Transfer of Energy in DA and ID markets

Market Development

17/06/2019

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1 Terminology

Access Point	An injection point and/or an offtake point to transmission or public distribution grid or to a CDS.
BRP	Balance Responsible Party (also known as Access Responsible Party or ARP); Any natural or legal person listed in the register of Balance Responsible Parties with whom Elia has concluded an ARP contract (and as defined in Art. 2 (7) of the Electricity Balancing Guideline).
BRPfsp	The Balance Responsible Party, appointed by the FSP, to take in its balancing perimeter the responsibility for the energy volumes requested by ELIA to the FSP or the energy volumes activated by the FSP to honor an exchange on the DA/ID markets. In the context of this document, BRPfsp is a general term which includes a BRPbsp and $BRPfsp_{DA/ID.}$
$BRPfsp_{DA/ID}$	The Balance Responsible Party, appointed by the $FSP_{DA/ID}$, to take in its balancing perimeter the energy volumes activated by the $FSP_{DA/ID}$ to honor an exchange on the DA/ID markets.
BRPfrp	The Balance Responsible Party, appointed by the FRP, which in the context of this document exchanges volumes on the DA/ID markets.
BRPsource	The Balance Responsible Party who has is his portfolio the Access Point of the Grid User providing flexibility with a Delivery Point.
BSP	Balancing Service Provider; An FSP with whom ELIA has concluded a contract to provide Balancing Services (and as defined in Art. 2 (6) of the Electricity Balancing Guideline).
Combo Delivery Point	A Delivery Point that was activated simultaneously for at least two products (ex. DA/ID and mFRR) during the same imbalance settlement period.
Delivery Point	A point on an electricity grid or within the electrical facilities of a Grid User where a volume of flexibility is delivered in order to provide a balancing service or strategic demand reserve or to participate to the DA/ID markets. This point is associated with measurement system(s) that enables Elia to control on and assess the delivery of the service.
Electricity Law	Law on the organization of the electricity market of 29 of April 1999.
FSP	Flexibility Service Provider; Any natural or legal entity, as defined in the Electricity Law, which uses for its activity (offering balancing services as BSP, strategic reserve services as SRP or DA/ID market services as $FSP_{DA/ID}$) the demand flexibility of one or more Grid Users.
$FSP_{DA/ID}$	Flexibility Service Provider to DA/ID markets; An FSP who offers demand flexibility by means of his $BRPfsp_{DA/ID}$ to DA/ID markets and with whom Elia has concluded an Elia-$FSP_{DA/ID}$ agreement.

Grid User	The natural person or legal entity connected to the Elia Grid, CDS or Public Distribution Grid as producer or consumer
Multiple FSP Delivery Point	A Delivery Point that was activated simultaneously by at least two FSPs during the same imbalance settlement period.
Pass-through contract or Contract with Valorization of the Deviation	Contract between the Grid User and the Supplier by which the Supplier valorizes the deviation between the nomination and the final position of the Grid User and through which the Grid User nominates his fixed offtakes before the real time (mostly day ahead) and the difference between the nomination and the actual offtake is charged / reimbursed by its Supplier at an agreed tariff, as described in CREG's Decision (B) 1677.
Supplier	Any physical person or legal entity who sells electricity to one or more Grid User(s). The Supplier produces or buys electricity sold to the Grid User(s).

2 Introduction

The present study analyses and describes the conditions that are necessary to allow the participation of the flexibility from demand to the Day-ahead and Intraday markets (hereafter referred to as "DA/ID markets") via the Transfer of Energy mechanism (hereafter referred to as "ToE").

This ToE mechanism allows the end user (or Grid User) to value his demand flexibility in the electricity markets by himself or by an intermediary of his own choice called "Flexibility Service Provider" and this independently from his Supplier and BRPsource. The ToE mechanism is based on the principles described in the CREG Study (F)160503-CDC- 1459 [1] relative to the *"means to be implemented to facilitate the participation of the flexibility of demand in the electricity markets in Belgium".*

In addition, the present study also analyses the participation of the flexibility to the DA/ID markets with alternative mechanisms that are called "Opt-out" and "Pass-through" mechanisms. In the Opt-out mechanism the $FSP_{DA/ID}$, and his associated $BRPfsp_{DA/ID}$, the Supplier and the BRPsource of a concerned Delivery Point are all the same party or collaborate together. The "Pass-through" mechanism allows a simplified participation of the Grid User with the $FSP_{DA/ID}$ (and $BRPfsp_{DA/ID}$) independently from the Supplier and BRPsource for those Grid Users who have concluded a "Pass-through contract" with their Supplier.

Furthermore, this study also describes the necessary design adaptations for a simultaneous participation of a Delivery Point in the balancing and DA/ID markets with one or multiple FSPs.

Finally, in order to assess the market conditions of such an extension and more specifically market interests and potential for a ToE mechanism applied to the DA/ID market, Elia performed a market study based on experienced feedback on the existing ToE mechanism in Belgium (for reserved and non-reserved mFRR) and in France (where ToE for DA/ID is implemented since 2014 under the name of NEBEF mechanism) as well as on the demand response participation in the electricity markets of the PJM region.

In preparation of the present study Elia organized two pre-consultation workshops and conducted a survey in order to take into account first expectations and remarks of market parties.

[1] This study can be consulted on the CREG's website in NL and FR.

This document is structured as follows:

1. Terminology
2. Introduction
3. Legal framework and context
4. Summary of the main principles in case of ToE

Part I: Design Study

5. Extension of ToE to DA/ID markets
6. Combo activations
7. Multiple FSP activations

Part II: Market Study

8. Feedback regarding the application of ToE on the Belgian mFRR market
9. Expectations on ToE in DA/ID markets

Annexes

3 Legal framework and context

The Electricity Law relative to the organization of the electricity market of 29th of April 1999 was amended on 13th of July 2017 in order to create a framework for the participation of demand side flexibility to the FRR balancing market segments, the Strategic Demand Reserve market and the DA/ID markets.

Conform Art. 19bis §2 of the Electricity Law, Elia proposed for approval to the CREG the Transfer of Energy rules[2] (hereafter called "ToE-rules"). These ToE-rules describe, amongst others:

- The applicable principles for the determination of the delivered volume, for the correction of the perimeter of the concerned BRPs and for the data exchange among concerned parties, and this as well for the ToE mechanism as for the alternative mechanisms (such as the Opt-out mechanism and soon the Pass-through mechanism);

- A phased implementation of ToE[3] in the different market segments that are foreseen by the Electricity Law. Each extension of the ToE to a new market segment is preceded by a specific feasibility study, aiming at demonstrating the technical feasibility and economic opportunity of the ToE for each concerned market segment.

So far, the ToE mechanism has been implemented or is announced to go-live in the following market segments:

- The market segment for non-reserved tertiary reserves (mFRR) from non-CIPU technical units, as from 1/6/2018;

- The market segment for reserved tertiary reserves (mFRR) from non-CIPU technical units as from 1/12/2018;

- Strategic reserve market by SDR-units units as from 1/11/2019;

- The extension of the ToE to the market segment for secondary reserves (aFRR) from non-CIPU technical units has been studied in 2018. Based on the conclusions of this study it has been agreed to re-asses the ToE mechanism for aFRR by the end of 2019 and in the meanwhile consider in 2019 the development of a new alternative mechanism called "Pass-through" for the aFRR as well as for the other existing market segments, as a priority.

In addition, only Delivery Points with a yearly average net-offtake on a yearly basis (based on an AMR meter) are eligible for ToE[4]. The same condition will apply in case ToE is extended to the market segment of DA/ID.

[2] The first publication of the ToE-rules goes back to May 2018.

[3] See section 5 of ToE-rules.

[4] In accordance with section 7.3 and 10.2 of the ToE-rules.

4 Summary of main principles in case of Transfer of Energy

This section describes the main principles of the ToE mechanism through the illustration of a use case.

The following roles illustrated in are involved in the ToE for the DA/ID markets:

- The Grid User, also called end user, who takes of energy from the grid and who can voluntarily activate his demand side flexibility by reducing/increasing his net-offtake based on an external signal;
- The Supplier of the Grid User which is responsible to foresee and provide energy to the Grid User at any moment;
- The BRPsource who has the Access Point of the Grid User in his perimeter and who is responsible to keep his portfolio balanced;
- The $FSP_{DA/ID}$ who has a flexibility contract with the Grid User in order to use his flexibility for the DA/ID markets. The $FSP_{DA/ID}$ is associated to a $BRPfsp_{DA/ID}$ and activates the flexibility in order to honor the volumes sold by this later;
- The $BRPfsp_{DA/ID}$ associated to the $FSP_{DA/ID}$. This BRP has access to the wholesale markets and sells/buys energy to/from a BRPfrp (via hub deals). In order to be balanced, the $BRPfsp_{DA/ID}$ asks the $FSP_{DA/ID}$ to activate a volume of flexibility equivalent to the volume of energy exchanged via hub deals. This flexibility activated by the $FSP_{DA/ID}$ comes from assets that belong to the portfolio of the BRPsource;
- The BRPfrp buys/sells energy from/to the $BRPfsp_{DA/ID}$ via hub deals (on behalf of the FRP).

Remark: For the sake of simplicity Elia will in the present document refer to exchanges on the DA/ID markets. Nevertheless all the rules described in the present note are also valid and applicable for exchanges between $BRPfsp_{DA/ID}$ and BRPfrp via the OTC mechanism.

Sign Conventions used in this document:

- A positive sign “+” will be used for any injections and any purchase of energy of a BRP;
- A negative sign “-“ will be used for any offtake and any sale of energy of a BRP;
- A positive sign “+” will be used for any upwards activation of the FSP (corresponding to an increase of injection or a decrease of offtake of a Delivery Point);
- A negative sign “-“ will be used for any downwards activation of the FSP (corresponding to a decrease of injection or an increase of offtake of a Delivery Point).

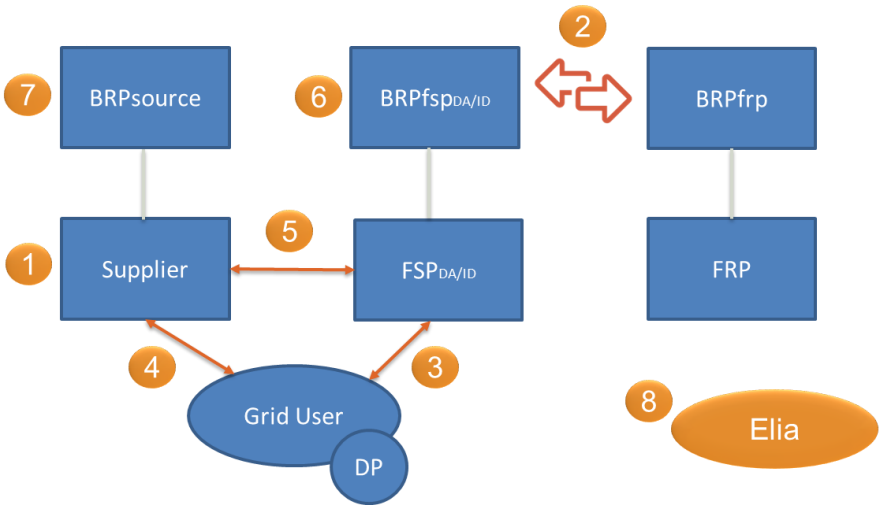

Figure 1 : Overview of the roles in case of ToE.

Let us consider the case of a volume of energy sold on the DA market by a BRPfsp$_{DA/ID}$ and delivered by the associated FSP$_{DA/ID}$ by means of a net-offtake reduction of one Delivery Point located in the perimeter of the BRPsource (corresponding to an upwards activation)[5]. The concerned Delivery Point is operated under a contractual ToE regime.

1. The Supplier of the Grid User buys energy in advance (via the BRPsource) on the electricity market to cover the estimated energy offtake of each Access Point in his portfolio. (In this example for simplification reasons we take the assumption that Delivery Point = Access Point).

2. The BRPfsp$_{DA/ID}$ sells a volume of energy in the DA market to a BRPfrp for a given period and nominates the energy sold to Elia via an existing hub nomination. At this stage the BRPfsp$_{DA/ID}$ is imbalanced if he doesn't take any additional action.

   In order to be balanced the BRPfsp$_{DA/ID}$ must ensure that the FSP$_{DA/ID}$ will activate flexibility (upwards) corresponding to the energy he sold and that this activation will be added to his perimeter (via perimeter correction applied by Elia). To do so he has to announce this to Elia and nominate, via a "Flex nomination"[6], the volume of flexibility that will be activated upwards by the FSP$_{DA/ID}$.

3. The FSP$_{DA/ID}$ operates his pool of Delivery Points and asks the Grid User to reduce his net-offtake in order to deliver the volume sold by the BRPfsp$_{DA/ID}$. The FSP$_{DA/ID}$ also announces to Elia this activation and the purpose of it via a FSP-Notification.

[5] The principles described here bellow apply also for the ID markets as well as for downwards activations by means of an offtake increase corresponding respectively to a volume of energy bought on the market.

[6] Although the hub Nomination is taken into account for the calculation of the imbalance of the BRPfsp$_{DA/ID}$, the Flex nomination is not. The BRPfsp$_{DA/ID}$ will be balanced, if the activation is correctly executed, via the perimeter correction applied by Elia in step 7.

4. Elia notifies the BRPsource with the volumes that are activated in his perimeter via a BRP-Notification.

5. As a consequence of this reduction in net-offtake (step 3), the Supplier cannot invoice this activated energy anymore to his final customer. Nonetheless the Supplier sourced this energy in advance on the electricity market (see step 1).

6. The delivered energy is financially compensated between $FSP_{DA/ID}$ and Supplier[7], either based on bilaterally agreed price or, in absence of such a bilateral agreement, via the application of a by default price formula determined by CREG[8]. The $FSP_{DA/ID}$ will thus compensate the Supplier for the sourced (but not invoiced) energy due to the activation of flexibility.

7. The balancing perimeter of the BRPsource is corrected on a quarter-hourly basis, for each quarter hour of the activation period, with the delivered volume. This correction is performed in order to neutralize the impact of the activation on the balancing perimeter of the BRPsource.

8. The $BRPfsp_{DA/ID}$ needs to take up the balancing responsibility for the activation of the flexibility. The $BRPfsp_{DA/ID}$ has to be responsible for the difference between the delivered volume (step 3) and the volume sold (step 2) in the DA market. Therefore, the volume sold on the market will be part of its imbalance calculation and the perimeter of the $BRPfsp_{DA/ID}$ is corrected with the delivered volume.

Aside from the ToE mechanism as described in the use case above, alternative mechanisms such as the Opt-out and Pass-through exist:

In case of the Opt-out alternative mechanism several aspects (i.e. volume, price and contractual modalities, including eventual financial guarantees) are jointly settled by the $FSP_{DA/ID}$, Supplier(s) and corresponding BRP(s). As a consequence Elia does not perform perimeter corrections for the BRPsource and the $BRPfsp_{DA/ID}$ (i.e. step 7 and step 8 above are skipped).

> **Specific case of Opt-out**: Note that already today a Grid User can valorize his flexibility on the DA/ID markets via his Supplier/BRPsource with or without the collaboration of third parties (e.g. independent aggregator). Therefore there is as such no "need" to develop an Opt-out regime in DA/ID in parallel of a ToE regime[9]. Nevertheless, Elia describes in the present note also the design to be adopted for an Opt-out regime in the optic of a harmonized extension of all the existing regimes for balancing (ToE, Opt-out & Pass-through) to the DA and ID markets.

