibits TSOs from offering Balancing Services themselves, except if their purpose is uniquely for system security. TSOs will use reasonable endeavours to ensure the Exchange of Balancing Energy within a Coordinated Balancing Area. Unanimous decision making rights are assigned to all TSOs within a Coordinated Balancing Area to ensure fairness and equal treatment among participants.

Article 11a – Role of Distribution System Operators

Article 11a underlines the necessity of cooperation of DSOs with TSOs for Balancing, especially referring to restraints in the distribution grid where many Balancing Service providing units are located. During prequalification DSOs evaluate whether a specific unit in principle may provide Balancing Services, as also defined in the NC LFC&R. Furthermore, this article contains provisions for short-term

curtailment during scheduling or even real-time, should the DSO deem this necessary due to congestion or other technical restrictions. Any cost that arises from such curtailment will be borne by DSOs.

Article 12 – Functions in Coordinated Balancing Areas

This article outlines the functions and responsibilities in Coordinated Balancing Areas, and refers the details of each of the functions listed in the first paragraph to relevant parts of the NC EB. Each TSO, being part of a market design area in its own right, is permitted to delegate any of the functions in this article to a competent third party - for example Settlement Functions or Activation Optimisation Function. The purpose of this is to ensure that the right tasks are performed in the most efficient way, and those with the capability, systems and skills to do so. For example, it would not be sensible to assign responsibility for the Activation Optimisation Function to a single TSO when the activities undertaken correspond to a whole Coordinated Balancing Area or wider, and where the creation of a functional body for this purpose would better achieve the targets of the code. Existing national organisations that undertake such tasks where appropriate should adapt their processes accordingly to comply with the NC EB. Clearly there is a need to maintain confidentiality where required, and where consistent with the transparency directive.

Article 13 – Terms and Conditions Related to Balancing

This article details how the terms and conditions related to all Balancing activities under the NC EB are established. These terms and conditions summarise all contractual relations between the TSOs and the BSPs or BRPs. Its purpose is to set the principles and roles by which such Balancing activities will take place and to ensure there is adequate competition. It places a requirement of all parties to comply with the terms and conditions. The timescales for implementation of the various parts of the NC EB require a step-wise approach to implementation. In order to ensure a proper coordination between TSOs and the consistency of the terms and conditions in each area, this approach takes as a starting point the development of a common methodology [for the establishment of the terms and conditions] between the TSOs of a Coordinated Balancing Area. Once this methodology is approved by all the involved NRAs, each TSO defines the terms and conditions to be applicable in its area.

The process is illustrated in Figure 13:

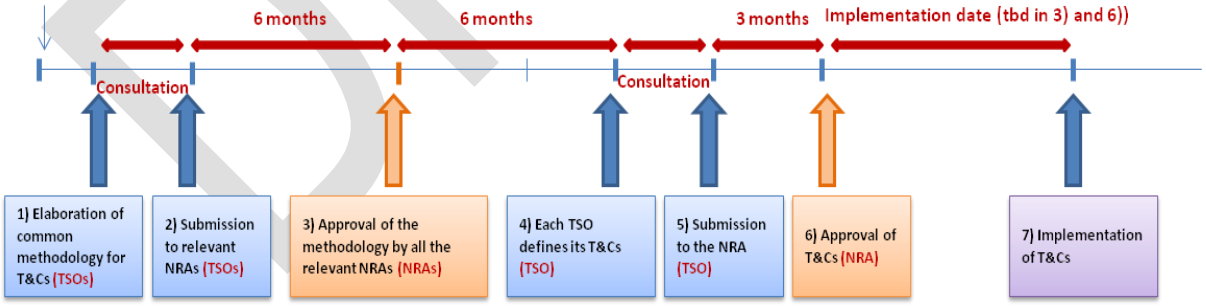

Figure 13: Terms and conditions related to Balancing activities

Consequently Paragraph 4 provides the necessary timescales, along with the framework of content for such terms and conditions. These include the technical and contractual requirements for BSPs, BRPs and the rules related to procurement and settlement, and all terms and conditions for such activities are required to be approved by regulators.

Paragraphs 5 and 6 define roles and responsibilities for BSPs and BRPs in more detail by establishing the minimum terms and conditions.

This article also sets the imbalance area that relates to the Relevant Area for which the terms and conditions apply, and places the onus on the national TSO to verify compliance.

CHAPTER 3: PROCUREMENT OF BALANCING SERVICES (ARTICLE 14 - 26)

Article 14 – Requirements for Standard and Specific Products

In order to allow an Exchange of Balancing Services, creation of Common Merit Order Lists and adequate liquidity, a standardisation of Balancing products is needed. NC EB lists the minimum set of standard characteristics, which define Balancing Energy and Balancing Reserve products. The standard characteristics are a minimum set of product attributes that allow for the activation of products through a Balancing Algorithm which use the relevant Common Merit Order List. Besides this, standard characteristics seek to minimize the number of Common Merit Order Lists so as to maximize the participation of all balancing resources and maximise the liquidity of Balancing Markets, while respecting the needs of the TSOs for balancing the system.

Based on the minimum characteristics detailed in the NC EB and possible ongoing ones, TSOs have to specify the product definition no more than one year after the entry into force of the NC EB, as specified by the FG EB. All TSOs are required to prepare a common proposal for standard Balancing Energy and Balancing Reserve products, including all needed detailed specifications of the characteristics.

A process will be set forth in order to allow defining, reviewing and updating the list of Standard Products, which includes a public consultation with market participants, followed by a proposal from all TSOs to all NRAs and ACER. This approach provides the possibility to learn from and to consider previously gained experiences.

The following standard characteristics are a minimum set of characteristics to define the standard Balancing Reserve and Balancing Energy products:

(a) Preparation Period [see “2” in the figure below] – preparation timeframe for the bid before starting to deliver its first MW

(b) Ramping period [see “3” in the figure below]– where the bid start the physical activation, deliver its first MW and begin reaching the request of the TSO. Expressed in seconds when the bid is not divisible and MW/s when the bid is divisible

(c) Full Activation Time – which is the sum of preparation period and Ramping period

(d) Minimum and maximum bid size [see “4” in the figure below]– Minimum and/or Maximum quantity of single bids in MW.

(e) Minimum and maximum Delivery Period [see “5” in the figure below]– the time period of delivery of in which the BSP delivers the full requested power to the system

(f) Deactivation Period [see “6” in the figure below]– start of physical de-activation of the unit until the full instruction MW has been delivered, in seconds when the bid is not divisible and MW/s when the bid is divisible.

(g) Divisibility – the minimum divisible unit of Balancing Energy expressed in MW for the divisibility of volume and in seconds for the divisibility of delivery period;

(h) The Validity period – the period defined by a beginning time (hh:mm) and an ending time (hh:mm), when the bid could be activated. The validity duration period is at least the full delivery period.

(i) Price of the bid – the price of Balancing Energy in €/MWh

(j) Mode of Activation – manual or automatic

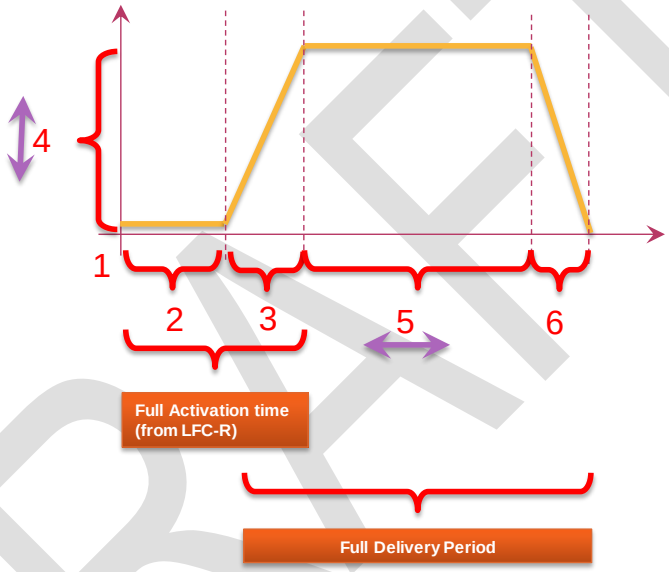

Figure 14 Reserve and Energy Products

In application of these parameters,

- FRRa have at least the following common characteristics
  - Full activation time and deactivation time shall not be more than 15 minutes (900s), but can be shorter, depending of the needs of the TSOs in CoBA
  - The minimum delivery period shall be 10s
  - The maximum delivery period shall be equal to the validity period duration,
  - Mode of activation shall be Automatic,
  - The product shall be divisible (10s time step and 1 MW power step)

- FRRa have at least the following common characteristics
  - Full activation time and deactivation time shall not be more than 15 minutes (900s), but can be shorter, depending of the needs of the TSOs in CoBA
  - Mode of activation shall be Manual

- RR have at least the following common characteristics
    - Full activation time and deactivation time shall be more than 15 minutes (900s), and up to
    - Mode of activation shall be Manual

Article 15 – The Use of Standard and Specific Products

This article mandates TSOs to use of the relevant Standard and Specific Products to maintain system balance in the respect of NC LFC&R and to ensure the safe and secure operation of the system. These products have sufficiently broad characteristics such that they can be provided by service providers including renewables resources, small-scale generation, intermittent resources and demand resources.

Article 16 – Selection and Conversion of Products

In this article, the methods and circumstances by which some Specific Products used by TSOs may be completely converted into Standard Products are described, for example, if they have better characteristics than Standard Products (e.g. shorter Activation Time). TSOs using such products shall be entitled to submit them into the common procurement of Balancing Services, after appropriately converting them.

TSOs operating in Central Dispatch Systems may decide about the dispatch of the majority of units in each time period and act as a BSP for their LFC Area. For that reasons they require much more information to be delivered in market participants bids, such as detailed technical characteristics of each generation unit. Therefore the process of collecting bids and offers as well as requirements towards them are usually substantially different than those in self dispatch systems.

Moreover in such systems the TSO is the only entity which is able to check if the given bid is available from a technical point of view because this process requires detailed knowledge about network conditions, particularly congestion in the network. Technical characteristics of all major generation units as well as their location within the grid are also required, which is not handled by the European Balancing Market.

