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Framework Guidelines on Electricity Balancing

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This document contains the Framework Guidelines on Electricity Balancing, which the Agency for the Cooperation of Energy Regulators has prepared pursuant to Article 6 of Regulation (EC) No 713/2009 and based on the request from the European Commission.

Related Documents

- Framework Guidelines on Electricity Grid Connections, 20 July 2011, Ref: FG-2011-E-001; http://www.acer.europa.eu/portal/page/portal/ACER_HOME/Public_Docs/Acts%20of%20the%20Agency/Framework%20Guideline/Framework%20Guidelines%20On%20Electricity%20Grid%20Connections/110720_FGC_2011E001_FG_Elec_GrConn_FIN_AL.pdf
- Framework Guidelines on Electricity System Operation, 2 December 2011, FG 2011-E-003; http://www.acer.europa.eu/portal/page/portal/ACER_HOME/Activities/FG_code_development/Electricity/FG-2011-E-003_02122011_Electricity%20System%20Operation.pdf
- “Framework Guidelines on Capacity Allocation and Congestion Management for Electricity, 29 July 2011, FG-2011-E-002; [http://www.acer.europa.eu/portal/page/portal/ACER_HOME/Public_Docs/Acts%20of%20the%20Agency/Framework%20Guideline/Framework_Guidelines_on_Capacity_Allocation_and_Congestion_M/FG-2011-E-002%20\(Final\).pdf](http://www.acer.europa.eu/portal/page/portal/ACER_HOME/Public_Docs/Acts%20of%20the%20Agency/Framework%20Guideline/Framework_Guidelines_on_Capacity_Allocation_and_Congestion_M/FG-2011-E-002%20(Final).pdf)
- “EREG Guidelines of Good Practice for Electricity Balancing Market Integration“, ERGEG, 9 September 2009, Ref: E09-ENM-14-04; http://www.energy-regulators.eu/portal/page/portal/EER_HOME/EER_CONSULT/CLOSED%20PUBLIC%20CONSULTATIONS/ELECTRICITY/New%20GGP%20Balancing%20Markets%20Integration/CD/E09-ENM-14-04_RevGGP-EBMI_2009-09-09.pdf
- “Implementing the 3rd Package: next steps”, CEER/ERGEG, 18 June 2009, Ref. C09-GA-52-06a; http://www.energy-regulators.eu/portal/page/portal/EER_HOME/EER_PUBLICATIONS/CEER_ERGEG_PAPERS/Cross-Sectoral/2009/C09-GA-52-06a_Implementing_3rdpackage_18-Jun-09.pdf
- ACER Work Programme 2011, http://www.acer.europa.eu/portal/page/portal/ACER_HOME/The_Agency/Work_programme/ACER%20Work%20Programme%202011.pdf
- Electricity Balancing, Initial Impact Assessment,
- ERGEG final advice on Comitology Guidelines on Fundamental Electricity Data Transparency, Ref. E10-ENM-27-03, 7 December 2010, ERGEG; http://www.energy-regulators.eu/portal/page/portal/EER_HOME/EER_CONSULT/CLOSED%20PUBLIC

[%20CONSULTATIONS/ELECTRICITY/Comitology%20Guideline%20Electricity%20Transparency/CD/E10-ENM-27-03_FEDT_7-Dec-2010.pdf](#)

External Documents

- European Commission: mandate for starting the work in the area of electricity balancing,
- Directive 2009/72/EC of the European Parliament and of the Council of 13 July 2009 concerning common rules for the internal market in electricity and repealing Directive 2003/54/EC, OJEU 14 August 2009 L 211/55:
<http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=OJ:L:2009:211:0055:0093:EN:PDF>
- Regulation (EC) No 713/2009 of the European Parliament and of the Council of 13 July 2009 establishing an Agency for the Cooperation of Energy Regulators.
<http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=OJ:L:2009:211:0001:0014:EN:PDF>
- Regulation (EC) No 714/2009 of the European Parliament and of the Council of 13 July 2009 on conditions for access to the network for cross-border exchanges in electricity and repealing Regulation (EC) No 1228/2003, OJEU 14 August 2009 L 211/15:
<http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=OJ:L:2009:211:0015:0035:EN:PDF>

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1 General Provisions

1.1 Scope

The Framework Guidelines on Electricity Balancing aim at setting out clear and objective principles for the development of network codes, pursuant to Article 6(2) of Regulation (EC) No 714/2009 (henceforth referred to as the “Electricity Regulation”). They cover the areas referred to in Article 8(6)(h) and (j) of the Electricity Regulation, i.e. the rules for trading related to technical 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, security of supply, providing benefits for customers, participation of demand response, supporting 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. To this end, these Framework Guidelines will strive for integration, coordination and harmonisation of the balancing regimes in order to facilitate electricity trade within the EU in compliance with the Electricity Regulation and Directive 2009/72/EC (henceforth referred to as the “Electricity Directive”).

The network code developed according to these Framework Guidelines (henceforth referred to as the “Network Code on Electricity Balancing”) must be in line with these Framework Guidelines and also with the relevant EU legislation. In particular, it shall take due account of the objectives – mentioned above – and the requirements under the Electricity Regulation and the Electricity Directive, such as the need for establishing objective, fair, transparent and non-discriminatory rules for balancing in a cost-reflective way, and for creating appropriate incentives for network users and *transmission system operators* (hereinafter referred to as “TSOs”) for more efficient balancing (see e.g. Articles 15(7), 37(6) and 37(8) of the Electricity Directive). Further to this and pursuant to Article 8(6) of the Electricity Regulation, the Network Code on Electricity Balancing shall take into account the regional specificities of different electricity market designs. In particular the European Network of Transmission System Operators for Electricity (ENTSO-E) shall take into account the parallel existence of central dispatch and self-dispatch arrangements of European electricity markets when drafting the Network Code on Electricity Balancing in line with these Framework Guidelines.

The Framework Guidelines on Electricity Balancing specifically address the roles and responsibilities of stakeholders involved in electricity balancing, the procurement of *frequency restoration reserves* and *replacement reserves*, the activation of *balancing energy* from *frequency restoration reserves* and *replacement reserves*, and the *imbalance settlement*.

The Agency will evaluate the Network Code on Electricity Balancing pursuant to Article 6(7) and (9) of the Electricity Regulation with regard to compliance with these Framework Guidelines and relevant EU energy legislation. For this evaluation, the Agency will particularly take into account the contribution of the Network Code on Electricity Balancing to the above-mentioned objectives of these Framework Guidelines.

The Network Code on Electricity Balancing shall set the minimum standards and requirements needed for a competitive, harmonised and effective EU-wide balancing market, concerning cross-border and market integration issues. In particular, it shall define the necessary level of harmonisation of the varying national balancing regime design elements, in order to foster European balancing market integration.

