# R3 2018

## Design note on the product evolutions to be released on 01/12/2018 for mFRR

Market Development

01/08/2018

# Table of Content

# 1 Introduction

## 1.1 Context and goal of the present design note

The purpose of the present design note is to provide all stakeholders with a clear view on the functional evolutions that will be released on the 1st of December 2018 for mFRR (upon condition that the necessary regulatory documents have been approved in time for the implementation of the Transfer of Energy for the market of reserved tertiary control offered by non-CIPU technical units):

- An activation price for non-CIPU R3 Standard & R3 Flex products.
- A common merit order activation for mFRR energy bids with unlimited number of activations (free bids and R3 Standard energy bids[1]).

Figure 1 illustrates the evolution of the merit order activation of mFRR:

- Until the end of 2017, the merit order activation of mFRR consisted of 6 steps with six sub-products of which three with an activation price and three without.
- As of the 1st of January 2018, the number of steps was reduced from 6 to 5 due to the end of the product ICH.
- As of the 1st of December 2018, the number of steps will be further reduced to two. As described in the present design note, the non-CIPU bids will now have an activation price. Also free bids and R3 Standard bids will be activated according to a common merit order.

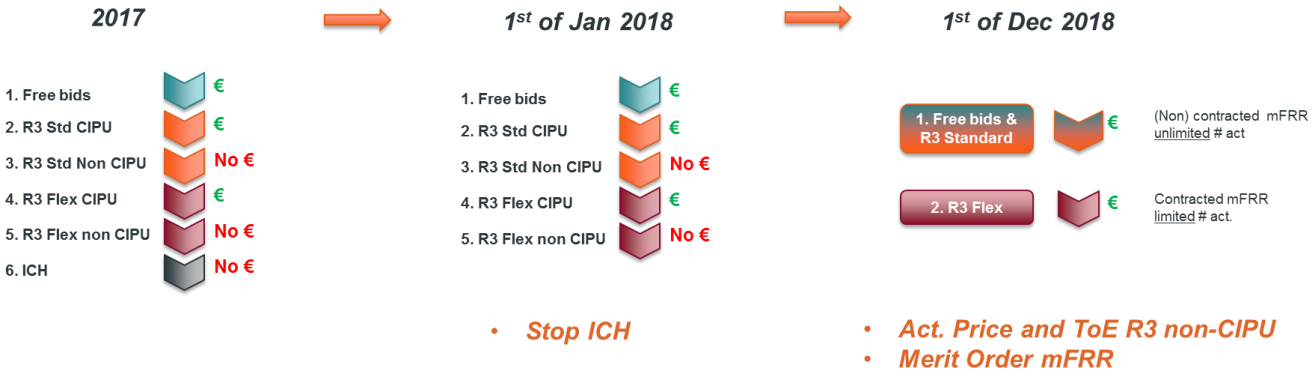


**Figure 1 - Evolution of merit order activation evolution**

[1] As explained during the meetings of the WG Balancing, because of the strong energy limitations of the R3 Flex product, R3 Flex energy bids will still be activated at the end of the merit order.

Those design changes have been presented to the stakeholders during different meetings of the Working Group Balancing in 2017 (15th of May, 22nd of June, 21st of September and 27th of October) and 2018 (20th of February, 30th of March, 15th of May 2018 and 20th of June 2018) and follow the presentation of the mFRR roadmap in 2016 (WG meeting of 17th of March 2016). A first version of the design not was sent to members of the WG Balancing on the 18th of April 2018 and discussed with the stakeholders. Upon request of some stakeholders and as explained during the meeting of 20th of June of the WG Balancing, two design changes have been made and are incorporated in this new version of the design note:

- As mentioned in 2.1.5, the maximum bid size of R3 non-CIPU bids is 100 MW (instead of 50 MW as initially proposed).
- As mentioned in 2.3.2, Elia will allow BSPs to refuse the activation of bids on two consecutive days if delay between the two activations is lower than the neutralization time.

All those design changes will also be reflected in the next versions of the Balancing Rules and of the General Framework for Tertiary Control by Non-CIPU Technical Units in the coming months.

Besides the above mentioned functional changes other important changes are foreseen for implementation in December 2018:

- As announced during the Working Group Balancing meeting of the 20th of February 2018, following the increase of the administrative imbalance price from 4 500 €/MWh to 10 500 €/MWh, the imbalance price bid cap shall be increase to 13 500 €/MWh.
- Elia is currently assessing the added value of a modification of the parameters α1, α2, β1 and β2 which are used to determine the imbalance prices. In case it appears that such modification is opportune, Elia will explain the reasons and discuss potential options with the members of the Working Group Balancing.

## 1.2 Scope and structure of the present design note

The present design note is structured in six sections according to the operational processes impacted by the design changes:

1. **Energy bids submission**: how the R3 non-CIPU energy bids are submitted by the BSPs to Elia with activation prices.
2. **Integration of the CIPU units startup cost in the balancing energy price**: how the startup cost of the CIPU units is integrated in the balancing energy price (pre-requisite for building a common merit order).
3. **R3 Flex required product updates**: how the rules related to activation counter and neutralization time of R3 Flex will evolve due to the new bid-based activation of R3 non-CIPU (consequence of the introduction of an activation price).

4. **Energy bids activation**: how mFRR energy bids are activated (merit order sequence and exchange of information).
5. **Energy bid settlement with Transfer of Energy**: how energy bids are settled with the extension of the Transfer of Energy mechanism to R3 non-CIPU energy bids.
6. **Performance controls**: how the activation / availability controls and penalties will be revised.