[7] The volumes for which $FSP_{DA/ID}$ and Supplier proceed to a financial compensation are communicated by Elia and the DSOs through a "TSO-DSO data-hub".

[8] CREG Decision (B) 1677 can be consulted on the CREG's website in NL and FR.

[9] In addition of the ToE-regime, Elia foresees a Pass-through contractual regime as was consulted via the aFRR implementation plan.

In case of a Pass-through regime, the BRPsource and the Supplier are not impacted by the deviations of the Grid User and actions of $FSP_{DA/ID}$, as they "financially pass their imbalance" to the Grid User. Allowing that, those same aspects (i.e. volume, price and contractual modalities, including eventual financial guarantees) are settled in a joint agreement by the $FSP_{DA/ID}$, the corresponding $BRPfsp_{DA/ID}$ and the Grid User himself. As a consequence Elia does not perform perimeter corrections for BRPsource and $BRPfsp_{DA/ID}$ (i.e. step 7 and step 8 above are skipped).

PART I: DESIGN STUDY

This part of the design note focuses on the design adaptations necessary for the extension of ToE to DA/ID markets, the simultaneous participation of a Delivery Point in the balancing and DA/ID markets (hereafter referred to as "Combo activation") and the simultaneous activation of a Delivery Point by multiple FSPs (hereafter referred to as "Multiple FSP activation").

This design of ToE on DA/ID is an extension of the existing Transfer of Energy mechanism that is in place for mFRR and SDR. The design explained hereafter is based on the already approved fundamentals, rules and regulations. This means that:

- All existing rules as described in the current ToE-rules remain valid;
- Roles and responsibilities of the relevant actors remain unchanged (and are extended towards DA/ID markets);
- Only Delivery Points with a yearly net-offtake character are eligible for the ToE mechanism as described in the Electricity Law;
- Notifications are sent to BRPsource prior to real time;
- Asymmetric Imbalance Adjustment is applied[10].

This design foresees the opening of ToE to the DA/ID markets without any change of the currents market rules of power exchanges. Moreover, elements as described in the Electricity Law Art. 19bis §3 that are the CREG's competence i.e. default transfer price and mechanisms for financial and contractual guarantees, are out of scope of the present analysis.

The design study focuses on the impact on the existing business processes, taken into account the feedback of market parties Elia received during workshops and in the survey. The design study is structured as follows:

- Section 5 handles the design elements that are necessary to extend the ToE to DA/ID markets based on the existing ToE mechanism and more particularly the impact on the registration of the $FSP_{DA/ID}$, the nominations of $BRPfsp_{DA/ID}$, the notifications of $FSP_{DA/ID}$ and finally the calculation of the delivered volumes and the perimeter corrections (which is the settlement phase);

- Section 6 handles the Combo activation which consists of the simultaneous participation of a Delivery Point in the balancing and DA/ID market. More particularly the cases of Combo activation for the Combo between mFRR and DA/ID; aFRR and DA/ID; and FCR and DA/ID are described in detail;

- Finally, Section 7 handles the case where multiple FSPs are simultaneously active on one Delivery Point. This so-called Multiple FSP activation (which is a particular case of a Combo activation) is described in detail with examples on an activation for the same or different services by multiple FSPs.

[10] See section 5.3.1 regarding the Settlement phase where the principles regarding Asymmetric Imbalance Adjustment are further explained and stakeholders are invited to provide their remarks on this specific point.

5 Extension of ToE to DA/ID markets

This section describes the extension of ToE to DA/ID markets with following elements described:

- Registration phase (see subsection 5.1);
- Nomination and Notifications (see subsection 5.2);
- Settlement phase, including perimeter corrections and baseline (see subsection 5.3);
- Applicable modalities for the alternative mechanisms "Opt-out" and "Pass-through" (see subsection 5.4).

5.1 Registration phase

In order to be allowed to activate flexibility exchanged on the DA/ID markets by his corresponding $BRPfsp_{DA/ID}$, a candidate $FSP_{DA/ID}$ needs to pass a registration process. This process consists of an application, a contract signature, BRP designation, a pool registration and communication tests. Those elements are discussed in detail here below.

Remark: Registration elements which are the CREG's competence (i.e. default transfer price and financial guarantees) are beyond the scope of this design note and are not discussed. Moreover, conditions to become a BRP and necessary conditions to obtain access to power exchanges and DA/ID markets are also not described in this note as they remain unchanged.

5.1.1 Application and contract signature

A candidate $FSP_{DA/ID}$ can apply by submitting a completed application form to Elia. If a candidate $FSP_{DA/ID}$ is eligible, he gets invited to sign an Elia-$FSP_{DA/ID}$ agreement which stipulates the terms and conditions between Elia and the $FSP_{DA/ID}$. To do so the candidate $FSP_{DA/ID}$ needs to fulfill all the formalities concerning contract completion which are described below.

5.1.2 BRP Designation

A candidate $FSP_{DA/ID}$ has to designate a BRP (in the context of DA/ID markets referred to as $BRPfsp_{DA/ID}$) with a valid ARP contract in order to be able to trade with other BRPs on the DA/ID markets. The candidate $FSP_{DA/ID}$ has to provide Elia with a proof of this designation.

Remark: A BSP who applies to become $FSP_{DA/ID}$ has already a BRP (= BRPbsp), so in this case the $BRPfsp_{DA/ID}$ will be the BRPbsp.

5.1.3 Pool registration

The $FSP_{DA/ID}$ has to provide Elia with the list of Delivery Points to be added in his pool and with the following information for each of them:

- Delivery Point name;
- Type (TSO, Submetering, CDS, DSO);
- EAN;
- Grid User;
- Maximum upwards and/or downwards flexibility (also called "$DP_{DA/ID,max\_up}$" and "$DP_{DA/ID,max\_down}$"). For Delivery Points located in distribution grid, its absolute value must be

≤ than the absolute value of the PreQualified flexibility Power (also called "PQP") delivered by the DSO for the associated Access Point and for the corresponding direction.

Moreover per Delivery Point used to offer the DA/ID product, the $FSP_{DA/ID}$ submits a:

- Grid User declaration if the Delivery Point is connected to the Elia grid;
- A copy of a signed DSO/FSP contract if the Delivery Point is connected to the DSO grid (and the qualification by a NFS providing among others the PQP, for the Delivery Point);
- The CDSO declaration, if applicable;
- The Submeter Technical Checklist (and successfully complete a Submeter commissioning test), if applicable.

In case of the ToE contractual regime, the $FSP_{DA/ID}$ needs to provide a proof to Elia of an agreement between the $FSP_{DA/ID}$ and the concerned Supplier(s)[11] on the transfer price or a CREG Decision authorizing the $FSP_{DA/ID}$ and the concerned Suppliers(s) the use of the default price formula.

In case of the Opt-out contractual regime, the $FSP_{DA/ID}$ needs to provide proof to Elia of the Opt-out agreement. The Pass-through contractual regime is applicable for all Delivery Points covered by a Pass-through contract between the concerned Grid User and the concerned Supplier; Elia verifies the existence of such a Pass-through contract via the Elia-Supplier Contract[12].

5.1.4 Communication tests

The $FSP_{DA/ID}$ performs an IT communication test before the delivery of the service. The purpose of this test is to verify that the $FSP_{DA/ID}$ is able to receive, interpret and send the signals regarding real-time exchange of information (i.e. notifications as described in subsection 5.2.2).

Remark: A BSP who applies to become $FSP_{DA/ID}$ could skip these communication tests upon request if a successful "communication test" for the mFRR product took place the last three months and if the same communication protocols are used for the mFRR product as for DA/ID product communication tests.

[11] The concerned Suppliers are the Supplier(s) of the Access Point behind which the candidate Delivery Point is located.

[12] This contract is published on Elia's website .

5.2 Nominations & Notifications

This subsection describes the impact on the nomination process and the notification process. Nominations are discussed in subsection 5.2.1 and notifications in subsection 5.2.2. A use case to illustrate the principles is described in section -.

5.2.1 Nominations of the BRPfsp$_{DA/ID}$

A new type of nomination called "Flex nomination" is introduced on top of the existing types of nominations a BRP submits today to Elia[13].

This nomination refers to flexibility volumes that will be activated by the associated FSP$_{DA/ID}$ during an activation period, for which the BRPfsp$_{DA/ID}$ is responsible.

Two subtypes of Flex nomination are possible: DA Flex nomination and ID Flex nomination. Their specificities are discussed below.

5.2.1.1 DA Flex nominations

The BRPfsp$_{DA/ID}$ who exchanges a volume in Day-ahead markets, which he wants to *balance* with activations of flexibility (done by the associated FSP$_{DA/ID}$), has to submit, on the top of his DA hub nominations, a DA Flex nomination, before 14h00 CET on the day before the activation (D-1).

A DA Flex nomination contains the flexibility volume that is supposed to be activated by the associated FSP$_{DA/ID}$ by quarter hour for every quarter hour of the day D (which is also the day of the activation). The BRPfsp$_{DA/ID}$ can update this DA Flex nomination until 14h00 CET on D-1[14].

In addition when a BRPfsp$_{DA/ID}$ submits DA Flex nominations to Elia, an identifier of the FSP$_{DA/ID}$ must be provided (i.e. FSP$_{DA/ID}$ name or other numerical reference to the FSP$_{DA/ID}$).

Elia will use the last update of the DA Flex nomination together with all other DA nominations of the BRPfsp$_{DA/ID}$ to verify if his portfolio is balanced in day-ahead[15].

Elia will moreover use this last update of the DA Flex nomination later on (together with an eventual last update of the ID Flex nomination of this BRPfsp$_{DA/ID}$ relative to day D) to calculate the total flexibility volume supposed to be activated by the corresponding FSP$_{DA/ID}$ for each quarter hour of the day D.

5.2.1.2 ID Flex nomination

A BRPfsp$_{DA/ID}$ who exchanges a volume in Intraday markets, which he wants to *balance* with activations of flexibility (done by the associated FSP$_{DA/ID}$), has to submit, on the top of his ID hub nominations, an ID Flex nomination before 14h00 CET on D+1.

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[13] As described in section 12 of the current ARP contract.

[14] Deadlines of the submission of the nominations are harmonized with the deadlines of the existing nomination process.

[15] As specified in section 12 of the current ARP contract.

An ID Flex nomination contains the flexibility volume that is supposed to be activated by the associated $FSP_{DA/ID}$ by quarter hour for every quarter hour of the day D. The $BRPfsp_{DA/ID}$ can update this ID Flex nomination until 14h00 CET on D+1[16].

For example:

- A $BRPfsp_{DA/ID}$ sells 10 MW for the period [13h00-14h00] of day D on the intraday market and submits an ID hub Nomination for that deal at 10h00 (ID hub Nomination 1 = - 10 MW);

- Later on the same day he buys on the Intraday Market ID for the same period 4 MW (from another counter party), and submits a second hub nomination for that second deal at 14h00 in D+1 (ID hub Nomination 2 = + 4 MW).

He can submit either one ID Flex nomination of + 6 MW for the period [13h00-14h00] or first submit one ID Flex nomination of + 10 MW for the period [13h00-14h00] and update this before 14h00 in D+1 to + 6 MW.

In addition when a $BRPfsp_{DA/ID}$ submits ID Flex nominations to Elia, an identifier of the $FSP_{DA/ID}$ must be provided (i.e. $FSP_{DA/ID}$ name or other numerical reference to the $FSP_{DA/ID}$).

Elia will use the last update of the ID Flex nomination of the $BRPfsp_{DA/ID}$ later on (together with an eventual last update of the DA Flex nomination) to calculate the total flexibility volume supposed to be activated by the corresponding $FSP_{DA/ID}$ for each quarter hour.

5.2.2 Notifications of the $FSP_{DA/ID}$

The $FSP_{DA/ID}$ has to activate a volume of flexibility for each period of the day D for which the Sum of the last update of the DA Flex nomination and the last update of the ID Flex nomination submitted by the $BRPfsp_{DA/ID}$ is not equal to 0.

The volume to be activated and the direction[17] of the activation corresponds to the result of the Sum of the last update of the DA Flex nomination and the last update of the ID Flex nomination of the $BRPfsp_{DA/ID}$ for that period.

For example, if the $BRPfsp_{DA/ID}$ submits for the entire period [13h00-14h00] of the day D the following Flex nominations:

- DA Flex Nomination= + 5 MW (corresponding to a volume of 5 MW sold in DA and nominated via a hub deal Nomination of - 5 MW);
- ID Flex Nomination = + 6 MW (corresponding to a volume of 10 MW sold in ID and nominated via a hub deal Nomination of - 10 MW and to an additional volume of 4 MW bought later on in ID and nominated via a hub deal of + 4 MW).

⇨ The sum of all Flex Nominations of the $BRPfsp_{DA/ID}$ for the period [13h00-14h00] is + 11 MW (= + 5 MW + 6 MW);
⇨ The $FSP_{DA/ID}$ must activate a volume of 11 MW upwards.

[16] Deadlines of the submission of the nominations are harmonized with the deadlines of the existing nomination process.

[17] An upwards activation has to be executed for a negative result of the sum of all Flex nominations and a downwards nomination has to be executed for a negative result of the sum of all Flex nominations.

Remark: This implies that, although the $BRPfsp_{DA/ID}$ is allowed to introduce his ID Flex nominations till 14h00 CET D+1 he has to inform the $FSP_{DA/ID}$ of all the flexibility that this later has to activate before the start of the activation so that that later can the total volume of flexibility that needs to be activated.

This activation has to be announced by the $FSP_{DA/ID}$ to Elia, under the form of a "Set of FSP-Notifications" so that Elia is able to execute the "settlement of the Transfer of Energy"[18].

Besides that, Elia will use the Set of FSP-Notifications received by the $FSP_{DA/ID}$ to provide the BRPsource with close to real time information regarding the aggregated activated volume within his portfolio to avoid counter balancing. This information is send via "BRP-Notifications" and is based on the data communicated by the $FSP_{DA/ID}$ to Elia through the "FSP-Notifications".

The notification procedure between the $FSP_{DA/ID}$ and Elia is similar to the Notification procedure already applicable[19] for mFRR and SDR[20] and is composed by an FSP-Notification 0 (before the activation), an FSP-Notification 1 (send at the start of the activation) and an FSP-Notification 2 (send at the end of the activation).

5.2.2.1 FSP-Notification 0

The $FSP_{DA/ID}$ sends an FSP-Notification 0 at the earliest fifteen (15) minutes and at the latest five (5) minutes before the start of the activation to Elia with the following information:

- Total activated flexibility volume of $FSP_{DA/ID}$;
- Activation period;
- Identifier of the $BRPfsp_{DA/ID}$;
- The list of the Delivery Points which will contribute to the delivery.

The total activated volume and activation period must be equal to the sum of all the Flex nominations for a given period. The sign of this volume indicates the direction of the activation. A positive sign means a net upwards activation of flexibility[21]. A negative sign means a net downwards activation of flexibility[22].

The identifier has to refer to the $BRPfsp_{DA/ID}$ (i.e. $BRPfsp_{DA/ID}$ name or other numerical reference to the $FSP_{DA/ID}$).

This FSP-Notification 0 will be used by Elia to proceed the first BRP-Notification to the BRPsource.

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[18] Including the correction of perimeter of the $BRPfsp_{DA/ID}$ and the BRPsource and the calculation of the aggregated delivered volumes to be communicated to the Supplier and the $FSP_{DA/ID}$ for their financial settlement.

[19] And consulted via the ToE-rules and the ARP contract.

[20] As described in section 13 of the ToE-rules.

