

## ENTSO-E Response

### ACER Draft Framework Guidelines on Electricity Balancing

Brussels, 22 June 2012

#### EXECUTIVE SUMMARY

The balancing of the electricity system is fundamental to both the efficient functioning of markets and to maintaining security of supply across Europe. Europe's TSOs have already begun to exploit the significant synergies and benefits to customers that can be realised by working more closely together on balancing issues via initiatives such as the Nordic Balancing Market, International Grid Control Cooperation and BALIT, and are committed to continuing to work with each other, with regulators and with stakeholders across the continent to develop a pan-European balancing market. ENTSO-E views the Framework Guidelines (FG) on Electricity Balancing and associated network code as an important step in this process.

However, we consider that the specific characteristics of balancing and the relative immaturity of existing balancing projects need to be kept in mind when developing the network code.

The balancing timeframe involves a single buyer (the TSO) taking actions immediately before real time to ensure security of supply. Therefore, unlike in other timeframes, there is no opportunity to make amendments after the closure of the market. As such, the operational consequences of decisions made in the balancing timeframes are much greater.

From a process perspective, balancing is also not like day ahead or intraday markets where regional projects have allowed stakeholders to work together to develop arrangements, to learn and share lessons from the implementation and operation of those projects and to identify the consequences of different policy choices. In ENTSO-E's view, this experience and analysis is lacking for balancing and, as a result, significant risks of unintended consequence or inefficiencies could arise from seeking to enshrine untested models into a piece of European law.

We have 3 fundamental concerns:

- The net benefits of many of the proposals have yet to be proven. In particular, harmonisation is a trade-off between integrating markets and preserving the flexibility of balancing products, processes and incentives to address current and future needs as well as keeping the secure operation of the system. There is a risk that seeking to push for extensive harmonization before analysis has been undertaken to assess that trade-off, could lead to the inefficient developments of European balancing markets.
- We have concerns about the feasibility of some of the proposals in the FG and firmly believe that a much more in depth assessment of the implications, operational risks and unintended consequences is needed before they could credibly be implemented.
- It is unclear how the proposals in the FG could be applied to European markets where central-dispatch of generation units is applied.

As such we recommend that:

- The FG set out a pragmatic incremental approach which delivers efficiency and security of supply benefits by developing a pan-European balancing market on a step by step basis.
- The transition from one step to another is justified and underpinned by a systematic cost benefit analysis and a full consideration of risks and interdependencies and is informed by practical experience gained through regional projects (which have the potential to deliver significant benefits).
- While having in mind the overall aim of a common internal balancing market, ACER makes sure that the proposals in the FG are compatible with fundamental electricity market design choices like self-dispatch and central-dispatch.

ENTSO-E would be pleased to work with ACER to further explain and develop the important points raised in this response.

## 1 INTRODUCTION

ENTSO-E welcomes the opportunity to comment on the ACER draft FG on Balancing. The FG is an important document which will not only influence the development of a network code on balancing, but will have important implications for operational security and system operation. As such, we urge ACER to consider the arguments and suggestions for change set out in this paper. We begin by raising general comments in this section, we then further expand on our concerns in section 2 before making a series of proposals for change. The questions posed by ACER are then addressed.

### *A shared vision to create efficient pan-European balancing markets*

We agree with the general objectives of the FG and are committed to working collaboratively to develop efficient and effective balancing arrangements across Europe which deliver efficiency benefits and maintain or enhance security of supply.

### *A need to recognise the specificities of balancing & the current state of balancing market development*

ENTSO-E considers that it is important to stress the unique characteristics of balancing and to point out the very different starting points from which the process of developing a pan-European balancing market sets out.

The balancing timeframe involves a single buyer (the TSO) taking actions immediately before real time to ensure security of supply. Therefore, unlike in other timeframes, there is no opportunity to make amendments after the closure of the market. As such, the operational consequences of decisions made in the balancing timeframes are much greater, the need to be able to guarantee that sufficient resources are available is paramount and the interactions with system operations are much more significant than for other market timeframes. The significant risks associated with problems in the balancing timeframe need to be carefully considered and kept firmly in mind when looking to develop markets.

Analysis has shown, and as the maps<sup>1</sup> recently produced by ENTSO-E clearly illustrate, there is no such thing as a pan-European balancing market design in existence today. The design of balancing schemes differs between member states in almost all regards (e.g. what is balancing, the role of the TSO, the role and incentives on market players, the cash-out mechanism etc.) and, while a number of

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<sup>1</sup> [https://www.entsoe.eu/fileadmin/user\\_upload/\\_library/position\\_papers/ENTSO\\_BalancingMaps\\_Final.pdf](https://www.entsoe.eu/fileadmin/user_upload/_library/position_papers/ENTSO_BalancingMaps_Final.pdf)

regional projects (e.g. BALIT, Grid Control Cooperation, Nordic balancing market) have been developed at a regional level and extended to some other countries, there is no experience with the target models proposed by the FG. Therefore, we consider that there is a need to proceed with caution, to take these various factors into account and to draw on the learning effects that will result from concrete implementation projects.

*A level of ambition which does not reflect discussions or development to date*

As ACER is aware, over the past two years ENTSO-E has released a series of position papers advocating target models for the exchange of balancing energy and the exchange of reserves and seeking to explain the challenges involved in developing a pan-European market. We have also published a series of maps setting out the, very different, designs of balancing markets as they exist today. In addition, we understand from the published minutes of the ACER expert group that ENTSO-E members have actively participated in that group and sought to provide useful and constructive suggestions. We are therefore somewhat surprised that the FG does not appear to take these arguments into account and has a far more ambitious scope than advocated by ENTSO-E or, as far as we're aware, discussed in the expert group.

ACER's attempt to set out this long-term vision as Target Models for Replacement Reserves (RR) and Frequency Restoration Reserves (FRR) in the FG, to specify all of the associated harmonisation requirements and to accompany these with fixed implementation times raises a number of fundamental concerns. These fundamental concerns relate to:

- The feasibility of the proposals – which requires careful consideration, particularly to take account of the operational risks which they are likely to give rise to and are not yet well understood.
- The efficiency of the proposals - given the far-reaching implications of the proposed Target Models and the huge effort and cost likely to be involved, we consider that it is important that the net benefits of such target models (and of supporting/intermediary targets) are clearly demonstrated before the project is embarked on.

We acknowledge that the FG allow for the reservation of cross-border capacity for the exchange of balancing resources, provided that increased social welfare can be demonstrated.