# 2 R3 2018 Product Design

## 2.1 Energy bids submission for R3 Flex & R3 Standard non- CIPU

The BMAP (Balancing MArket Platform) application was implemented in the context of the Bidladder project to allow BSPs to nominate their free bids from non-CIPU units (volume, prices, EANs). BMAP will also be used to nominate the R3 non-CIPU energy bids (volume, prices, EANs)[2]. The principles of the nomination process for R3 Non-CIPU energy bids are described below.

### 2.1.1 Application interface

BSPs can nominate their bids in BMAP via two interfaces:

- BMAP web-based application: data are entered manually in a web application.
- B2B xml-based interface: data are sent via a machine-to-machine interface (xml messages).

### 2.1.2 Gate opening and closing time

BSPs can enter their bids shortly after the R3 auctions, once the results of the auction are known. BSPs have the possibility to enter their bids for the complete contractual period (month) at once. They also have the possibility to update them during the delivery period in day-ahead or intraday.

#### *Day-ahead nomination: contractual gate closure time*

The contractual gate closure time in day-ahead is at 15:00, i.e. BSPs must enter bids corresponding to their R3 obligations for each quarter-hour (initial obligation plus transfer executed in the secondary market) at 15:00 in day-ahead at the latest.

#### *Intraday re-nomination: neutralization time*

BSPs have the possibility to update their bids or enter new ones after the contractual gate closure time of 15:00 in day-ahead up to 45 minutes before delivery. BMAP will not allow the BSP to modify existing bids or enter new bid(s) for delivery within the neutralization period of 45 minutes before delivery.

[2] Volumes and EANs are already nominated since the 1st of January 2018 but price will be introduced on the 1st of December.

### 2.1.3 Format of the bid

On top of the existing non-CIPU free bids (Bidladder) and FCR nomination, two other types of bids are available in BMAP: R3 Standard and R3 Flex non-CIPU. When creating a R3 Standard or R3 Flex bid on BMAP, the BSP enters:

- At QH level: a volume in MW and a price in €/MWh.
- At bid level: a list of EANs (similarly to the non-CIPU free bids). Note the BSP can only select the EANs that have been contractually registered ("Annex 2 – template for the list of R3 delivery points" of the General Framework for Tertiary Control by Non-CIPU Technical Units) for the corresponding type of bid (R3 Standard, R3 Flex or free bids).

As opposed to the non-CIPU free bids, the BSP does specify neither the direction of the bid (R3 is always upwards) nor the max number of quarter-hours the bid can be activated (this is implicitly known in function of the type of bid, i.e. R3 Standard or Flex).

### 2.1.4 Rules on delivery point exclusivity and "combo"

There is an exclusivity of the delivery points within each of the three types of mFRR non-CIPU bids (free bids, R3 Standard and R3 Flex) but combinations between the categories are allowed. A BSP can create multiple bids of the same category (free bids, R3 Standard and R3 Flex) with the same delivery points on the same delivery period but only one of them is allowed to have a volume higher than zero during a given QH (note this rules is already applicable for Bidladder). On the other hand a combination ("combo") between the different categories is possible, i.e. a given delivery point can be part of multiple bids on the same delivery period as long as those are different types of bid (free, R3 Standard or R3 Flex bids).

Example:

Assume Bid "Bid1Std" (R3 Standard non-CIPU), Bid "Bid2Flex" (R3 Flex non-CIPU), Bid "Bid3Flex" (R3 Flex non-CIPU), Bid "Bid4Free" (free bid non-CIPU) :

1. The BSP can include delivery point DPX in Bids "Bid1Std", "Bid2Flex" and "Bid4Free" at the same time whatever their delivery periods.
2. The BSP can only include delivery point DPX in Bids "Bid2Flex" and "Bid3Flex" for different delivery periods (different quarter-hours). The BSP can include delivery point DPX in Bids "Bid2Flex" and "Bid3Flex" on the same quarter-hour only if one of the two bids has a volume of 0 MW during this quarter-hour. Note the exact same rule is already applicable for free bid non-CIPU (Bidladder).

### 2.1.5 Rules and checks on the bids

Different checks are performed on the bids when entering them on BMAP in order to verify their validity. They are described below.

#### *Maximum bid size*

Energy bids of R3 Standard and Flex non-CIPU have a maximum size of 100 MW if they contain more than one delivery point. The volume of a bid containing only one delivery point is only limited by the "Volume check" described below.

#### *Volume check*

The volume of a bid of R3 Standard / R3 Flex cannot be greater than the sum of the maximum contribution to mFRR of the delivery points participating to the bid. A check in BMAP will verify that condition. Two concepts will be introduced in the "General Framework for Tertiary Control by Non-CIPU Technical Units":

- mFRRMax: equal to R3NRref as defined and used in the "General Framework for the Tertiary Control Non-Reserved Power Service" (R3NRref will be renamed accordingly in the "General Framework for Tertiary Control by Non-CIPU Technical Units"). The aforementioned volume check will be performed on the sum of mFRRMax of the delivery points.

- R3contrib: the existing R3ref will be renamed R3contrib in the "General Framework for Tertiary Control by Non-CIPU Technical Units" for the sake of clarity. It is the reference R3 power that can be supplied by a delivery point and is used for pool management (removal of a delivery point from a pool).

#### *Obligation check*

As for R1, BSPs are not allowed to nominate more R3 Flex or Standard than their obligation (equal to their initial monthly obligation following the auctions in STAR) corrected by the transfer(s) done on the bilateral secondary market for reserve (SMART). BSPs are allowed to submit less than their obligation but will see a warning in BMAP and would be indirectly penalized in the availability control as described in section 2.6.

#### *Congestion check*

Once red zones are known (in day-ahead around 18:00), BMAP will not allow a BSP to create a new bid or increase the volume of an existing bid containing a problematic delivery point. A delivery point is considered as problematic if it has a mFRRMax higher than 25 MW and is located in a red zone. Note that BMAP will never block any bids for congestion reason before the day-ahead gate closure time at 15:00 as red zones are only known at around 18:00.