1.2 Links and dependencies

The Agency recognises the close interrelationship between issues related to electricity balancing, system operation and capacity allocation and congestion management, as well as electricity grid connection. In drafting the Network Code on Electricity Balancing, the Agency expects ENTSO-E to take into consideration the following principles, as a minimum, and to propose the separation of issues within the relevant network codes:

- **Electricity System Operation** – With respect to:
 - a) Network Code on Operational Security: the Network Code on Electricity Balancing shall deal with market-based selection of *balancing services* for load frequency control and, where relevant, real-time congestion management and take into consideration rules and processes to be defined in the network code on operational security;
 - b) Network Code on Operational Planning and Scheduling: with regard to maintaining the security of supply and selection and cross-border exchange of *balancing services*, the Network Code on Electricity Balancing shall deal with the procurement and product specifications of these services and take into consideration operational planning and scheduling procedures to be defined in the Network Code on Operational Planning and Scheduling;
 - c) Network Code on Load-Frequency Control and Reserves: with regard to the technical requirements for *balancing services* and their utilisation, the Network Code on Electricity Balancing shall ensure an efficient and market-based selection of *balancing services* and take into consideration technical processes, requirements and sizing principles to be defined in the Network Code on Load-Frequency Control and Reserves, as well as the technical and operational limitations for cross-border exchanges of *balancing services* to be defined in the Network Code on Load-Frequency Control and possibly on the Network Code on Operational Security.

- **Capacity Allocation and Congestion Management for Electricity** – With respect to the Network Code on Capacity Allocation and Congestion Management for electricity: the Network Code on Electricity Balancing shall take into account interactions with *intraday* and *day-ahead* time-frames, in particular *gate closure times*, and shall be consistent with them in terms of calculation of and access to *cross-border capacities*, when using them for *cross-border balancing* and balancing market integration.

- **Electricity Grid Connection** – With respect to the Network Codes for Requirements for Grid Connection applicable to all Generators and the Demand Connection Code, the Network Code on Electricity Balancing shall take into account these technical requirements, where relevant, to define the product specifications for generators and loads needed for the provision of *balancing services*.

Similarly, issues addressed in these Framework Guidelines may have an impact on electricity system operation, capacity allocation and congestion management and electricity grid connection. Therefore, this impact shall be taken into account while drafting or revising the corresponding network codes to ensure that the provisions foreseen in these Framework Guidelines and in the Network Code on Electricity Balancing are applicable in practice to maximise the efficiency of balancing while safeguarding operational security.

In drafting the relevant network code(s), ENTSO-E shall ensure that these issues are appropriately coherent and compatible.

Issues, which are relevant to more than one framework guideline, are mentioned in each appropriate set of guidelines and, where necessary, also specified in more detail. Some redundancy might emerge from this approach, but priority has been given to the avoidance of omission of important aspects.

Finally, the Network Code on Electricity Balancing shall ensure an adequate level of transparency for market participants, in consistency with ERGEG final advice on Comitology Guidelines on Fundamental Electricity Data Transparency and the Comitology Guidelines on Fundamental Electricity Data Transparency once adopted.

1.3 Definitions

For the purposes of these Framework Guidelines, the definitions contained in Article 2 of the Electricity Directive and Article 2 of the Electricity Regulation shall apply.

The following definitions are intended to clarify the provisions of these Framework Guidelines and are without prejudice to the definitions that shall be provided in the Network Code on Electricity Balancing.

- **Agency** – Agency for the Cooperation of Energy Regulators, as established by Regulation (EC) No 713/2009.
- **Annual report** – report to be published by ENTSO-E on a yearly basis, in accordance with Section 2.5 of these Framework Guidelines.
- **Balancing** – all actions and processes through which TSOs ensure that total electricity withdrawals are equalled by total injections in a continuous way, in order to maintain the system frequency within a predefined stability range.
- **Balancing Energy** – energy (MWh) activated by TSOs to maintain the balance between injections and withdrawals.
- **(Balancing) Reserves** – power capacities (MW) available for TSOs to balance the system in real time. These capacities can be contracted by the TSO with an associated payment for their availability and/or be made available without payment. Technically, *Reserves* can be either automatically or manually activated.
- **Balancing Services** – *balancing reserves* or *balancing energy*.
- **Balance Responsible Party (BRP)** – a market participant or its chosen representative responsible for its *imbalances*.
- **Balance Service Provider (BSP)** – a market participant providing *balancing services* to one or several TSOs within one or several *control area(s)*.
- **Bidding zone** – the largest geographical area within which market participants are able to exchange energy without capacity allocation.
- **Control Area** – a coherent part of the interconnected system, operated by a single TSO responsible for *load-frequency-control* for physical loads and generation units connected.
- **Cross-border balancing** – exchanges of *balancing energy* and/or *reserves* between *control areas* and/or between *bidding zones*.
- **Cross-border (Transmission) Capacity** – a capacity to transfer the energy from one congestion management *bidding zone* to another one.

- **Day-Ahead** – market timeframes where commercial transactions are executed one day ahead of the day of delivery of traded products.
- **Demand response** – Changes in electric usage by end-use consumers from their normal load patterns in response to changes in electricity prices and/or incentive payments designed to adjust electricity usage, or in response to the acceptance of the consumer's bid, including through aggregation.
- **Frequency containment reserves** – operating *reserves* necessary for constant containment of frequency deviations (fluctuations) from nominal value in order to constantly maintain the power balance in the whole synchronously interconnected system. Activation of these *reserves* results in a restored power balance at a frequency deviating from nominal value. This category typically includes operating *reserves* with the activation time up to 30 seconds. Operating *reserves* of this category are usually activated automatically and locally.
- **Frequency restoration reserves** – operating *reserves* used to restore frequency to the nominal value and power balance to the scheduled value after sudden system *imbalance* occurrence. This category includes operating *reserves* with an activation time typically up to 15 minutes (depending on the specific requirements of the synchronous area). Operating *reserves* of this category are typically activated centrally and can be activated automatically or manually. In these Framework Guidelines, automatically activated reserves refer to reserves activated by an automatic controller.
- **Gate Closure Time** – deadline for the participation to a given market or mechanism.
- **Imbalances** – 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*.
- **Imbalance Settlement** – a financial settlement mechanism aiming at charging or paying *BRPs* for their imbalances.
- **Imbalance Settlement Period** – time unit used for computing *BRPs'* *imbalances*.
- **Intraday** – market timeframe beginning after the *day-ahead gate closure time* and ending at the *intraday gate closure time*, where commercial transactions are executed prior to the delivery of traded products.
- **Merit Order List** – in the *balancing* markets a *merit order list* is a list of all valid *balancing* bids submitted by *BSPs* and sorted in order of their bid prices.
- **Program Time Unit** – time unit used for scheduling and programs.
- **Replacement Reserves** – operating *reserves* used to restore the required level of operating *reserves* to be prepared for a further system *imbalance*. This category includes operating *reserves* with activation time from 15 minutes up to hours.
- **Reservation of cross-border transmission capacity** – a portion of available *cross-border capacity* which is reserved for cross-border exchange of *balancing reserves* and thus is not accessible to market participants for cross-border energy trade.

All defined terms are in *italic* in these Framework Guidelines.

1.4 Application

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.

The Network Code on Electricity Balancing shall be without prejudice to the Member States' rights to maintain or introduce more detailed measures, provided such measures are compatible with the provisions of the Network Code on Electricity Balancing.

The Network Code on Electricity Balancing shall also be without prejudice to the Member States' rights to establish national network codes which do not affect cross-border trade, in accordance with Article 8(7) of the Electricity Regulation, provided such national codes do not prevent the application and implementation of the Network Code on Electricity Balancing.