[21] By example through a net-offtake reduction or a net-injection increase.

[22] By example through a net-offtake increase or a net-injection decrease.

5.2.2.2 First BRP-Notification to the BRPsource

Once Elia receives the FSP-Notification 0, Elia sends a first BRP-Notification to the BRPsource; this first notification takes place at the earliest fifteen (15) minutes and at the latest three (3) minutes before the start of the activation.

This first notification corresponds to an estimate of the maximum volume (upwards or downwards) that can be activated in the balancing perimeter of the BRPsource for each quarter of an hour of the activation period.

The determination of this maximum volume is calculated as follows:

1. Elia calculates the sum of the maximum contributions ("$DP_{DA/ID,max}$") of all the Delivery Points declared by the $FSP_{DA/ID}$ in his FSP-Notification 0 and located in the balancing perimeter of the BRPsource (= $\sum DP_{DA/ID,max}$).

   The sign of the total activated flexibility volume in FSP-Notification 0 will determine if Elia will calculate this sum based on the maximum upward flexibility ($DP_{DA/ID,max\_up}$) or maximum downward flexibility ($DP_{DA/ID,max\_down}$)[23];

2. This $\sum DP_{DA/ID,max}$ calculated in the previous step is capped with the Total activated flexibility volume of $FSP_{DA/ID}$ declared in FSP-Notification 0.

   Thus in other words, if $\sum DP_{DA/ID,max}$ is larger than the Total activated flexibility volume of $FSP_{DA/ID}$ declared in FSP-Notification 0, the maximum volume corresponds to this Total activated flexibility volume.

   Else the maximum volume corresponds $\sum DP_{DA/ID,max}$.

This principle is illustrated below with an example[24]:

The $FSP_{DA/ID}$ submits a FSP-Notification 0 which the following elements:

- Volume to be activated = 5 MW (those 5 MW correspond to the sum of the last update of the DA Flex nomination and the last update of the ID Flex nomination of the associated $BRPfsp_{DA/ID}$ for the Period [13h00-14h00]);
- Activation Period: [13h00-14h00];
- Delivery Points used for this activation: DP 1; DP 2; DP 3; DP 4.

Where:

- DP 1 has a $DP_{DA/ID,max\_up}$ = 2 MW and is located in the portfolio of BRPsource A;
- DP 2, DP 3, DP 4 have each an individual $DP_{DA/ID,max\_up}$ = 2 MW and are all located in the portfolio of BRPsource B.

Then the maximum volumes communicated to BRPsources in the first BRP-Notification will be:

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[23] It is important to remark Elia will calculate only the maximum flexibility for one direction (upwards or downwards) for all impacted BRPsources, which implies all impacted BRPsources receive the maximum upwards flexibility for all the Delivery Points in their perimeter or all impacted BRPsources receive the maximum downwards flexibility for all the Delivery Points in their perimeter. In other words for the same activation it is not possible BRPsource A with DP 1 is notified with a maximum upwards flexibility and BRPsource B with DP 2 is notified with a maximum downwards flexibility.

[24] The same algorithm is applied today for notifications to the BRPsource in mFRR markets.

- For BRPsource A: the $\sum DP_{DA/ID,max}$ of DPs in his perimeter (here 2 MW from DP 1) capped with the volume activated (here 5 MW): 2 MW capped with 5 MW = 2 MW;
- For BRPsource B: the $\sum DP_{DA/ID,max}$ of DPs in his perimeter (here 2 MW + 2 MW + 2 MW from DP 2, DP 3 and DP 4) capped with the volume activated (here 5 MW): 6 MW capped with 5 MW = 5 MW.

5.2.2.3 FSP-Notification 1

The $FSP_{DA/ID}$ has to send the FSP-Notification 1 to Elia at the earliest immediately after the FSP-Notification 0 and at the latest three (3) minutes after the start of the activation. The FSP-Notification 1 contains the following information:

- Total activated flexibility volume of $FSP_{DA/ID}$;
- Activation period;
- Identifier of the $BRPfsp_{DA/ID}$;
- Distribution of the activated flexibility volume for each Delivery Point.

The total activated volume, activation period, list of Delivery Points and identifier of the $BRPfsp_{DA/ID}$ must match with FSP-Notification 0. The sign of the activated flexibility volume for each Delivery Point indicates the direction of the activation of this Delivery Point.

This notification will provide Elia with information to assemble the second BRP-Notification to the BRPsource.

5.2.2.4 Second BRP-Notification to BRPsource

Elia sends a second BRP-Notification to the BRPsource as soon as possible after the reception of the FSP-Notification 1 from the $FSP_{DA/ID.}$

The volume communicated to the BRPsource is the total volume activated by the $FSP_{DA/ID}$ in the balancing perimeter of the BRPsource and is equal to the sum of activated volumes for each Delivery Point in its balancing perimeter.

This information is based on the distribution of the activated flexibility volume across the various Delivery Points, as communicated by the $FSP_{DA/ID}$ to Elia in FSP-Notification 1.

5.2.2.5 FSP-Notification 2

The $FSP_{DA/ID}$ has to send FSP-Notification 2 at the latest within (3) three minutes after the end of the activation period with the following information:

- Total activated volume of $FSP_{DA/ID}$;
- Activation period;
- Identifier of the $BRPfsp_{DA/ID}$;
- Update or confirmation of the distribution of the activated flexibility volume for each Delivery Point.

The total activated volume, activation period, list of Delivery Points and identifier of the $BRPfsp_{DA/ID}$ must match with FSP-Notification 1. The sign of the activated flexibility volume for each Delivery Point indicates the direction of the activation of this DP.

This notification will provide Elia with information to assemble the third notification to the BRPsource.

This FSP-Notification 2 is used in settlement to determine which Delivery Points are used to calculate the delivered energy ($E_{delivered}$) (see subsection 5.3).

5.2.2.6 Third notification to BRPsource

A third notification is sent to the BRPsource as soon as possible after the Elia reception of the FSP-Notification 2 from the $FSP_{DA/ID}$ related to the activation.

The volume communicated to the BRPsource is the total volume activated by the $FSP_{DA/ID}$ in the balancing perimeter of the BRPsource and is equal to the sum of activated volumes for each Delivery Point in its balancing perimeter.

This information is based on the update or confirmation on the distribution of the activated flexibility volume across the various Delivery Points, as communicated by the $FSP_{DA/ID}$ to Elia in FSP-Notification 2.

5.2.2.7 Additional rules regarding notifications

To ensure a consistent ensemble of notifications and to inform a BRPsource in an optimal way following additional rules apply:

- If Elia does not receive a FSP-Notification from the $FSP_{DA/ID}$, Elia is not able to inform the BRPsource regarding the activated flexibility volumes within his balancing perimeter.
- Any FSP-Notification within the above-mentioned notification process not received by Elia is considered as a missing notification (regardless if it is FSP-Notification 0, FSP-Notification 1 or even FSP-Notification 2). If Elia notices three or more missing notifications within a period of 30 calendar days, it will notify the $FSP_{DA/ID}$ and suspend him from the mechanism for a period of 5 calendar days[25].
- FSP-Notification 2 will be used for settlement: Delivery Points for which the volume reported by the FSPDA/ID in this Notification 2 is equal to 0 MW are further excluded by Elia for the settlement calculations. If Elia does not receive FSP-Notification 2, FSP-Notification 1 will be used for the settlement. If both FSP-Notification 1 and FSP-Notification 2 are not received by Elia, the activation is considered as not proceeded and no correction of perimeters will be done. In this situation FSPDA/ID will be suspended from the mechanism for a period of 30 calendar days because by doing so he creates an imbalance in the perimeter of BRPsource that Elia cannot neutralize.

[25] As already described in section 14 of the ToE-rules.

5.2.3 Use case nominations and notifications

The following use case illustrates the principles for nominations and notifications that are described in the previous subsections:

a) A $FSP_{DA/ID}$ has following Delivery Points in his portfolio:

- A pool of Delivery Points which can be activated to deliver flexibility volumes (all Delivery Points are registered to deliver only to the DA/ID product in this example):

Delivery Point	BRPsource	$DP_{DA/ID,max\_up}$	$DP_{DA/ID,max\_down}$	Contr.Regime
DP 1	BRPsource A	+ 10 MW	- 10 MW	ToE
DP 2	BRPsource B	+ 5 MW	- 10 MW	ToE
DP 3	BRPsource C	+ 8 MW	- 4 MW	Opt-out
DP 4	BRPsource A	+ 7 MW	NA	ToE

b) The $BRPfsp_{DA/ID}$ exchanges following volumes on the DA and ID market for activation period X on day D:

Market	Volume	Buy/Sell	Counterparty
DA	- 15 MW	Sell	BRPfrp X
ID	+ 10 MW	Buy	BRPfrp Y
ID	- 8 MW	Sell	BRPfrp X

To balance his perimeter the $BRPfsp_{DA/ID}$ will ask the $FSP_{DA/ID}$ to activate his pool.

Remark: As described in the ARP contract and conform the EBGL, the hub nominations submitted by $BRPfsp_{DA/ID}$ and BRPfrp will be used for the calculation of their imbalances. This means that, at this stage, **if** $BRPfsp_{DA/ID}$ does not take any other action

- His nominations won't be balanced in DA;
- His perimeter will be in imbalance with - 13 MW for the period X when Elia will proceed to the imbalance calculations (- 15 MW + 10 MW - 8 MW).

c) $BRPfsp_{DA/ID}$ nominates in **DA** (submission to Elia before 14h00 CET on D-1):

- ✓ **NEW:** DA Flex nomination: 15 MW for activation period X on day D with $FSP_{DA/ID}$ identifier
- ✓ hub nomination: - 15 MW, Sell, for activation period X on day D to Counterparty BRPfrp A

⇨ $BRPfsp_{DA/ID}$ is balanced in D- 1

Remark: In this example, the $BRPfsp_{DA/ID}$ has no physical assets in his portfolio so he has to call the flexibility of his associated $FSP_{DA/ID}$ to cover the volume sold in the market. One could also imagine that a $BRPfsp_{DA/ID}$ has a physical CIPU unit in its portfolio and that he uses this CIPU unit to honor one part of his deal traded on DA. For instance he sells 40 MW on the DA market and in order to be balanced he nominates 25 MW of injection on his CIPU unit and

submits a Flex Nomination of 15 MW. Those 15 MW of Flex nomination correspond to a volume of flexibility that will be activated by his associated $FSP_{DA/ID}$ via Delivery Points in the portfolio of another BRP.

$BRPfsp_{DA/ID}$ nominates in **ID** (submission to Elia before 14h00 CET on D+1)

- ✓ **NEW:** ID Flex nomination: - 2 MW for activation period X on day D with $FSP_{DA/ID}$ identifier;
- ✓ hub nomination: + 10 MW, Buy, for activation period X on day D to Counterparty BRPfrp B;
- ✓ hub nomination: - 8 MW, Sell, for activation period X on day D to Counterparty BRPfrp A.

d) The total sum of the last updates of DA and ID Flex nominations of $BRPfsp_{DA/ID}$ for the period X on day D = 13 MW (=15 MW - 2 MW). This corresponds to the total volume supposed to be activated by the $FSP_{DA/ID}$ for the same period. This sum (13 MW) will be used during settlement as the requested energy ($E_{requested}$).

Remarks:

i. Only the $BRPfsp_{DA/ID}$ submits Flex nominations: nor the BRPfrp neither the BRPsources. All other nomination types remain unchanged and are aligned with existing nomination process;

ii. Although several Flex nominations can be introduced for the same period X, the $FSP_{DA/ID}$ activates only one volume per DP for the period X in order to cover the sum of the last updates of the DA and ID Flex nominations of $BRPfsp_{DA/ID}$ for that same period X. For example if only one Delivery Point is used by $FSP_{DA/ID}$ to cover the above mentioned 13 MW nominated in total by the $BRPfsp_{DA/ID}$, the Delivery Point will be activated upwards for 13 MW. This means that **an activation of one DP for different exchanges of energy in DA/ID markets is not considered as a Combo activation (as further described in section 6) but as the same DA/ID product.**

e) $FSP_{DA/ID}$ sends FSP-Notification 0 to Elia at the latest five minutes before the start of the activation with the following information:

- Total activated volume: + 13 MW (which corresponds with the sum of the Flex nominations, see previous step);
- $BRPfsp_{DA/ID}$ identifier;
- Activation period X;
- Pool of Delivery Points: DP 1 – DP 2 – DP 3 – DP 4;

Remark: $FSP_{DA/ID}$ sends only one Set of FSP-Notification to Elia for activation period X on day D.

f) Once the FSP-Notification 0 is received, Elia sends BRP-Notifications to all BRPsources with an estimation of the maximum volume aggregated for all their Delivery Points within their perimeter:

- The total activated volume in FSP-Notification 0 has a positive sign (see step e.), so Elia will use the $DP_{DA/ID,max\_up}$ (see table step a. for the values):
  - For BRPsource A the maximum volume up = + 17 MW

    (=$DP_{DA/ID,max\_up\_dp1}$ + $DP_{DA/ID,max\_up\_dp4}$ = 10 MW + 7 MW);
  - For BRPsource B the maximum volume up = + 5 MW

(=$DP_{DA/ID,max\_up\_dp2}$ = + 5 MW);

- For BRPsource C the maximum volume up = + 8 MW

(=$DP_{DA/ID,max\_up\_dp3}$ = + 8 MW).

- Elia will compare and cap this values with the Total activated volume in FSP-Notification 0 (= 13 MW, see step e.)
- This results in following FSP-Notifications 0 to the different BRPsources:

BRPsource A	BRPsource B	BRPsource C
▪ Max. volume up: + 13 MW (17 MW capped to 13 MW) ▪ Activation period X	▪ Max. volume up: + 5 MW ▪ Activation period X	▪ Max. volume up + 8 MW ▪ Activation period X

Remark: All BRPsources are notified with the maximum volume that can impact their perimeter in the direction of the activation (i.e. upwards in this example). If one Delivery Point is activated in the opposite direction, the BRPsource of the concerned point will receive during this first notification inaccurate information. Elia wonders however if such theoretical situations will indeed happen in practice. Elia invites therefore market parties to indicate if they foresee to activate Delivery Points in different directions (upwards and downwards) for the same activation period and to provide examples of such situations.

g) $FSP_{DA/ID}$ sends FSP-Notification 1 to Elia at the latest three minutes after the start of the activation with following information:

- Total activated volume: 13 MW (which corresponds with the total activated volumes in FSP-Notification 0);
- $BRPfsp_{DA/ID}$ identifier;
- Activation period X;
- Update pool of Delivery Points with volumes:
  - ✓ DP 1 (9 MW)
  - ✓ DP 2 (2 MW)
  - ✓ DP 3 (1 MW)
  - ✓ DP 4 (1 MW)

h) Elia sends BRP-Notifications to all BRPsources as soon as FSP-Notification 1 is received with an update of the volumes aggregated for all their Delivery Points within their perimeter:

BRPsource A	BRPsource B	BRPsource C
▪ Activated volume: + 10 MW ▪ Activation period X	▪ Activated volumes: + 2 MW ▪ Activation period X	▪ Activated Volume = + 1 MW ▪ Activation period X

i) $FSP_{DA/ID}$ sends FSP-Notification 2 to Elia at the latest three minutes after the end of the activation with following information:

- Total activated volume: 13 MW (which corresponds to the previous FSP-Notifications);
- $BRPfsp_{DA/ID}$ identifier;

- Activation period X;
- Confirmation pool of Delivery Points with volumes:
  - ✓ DP 1 (10 MW)
  - ✓ DP 2 (2 MW)
  - ✓ DP 3 (1 MW)
  - ✓ DP 4 (0 MW)

This FSP-Notification 2 will be used for settlement later on.

j) Elia sends the 3rd BRP-Notifications to all BRPsources, as soon as FSP-Notification 2 is received, confirming of the volumes aggregated for all their Delivery Points within their perimeter:

BRPsource A	**BRPsource B**	**BRPsource C**
▪ Volume = + 10 MW ▪ Activation period X	▪ Volume = + 2 MW ▪ Activation period X	▪ Volume = + 1 MW ▪ Activation period X

5.3 Settlement phase

This subsection describes the principles regarding on one hand the correction of the perimeters of $BRPfsp_{DA/ID}$ and BRPsource and on the other hand the calculation of the volumes that will be communicated to the $FSP_{DA/ID}$ and the Supplier for their financial compensation. In addition, the applicable baseline is also described.