### *Price check*

Exactly as for the free bids (Bidladder), a check is performed to verify that bid prices are between the inferior and superior price boundaries of incremental bids.

## 2.2 Integration of the startup cost of the CIPU units in the balancing energy price

### 1.1.1 As Is situation

The payment for activating mFRR (free bids and R3) supplied by CIPU units comprises two components:

- A payment of the energy supplied to Elia which is equal to the energy requested (in MWh) multiplied by the activation price of the unit (in €/MWh).
- A payment to cover the startup cost (in €) if Elia explicitly requested the CIPU unit to be started. This cost is calculated using a formula detailed in the CIPU contract (using as input the specific parameters of the unit and the cost of the fuel used to start it up).

Currently the startup cost is paid to the BSPs but is not taken into account in the imbalance tariffs and the total activation cost used for the merit order ranking:

- Not in the imbalance tariffs: this means that the startup cost paid to the BSPs delivering the balancing energy is not considered in the calculation of the imbalance price.
- Not in the activation cost used for the merit order ranking: only the price of the energy supplied in €/MWh is taken into account for the merit order ranking. As a result it was historically decided to place the non-running units (even if capable of starting within 15 minutes) at the end of the merit order of their corresponding product category (free bids, R3 Standard or R3 Flex).

### 1.1.2 To Be

A total activation price (in €/MWh) is implemented that covers both the cost of the energy requested (in €/MWh) and the startup cost (in €). The way the startup cost and the total activation price are calculated is detailed below.

#### *Startup cost*

As defined in the CIPU contract, the startup cost is calculated with a contractual formula per CIPU PP (Power Plant) and per day:

*Startup Cost = FC + Sstart * SFprice_x + CO2cost*

With:

- *FC* [€]: the fixed startup cost as defined per CIPU unit in annex 5 of the CIPU contract. The value of this parameter can be updated according to the disposition of the CIPU contract.
- *Sstart* [GJ]: the startup fuel consumption as defined per CIPU unit in annex 5 of the CIPU contract. The value of this parameter can be updated according to the disposition of the CIPU contract.

- *SFprice_x* [€/GJ]: the cost of the startup fuel x. As example for units starting on natural gas the index is the day-ahead ZIG (Zeebrugge Index for natural Gas) which changes every day.
- *CO2cost [€/MWh]:* the day-ahead CO2 cost multiplied by the emission factor of the startup fuel. The value of this parameter changes every day.

### *Total activation price*

The total activation price (in €/MWh) is calculated per CIPU Power Plant and is the sum of the Ibid price (in €/MWh) and the Startup Cost (in €) divided by the Pmax of the Power Plant (in MWh) and allocated to the first quarter of activation. The total activation price is calculated with the following formula per CIPU Power Plant and per QH:

*Total activation price [€/MWh]=*

*Ibid Price [€/MWh] + ( Startup Cost [€] / Pmax [MW] * 4 )*

With:

- *Ibid Price* [€/MWh]: the price of the incremental bid nominated per quarter-hour in day-head or possibly re-nominated in intraday via IDPCR (Intraday Program Change Request).
- *Startup Cost:* is the startup cost calculated per Power Plant and per day as described above.
- Pmax [MW]: the maximum power output of the Power Plant.
- A factor 4 is applied to allocated the cost in €/MWh to the first quarter-hour of activation.

Example:

Let's assume an open cycle gas turbine (OCGT) unit with the following parameters:

- Ibid Price = 100 €/MWh
- Startup Cost = 1000 €
- Pmax = 50 MW

This leads to a Total activation price of 100 + ( 1000 / 50 * 4 ) = 180 €/MWh

### *Special rules*

Note the following rules will apply:

1. The startup cost only impacts the total activation price of the first quarter-hour of the activation. This means during the subsequent quarter-hours of the activation, the total activation price is equal to the Ibid Price.

   Example: Elia activates a bid during two quarter-hours: the startup cost is only applied to the first quarter-hour.

2. The startup cost is not applied in case of bid prolongation. Example:
   - Elia activates a bid during one quarter then prolong it for one subsequent quarter: the startup cost is only applied to the first quarter.
   - Elia activates a bid during one quarter then reactivate it 30 minutes later for one quarter. The startup cost is applied to both quarters of activation as they are not subsequent.

3. The startup cost is not applied if the Power Plant is running in one of the quarter-hours during which the activation is requested or during the quarter-hour preceding or following the activation according to the last nominated program (day-ahead nomination or last IDPCR).

   Examples:

   - Elia activates a bid during one quarter QH 1. The Power Plant is running during the quarter-hour preceding (QH 0) according to the last program received. The startup-cost is not applied.
   - Elia activates a bid during three quarters QH 1, 2 and 3. The Power Plant is running during QH 3 according to the last program received. The startup-cost is not applied.

4. The following rules apply to the special case of Power Plants with multiple Power Units, e.g. the CCGTs:
   - Startup cost is not applied if at least one of the Power Unit(s) of the Power Plant is already running in one of the quarter-hour during which the activation is requested or during the quarter-hour preceding or following the activation according to the last program (day-ahead nomination or last IDPCR)
   - In case there are multiple startup costs possible for a given Power Plant depending on the configuration to be started, the configuration for which the ratio startup cost / Pmax is the lowest among all configurations available, i.e. the cheapest configuration will be taken into account. This assumption is rather conservative and limits the impact of the startup cost on the price of balancing energy (and imbalance price as a result).

### 2.2.1 Impact on existing processes

#### *Impact on merit order activation*

Non-running units able to start within 15 minutes are currently activated after the running units because the startup cost is not taken into account. With the introduction of the startup cost in the balancing energy price, those units will be activated with the running units according to the merit order further described in section 2.4.1 page 15.

