

03-MARCH16 APRIL 2020

**Informative document in support of  
the public consultation on the  
proposal for Terms and Conditions  
for balancing service providers for  
automatic Frequency Restoration  
Reserve (aFRR)**



# Content

|  |           |
|--|-----------|
| <b>Practical information</b> .....                         | <b>3</b>  |
| <b>Introduction</b> .....                                  | <b>4</b>  |
| <b>1. Main changes compared to T&amp;C version 1</b> ..... | <b>5</b>  |
| 1.1 Structure and terminology .....                        | 5         |
| 1.2 Evolutions of the design .....                         | 6         |
| <b>2. aFRR capacity tender</b> .....                       | <b>8</b>  |
| <b>3. Limitations of aFRR energy bid prices</b> .....      | <b>9</b>  |
| 3.1 Some examples .....                                    | 10        |
| 3.2 Conclusion .....                                       | 11        |
| <b>4. Settlement of balancing energy</b> .....             | <b>12</b> |
| <b>5. Additional information</b> .....                     | <b>13</b> |

## Practical information

Elia has launched a public consultation regarding the proposal for the Terms and Conditions for balancing service providers for automatic Frequency Restoration Reserve (aFRR) (hereafter referred to as “T&C BSP aFRR”). The document submitted for consultation is published on the Elia website.

This note serves to support the stakeholders in their review of the proposal of T&C BSP aFRR.

The purpose of this public consultation is to receive comments and suggestions from involved market parties in the context of the official approval procedure of the T&C BSP aFRR pursuant to article 10 of the Regulation (EU) 2017/2195 of 23 November 2017 establishing a guideline on electricity balancing (hereafter referred to as “EBGL”). Comments concerning items outside the scope of the T&C BSP aFRR will not be considered by Elia.

Following the consultation Elia will submit all stakeholders’ responses to the CREG together with the T&C BSP aFRR proposed for regulatory approval, the consultation report, and this supporting document. Consequently, all non-confidential responses will be made public on Elia's website, with an explanation of how Elia responded to these remarks or the reasons why they were not considered. Elia will respect the request for confidentiality and/or anonymity of respondents.

The market parties have a period of one month to submit their responses via the online form on the Elia website, from 3 March to 3 April 2020 included.

Questions relative to this consultation can be sent to the following email address: [consultations@elia.be](mailto:consultations@elia.be).

## Introduction

Pursuant to article 18 of the EBGL, in June 2018 Elia submitted to the CREG a set of Terms & Conditions for the BSP for the delivery of aFRR services (hereafter referred to as “T&C version 1”). In the meantime, Elia has proposed design changes to the aFRR service related to:

- the opening of market to non-CIPU units with an opt-out or pass-through agreement;
- the evolution towards daily procurement of aFRR balancing capacity;
- the evolution from pro-rata activation to merit order activation of aFRR balancing energy bids;
- new data exchange requirements and baseline controls; and
- other design changes such as those relating to availability control.

These proposed design changes have been extensively discussed with market parties during the period 2018-2019 (cf. paragraph 4 below for a link towards the relevant documentation).

Considering the important changes in the design, Elia has amended the T&C version 1 to bring the T&C BSP aFRR in line with the new proposed design that is planned to go live on 1 July 2020. The main changes with respect to T&C version 1 are described in Chapter 1. Some important design elements are described in Chapter 2, 3 and 4.

The T&C BSP aFRR under consultation is thus a new version, fully compliant with article 18 of the EBGL and comprising all elements necessary for the new design.