Some TSOs operating in Central Dispatch Systems have to transform bids submitted for the whole available generation capacity of each unit into upward and downward bids or make some other transformation to reflect current system conditions and cost of bid's activation, requiring therefore conversion of bids and offers submitted by market participants.

Therefore TSOs operating in Central Dispatch Systems shall be allowed to select and convert bids received from market participants before submitting them into common procurement or activation, even if products used by these TSOs fulfil characteristics of Standard Products. This will enable the TSO to provide bids which are technically available and may directly contribute to the common Balancing Market.

To ensure that all processes of selecting and converting bids are fair, transparent and non-discriminating they shall be approved by the relevant NRA.

Article 17 – Firmness of Products

This article defines when bids of Balancing products become binding between BSP and Transmission System Operator. Balancing product bids submitted by a BSP shall be Firm and with no possibility to adjust volumes and prices after the Gate Closure Time defined for the relevant Balancing product.

In case of activation of Balancing products by a TSO even prior to Gate Closure Time, the activated Balancing products are Firm and subject to TSO-BSP settlement.

Article 18 – Fall-back Procedures

Even if the different procedures and tools for procurement and activation of Balancing Services have a high reliability and availability, there could be cases where these can fail. This article requires TSOs to ensure that robust and timely fall-back solutions are in place to guarantee efficient, transparent and non-discriminatory functioning of the common procurement and activation of Balancing Services in the event that normal procedures fail.

In case the procurement of Balancing Services fails, TSOs may have an additional procurement process (e.g. second auction round) to achieve market based contracting to the greatest extent. To ensure transparency, Market participants should be informed before TSOs use such fall-back procedures.

In case activation by using Common Merit Order Lists fails, TSOs are allowed to directly contact BSPs for activation of locally required Balancing Energy, in order to ensure system security.

Section 2 – Procurement of Balancing Reserves

Article 19 – General Provisions

For secure and safe operation of the synchronous zone each TSO must procure a sufficient amount of Balancing Services, respectively Balancing Reserves, following the criteria defined in NC LFC&R. In this article the NC EB describes the rules governing how a TSO procures Balancing Reserves in order to fulfil the operational requirements set forth in other Network Codes.

The NC EB aims to unify the rules on how the Balancing Reserves are procured by harmonising certain areas in the terms and conditions related to Balancing. The terms and conditions then set a level playing field for each BSP and each TSO for Procurement of Balancing Reserves. The procurement is carried out for standard Balancing Reserve products, the Frequency Containment Process, the Frequency Restoration Process and the Reserve Replacement Process and if necessary also the Specific Product for the Relevant Area.

These products are procured separately for upward and downward directions. For procurement of FCR upward and downward Balancing Reserve Bids can be linked together. In some cases, as noted in the NC EB, the TSO can gain approval of relevant NRA for linkage of Balancing Reserve Bids from FRR and RR as well.

The Balancing Reserve Bids are submitted by the BSP to its Connection TSO. The TSO cannot modify the bids of a Standard Balancing Reserve Product but can convert bids of a Specific Product into the bid of the Standard Balancing Reserve Product.

After the Gate Closure Time for submission of Balancing Reserve Bids the Connection TSO collects all the bids and processes them either:

a. alone – TSOs procure reserves solely within its own area; or
b. in coordination with other TSOs – it participates in the Exchange of Balancing Reserves.

Regardless of whether the TSO cooperates with other TSO(s) it has to respect the terms and conditions related to Balancing applicable in its Relevant Area.

In order to limit distortions in Balancing Markets the duration of Balancing Reserve contracts should be similar regardless of whether the TSO cooperates with other TSO(s) or not. Hence, if a TSO intends to conclude a contract for a longer period than twelve months it has to gain approval of a relevant NRA. This should be the case when its Balancing Market does not provide a sufficient liquidity in shorter time frames before real-time.

TRANSFER OF OBLIGATIONS

In some cases a Balancing Service Provider cannot comply with the Balancing contract that it has entered into and committed itself to, e.g. caused by an unpredicted technical malfunction on its assets. Because of the unpredictability of those cases the Balancing Service Provider should have the option to fulfil its obligation without any punitive consequence for not delivering the service. In this respect, the Transmission System Operator has to define a set of rules which, if they are abided, guarantee that the Balancing Service Provider can fulfil their obligation using another service provider, and not be penalized for non-delivery. Those rules are defined in the NC EB and should also be included in the Terms and Conditions related to Balancing.

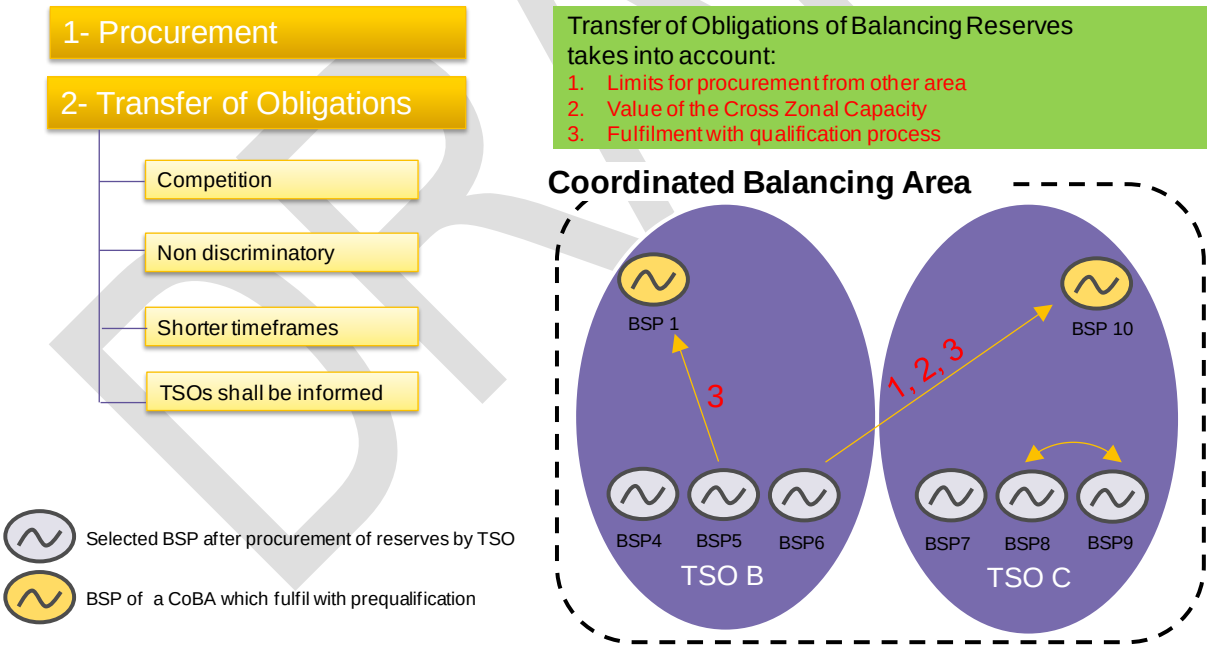

Figure 15: Transfer of Obligations of Balancing Reserves

The first stage of the procurement of Balancing Reserves is market based, non-discriminatory and fosters competition. Common procurement takes into account the limits for procurement from other areas, the value of the Cross Zonal Capacity and the possible savings from procurement of Balancing Reserves in other areas. Balancing Reserve bids are collected, accepted and tender information is fed back to the Balancing Service Providers. The second stage is the possibility of the transfer of

obligations of Balancing Reserves. As the first stage, this process is non-discriminatory and fosters competition but takes place in shorter timeframes and the TSOs must be informed of the activity. The transfer of obligations of Balancing Reserves between Balancing Service Providers within a TSOs area must fulfil the qualification process. The transfer of obligations of Balancing Reserves between Balancing Service Providers outside a TSOs area but still within a Coordinated Balancing Area, in addition to fulfilling the qualification process, must also respect the limits for procurement from the other area and take account of the value of Cross Zonal Capacity. This approach is outlined in Figure 15.

SECONDARY MARKET

In comparison with the previous case, there might be cases when a Balancing Service Provider wants intentionally to give up its reservation obligation and would like to sell its commitment to another Balancing Service Provider. Also, there are Balancing Service Providers who would like to provide a reservation because of its associated payment and to buy the reservation obligation from another Balancing Service Provider. Such obligation transitions could be also possible; however, given Balancing timescales are so close to real time and because Connection Transmission System Operators could face the risk to Operational Security of the grid, it is necessary that the Transmission System Operators must be involved in the market as its operators. If the Transmission System Operators agree that it is beneficial having secondary market they can create it. In such case the Transmission System Operators define rules in the Terms and Conditions related to Balancing taking into consideration the minimum requirements defined by the NC EB.

Section 3 – Exchange and Sharing of Balancing Reserves

Article 20 – General Provisions

Exchange and Sharing of Balancing Reserves permit a Transmission System Operator to reduce procurement costs and volumes of Balancing Reserves and follows on from the approach adopted within the NC LFC&R. The exchange of reserves allows but does not oblige the TSO(s) of Area A to place part of their reserves (FCR, FRR or RR) within the Area B of other TSO(s) in order to ensure the provision of the required amount of reserves resulting from the reserve dimensioning process. The exchange of reserves changes the geographical distribution of reserves without changing the total amount of reserves in the system. In contrast the sharing of reserves allows the TSO(s) of an Area A and the TSOs of an Area B to rely on the same reserves (FCR, FRR and RR) in order to ensure the provision of the required amount of reserves resulting from the reserve dimensioning process. The sharing of reserves changes the total amount of reserves in the system, thereby also impacting the geographical distribution.

The exchange or sharing of Balancing Reserves, however, is not obligatory for any TSO. The NC EB seeks to harmonise the rules for it by obliging participating TSOs to cooperate under the Coordinated Balancing Area and by defining common rules of procurement in terms and conditions related to Balancing Reserves. Technical rules governing how the Exchange and Sharing of Balancing Reserves have to be performed are set forth in the Network Code on Load Frequency Control and Reserves.

Article 21 – Procurement of Balancing Reserves

Limits of Balancing Reserves which can be procured outside TSO's Relevant Area are defined in the NC LFC&R.