#### *Impact on transparency*

The implementation of the startup cost in the balancing energy prices will be taken into account in the prices and the merit order of ARC (Available Regulation Capacity) published on the Elia website. The principles described above will apply:

- Incremental price in ARC is equal to the total activation price as defined above and that includes the startup cost (at Pmax during 1 QH).
- The impact of the startup cost is reassessed continuously based on the last program received (IDPRC) and actual activations. The startup cost is added to the Ibid price for a given quarter-hour if the Power Plant is not planning to run during that quarter-hour or the quarter-hours before and after.

#### *Impact on imbalance pricing*

The MIP (Marginal Incremental Price) used for imbalance price calculation is the total activation price as described above rather than the Ibid price in the As Is situation.

#### *Impact on remuneration of activations*

The remuneration remains the same: the two cost components (Ibid price and the startup cost) are paid in case of startup request by Elia. Note the startup cost to be paid is calculated ex-post for each activation and could, in some cases, be different from the startup cost calculated automatically ex-ante for imbalance prices. The reason for this is that the cheapest configuration is taken into account ex-ante as described above.

## 2.3 R3 Flex required product updates

Currently R3 non-CIPU bids (Flex and Standard) are activated per contract, i.e. each BSP has one contract with the volume sold in the monthly auction and Elia activates totally or partially each contract depending on the regulation capacity needed. With the introduction of an activation price, BSPs will be free to split their portfolio into multiple energy bids with different activation prices. Hence R3 Flex non-CIPU (and R3 Standard non-CIPU as well) activations will be bid-based rather than contract-based. We show below that due to this new way of activating the energy bids some characteristics of the R3 Flex product (activation counter and neutralization time) should be changed in order to keep the product properly working.

### 2.3.1 Activation counter for R3 Flex CIPU & non-CIPU

#### *As Is situation*

R3 Flex contract can be activated maximum 8 times per month. R3 Flex non-CIPU bids (and R3 Standard non-CIPU as well) are activated per contract, i.e. each BSP has one contract with the volume sold in the monthly auction and Elia activates totally or partially each contract depending on the regulation capacity needed. The activation counter of R3 Flex is defined at contract level and incremented each time a given contract is activated. Once the counter reaches the value 8, the contract cannot be activated anymore during the corresponding month.

With the introduction of an activation price, R3 Flex non-CIPU (and R3 Standard non-CIPU as well) activations will be bid-based rather than contract-based. The current logic of counter will not work anymore with bid-based activation. We illustrate this with Figure 2:

- In case of contract-based activation, Elia activates a contract completely except if the needed regulation capacity is less that the size of the contract. In the example of Figure 2, Elia activated completely the contract of BSP A. The activation counter of BSP A is incremented by 1 (activation counters of other BSPs are not incremented).
- In case of bid-based activation, Elia cannot decide to activate a contract completely; a merit order activation sequence must be followed. In the example of Figure 2, BSP A has split his contract in two bids: most of the volume is at a high price at the end of the merit order but a small volume is offered at a cheap price at the beginning of the merit order. Elia activates the cheapest bid of A and then bids from other BSPs. With the current rule, the counter of A would be increased even though a very small volume of the contract was activated (activation counters of the other BSPs activated are also incremented).

This example shows that using the current activation counter with the introduction of an activation price would result in the counter to reach its maximum value (8 activations per month) quite quickly depending on the bids of the BSP.

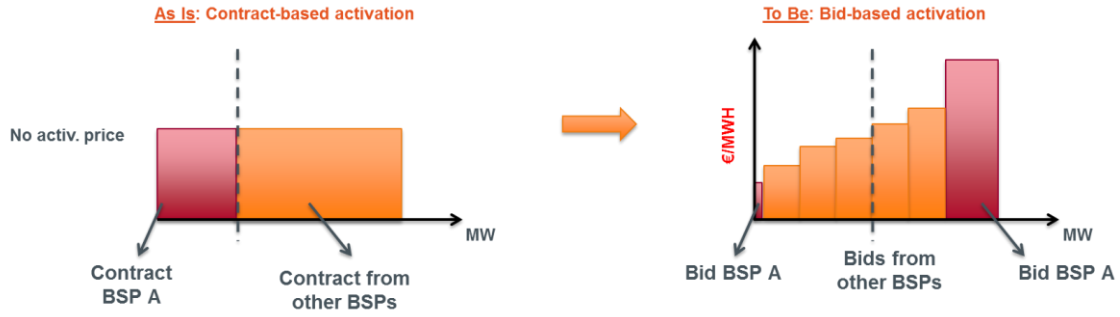


**Figure 2 - Contract-based vs bid-based activation**

## *To Be*

A new power-based counter is introduced taking the assumption that each contract can be activated at its maximum value during 2 hours 8 times per month or more times if split in multiple bids by the BSP.

The principles of the power-based counter are the following:

- For each bid activated: increment counter by the ratio size of activated bid[3] (in MW) / sum of all bids R3 Flex non-CIPU (in MW) for the contract of the BSP during this QH rounded up to 0,1. Note the duration of activation does not impact how the counter is incremented.
- In case of bid prolongation, the counter is not incremented (the max total activation duration of 1 bid remains 2 hours).
- Counters for CIPU and non-CIPU for a given BSP are incremented separately as they are handled by two different General Framework Agreements.

The solution to be implemented for R3 Flex CIPU units is exactly the same as for R3 Flex non-CIPU with the nuance that energy bids corresponds to the CIPU units (1 CIPU units 1 energy bid), i.e. activation occurs unit-based.

[3] Size of the bid as offered by the BSP (not the volume activated by Elia).