*Significant concerns about justification and process*

ENTSO-E also considers that it is necessary to register our concerns about the level of justification which ACER has provided to support its decisions and to note what we consider to be some significant procedural concerns. In particular, we note that the European Commission has commissioned consultants to undertake an impact assessment of options for the harmonisation of balancing markets. As we understand it, the impact assessment will not be publically consulted on and we have concerns that such a potentially important piece of work that may consider many of the issues which ENTSO-E believes need to be assessed in more detail, has not influenced ACER's thinking.

*ENTSO-E advocates an incremental approach*

In recognition of the specificities of balancing, the very different market designs that exist today and the need to further analyse the feasibility and benefits of proposed approaches, ENTSO-E considers that the FG should set out an incremental approach. This approach would proceed with the development of balancing markets in a series of steps, with each step drawing on the results of implementation projects and appropriate analysis of the technical and economic consequences to

ensure the European balancing market develops in an efficient manner. ENTSO-E considers that an incremental approach characterised by strong working relationships between TSOs and regulators and extensive engagement with market players will support the development of a pan-European balancing market which can provide significant benefits in terms of efficiency and security of supply. We note that, despite the considerable work by the ACER expert group on balancing, the issues contained in the Framework Guideline have not benefitted from the level of discussion and development which has happened prior to the development of network codes in other areas (for example day ahead and intraday) and we therefore consider that this approach is appropriate and pragmatic.

## **2 MAIN CONCERNS REGARDING THE FRAMEWORK GUIDELINES**

### **POLICY OBJECTIVES**

In this section, we describe a number of potentially fundamental issues relating to the policy choices in the FG, both from the operational and the market design viewpoints. All the issues developed in this section have a common point in that they may affect the feasibility and proportionality of the policy choices in the FG and require further analysis. Most of them relate to the provisions regarding cross border exchanges of balancing energy and supporting measures.

#### **a) DEGREE OF HARMONIZATION OF PRODUCTS AND PROCESSES**

In this section we discuss issues related to the harmonisation of products, gate closures, and imbalance settlement periods. The harmonisation of settlement rules and imbalance charges are addressed later in this chapter in section c). In general, we support the requirement for some harmonisation of market design and regulatory framework, to the extent necessary to prevent the possible free-riding effects from remaining structural differences between TSOs. We feel however that it is important to note that harmonisation in and of itself cannot be seen as the objective of the FG. Harmonisation should only be pursued to the point where it continues to provide benefits to customers (i.e. to the point where the net benefits of further integration are zero or negative).

The FG foresees the creation of “common standard balancing products with the aim to achieve high liquidity on those products” and the possibility for “specific balancing products” to be justified and approved. The FG also foresees that all such products (standard or specific) should be made available for cross-border exchanges. We have concerns that this approach may not be proportionate and could prove counterproductive in some cases.

First, we would like to stress that the recognition of specific products is a fundamental point. Indeed, harmonisation of products should not be considered as a target in itself but rather as a trade-off between the benefits of integrating markets and the efficiency of adequacy of balancing processes to local specificities (such as dynamic behaviour of generation or load, volatility of resulting imbalances in a specific control area). If a right balance in respect to this trade-off is struck, it will result in net efficiency gains through the use of cheaper resources. If it is not, it can result in net efficiency losses, increased costs of system operation and system reliability issues. We illustrate this point in the text box below for the case of automatic FRR.

<i>Example: The case of automatic frequency restoration reserves</i>
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The dynamic response of the automatic FRR differs between and even within synchronous areas according to the local characteristics of imbalances and the availability and dynamics of providers of automatic FRR. The overall harmonization of automatic FRR would lead, on one hand, to a decrease in the dynamics of automatic FRR provided in control areas with high imbalance fluctuations which would, in all likelihood, result in negative effects on frequency quality and/or an increase in the required volumes and, on the other hand, to a possible lack of automatic FRR providers in control areas with only slower FRR resources.

Besides the individual dynamic response of FRR service providers, harmonisation of the global activation algorithm (merit order activation vs. parallel activation) might have an important negative impact on the resulting global dynamics that has to be thoroughly investigated. For some countries a change from parallel to merit order activation is likely to lead to a significant increase of reserves requirements, which is unlikely to be matched by liquidity from cross border exchanges in the absence of cross border transmission capacity can be reserved, therefore resulting in net costs for that country and for the entire system.

A pan-European harmonization of automatic FRR (especially between different synchronous areas) seems to raise significant questions of technical feasibility and of economic efficiency.

Second, the net benefits of sharing all specific products would need to be further assessed. There are cases in which incremental costs of implementation are likely to be high for low incremental benefits. Again FRR provides a good example.

*Example continued: The case of automatic frequency restoration reserves*

Assuming products and activation algorithms for automatic FRR are not fully harmonised for the reasons described above, an optimized real-time activation of different automatic FRR products being activated differently will require an extremely complex control system depending on the real-time availability of the cross border capacity and interfering with the activation of cross border exchanges of manually activated products. It is questionable whether net benefits of this complex approach are higher than straightforward approaches.

There are fundamental questions about whether a pan-European Common Merit Order (CMO) is a reasonable goal for automatic FRR.

In addition, making specific products available for cross border exchanges could raise reciprocity issues related to the local costs (and as the case may be the related tariffs) of securing such specific products.

Similar issues could arise with harmonisation of gate closure times and/or imbalance settlement period.

We consider that there are strong arguments for assessing the trade-off between the benefits of integrating markets and the efficiency of adequacy of balancing processes to local specificities (which is not done in the impact assessment) as a prerequisite for each target step foreseen in the FG. As regional initiatives such as BALIT have proven, exchanges of balancing energy can be possible without complete harmonisation (even if a minimum is required) via TSO to TSO mechanisms; in such approaches, each TSO has access to un-harmonised local resources, but also to a standardised version of the neighbouring available resources.

## **b) COMPATIBILITY OF A COMMON MERIT ORDER WITH TSOs LEGAL AND TECHNICAL RESPONSIBILITIES**

Interactions between an integrated balancing market and local responsibilities in Load Frequency Control (LFC) are not yet well-understood, but are expected to be very significant, as very few decisions which could impact the local imbalances and the local resources are left to a local TSO.

Balancing markets must be designed in order to ensure full compliance with the requirements of the Operational Network Codes. In that respect we welcome and support the clarifications in section 1.2 of the FG regarding the scope of the various network codes. However, when it comes to the substance of the FG, the concrete implications of respecting principles and requirements from Operational Network Codes seem to be underestimated, and we would like to stress the importance of some of them.