The cooperating TSOs calculate the amounts to be procured, commonly define rules of the procurement and publish timing of the process. The information is publicly available so the BSPs are availed of the necessary information and can participate in the procurement. Balancing Reserve Bids are submitted to the Connecting TSO. When all the bids are collected they are submitted to the Reserve Procurement Optimisation Function to perform the common procurement. All the BSPs are informed about procurement results by their Connection TSO.

Section 4 – Procurement of the Balancing Energy

Article 22 – General Provisions

The NC EB defines the process to determine the pricing mechanism for Balancing Energy. The decision about pricing shall be taken by all TSOs by considering several criteria including correct pricing incentives to market participants, the efficient use of Demand Response and an effective Common Merit Order List. The initial pricing method shall be based on marginal pricing (pay-as-cleared), unless detailed analysis demonstrates that a different pricing method is more efficient for EU-wide implementation. According to the FG EB, this proposal shall be submitted to ACER and all NRAs no later than one year after entry into force of the NC EB.

The process of defining the pricing mechanism shall be coordinated with the process which defines harmonised Balancing Energy products.

TSOs operating in Central Dispatch Systems decide about the dispatch of the majority of units in each time period and act as a BSP for their whole LFC Area. The dispatch process usually starts the day before and lasts until real-time. This process is based on the bids and offers submitted by market participants, requiring therefore rules for submission and modification of bids and offers by market participants. Substantial changes of bids and offers during the dispatching process might lead to sub-optimal dispatch and could expose TSOs and energy consumers as well as other market participants to very high costs. As market participants know in advance some results of the dispatch process (e.g. decision about start-up and shut down of units) they may use this knowledge to abuse market power e.g. by substantial increase incremental/ decremental bid's prices after obtaining information that their unit will be operating in given hours of the following day.

Therefore market participants in Central Dispatch Systems, subject to NRA approval, may be obliged to provide their bids sufficiently long in advance and possibilities of modification of this bid may be limited.

Section 5 – Activation of the Balancing Energy

Article 23 – General Provisions

TSOs of a Coordinated Balancing Area can only reach targets by establishing a set of algorithms. One of them is the Activation Optimisation Algorithm, a common algorithm which is operated by a responsible entity for operation of the common optimisation function. This algorithm follows the principles described in the NC EB.

Deviations in activation from the Activation Optimisation Algorithm will for transparency purposes be regularly reported by TSOs to NRAs.

When the activation of a bid is triggered by the Activation optimisation Algorithm (direct activation is done by the Connection TSO), the BSP is obliged to deliver the requested energy with the amount and price submitted to the Common Merit Order List valid at the time of activation.

As the Connection TSO is responsible for operating the grid and having real time data for its area it shall be the Connection TSO which is responsible for physical activation of BSPs. As TSOs are responsible for submitting all necessary data (e.g. bids, energy flow measurements, operational status of power system) to the Activation Optimisation Function and for delivering the activated Balancing Energy to the border it is natural that TSOs have the direct control of the process for exchanging Balancing Energy.

As the roadmap towards to final target solution of a European-wide TSO-TSO model with Common Merit Order List includes intermediate periods where it is allowed for TSOs not to share all bids. In the intermediate time period the TSOs can learn, even with limited amount of Balancing Energy Bids, how the Exchange of Balancing Services influence operation of the grid. To create level playing field NC EB describes the rules for defining the certain amount of bids that can be unshared.

The volumes of Balancing Energy for each TSO must respect operational restrictions. Therefore the NC EB defines rules for how operational restrictions should be taken into account.

Article 24 – Avoidance of Counteracting Activation

The technical and operational basis and requirements for the avoidance of counteracting activation are defined in the NC LFC&R. Therefore the NC EB focuses on the economic and financial aspects of the avoidance of counteracting activation.

The avoidance of counteracting activation is an intentional exchange of energy which reduces the Activation of Balancing Energy and does not cause any Activation of Balancing Energy. The avoided Activation of Balancing Energy particularly due to different prices for positive and negative Balancing Energy has generally different financial values. Furthermore the respective energy exchange between the TSOs can be asymmetric due to congestions on the borders, which then could also lead to a financial asymmetry. Therefore the intentionally exchanged energy due to the avoidance of counteracting activation has to be settled between the participating TSO.

As it is Balancing Energy in the Frequency Restoration Process which will be avoided, the Settlement price of intentionally exchanged energy due to Imbalance Netting Processes shall be based on the value of the avoided Activation of Balancing Energy in the Frequency Restoration Process inside each participating LFC Area during the Imbalance Settlement Period. Performing the Imbalance Netting shall lead to a reduction of costs due to the avoidance of Activation of Balancing Energy. But furthermore Imbalance Netting also maintains system security as it can keep Balancing Reserves free for further activation.

Based on the FG EB, the NC EB requires that, no later than two years after its entry into force, TSOs of a Coordinated Balancing Area coordinate in order to minimise counteracting activation of balancing energy when it is economic to do so taking into account cross-border capacities.

Article 25 – Activation Mechanism of Balancing Energy

This article describes the Activation of Balancing Energy and the required steps for TSOs. As the main goal is to reduce the costs for Balancing Energy activation together with a transparent, non-discriminatory, fair and objective process, the activation will be done by Optimisation Activation Function based on Common Merit Order Lists. These Merit Order Lists will be established by TSOs for

each Standard Product as defined in the NC EB and will be also separated for upward and downward regulating bids. These distinctions of Merit Order Lists are necessary in order to ease and control the processes and could be understood as the lowest level of optimisation. If there is the need to create more than one Merit Order List for a Standard Balancing Energy Product than TSOs are also allowed to establish these lists. Reasons for could be, e.g. the amount of bids that have to be processed, local needs of TSOs that otherwise could not be tackled without complicating the whole process and risking the performance of the process.

After establishing the Common Merit Order Lists the TSOs will use them as described in the following. The TSOs will send all the bids for each Standard Product they previously collected from BSPs within their LFC Area to the Optimization Activation Function, which includes the Common Merit Order Lists. This has to be done before the Gate Closure Time for bid submission of TSOs, which will be defined by TSOs based on the technical characteristics of the relevant standard Balancing Energy Product, e.g. depending on the Activation Time. After sending all the bids, each TSOs will also send its needs for Balancing Energy to that function in due time. That means, depending on the technical characteristics of the needed Balancing Energy and in relation to the available Standard Balancing Energy Product. This step is necessary to build the relevant Merit Order Lists, which consist of bid and offers for Balancing Energy. After creating the Common Merit Order Lists, the Matching of the bids and offers will be done automatically by the Activation Optimization Function, as described in Article 23.

After the Matching the TSOs will receive a confirmation of telling the TSOs which of its bids and offers are accepted. Regarding the accepted bids, the TSOs have to activate the relevant BSPs. The BSPs are obliged to deliver the relevant Balancing Energy. In case of the accepted offers, the TSOs have to know if requested amounts of Balancing Energy will be delivered or if additional steps have to be undertaken by some TSOs, to fulfil the individual security needs.

Article 26 – Optimisation Principles of Activation from Common Merit Order List

As there might be an opportunity for TSOs to reduce the costs of Activation of Balancing Energy by optimizing the activation of different Standard Balancing Products in different Common Merit Order Lists, such optimization functions shall be established by the TSOs and could be understood somehow as a global optimization function. This function has at least to take into account all relevant Balancing Energy Bids and Requests that are provided to the relevant Common Merit Order Lists by the TSOs (See article 25). Also the available Cross Zonal Capacities have to be taken into account in order to allow for a Firm delivery of the activated Balancing Energy. The major issue of this global optimization function is the consideration of technical constraints of each Standard Balancing Energy Product included. These might be e.g. different Activation Times (like it is e.g. for FRR and RR), different activation procedures (e.g. automatic and manual activation; directly or scheduled) and also the minimum time and/or maximum time a Balancing Energy Product can be used.

Example of how the Balancing Energy in a Common Merit Order of a Coordinated Balancing Area is affected

Scenario description

As shown in Figure 16, Coordinated Balancing Area AB and Coordinated Balancing Area CD are two synchronous areas connected by a HVDC link. Area A and Area B cooperate with Reserve procurement and activation of Balancing Energy. Area C and Area D exchange Balancing Energy.

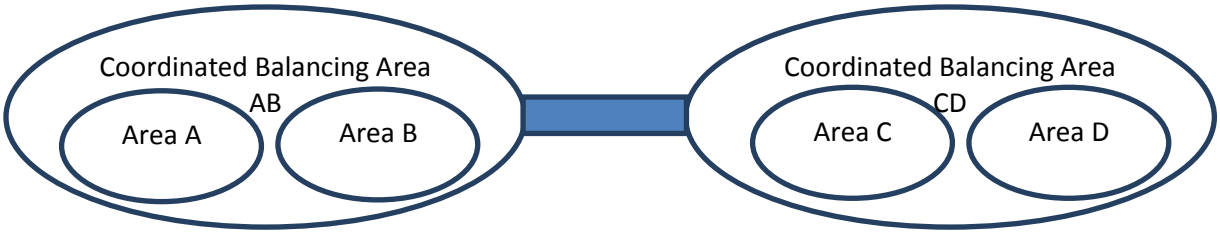

Figure 16:Coordinated Balancing Area Example

Activation of Balancing Energy in other synchronous area is done by changing flow on HVDC link. One way of activating the Balancing Energy is that the activation signal from LFC unit in requesting area is sent simultaneously to HVDC link control and input to LFC unit (or a specific provider) in connecting area. For the requesting area, activating Balancing Energy on HVDC link is just like activating any BSP in own area.

The table below considers how the Balancing Energy in a Common Merit Order of a Coordinated Balancing Area AB is affected.

	AREA A	**AREA B**	**AREA C**	**AREA D**
OBLIGATION	**50 MW**	**50 MW**	**50 MW**	**50 MW**
AVAILABLE RESERVE BIDS	**200 MW**	**200 MW**	**200 MW**	**200 MW**

For the actual period both Balancing Reserves and Balancing Energy are cheapest in Area B, and there is congestion between both Area A-Area B and Area B–Area C. Also both TSO in Area A and TSO in Area C have procured 25 MW of Balancing Reserves from Area B. The available transmission capacity for Exchange of Balancing Energy is 25 MW between both Area A-Area B and Area B-Area C.