Examples:

1. A bid of 5 MW (out of a total contract of 20 MW) is fully activated by Elia during 1 hour ➔ the activation counter is incremented by *roundup [ bid size / contract size; 1 ] = roundup[ 5 / 20; 1 ] = 0,3*

2. A bid of 5 MW (out of a total contract of 20 MW) is partially activated by Elia (1 MW for example) during 1 hour ➔ the activation counter is incremented by *roundup [ bid size / contract size; 1 ] = roundup [ 5 / 20; 1 ] = 0,3*

### 2.3.2 Neutralization time for R3 Flex CIPU & non-CIPU

#### *As Is situation*

Currently, there must be at least 12 hours of neutralization between the start of two consecutive activations of R3 Flex. This logic works in case of contract-based activation but not bid-based activation that will result from the introduction of an activation price for R3 Flex non-CIPU. Indeed in case of bid-based activation, a neutralization time at the level of the contract would not allow Elia to activate R3 Flex sufficiently as the full contract would be neutralized for 12 hours even in case of activation of a small bid. Also a neutralization time at the level of the bid is not possible as a bid is only valid for a day (neutralization cannot be taken into account over two consecutive days if it applies to the bid).

#### *To Be*

As presented during the meeting of the 20/02/2018 of WG Balancing, Elia will shorten the neutralization time from 12 to 8 hours.

Given the very sparse activation of R3 Flex, it is proposed to stick to a pragmatic solution and implement the neutralization time at bid level, i.e. per day. As requested by the market parties and discussed during the meeting of the 20/06/2018 of the WG Balancing, if Elia requests two consecutive activations on two consecutive days, the BSP is allowed to refuse the second activation if the delay between the start of the two activations is less than the neutralization time. Note if the volumes of the two bids are different, the BSP will be allowed to refuse a volume corresponding to the one nominated for the first bid.

The solution to be implemented for R3 Flex CIPU units is exactly the same as for R3 Flex non-CIPU with the nuance that energy bids corresponds to the CIPU units (1 CIPU units 1 energy bid), i.e. neutralization is accounted per unit and per day.

Examples:

- A bid of 50 MW is fully or partially activated by Elia (out of a total contract of 200 MW) at 12:00 ➔ the bid is neutralized during the next 8 hours, i.e. it can only be activated as of 20:00.

## 2.4 Energy bids activation

### 2.4.1 Merit order

The merit order activation for mFRR is modified and simplified by:

- The modification of article 157 of the Federal Grid Code in September 2017. As a consequence of this modification non-reserved tertiary control power is not required to be completely activated before reserved tertiary control power. Free bids will be activated in a common merit order with R3 Standard while R3 Flex will still be activated at the end of the merit order due to the limited number of activations per contractual period of this product (while the number of activations of R3 Standard is unlimited). R3 Flex activations must therefore be spared to avoid having no R3 Flex anymore available before the end of the contractual period.
- The introduction of the activation price for R3 Standard and Flex non-CIPU, i.e. non-CIPU units have now an activation price and are placed in the merit order with CIPU units according to their activation price.
- The implementation of the startup costs of the CIPU units in the balancing energy price allows placing the non-running unit in the merit order.

The impact of those three aforementioned elements is illustrated on Figure 3 - As Is Merit Order and Figure 4 - To Be Merit Order. Note this merit order only includes flexibility which can be activated within 15 minutes (which is the activation time requirement of mFRR).

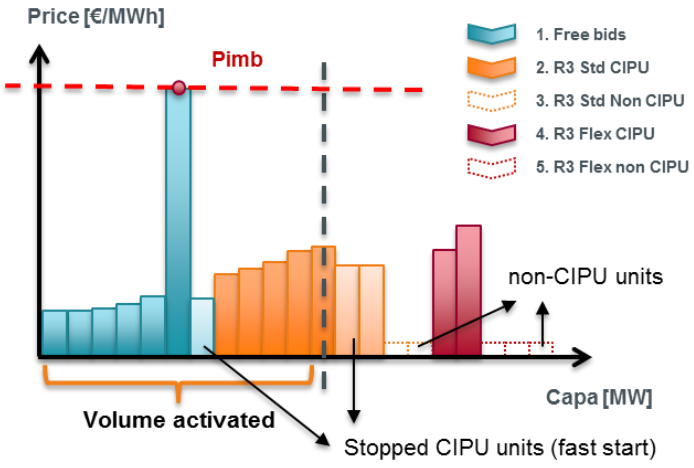


**Figure 3 - As Is Merit Order**

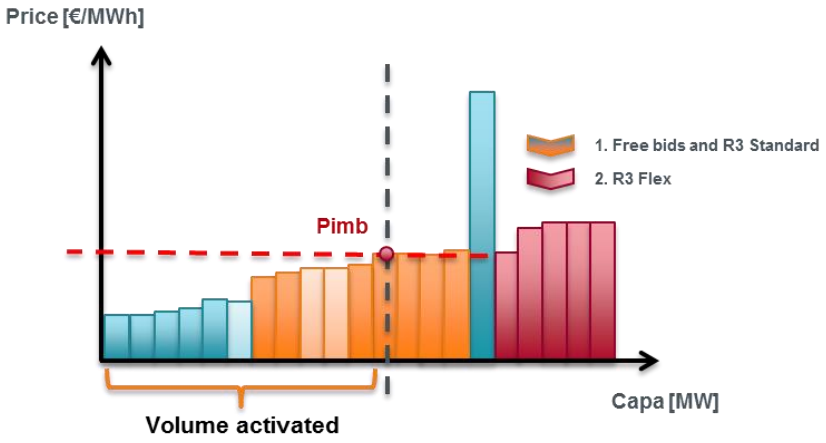


**Figure 4 - To Be Merit Order**

### 2.4.2 Exchange of information

With the introduction of the activation price and the mechanism of Transfer of Energy (discussed below in section 0), the same rules as for Bidladder[4] are implemented for the exchange of information between Elia, the BSP and the $BRP_{source}$ upon R3 non-CIPU (Standard and Flex) activation:

- When an energy bid is activated or prolonged, Elia will send a notification to the BSP.
- The BSP communicates to Elia, at the latest 3 minutes after the request for activation or prolongation of the bid, an acknowledgement message and the list of the delivery points (limited by the list of delivery points indicated in his bid) with which he will deliver the energy requested along with the volume repartition among those points. This first notification is referred to as the "acceptation".
- Within the quarter-hour following the start of the activation (or prolongation), Elia sends a first notification to the impacted $BRP_{source}$'s with the volume activated per delivery point aggregated per $BRP_{source}$ (based on the list of delivery points communicated by the BSP to Elia in the first notification).
- At the latest to 3 minutes after the end of the activation (or prolongation), the BSP communicates to Elia the final list of delivery points with which he performed the activation along with the corresponding volume activated for each point. This second notification is referred to as the "confirmation". In case the BSP indicates

[4] See Annex 6 of the General Framework for the Tertiary Control Non-Reserved Power Service or the Bidladder design note (section 2.3.1 of the final version of the design note) available on the Elia website: http://www.elia.be/en/users-group/Working-Group_Balancing/Task_Force_BidLadder

having activated 0MW the delivery point will not be further taken into account neither for the calculation of the delivered energy and imbalance adjustment in the context of transfer of energy, as described in section 0 nor for the activation control described in section 2.6.

- Within the quarter-hour following the end of the activation (or prolongation), Elia sends a second notification to the impacted $BRP_{source}$'s with the volume activated per delivery point aggregated per $BRP_{source}$ (based on the list of delivery points communicated by the BSP to Elia in the second notification).

## 2.5 Energy bids settlement with Transfer of Energy

### 2.5.1 Generalities

The Transfer of Energy is a pre-requisite for the implementation of an activation price for R3 Standard and Flex non-CIPU. Without such a mechanism, no activation price can be paid out for R3 Non-CIPU, as no imbalance correction of the impacted $BRP_{source}$ is possible.

The principles laid down in the current version of the Transfer of Energy rules, which have been submitted to CREG for final approval to enter into force as from 1/6/2018 for the market of non-reserved tertiary control, form the basis for Transfer of Energy for R3 non-CIPU Standard and Flex.

The following general modalities described in the Transfer of Energy rules will be applicable also for R3 non-CIPU Standard and Flex:

- Roles and responsibilities of the different market parties remain the same (as described in the Transfer of Energy rules for which a consultation has been organized until the 9th of April 2018[5]).
- Possible market scenarios[6]: the opt-out regime and the conditions under which the ToE regime is applicable remain the same for Bidladder and R3.
- Rules for imbalance adjustment in case of underdelivery, exact delivery or overdelivery are the same for activation of free bids non-CIPU (Bidladder) and activation of R3 non-CIPU bids.

Elia wishes to underline that some product-specific modalities such as the use of the baseline methodology X out Y, which is not an option for non-reserved tertiary control, will be considered in the next version of the Transfer of Energy rules. These Transfer of Energy rules including R3 Standard and Flex will be publicly consulted with all market actors and are subject to approval of CREG.

Elia anticipates that the Transfer of Energy will be operationalized for the market of reserved tertiary control offered by non-CIPU technical units by December 2018 on condition that the necessary regulatory documents have been approved in time.

[5] See on the Elia website: http://www.elia.be/en/about-elia/publications/Public-Consultation/Formal-consultation-regarding-the-rules-on-the-organization-of-Transfer-of-Energy

[6] See section 8 of the rules of Transfer of Energy available on the Elia website in French (http://www.elia.be/~/media/files/Elia/About-Elia/Publication/TOE/20180326-ToE-rules-2-0-FR-clean.pdf) or Dutch (http://www.elia.be/~/media/files/Elia/About-Elia/Publication/TOE/20180326_ToErules-2-0-NL-clean-v2.pdf)

### 2.5.2 Imbalance adjustment in case of "combo"

As described in 2.1.4, the "combo" between the three types of non-CIPU mFRR energy bids (R3 Standard, R3 Flex and free bids) is allowed meaning a given delivery point can participate to a bid of R3 Standard non-CIPU, R3 Flex non-CIPU and also to a free bids non-CIPU during the same quarter-hour. Given this possibility of "combo" some special rules are needed to determine the volumes of mFRR delivered by the different delivery points involved. An adequate calculation of those volumes is key:

- Elia uses them to perform the imbalance adjustment to the $BRP_{source}$'s and $BRP_{BSP}$'s perimeters.
- Elia uses them to publish the aggregated (upwards and downwards) delivered volumes on a quarter-hour basis and per metering direction (injection or offtake). Those publications are key to allow the financial compensation between BSP and supplier(s) for a market situation with Transfer of Energy.

The algorithm developed ensures that the notification message of the BSP is taken into account, meaning that delivery points that were notified to deliver only one product are treated as such. For the delivery points involved in a "combo", Elia will allocate the volume over the different products (free bids, R3 Standard, R3 Flex) according to a predefined algorithm in the following order: first free bids, then R3 Standard and finally R3 Flex. The fact that energy is allocated to free bids before R3 is motivated by the fact that R3 is a reserved balancing capacity that must always be available. Note this rule is already contractually applicable with the existing "combo" R3 – Bidladder without Transfer of Energy (for the activation control of R3). The fact that energy is allocated to R3 Standard then to R3 Flex is in line with the merit order activation (R3 Flex at the end of the merit order).