5.3.1 Calculation of the delivered energy and perimeter corrections

To perform a perimeter correction of the BRPsource and $BRPfsp_{DA/ID}$ in case the ToE-mechanism is applied, both the requested energy (via the DA and ID Flex Nominations of the $BRPfsp_{DA/ID}$) and the delivered energy need to be calculated:

- The requested energy "$E_{requested}$" is calculated as the sum of the last updates of the DA and ID Flex nominations of the $BRPfsp_{DA/ID}$ for a given activation period (see subsection 5.2.1)[26].

- The delivered energy is calculated for a given activation period for each Delivery Point that has been communicated by the $FSP_{DA/ID}$ in FSP-Notification 2 and corresponds, per Delivery Point, to the difference between the Baseline[27] and the validated metering[28] during the delivery period. The delivered volume of flexibility on a Delivery Point is always limited to the maximum upward or downward flexibility ($DP_{DA/ID,max\_up}$ or $DP_{DA/ID,max\_down}$)[29].

Besides that, the proposed design described in this document foresees the application of the "Asymmetric Imbalance Adjustment" (hereafter also referred to as A.I.A).

This means that if the total volume delivered by the activated Delivery Points of the $FSP_{DA/ID}$ exceeds the sum of all the Flex nominations submitted by the $BRPfsp_{DA/ID}$ for the activation period (in other words if $E_{delivered} > E_{requested}$), the delivered energy per Delivery Point is adjusted on a pro-rata basis to the sum of the individually delivered volumes of all concerned Delivery Points, so that the total delivered volume, added across all Delivery Points that participate in the activation, is equal to the requested energy.

This implies that the over-delivered volume remains in the perimeter of the BRPsources. This is illustrated in step 7 of the example at the end of the present section.

[26] If Elia receives for a given activation period all necessary notifications but no Flex nomination, Elia will settle with $E_{requested} = 0$.

[27] See subsection 5.3.2

[28] As stipulated in section 10 of the ToE-rules.

[29] See subsection 5.1.3

The Asymmetric Imbalance Adjustment mechanism (A.I.A.) dates back to 2016 and was introduced during the design phase of the Bid-ladder project[30]. For harmonization reasons the design described in this note foresees a common approach (i.e. application of A.I.A.) also for the ToE in DA/ID markets.

During the pre-consultation workshops organized on 2/4/2019 and 15/5/2019 some stakeholders expressed concerns about this mechanism. More specifically one stakeholder noticed that the over-delivery can have negative impact on the BRPsource as the direction of the activation (decided in DA/ID) is not correlated to the direction of the Imbalance of the control area in RT neither to the imbalance price.

Another stakeholder suggested to abandon the A.I.A.

Elia invites therefore all market parties to specifically provide their position regarding the A.I.A. and to explain their arguments.

The main principles for the perimeter correction of the BRPsource and $BRPfsp_{DA/ID}$ in a market situation with ToE:

- For each quarter-hour of the activation period, the perimeter of the BRPsource is corrected with the delivered energy by the $FSP_{DA/ID}$ (in the opposite direction of the activation[31]) after application of A.I.A, which is - $E'_{delivered}$.

- For each quarter-hour of the activation period, the $BRPfsp_{DA/ID}$ is corrected with the delivered energy by the $FSP_{DA/ID}$ after application of A.I.A, $E'_{delivered}$. In this way, the $BRPfsp_{DA/ID}$ takes up the balancing responsibility for the activation of flexibility.

In order to guarantee the confidentiality of the different market parties, Elia corrects the balancing perimeter of BRPsource per quarter-hour and on the level of the portfolio.

Important remark: The $BRPfsp_{DA/ID}$ is, in case of the ToE mechanism on DA/ID markets, only corrected with the delivered energy by the $FSP_{DA/ID}$ ($E'_{delivered}$), and not with ($+E_{requested} - E'_{delivered}$) as it is the case for ToE in balancing markets. $BRPfsp_{DA/ID}$ is not corrected with the requested energy ($E_{requested}$) as this volume is implicitly already integrated in the calculation of his perimeter's imbalance through his hub nomination (see use case described in -, and at the end of the present section; in particular step b of section - and step 9 of the example in this section)

In addition, Elia will also as publish the aggregated (upward and downwards) delivered volumes (from all Delivery Points under a ToE regime) on a quarter-hourly basis and per metering direction (injection or offtake). These publications are the basis for the financial compensation between $FSP_{DA/ID}$ and Supplier[32].

[30] The design note of the Bidladder project can be consulted on Elia's website

[31] For an upwards activation of E'del= + 8MW, the perimeter of BRPsource will be corrected with -E'del = - 8MW; For an downards activation of E'del=- 8MW, the perimeter of BRPsource will be corrected with - E'del= -(- 8MW);

[32] As described in section 15 of the ToE-rules.

In case of a market situation with the alternative mechanisms Opt-out and Pass-through, Elia will not perform perimeter corrections of the BRPs. For Opt-out, all market parties including the BRPs have a joint agreement to settle their imbalances and for Pass-through, BRPsource and Supplier are not impacted by the deviations of the Grid User and actions of $FSP_{DA/ID}$ as they pass their imbalance to the Grid User.

The principles described above are illustrated in the example here-bellow.

Let us consider the use case described in the subsection -.: Based on the Flex nominations of $BRPfsp_{DA/ID}$ for a given period X, FSP $_{DA/ID}$ has to activate 13 MW during this period with the Delivery Points DP 1; DP 2; DP 3 and DP 4.

0. As described in step b of section -, the $BRPfsp_{DA/ID}$ has submitted hub nominations (to nominate his exchanges of energy in the DA/ID markets) and Flex nominations to balance the share of his hub nominations that will be balanced with an activation of flexibility by the $FSP_{DA/ID}$. The hub nominations submitted by $BRPfsp_{DA/ID}$ will be used for the calculation of his imbalance	• $BRPfsp_{DA/ID}$ Imbalance = - 13 MW (- 15 MW + 10 MW - 8 MW as described instep b of section -)
1. Elia determines the volume that is supposed to be activated by $FSP_{DA/ID}$ based on the sum of the last updates of the DA Flex nomination and ID Flex nomination of $BRPfsp_{DA/ID}$.	• $E_{requested}$ = 13 MW
2. With FSP-Notification 2 by the $FSP_{DA/ID}$, Elia receives the details of the total volume delivered by the $FSP_{DA/ID}$ per Delivery Point.	FSP-Notification 2 to Elia • DP 1 = + 10 MW • DP 2 = + 2 MW • DP 3 = + 1 MW • DP 4 = 0 MW
3. Delivery Points for which the volume reported by the $FSP_{DA/ID}$ in the previous step is equal to 0 MW are further excluded by Elia.	Elia does not include Delivery Points for which the $FSP_{DA/ID}$ reports 0 MW: • DP 1 = + 10 MW • DP 2 = + 2 MW • DP 3 = + 1 MW • ~~DP 4 = 0 MW~~
4. Elia calculates the volume delivered ($E_{delivered}$) per Delivery Point, taking into account the measurement data and the baseline. This may differ from the values reported by the $FSP_{DA/ID}$ in step 2.	Volumes delivered per supply point as calculated by Elia: • $E_{delivered\_dp1}$ = + 11 MW • $E_{delivered\_dp2}$ = + 3 MW • $E_{delivered\_dp3}$ = + 1 MW
5. Elia verifies whether the calculated delivered volumes for each Delivery Point are smaller than the $DP_{DA/ID,max}$. If the $DP_{DA/ID,max}$ is exceeded, the volume delivered at that Delivery Point is limited to the $DP_{DA/ID,max}$.	$DP_{DA/ID,max}$ is exceeded for DP 1 so $E_{delivered\_dp1}$ is capped: • $E_{delivered\_dp1}$ = ~~+11 MW~~ + 10 MW • $E_{delivered\_dp2}$ = + 3 MW • $E_{delivered\_dp3}$ = + 1 MW
6. Elia compares the requested flexibility volume with the sum of the volumes delivered per Delivery Point in step 5. This leads to the determination of under-delivery, precise delivery or over-delivery.	• $E_{requested}$ = 13 MW • $E_{delivered}$ = (10 MW+ 3 MW+ 1 MW) = 14 MW • 1 MW over-delivery
7. Elia reduces the volume delivered per Delivery Point calculated in step 5 pro rata to the total excess energy supplied. The volume supplied by the $FSP_{DA/ID}$ is thus reduced to the required volume ($E'_{delivered}$).	The excess energy supplied is reduced pro rata to the energy supplied per supply point: • $E'_{delivered\_dp1}$ = 10 MW – (1*10/14) = 9,28 MW • $E'_{delivered\_dp2}$ = 3 MW – (1*3/14) = 2,79 MW • $E'_{delivered\_dp3}$ = 1 MW – (1*1/14) = 0,93 MW ⇨ Total Delivered volume by $FSP_{DA/ID}$: 13 MW

8. Elia adds the sum of the energy supplied at the various Delivery Points, which are under ToE mechanism, calculated in step 7 to the perimeter of the $BRPfsp_{DA/ID}$.	Perimeter of $BRPfsp_{DA/ID}$ is corrected with $E'_{delivered\_dp1}$ and $E'_{delivered\_dp3}$ (DP 2 has Opt-out regime so no correction is applied). = 9,28 MW + 0,93 MW = 10,21 MW **Remark:** the perimeter of the $BRPfsp_{DA/ID}$ is not corrected with $E_{requested}$ as this is already included in his imbalance in step 0.
9. Elia neutralizes the perimeters of the relevant BRPsource's (only those under ToE mechanism) with the delivered energy as calculated in step 7.	Elia corrects the perimeters of the BRPsource's as follows: • BRPsource A: - 9,28 MW (= $-E'_{delivered\_dp1}$) • BRPsource C: - 0,93 MW (= $-E'_{delivered\_dp3}$) (BRPsource B: no correction as this delivery point is in Opt-out regime)

5.3.2 Baseline

This subsection describes the baseline that has to be used for the calculation of the delivered volume of flexibility on a Delivery Point. For the DA/ID market the baseline used is called High X of Y * and it consists in a variant of the High X of Y[33]. This methodology is based on historical consumption/production data of the Delivery Point.

> Elia proposes in this design study the High X of Y* methodology for the ToE in DA and ID as this methodology provides good results[34] for long duration activations and for long notification delays[35] in terms of accuracy, robustness (as the ability to be accurate in a large number of cases) and has a limited bias (average error is relatively low).
>
> Besides that this methodology is well known by stakeholders as it has been introduced since 2015[36]. Moreover there is no experience or insight on the type of assets that will participate to the ToE in DA/ID neither on the duration of their activations making it not possible to analyze at this stage whether another methodology could perform better.
>
> Elia welcomes suggestions of stakeholders for additional/other baselines and believes that any additional baseline should be proposed and analyzed when more experience (among others on the type of assets that participate and the duration of their activations) is build.

The baseline methodology High X of Y* is described here below; all additional or different features compared to the currently applicable and well know High X of Y methodology are explicitly indicated as "**NEW**".

For an activation with a duration A on a day D the Baseline High X of Y is established as follows:

Step 1. Selection of Representative Days

Representative Days are all days in the past of the same type as day D where the activation occurs for which the offtake (or injection) is not influenced by an unforeseen or unusual event.

Representative Days are divided in three categories:

- Working Day;
- Week-end and holiday: all days that are not working days;
- Monday or 1rst working day following a holiday. This category is optional[37].

[33] Described in section 9.3.2 of the ToE-rules.

[34] According to KEMA – 2011 – PJM Empirical Analysis of Demand Response Baseline Methods (study conducted for PJM).

[35] Time between the order of activation or the decision to activate and the beginning of the activation period.

[36] As baseline for the SDR since the winter period 2015- 2016.

[37] In absence of explicit mention of the FSP to consider the days of this category as a separate category, they will be considered in category 2.

By default, all days of the year are considered as representative days of one category, except

- Days on which a demand response event has occurred;
- **NEW:** The day before the day of the activation of flexibility (D-1) through ToE in DA/ID. This exclusion of D-1 in case of activation for day D excludes gaming possibilities after the gate closure time of the DA-markets.

The $FSP_{DA/ID}$ may ask to exclude one (or more) days of the representative days at the following conditions only:

- The request is motivated and justified by the $FSP_{DA/ID}$;
- **NEW:** Circumstances mentioned to exclude a representative day are not met the day of the activation (e.g. a day with maintenance cannot be excluded if on the day of the activation there was also a maintenance);
- The justification must correspond to one of the following list:
    - An activation of any flexibility service to which the Delivery Point participated (if applicable);
    - A "Force Majeure" ;
    - A planned or unplanned maintenance;
    - Holidays, strike days with an impact or closing period that differ from the past;
    - **NEW:** Peak price day, which is defined as a day with at least one hour with EPEX BE DA price > 150EUR/MWh. (Only if such a price peak day has an impact on the consumption of a Grid User f.e. because the Grid User's asset is price sensitive).

Step 2: Identification of reference days

This step consists of identifying X days for which quarter hour metering data of the Delivery Point will be used to calculate the Baseline.

Those X days are retained between Y last Representative Days of the same category as day D (with a maximum historical time window of 60 days). They correspond to the X days for which the average consumption (then injection) of active power over the corresponding period as the activation period A is the highest (lowest).

X and Y for each category of representative days are defined as presented in the table below:

Category of representative days	X	Y
Working days	4	5
Week-end/bank holiday	2	3
Mondays (only upon explicit request by the $FSP_{DA/ID}$)	2	3

Step 3: Baseline profile

This step is dedicated to the calculation of the Baseline value for each quarter hour of the period A. This value is the average of the X values of active power of the considered Delivery Point, measured at the same quarter hour of the X representative days.

Step 4: Adjustment of the Baseline level (uncapped symmetric additive)

In the baseline methodology High X of Y used for mFRR and for SDR an adjustment is applied based on consumption/production 3 hours before delivery.

NEW: For the variant baseline methodology High X of Y* no adjustment of the baseline level is applied. In other words, the baseline methodology High X of Y* corresponds to step 1 to step 3 of the methodology described above.