Here are some options on how to ensure the availability of Balancing Energy bids from Area B to Area C without distorting the Common Merit Order of Coordinated Balancing Areas. There may be better alternatives. These examples just show that different combinations are possible.

a) Common Merit Order of Coordinated Balancing Area AB is totally available for TSO C

This means that Common Merit Order for Coordinated Balancing Area AB have at least 125 MW available - 100 MW in Area B and 25 MW in Area A. Activation Optimisation Function in Coordinated Balancing Area AB is then using Common Merit Order AB in the normal way, including the constraint that just 25 MW Balancing Energy can be exchanged from Area B to Area A. Hence, there will still be at least 75 MW Balancing Energy left in Area B, where 25 MW of which is available for Area C. This structure would in make it possible for TSO C to activate a bid in Area A as well. If the cooperation is on the same level within Coordinated Balancing Area CD, the bids will be available for the whole Coordinated Balancing Area CD.

b) The HVDC exchange is just a cooperation between TSO B and TSO C.

Only Balancing Energy Bids from Area B are available for TSO C. Bids in Area B are available both in Coordinated Balancing Area AB and for TSO C. The constraint in the Activation Optimisation Function is that 25 MW in Area B must always be left for activation from TSO C. The solution in this example would be the same. (However in other situations there could be different solutions with alternative model a and b, as b does not allow TSO C to activate Balancing Energy in Area A at all). If cooperation is on same level in Coordinated Balancing Area CD, Area C contributes 25 MW to the Common Merit Order of Coordinated Balancing Area CD. TSO C also needs to have an optimisation function which always picks the cheapest bids. This can be complicated for TSO C, but if in a practical situation bids from Area B are the cheapest for 90 % of the time, simplified solutions could be feasible as well.

c) The reserve procured in Area B by TSO C is dedicated to certain providers

The bids from the BSPs that are dedicated to deliver Balancing Energy to Area C after the reserve procurement process will not be available on the Common Merit Order of Coordinated Balancing Area AB. In Coordinated Balancing Area CD TSO C may put these bids on the Common Merit Order of Coordinated Balancing Area CD as any other bid from BSPs in Area C.

CHAPTER 4 - USE, ALLOCATION AND RESERVATION OF CROSS ZONAL CAPACITY FOR BALANCING RESERVES (ARTICLES 27 - 31)

This chapter describes the relevant issues for enabling exchange and sharing of Balancing Services between TSOs. Each TSO is responsible for its LFC Area and is connected to other LFC Areas by tie lines/Interconnectors. These may be organised together with other TSOs into a Coordinated Balancing Area. The Interconnectors between the Bidding Zones are usually used for energy market purposes and the transfer of energy that was traded by market participants. The implementation of the European Integrated Energy Market will foster the greater and more efficient use of these Interconnectors.

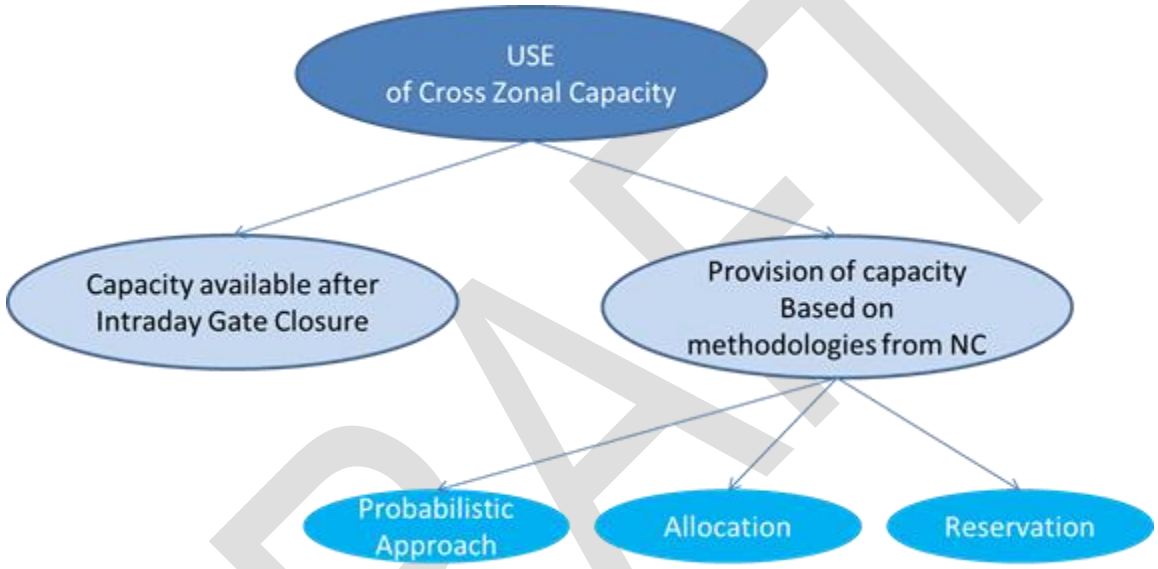

Figure 17: Illustration of alternative ways on how TSOs can use Cross Zonal Capacity for Exchange of Balancing Services.

Article 27 – Use of Cross Zonal Capacity for Balancing Services

In order to enable TSOs to procure and use Balancing Services in an efficient, economic and market based manner, there is the need to foster market integration, as described in the NC EB. This includes procuring Balancing Services also outside the TSOs area.

To guarantee the availability of Balancing Services procured outside the domestic LFC Area, there is the need for TSOs to obtain access to interconnection capacities. As Cross Zonal Capacities are limited and mainly used by market participants through market based allocation processes in Day Ahead and intra-daytime frames, in order to gain a Social Welfare benefit while not endangering secure operation there is a need to define rules to allow TSOs to get access to these capacities. This results in a sharing of the available Cross Zonal Capacities between market participants and TSOs. In order to avoid discrimination in allocation of Cross Zonal Capacities the rules for the use of capacity must be equal for market participants and TSOs. The same rules for Firmness are applicable for both market participants and TSOs under normal operating conditions as specified in the NC OS. The TSO are not permitted to use TRM for Balancing except for FCR or an Emergency Situation. The approach is outlined in Figure 17.

The basic requirements for assessing and pricing Cross Zonal Capacities are set out in the NC CACM. These requirements are also applied to Balancing Services. For simplicity and consistency reasons these are not repeated here.

Article 28 – Pricing of Cross Zonal Capacity for the Exchange of Balancing Services or Sharing of Balancing Reserves

The pricing method used Cross Zonal Capacities should be consistent with pricing methods used for other purposes which have similar timescales. This means that if there is a parallel market timeframe running (e.g. Cross Zonal Capacity auctions, Day-Ahead or Intraday markets), the same pricing principles need also to be applied to Cross Zonal Capacities required for Balancing Services. If there is no other timeframe running the pricing methods of the last available timeframe will also be used for Balancing Services. This also includes the use of available capacities after Intraday gate closure. For pricing of capacities before any market timeframe has started, a Social Welfare calculation should be performed by TSOs based on the best available information at that time.

Whatever pricing method is used, TSOs are required to develop it and NRAs need to approve it at least twelve months before the entry into force. This time period should allow all participants to implement it into their systems and also to take it into account for their market actions in order to avoid market distortions. As the NC EB will allow for a step by step development of the European Balancing Market, the pricing mechanisms only have to be developed for the relevant Coordinated Balancing Areas, or where Coordinated Balancing Areas cooperate on the Exchange of a Balancing Service. As the level of cooperation increases, the harmonisation of the pricing of Cross Zonal Capacity will follow on the way to meeting the targets. Once all Coordinated Balancing Areas have merged into one European Market, the same pricing method will be applied across Europe.

TSOs are only allowed to charge for grid losses if approved to do so by the NRAs of the concerned LFC Areas or Coordinated Balancing Area(s). TSOs and exempted Interconnectors are forbidden to apply other charges unless the exempted Interconnectors do not have a special permission within their exemption. This is necessary to avoid windfall profits for owners of Interconnectors as Balancing is a requirement of operational security and therefore in most cases the TSO have no alternative. Otherwise this could lead to extreme prices for capacities used for Balancing Services which should be avoided to safeguard operational security and also maximise Social Welfare.

Article 29 – Approaches for the Provision of Cross Zonal Capacity for Balancing Services

The alternative approaches for the provision of the Cross Zonal Capacities are described. Depending on the available capacities between zones and the relevant timeframes, different approaches are possible and are allowed by the NC EB.

For borders between zones which are well-developed, where congestion is unlikely to occur, a Probabilistic Approach is allowed. The outcome of this approach is a capacity volume that is almost always available in real time and therefore could also be used for Balancing Services without the need for any allocation or reservation of capacities.

For borders between zones where congestion is likely, an allocation process which competes with the normal market procedures will be allowed. In this case the value for the capacities that should be allocated to Balancing Services will be calculated/priced the same way as in the normal energy market and the market participants with the highest prices will get the capacities.

A third approach is the reservation of capacities. This would only be allowed outside any other market timeframe - before any timeframe has started or between different timeframes. In case of reservation, the TSO has to perform a Cost-Benefit Analysis, using the best available data at this time, e.g. historical or future market prices across an Interconnector. For shorter timeframes and closer to the time period for the reservation, a modified capacity provision method is allowed which would require a reduced application of the Cost-Benefit Analysis. The established capacity provision methodology is supposed to ensure a fair and market based approach and ensuring the most efficient provision of capacities. The methodology should be approved by relevant NRAs ex-ante.

Article 30 – Capacity Provision Methodologies for Balancing Services

It is necessary to define a clear, structured and transparent methodology. It also defines the minimum requirements for each provision. To avoid confusion, the methodology should refer to the relevant timeframe so that market participants can quickly see and understand the results. Also the pricing of the capacity should be included for evaluation of the Social Welfare and finding the most efficient allocation of capacity. A clear process description is required to help market participants to understand the methodology and take it into account when calculating their own offers for the relevant markets.