We illustrate the algorithm with an example in which Elia activates 2 bids non-CIPU and a "combo" is involved:

- Bid 1: Free bid non-CIPU of 10 MW
- Bid 2: R3 Flex non-CIPU of 10 MW

In the acknowledgement messages of the bids, the BSP confirms DP1 and DP2 were used for Bid 1 (free bid) while DP2 and DP3 were used for the Bid 2 (R3 Flex) (see table below). The delivered energy is calculated per delivery point based on the difference between metering at delivery point and the baseline (see table below).

| | **DP 1** | **DP 2** | **DP 3** |
|---|---|---|---|
| **Calc. of energy delivered** | 9 MW | 5 MW | 4 MW |
| **Bid 1 (free bid) - Ack. Particip.** | V | V | |
| **Bid 2 (R3 Flex) – Ack. Particp.** | | V | V |

### *Energy allocation for the product free bid*

We start with the product free bid as explained above. Within this category, we start by looking at the delivery point(s) not involved in any "combo". In the present case it is DP1. We have $E_{del,DP1}$ = 9 MW but $E_{requested,Bid1}$ = 10 MW. Hence we consider $E_{allocated,DP1,Bid1}$ = 9 MW and the remaining 1 MW will be filled in by the "combo" point DP 2 which participates also in R3 Flex. Hence the remaining volume for Bid 1 (free bid) will be delivered by DP2, we consider $E_{allocated,DP2,Bid1}$ = 1MW and therefore $E_{allocated,DP1,Bid1}$ + $E_{allocated,DP2,Bid1}$ = 10MW.

➔ The $BRP_{BSP}$ is perfectly balanced for Bid 1 (case of exact delivery).

➔ The $BRP_{source}$ of DP 1 is neutralized with 9 MW and does not encounter any impact on its perimeter due to the delivery of flexibility.

➔ DP 2 has a remaining 4 MW available for energy allocation of the product R3 flex (Bid 2).

### *Energy allocation for the product R3 Flex*

Within the second product category, we start by looking at the delivery point(s) not involved in any "combo". In the present case it is DP3. We have $E_{del,DP3}$ = 4 MW but $E_{requested,Bid\ 2}$ = 10 MW. Hence we consider $E_{allocated,DP3,R3Flex}$ = 4 MW. For the remaining 6 MW of Bid 2, we will look at delivery point(s) involved in a "combo". In the present case it is DP2. DP 2 had a remaining 4 MW available after the energy allocation of the product free bid, hence we attribute this remaining 4 MW for the R3 Flex product, resulting in $E_{allocated,DP2,Bid2}$ = 4 MW. We are in a situation of underdelivery for Bid 2 as $E_{allocated,DP2,Bid2}$ + $E_{allocated,DP3,Bid2}$ = 8 MW which is less than $E_{requested,Bid\ 2}$ = 10 MW.

➔ The $BRP_{BSP}$ experiences a negative imbalance of 2 MW for Bid 2 (case of underdelivery).

➔ The $BRP_{source}$ of DP 2 and DP 3 are respectively neutralized with 5 MW (1 MW for Bid 1 + 4 MW for Bid 2) and 4 MW and do not experience any imbalance.

The different BRPs experience the following imbalance:

| | **$BRP_{BSP}$** | **$BRP_{source}$ of DP 1** | **$BRP_{source}$ of DP 2** | **$BRP_{source}$ of DP 3** |
|---|---|---|---|---|
| **Imbalance** | -2 MW | 0 MW | 0 MW | 0 MW |

By applying this algorithm, the acknowledgement of the BSP is correctly taken into account in real-time. It ensures a precise correction of the imbalance perimeter of the BRP's and a volume calculation that allows a correct compensation between the Supplier(s) and the BSP.

## 2.6 Performance controls

### 2.6.1 As Is situation

The As Is performance (availability and activation) controls are described in the text below and summarized in Table 1.

### *Availability controls and penalties*

Currently, there are two types of availability control for R3 (Standard / Flex and CIPU / non-CIPU):

1. Nomination-based:
    - CIPU units: a penalties proportional to Belpex is applied for quarter-hours during which the R3 made available according to the nomination does not match the obligation of the BSP.
    - Non-CIPU units: no direct financial penalty is applied in case of incorrect nomination but the R3 made available calculated in the availability control (metering-based) is capped to the last volume nominated. Hence nominations lower than the obligation of the BSP will indirectly generate a financial penalty.
2. Metering-based:
    - CIPU units: a special penalty proportional to the capacity reservation is applied if it appears that the BSP has deliberately used in real time the capacity sold to Elia as R3 for its own use[7].
    - Non-CIPU units: R3 made available is calculated for every quarter-hour and for each delivery point of the pool based on metering and the "unsheddable margin" of the corresponding delivery point. Also the calculation takes into account the volume offered as free bids non-CIPU (Bidladder) to penalize any double selling. The R3 made available is capped to the last volume nominated. A penalty proportional to the capacity reservation (with a penalty factor of 1,3) is applied in case R3 made available does not match the obligation of the BSP.

[7] Outside the case of activation for compensation of a forced outage of another unit with the explicit approval of Elia.