The Network Code on Electricity Balancing shall concur with the competences of National Regulatory Authorities (hereinafter referred to as "NRAs"), deriving from Article 37(6)(b) of the Electricity Directive, to fix or approve, sufficiently in advance of their entry into force, at least the methodologies used to calculate or establish the terms and conditions for the provision of *balancing services*. Such fixing or approval shall be realised according to objective, non-discriminatory, fair and transparent procedures, including public consultations with relevant stakeholders. The terms and conditions or the methodologies referred to in the Network Code on Electricity Balancing shall be approved or fixed by NRAs on this basis.

NRAs shall, when approving or fixing terms and conditions or methodologies pursuant to this Network Code which are based on a common proposal which involves more than one jurisdiction, consult and closely cooperate with each other in order to reach an agreement. The Network Code on Electricity Balancing shall provide criteria for the elaboration and adoption of common methodologies, terms and/or conditions, as well as the deadline for submission to NRAs and the Agency, where relevant.

The Network Code on Electricity Balancing shall be without prejudice to the competences and powers of NRAs pursuant to the Electricity Directive, particularly pursuant to its Articles 35 et seq., which notably include, further to the competences regarding the terms and conditions, or at least the methodologies for their calculation or establishment, for the provision of *balancing services* in accordance with the above, competences and powers for monitoring, disputes settlements and information requests.

Where relevant, the Network Code on Electricity Balancing shall require that NRAs approve, reject or request to amend the proposed terms and conditions, methodologies or any other procedures related to *balancing*:

- within three months after having received a proposal if the approval process concerns only one NRA;
- within six months after having received a proposal if the approval process concerns more than one NRA.

The Network Code on Electricity Balancing shall be applied taking into account possible public service obligations in application of Article 3 of the Electricity Directive and without prejudice to the regulatory regime for cross-border issues pursuant to Article 38 of the Electricity Directive.

The standards and requirements of the Network Code on Electricity Balancing shall apply after the expiration of a transitory period to be determined in the Network Code on Electricity Balancing, unless specified otherwise in these Framework Guidelines. The determination of the transitory period shall be subject to consultation with the relevant stakeholders. This period shall not exceed two years, starting on the day of entry into force of the Network Code on Electricity Balancing.

The standards and requirements of the Network Code on Electricity Balancing shall also apply to existing agreements related to electricity *balancing* that were concluded between *TSO* and relevant grid users (such as *Balance Responsible Party (BRP)* and *Balance Service Provider (BSP)*) before the expiration of the transitory period.

1.5 Derogations

The Network Code on Electricity Balancing shall describe the process and criteria to apply for derogation. This process is applicable to *TSOs* which would be unable to implement some provisions of the Network Code on Electricity Balancing within the timeframe(s) required by the Network Code on Electricity Balancing for the reason that:

- a) either the concerned *TSO* would be, at the day of entry into force of the provisions it requests derogation from, in a significantly different situation from other *TSOs* in Europe in terms of national balancing arrangements;
- b) or the implementation of the provisions for which derogations is requested would result in significant problems in *balancing* the *control area* of the concerned *TSO*.

Where granted, derogations shall allow *TSOs* to benefit from transitional arrangements for the implementation of provisions.

The Network Code on Electricity Balancing may allow for derogation for a maximum period of 2 years and shall specify the provisions for which the derogation can be granted. When identifying these provisions ENTSO-E shall provide detailed justifications with regard to the conditions mentioned in the first paragraph of this section.

The Network Code on Electricity Balancing shall require that the application process for derogations is completed prior to the day of application of the relevant provisions. An application process starts when the *TSO* concerned has filed an admissible application.

The Network Code on Electricity Balancing shall provide that the derogation process is transparent, non-discriminatory, non-biased, well-documented and based on a reasoned request demonstrating the fulfilment of the conditions mentioned above.

The format and content of the reasoned request shall be prescribed in the Network Code on Electricity Balancing. The Network Code on Electricity Balancing shall prescribe that the reasoned request shall also include a detailed plan and timeline as to how the *TSO* requesting derogations shall address the reasons underlying its request for derogation and thus ensure the implementation of the concerned provision of the Network Code on Electricity Balancing after expiration of the derogation period. The reasoned request shall additionally take into account the consequences on adjacent markets and the fact that the derogation shall not jeopardise the integration of *balancing* markets across Europe.

During the derogation application process, the concerned *TSO* shall be deemed as compliant.

The Network Code on Electricity Balancing shall require that the relevant *NRA* decides within 6 months on whether to grant the derogation, based on the *TSO's* reasoned request. In assessing the request for the derogation, the relevant *NRA* shall consider the following aspects:

- difficulties of implementing the concerned provisions due to the specificities of the *TSO's* situation, in terms of national *balancing* arrangements;
- risks and/or implications of the concerned provisions, in terms of operational security;

- actions taken by the *TSO* to facilitate the implementation of the concerned provisions;
- impacts of non-implementation of the concerned provisions, in terms of non-discrimination and competition with other European market participants, in particular as regards *demand response* and renewable sources of energy;
- impacts on overall social welfare;
- impacts on other control areas and overall consequences on European market integration process.

The Network Code on Electricity Balancing shall require the communication of the *TSO*'s reasoned request to the *Agency*.

The *NRA* shall notify the *Agency* and the European Commission of their decision and publish it on its web page.

Each *NRA* shall also maintain a register in which derogations are recorded, together with the reasons for their granting and the consequences of the derogations.

1.6 Agency involvement

The Network Code on Electricity Balancing shall provide that ENTSO-E or *NRA(s)* or *TSO(s)* directly, as relevant, submit to the *Agency*, without delay, all the relevant information and documents related to the opening of any approval or fixing procedure by *NRA(s)*, as provided for in Sections 1.5, 2.2, 3.2, 3.3.1, 3.3.2, 3.4.1, 4.2 and 4.3 of these Framework Guidelines. The Network Code on Electricity Balancing shall also require relevant *NRA(s)* to inform the *Agency* of the outcome of any approval or fixing procedures.

The opening of any approval or fixing procedure shall not affect the *Agency*'s right under Article 7 of Regulation (EC) No 714/2009 to propose an amendment of the Network Code on Electricity Balancing at any time, either on its own initiative or following a proposal by persons who are likely to have an interest in the Network Code on Electricity Balancing.

If the *Agency* initiates an amendment procedure within two months of having been informed of the opening of any approval or fixing procedure, the *Agency* may recommend and the *NRA(s)* may decide to postpone or discontinue the approval or fixing procedure.

The competences of the *Agency* pursuant to Regulation (EC) No 713/2009, and particularly its Articles 4, 6, 7 and 8, shall remain unaffected. With respect to the *NRA* decisions referred to in Sections 1.4, 1.5, 3.3.2, 3.4.2 and 4.3 of these Framework Guidelines, the provisions of Articles 5 and/or 7(4) of Regulation (EC) No 713/2009, as relevant, apply.

2 General principles

2.1 General principles pursued in the Network Code on Electricity Balancing

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. This section describes the principles for ensuring and facilitating an integrated *balancing* market across Europe.

The specifications for national *balancing reserve* and *balancing energy* procurement and *cross-border balancing* exchanges shall pursue the following objectives:

- safeguarding operational security;
- fostering competition, non-discrimination and transparency in *balancing* markets;
- facilitating wider participation of *demand response* and renewable sources of energy;
- increasing overall social welfare and efficiency;
- promoting *cross-border balancing* exchanges.

In addition, it shall be ensured that these specifications are consistent and take into account interactions with other market timeframes (e.g. *intraday*, *day-ahead*).