[Elia has corrected the example on section 3.1 based on the feedback received during the public consultation of the stakeholders and CREG.](#)

# 1. Main changes compared to T&C version 1

## 1.1 Structure and terminology

One of the main changes is that the structure of the T&C BSP aFRR has been brought in line with the structure of the other T&C for ancillary services. Next to the main part of the T&C, the contractual elements have been integrated in an appendix, being the BSP Contract for aFRR. The latter comprises of the following parts:

- General Conditions containing the articles that are applicable for all ancillary services
- Specific Conditions for the aFRR service
- Annexes

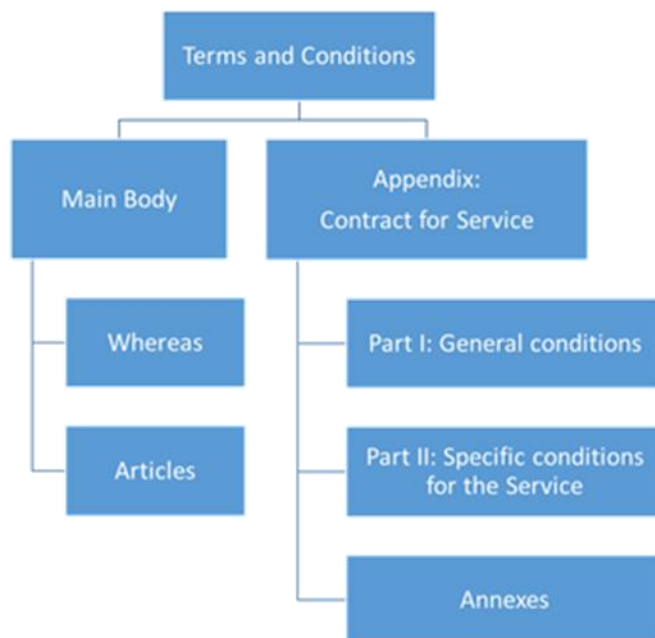


Figure 1: *General structure of the Terms and Conditions for ancillary services*

In comparison with the first version of the T&C BSP aFRR<sup>1</sup> (submitted in June 2018) that was comprised of the General Conditions and a specific part corresponding to the T&C BSP R2 (replacing the GFA R2 CIPU), this new structure has been applied. The T&C have also been made technology neutral. This evolution is shown in below Figure 2

The proposed structure allows the BSP to provide the aFRR Service based on a “technology neutral approach”. The technical units providing the service are all included in a single contract.

Also the terminology has been adapted to align and avoid confusion with all applicable legislation, the new Federal Grid Code and the European guidelines.

---

<sup>1</sup> More information regarding this first version of the T&C BSP aFRR can be found here: <https://www.elia.be/en/public-consultation/20180315-draft-proposals-for-the-contracts-bsp>

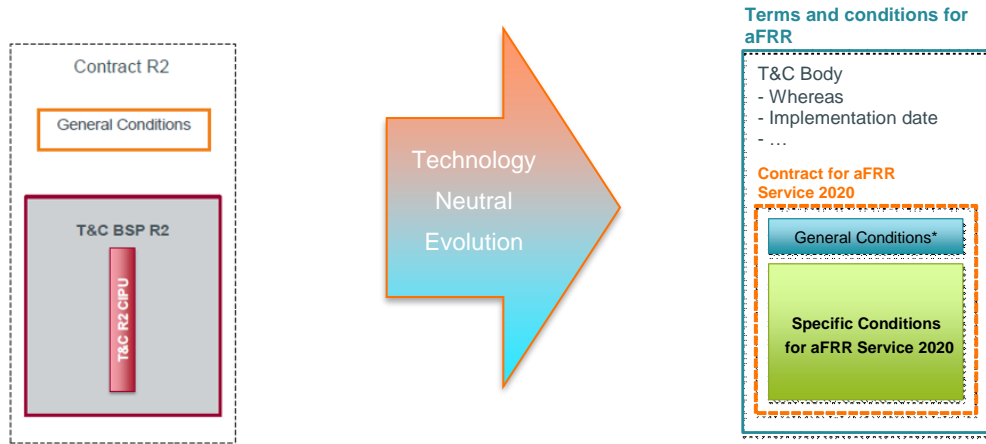


Figure 2: Evolution of the T&C BSP R2 to the new T&C BSP aFRR

As specified in the T&C BSP aFRR, the General Conditions have been subject to a separate public consultation given that these will apply for all Terms and Conditions that are and will be proposed by Elia to the competent regulatory authority(ies). **As a consequence the General Conditions are not open to comments anymore, unless if the respondent believes (and upon motivation) it is necessary to deviate in Part II from one or more of the General conditions of Part I given the specific context of the contract concerned.**