The interconnected European electricity system was built on the basis of mutual trust and cooperation between TSOs. This was achieved by a clear separation of responsibilities: each TSO must comply with common standards, but the way the standards are met is an individual responsibility. The operational and economic improvements in TSO cooperation which have occurred in recent years have been built from and have respected those principles.

In particular, local responsibility of individual control blocks in frequency restoration is a corner stone of the operation of the largest synchronous power system, i.e. Continental Europe, where (contrary to the Nordic market) a decentralised LFC of control blocks is applied. Such control block responsibilities include:

- meeting agreed targets for frequency quality per control block (as a result of imbalances of the control block and activations of balancing energy for that control block).
- securing the amount of reserves required to cover amongst others a dimensioning incident.
- securing a given amount of this reserve specifically within one's control area in line with the rules for geographical distribution.

A key requirement for any model for integrating a balancing market is that it remains compatible with such responsibilities, which are largely dictated by considerations of practical feasibility (in view of the size of the synchronous area) and are essential e.g. to congestion management and to policies governing emergency state.

The target model of a common merit order, and possibly intermediate stages of integration, will interfere with the roles and responsibilities of TSOs in LFC (which will be defined in the Operational Network Codes) in a variety of ways which have not been fully explored today. For instance:

- In a CMO, control reserves may not be available at each time for an individual request as they can be used by other TSOs.
- Depending on the way imbalance charges take into account cross border activations, TSOs may not be in a position to specifically minimise local imbalances using local price signals (see below section c).
- Integrating balancing markets is likely to impact on the behaviour of market participants in energy markets and balancing markets and increase the uncertainty in resulting power flows.
- Introduction of a financial settlement of unintentional deviations will result in new incentives on TSOs - which need to be made consistent with their local responsibilities.

As a result, the respective roles and responsibilities of individual TSOs could become less clear, which could have unforeseen implications, for instance on system security.

A variety of options need to be explored in order to confirm the compatibility of an integrated market while respecting the local responsibility of individual control blocks in frequency restoration (feasibility concern). The sharing of resources via a pan-European CMO will remain subject to intrinsic operational limitations in order to guarantee that each TSO always has access to the adequate amount of reserves (taking into account local and cross-border grid constraints) and for the sake of real-time management of the resulting power flows. Such necessary limitations will have an impact, which is not currently known, on the net benefit of implementing a common merit order (efficiency concern).

### **c) IMPORTANCE OF PRICE SIGNALS**

The efficiency of balancing markets can be enhanced either:

- By reducing the price of activation requests by TSO for balancing purposes, or
- By reducing balancing needs (the volume of residual imbalances to be resolved by TSOs).

While cross border exchanges act on the first driver, the second effect depends on incentives and is therefore closely related to imbalance charges and the development of liquid intraday markets.

ENTSO-E fully supports the provisions in the FG in relation to incentives. In particular we appreciate the statement that the imbalance tariffs should “*give BRPs incentive to support the system’s balance in an efficient way and incentivise market participants in keeping and/or helping to restore the system balance*” and the application of imbalance settlement to all imbalances in a non-discriminatory way.

We would like to go further and stress that well-designed imbalance charges are a corner-stone of efficient balancing markets, as well as a prerequisite for the well-functioning of the intraday and day-ahead markets. We believe that the concept of “balancing” has a larger scope than “*all actions and processes through which TSOs ensure that the total electricity withdrawals are equalled by the total injections in a continuous way*” and also involves the design of incentives for the market to reduce imbalances. In future (and today in some markets) end consumers and local producers may change their normal operating behaviours in response to price signals without explicit requests. Incentives therefore provide a powerful tool to foster the participation of decentralised energy resources and smaller actors and well-designed imbalance charges allow capturing a larger part of the flexibility in the power system at virtually no cost for society.

We see three consequences in relation with the policy objectives of the FG:

- Well-designed incentives and well-functioning intraday markets may already deliver significant benefits in terms of balancing efficiency. This should be taken into account when assessing the incremental benefits of the various steps of integration and harmonization of balancing markets. We note that this has not been covered in the Impact Assessment.
- While cross border exchanges create benefits by making sure that that the cheapest resources are activated (subject to technical and network constraints) this could in turn reduce incentives and increase the need for balancing energy. Both effects, on imbalance prices and imbalance volumes, should be taken into account in assessing the net benefits of the different stages of integration foreseen in the FG. This aspect is missing in the Impact Assessment.
- Principles setting out how implicit and explicit cross border exchanges are taken into account in imbalance prices should be designed with great care for the sake of overall efficiency. Indeed, depending on such design, an activation to solve an imbalance in one control area might trigger an undesired and excessive response in several other control areas. This could lead to further imbalances, increased uncertainty on flows and a resulting increase in reserve

requirements. In that respect, we have concerns about the FG seeking to specify a single pricing methodology. We accept that alternative pricing approaches have different pros and cons but feel that a more detailed analysis needs to be undertaken before it is possible to say with certainty that a marginal pricing system should be implemented across Europe. Factors such as efficiency, market power concerns and consequences on the local signals sent to market players need to be considered and traded off in order to come to a decision about which approach is best. We support however the need consistent pricing principles and suggest to stipulate that this should be defined in the Network Code.

#### **d) PRESSURE ON RESERVE SIZING**

While we understand the objective of creating and promoting liquid markets for balancing energy and of ensuring that the optimal amount of each type of reserves is procured, we are concerned by the underlying pressure in the FG towards a reduction in the level of reserves. While we welcome (and agree with) the clarifications brought in section 1.2 to the scope of the various network codes and the interactions between them, we believe that some implications deserve to be clarified.

There is already today TSO co-operation that enables efficient use of reserves, including the cross-border “sharing” of reserves needed for solving contingencies (to cover the biggest outage of a unit). However, the current frequency quality does not indicate that the volume of reserves being held are excessive. In addition, as ENTSO-E explained in the position paper on “RES Balancing”,<sup>2</sup> the increased penetration of variable renewable generation will increase the need for flexibility in the power system, while reducing the availability of the resources traditionally providing such flexibility (e.g. combined cycle gas turbines).

This is exactly the reason why ENTSO-E believes that the potential of flexible resources in the European power system to provide reserves should be optimally used. In this respect, ENTSO-E warmly welcomes the fact that the FG do not entirely prohibit the allocation of cross border capacity to the balancing timeframe to facilitate the sharing of reserves. ENTSO-E also supports the provisions of the FG regarding the importance of incentives and the financial responsibility for imbalances including from intermittent renewable energy sources.