The third relevant criterion is the Cost-Benefit Analysis required for the reservation case (see Article 29). In the case of co-optimisation within or parallel to normal market timeframes, the Cost-Benefit Analysis will be carried out implicitly in the market clearing or with the acceptance of offers. In the third case, the Probabilistic Approach, no Capacity Allocation is needed and therefore it is not possible to perform a Cost-Benefit Analysis.

For a calculation of a month ahead or longer, a concrete value could be calculated ex-ante and compared to other market timeframes or assumptions on other market timeframes, e.g. auctions for Cross Zonal Capacity, and therefore compete with other products on parallel markets.

For shorter timeframes there are usually other markets in parallel that could be used for allocation of capacity, so there is no need for a comprehensive ex-ante Cost-Benefit Analysis, as this will be done by the market clearing processes as a result of the different offers of market participants. Therefore the TSOs need to develop a modification to the capacity provision methodology in order to allow an accelerated application of the methodology close to real time. It would also ease the process for TSOs if they only have to calculate their own willingness to pay and do not forecast the willingness to pay of other market participants for the Cross Zonal Capacities.

Article 31 – Calculation of Cross Zonal Capacity for Balancing Reserves and Balancing Energy

Article 31 describes special requirements of the NC EB to those of the later timeframes.

In most Capacity Allocations all available capacities are only traded for use on the energy market and all calculations of available Cross Zonal Capacities at each timeframe are taking these into account. The provisions of the NC EB are unique as available Cross Zonal Capacity is not only traded for use on the energy market but Cross Zonal Capacity can also be reserved or allocated to Balancing Services which could be seen as two different things The Cross Zonal Capacity traded for energy markets will be used for transportation of energy, while the Cross Zonal Capacity reserved or allocated for Balancing Services is in the first place a kind of an “insurance”, to guarantee the TSOs the availability of the Balancing Reserves.

The decision as to whether the capacity is used for the transportation of Balancing Energy can only be done in real time or close to real time, when the physical Balancing needs of each LFC

Area/Coordinated Balancing Area are known. Nevertheless, as stated above, the Cross Zonal Capacities are allocated/reserved based on market procedures and therefore have proven a Social Welfare gain.

In the calculations of the availability of Cross Zonal Capacities for the relevant timeframes, this needs to be taken into account. This means that the allocated/reserved Cross Zonal Capacity for Balancing Services needs to be taken into account along with any other allocated Cross Zonal Capacity.

For the Balancing timeframe, i.e. the timeframe after the gate closure of the Intraday market, a grid model is needed that takes into account the already allocated Cross Zonal Capacities and is able to calculate the available capacities. As the Balancing timeframe is rather short – a maximum of one hour – there is no time to transfer and check the data from the Intraday model. Therefore it is suggested that the grid model for the Balancing timeframe is based on the model used in the Intraday timeframe, so the same data used for Intraday could be used in the Balancing timeframe. This would simplify the process and minimise the risk of a system failure due to missing data or wrong data. Special requirements of the Balancing timeframe, such as calculation speed, requirements due to the used Common Merit Order Lists, timeframes (sufficiently often reassessed calculations) and different Gate Closure Times for different products need to be included in that model. The model must be able to handle all these issues.

CHAPTER 5: SETTLEMENT (ARTICLES 32 - 52)

Section 1 – Settlement Principles (Generalities)

Article 32 – General Settlement Principles

The NC EB shall take account of the objectives of the FG EB and of the requirements of the Electricity Regulation and the Electricity Directive, such as the need for establishing objective fair, transparent and non-discriminating rules for Balancing, in a cost-reflective way, and for creating appropriate incentives for network users and TSO's for efficient Balancing.

Amongst them is the requirement that a harmonised pricing method for Balancing Energy products shall give correct price signals and incentives to market participants.

Additional requirements are concerned with safeguarding operational security and that the specifications of the NC EB shall be consistent and take into account interactions with other market timeframes (e.g. Intraday, Day-ahead), that common principles are defined for the Procurement of Balancing Reserves and Balancing Energy to ensure that distortions within the internal market and in particular between adjacent markets that use different procurement mechanisms are avoided and with respect to Imbalance Settlement that there are limited distortions between adjacent markets induced by different settlement mechanisms.

Therefore the NC EB does not contain any articles inducing perverse incentives to any party involved (BRP, BSP, TSO, NRA), that may result in jeopardizing operational security or economic efficiency, or in exploitation by TSO's of differences in market designs.

Settlement mechanisms (settlement rules) are part of the terms and conditions to be defined by each TSO inside its LFC Area, and shall be approved by its NRA.

When settlement mechanism involves more than one TSO (TSO-TSO Settlement), the rules must be commonly defined, and harmonised principles would be required. In this case, all the NRAs must approve the rules.

The NRA shall not allow the inclusion of any settlement process as a part of regulated income or expenditure of the TSO. All settlement processes should be market based and first of all generate appropriate economic signal for market participants. TSO may not be allowed to gain profit from any settlement process.

The following settlement processes are required in a European Balancing Market:

1. TSO to BSP: Implicitly mentioned in the FG EB: pricing method for Balancing Energy products)
    a. Settlement of the local activated Balancing Energy
    b. Settlement of the contracted reserves
2. TSO to Central Party (Common Merit Order/Balancing function): Explicitly mentioned in the FG EB
    a. Settlement of intended exchange of LFC Area imbalance due to activation on Common Merit Order List
    b. Settlement of control area imbalance due to imbalance netting

    c. Settlement of the Unintentional Deviations
3. TSO to BRP: Explicitly mentioned in FG-EB
    a. Settlement of Imbalances

Additional components of TSO-TSO exchange of energy due to e.g. intentionally exchanged energy due to ramping restrictions on cross-border schedules, or due to emergency measures in not-normal operating conditions.

All energy settlements involve:

- energy volumes (kWh, MWh)
- per specific time units (Settlement Time Unit)
- in a specific direction (positive for [relative] Injections, negative for [relative] Withdrawals)due to a specific process subject to settlement described in this NC (e.g. Imbalance Netting, FRR process…),
- against a specific price, (local currency per MWh, e.g. €/MWh),
- to be settled between a TSO and a specific counterpart. (Central Counterparty, BRP, BSP, another TSO…)

Each settlement article has clear references to the relevant definitions for each of these items described above.

The NC EB foresees that the rules for the settlement, as being part of the terms and conditions related to Balancing of each TSO, must be transparent, consulted, publically available and approved by the (relevant) NRA(s).

The NC EB engages TSOs for a fair distribution of costs and benefits derived from the settlement mechanisms:

- In the case where financial asymmetry between TSOs due to the Exchange of Balancing Reserves and especially Balancing Energy is inevitable, compensation should be agreed between involved TSOs. If costs and benefits are unequally distributed a fair distribution should be carried out through a TSO-TSO Settlement.
- The impact of pricing on national settlement mechanisms must be also taken into account (for example the consequences of having marginal or pay-as-bid in the Common Merit Order platform and/or internal settlement scheme).

Section 2 – Settlement Balancing Energy Volumes TSO-BSP

Article 33 – General Principles

This article deals with the settlement of each of the processes described in the NC LFC&R: FCR, FRR, RR, thus making it optional but not necessary to use the same prices for all three processes.

The settlement between TSO and BSP of energy from FCR is left optional in the NC EB due to potentially small volumes of capacity and activated energy and the possible difficulties for measurement associated to the FCR process.

Because transactions are Firm,

a) settlement is always performed separately per direction, so there will be no netted volumes to be settled with BSPs, and
b) the volumes of energy to be settled will be based on requested volumes.

Article 34 – Balancing Energy from Frequency Containment Process

This article describes the settlement of Balancing Energy from Frequency Containment Process as an option.

Article 35 – Balancing Energy from Frequency Restoration Process

This article describes the settlement of Balancing Energy from Frequency Restoration Process. The general principles described in Article 33 will apply.

Article 36 – Balancing Energy from Reserve Replacement Process

This article describes the settlement of Balancing Energy from Reserve Replacement Process. General principles described in Article 33 will apply.

Article 37 – Imbalance Adjustment to BRP

In the case of activation of Balancing Energy Bids from a BSP, the net volumes of Balancing Energy from these activations will be reflected, as per Article 47 Imbalance Volume Calculation, as an adjustment in the calculation of the imbalance of the BRP's that are declared to be associated with the BSP as required under Article 13 Terms and Conditions Related to Balancing.

Adjustment is a prerequisite for the functioning of the Balancing Market, The rationale is that, assuming the BRP is balanced initially, the non-delivery of the requested volume (by the BSP) would result in an Imbalance for the BRP, whereas exact delivery of the requested volume from the connections for which the BRP is responsible, would result in no Imbalance to be settled between the TSO and BRP.

Section 3 – Settlement of Exchanged Energy Volumes between TSOs

Article 38 – General Principles

In order to ensure proper functioning of Cross Border Balancing Market, all Balancing Energy exchanged within Coordinated Balancing Area shall be settled among relevant TSOs cooperating within this area. This covers the settlements resulting from:

(a) Imbalance Netting Process;

(b) Frequency Restoration Activation Process; and

(c) Reserve Replacement Activation Process;

shall be harmonised within Coordinated Balancing Area and conducted by one party, the TSO-TSO Settlement Function. This party shall be also responsible for performing invoicing. The rules of above mentioned settlement processes shall be developed by all TSOs from a given Coordinated Balancing Area within six months after its notification. The Exchange of Balancing Energy resulting from any

other process that is not directly related to a Coordinated Balancing Area shall be settled according to the rules agreed between TSOs involved.

This is the first mechanism that is implemented on a pan-European scale, extending beyond Coordinated Balancing Areas. It will be defined within one year after entry into force of the NC EB, covering settlements resulting from:

(a) Unintentional Deviations.

(b) Ramping Period or agreed Ramp Rate Process

All TSO-TSO settlements mechanisms used shall ensure:

(a) fair and equal distribution of costs and benefits;

(b) incentives for TSOs to actively participate in Cross Border Exchange of Balancing Energy; and

(c) lack of incentives for TSOs to free riding behaviour.

Article 39 – Intended Exchange of Energy through the Imbalance Netting Process

This article describes the process for the settlement of energy exchanged intentionally through Imbalance Netting Process. This article also describes the principles for the pricing method.