### 1.2 Evolutions of the design

The table below details the evolution of the design with regard to the T&C version 1. These evolutions have been integrated in the new proposal for T&C BSP aFRR currently published for consultation of the market parties.

| Topic                         | Version June 2018   | New proposal for the T&C  |
|-------------------------------|---|---|
| <b>Pool Composition</b>       | ✓ Only CIPU Technical Units                               | <ul style="list-style-type: none"> <li>✓ Technology neutral approach</li> <li>✓ The BSP has a single pool with all technical units included in the same contract</li> </ul>                     |
| <b>Application of ToE</b>     | ✓ ToE not applicable                                      | ✓ Delivery Points DP <sub>PG</sub> (old Non-CIPU Technical Units) with an opt-out or pass-through agreement can participate   |
| <b>Prequalification test</b>  | ✓ Only CIPU Technical Units test                          | ✓ Technology neutral test   |
| <b>aFRR capacity auctions</b> | ✓ Weekly capacity auctions with a total cost optimisation | <ul style="list-style-type: none"> <li>✓ Daily capacity auctions with two steps :</li> <li>✓ Step 1: One auction corresponding to one block of 24 hours with total cost optimization</li> </ul> |

|                              |   |  |
|------------------------------|---|--|
|                              |   | <ul style="list-style-type: none"> <li>✓ Step 2: Six simultaneous auctions corresponding to six blocks of 4 hours with a merit order selection</li> </ul>  |
| <b>Secondary market</b>      | <ul style="list-style-type: none"> <li>✓ Two different processes were applicable in day-ahead and in intraday</li> </ul>  | <ul style="list-style-type: none"> <li>✓ Process is the same at any time and is simplified</li> </ul>  |
| <b>Energy Bid submission</b> | <ul style="list-style-type: none"> <li>✓ Only nominations for CIPU Production Unit</li> </ul>   | <ul style="list-style-type: none"> <li>✓ Possibility to pool delivery points DP<sub>PG</sub> in an energy bid</li> </ul>   |
| <b>Activation</b>            | <ul style="list-style-type: none"> <li>✓ Day ahead selection of bids and pro-rata activation</li> </ul>   | <ul style="list-style-type: none"> <li>✓ Merit order activation</li> </ul>   |
| <b>Availability control</b>  | <ul style="list-style-type: none"> <li>✓ Availability control based exclusively on day ahead nominations</li> </ul>   | <ul style="list-style-type: none"> <li>✓ Addition of availability tests for all technical units</li> </ul>   |
| <b>Activation control</b>    | <ul style="list-style-type: none"> <li>✓ Only CIPU Technical Units</li> <li>✓ Continuous control</li> </ul>   | <ul style="list-style-type: none"> <li>✓ Technology neutral</li> <li>✓ Continuous control</li> </ul>   |
| <b>Baseline control</b>      | <ul style="list-style-type: none"> <li>✓ Not existing</li> </ul>  | <ul style="list-style-type: none"> <li>✓ New control based on baseline data communicated on real time</li> </ul>   |
| <b>Remuneration</b>          | <ul style="list-style-type: none"> <li>✓ Capacity and energy bids “pay as bid” principle</li> </ul>   | <ul style="list-style-type: none"> <li>✓ Capacity and energy bids “pay as bid” principle</li> </ul>  |
| <b>Penalties</b>             | <ul style="list-style-type: none"> <li>✓ Only CIPU Technical Units</li> <li>✓ Availability control penalty based on clean spark spread</li> <li>✓ Activation control penalty of flat fee of 45 €/MWh</li> </ul> | <ul style="list-style-type: none"> <li>✓ Technology neutral</li> <li>✓ Alignment of availability control penalties calculation with T&amp;C mFRR</li> <li>✓ Activation control penalty based on remuneration</li> <li>✓ Baseline control penalty leading to suspension instead of financial penalty</li> </ul> |