ENTSO-E also recognises the potential of liquid balancing markets to contribute for optimising the amount of reserves to be contracted in advance. Indeed, probabilistic approaches are already used to size reserves in some areas, as the relative importance of forecast errors vs. contingencies increases. However, we would like to stress that a deterministic element to reserve sizing related, for instance, to the coverage of contingencies (like the potential loss of a production unit) will need to remain. This will limit on practice the possibility to share reserves without reservation of cross border capacity (an option contemplated in the FG), certainly for automatic reserves.

In other words, the potential for a reduction of the total amount of reserves as a consequence of liquid balancing energy markets should not be overestimated

In addition, we are concerned that in the future, TSOs could be incentivised to procure fewer reserves than required to ensure operational security. The risks of a “race to the bottom” for fear of lack of reciprocity and under pressure from NRAs should be avoided. A TSO should not be put in a position that it is directly or indirectly prevented from determining and/or if applicable, procuring the amount of reserves necessary to comply with the requirements in Network Code LFC & R. In particular, where applicable, incentive regulation scheme should not conflict with such requirements.

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<sup>2</sup> [https://www.entsoe.eu/fileadmin/user\\_upload/\\_library/position\\_papers/111104\\_RESBalancing\\_final.pdf](https://www.entsoe.eu/fileadmin/user_upload/_library/position_papers/111104_RESBalancing_final.pdf)



## **e) OPERATIONAL FEASIBILITY**

There is a basic but genuine concern that the complexity of the arrangements required to support a common merit order for balancing energy, combined with the ambitious geographical scope, could go beyond what is practically manageable in real-time operations – or require extremely high costs to ensure that operation of the power system remains reliable and that system operators can adequately monitor it.

In the end, the target models should lead to manageable operational processes, and in particular take into account the need for system operators to constantly monitor the state of the system based on a manageable number of indicators and to react immediately on unexpected grid situations. In order to protect a single point of failure, in the process of imbalance netting or in the activation of reserves from a CMO, and to ensure operational robustness, the geographical scope of cross-border exchange might have to be limited. Again, we believe that the net benefits and risks of a large geographical scope should be assessed more in depth.

## **f) THE NEED TO ALLOW FOR A LEARNING PROCESS**

ENTSO-E understands the rationale for including fixed deadlines in the FG but has some concerns that they may prove to be too inflexible and constrain the development of efficient balancing arrangements, particularly given the many interactions between balancing and other ongoing issues. It is also very difficult and risky to describe detailed requirements for a network code which may apply several years in the future and also when there is such little experience even within smaller regional areas.

As we have previously discussed, we think it would be more appropriate for the network code to define a process closer to a roadmap which identifies the preceding steps and interactions which must be in place in order to further develop balancing markets.

This approach would provide support for a learning process and create an opportunity for a cost benefit analysis and regulatory approval to be undertaken before the project moved to the next stage. We consider that this would allow for a more inclusive and collaborative approach, which creates proportionate and fit-for-purpose arrangements in response to market needs.

## **g) CENTRAL DISPATCH MARKETS**

The FG do not recognise that currently, in some countries, the balancing market design is fundamentally different to the model assumed in the FG. Balancing of electricity in Europe is carried out in several different ways. In order to schematize, for the purposes of this document, there are basically two groups: (i) based on a self-dispatch model, and (ii) based on a central-dispatch model. Central-dispatch models typically occur in electrical systems where the impact of locational market imbalances is a material threat to the security of the system. In such systems, a central-dispatch model can be considered a necessity.

Despite the fact that currently both self-dispatch and central-dispatch models are used in Europe the FG implicitly assumes that a self-dispatch model is the only one that is appropriate for use in Europe. In some countries (e.g. Poland, Ireland and Northern Ireland, Italy, Greece) there is a need for central-dispatch in order to ensure system security and minimum cost of energy delivery to the end consumer. It is not clear what the intent of the FG is in this regard.

### 3 PROPOSAL FOR AMENDMENTS

Section 2 illustrates that there remain fundamental concerns with the feasibility and the net benefits of the policy choices in the FG.

In particular, the detailed design and consequences of a pan-European CMO and supporting harmonisation prescriptions in the FG are not fully known today and their elaboration will require considerable work and will need to be confirmed. We are concerned that, if the target model is inappropriately assessed and justified, individual TSOs and countries could face a significant and potentially intolerable increase in the net costs of balancing their system or, in extreme cases, could even encounter threats to the reliability of their systems. In ENTSO-E's view, experience and analysis is lacking for balancing market integration and, as a consequence, significant risks of unintended consequence or inefficiencies could arise from seeking to enshrine untested models into a piece of European law.

We readily acknowledge that such in-depth impact analysis is difficult to conduct based on the current fairly limited level of experience with balancing market integration. We also acknowledge that ACER is taking this into account to some extent when making the common merit order step conditional with an optional cost-benefit analysis.

ENTSO-E is also convinced of the need to enhance efficiency of European balancing markets in order to integrate a larger share of variable renewable generation in the system while maintaining a high level of security of supply - a challenge which requires a better use of the flexibility in the power systems. On the one hand existing resources should be used in an optimal way, *inter alia* via development of cross-border exchanges, and on the other hand, there is a need to develop (implicit or explicit) access to new and possibly more specific balancing resources in the power system. The former is supported by some standardisation while the latter will require some flexibility in the design of products, processes and incentives. The FG should create the conditions for striking the right balance between both approaches.

Consequently, ENTSO-E considers that the FG can and should be modified in order to deliver a process which will allow the issues raised above to be evaluated and addressed at appropriate points in time. ENTSO-E is committed to continue to work pro-actively to progress towards balancing market integration and harmonisation, and is ready to support a pan-European Common Merit Order as the visionary long-term goal and to guide development. However, given the uncertainties and risks implied, the process must take into account the need to further elaborate the concepts, must recognise the need to further assess the feasibility and desirability of the proposed policy objectives and must provide that alternatives remain possible in the case where such assessment would be negative.

As a consequence of the points raised in section 2, ENTSO-E recommends to:

- **Introduce a systematic cost-benefit analysis and a risk analysis as a prerequisite for each step of integration.**

The cost-benefit analysis should be qualitative and quantitative and should at least include, in addition to the benefits of integration and the costs of implementation, all the considerations raised in section 2. In particular, it should include:

- The implications on price signals and the likely effects on imbalance volumes and price response.
- The potential loss of flexibility and efficiency resulting from increased harmonization of products and processes.

- The intrinsic operational limitations related to real-time operation (real-time congestion management, local responsibilities in securing control reserves, geographical distribution of reserves, practical operational feasibility), and the resulting restrictions on exchanges of balancing energy.
- Any other implications the model might have.