2.2 Role of TSOs in balancing

The Network Code on Electricity Balancing shall clearly specify the roles and responsibilities of TSOs regarding electricity *balancing*, including the tasks and requirements specified in this section.

TSOs are responsible for organising *balancing* markets and shall strive for their integration, keeping the system in balance in the most efficient manner and following the general objectives defined in Section 2.1 of these Framework Guidelines. To do so, they shall work with each other in close cooperation and coordinate their activities as much as necessary.

The Network Code on Electricity Balancing shall require that each TSO is responsible for procuring the required *balancing services* from BSPs and is not allowed to offer the *balancing services* itself except, subject to NRA's approval, if system security is threatened due to insufficient bids from BSPs.

The Network Code on Electricity Balancing shall define common principles for the procurement of *reserves* and *balancing energy* in order to ensure that:

- it is non-discriminatory, fair, objective, transparent and market based;
- it is set to foster liquid *balancing* markets and avoid undue entry barrier for new entrants;
- undue distortions within the internal market and in particular between adjacent markets that use different procurement mechanisms are avoided.

2.3 Terms and conditions related to balancing

The Network Code on Electricity Balancing shall require that TSOs, or other responsible entity where relevant, define terms and conditions related to *balancing* in accordance with the Network Code on Electricity Balancing and European and national legislation.

The Network Code on Electricity Balancing shall require that these terms and conditions include reasonable and justified requirements for BSPs and BRPs. The Network Code on Electricity Balancing shall provide that TSOs are responsible for defining the modalities to be applied to BSPs, in the case of non-compliance with technical and contractual requirements, within the terms and conditions.

The Network Code on Electricity Balancing shall allow for the aggregation of – at least – small units (demand and/or generation) within a *control area* to offer *balancing services*. The conditions for aggregation shall be described in the terms and conditions to be approved by NRAs after public consultation.

The Network Code on Electricity Balancing shall require that the terms and conditions related to *balancing* allow for load entities (whether through aggregators or not) as well as generation units from renewable and intermittent energy sources to become BSPs. These terms and conditions,

including the underlying requirements, shall, in particular, be set in order to facilitate the participation of *demand response*, renewable and intermittent energy sources in the *balancing* markets, while respecting the other objectives mentioned in Section 2.1 of these Framework Guidelines.

The Network Code on Electricity Balancing shall require *TSOs* to establish a framework for discussion with and disseminating information to the relevant stakeholders, as well as a formal process for public consultation and the possibility for *BSPs* and *BRPs* to propose amendments to the terms and conditions related to *balancing*. *TSOs* shall coordinate with other system operators (including neighbouring *TSOs*, distribution system operators or gas system operators where applicable) when elaborating the terms and conditions.

The Network Code on Electricity Balancing shall require that the terms and conditions related to *balancing*, including the rules and tariffs, shall be established pursuant to a methodology compatible with the competences of NRAs pursuant to Article 37(6)(b) of the Electricity Directive to fix or approve, sufficiently in advance of their entry into force, at least the methodologies used to calculate or establish the terms and conditions for the provision of *balancing services*. The Network Code on Electricity Balancing shall specify that the provisions and process described in Section 1.4 of these Framework Guidelines apply in this case. When submitting the terms and conditions to NRAs, the *TSOs*, together with other responsible entities, where relevant, shall enclose, the results of the consultation with the stakeholders, where appropriate. In this context, the notion of tariffs refers to modalities to recover costs linked to *balancing* (e.g. *imbalance settlement*, *balancing charges*, *balancing services costs*).

The Network Code on Electricity Balancing shall require that *TSOs*, when consulting stakeholders on terms and conditions, methodologies or any other procedures related to *balancing*, give at least four weeks to stakeholders to provide their consultation responses.

The Network Code on Electricity Balancing shall require *TSOs* to ensure that all parties subject to those terms and conditions related in the *control area*, including *BSPs* and *BRPs*, meet the requirements set in the terms and conditions for *balancing* markets to ensure operational security of the system.

In case the Network Code on Electricity Balancing shall refer to cost recovery, it shall be without prejudice to the competences and powers of NRAs pursuant to the Electricity Directive, in particular its Article 37(1)(a), while the recovery of costs shall be limited to efficiently incurred costs.

2.4 Transparency

The Network Code on Electricity Balancing shall require *TSOs* to make sure that, at least, the following information is published on a public website:

- the terms and conditions related to *balancing*, both *reserves* and *balancing energy*, including rules and tariffs;
- the information related to the requirement for becoming a *BSP* or a *BRP*;
- the necessary data to ensure an economically-efficient functioning of *balancing* markets and to provide symmetrical information to all interested market parties: this includes volumes and prices of procured reserves, volumes and prices of all *balancing energy* bids – possibly in an aggregated and anonymous format – as well as volumes and prices of activated *balancing energy* bids of the previous *imbalance settlement period*; timing for publication shall be shortened in order to ensure that interested market parties are able to take this information into account in an efficient manner and shall not be longer than one hour.

This information shall be provided in English, at least, and shall be made available in an efficient manner and gathered in a single interface.

The Network Code on Electricity Balancing shall ensure an adequate level of transparency for market participants, taking into account ERGEG final advice on Comitology Guidelines on Fundamental Electricity Data Transparency and in consistency with the Comitology Guidelines on Fundamental Electricity Data Transparency once adopted.

2.5 Reporting and monitoring

The Network Code on Electricity Balancing shall require that TSOs develop tools ensuring real-time monitoring of performance and quality of *balancing* in order to maintain their area control error inside a defined range corresponding to each *control area*, in accordance with the provisions of Network Code on Load Frequency Control and Reserves.

The Network Code on Electricity Balancing shall require ENTSO-E to publish an *annual report* monitoring, describing and analysing the implementation of the Network Code on Electricity Balancing, as well as the progress made in terms of harmonisation and integration of *balancing* markets.

The *annual report* shall also include some indicators measuring the efficiency of electricity *balancing* (for each *control area* if applicable), such as:

- a) availability of balancing resources (reserves, availability distribution);
- b) total costs of *balancing* (balancing energy price distribution, activated *balancing energy*, procurement of *reserves*);
- c) quality of balancing (e.g. Area control error open loop, area control error, unintentional deviations);
- d) welfare gain due to cross-border exchanges of *balancing energy* and *reserves*.

Sections 3.2, 3.3.1, 3.3.2, 3.4.1, 3.4.2, 4.3 and 5.3 also specify some topics that are required to be included in this *annual report*.

The Network Code on Electricity Balancing may foresee that a more detailed version of the *annual report* is published every two years and that, for the years in between, a simpler version is published to review the progress made and update indicators, without performing detailed analyses.

The Network Code on Electricity shall include a process to review the modalities of publication of the *annual report* after the target models are implemented.

2.6 Cost-benefit analysis

The Network Code on Electricity Balancing shall describe the process for carrying out cost-benefit analysis.

This process shall require that, when TSOs are planning to carry out such an analysis, they shall first submit the criteria and the methodology to the relevant NRAs for approval. These criteria and the methodology shall be consistent with the general principles and objectives set out in these Framework Guidelines.

TSOs shall then provide the results of the cost-benefit analysis to the relevant NRAs, together with justified proposals on how to tackle possible issues identified by the cost-benefit analysis. On that basis, the relevant NRAs shall decide on the way forward after public consultation.