## 2. aFRR capacity tender

Elia proposes a two-step approach for the capacity tender. In the first step, i.e. the “all CCTU” auction, Elia will procure a 24-hour block based on a total cost optimization for the upward and downward directions together. The second step, i.e. the “per CCTU” auction is a merit order selection for the upward and downward directions separately. A volume allocation mechanism is put in place to determine the volume to be sourced in each step. The volume for each step is determined daily based on the volumes procured in each step over a rolling window of 7 days and the comparison of the prices of the capacity bids offered in the “all-CCTU” capacity auction and in the “per-CCTU” capacity auction, as described in annex 7 of the T&C BSP aFRR.

Based on the informal consultation on the two-step approach, this approach is seen as a good compromise for allowing the development of new entrants (for which offering balancing capacity for a period of 24 hours would be difficult or impossible) while ensuring that it would not result in an unacceptable cost increase (by allowing participants with thermal units to recover their start-up costs over a period of 24 hours instead of 4 hours).

The objective is to develop liquidity on the aFRR balancing capacity market and evolve gradually and in a cost efficient way to the target model (i.e. merit order selection with 6 times 4-hour blocks, being the “per CCTU” auction). The “all CCTU” auction is only an intermediate solution, which should disappear on mid-term.

This evolvement towards the target model will be achieved by increasing the volume to be procured in the “per CCTU” auction taking into account the cost efficiency and the competitiveness of this auction. If proven that the “per CCTU” auction is competitive, the volume of the “per CCTU” auction will quickly increase according to volume allocation methodology. The volume of the “per CCTU” auction can increase (or decrease) with a maximum of 2MW per day and thus 14MW per week per direction. Elia foresees a minimum volume of 10MW in the “per CCTU” auction per direction. In the situation that the weekly volume for the “per CCTU” is increased with 14MW for each week, Elia will source within 11 weeks the complete volume in the “per CCTU” auction, i.e. by the mid-September in the up and/or down direction.

The market shall be closely followed up and a revision of the proposed design needs to be considered when it appears that bidding behaviour is blocking an efficient market functioning. At least a re-evaluation need to be done after one year after entry into force.



### 3. Limitations of aFRR energy bid prices

Today, the aFRR energy bids are activated based on a pro-rata mechanism. The volume selected for possible activation is capped to 145MW (i.e. the contracted volume) and a price cap is applied and is equal to  $FC50\%CCGT2 + 40 \text{ €/MWh}$  (which is approximately 100€/MWh) for a bid in the upward direction. The bid price in the downward direction must be larger than zero. Today, the controller is saturated several times per day, meaning that the total volume of the aFRR energy bids, i.e. 145MW is fully activated in the upwards or downwards direction.

In the new aFRR design, the aFRR energy bids are activated based on a merit order mechanism and Elia will no longer apply a volume cap. If no limitations on the activation price is foreseen, it can be assumed that there will be bids at the end of the aFRR merit order with an activation price significantly larger than the cheapest available mFRR bids. Since the aFRR bids are activated automatically by Elia’s LFC controller, the most expensive energy bids would be activated in case of sudden large system imbalances. This is represented in Figure 3. As long as the total volume of aFRR balancing energy bids remains relatively small compared to the sudden variations in the system imbalances, the activation of the most expensive aFRR bids will be unavoidable.