5.4 Comparative summary of modalities applicable in case of Transfer of Energy, Opt-out and Pass-through mechanisms

An overview of the impact on the alternative mechanisms Opt-out and Pass-through (together with a comparison to the ToE mechanism) is described in the table below:

	Transfer of Energy	Implicit Opt-out	Explicit Opt-out	Pass-through
Relation between market actors	1. BRP is different from Supplier and/or 2. $BRPfsp_{DA/ID}$ is different from at least one BRPsource on Delivery Point	$FSP_{DA/ID}$ = Supplier = $BRPfsp_{DA/ID}$ = BRPsource	Agreement between $FSP_{DA/ID}$, Supplier and their respective BRP's ($BRPfsp_{DA/ID}$ and BRPsource) to discard a market situation with ToE.	Contract between the Grid User and the Supplier by which the Supplier valorizes the deviation between the nomination and the final position of the Grid User.
Section in the ToE- rules	Section 8.1: Market situation with transfer of energy	Section 8.2: Exceptions	Section 8.2: Exceptions	Section 8.2 : Exceptions
Perimeter correction of BRP's	1. BRPsource is corrected with the delivered energy ($-E_{delivered}$) 2. $BRPfsp_{DA/ID}$ is corrected with the delivered energy [38] ($+E_{delivered}$)	No correction of BRP's [38]	No correction of BRP's[38]	No corrections of BRP's [38]

[38] The $BRPfsp_{DA/ID}$ is for ToE in DA/ID markets only corrected with the delivered energy ($+ E_{delivered}$), the requested energy ($-E_{requested}$) is implicitly in his hub nomination so this is not taken into account in the perimeter corrections.

6 Combo activations

This section of the design study describes the **additional design elements** related to the combined participation of one Delivery Point to the DA/ID market and the balancing market (FCR, aFRR or mFRR) called hereafter "Combo activation between DA/ID and balancing (FCR, aFRR, mFRR)". This section builds further up on the proposed design elements of the previous sections and is considered to be an **optional and additional layer** on top of the proposed design for Transfer of energy in DA/ID.

> In parallel, Elia conducted a market study to assess the economic opportunity of such an extension of the design, which evidently also increases the level of complexity. (see section 9 of this note).
>
> Therefore, Elia keeps on welcoming all market actors to provide additional feedback via this public consultation on the proposed design elements related to a Combo situation described hereunder, in order that Elia can assess the market interest and true potential of it.

Where relevant any deviations from the design elements described in the previous section will be clearly identified and explained.

Following elements are described:

- **What** is a Combo activation (see subsection 6.1);
- **Hypothesis** throughout this exercise (see subsection 0);
- **Recap**: Combo activation between mFRR reserved and non-reserved (see subsection 6.3);
- Combo activation between **mFRR** and **DA/ID** (see subsection 0);
- Combo activation between **aFRR** and **DA/ID** (see subsection 0);
- Combo activation between **FCR** and **DA/ID** (see subsection 6.6).

6.1 What is a Combo activation

A Combo activation is defined as a simultaneous activation of one or more Delivery Point(s) for multiple services (ex. in DA and mFRR) during the same imbalance settlement period ("ISP").

As mentioned in section 5.2, the combination between DA and ID is not treated as a Combo activation. This section therefore merely focuses on the combined participation of a Delivery Point to the DA/ID market and the balancing market as mentioned earlier.

The next subsection describes the assumptions that lie at the basis of this analysis.

6.2 Hypotheses throughout this exercise

The uses cases build up hereafter are based on the following hypotheses:

- A Delivery Point has **one contractual regime**: it has or an Opt-out[39]-regime, or a ToE-regime or a Pass-through[40]-regime. This contractual regime is independent from the market segment (mFRR, DA/ID, …) in which the Delivery Point is active;

- **Maximum one FSP[41]** that is different from the Supplier/BRPsource is active per Delivery Point[42].

[39] Explicit or implicit Opt-out as described in section 8.2 of the ToE-rules .

[40] Referring to the Pass-through regime as was consulted via the aFRR implementation plan. Please note that at the moment of the public consultation of this note a Public consultation of adapted ToE Rules is also running in order to introduce the simplified "Pass-through" regime (for mFRR, aFRR and SDR) as described in the aFRR design note.

[41] In the context of this section the general term "FSP" is used as reference to the roles of $FSP_{DA/ID}$ and BSP. Similarly the role of "BRPfsp" includes the role of BRPbsp and $BRPfsp_{DA/ID}$.

[42] Please note that this constraint will be released and investigated in depth in section 7 of this design study.

6.3 Recap: existing principles of Combo activation between reserved and non-reserved mFRR.

The objective of this section is to remind the reader on the **existing approach** (also called "Tetris-approach hereafter) that is applicable for the Combo between the three types of non-CIPU mFRR energy bids (Standard, Flex and free bids). This approach was:

- Consulted between April 2018 and July 2018 via the Working Group Balancing (link R3 2018 design note);
- Publicly consulted between June 2018 and July 2018 on the ToE-rules (link ToE rules).

This same Tetris-approach lies further on at the basis of the proposed Combo design between mFRR and DA/ID. The Tetris-approach allows to split the delivered volume of a Combo Delivery Point that was activated simultaneously for a given period for two products and attribute this delivered volume separately to the services in which it participated. An adequate calculation to split the delivered volume is key in order to correctly:

- Perform the activation and availability controls[43] for those products procured or activated by Elia;
- Perform the perimeter corrections of the BRPsource(s) and BRPfsp;
- Publish the aggregated (upwards and downwards) delivered volumes on a quarter-hourly basis and per metering direction (injection or offtake). Those publications are key to allow the financial compensation between FSP and Supplier(s) for a market situation with ToE.

The **basic principles** for the calculation of these delivered volumes of flexibility for Combo activations are the following:

- The delivered volume of flexibility is currently allocated to the different products according to a fixed and predetermined order. First the delivered volume per Delivery Point is allocated to the non-reserved mFRR (free bids), then to reserved mFRR Standard and finally to reserved mFRR Flex.
- For each of the bids (products) the delivered volume is calculated in accordance with the following **two steps:**

    1. In a **first step**, the delivered volumes of the "Pure Delivery Points[44]" are allocated to the relevant bid;
    2. In a **second step**, if the sum of the delivered volumes of Pure Delivery Points is smaller than the requested volume, the delivered volumes of Combo Delivery Points are addressed to fill in the remaining missing volume of each bid.

    Both steps are applied on each bid based on the predetermined order as explained in previous bullet-point. This approach allows to allocate volumes accurately per product while

[43] Elia performs an availability control for those product which are contracted and receive a reservation fee.

[44] We refer to '**Pure** Delivery Points' for those Delivery Points that did not perform a simultaneous activation and were only involved in delivering one service (ex. aFRR, mFRR,…) during the ISP in question.

respecting the notification of the FSP; Pure Delivery Points that were only notified in one single product will not affect the other product and Combo Delivery Points are allocated based on a pre-determined priority order.

This Tetris-algorithm is illustrated with an example of a simultaneous activation of a Delivery Point in a non-reserved mFRR bid[45] and a bid of the reserved mFRR Flex product. The example is based on a constellation with partially overlapping pools as illustrated in Figure 2.

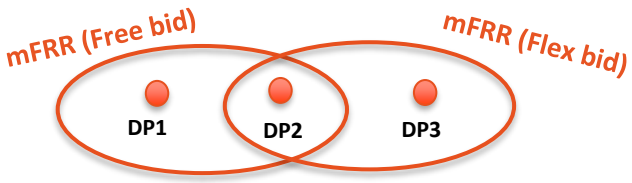


Figure 2 : Overlapping pools for a Combo between non-reserved mFRR and reserved mFRR Flex. DP 1 and DP 3 are Pure Delivery Points, DP 2 is a Combo Delivery Point.

a) Elia activates following bids between 15h00 and 15h15:

- **Bid 1:** 10 MW upwards of non-reserved mFRR = free bid
- **Bid 2:** 10 MW upwards of a reserved mFRR = flex bid

b) The Delivery Points notified by the FSP are used for the settlement phase:

	Bid 1	**Bid 2**
$E_{requested}$	10 MW	10 MW
Delivery Points and notified volumes by the FSP	• DP 1 = + 10 MW • DP 2 = + 2 MW	• DP 2 = + 1 MW • DP 3 = + 6 MW

c) Elia calculates the delivered volume per Delivery Point:

- DP 1 = 9 MW ($=E_{delivered\_dp1}$)
- DP 2 = 5 MW ($=E_{delivered\_dp2}$)
- DP 3 = 4 MW ($=E_{delivered\_dp3}$)

d) Elia calculates the delivered volumes for both the mFRR free bid and the mFRR flex bid based on the Tetris-approach (based on the predetermined order as described above):

[45] Also referred to as a "free bid".

Calculation of Bid 1 (=mFRR free bid)	
1. Elia identifies the Delivery Points of Bid 1 that are not performing a simultaneous activation (also called "Pure Delivery Points")	⇨ DP 1 is a Pure Delivery Point
2. Elia compares the requested volume of Bid 1 with the sum of the delivered volumes of the Pure Delivery Points of Bid 1. In a next step Elia attributes the delivered volumes of the Pure Delivery Points (DP 1) to Bid 1 and calculates the remaining part of the requested volume that needs to be filled in by the delivered volumes the Combo Delivery Points of bid 1.	⇨ $E_{requested\_bid1}$ = 10 MW ⇨ $E_{delivered\_dp1}$ = 9 MW ⇨ $E_{remaining\_bid1} = E_{requested\_bid1} - E_{delivered\_dp1}$ = 10 MW – 9 MW = 1 MW The remaining 1 MW of the requested volume will be filled in by the delivered volumes of the Combo Delivery Points.
3. Elia identifies the Combo Delivery Points that performed a simultaneous activation in both Bid 1 (mFRR reserved flex) and Bid 2 (mFRR non-reserved free bids) and determines the delivered energy.	DP 2 was notified by the FSP in both Bid 1 and Bid 2 ⇨ DP 2 is a Combo Delivery Point And Elia determines the delivered energy : $E_{delivered\_dp2}$ = 5 MW
4. Elia compares the remaining share of the delivered volume of Bid 1 that needs to be filled in (as calculated under step 2) with the delivered volume of the Combo Delivery Point(s) identified under step 3. Elia then fills in the remaining volume of Bid 1 with the delivered volumes of the Combo Delivery Points.	• $E_{remaining\_bid1}$ = 1 MW (see step 2) • $E_{delivered\_dp2}$ = 5 MW (see step 3) ⇨ The remaining 1 MW of the requested volume of Bid 1 is filled in with the delivered volume of DP 2 (=Combo Delivery Point) ⇨ Since the remaining volume for Bid 1 is smaller than the delivered volume of DP 2 the part of $E_{delivered\_dp2}$ that is allocated to Bid1 ($E_{delivered\_dp2\_bid1}$) is 1 MW The delivered volume by the FSP for Bid 1 equals 10 MW (= $E_{delivered\_dp1} + E_{delivered\_dp2\_bid1}$ = 9 MW + 1 MW)
5. Elia calculates the available share of the delivered volume of the Combo Delivery Points that can be used for allocation to Bid 2.	• $E_{dp2\_available\_bid2} = E_{delivered\_dp2} - E_{delivered\_dp2\_bid1}$ = 5 MW – 1 MW = 4 MW ⇨ 4 MW of DP 2 is available for allocation to Bid 2

Calculation of Bid 2 (=mFRR flex)	
6. Elia identifies the Pure Delivery Points of Bid 2.	⇨ DP 3 is a Pure Delivery Point
7. Elia compares the requested volume of Bid 2 with the sum of the delivered volumes of the Pure Delivery Points of Bid 2. In a next step Elia attributes the delivered volumes of the Pure Delivery Points (DP 3) to Bid 2 and calculates the remaining part of the requested volume that needs to be filled in by the delivered volumes of Combo Delivery Points.	⇨ $E_{requested\_bid2}$ = 10 MW ⇨ $E_{delivered\_dp3}$ = 4 MW ⇨ $E_{requested\_bid2\_remaining} = E_{requested\_bid2} - E_{delivered\_dp3}$ = 10 MW – 4 MW = 6 MW The remaining 6 MW of the requested volume will be filled in by the delivered volumes of the Combo Delivery Points.

8. Elia takes the available share of the Combo Delivery Points (see step 5.) for allocation to Bid 2 and determines the total delivered volume of the second bid.	⇨ $E_{dp2\_available\_bid2}$ = 4 MW available and allocated to Bid 2. The total delivered volume of the second bid is equal to 8 MW (4 MW + 4 MW), coming from DP 3 (see step 7) and DP 2 (current step 8). ⇨ This results in a situation with **an under-delivery** of 2 MW for Bid 2.
9. Elia corrects the BRPfsp with the difference between the delivered volume and the requested volume for Bid 1 and Bid 2.	Elia corrects the perimeter of the BRPsource as follows: ⇨ Perimeter BRPfsp = - $E_{requested}$ + $E_{delivered\_(on\ all\ DPs)}$ = - 20 MW + (9 MW + 5 MW + 4 MW) = - 2 MW
10. Elia corrects the BRPsource(s) with the delivered volumes of the different Delivery Points.	Elia corrects the perimeters of the BRPsource as follows: • $BRPsource_{\_dp1}$ = - 9 MW • $BRPsource_{\_dp2}$ = - 5 MW • $BRPsource_{\_dp3}$ = - 4 MW

6.4 Combo activation between mFRR and DA/ID

This section describes a simultaneous activation for mFRR and for DA/ID for non-CIPU Delivery Points and is divided into following subsections:

- Prequalification (mFRR) and registration (DA/ID) phase
- Bidding phase
- Activation phase
- Settlement phase
- Publication of Imbalance volumes
- Conclusion

Remark: We refer to mFRR in a generic way; all conclusions hold for both mFRR non-reserved as the mFRR-reserved products (flex and standard).

6.4.1 Prequalification (mFRR) and registration (DA/ID) phase

All Combo Delivery Points that wish to participate in both mFRR and the DA/ID market need to be prequalified (mFRR) or registered (DA/ID) separately; a pre-qualification in mFRR does not imply that these Delivery Points are also registered for DA/ID.

During the contracting phase, the FSP chooses the baseline methodology per Delivery Point and per product (f.e. Last Qh for mFRR and High X of Y* for DA/ID). Baselines therefore differ between mFRR (Last Qh or High X of Y) and DA/ID (High X of Y*) for activations where no Combo takes place.

However, when, a Combo activation does take place, the calculation of the total delivered volume per delivery point has to be done based on one and unique reference baseline; therefore one single **master-baseline** is adopted. Such a master-baseline serves to calculate one overall delivered energy of a Delivery Point participating to a Combo activation, that afterwards is split amongst the different products (mFRR and DA/ID) according the Tetris-approach. For a Combo between mFRR and DA/ID the baseline methodology High X of Y* will serve as the master-baseline.

Remark: Elia observes that the baseline Last Qh before the mFRR activation has proven to be an accurate baseline for reserved and non-reserved mFRR, favoured and widely adopted by most market parties. However, during a Combo activation a **master-baseline** is required to determine the delivered volume for both products (incl. mFRR), possibly leading to less accurate results for mFRR compared to a pure mFRR activation.

During periods when no Combo activations take place, it is preferred that each product uses the product-specific baseline[46].

[46] Which is High X of Y* for DA/ID and Last Qh of High X of Y for mFRR as chosen by the FSP the prequalification phase.

6.4.2 Bidding phase

It is the FSPs' responsibility is to ensure that volumes that are offered in the DA/ID market (by means of his BRPfsp) and volumes that are offered in the mFRR market can effectively be delivered by the Delivery Points in its pool and thus also respects the physical constraints set by the DSO via the Network Flex Study (NFS).

The proposed design does not foresee to inform the FSP if the sum of the offered volumes in the DA/ID product and the offered volumes in mFRR is bigger than the maximum amount of flexibility that can be offered by its portfolio in question.