This pricing method will appropriately reflect overall benefits arising from avoidance of FRR counter activation through the Imbalance Netting Process and to encourage TSOs to participate.

Article 40 – Intended Exchange of Energy through Frequency Restoration Activation Process

This Article stipulates that all Transmission System Operators in a Coordinated Balancing Area participating in a Frequency Restoration Activation Process have to settle among themselves the volume of intentionally exchanged energy due to these processes

Article 41 – Intended Exchange of Energy through Reserve Replacement Activation Process

This Article stipulates that all Transmission System Operators in a Coordinated Balancing Area participating in a Reserve Replacement Process have to settle among themselves the volume of intentionally exchanged energy due to these processes

Article 42 – Intended exchange of energy through agreed Ramping Period or agreed Ramp Rate Process

This article describes in a general manner the settlement of energy exchanged intentionally through agreed Ramping Period or agreed Ramp Rate Process to be performed between TSOs that are connected by HVDC Interconnectors.

Because the use of Ramping Processes is one of the methods not to manage system frequency on either side of the link by limiting frequency deviations on both sides of Interconnector, the energy exchange resulting from this process shall be appropriately priced and settled between the involved TSOs.

TSOs involved in the Ramping Process shall develop a common methodology to calculate the volume and the price of the intentionally exchanged energy due to this process. The common methodology should prevent arbitrage between separate links (e.g. HVDC A-B and HVDC A-C).

Article 43 – Unintended Exchange of Energy through Unintentional Deviations

All Unintentional Deviations shall be settled financially. However, the settlement rules and processes for settlement of Unintentional Deviations may vary depending on whether the process is performed within one Synchronous Area or between Synchronous Areas because the causes of the deviations can be different.

Within a Synchronous Area, the Unintentional Deviations settlement mechanism shall give adequate price signals to TSOs to be balanced. Therefore energy from Unintentional Deviations shall be the most expensive Balancing Energy which could be obtained by TSOs, in order to prevent free riding behaviour of one TSO at the expense of others.

Unintentional Deviations between Synchronous Areas often result from technical parameters, control inaccuracies or tripping on HVDC links, and should be settled according to other rules.

This is the first mechanism that is implemented on a pan-European scale, extending beyond Coordinated Balancing Areas. This essential step towards a European Balancing mechanism will be defined within one year after entry into force of the NC EB.

Article 44 – Settlement and Invoicing

All settlements between TSOs described in this section will be performed by the TSO-TSO Settlement Function.

Section 4 –Imbalance Settlement TSO-BRP

Article 45 – General principles

This article describes how the Imbalance Volume for each BRP is calculated according to the definition of Imbalance from the Framework Guidelines. The Framework Guidelines themselves define Imbalances as *deviations between generation, consumption and commercial transactions (in all timeframes – commercial transactions include sales and purchases on organised markets or between BRPs) of a BRP within a given imbalance settlement period*.

The following volumes are therefore defined:

- A notified position (scheduled position) reflecting the final net volume of commercial transactions on all timescales on organised markets or between BRP's.
- An allocated value (usually based on metered values or profiled values), reflecting the net volume of generation and consumption over the connections for which the BRP is responsible for the Imbalances.
- An adjusted volume reflecting the activation of Balancing Energy Bids from the associated with this BRP, at least at Balancing Energy Bid level. Adjustment is a prerequisite for the functioning of the Balancing Market, The rationale is that, assuming the BRP is balanced

initially, the non-delivery of the requested volume (by the BSP) would result in an Imbalance for the BRP, whereas exact delivery of the requested volume from the connections for which the BRP is Balance Responsible, would result in no Imbalance to be settled between the TSO and BRP.
Any curtailments of commercial transactions on all timescales on organized markets or between BRP's, as performed by a TSO under not normal operating conditions will also be an adjustment in the Imbalance Volume calculation. An Imbalance Price shall be calculated for each direction, these prices may however be the same, thus allowing for single pricing.

The Imbalance Price for Imbalances aggravating system Imbalances should at least be related to the average price of Balancing Energy activated within the area. The rationale for average price here is that in marginal pricing the average price *is* the marginal price, and the present wording allows for the marginal price being used in case of not marginal pricing. The pricing of the other direction is left to the TSO (may be the same, thus enabling single price system).This fulfils the intention of the Framework Guidelines to give correct price signals and incentives to market participants while also take into account the regional specificities of different electricity market designs.

A separate provision has to be made in case no Balancing Energy has been activated (This is not uncommon for systems that practice Imbalance Netting Process).

Imbalance Prices shall reflect the Imbalance situation of the area in which imbalances are calculated, and Imbalance Settlement mechanisms shall result in adequate economic signals that reflect the Imbalance situation of the balance area.

The following items are related to terms and conditions for BRPs related to Imbalance Settlement.

- All withdrawals and injections shall be covered by BRP
  Withdrawals and injections from Interconnectors however cannot be covered by BRP
- Each BRP is financially responsible for the imbalance of all withdrawals and injections covered by this BRP
- Each BRP shall provide all necessary data and information needed by TSO/DSO to evaluate Balancing service needs
- BRPs shall be entitled to challenge its Imbalance Volume calculation

Article 46 – Imbalance Settlement Period

In this article, the NC EB establishes a step-by-step process for the harmonisation of the Imbalance Settlement Period.

This process starts with a Cost-Benefit Analysis for the harmonisation of the Imbalance Settlement Period, carried out by all the TSOs. The results of this analysis are then submitted to all the NRAs and to ACER.

According to the results of the Cost-Benefit Analysis, the NRAs will propose a target date for the implementation of the Imbalance Settlement Period in each system. As the settlement features (including imbalance settlement) are part of the terms and conditions related to balancing, this date has to be consistent with the date of applicability of the terms and conditions according to Article 13.

In line with the provisions established by the FG EB in Chapter 5.3, the NC EB also allows for a TSO to apply for a longer Imbalance Settlement Period than decided by all the NRAs. In this case, the TSO must provide its NRA with a detailed Cost-Benefit Analysis and the NRA will decide on the approval.

The following graphs show the process for harmonisation of the Imbalance Settlement Period depending on the decision taken by all the NRAs after the Cost-Benefit Analysis, taking as a reference the approval of the methodology for establishment of the terms and conditions within a Cost-Benefit Analysis.

If the decision is “yes” (i.e. the Imbalance Settlement Period should be harmonised) the process would be as shown in Figure 18:

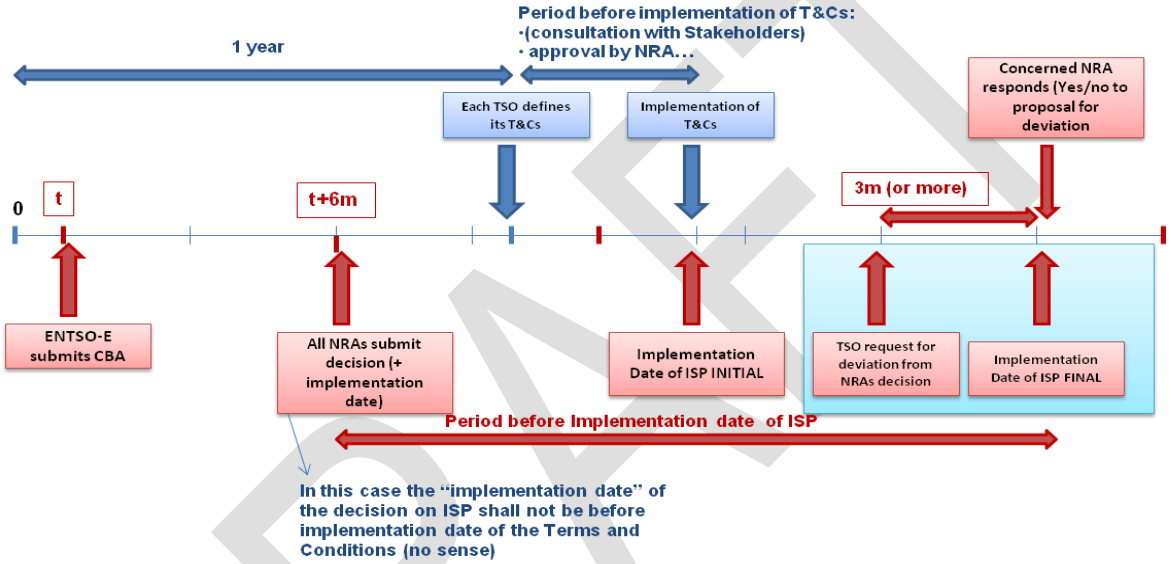

Figure 18:Process if Imbalance Settlement Period is harmonised

If the decision is “no” (i.e. it is not necessary to harmonize at this point the Imbalance Settlement Period) the process would be as shown in Figure 19.

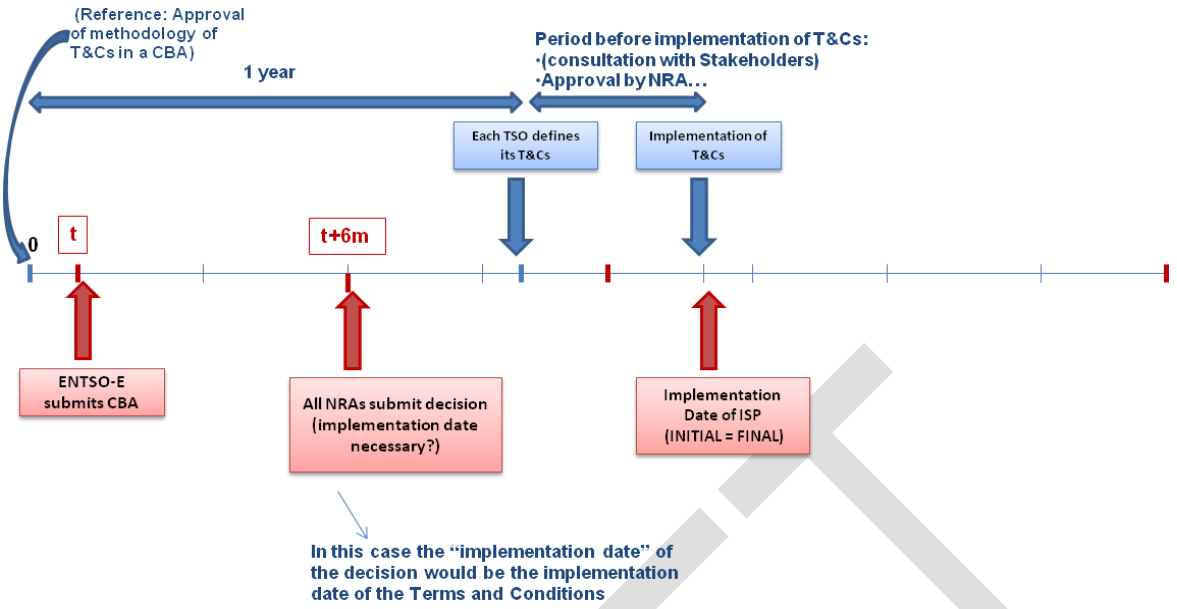

Figure 19: Process if Imbalance Settlement Period is not harmonised

Article 47 – Imbalance Volume Calculation

- This article describes how the Imbalance Volume for each Balance Responsible Party is calculated from three volumes (notified position, allocated value, adjusted volume).