### *Activation controls and penalties*

Currently, there are three types of penalties in case of R3 (Standard / Flex and CIPU / non-CIPU) activation failure:

1. Exposure to the imbalance:
    - CIPU units: the perimeter of the BSP (who is also the ARP) is corrected with the volume requested hence the BSP is subject to an imbalance in case of incorrect delivery.
    - Non-CIPU units: no exposure to imbalance for the moment in absence of Transfer of Energy.
2. Financial penalties:
    - CIPU units: no financial penalties on top of the imbalance in case of incorrect delivery.
    - Non-CIPU units: proportional to the reservation price. This penalty is only applicable to non-CIPU units as they are not exposed to the imbalance.
3. Need of new prequalification:
    - CIPU units: in case of two consecutive failed activations a new prequalification is required.
    - Non-CIPU units: in case of two consecutive failed activations, the "R3max,std" / "R3max,flex" values of the portfolio are lowered. A new prequalification is required if the BSP wants to increase the value of those parameters.

| | | CIPU | Non-CIPU |
|---|---|---|---|
| **Availability Ctrl** | Nomination-based | Proportional to Belpex price (in problem. QH)<br>$P_{MonthM} = \sum_{k}^{M}\left[MAX\left(10\frac{€}{MWh}; Ref\_Price\ (k)\right) * \frac{Missing\_MW\ (k)}{4}\right]$ | Indirect via "capping" of R3_Made_Av to DA nominations |
| | Metering-based | • Control of own use outside of allowed cases<br>• Penalties proportional to capa. remun.<br>$RED4 = \left[\frac{R3_{Infraction}}{R3_{contractuel\ Std+Flex_{equiv_{lot_i}}}}\right] * \left[\frac{Monthly\ fixed\ Remuneration\ R3\ Std + Flex}{4}\right]$ | • Calculation of R3_Made_Av based on metering and UM<br>• Penalty proportional to mthly capa. rem.<br>$\text{PMonthM} = \sum_{i=k}^{m} 1.3 * Missing\ MW(i) * Pavg(i) * 1/4$ |
| **Activation Ctrl** | Imbalance exposure | Exposure to Pimb (BSP = ARP) | No, not in absence of ToE |
| | Financial penalties | No | Proportional to missing MWh and mthly capa. remun:<br>$P_{R3}(n) = PF * \left[\frac{\sum_{All} Monthly\ Fixed\ Remuneration}{8}\right] * \left[\sum_{q=k}^{k+L} 1 - \frac{\min[R3\ Sup(q); R3\ Req(q)]}{R3\ Req\ (q)}\right] /L$ |
| | Need of new PQ | In case of 2 consecutive failed startup, units must do new prequalification | In case of 2 consecutive failed startup, R3max,std and R3max,flex are lowered. New prequalification is required if the BSP wants to increase the value of those parameters. |

**Table 1 - As Is availability and activation controls**

### 2.6.2 To Be (for 01/12/2018)

The To Be performance (availability and activation) controls that will be implemented on the 1st of December 2018 are described in the text below and summarized in Table 2.

#### *Availability controls and penalties*

Penalties related to availability controls for CIPU and non-CIPU will not be fully aligned for the moment. Indeed CIPU can "technically" arbitrate and double sell its capacity on the energy market (day-ahead, intraday) which is not the case for non-CIPU as the Transfer of Energy only applies for the balancing market (not for day-head and intraday). We will therefore keep penalties for CIPU proportional to Belpex while the one for non-CIPU will remain proportional to the capacity reservation price only.

Also note that the availability controls of CIPU / non-CIPU units and underlying penalties will be further aligned in the future with the introduction of ad-hoc activation tests as replacement of the current controls[8].

Penalties applicable to non-CIPU are currently lower than the one applicable to CIPU units though not fully comparable (Belpex vs capacity reservation price). Following a pragmatic approach and awaiting for a complete alignment foreseen in the future, it is therefore proposed to increase the penalty factor of 1,3 to 5 in the penalty formula of availability control of non-CIPU units (as described in Annex 11 of the General Framework for Tertiary Control by Non-CIPU Technical Units). Penalties related to CIPU units will remain unchanged.

#### *Activation controls and penalties*

With the implementation of the Transfer of Energy for tertiary control offered by non-CIPU units, the corresponding $BRP_{BSP}$'s will be exposed to the imbalance in case of incorrect delivery. As a result, the financial penalty in case of incorrect delivery mentioned above for non-CIPU units is not necessary anymore and will be suppressed. As a result, penalties in case incorrect delivery will be aligned for CIPU and non-CIPU units.

[8] This has been discussed during meetings of the WG Balancing in the context of the mFRR roadmap (initially presented during the meeting of the WG of 17th of March 2016)

| | | CIPU | Non-CIPU |
|---|---|---|---|
| **Availability Ctrl** | Nomination-based | Proportional to Belpex price (in problem. QH)<br>$P_{MonthM} = \sum_{k}^{M} \left[ MAX\left(10\frac{€}{MWh}; Ref\_Price\ (k)\right) * \frac{Missing\_MW\ (k)}{4} \right]$ | Indirect via "capping" of R3_Made_Av to DA nominations |
| | Metering-based | • Control of own use outside of allowed cases<br>• Penalties proportional to capa. remun.<br>$RED4 = \left[ \frac{R3_{Infraction}}{R3_{contractuel\ Std+Flex_{equiv_{lot_i}}}} \right] * \left[ \frac{Monthly\ fixed\ Remuneration\ R3\ Std + Flex}{4} \right]$ | • Calculation of R3_Made_Av based on metering and UM<br>• Penalty proportional to mthly capa. rem.<br>$\mathrm{PMonthM} = \sum_{i=k}^{m} \mathbf{5} * \boldsymbol{Missing\ MW}(i) * \boldsymbol{Pavg}(i) * \mathbf{1/4}$ |
| **Activation Ctrl** | Imbalance exposure | Exposure to Pimb (BSP = ARP) | **NEW with ToE** ➔ Exposure to Pimb (BSPBRP) |
| | Financial penalties | No | **NEW with ToE** ➔ No specific financial penalty |
| | Need of new PQ | In case of 2 consecutive failed startup, units must do new prequalification | In case of 2 consecutive failed startup, R3max,std and R3max,flex are lowered |

**Table 2 – To Be (for 01/12/2018) availability and activation controls**