3 Procurement of *balancing services*

3.1 Role of *BSPs* in *balancing*

BSPs shall meet the requirements set in the terms and conditions adopted by the *TSO*. They shall ensure the proper functioning of all services to the extent they have committed to.

BSPs shall provide all necessary data and information needed by the *TSO* and/or distribution system operator to evaluate the *balancing* service provided, at both the pre-qualification stage¹ and real-time operation of the system.

This data and information shall make it possible for *TSOs* to ensure that *BSPs* meet all the above-mentioned requirements, including those relating to the availability of the proposed *balancing* service and real-time performance of the *balancing* service provided.

3.2 Standardisation of products

The Network Code on Electricity Balancing shall require a standardisation of *balancing energy* and *balancing reserve* products used to balance the system in line with the objectives mentioned in Section 2.1 of these Framework Guidelines. The Network Code on Electricity Balancing shall list the standard characteristics, which define *balancing energy* and *balancing reserve* products.

The Network Code on Electricity Balancing shall require that all *TSOs* prepare a common proposal for standard *balancing energy* and *balancing reserve* products, including detailed specifications of their characteristics. The Network Code on Electricity Balancing shall set forth a process to define, review and update the list of standard products, which includes a public consultation with market participants. The process shall foresee a proposal from all *TSOs* to all NRAs and the Agency. The Network Code on Electricity Balancing shall specify that the provisions and process described in Section 1.4 of these Framework Guidelines apply to the approval of the list of standard *balancing energy* and *balancing reserve* products and of its subsequent updates. The first proposal shall be submitted to the Agency and to all NRAs, no later than one year after entry into force of the Network Code on Electricity Balancing.

The characteristics of standard products (e.g. technical constraints, speed of activation, minimum bid size, etc.) shall satisfy the needs of *TSOs*, in order to balance the system and take into account the technical characteristics of available *balancing* resources across Europe, in particular from demand and renewable generation units, as well as smaller generation units. When defining these products, *TSOs* shall foster cross-border competition and avoid undue market fragmentation.

The Network Code on Electricity Balancing shall also allow for specific *balancing energy* and *balancing reserve* products, if the resources from standard products would not be sufficient to balance the system, and if this does not create significant inefficiencies and distortions in national or cross-border adjacent markets. In such cases, *TSOs* using these specific products shall justify the existence of these products and seek the approval or fixing of the relevant NRAs.

¹ The pre-qualification stage refers to a possible step for a *TSO* to test and validate the capability of a potential *BSP* to actually provide the *balancing services* considered

In addition, they shall publish the information on the volumes of specific products available and actually activated, and analyse in the *annual report* the costs and benefits, and the possible inefficiencies and distortions of having these specific products in terms of competition and market fragmentation, facilitation of *demand response* and participation of renewable energy sources, integration of *balancing* markets and side-effects on other electricity markets.

TSOs shall make specific *balancing energy* products available for cross-border exchanges. In case these products cannot be activated by other TSOs, they shall still be made visible to them.

3.3 Activation and cross-border exchanges of *balancing energy*

Unless specified otherwise, the following section refers to *balancing energy* from *frequency restoration reserves* and *replacement reserves*, and does not address the *balancing energy* used from *frequency containment reserves*.

3.3.1 Activation of *balancing energy*

The Network Code on Electricity Balancing shall provide that the bids from the *merit order list* are activated through a non-discriminatory, fair, objective and transparent mechanism which optimises the use of *balancing* resources and of the transmission infrastructure and minimises the costs of balancing whilst taking into account technical and network constraints. This mechanism shall be described in the terms and conditions mentioned in Section 2.3. Deviation from the *merit order* shall be reported transparently.

The Network Code on Electricity Balancing shall foresee that the activation of *frequency restoration reserves* (in particular when manually activated) and *replacement reserves* is coordinated in order to allow efficient utilisation and arbitrage between these *balancing* resources across markets.

The Network Code on Electricity Balancing shall require the harmonisation of the pricing method for *balancing energy* products, which shall ensure an economically efficient use of *demand response* and other *balancing* resources subject to operational security limits and shall give correct price signals and incentives to market participants. The Network Code on Electricity Balancing shall set forth a process to define, review and change the common pricing method. This process shall include public consultation with market participants. Further, it shall foresee a proposal from all TSOs to all NRAs and the Agency. The Network Code on Electricity Balancing shall specify that the provisions and process described in Section 1.4 of these Framework Guidelines apply to the approval of the common pricing method and of any subsequent revisions. The Network Code on Electricity Balancing shall provide that the initial proposal for the pricing method shall be submitted to the Agency and all NRAs no later than one year after the entry into force of the Network Code on Electricity Balancing and shall be based on marginal pricing (pay-as-cleared), unless TSOs provide all NRAs with a detailed analysis demonstrating that a different pricing method is more efficient for EU-wide implementation in pursuing the general objectives defined in Section 2.1.

The Network Code on Electricity Balancing shall allow *BSPs* to place and/or update their bids as close to real time as possible and at least up to one hour before real time. It shall take into account system security and the *gate closure times* of the other cross-border energy markets and it shall promote the liquidity of markets.

The Network Code on Electricity Balancing shall give the possibility for *TSOs* to require information on unused generation capacity and other *balancing* resources after *day-ahead* and *intraday* markets, and/or require *BSPs* to offer this capacity in the *balancing* markets, subject to

approval or fixing of the respective NRAs. The Network Code on Electricity Balancing shall require TSOs to perform and share, amongst themselves, close-to-real-time short-term predictive forecasts of system conditions (generation, load, reserve requirements, transmission network, etc.) in a harmonised way, in order to coordinate and optimise the *balancing* actions taken.

The Network Code on Electricity Balancing shall oblige TSOs to allow the participation of *balancing* resources to provide *balancing energy*, without having a contract for *reserves*, at least for resources that are used as *replacement reserves* and manually activated *frequency restoration reserves*.

The Network Code on Electricity Balancing shall require ENTSO-E to assess, in the *annual report*, the progress in harmonisation of *balancing* products and rules for activation of *balancing energy* and integration of *balancing* markets, as well as the progress in terms of social welfare and economic efficiency. The *annual report* shall also analyse the effects of remaining non-harmonisation.

3.3.2 Cross-border exchanges of balancing energy

The Network Code on Electricity Balancing shall set all necessary features to facilitate the development of cross-border exchanges of *balancing energy* and stipulate that these are made possible on every border.

Firstly, the Network Code on Electricity Balancing shall oblige TSOs to coordinate in order to minimise, when economically efficient, counteracting activation of *balancing energy* between *control areas*, taking into account *cross-border capacities* (i.e. netting of system *imbalances*).

Secondly, the Network Code on Electricity Balancing shall oblige TSOs to coordinate and optimise the activation of *balancing energy* from resources that are used as *replacement reserves* and manually activated *frequency restoration reserves*.

Thirdly, the Network Code on Electricity Balancing shall oblige TSOs to coordinate and optimise the activation of *balancing energy* from resources that are used as automatically activated *frequency restoration reserves*.