The article prescribes to all TSO's to establish a procedure to determine each of these three volumes.

The article asserts the right of the Balance Responsible Party to appeal to the result of the calculation.

The article defines the directions of the imbalance volume.

Article 48 – Imbalance Pricing

This article describes the principles of the pricing of the imbalances to be settled by the TSO with the Balance Responsible Parties.

Imbalances will be settled in each direction that is shortage or surplus.

The imbalance price will be related to what the TSO or TSOs have *doneor avoided* to restore system balance or frequency, or when relevant what TSO has done to replace reserves.

The following situations have to be covered:

	Balance Responsible Party Imbalance		
TSO Activating	short (-)	neutral (0)	long (+)
none	n.a.	n.a	n.a.
upward	aggravating	n.a	supporting
downward	supporting	n.a	aggravating
upward + downward	n.a.	n.a	n.a.

The article asserts that Balance Responsible Party aggravating imbalances shall not be priced less respectively more than the weighted average price for FRR and RR in the Relevant Area, in order to reflect the local Imbalance situation.

For marginal pricing of Balancing Energy the average price will equal the marginal price thus giving the appropriate incentives to the Balancing Service Provider to provide the requested volumes.

By including the value of the avoided activation in these formulae, this value will appear as the imbalance settlement price in TSO has avoided all activation.

In case of both upward and downward activation within the same Settlement Time Unit, at least one of the imbalances will be priced according to the aggravating principle.

These are high level principles; the price in the other, unmentioned directions is not prescribed.

Nor is it prohibited in case of aggravating imbalance to exceed the price condition.

Section 5 – Settlement of Procured Reserves

Article 49 – General Principles

Settlement of Balancing Reserves involves the following processes:

- Settlement between TSOs (or conducted through a TSO-TSO Settlement Function) in case of Exchange of Balancing Reserves within a Coordinated Balancing Area
- Settlement between each Responsible TSO and the BSPs that have provided reserve products

Article 50 – Settlements with BSPs for provided Balancing Reserve products

Each TSO must perform the settlement for all the BSPs (associated to a BRP inside its Control Area) that have provided Balancing Reserve Products to the TSO (either for internal use, or for exchange and or sharing within a Coordinated Balancing Area).

The rules for this settlement will be defined by the TSO (being part of the terms and conditions related to Balancing) and will be transparent and published.

Article 51 – Settlements between TSOs due to the Exchange and Sharing of Reserves

This settlement must allow for all the possible mechanisms of Exchange of Balancing Reserves which are allowed in the FG (but not obliged) inside a Coordinated Balancing Area.

The TSOs will settle among themselves the products exchanged in the Coordinated Balancing Area (or through the TSO-TSO Settlement Function), and then each TSO will perform the internal settlement accordingly with its BSPs.

The rules for the settlement of Reserve Products between TSOs will be common and will be defined in a coordinated manner between all the involved TSOs and shall be transparent and published.

Also, the settlement between TSOs must be consistent with the results from the Common Merit Order List for the corresponding Reserve Product.

Section 6 – Settlement Amendments

Article 52 – General principles

The purpose of introducing principles for amendments in the NC EB is to allow for a possibility of the parties involved in the settlement to amend measurements and reports in circumstances where, for some reason, these were incorrectly measured or were incorrectly reported. In order to be able to close the settlement at some point in time there shall be a maximum time period in which amendments are allowed.

CHAPTER 6: ALGORITHM DEVELOPMENT (ARTICLE 53 - 54)

This Chapter details the general requirements for the development of algorithms. These Algorithms are operated by the respective functions (established in Article 12, NC EB) performing the optimisation of Balancing Reserve procurement, Optimised Activation, Counteracting Activation, Minimisation or Transfer of Obligations Optimisation where these are performed commonly in a Coordinated Balancing Area.

Article 53 –Algorithm Development

Article 53 requires all TSOs to establish the principles which have to be followed in the development of the relevant algorithms which are developed and applied in a Coordinated Balancing Area. The TSOs of each Coordinated Balancing Area are obliged to respect these principles and to develop the algorithms relevant for the Balancing cooperation in their Coordinated Balancing Area. The principles have to be submitted to all NRAs and ACER within one year after entry into force. This timeline shall guarantee that algorithm development is being progressed in a timely manner to ensure that the targets set for a European balancing market are achieved. The proposals for the relevant algorithms developed in accordance to these principles have to be approved by the relevant NRAs.

Article 54 –Algorithm Amendment

This Article details the conditions for amendments of all Balancing Algorithms. As it does not contain restrictions on who is entitled to make proposals for amendments, everyone or every entity can make such proposals to TSOs of a Coordinated Balancing Area, which are granted the right to amend the algorithms. Nevertheless, these proposals have to be supported by detailed information explaining and documenting the rationale for them.

CHAPTER 7: REPORTING

Section 1 – ENTSO-E Reporting to the Agency

Article 55 – Annual Report

The TSOs will publish an Annual Report on Cross Border Balancing which will, as specified in the FG EB, include detailed analyses every two years and updates thereof in the intervening years. This process will be coordinated by ENTSO-E, Structure and content which will include performance indicators as well as the frequency of publication will be agreed between ENTSO-E and ACER and may be amended later on if deemed necessary and agreed again.

Initially, the Annual Report will focus on the implementation of the NC EB. Once the target model is fulfilled, this focus will shift towards monitoring the regional and/or pan-European Balancing markets. Article 55 lists the foreseen contents of the report in detail.

CHAPTER 8: TARGETS AND TRANSITIONAL ARRANGEMENTS (ARTICLES 56-60)

Article 56 - General Provisions

This section of the NC EB details the targets set by FG EB and underlines the necessity of consistency with other Network Codes. The concept of Coordinated Balancing Area is deemed as a vehicle to foster integration of pan-European Balancing markets and reaching the defined targets in the required timeframe.

Article 57 - Targets

As foreseen in the FG EB, the NC EB describes a process that leads to a regional/European-wide TSO-TSO model for Balancing (see also Chapter 4). The timings follow the provisions in the FG EB. From entry into force of the NC EB, TSOs shall not take any steps that are counterproductive to this goal. Thus agreements that are concluded between TSO and BRP, BSP or other relevant grid users during the transitory period must also follow the requirements of the NC EB.

As shown in Step 1 in Figure 20, TSOs first set up a multilateral TSO-TSO model for manual Balancing Reserves with a Common Merit Order List for Replacement Reserves at the latest two years after entry into force of the NC EB. At this point, TSOs may declare certain bids unshared.

(Ref Article 23 Paragraph 9). If modifications in the target model are deemed necessary, TSOs will together prepare a proposal for modification of the multilateral TSO-TSO model for manual Balancing Reserves no later than three years into force. This amended model must be supported by a Cost-Benefit Analysis (compare Article 58) and is subject to regulatory approval (Art 7 Paragraph 2(h)).

Four years after entry into force, the multilateral TSO-TSO model with a Common Merit Order is extended to Manual FRR, again allowing for Unshared Bids if justified (see Step 3 in Figure 20). With a next two year step, taking this process to a total of six years after entry into force, the TSO-TSO model is expanded to a European-wide scale including new products, with both RR and manual FRR. At this stage, Unshared Bids are not permissible any longer see Step 5 in Figure 20).

With regard to Automatic FRR, as visualised on the lower axis in Figure 20, TSOs have to coordinate in order to minimize counteracting activations within two years after entry into force of the NC EB (see Step 2 in Figure 20), by means of Imbalance Netting. By the end of the third year after entry into force, TSOs have to submit the target model for Automatic FRR to all NRAs (see Article 7 Paragraph 2(g)). Implementation for the model of Automatic FRR within Coordinated Balancing Area s is foreseen one year after submission of the target model to NRAs (Step 4 in Figure 20).

Reaching the final target six years after entry into force, a European-wide TSO-TSO model with Common Merit Order List will be implemented for RR and manual FRR. TSOs may also develop a proposal for modification of the target model on Automatic FRR, if technically needed.

Harmonisation of the Imbalance Settlement Period on a European level will be analysed by all TSOs. Three years after entry into force, all TSOs have to submit a Cost-Benefit Analysis (Article 58) to their NRAs (Article 7).