It should reflect the latest market design developments and include experience gained from previous stages of integration. It should specifically analyse the optimal product scope for cross border exchanges in the relevant step of integration. It should look at the net benefits but also at particular impacts on the reliability and costs of individual power systems.

The cost-benefit analysis should be complemented by a risk analysis.

Those analyses could be performed following a similar process as the one described in the FG for the CMO step, but would be a compulsory milestone and apply to each step.

- **Make deadlines relative to each other (instead of absolute) and recognise relevant dependencies (e.g. with intraday market development) in order to allow for a step by step approach.**

In ENTSO-E's opinion, the FG should identify a series of conditions, steps or milestones which will need to be met before each step of integration (CMO with margins for RR, coordination of FRR, and CMO) can be realised. This relates both to the conditions which need to be in place for work to begin, which are mainly related to the level of maturity and experiences gained by implementing the target model in previous time frame, and the steps at which an assessment needs to be made to ensure the approach is proportionate and fit-for-purpose.

In particular, for a CMO, once the intermediate models for both FRR and RR are implemented on a large scale, at least 4/5 years are required before the implementation of a pan-European model in order to allow for observation, cost-benefit and risk analysis and implementation.

Another clear example lies with the intraday market. There is clearly a very significant relationship between the two markets and a need to design them in an integrated and coordinated manner (for example, one might presumably wish to use a single Capacity Management Module for balancing and intraday). However, there is currently little operational experience of a large scale cross-border intraday market and too much room for confusion and inconsistency as well as resource challenges. Therefore, we advocate specifying the completion of a pan European intra-day market as a key milestone before the development of pan European balancing markets.

- **Explicitly recognise the limitations to harmonisation of products and gate closure times (GCTs) and the need for the harmonisation process to be gradual and driven by progress in market integration.**

The FG should acknowledge that harmonisation of balancing is not a target in itself. More specifically, regarding products, the requirement to make all specific products available for exchanges of balancing energy could be disproportionate and in any case may not be required in the first stages if integration. The FG should stipulate that the optimal product scope for each stage of integration should be a part of the cost-benefit analysis to be performed before the relevant stage.

The harmonisation of GCTs for balancing bids might be beneficial and is probably required to some extent, but not necessarily at the date when the code enters into force. The harmonisation and the "as close to real-time as possible" requisite is very challenging and might require a new design of national

balancing markets, new contracts with BSPs and new IT-platforms. Therefore the timeframe of implementation should be considered with reference to the target model and should only be forced to the extent it is necessary to support the integration objective at a given step.

The harmonisation of GCTs for schedules *per se* is not necessary in all markets and ENTSO-E would like to ask ACER to reflect this..

ENTSO-E's view is that moving the settlement period to 30 min (or finer resolution) and further harmonization steps should first be supported by a cost benefit analysis.

➤ **Recognise the specific complexities of automatic FRR compared to manual FRR (see also Question 3)**

As explained in Section 2a), there might be net costs and risks in harmonising products for automatic FRR. Across different synchronous areas, different system dynamics make it probably impossible for system reliability reasons. Even within a synchronous area, the cost of harmonising certain features (i.e. activation algorithms) could be much higher than the gains from exchanges in the absence of cross border capacity reservation. A CMO for automatic reserves combining activation of different products is in our view extremely complex and could actually be impossible.

As a consequence for the Framework Guidelines:

- Considerations driving the costs and benefits of FRR are significantly different for manual and automatic FRR and need to be analysed separately.
- More time should be allowed for development of arrangements for automatic FRR than for manual FRR.
- The FG should allow for other types of cross border exchanges of automatic FRR rather than only merit order activation.

➤ **Further specify some of the key interaction of the proposed schemes with TSOs legal and technical responsibilities.**

The FG should very clearly stipulate that the evolutions in Balancing market design can only take place to the extent they are compatible with complete respect of TSO responsibilities and obligations as defined in the Electricity System Operation Network Codes. In particular:

- The FG should clearly specify that the developments of cross-border exchanges of balancing energy shall always preserve the principle that each TSO, at any moment, needs to have access to sufficient reserve capacity to meet its obligations in the LFC & R Network Code and related multilateral agreements regarding system operation. This is relevant in particular for section 3.2.2 of the FG and the provisions regarding the implementation of a pan-European common merit order;
- Whenever the FG require that TSOs should coordinate and/or optimise balancing actions, then they shall also note that this should not prevent TSOs from fulfilling their individual responsibilities as defined in the Network Code LFC& R. This is relevant in particular for section 3.2.2 of the FG.
- The FG should clearly specify that when determining the amount of reserves for a certain control area, the possibility to take into account cross-border exchanges shall be subject to the limitations defined by the Network Code LFC & R. In addition, this should only be done based on statistically significant observations and therefore after sufficient experience has developed with cross-border exchanges. This is relevant for sections 3.3.1 and 3.3.2 of the FG.

In general, TSOs should not be obliged to establish products or take part in a market that does not promise advantages and would represent a step backwards compared to current market design (e.g. implement longer time products that could compete with the intraday market or impair incentives given by local imbalance charges) especially during the intermediate steps towards the long term target model.

➤ **Further clarify the importance of price signals**

- The FG should not define Imbalance Settlement (see Definitions section) as a mechanism aiming primarily at cost-recovery. The definition should be more general and/or highlight primarily the objective specified at the beginning of section 5.1 of the FG, i.e. “ensure that BRPs support the system balance in an efficient way and incentivise market participants in keeping and/or helping to restore the system balance”.
- The FG should not prescribe a single pricing method. Instead, we suggest the FG stipulate that the Network Code shall define consistent pricing principles, taking into consideration economic efficiency, market power issues, the need to support cross border exchanges and the need to give adequate local signals.

➤ **Clarify the intention with respect to respectively central-dispatch and self-dispatch markets**

When defining the cross-border balancing model, the FG should take into account different balancing models existing in Europe: self-dispatch and central-dispatch.

In general, ENTSO-E supports the introduction of a section on derogations, as some markets may need more time to develop the necessary conditions for application of the future Electricity Balancing Network Code. However, this should not refer to changing the balancing market model from a central-dispatch based model to a self-dispatch based model, as the central-dispatch model is a fundamental market design choice in systems where the impact of locational market imbalances is a material threat to the security of the system.

## 4 OTHER ISSUES TO CONSIDER

This section raises a number of other important questions raised by the draft FG.