To achieve these steps, the Network Code on Electricity Balancing shall define that exchanges of *balancing energy* are to be based on a TSO-TSO model with common *merit order list*. In this model, TSOs share their *balancing* resources and optimise their activation in order to minimise the cost of *balancing* by gathering *balancing* bids and offers, that have been submitted by BSPs in their *control areas*, into a common list and activate them according to the common *merit order list* taking into account technical constraints and operational security limits, including the availability of transmission capacities. Access of *balancing* bids and offers to the common list and their activation shall be non-discriminatory, fair, objective and transparent. The Network Code on Electricity Balancing may allow for a different common *merit order list* at least for automatically, where relevant, and manually activated reserves. An optimisation process may be used to allow for a concrete and efficient implementation, and the use of common *merit order lists* with different products and technical constraints.

The Network Code on Electricity Balancing shall provide a full description of the models for exchanging *balancing energy*, including the prerequisites (e.g. contractual or operational) and the technical requirements to implement them. In particular, the Network Code on Electricity Balancing shall describe:

- the principles according to which TSOs share and activate *balancing* bids and offers. These principles shall ensure non-discrimination and avoid distortions between markets.

- The declination of these principles at the national level shall be non-discriminatory, objective, fair and transparent, and submitted to NRAs for approval or fixing;
- the adaptation of processes needed to allow for exchanging *balancing energy*;
 - the settlement rules between *TSOs*;
 - the responsibilities of the different parties involved.

The Network Code on Electricity Balancing shall foresee that the settlement rules between *TSOs* include financial compensation for *balancing energy* exchanged implicitly, in particular due to the netting of system *imbalances* and due to unintentional deviations (difference between the *control area* schedules and tie-line flows), based on the prices of *balancing energy*.

The Network Code on Electricity Balancing shall define standard features for the exchange of *balancing energy*, both from *replacement reserves* and from *frequency restoration reserves* – including the products needed and the characteristics of a common optimisation process – so as to ensure compatibility between different implementation projects towards the solutions required in these Framework Guidelines. The Network Code on Electricity Balancing shall oblige the *TSOs* involved in different *cross-border balancing* projects to work in close coordination so that these projects remain compatible in terms of systems, governance etc. in order to ensure efficient convergence of these projects. The Network Code on Electricity Balancing shall oblige ENTSO-E to report to the *Agency* as soon as incompatibilities are identified.

The Network Code on Electricity Balancing shall require that for each project the implementation model for cross-border balancing exchanges is submitted to the relevant NRAs for approval or fixing, after public consultation.

Cross-border exchanges of balancing energy from replacement reserves and manually activated frequency restoration reserves

The Network Code on Electricity Balancing shall require that, no later than two years after its entry into force, the multilateral *TSO-TSO* model with common *merit order list* is implemented for the exchange of *balancing energy* from resources that are used as *replacement reserves*.

The Network Code on Electricity Balancing shall require that, no later than four years after its entry into force, the multilateral *TSO-TSO* model with common *merit order list* is extended to *balancing energy* from resources that are used as manually activated *frequency restoration reserves*.

The Network Code on Electricity Balancing shall foresee that, at these stages, *TSOs* may decide not to share a certain amount of the most expensive *balancing energy* bids gathered in their *control area* in the common *merit order list*.

The Network Code on Electricity Balancing shall specify the criteria and general methodology for defining the volume of unshared bids, which shall take into account the availability (e.g. using a statistical or probabilistic approach) of the bids from the common *merit order list*. If specific products cannot be activated by other *TSOs*, they can also be considered as part of unshared bids. However the total volume of unshared bids (*i.e.* most expensive and specific) shall not exceed the volumes of *reserves* defined by the dimensioning rules foreseen in the Network Code on Load Frequency Control and Reserves. The methodology shall avoid any free-riding behaviour from participating *TSOs* and allow for a reciprocal and efficient sharing and activation of *balancing* resources.

The Network Code on Electricity Balancing shall impose that the definition and application of the methodology at the national level is submitted to public consultation and that each *TSO* justifies

the volume of unshared bids and seeks the approval or fixing of NRAs. The methodology and its application may be reviewed and updated every year to improve its efficiency, after public consultation and NRA's approval or fixing.

The Network Code on Electricity Balancing shall require, no later than six years after its entry into force, TSOs to be obliged to share, in a European-wide *TSO-TSO* model with common *merit order list*, all *balancing energy* bids from resources that are used as *replacement reserves* and manually activated *frequency restoration reserves*. The Network Code on Electricity Balancing shall require that, if TSOs identify certain features of this target which are not feasible or do not ensure positive net benefit, they shall prepare a proposal for modification of these features no later than three years after the entry into force of the Network Code on Electricity Balancing. This proposal shall be consulted with market participants and supported by a thorough cost-benefit analysis and justification of each proposed modification. The proposal shall be submitted to all NRAs and the Agency. The Network Code on Electricity Balancing shall specify that the provisions and process described in Section 1.4 of these Framework Guidelines apply to the approval of the modification of the above-referred features.

Cross-border optimised activation of balancing energy from automatically activated frequency restoration reserves

The Network Code on Electricity Balancing shall require that, no later than two years after its entry into force, TSOs coordinate in order to minimise, when economically efficient, counteracting activation of *balancing energy* between *control areas*, taking into account *cross-border capacities* (i.e. netting of system *imbalances*).

The Network Code on Electricity Balancing shall require that, no later than four years after its entry into force, the activation of *balancing energy* from automatically activated *frequency restoration reserves* is coordinated between TSOs in order to optimise their use and reduce *balancing* costs. It shall also be coordinated with the activation of *balancing energy* from manually activated *frequency restoration reserves* and *replacement reserves* to ensure the efficient use of all *balancing* resources.

The Network Code on Electricity Balancing shall require that all TSOs elaborate a proposal on the target model for the exchanges of *balancing energy* from automatically activated *frequency restoration reserves*. This proposal shall be consulted with market participants and submitted to all NRAs and the Agency no later than three years after the entry into force of the Network Code on Electricity Balancing. The Network Code on Electricity Balancing shall specify that the provisions and process described in Section 1.4 of these Framework Guidelines apply to the approval of the target model for the exchanges of *balancing energy* from automatically activated *frequency restoration reserves*. The proposal shall ensure the activation of the most efficient resources across large areas and positive net benefits of implementation. It shall be based on the *common merit order list* or another approach, for which TSOs are able to demonstrate a higher efficiency based on the comparison between economic net benefits and implementation as well as related operational costs. When elaborating this proposal, TSOs shall ensure a proper level of stakeholder involvement.

Unless otherwise decided by all NRAs, the proposed model shall be implemented no later than six years after the entry into force of the Network Code on Electricity Balancing.

The Network Code on Electricity Balancing shall specify that ENTSO-E shall include, in the *annual report*, an assessment of the progress of coordinating the activation of *balancing energy* from *frequency restoration reserves* and from *replacement reserves* and clearly address in the *annual report* the status of the projects in which each TSO is involved.

3.4 Procurement and exchanges of contracted reserves

This section only deals with *balancing reserves* – both *frequency restoration reserves* and *replacement reserves* – contracted in advance by *TSOs*. The Network Code on Electricity Balancing shall foresee that *TSOs* can contract *reserves* ahead of real time to ensure that a sufficient amount of balancing energy bids is always available to balance their system.

BSPs with a contract for *reserves* shall then bid on the *balancing energy* market. At least in case of contracted manual *reserves*, the corresponding *balancing energy* bids shall be shared in the common *merit order lists*, unless it is specified otherwise when defining the unshared *balancing energy* bids. A similar requirement shall apply to *balancing energy* bids from contracted automatic reserves, in consistency with the target model foreseen in Section 3.3.2.