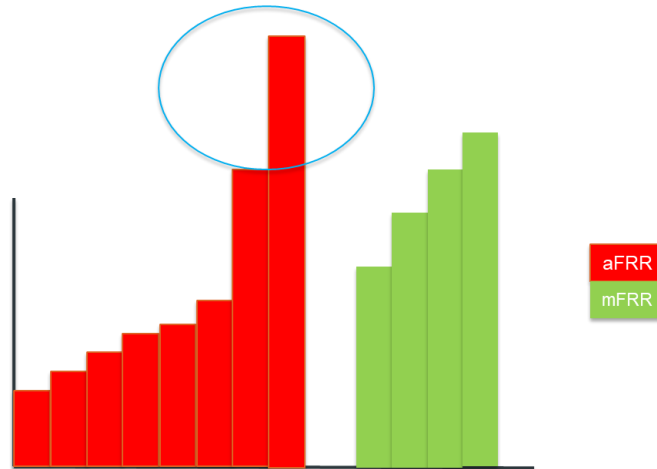


Figure 3: Merit order for aFRR and mFRR

The only way to avoid the activation of aFRR bids with extreme activation prices is the introduction of a limitation for the aFRR energy bid price. This limitation together with an average weighted pricing mechanism mitigates the risk of having frequent, large impacts of aFRR price peaks on the imbalance tariff in absence of significant system imbalances, as described below.

One could argue that the activation of the most expensive aFRR bids can be avoided by Elia by activating more frequently cheaper mFRR reserves. This preventive activation of mFRR bids, which would require a forecast of the system imbalances and arbitrage rules for Elia, is not a 100% waterproof solution. On top of that, the system imbalance is more and more impacted by the renewable energy that makes the activation more complex to forecast. The

<sup>2</sup> FC50%CCGT : Fuel cost (€/MWh) of a CCGT with 50% efficiency

preventive activations of mFRR will also affect the activation of cheaper aFRR bids. On the other hand, aFRR is an automatic product and an activation of bids with large prices (at the end of the merit order list) cannot be avoided in a situation with quickly changing power deviations

### 3.1 Some examples

The three tables below show the impact of different maximum prices for the aFRR energy bids on the imbalance prices. Elia has evaluated the situation for an energy bid price of 1000€/MWh, 3000€/MWh and 13500€/MWh (aligned with limitation for mFRR energy bid prices) for the most expensive energy bid and for different activation times. The total activated volume (of bid 1 and bid 2 together) is in all cases 150MW. The time of the activation of the most expensive bid varies from 60 seconds to 600 seconds and the volume varies from 5MW until 20MW.

In Table 1, with the price of the most expensive energy bid defined at 1000€/MWh, the imbalance price varies from ~~56~~ 62 €/MWh until ~~63123~~ €/MWh depending on the activation time and the activated volume for a total activated volume (of bid 1 and 2 together) of 150MW.

| Price of bid 1 [€/MWh] | activation time of bid 1[sec] | activated volume of bid 1 [MW] | Price of bid 2 [€/MWh] | activation time of bid 2 [sec] | activated volume of bid 2 [MW] | Imbalance price [€/MWh] |
|------------------------|-------------------------------|--------------------------------|------------------------|--------------------------------|--------------------------------|-------------------------|
| 1000                   | 60                            | 5                              | 60                     | 840                            | 145                            | <u>6256</u>             |
| 1000                   | 60                            | 20                             | 60                     | 840                            | 130                            | <u>7057</u>             |
| 1000                   | 300                           | 5                              | 60                     | 600                            | 145                            | <u>7650</u>             |
| 1000                   | 600                           | 10                             | 60                     | <del>300600</del>              | 140                            | <u>12363</u>            |

Table 1 : maximum price of 1000€/MWh for bid 1

In Table 2, the price of the most expensive energy bid is increased up to 3000€/MWh. In that situation, the imbalance price is increased up to 256452€/MWh for a total activated volume of 150MW for aFRR.