### 4.1 THE CONCEPT OF A MERIT ORDER

We interpret the CMO model without margins as an approach in which all balancing energy bids in Europe are contained in the CMO(s). Depending on congestions in the grid, the CMO(s) may be further split into local "non-congested" CMO(s) for activation. TSOs activate balancing energy from the "non-congested" CMO(s).

A common standard product is not always the most economical way to activate balancing energy due to technical features (minimum running time, start-costs, minimum stable generation, etc.). Balancing is an optimisation procedure taking into account technical possibilities and constraints, instead of a purely price based activation from a CMO list. Depending on the expected duration and volume of imbalances, different types of balancing energy products might be activated to optimise the balancing cost

In a similar way, the possibility to take into account locational information (which is rightly foreseen by the FG as part of managing the interactions with real-time congestion management), will limit the extent to which bids can be shared. At an extreme point, in this context, balancing can be compared

to re-dispatching were resources are activated based on location and not so much on the price of bids.

As a result, the Framework Guidelines should recognise that:

- Different CMO lists should be possible for different types of cross border balancing energy products (i.e. automatic FRR and manual FRR).

Due to grid congestions or other local system operations constraints, it should be permissible to activate balancing energy “out of merit order”, i.e. the merit order should not be seen as a simple price-ranking with pure price-based activation; instead, it is a complex optimisation process with a variety of constraints (grid constraints but also product/technical characteristics, and so on), where activation is performed according to technico-economic criteria.

## 4.2 CROSS BORDER CAPACITY RESERVATION AND EXCHANGES OF RESERVES

ENTSO-E welcomes ACER’s decision to facilitate the allocation of some capacity to the balancing timeframe where the benefits of so doing can be demonstrated. ENTSO-E fully agrees that cross-border exchanges of reserves might contribute significantly to increasing social welfare.

We largely support the provision of the FG regarding exchanges of cross-border reserves and the use of cross-border transmission capacity.

We would simply like to highlight three points on which a clarification of the FG would be welcome:

- The FG stipulates two models for exchanging reserves, i.e. “bilateral exchanges of reserves between two adjacent areas” and a common procurement process. It is unclear whether under the former, both TSO-TSO and TSO-BSP (with appropriate coordination with the connecting TSO) arrangements are possible. As regards reserves, as a pan-European target model for exchanges of reserves is not envisaged, we see there is no reason to exclude any option, and in particular no reason to exclude TSO-BSP cross border exchanges. We would welcome such a clarification.
- Section 4.3 of the FG indicates that “In case cross-border capacity is not used for a given purpose, it shall be given to the market at the next allocation.” In the particular context of reservation of cross border capacity for balancing, this sentence is confusing. Indeed the balancing time frame is the last timeframe where cross-border capacity is allocated and thus unused capacity cannot by definition be used for the next allocation. Here it should be clearly recognized that although there is reservation for balancing timeframe the usage of cross-border lines for balancing purposes may be actually be small in practice. However there is also an intrinsic value in reducing the costs of reserves (MW) which is a different product than balancing energy (MWh).
- We think the definition of “sharing of reserves” given in section 3.3.2 is too comprehensive. There could be in principle, opportunities to share reserves (i.e. reduce the total reserve requirements) without necessarily “a common and fully coordinated use and activation of reserves”.

## 4.3 REPORTING REQUIREMENTS

The process of developing an effective pan-European cross border balancing market is highly complex and will require a high level of coordination and cooperation between TSOs and NRAs. Only through on-going discussions and monitoring will it be possible to deliver an approach that meets market players, regulators and TSOs needs. We consider that the existing reporting requirements are inconsistent with this collaborative approach.

The FG require an annual report on progress, with a specific focus on particular elements. We are concerned that this report will divert resource from delivering the requirements of the FG and add little value. We fully support the need to liaise with regulators and market players on a frequent basis and to proceed in an open and transparent manner. We also acknowledge that there may be points, such as those when a decision to move from an intermediate model to a longer term model, when reports will be needed. However, we do not consider that rigid reporting requirements contribute significantly to this process. In some markets, there is an inherent need for very specific balancing products due to the portfolio of plant on the system and the size of the system. The requirement for annual reporting to justify the existence of these specific balancing products seems onerous.

In our view, the need for a more collaborative approach should be acknowledged and we would advocate amending the reporting requirement to ensure the process is more proportionate and also that the reports are produced either bi-annually or only when there is a clear added value of doing so.

#### **4.4 DIRECT APPLICABILITY OF THE CODE TO THIRD PARTIES**

It should be clear in The Electricity Balancing Network Code that these codes are directly applicable to all EU citizens<sup>3</sup> – not just TSOs (see section 1.4). In the same spirit, we think the sentence “the TSOs shall ensure that all users 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 (section 2.3)” should be clarified. All users (including BSPs and BRPs) shall meet the requirements set in the terms and conditions for balancing markets to ensure operational security of the system.

#### **4.5 SCOPE OF RESPECTIVE NETWORK CODES**

In section 3.3.2, the FG should stipulate that the Network Code on LFC & R (and not the Electricity Balancing Network Code) “shall define under which conditions cross-border exchanges of reserves may be allowed without reservation of cross-border capacity”.

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<sup>3</sup> The NC on Balancing (like any other NCs) will also be applicable outside EU- in EEA Member States, Switzerland and the countries that are parties to the Energy Community Treaty.

## ANNEX 1: RESPONSES TO THE QUESTIONS POSED BY ACER

In this section we answer the questions raised by ACER in its consultation. While we have tried to minimise duplication with the points above, some repetition is unfortunately inevitable.

**Question 1:** *Do you consider that harmonization of the pricing method is a prerequisite to establish a TSO-TSO model with common merit order list for balancing energy? Do you support the use of the pay-as-cleared principle?*

ENTSO-E fully supports the need for defining consistent pricing principles as a prerequisite to establish a TSO-TSO model with common merit order list for balancing energy. Whether that implies full harmonisation and a single pricing rule remains to be fully investigated.

The definition of the optimal pricing mechanism (for energy settlement with BRPs on the one hand, and between TSOs on the other hand) is a complex topic because of many interactions with other design aspects of the balancing market, in particular with the primary goal of imbalance tariffs giving adequate local incentives to limit and restore imbalances of a control area.

In particular, principles setting out how implicit and explicit cross border exchanges are taken into account in imbalance prices should be designed with great care for the sake of overall efficiency. This is particularly important when thinking of balancing markets where through a single pricing mechanism incentives are given to BRPs and decentralised energy resources<sup>4</sup> to help restore system imbalances. A high pay-as-cleared price in a balanced control area—caused by a high activation price in another control area – might lead to an overreaction of BRPs/DERs and create imbalances. This could lead to further imbalances, increased uncertainty on flows and a resulting increase in reserve requirements. In general this interacts with local responsibilities of TSOs in Load-Frequency Control.