In this section, the procurement of reserves from *frequency containment reserves* is not considered. However, the principles of cross border exchanges of contracted reserves described in this section shall be applied for the cross-border exchanges of *frequency containment reserves*.

3.4.1 Procurement of contracted reserves

The Network Code on Electricity Balancing shall require *TSOs* to coordinate in determining the amount of *reserves* which is necessary in their *control area*, taking into account requirements from the Network Code on Load Frequency Control and Reserves and potential gains from the sharing of *reserves* and *balancing energy* as foreseen in Sections 3.2.2 and 3.3.2 of these Framework Guidelines. *TSOs* shall publish an annual report in which they shall justify the amount of procured *reserves* with respect to these considerations.

The Network Code on Electricity Balancing shall define common principles for the procurement of *reserves* in order to ensure that it is non-discriminatory, fair, objective, transparent, market-based and economically efficient, and that there are limited distortions between adjacent markets that use different procurement mechanisms. In particular, procurement shall be made for upward and downward reserves separately. However, if it can be demonstrated that social welfare is improved and that it does not hinder the participation of *demand response*, renewable and intermittent energy sources, then a *TSO* may be allowed to combine procurement and to accept additional bids linking upward and downward bids, subject to approval by its *NRA*.

The Network Code on Electricity Balancing shall provide that the timeframes and duration of reserve procurement are defined – for instance, by limiting the duration of reserve contracts – so that it facilitates participation of new entrants, *demand response* and renewable generators as well as small generators. The Network Code on Electricity Balancing shall oblige *TSOs* to procure as many *reserves* as possible in the short term. Any long term procurement shall be thoroughly justified to their *NRA*s and related information shall be published.

The Network Code on Electricity Balancing shall oblige *TSOs* to allow the collateralisation of *reserves*: a *BSP* who contracted with a *TSO* to provide *reserves* shall be allowed to purchase *reserves* from another *BSP* in shorter timeframes, as long as the *TSO* is informed and the other *BSP* is physically able to provide the required *reserve* product. To allow for this, *TSOs* shall define the modalities of collateralisation of *reserves*, which shall be included in the rules and/or modalities of reserve procurement. These modalities shall include responsibility/liability arrangements.

The Network Code on Electricity Balancing shall require that rules and/or modalities of reserve procurement are made public and submitted to NRAs for approval or fixing after public consultation.

The Network Code on Electricity Balancing shall require ENTSO-E to assess the progress of harmonisation of products and rules for procurement of contracted *reserves*, in the *annual report*. This report shall analyse the effects of non-harmonisation.

3.4.2 Cross-border exchanges of contracted reserves

The Network Code on Electricity Balancing shall support cross-border exchange of *reserves*. Cross-border exchange of *reserves* shall respect the requirements defined in the Network Codes on Load Frequency Control and Reserves and on operational planning and scheduling.

The Network Code on Electricity Balancing shall specify that cross-border exchanges of *reserves* are possible only in situations where *reservation of cross-border capacity* is not necessary, or under condition of capacity reservation as defined in the Network Code on Electricity Balancing according to Chapter 4 of these Framework Guidelines. The Network Code on Electricity Balancing shall allow cross-border exchanges of *reserves* without *reservation of cross-border capacity* (e.g. no congestion, probabilistic approach), subject to conditions for system security as set out by the Network Code on Load Frequency Control and Reserves. The Network Code on Electricity Balancing shall oblige neighbouring TSOs to regularly assess the opportunity to exchange *reserves* cross-border without *reservation of cross-border capacity* and report back to their NRAs.

The Network Code on Electricity Balancing shall define and allow the following models for exchanging *reserves*, as well as their prerequisites in terms of coordination, arrangements and guaranteeing operational security:

- to exchange surpluses of *reserves* through a bilateral *reserve* trading model: this model refers to bilateral exchanges of *reserves* between two adjacent areas in which reserve procurement processes have not been integrated, nor harmonised;
- to implement a multilateral *reserve* trading model involving TSOs and BSPs of two or more *control areas*, through a common procurement process: this model refers to multilateral exchanges of *reserve* between two or more adjacent areas in which reserve procurement processes have been harmonised and integrated into a common procurement process.

The Network Code on Electricity Balancing shall also define and allow the sharing of *reserves*. The sharing of *reserves* is a TSO-TSO agreement that allows TSOs under certain conditions to share part of their *reserves* amongst each other. TSOs can take the shared *reserves* made available to them into account, in order to meet individual *reserve* requirements as defined in the Network Code on Load Frequency Control and Reserves, allowing the participating TSOs to size their *reserves* and possibly procure them together in the most efficient manner. The sharing of *reserves* shall allow to diminish the amount of contracted *reserves*, *ceteris paribus*, while keeping the same level of security following the stipulations of the Network Code on Load Frequency Control and Reserves, by using them more efficiently and limiting risks of system *imbalances*. The Network Code on Electricity Balancing shall require that the sharing of *frequency restoration reserves* is envisaged by adjacent TSOs. Where requested, TSOs shall provide their NRAs with a cost-benefit analysis on the implementation of such a model. Based on this analysis, NRAs shall decide on the extent to which sharing of *reserves* shall be implemented.

The Network Code on Electricity Balancing shall oblige TSOs to define modalities for exchanges of *reserves* and to submit them to relevant NRAs for approval or fixing after public consultation.

The Network Code on Electricity Balancing shall impose that these modalities are transparent, objective, fair, non-discriminatory, market-based, and allow for an economically efficient cross-border procurement of *reserves*

The Network Code on Electricity Balancing shall require ENTSO-E to assess the development of cross-border exchanges of contracted *reserves*, in the *annual report*.

4 Reservation and use of *cross-border capacity* for *balancing*

4.1 Underlying grid model and *cross-border capacity* calculation for *balancing*

The Network Code on Electricity Balancing shall impose that, when *balancing* the system and exchanging *balancing energy*, TSOs take into account the physical capabilities of the network and make the most efficient use of these network capabilities. To do so, TSOs shall use a *cross-border capacity* calculation method at least as precise as in previous timeframes. Load flow calculations in *balancing* time-frame shall be considered, if applicable, and TSOs shall avoid any aggregated approach which would deteriorate the economic efficiency of *balancing*, unless it is thoroughly and transparently justified to NRAs and the Agency.

The Network Code on Electricity Balancing shall require that locational information of *balancing* resources is used to further optimise the *balancing* of the system and perform security analysis to avoid internal and *cross-border* congestions. The functioning of common *merit order list* shall technically enable TSOs to benefit from locational information of *balancing* resources.

4.2 Use of *cross-border capacity* for *balancing*

The Network Code on Electricity Balancing shall foresee a mechanism that allows TSOs to allocate *cross-border capacities* for the exchange of *balancing services* on an efficient, market-based, fair, objective, non-discriminatory and transparent basis and, in case of congestion or scarce *cross-border capacities*, price *cross-border capacities* in consistency with other timeframes.

The Network Code on Electricity Balancing shall prohibit any additional charge (except for losses in consistency with other timeframes, if approved by relevant NRAs) for the exchange of balancing energy for TSOs, which use the available transfer capacity after the intraday cross-border gate closure time. This rule shall not prevent cost recovery for exempted interconnectors² – if foreseen in their exemption – if they are used to facilitate the exchange of *balancing energy*, in consistency with other timeframes.