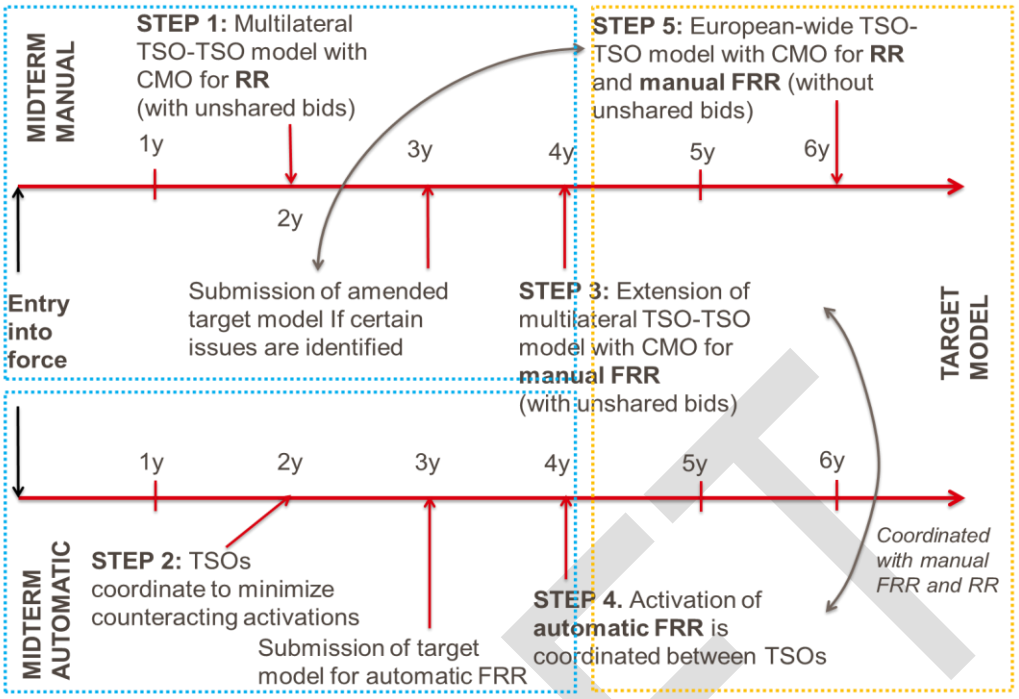

Figure 20: Integration Targets for Balancing

Article 58 - Cost-Benefit Analysis

During the development and implementation of regional and European wide solutions, TSOs are obliged to evaluate costs and benefits for certain issues, choosing those options that provide the highest Social Welfare.

Article 58 lists the items that must be subjected to a Cost-Benefit Analysis on a regional and European-wide level. This includes:

- Proposals for European-wide TSO-TSO models
- Harmonisation of Imbalance Settlement Period
- Provision and use of Cross Zonal Capacity
- Sharing of reserves

The criteria and methodology of the Cost-Benefit Analysis are subject to public consultation and must be submitted to the (relevant) NRA for approval (Art 7) within six months after having received the proposal as per the approval process for considerations that concern more than one NRA.

The minimum objectives of this Cost-Benefit Analysis include the objectives of the NC EB as listed in Article 9 as well as the following:

- A Social Welfare quantification in accordance with the NCCACM
- The implementation cost of a new Balancing mechanism or platform
- The impact on European, regional and national Balancing cost
- The potential impact on regional energy market prices as well as
- The impact on market parties in terms of additional technical or IT requirements.

The results of a Cost-Benefit Analysis will be provided to the Regulatory Authorities as part of a comprehensive proposal for specific steps forward in Balancing integration. After public consultation, the decision on the way forward then lies with the Regulatory Authorities.

Article 59 – Derogations

If a TSO cannot follow the process outlined in the NC EB, the code foresees the possibility of derogations, limited in scope as well as time and linked to a clear roadmap on how this TSO plans to remove the existing obstacles. Derogations can only be granted on a reasoned request by the TSO, submitted at least six months before the provision under question is applied. The process to grant and monitor derogation must be transparent, non-discriminatory, non-biased and well documented. In their decision, the relevant Regulatory Authority must take effects for adjacent markets into account and must evaluate the impact on overall Balancing integration across Europe. Following the FG EB, the decision must be available within six months, meaning before the provision in question enters into force.

The reasoned request must show at least one of two situations:

1. The TSO applying for derogation is in a significantly different situation from other TSOs across Europe regarding the Balancing arrangements.

2. Implementing the provision for which derogation is requested would lead to significant problems in the Balancing of the TSO under question.

If derogation is granted, this TSO shall be considered compliant with the NC EB. The maximum time span for derogation, however, is two years, after which period the initial reason for derogation must have been resolved and the TSO must fulfil the original provision in the NC EB.

CHAPTER 9: FINAL PROVISIONS (ARTICLE 61)

Article 61 – Entry into Force

The Network Code will enter into force 20 days after its publication. However, due to the various consultations and approvals, the application of different parts of the code will be triggered by the timing of regulatory decisions. Because of uncertainties about the ACER opinion, the timings of the Comitology process, the time needed to deliver parts of the code (the timings are “no later than”) and the time needed to approve parts of the code (which could include a referral to ACER) it is not possible to say exactly when each part will apply. A close working relationship between ENTSO-E, ACER, national regulators and the Commission is, in our view, necessary to ensuring the NC EB can be implemented as quickly as possible.

6 ADDED VALUE OF THE NC EB

The NC EB provides for a progressive approach to foster cooperation amongst TSOs in various areas of Balancing. Its added value lies in the deemed cost reductions based on market based TSO-TSO cooperation. The targets and methods are set forth by the FG EB with the aim to reduce total related costs and to increase Social Welfare while safeguarding operational security. In order to enable this, TSOs have to develop models for market based cooperation, at least on regional level, within a given time period of max. 6 years.

In general, Balancing Markets represent 2-3% of the total turnover volume of wholesale markets, while interconnectivity as an average is around 10% of peak demand amongst member states. In a recent Impact Assessment commissioned by the European Commission the Annual benefits from balancing energy trade have been assessed as potentially of the order of € 51 million.

For a swift transition towards the relevant target models, a flexible obligation for cooperation by means of the concept of Coordinated Balancing Areas is introduced The NC EB thus aims to provide a foundation for a coordinated set of Balancing rules, enabling learning from experience, towards a regional and/or European-wide Balancing Market.

Additionally to the measures already foreseen in the FG EB the NC EB includes coordinated procurement activities related to FCR as well as coordinated activities regarding reservation and procurement of reserves. Only such a comprehensive approach allows realisation of the potential benefits related to the field of TSO energy Balancing.

The NC EB aims to create a level playing field for all potential providers of Balancing Services. Harmonised processes and Standard Products will form a framework for Demand Response, renewable sources and already existing providers to offer Balancing Services to regional or pan-European markets based on TSO-TSO cooperation. Finally end consumers should profit from any achieved cost savings.

7 RESPONSES AND NEXT STEPS

7.1 OVERVIEW

This chapter provides information on how to respond to the consultation on the NC EB and provides an overview of the processes which ENTSO-E intends to follow in developing a final version of the NC EB for submission to ACER.

7.2 SUBMISSION OF RESPONSES

The public consultation is expected to launch in June 2013. Responses to the public consultation will be submitted via the website, and the deadlines for this will accompany the consultation. All responses should be submitted electronically via the ENTSO-E consultation tool, explained at https://www.entsoe.eu/resources/consultations/.

ENTSO-E appreciates that many stakeholders and involved parties may wish to discuss issues raised in this document. For this reason ENTSO-E has scheduled a public workshop for 07. May 2013 in Brussels..

7.3 RESPONDING TO COMMENTS

ENTSO-E will endeavour to respond to comments raised by stakeholders, indicating how a comment has been taken into account or indicating the reasons for not doing so, via the consultation tool. This document seeks to answer some of the questions which have been repeatedly asked during the process of developing the NC EB to date.

7.4 NEXT STEPS

The main steps of the Network Code Development Process with a special focus on those which will occur between the submission of the NC EB to ACER and its application are briefly summarised.

7.4.1 Submission to ACER

Regulation (EC) No 714/2009, and in particular its Article 6, defines a clear Network Code Development Process. The process begins with the set up by the Commission of an annual list of priorities amongst the twelve areas where Article 8(2) of Regulation (EC) No 714/2009 foresees the need for a NC. The annual priority list must be adopted after consultation with the relevant stakeholders.

Once a priority list is established, the Commission shall request ACER to develop and submit to it a non-binding framework guideline. The Framework Guidelines are intended to set clear and objective principles with which the Network Code should be in line. The development of a Framework Guideline is followed by a request from the Commission for ENTSO-E to develop a Network Code within a twelve month period. The Network Code to be developed by ENTSO-E within that period shall be subject to an extensive consultation, taking place at an early stage in an open and transparent manner. At the end of these twelve months ENTSO-E delivers a Network Code and set of explanatory documents to ACER for its assessment.

7.4.2 The ACER Opinion

ACER has three months to assess the draft prepared by ENTSO-E and deliver a reasoned opinion. In doing so, ACER may decide to seek the views of the relevant stakeholders.

ACER can decide to recommend to the Commission that it adopts the Network Code if it is satisfied that it meets the requirements of the Framework Guidelines or can provide a negative opinion; effectively meaning the Network Code is returned to ENTSO-E.

7.4.3 The Comitology Procedure

The Network Code prepared by ENTSO-E shall only become binding if, after being recommended to the Commission by ACER, it is adopted via the Comitology procedure.

The Comitology process will be led by the Commission who will present the draft text to representatives of Member States organized in so-called “committee”. The Comitology procedure used for the Network Codes (called regulatory procedure with scrutiny) grants the European Parliament and the Council important powers of control and oversight over the measure adopted by the committee.

For that reason, it is unclear how much time the process can take in practice. The working assumption is that it will take about twelve months from the issuing of the ACER opinion (if positive) to the conclusion of the Comitology process.

7.4.4 ENTSO-E Steps During This Period

Meeting the requirements of the NC EB is a significant challenge for ENTSO-E. During the period in which the Network Code is being considered by ACER and the Commission, ENTSO-E will continue working to prepare for the delivery of the requirements of the Network Code. Some of these requirements are particularly challenging and therefore beginning work in the near term is necessary to delivering them on time.

7.4.5 Entry Into Force

The NC EB will enter into force 20 days after its publication. All provisions of this Network Code shall apply as from the day of expiration of a two years period following its publication.

7.4.6 NC EB Implementation

Add high level implementation plan based on draft NC.

8 LITERATURE & LINKS

[1] “Framework Guidelines on Electricity Balancing” (FG-2012-E-009), Agency for the Cooperation of Energy Regulators (ACER), 18 September 2012

[2] Initial Impact Assessment for the Framework Guidelines on Electricity Balancing, Agency for the Cooperation of Energy Regulators (ACER), 18 September 2012