In addition, ENTSO-E also believes that in particular cases (market power, for instance but not only in the presence of internal congestions) it should be possible to apply administrative pricing (e.g. a cap and/or floor on the activation price) for requested activated balancing energy.

While we accept that alternative pricing approaches have different pros and cons and that marginal pricing is generally considered superior in competitive markets, there is probably a need for some differentiated arrangements. We therefore recommend that the FG do not prescribe a single pricing method. Instead, we suggest stipulating that the network code shall define consistent pricing principles, taking into consideration economic efficiency, specific market power situations, the need to support cross border exchanges and the need for local price signals reflecting the local imbalance situation.

**Question 2:** *Do you think the “margins” should not exceed the reserve requirements needed to meet the security criteria which will be defined in network code(s) on System Operation?*

A limitation of bids not shared (the so called “margins”) to the reserve requirements needed to meet the security criteria which will be defined in network code(s) on System Operation seems to be reasonable.

However on that matter, ENTSO-E would like to recall that determining the right amount of FRR and RR to meet the prescriptions of the LFC & R code is the responsibility of individual TSOs. For FRR and RR, the Network Code Load Frequency Control and Reserves will not stipulate the exact amount or even the dimensioning method to be followed by each control area. Instead, it will prescribe a

<sup>4</sup> Demand side management reacting to imbalance prices belongs to this category.



minimum requirement and quality targets to be respected using FRR and RR. Such minimum requirement and quality targets can be achieved by various combinations of incentive schemes, market design and reserve procurement. The most efficient combination in different control areas may vary depending e.g. on the generation or on the market structure.

The specific roles of market design, incentives schemes, and procurement of different types of reserves in meeting the security criteria for a certain control area, should be recognised when assessing and approving the amounts of unshared bids for a specific control area.

In addition, as developed in the section on harmonisation, the cost-benefit of sharing certain specific product might be low or even negative. Margins should also be an adequate vehicle to cover this point, subject to due justification and approval.

We therefore do not see it desirable to make further specification or restriction to this in the FG. We welcome the already formulated provisions of the FG, i.e. defining the principles of evaluating the amount of the unshared bids within the network code including approval by NRAs..

**Question 3:** *Do you support to aim at similar target models for frequency restoration reserves and for replacement reserves? Do you think a distinction should be made between manually-activated and automatically-activated frequency restoration reserves in terms of models of exchanges and/or timeframes for implementation?*

We would like to highlight that the different kind of reserves are specifically designed for different applications and hence comprise a different technical complexity. The different kind of reserves cannot be “optimised” by applying one instead of the other – only the “higher quality” reserves can match the “lower quality” reserves (which is not an efficient solution).

#### Automatic vs. manual reserves

In terms of implementing cross-border exchanges and the resulting impacts and complexities, the most important distinction to be made is between manually activated reserves and automatically activated reserves. For the sake of clarity, a reserve is considered to be automatically activated when no real-time human decision is involved in a specific activation.

As explained in Section 2a), there might be net costs and risks in harmonising products for automatic FRR. Across different synchronous areas, different system dynamics make it probably impossible for system reliability reasons. Even within a synchronous area, the cost of harmonising certain features (i.e. activation algorithms) could be much higher than the gains from exchanges in the absence of cross border capacity reservation. A common merit order for automatic reserves combining activation of different products is in our view extremely complex and could actually be impossible. In addition, the exchange of the automatic part of FRR especially requires co-ordinated real-time signals between control areas. Therefore a target model for automatic FRR is more complex to handle and implement. FRR acts immediately before real time and in case of quick automatic activation directly causes balancing actions with great effects on the security of supply.

As a consequence, these major design differences explain why different target models should be analysed.

We believe that:

- the FG should allow for other types of cross border exchanges of automatic FRR than a merit order activation.
- the relevant geographical scope of cooperation on automatic FRR is potentially more limited than for manual reserves;

- considerations driving the costs and benefits of FRR are significantly different for manual and automatic FRR and need to be analysed separately;
- more time should be allowed for development of arrangements for automatic FRR than for manual FRR.

### Manual FRR vs. RR

A second (less) important distinction is between manually activated FRR and Replacement Reserves. The characteristics of FRR and RR are different as FRR typically includes automatic and some fast manually activated reserves within 15 minutes, while RR typically includes only slower manually activated reserves. In terms of implementation, an important difference is that, to simplify, the RR is similar to products on the intra-day market and can normally be exchanged by schedules while exchanges of FRR are likely to require setting up virtual tie-line (see position paper ENTSO-E on the mid-term model, Appendix A)<sup>5</sup>; in addition interference with TSO responsibilities is higher with FRR.

For the above reason, RR is easier to implement due to the timing and is more suitable for cross-synchronous area exchanges. However one should note that, depending on market design, market functioning and the pattern of imbalance in each control area, not all TSOs procure RR. Well-functioning close-to-real time intraday markets, efficient system response to price signals, or very high volatility in imbalances can make it irrelevant for the TSO to have explicit access to RR for balancing energy activation. As a result, the target model for RR will not be applicable in all control areas.

The main purpose of the FRR is the short term (within minutes) offsetting of contingencies and imbalances caused by the volatility of the system in case of the absence of market reaction; i.e. imbalances inside the settlement time frame. The development of a CMO is technically complicated and limited due to operational constraints.

In contrast the RR aims at the balancing of persistent imbalances (> 15 minutes) caused by the forecast errors (market, renewable) or incidents in case of the absence of market reaction and is by nature much more appropriate for European Market Integration (CMO).

### **Question 4: Do you support the timeframes for implementation?**

(Copy-paste from section 3) ENTSO-E recommends to:

- **Introduce a systematic cost-benefit analysis and a risk analysis as a prerequisite for each step of integration.** The cost-benefit analysis should be qualitative and quantitative and should at least include, in addition to the benefits of integration and the costs of implementation, the various considerations raised in section 2. In particular, it should include:
  - The implications on price signals and the likely effects on imbalance volumes and price response.
  - The potential loss of flexibility and efficiency resulting from increased harmonization of products and processes.
  - The intrinsic operational limitations related to real-time operation (real-time congestion management, local responsibilities in securing control reserves, geographical distribution of reserves, practical operational feasibility), and the resulting restrictions on exchanges of balancing energy.
  - Any other implications the model might have.