4.3 Reservation of *cross-border capacity* for *balancing*

Frequency containment reserves are shared and commonly activated in synchronous areas; since a reliability margin is foreseen for this purpose, this section does not apply to cross-border exchanges of *balancing energy* from *frequency containment reserves*. In case of cross-border exchanges of *balancing reserves* from *frequency containment reserves*, this section shall apply only in case such exchanges would require an increase of the reliability margin.

The Network Code on Electricity Balancing shall forbid TSOs to reserve *cross-border capacity* for the purpose of *balancing*, except for cases where TSOs can demonstrate that such reservation would result in increased overall social welfare and provide a robust evaluation of costs and

² As defined in Article 17 of the Electricity Regulation.

benefits. The modalities for the assessment of *cross-border capacity* reservation shall be defined in the Network Code on Electricity Balancing, avoiding undue discrimination between *TSOs* and market participants using the *cross-border capacity* in particular with regard to firmness. These modalities shall also take into account, for highly meshed areas with interdependent interconnections, particularities linked to flow based capacity calculation and allocation and the necessary regional coordination.

The Network Code on Electricity Balancing shall require that any decision on *cross-border transmission capacity* reservation for *balancing* is taken on a case-by-case basis, by relevant NRAs supported by a full cost-benefit analysis and market consultation, in a transparent, non-discriminatory, fair and objective manner.

The Network Code on Electricity Balancing shall establish a general methodology for the cost-benefit analysis required to support *cross-border capacity* reservation. The methodology shall, amongst other things, require an assessment of the expected costs and welfare loss on other electricity markets and the expected benefits and welfare gain on *balancing* market, and shall also consider the distribution of both among markets and *TSOs*. The cost-benefit analysis shall, as far as possible, be undertaken on the basis of market data and consider the impacts on neighbouring markets.

The Network Code on Electricity Balancing shall foresee that *TSOs* request a *cross-border capacity* reservation, before the period of reservation, from relevant NRAs for approval or fixing, specifying the reservation period, maximum amount of *cross-border capacity* to be reserved, the expected purpose of the reservation and providing cost-benefit analysis based on the methodology described in the Network Code on Electricity Balancing. Prior to the decision, the relevant NRAs shall consult with market participants. In case *cross-border capacity* is not used for a given purpose, it shall be given to the market at the next allocation, if applicable.

The Network Code on Electricity Balancing shall allow the implementation of a method which combines and co-optimises *cross-border capacity* reservation for *balancing* purposes and *cross-border capacity* allocation for other electricity market purposes. In such cases, the cost-benefit analysis may be simplified and it would facilitate the relevant NRAs' approval or fixing to ensure that social welfare is maximised.

The Network Code on Electricity Balancing shall oblige that the relevant *TSOs* publish:

- before the start of the reservation period - the amount of *cross-border transmission capacity* reserved and the duration of this reservation, as well as the price at which the *cross-border capacity* was reserved, where relevant;
- every day - the actual use of this reserved *cross-border capacity* on a *program time unit* basis.

The Network Code on Electricity Balancing shall require that the relevant *TSOs* provide the data and analyses to their NRAs, if requested, for the purpose of ex-post monitoring of realised costs and benefits.

The Network Code on Electricity Balancing shall require ENTSO-E to prepare and present an ex-post analysis of the realised costs and benefits of all reserved *cross-border capacities*, in the *annual report*.

5 Balance responsibility and *imbalance settlement*

5.1 General principles

The Network Code on Electricity Balancing shall describe that the general objective of *imbalance settlement* in national *balancing* mechanisms is to ensure that *BRPs* support the system's balance in an efficient way and incentivise market participants in keeping and/or helping to restore the system balance.

Imbalance settlement refers to the *imbalance settlement period*, the definition of *imbalance*, *imbalance* calculation and *imbalance* pricing.

The Network Code on Electricity Balancing shall define *imbalance settlement* and ensure that it is made on a non-discriminatory, fair, objective and transparent basis, and that there are limited distortions between adjacent markets induced by differing settlement mechanisms. Settlement mechanisms shall be part of the terms and conditions that are to be fixed or approved *ex ante* by the NRAs, and shall be transparent and published.

The Network Code on Electricity Balancing shall require that *imbalance settlement* rules are defined in a way that supports competition among market participants by creating a level-playing field and does not unduly discriminate against participants without generation or demand inside a *control area*.

5.2 Role of *BRPs*

The Network Code on Electricity Balancing shall specify the role of *BRPs*, including the requirements specified in this section.

All injections and withdrawals shall be covered by *balancing* responsibility.

The *BRPs* shall meet the requirements set in the terms and conditions defined by the *TSO* or an entity responsible for imbalance settlement and contractually agreed upon.

The *BRPs* shall provide all necessary data and information needed by the *TSO* and/or Distribution System Operator to evaluate the *balancing* service needs both for the planning and balance settlement purposes.

The *BRPs* shall ensure the procedures for proper *imbalance* handling. The *BRPs* shall be incentivised to be balanced in real time. *TSOs* and NRAs may also decide to oblige *BRPs* to provide balanced programs in the *day-ahead* timeframe which may be subject to changes in intraday and to incentivise *BRPs* to help to restore system balance.

The Network Code on Electricity Balancing shall impose that generation units from intermittent renewable energy sources do not receive special treatment for *imbalances* and have a *BRP*, which is financially responsible for their *imbalances*.

5.3 *Imbalance settlement*

Imbalance settlement period

The *imbalance settlement period* is the time unit used for computing *BRPs'* *imbalances*. The Network Code on Electricity Balancing shall provide that it is consistent with *program time unit* and encourage *BRPs* to be balanced as close to the physical reality as possible, or help the

system to restore its balance. 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*.

Imbalance calculation

The Network Code on Electricity Balancing shall define harmonised principles for calculating *imbalances*. All *imbalances* shall be subject to compensation via the *imbalance pricing*.

Imbalance pricing

The Network Code on Electricity Balancing shall define the principles for *imbalance settlement pricing*. *BRPs* shall have the right incentives to manage their own balance close to real time. Therefore, *imbalances* shall be settled in a non-discriminatory, transparent, fair and objective way, at a price that provides incentives to *BRPs* to support the system's balance in an efficient way and/or to balance their portfolio before real time actions are necessary from the TSOs and reflects the costs of *balancing* the system in real time. *Imbalance pricing* shall at least include the costs of activated *balancing energy* (from *frequency restoration reserves* and *replacement reserves*) in the *imbalance settlement period*. *Imbalance pricing* shall also take into account the cross-border netting of system *imbalances* and unintentional deviations in order to avoid distortions of incentives or counterproductive incentives. However, *imbalance pricing* shall not include additional costs linked to possible deviations from the *merit order list* to alleviate congestions internal to a *control area*.

The Network Code on Electricity Balancing shall describe the necessary information to be published by the *TSOs* that is needed for *BRPs* to be able to help to balance the system and/or to restore its balance.

The Network Code on Electricity Balancing shall impose that the main features of the *imbalance settlement* are harmonised no later than three years after the entry into force of the Network Code on Electricity Balancing.

The Network Code on Electricity Balancing shall require ENTSO-E to assess the progress of harmonisation of *imbalance settlement* arrangements as well as the consequences and possible distortions due to non-harmonised features in the *annual report*.



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