6.4.3 Activation phase

No impact has been identified on the activation phase for a Combo activation between mFRR and DA/ID as the decision (or the order send by the BRPfsp to the FSP) to activate flexibility for a given period is made a few days (OTC, DA) till hours (ID) before the start of the activation, while the mFRR activation order is send by Elia to the FSP a few minutes before the real-time.

6.4.4 Settlement phase

As explained in the previous section 6.3, the Combo activation between mFRR and DA/ID is based on the **Tetris-approach** and should be considered as an **extension** of the existing Tetris-approach as was already implemented for the Combo between the reserved and non-reserved mFRR products.

During the settlement phase the delivered volume per Delivery Point is split between the mFRR product and the DA/ID product. Such a split is necessary to ensure that activation controls, availability controls and a perimeter corrections of a Combo activation can be performed correctly without taking into account volumes that were delivered for another product.

For the Combo Delivery Points, Elia will allocate the delivered volume over the different products[47] according to a predefined algorithm in the following order: first DA/ID, then non-reserved mFRR, then mFRR Standard and finally mFRR Flex. The fact that energy is first allocated to the DA/ID product, then to non-reserved mFRR product and finally to the reserved mFRR product (Standard and Flex) is motivated by the fact that reserved mFRR is a reserved balancing capacity product that must always be available, as was consulted via the mFRR design note[48]. The fact that energy currently is being allocated to reserved mFRR Standard then to reserved mFRR Flex is in line with the merit order activation (reserved mFRR Flex is at the end of the merit order).

The example hereunder illustrates the Tetris-algorithm for a Combo activation between mFRR and DA/ID and the required adaptations needed to take into account the situation where a Delivery Point delivers **both upwards and downwards flexibility**.

[47] DA/ID product, non-reserved mFRR product, reserved mFRR Standard product and reserved mFRR Flex product.

[48] Consulted between April 2018 and July 2018 via the Working Group Balancing (R3 2018 design note).

The example is based on a constellation with partially overlapping pools as illustrated in Figure 3. Such an example allows to take into account the complexity that delivered volumes of Pure Delivery Points (ex. DP 1) cannot be attributed to a service in which it did not participate (ex. mFRR).

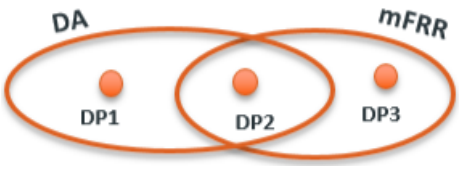


Figure 3 : Overlapping pools for a Combo between DA and mFRR. DP 1 and DP 3 are Pure Delivery Points, DP 2 is a Combo Delivery Point.

Figure 3 illustrates a situation in which:

a) The FSP activates flexibility in his pool in the upwards direction (reduction in net-offtake) that corresponds to the (sum of all) Flex nomination(s) of the associated BRPfsp for a given activation period X:

   - **Sum of Flex Nominations ($E_{requested\_DA/ID}$):** 10 MW

   Elia activates following bid for the same activation period of downward mFRR (increase in net-offtake):

   - **mFRR free bid ($E_{resuested\_mFRR}$):** - 10 MW

   Remark: In this example is explicitly chosen to illustrate a situation where the combo Delivery Point DP 2 is simultaneously participating to an upward and a downward activation. As there is no direct correlation between the DA/ID prices and the real time imbalance the probability of such a situation is not zero. The following steps describe how the "netto" delivered volume of such a Delivery Point (upwards or downwards) is split into upwards delivered volume and downwards delivered volume.

b) The Delivery Points notified by the FSP are used for the settlement phase:

	DA/ID product	**mFRR free bid**
$E_{requested}$	10 MW	- 10 MW
Delivery Points and volumes notified by the FSP	• DP 1 = + 5 MW • DP 2 = + 5 MW	• DP 2 = - 5 MW • DP 3 = - 5 MW

c) Elia[49] calculates the delivered volume per Delivery Point based on the baseline High X of Y*, which is master-baseline (see subsection 6.4.1) and the quarter-hour metering data:

- DP 1 = 5 MW (=$E_{delivered\_dp1}$)
- DP 2 = 0 MW (=$E_{delivered\_dp2}$)
- DP 3 = - 5 MW (=$E_{delivered\_dp3}$)

d) Elia calculates the delivered volumes for both the DA/ID product and the mFRR flex based on the **updated Tetris-approach** (based on the predetermined order as described above):

Calculation of the DA/ID product	
1. Elia identifies the Delivery Points of the DA/ID product that are not performing a simultaneous activation (also called "Pure Delivery Points")	⇨ DP 1 is a Pure Delivery Point
2. Elia compares the requested DA/ID volume with the sum of the delivered volumes of the Pure Delivery Points. In a next step Elia attributes the delivered volumes of the Pure Delivery Points (DP 1) to the DA/ID product and calculates the remaining part of the requested volume that needs to be filled in by the delivered volumes of Combo Delivery Points. (ex. mFRR and DA).	⇨ $E_{requested\_DA/ID}$ = 10 MW ⇨ $E_{delivered\_dp1}$ = 5 MW ⇨ $E_{remaining\_DA/ID} = E_{requested\_DA} - E_{delivered\_dp1}$ = 10 MW – 5 MW = + 5 MW The remaining 5 MW of the requested volume will be filled in by the delivered volumes of the Combo Delivery Points.
3. Elia identifies the Combo Delivery Points that performed a simultaneous activation and determines a. The delivered energy b. **NEW If the Combo DP was activated in both directions:** the DA/ID notified volume	DP 2 was notified by the FSP for both DA/ID and mFRR respectively for an upwards and downwards activation(=> "Combo Delivery Point") and Elia a. Determines the delivered energy: = $E_{delivered\_dp2}$ = 0 MW b. **New:** the notified volume: = $E_{notified\_dp2\_DA/ID}$ = + 5 MW
4. **NEW If the Combo Delivery Point was activated in both directions:** Elia splits up the 'net-reaction' of Combo Delivery Points into an upward and downward delivered volume. In order to do so, Elia first allocates to the DA/ID product the minimum (if upwards and maximum if downwards) between the notified volume by the FSP and the remaining share of the delivered volume of the requested DA/ID volume (see step 2). **Please note** that the notified volume will **only be used** in case of an upward and downward delivery during the same ISP. When both activations take	⇨ $E_{remaining\_DA/ID}$ = + 5 MW ⇨ **New:** $E_{notified\_dp2\_DA}$ = + 5 MW ⇨ Attribute the **notified volume** to the remaining requested DA/ID volume ⇨ $E_{attributed\_dp2\_DA/ID}$=min ($E_{notified\_dp2\_DA}$;$E_{remaining\_DA/ID}$)[50] = + 5 MW ⇨ The delivered volume by the FSP equals 10 MW (= 5 MW + 5 MW)

[49] The calculation of delivered volume per Delivery Point is done in collaboration with the DSOs.

[50] In case of an upward delivery for the DA/ID product. In case of a downward delivery: $E_{attributed\_dp2\_DA/ID}$ = **max** ($E_{notified\_dp2\_DA}$; $E_{remaining\_DA/ID}$)

place in the same direction, the same basic algorithm as illustrated under section 6.3 is applicable.	
5. Elia calculates the available share of the delivered volume of the Combo Delivery Points that can be used for allocation to the mFRR bid.	⇨ $E_{dp2\_available\_mFRR} = E_{delivered\_dp2} - E_{attributed\_dp2\_DA/ID} = 0$ MW – 5 MW = - 5 MW ⇨ - 5 MW of DP 2 available for allocation to mFRR

Calculation of mFRR free bid	
6. Elia identifies the "Pure Delivery Points" of the mFRR bid.	⇨ DP 3 is a Pure Delivery Point
7. Elia compares the requested volume of the mFRR bid with the sum of the delivered volumes of the Pure Delivery Points of the mFRR bid. In a next step Elia attributes the delivered volumes of the Pure Delivery Points (DP 3) to the mFRR bid and calculates the remaining part of the requested volume that needs to be filled in by the delivered volumes of Combo Delivery Points.	⇨ $E_{requested\_mFRR}$ = - 10 MW ⇨ $E_{delivered\_dp3}$ = - 5 MW ⇨ $E_{remaining\_mFRR} = E_{requested\_mFRR} – E_{delivered\_dp3}$ = - 10 MW – (– 5 MW) = - 5 MW The remaining - 5 MW of the requested volume will be filled in by the delivered volumes of the Combo Delivery Points which performed a simultaneous activation.
8. Elia takes the available share of the Combo Delivery Points (see step 5.) for allocation to the mFRR bid and determines the total delivered volume of the bid.	⇨ $E_{dp2\_available\_mFRR}$ = - 5 MW available and allocated to the mFRR bid. The total delivered volume of the bid equals to - 10 MW (- 5 MW + (- 5 MW)), coming from DP 3 (see step 7) and DP 2 (current step 8). ⇨ This results in a situation with **an exact delivery**
9. Elia corrects the BRPfsp with the delivered volume for the DA/ID product and with the difference between the delivered volume and the requested volume for the mFRR bid.	Elia corrects the perimeter of the BRPfsp as follows: ⇨ Perimeter BRPfsp = + 10 MW + (- 10 + 10 MW) = + 10 MW
10. Elia corrects the BRPsource(s) with the delivered volumes of the different Delivery Points.	Elia corrects the perimeters of the BRPsource as follows: • Perimeter $BRPsource_{\_dp1}$ = - 5 MW • Perimeter $BRPsource_{\_dp2}$ = + 0 MW • Perimeter $BRPsource_{\_dp3}$ = + 5 MW

6.4.5 Publication of Imbalance volumes

The volumes calculated under the settlement step via the Tetris-algorithm are used for

- Perimeter corrections of the BRPsource(s) and the BRPfsp perimeter
- Publication of the aggregated (upward and downwards) delivered volumes (from all Delivery Points under a ToE regime) on a quarter-hourly basis and per metering direction (injection or offtake). These publications are the basis for the financial compensation between FSP and Supplier.

In case of a Combo activation the cross-product aggregated volumes **will** be published to Supplier and FSP and published volumes **will not** be split and aggregated per product.

6.5 Combo activation between aFRR and DA/ID

This section describes the proposed design for a simultaneous activation between aFRR and DA/ID for non-CIPU Delivery Points.

The proposed design takes into account the fact that ToE is not implemented for the aFRR market and has been postponed as described in the aFRR implementation plan[51] of 2018.

Elia proposed, at stakeholders' request, an alternative solution allowing BSPs to offer – independently from the BRPsource – flexibility from non-CIPU Delivery Points with a net-injection character that are covered by a Pass-through contract, since an important part of the assets that can participate to the aFRR-market are net-injection assets with a Pass-through contract (see results R2 non-CIPU pilot project[52]). This alternative solution for Pass-through contract holders will be foreseen[53] together with the go-live of the new aFRR product (opening to non-CIPU units) in 2020 for both Delivery Points with an average net-injection or net-offtake character.

Therefore this chapter focusses on Combo design for aFRR Delivery Point that are operated under a Pass-through or an op-tout regime.

This section is divided into following subsections:

- ⇨ Prequalification (aFRR) and registration (DA/ID) phase
- ⇨ Bidding phase
- ⇨ Activation phase
- ⇨ Settlement phase
- ⇨ Allowed constellations for a Combo activation between aFRR and the DA/ID market
- ⇨ Publication of Imbalance volumes

6.5.1 Prequalification (aFRR) and registration (DA/ID) phase

All Combo Delivery Points that wish to participate in both aFRR and the DA/ID market need to be prequalified (aFRR) and registered (DA/ID) separately; a pre-qualification in aFRR does not imply that these Delivery Points are also registered for DA/ID and vice versa.

Next, as already mentioned earlier in section 0, a Delivery Point can only have 1 contractual regime (ToE, Opt-out or Pass-through) regardless of the market segment (aFRR, mFRR, DA/ID,…) in which the Delivery Point in question is participating.

- ⇨ As a result, a Delivery Point that prequalifies in aFRR and registers for the DA/ID market, as described in section 5.1 can only be in an Opt-out or Pass-through regime. The implications of this are made clear hereafter.

[51] The aFRR implementation plan can be consulted on Elia's website .

[52] This result can be consulted on Elia's website.

[53] Subject to approval of CREG.

6.5.2 Bidding phase

It is the FSPS' responsibility to ensure that volumes that are offered in the DA/ID markets (by means of his BRPfsp) and volumes that are offered in the **aFRR market** can effectively be delivered by the Delivery Points in its pool.

The proposed design does not foresee to inform the FSP if the sum of the offered volumes in the DA/ID product and the offered volumes in **aFRR** is bigger than the maximum amount of flexibility that can be offered by its portfolio in question.

6.5.3 Activation phase

As for the Combo between DA/ID and mFRR, no impact has been identified on the activation phase for a Combo activation between aFRR and DA/ID.

6.5.4 Settlement phase

If the DA/ID pool has at least one Delivery Point with a ToE-regime, the delivered volume of aFRR on a quarter-hourly basis (per Delivery Point) needs to be calculated in order to take this aFRR activation into account (subtract or add) in the calculation of the delivered volume for DA/ID.

However, as stated in the introduction of this section 0 the implementation of ToE for aFRR is postponed and will be subject to a further re-assessment. Therefore the calculation of the delivered volume of aFRR is performed on a pool basis (ex. for activation controls) every 4 seconds, and not per Delivery Point on a 15min basis (see aFRR design note).

This implies that the Combo combinations between aFRR and DA/ID have to respect the following condition: all Delivery Points that are part of all pools participating in a Combo activation have an Opt-out or Pass-through regime. The example in Figure 4 illustrates this situation of Combo activation between aFRR and DA/ID that is not allowed.

Figure 4 : Combo activation of aFRR and DA.

The application of a Combo as described in 6.4 is not possible in this example as it would imply to calculate separately:

- $E_{delivered\_dp\ 3\_DA/ID}$ on a 15 min basis for the ToE perimeter correction
- $E_{delivered\_dp\ 2\_aFRR}$ for aFRR on a 15 min basis to take this aFRR reaction into account for the calculation of delivered volume of DA/ID ($E_{delivered\_dp\ 2\_DA/ID}$). As explained, such a calculations is subject to an implementation of ToE for aFRR which is postponed at this moment in time.

[54] As stated in the introduction of this section, Combo Delivery Points ("DP 2") can only be under an Opt-out or Pass-through contractual regime.

As a result, the allowed constellations for a Combo activation between aFRR and DA/ID are limited and further explained in the next subsection.

6.5.5 Allowed constellations for a Combo activation between aFRR and DA/ID

This subsection describes the allowed constellations if a FSP wants to perform a Combo activation between aFRR and DA/ID. The following constellations are allowed:

1. **Identical pools:** both pools of Delivery Points that participate to the delivery of the DA/ID product and to the aFRR service are the same (see Figure 5).

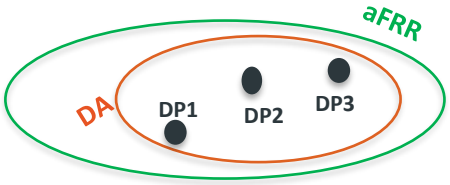


Figure 5 : Identical pools are allowed for Combo DA/ID and aFRR.

   - ⇨ Since a Delivery Point has only one regime and no ToE applies for aFRR, this implies that both DP 1, DP 2 and DP 3 have an Opt-out or Pass-through regime. As all Delivery Points are in an Opt-out or Pass-through regime, no calculation of $E_{delivered\_DA/ID}$ per delivery point is needed.
   - ⇨ Remark: please note that activation controls and availability controls for aFRR are not affected in any way, since the aFRR baseline[55] takes into account any exchanged and activated volumes for DA/ID purposes.