| Price of bid 1 [€/MWh] | activation time of bid 1[sec] | activated volume of bid 1 [MW] | Price of bid 2 [€/MWh] | activation time of bid 2 [sec] | activated volume of bid 2 [MW] | Imbalance price [€/MWh] |
|------------------------|-------------------------------|--------------------------------|------------------------|--------------------------------|--------------------------------|-------------------------|
| 3000                   | 60                            | 5                              | 60                     | 840                            | 145                            | <u>6764</u>             |
| 3000                   | 60                            | 20                             | 60                     | 840                            | 130                            | <u>9275</u>             |
| 3000                   | 300                           | 5                              | 60                     | 600                            | 145                            | <u>11072</u>            |
| 3000                   | 600                           | 10                             | 60                     | <del>300600</del>              | 140                            | <u>256452</u>           |

Table 2 : maximum price of 3000€/MWh for bid 1

In Table 3, the price of the most expensive bid is increased up to 13500€/MWh. In that situation, the imbalance price is increased up to 649956€/MWh for a total activated volume of 150MW for aFRR.

| Price of bid 1 [€/MWh] | activation time of bid 1[sec] | activated volume of bid 1 [MW] | Price of bid 2 [€/MWh] | activation time of bid 2 [sec] | activated volume of bid 2 [MW] | Imbalance price [€/MWh] |
|------------------------|-------------------------------|--------------------------------|------------------------|--------------------------------|--------------------------------|-------------------------|
| 13500                  | 60                            | 5                              | 60                     | 840                            | 145                            | <u>9384</u>             |
| 13500                  | 60                            | 20                             | 60                     | 840                            | 130                            | <u>206469</u>           |
| 13500                  | 300                           | 5                              | 60                     | 600                            | 145                            | <u>288489</u>           |
| 13500                  | 600                           | 10                             | 60                     | <del>300600</del>              | 140                            | <u>956649</u>           |

Table 3 : maximum price of 13500€/MWh for bid 1

### 3.2 Conclusion

If the limit of aFRR energy bid price were equal to 13500€/MWh, an activation of only 150MW of aFRR energy bids would lead to an imbalance price of [649956€/MWh](#) which is not giving the correct signal to the balancing market. Elia is of the opinion that an imbalance price reaching [649956€/MWh](#) should reflect a large system imbalance, and the activation by Elia of a large volume of FRR (including mFRR). Therefore, Elia will consider a technical limitation of the energy bid prices of 1000€/MWh in order to give a correct signal to the balancing market while being high enough for not unnecessarily constraining the BSPs willing to offer aFRR while having high activation costs. If this limitation is reached, Elia proposes to re-evaluate the value of this limitation for the energy bids, in coordination with the CREG. The mechanism as described in the Balancing Rules for mFRR will also apply for aFRR.

## 4. Settlement of balancing energy

The settlement of the balancing energy will be based on pay-as-bid mechanism. The prerequisites for having a pay-as-cleared settlement for aFRR are defined in the “*Study on pay-as-cleared settlement for aFRR and mFRR activated energy*”<sup>3</sup> and are the following:

- A merit order activation
- Liquid aFRR market

A merit order activation will be implemented. Currently the aFRR market is not liquid enough. More liquidity is expected once the Belgian aFRR market will be integrated into a wider European aFRR market (PICASSO project).

---

<sup>3</sup> <https://www.elia.be/-/media/project/elia/elia-site/electricity-market/system-services/system-services-pdf-document-library/03-balancing-services-bsp/01-general/03-studies/2017-study-report-on-paid-as-cleared-settlement-for-afrr-and-mfrr-activated-energy.pdf?la=en>

## 5. Additional information

- [aFRR design note](#)
- [Implementation plan](#)
- [aFRR workshop of May](#)
- [aFRR workshop of September](#)
- [Working Group Balancing of the 25<sup>th</sup> of June](#)
- [Working Group Balancing of the 23<sup>rd</sup> of October](#)