It should reflect the latest market design developments and include experience gained from previous stages of integration. It should specifically analyse the optimal product scope for cross border

<sup>5</sup> [https://www.entsoe.eu/fileadmin/user\\_upload/\\_library/position\\_papers/120228\\_Mid\\_Term\\_Model\\_Balancing\\_final\\_.pdf](https://www.entsoe.eu/fileadmin/user_upload/_library/position_papers/120228_Mid_Term_Model_Balancing_final_.pdf)

exchanges in the relevant step of integration. It should look at the net benefits but also at particular impacts on the reliability and costs of individual power systems.

The cost-benefit analysis should be complemented by a risk analysis.

Those analyses could be performed following a similar process as the one described in the FG for the CMO step, but would be a compulsory milestone and apply to each step.

- **Make deadlines made relative to each other (instead of absolute) and recognise relevant dependencies (e.g. with intraday market development) in order to allow for a step by step approach.**

In ENTSO-E's opinion, the FG should identify a series of conditions, steps or milestones which will need to be met before each step of integration (CMO with margins for RR, coordination of FRR, and CMO) can be realised. This relates both to the conditions which need to be in place for work to begin, which are mainly related to the level of maturity and experiences gained by implementing the target model in previous time frame, and the steps at which an assessment needs to be made to ensure the approach is proportionate and fit-for-purpose.

In particular for a CMO, once the intermediate models for both FRR and RR are implemented on a large scale, at least 4/5 years are required before the implementation to a pan-European level, in order to allow for observation, cost-benefit and risk analysis and implementation.

Another clear example lies with the intraday market. There is clearly a very significant relationship between the two markets and a need to design them in an integrated and coordinated manner (for example, one might presumably wish to use a single Capacity Management Module for balancing and intraday). However, there is currently little operational experience of a large scale cross-border intraday market and for confusion and inconsistency as well as resource challenges. Therefore, we advocate specifying the completion of a pan European intra-day market as a key milestone before the development of balancing markets.

**Question 5:** *Do you consider regional implementation objectives as relevant milestones which should be aimed at in these Framework Guidelines on electricity balancing and the Electricity Balancing Network Code(s)?*

While we support the long-term objective of the integration of balancing markets, we consider that an approach which develops and progressively merges regional arrangements is likely to be most pragmatic.

Regional integration provides an opportunity to gain experience of using various cross border balancing products and a chance to evaluate their effectiveness. Also, in the view of the challenges of a common merit order approach the progressive development of regional platforms should be capable of being achieved more quickly than a leap to a single solution. Furthermore, a regional approach allows the development of adjacent markets like intraday markets to be taken into account.

The implementation of regional balancing schemes will act as natural step towards a long term pan-European balancing market and will provide learning from practical experiences and would allow further long-term integration. Therefore, we do not consider it desirable to define detailed regional implementation objectives in the FG.

**Question 6:** *Do you consider important to harmonise imbalance settlement? Do you think these Framework Guidelines on electricity balancing should be more specific on how to do it?*

### Regarding imbalance prices

ENTSO-E believes that imbalance prices are a cornerstone of the design of efficient balancing markets and support the goal of the reduction of balancing costs. ENTSO-E therefore fully supports inclusion of imbalance prices in the scope of the Electricity Balancing Network Code and the provisions of the FG in relation to incentives. Analysis of the impacts on pricing and price signals should be a part of each market integration step and might lead to harmonisation of some principles.

However we do not think that FG should be more specific on this topic. On the contrary, some principles defined in the FG could already be too restrictive regarding options for the design of efficient imbalance prices.

We specifically think the requirement to “include the costs of balancing energy exchanged implicitly” (i.e. from imbalance netting and from the settlement of unintentional deviations) could be too restrictive. It should certainly be possible to recover the costs of such implicit exchanges, and it should be possible to recover them via imbalance charges and/or other means. However using the specific price of such exchanges as a component in imbalance charges on the corresponding PTU is not the only way and could be counter-productive. First, as such prices would typically be available some days after real-time, this could jeopardise real-time publication and therefore real-time incentives in the applicable markets, thus also conflicting with the provisions of the future ‘Regulation on transparency and provision of information in electricity markets’. In addition, the interaction with consistency of local incentives needs to be clarified.

The FG rightly recognises two objectives to imbalance settlement, i.e. the need to “ensure that BRPs support the system balance in an efficient way and incentivise market participants in keeping and/or helping to restore the system balance” (section 5.1) and cost-recovery (definitions). We believe that the former is the primary specific objective when designing imbalance prices, while cost-recovery is an objective that can be met in a variety of ways. We think the FG deserve to be clarified in that respect.

Regarding cost-recovery as a general objective, we would like to stress that, whatever the regulatory framework for the balancing activities of an individual TSO (cost-neutrality, incentive regulation, etc.), the TSO should not have a financial disinterest in complying with its operational responsibilities.

### Regarding imbalance volumes

Currently differences exist between countries because of legal provisions and local characteristics of the markets. On the other hand because BRPs should be balanced per control area, the existence of different methodologies for the calculation of imbalances shouldn't affect the functioning of the common merit order. Therefore ENTSO-E believes that a harmonisation of the calculation of imbalance volumes is not required.

In general there are 2 different ways to calculate imbalance volumes :

- 1 step calculation: imbalance volumes are calculated by taking differences between physical injections and off-takes considering cross-border exchanges, sales and purchases.
- 2 step calculation: imbalance volumes are calculated separately for load and injection by taking the differences between the schedules and measured volumes. The cross-border exchanges, sales and purchases are also taken into account.

Typically a 2 step calculation mechanism is applied if the quality of the schedules for injections and off-takes are important (congestion or other reasons). The issue of qualitative programs isn't equally important for each TSO and other solutions exist.

We think that the Framework Guidelines:

- Should not define Imbalance Settlement (see Definitions section) as a mechanism aiming primarily at cost-recovery. The definition should be more general and/or highlight primarily the objective specified at the beginning of section 5.1 of the FG, i.e. “ensure that BRPs support the system balance in an efficient way and incentivise market participants in keeping and/or helping to restore the system balance”.
- Should not stipulate that imbalance prices “reflect the costs of balancing the system in real-time” – which is ambiguous. To be clear, it should not be excluded that the imbalance price could need to be higher than such costs, for the sake of incentives.
- Should not impose that the costs of balancing energy exchanged implicitly is necessarily covered by including the price of such exchanges in the imbalance price, but leave sufficient flexibility for other options.
- Should leave some flexibility for the definition of imbalance volumes