2. **Sub-pools:** if one pool of Delivery Points is a sub-pool of the other pool, all the participating Delivery Points in both pools need to be in an Opt-out or Pass-through regime (and thus not only the Delivery Points involved in a simultaneous activation). When we apply this principle in Figure 6 this means that DP 1 should be in an Opt-out or Pass-through regime and cannot participate under a ToE-regime.

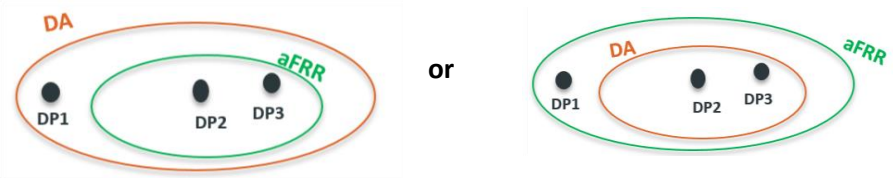


Figure 6 : Allowed sub-pool constellation for Combo DA/ID and aFRR.

[55] Send 1 minute prior to real-time by the FSP with an interval of 4 seconds.

3. **Partially overlapping pools:** in case we have partially overlapping pools all Delivery Points of both pools need to be in an Opt-out or Pass-through contractual regime (see Figure 7).

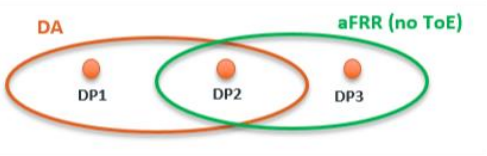


Figure 7 : Partially overlapping pools for Combo DA/ID and aFRR

6.6 Combo activation between FCR and DA/ID

A Combo activation between FCR and DA/ID is allowed in all cases and it does not effect in any way the prequalification, bidding, activation or settlement phase of one of both product.

FCR is no energy product and therefore its reaction will not be corrected or taken into account when calculating of the delivered energy for DA/ID.

7 Multiple FSP Activations

The previous section described the design for Combo activations with the assumption that there is only one FSP[56] active on each Delivery Point. This section analyses the additional impact on the design described in section 6 when more than one FSP are simultaneously activating a common Delivery Point. Such particular case of Combo is called hereafter "Multiple FSP activation".

Today a kind of Multiple FSP situation already exists as a Grid User has the possibility to valorise one part of his flexibility on a Delivery Point with an FSP as explicit flexibility, and the remaining part of flexibility on that Delivery Point with his Supplier/BRPsource as implicit flexibility (ex. on the DA/ID or even in real time).

The Multiple FSP situation intended in this section, describes additional design elements related to two separate FSPs (who are not Supplier/BRPsource).

Remark:

Elia reminds that the different options related to multiple BRP's per Access Point are already described in the Access contract[57]. Appendix 3bis and appendix 3ter of this contract describe for the following possible schemes:

- Two BRPsources on one access point charged with respectively the gross-offtake or gross-injection;
- Two BRPsources on one access point charged with respectively net-offtake or net-injection.

The principles for the BRP perimeter correction related to both aforementioned situations are described in the ToE-rules[58].

With regard to appendices 10[59] and 11[60] of the Access contract, Elia refers to the outcome of the Working Group Belgian Grid[61] of the 1st of December, where it was agreed upon that as those features are not used by market parties, Elia would not launch the developments related to those features as long as there is no effective request by market parties to apply those modalities.

[56] In the context of this section the general term "FSP" is used as a reference to the roles of $FSP_{DA/ID}$ and BSP. Similarly is the role of "BRPfsp" is includes the roles of BRPbsp and $BRPfsp_{DA/ID}$.

[57] The access contract can be consulted on Elia's website.

[58] See section 12.2 of the ToE-rules.

[59] Fixed band delivery

[60] Flexible band delivery

[61] This outcome can be consulted on Elia's website .

This section of the design note continues as follows:

- **What** is a Multiple FSP activation (see subsection 7.1);
- Multiple FSP activation between DA/ID and mFRR (see subsection 0);
- Multiple FSP activation between DA/ID and DA/ID (see subsection 0);
- Multiple FSP activation between DA/ID and aFRR (see subsection 7.4).

7.1 What is a Multiple FSP activation

A Multiple FSP activation can be (similar to a Combo activation see subsection 6.1) divided into two levels of complexity:

- **Simultaneous activation**: a simultaneous activation by multiple FSPs on one Delivery Point on the same moment;
- **Contractual combination**: the same Delivery Point is activated by multiple FSPs over different periods, but cannot perform a simultaneous delivery on the same moment.

The multiple FSP design described hereafter focuses on the **simultaneous activation**.

Remark: In case of a contractual combination the same principles regarding the business processes as a simultaneous activation remain valid. If multiple FSPs should however perform a simultaneous activation on a Delivery Point with a multiple FSP contractual combination, only one only one of those FSP-activations would have to be settled based on a priority rule to be determined (f.e. priority fixed by Grid User).

Moreover, as multiple FSPs can activate different services, the distinction has to be made between:

- Multiple FSPs that are active on the same Delivery Point and that offer **different** services;
- Multiple FSPs that are active on the same Delivery Point and that offer **the same** service.

Finally, we refer to 'Multiple FSP Delivery Points' for those Delivery Point that performed a simultaneous activation (a Combo activation) during the same ISP and 'Single FSP Delivery Points' for those Delivery Points that did not perform a simultaneous activation and are only covered by one FSP during the ISP in question.

7.2 Multiple FSP activation between DA/ID and mFRR

This section describes a simultaneous activation of a Delivery Point with FSP A for DA/ID on one hand and with FSP B for mFRR on the other-hand In this exercise only the case of two FSPs on a Delivery Point is discussed, the same conditions apply in case more than two FSPs active on the Delivery Point.

The design elements proposed in this section come in addition to the already described Combo activation between DA/ID and mFRR (see section 0).

This section is divided into following subsections:

- Prequalification (mFRR) and registration (DA/ID) phase
- Bidding phase
- Activation phase
- Settlement phase
- Publication of Imbalance volumes

Remark: We refer to mFRR in a generic way and all conclusions hold for both non-reserved and reserved mFRR products.

7.2.1 Prequalification (mFRR) and registration (DA/ID)

Following topics are described regarding the prequalification and registration for a Multiple FSP design:

- FSP-acceptance
- Grid User declaration and prequalification of the Delivery Point
- Maximum available flexibility

7.2.1.1 FSP acceptance

All FSPs active on one Delivery Point need to pass the according acceptance process depending on the service they want to offer i.e. BSP acceptance for mFRR (as stipulated in T&C BSPs) or FSP acceptance for the DA/ID (see section 5.1).

7.2.1.2 Grid User declaration and prequalification of the Delivery Point

Regarding Delivery Point acceptance, a Delivery Point can be declared by multiple FSPs in different Grid User declarations[62]. All Multiple FSP Delivery Points wishing to participate in both mFRR and the DA/ID market need to be prequalified separately: a pre-qualification in mFRR does not imply that these Delivery Points are also registered for DA/ID (see Combo activation between mFRR and DA/ID in section 6.4.1).

Remark: This design note focuses on the case of multiple FSPs where one of the FSPs activates in DA/ID. In case of multiple FSPs on one Delivery Point providing two reserved capacity services (ex. if

[62] Of the same Grid User

two FSPs use the Delivery Point for a reserved mFRR contract) the prequalification test[63] has to be performed for both FSPs in the same period (simultaneously) in order to verify that there is no overlap between the two reserved capacities of those FSPs.

7.2.1.3 Maximum available flexibility

Currently, as described in subsection 5.1.3, the unique FSP has to provide Elia per Delivery Point with the Maximum upwards and/or downwards flexibility (also called "$DP_{DA/ID,max\_up}$" and "$DP_{DA/ID,max\_down}$" which has to be ≤ the PreQualified flexibility Power (PQP) for this Delivery Point (and this FSP) by the DSO. This maximum limit per direction and DP has to be respected even in a situation with multiple FSPs. This implies that the FSPs active on the same Delivery Point have to coordinate in order to declare the same value for the Multiple FSP Delivery Points during the registration process and in order to avoid exceeding the $DP_{DA/ID,max.}$ when the Delivery Point is activated.

Impact on DSO processes

Today the FSP-DSO contract foresees only the situation of one FSP per DP; Moreover the NFS study (which fixes the PQP per access point) is delivered to the Grid User or to the FSP (and for some regions only to the FSP).

A detailed impact analysis of the DSO procedures has to be done in order to assess the exact impact on the existing procedures and the feasibility of multiple FSPs per DP.

7.2.2 Bidding phase

The same principles remain valid as described in section 0 (Bidding phase related to a Combo activation between DA/ID and mFRR) with the addition that these principles apply for every FSP on Multiple FSP Delivery Point.

Remark: It is the responsibility of all FSPs to ensure that volumes that are offered in the DA/ID markets and volumes that are offered in the mFRR market can effectively be delivered by the Delivery Points in their pool. All concerned FSPs should coordinate when bidding their volumes in each market to avoid that the maximum available flexibility $DP_{DA/ID,max\_down}$ of the Multiple FSP Delivery Points is not exceeded.

7.2.3 Activation phase

The same principles remain valid as described in section 6.4.3 (Activation phase related to a Combo activation between DA/ID and mFRR) with the only addition that these principles apply for every FSP on Multiple FSP Delivery Point.

If multiple FSPs activate simultaneously on a Multiple FSP Delivery Point, they need to be aware of each other's activation as:

- The activated volume on the Multiple FSP Delivery Points should not exceed their maximum available flexibility $DP_{DA/ID,max\_down}$ and

[63] And any availability tests later on.

- As explained in the next section the simultaneous activation of the Multiple FSP Delivery Point impacts their settlement (volumes will be allocated per FSP and baseline choice).

7.2.4 Settlement phase

Following topics are described regarding the settlement for a Multiple FSP design:

- Calculation of the delivered energy
- Multiple contractual regimes
- Baseline

7.2.4.1 Calculation of the delivered energy

Specific allocation rules must be defined in order to split the delivered volume ($E_{delivered)}$ per Delivery Point among the associated FSPs for every Multiple FSP Delivery Point. The same Tetris-algorithm as described in section 6.4.4 performs this split. This attributes in a first step the volumes to the DA/ID product (of FSP A) and in a second step to the mFRR bid (of FSP B) following the same priorities as described in section 6.4.4.

This implies that FSPs will impact each other's settlement. In other words the behaviour of one FSP will impact the other FSP. This is illustrated by the following example:

Let us consider two FSPs (FSP A and FSP B) with distinguished pools of Delivery Points and with one common "Multiple FSP Delivery Point" (DP 2), as illustrated in Figure 8. FSP A activates his pool (DP 1 and DP 2) to deliver for the DA/ID product and FSP B activates his pool (DP 2 and DP 3) to deliver for the mFRR product.

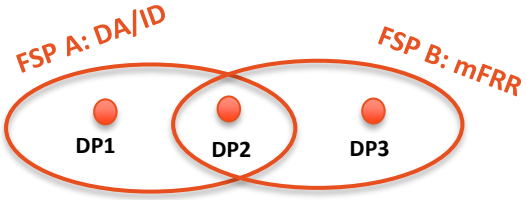


Figure 8 : Overlapping pools for Multiple FSP activation between DA and mFRR. DP 1 and DP 3 are Single FSP Delivery Points, DP 2 is a Multiple FSP Delivery Point.

a) Characteristics of each DP Delivery Point as fixed during the registration are:

Delivery Point	FSP	$DP_{,max\_up}$[64]	Contr.Regime
DP 1	FSP A	+ 10 MW	ToE
DP 2	FSP A/FSP B	+ 25 MW	ToE
DP 3	FSP B	+ 5 MW	ToE

[64] FSP A will in this case more specifically declare DP_{DA/ID_max_up} and FSP B will declare $DP_{mFRR\_max\_up}$ for each of their Delivery Points. For a Multiple FSP Delivery Point this value must be the same.

- **Remark:** In this example both FSPs negotiated a contractual regime of ToE with the Supplier/BRPsource. A constellation with multiple contractual regimes is discussed in subsection 7.2.4.2

b) FSP A activates flexibility in his pool in the upwards direction (reduction in net-offtake) that corresponds to the (sum of all) Flex nomination(s) of the associated BRPfsp for a given activation period X:

- **Sum of Flex Nominations ($E_{requested\_DA/ID}$):** 15 MW

Elia activates following bid for the same activation period of upward mFRR (reduction in net-offtake):

- **mFRR free bid ($E_{requested\_mFRR}$):** 20 MW

c) The Delivery Points notified by the FSPs are used for the settlement phase:

	DA/ID product (FSP A)	**mFRR free bid (FSP B)**
$E_{requested}$	15 MW	20 MW
Delivery Points and notified volumes by the FSP	• DP 1 = + 5 MW • DP 2 = + 10 MW	• DP 2 = + 15 MW • DP 3 = + 5 MW

Remark: Both FSPs need to coordinate on the activation to not exceed the maximum flexibility on the Multiple FSP Delivery Point (DP 2). In this case FSP A and FSP B aligned correctly on DP 2 to not exceed the maximum flexibility (= 25 MW as declared in step a.).

d) Elia calculates the overall delivered volume per Delivery Point based on the defined baseline and the quarter-hour metering data of each Delivery Point:

- DP 1 = 0 MW (=$E_{delivered\_dp1}$)
- DP 2 = 15 MW (=$E_{delivered\_dp2}$)
- DP 3 = 5 MW (=$E_{delivered\_dp3}$)

Remark: At this stage, in case the $E_{delivered}$ of a Delivery Point exceeds the maximum available flexibility DP_{max}, the delivered volume will be capped to this maximum before continuing the calculations below. This cap is already performed in the existing settlement process. For example, if the calculated delivered volume of DP 2 was = 26 MW, $E_{delivered\_dp2}$ would have been capped to 25 MW (DP_{max} declared in step a.)

e) Elia allocates the overall delivered volumes per DP to the DA/ID product and the mFRR product based on the **updated Tetris-approach**[65] as already described in section 6.4.4 and

[65] This example builds further up on the example in section 6.4.4, the additional impact is identified.

based on the predetermined order of priority of the products. Therefore the delivered volumes on Multiple FSP Delivery Points will be first attributed to the DA/ID product and afterwards to the mFRR bid):

Calculation of DA/ID product	
1. Elia identifies the Delivery Points of the DA/ID product that are not performing a simultaneous activation (also called "Single FSP points")	⇨ DP 1
2. Elia compares the requested DA/ID volume with the sum of the delivered volumes of the Single FSP Delivery Points. In a next step Elia attributes the delivered volumes of the Single FSP Delivery Points (DP 1) to the DA/ID product and calculates the remaining part of the requested volume that needs to be filled in by the delivered volumes of Multiple FSP Delivery Points.	⇨ $E_{requested\_DA/ID}$ = 15 MW ⇨ $E_{delivered\_dp1}$ = 0 MW ⇨ $E_{requested\_DA/ID\_fspA\_remaining}$ = $E_{requested\_DA/ID\_fspA}$ – $E_{delivered\_dp1}$ = 15 MW – 0 MW = 15 MW The remaining 15 MW of the requested volume will be filled in by the delivered volumes of the Multiple FSP Delivery Points which conducted a simultaneous activation.
3. Elia identifies the Multiple FSP Delivery Points that performed a simultaneous activation and determines the delivered energy.	DP 2 is identified as the Multiple FSP Delivery Point activated by both FSPs: • The delivered volume = $E_{delivered\_dp2}$ = 15 MW
4. Elia compares the remaining share of the requested DA/ID volume (identified under step 2) that needs to be filled in with the DA/ID delivered volume of the Multiple FSP Delivery Point(s)(identified under step 3) and attributes it to the requested DA volume.	⇨ $E_{requested\_DA/ID\_fspA\_remaining}$ = 15 MW ⇨ $E_{delivered\_dp2}$ = + 15 MW (see step 3) ⇨ Attribute the **delivered volume** to the remaining requested DA/ID volume (= $E_{\mathbf{attributed\_dp2\_DA/ID\_fspA}}$ = 15 MW) ⇨ The delivered volume by FSP A equals to 15 MW (=$E_{delivered\_DA/ID\_fspA}$) ⇨ This results in a situation with an perfect delivery for the DA/ID product
5. Elia calculates the available share of the delivered volume of the Multiple FSP Delivery Points that can be used for allocation to the mFRR bid.	⇨ $E_{\_available\_dp2\_mFRR\_fspB}$ = $E_{delivered\_dp2}$ - $E_{attributed\_dp2\_DA/ID}$ = 15 MW – 15 MW = 0 MW $E_{\_available\_dp2\_mFRR\_fspB}$ = 0 MW ⇨ 0 MW of DP 2 available for allocation to mFRR

Calculation of mFRR free bid	
6. Elia identifies the Delivery Points of the mFRR bid that are not performing a simultaneous activation.	⇨ DP 3

7. Elia compares the requested volume of the mFRR bid with the sum of the delivered volumes of the Single FSP Delivery Points of the mFRR bid. In a next step Elia attributes the delivered volumes of the Single FSP Delivery Points (DP 3) to the mFRR bid and calculates the remaining part of the requested volume that needs to be filled in by the delivered volumes of Multiple FSP Delivery Points.	⇨ $E_{requested\_mFRR\_fspB}$ = 20 MW ⇨ $E_{delivered\_dp3}$ = 5 MW ⇨ $E_{requested\_mFRR\_remaining}$ = $E_{requested\_mFRR}$ – $E_{delivered\_dp3}$ = 20 MW – 5 MW = 15 MW The remaining 15 MW of the requested volume would be filled in by the delivered volumes of the multiple FSP Delivery Points which performed a simultaneous activation.
8. Elia takes the available share of the Multiple FSP Delivery Points (see step 5.) for allocation to the mFRR bid and determines the total delivered volume of the mFRR bid.	⇨ $E_{dp2\_available\_mFRR\_fspB}$ = $E_{delivered\_dp2}$ - $E_{attributed\_dp2\_DA/ID}$ = 15 MW – 15 MW = 0 MW available and allocated to the mFRR bid (see step 5.). The total delivered volume of the mFRR bid is equal to 5 MW (5 MW + 0 MW)), coming respectively from DP 3 (step 7) and DP 2 (current step 8) (= $E_{delivered\_mFRR\_fspB}$) ⇨ This results in a situation with **an under-delivery** of 15 MW
9. Elia corrects each BRPfsp with the delivered volume for the DA/ID product or with the difference between the delivered volume and the requested volume for the mFRR bid.	Elia corrects the perimeter of BRPfsp A and BRPfsp B as follows: ⇨ Perimeter BRPfsp A = + 15 MW (= $E_{delivered\_DA/ID\_fspA}$) ⇨ Perimeter BRPfsp B = -$E_{requested\_mFRR\_fspB}$ + $E_{delivered\_mFRR\_fspB}$ =- 20 MW + 5 MW = - 15 MW **Remark:** Perimeter corrections of BRPfsp for the DA/ID product are different then for mFRR products (see subsection 5.3.1).
10. Elia corrects the BRPsource(s) with the delivered volumes of the different Delivery Points.	Elia corrects the perimeter of BRPsources as follows: • Perimeter BRPsource$_{dp1}$ = + 0 MW • Perimeter BRPsource$_{dp2}$ = - 15 MW • Perimeter BRPsource$_{dp3}$ = - 5 MW

Remark: In this example there are only 20 MW delivered in total while 35 MW were requested by both FSPs. The volume delivered by DP 1 is fully allocated to FSP A as it is a Single FSP DP (0 MW); The volume delivered by DP 2 (15 MW) is allocated to FSP A conform the priority rules of the Tetris-approach. This leads to a perfect delivery of FSP A and an under-delivery of FSP B.

It is impossible to identify if the 15 MW delivered by DP 2 were activated by FSP A or by FSP B. Indeed, one could imagine here that FSP B does his job correctly and activates 15 MW on DP 2 and 10 MW of DP 3 while FSP A misses all his activations (0 MW on DP 1 and 0 MW on DP 2) implying that FSP B is penalized by the behavior of FSP A;

Or one could also imagine that FSP A did activate 15 MW on DP 2 to compensate the non-reaction of DP 1 and that FSP B missed his activation on DP 2. In this second example FSP B is correctly penalized.

In conclusion as of the moment that two different FSPs are active simultaneously on one and unique Delivery Point there is an inherent risk that the behavior of the one impacts negatively the other.

7.2.4.2 Multiple contractual regimes

In the example above the assumption was made that the Multiple FSP Delivery Point DP 2 has one contractual regime (in this case ToE). This means both FSP A and FSP B agreed with the Supplier/BRPsource of the de Multiple FSP Delivery Point the same contractual regime.

However the regime of one Delivery Point is determined by the type of relation between the FSP (and BRPfsp) and the Supplier (and BRPsource) of this Delivery Point. This implies that FSP A of the previous example could have a ToE agreement with the Supplier of the Delivery Point 2 while the FSP B has an Opt-out agreement with the Supplier of DP 2 leading to different contractual regimes for DP 2 depending on who activates it.

To illustrate this, let us consider the example described in the previous subsection where FSP A and FSP B apply respectively Opt-out and ToE for all their offtake points that are in the portfolio of the Supplier of DP 2:

Delivery Point	FSP	$DP_{DA/ID,max\ up}$	Contr. Regime	$E_{delivered}$
DP 1	FSP A	+ 10 MW	ToE	0 MW
DP 2	FSP A/FSP B	+ 25 MW	~~ToE~~ **Opt-out for FSP A /ToE for FSP B**	15 MW
DP 3	FSP B	+ 5 MW	ToE	5 MW

The assumptions (step a to f) and calculations (step 1 to 9) for settlement described in the example above, remain the same. Only the perimeter corrections calculations (step 10 and step 11) are different as for an Opt-out agreement we do not correct BRPfsp and BRPsource (for those delivered volumes that were attributed to them). The alternative perimeter corrections are described below:

Perimeter corrections in case of multiple contractual regimes	
10. (bis) Elia corrects the BRPsource(s) **only for those volumes on DP's under a contractual regime of ToE** with the delivered volumes of the different Delivery Points or with the difference between the delivered volume and the requested volume for the mFRR bid.	Elia corrects the perimeter of BRPfsp A and BRPfsp B as follows: • Perimeter BRPfsp A = **+ 0 MW (= $E_{delivered\_dp\ 1}$)** • Perimeter BRPfsp B = $-E_{requested\_mFRR\_fspB} + E_{delivered\_mFRR\_fspB}$ =- 20 MW + 5 MW = - 15 MW The perimeter of BRPfsp A is only corrected with the delivered energy of DP 1 as this is the only DP under contractual ToE regime.
11. (bis) Elia corrects the BRPsource(s) with the delivered volumes of the different Delivery Points **only for those volumes under a contractual regime of ToE.** If a Multiple FSP Delivery Point with a multiple contractual regime is identified then the allocation among the FSPs which is calculated in previous steps 4 and 8 is used to determine the perimeter correction of the according BRPsource.	Elia corrects the perimeter of the BRPsources with Delivery Points under a single contractual regime as follows: • Perimeter $BRPsource_{\_dp1}$ = **- 0 MW** (DP 1 is under a contractual regime of ToE so correction with - $E_{delivered\_dp1}$) • Perimeter $BRPsource_{\_dp3}$ = **- 5 MW** (DP 3 is under a contractual regime of ToE so correction with - $E_{delivered\_dp3}$) DP 2 is identified as Multiple FSP Delivery Point with a multiple contractual regime ToE and Opt-out: • $E_{attributed\_dp2\_DA/ID\_fspA}$ = **15** MW (This is the delivered volume of the Multiple FSP Delivery Point DP 2 which was attributed in step 4 to FSP A) • $E_{attributed\_dp2\_mFRR\_fspB}$ = **0** MW (This is the delivered volume of the Multiple FSP Delivery Point DP 2 which was allocated in step 8 to FSP B)

	As the FSP A (and the BRPfsp A) negotiated an Opt-out with the Supplier (and the BRPsource$_{DP\ 2}$) of DP 2 there is no correction of the perimeter applied on concerned BRPs relative to the delivered volume allocated to the FSP A on DP 2. Only the delivered volumes allocated to the FSP B (ToE contractual regime) are taken into account for the correction of the concerned BRPs: ⇨ Perimeter BRPsource$_{dp2}$ = - $E_{\textbf{vailable\_dp2\_mFRR\_fspB}}$ = **0** MW

7.2.4.3 Baseline

As already mentioned, a Multiple FSP activation with one FSP activating for the DA/ID product and the other activating for the mFRR product is in fact a particular case of a Combo activation between DA/ID and mFRR. In case of a Multiple FSP Delivery Point between DA/ID and mFRR the same principles regarding the baseline choice as already described in section 6.4.1 apply.

All FSPs on the Multiple FSP Delivery Point must be aware that in case of simultaneous activation the master-baseline will be applied, which is High X of Y* for the Multiple FSP activation between DA/ID and mFRR.

This implies that FSPs must at least be informed of each other's activations as during the common activation period of their Multiple FSP Delivery Point as the Baseline used for the settlement during those periods is fixed and influenced by the past activations of the delivery point. For example:

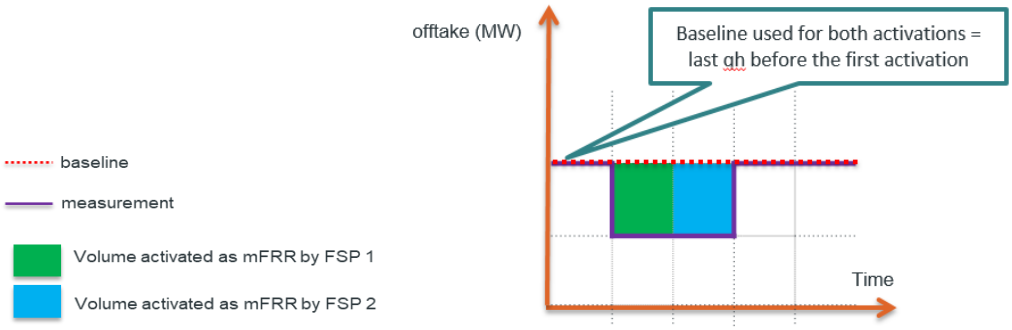
- The BSP providing mFRR should be informed by the $FSP_{DA/ID}$ of the periods during which the baseline would not be Last Qh but High X of Y*.
- Both FSPs need to be aware of the days the other FSP did an activation as this will impact the baseline calculation of the baseline High X of Y* as well

Moreover close coordination is needed on the possible motivated exclusion of reference days by the FSPs in the calculation of the baseline methodology High X of Y* for their common Delivery Point. In other words all FSPs need to agree to exclude f.e. a striking day, as this impacts the calculation of the baseline for all FSPs on the Multiple FSP Delivery Point.

Remark:

General remark on baselines: In case of Multiple FSP activations there is always coordination and alignment needed among FSPs on a Multiple FSP Delivery Point. This was already addressed above in case of baseline methodology High X of Y* (and will be addressed in the next subsection for the forecasted baseline of aFRR). In addition, this is also needed in case of baseline methodology Last Qh.

Indeed in case of consecutive activations or in case of simultaneous activations that do no start together the master-baseline would be the Last Qh of the first activation. Therefore here again concerned FSPs must be coordinated as the activation of one of them impacts the value of the baseline that will be used for the other one.



7.2.5 Publication of Imbalance volumes used for the settlement between Supplier and FSP

Elia will, based on the above calculations, provide both FSP and Supplier(s) with the aggregated (upward and downwards) delivered volumes of all Delivery Points under ToE regime on a quarter-hourly basis, and this, per metering direction (injection or offtake) and per FSP.

7.3 Multiple FSP activation between DA/ID and DA/ID

This section describes the particular case of a simultaneous activation of one (or several) Delivery Point(s) by two different FSPs for the same product. By example Delivery Point DP 2 (in Figure 9 below) is activated simultaneously by FSP A for DA/ID and FSP B for DA/ID.

The principles regarding registration and activation are similar and already discussed in the previous subsections 7.2.1 and 7.2.3 (with the difference that there is no mFRR so no prequalification but only registration of the Delivery Points)[66].

In addition, all FSPs, or the Grid User of the Multiple FSP Delivery Point must agree on an order of priority during the registration phase which is needed for settlement later on (f.e. FSP A has a higher priority than FSP B). This requires coordination among the FSPs and the Grid User to decide the order of priority. FSPs need to be aware of this order as this will impact their settlement.
Regarding the settlement phase a similar Tetris-algorithm is proposed as described in section 0 but with an extra rule:

If the same service is offered by multiple FSPs on a Multiple FSP Delivery Point, the delivered volume is split with the following rules: the volumes are attributed first to the DA/ID product of the FSP with a higher priority and, in a second step the remaining volumes are attributed to the DA/ID product of the FSP with a lower priority.

An example of such a Multiple FSP activation between two FSPs offering DA/ID is illustrated in Figure 9. DP 2 is a Multiple FSP Delivery Point which offers to the DA/ID product for both FSP A and FSP B.

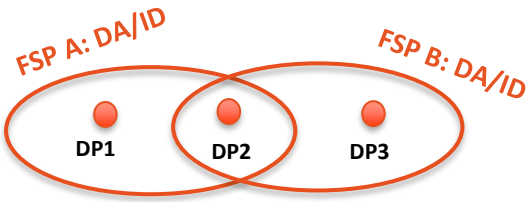


Figure 9 : Overlapping pools for Multiple FSP activation between DA and mFRR. DP 1 and DP 3 are Single FSP Delivery Points, DP 2 is a Multiple FSP Delivery Point.

The same Tetris-algorithm as already discussed in section 0 is applied. There are however some adaptations to this calculations:

- The DA/ID product of the FSP with the highest priority will be calculated first (in this case FSP A). This implies that delivered volumes of Multiple FSP Delivery Points will be first allocated to FSP A to fill the remaining requested volume of FSP A and in a next phase will be allocated to the FSP B, which has a lower priority, to fill the remaining requested volume of FSP B;
- The perimeter of the BRPfsps is only corrected with the delivered energy and not the requested energy (both activate a DA/ID product so their perimeters are only corrected with the delivered energy, see 5.5.1);
- The baseline methodology will be High X of Y*. The same coordination and alignment as discussed in 7.4.4.3 is needed.

[66] Please note there is also no bidding phase because both offered services are the DA/ID product.

7.4 Multiple FSP activation between DA/ID and aFRR

This section describes a simultaneous activation between FSP A for DA/ID and FSP B for aFRR for non-CIPU Delivery Points.

As the Multiple FSP activation is an additional layer of complexity to the Combo activation, the design elements proposed in this section are an addition to the already described Combo activation between DA/ID and aFRR (see section 0).

As already mentioned in this previous section, ToE is not implemented for the aFRR market and has been postponed via the aFRR implementation plan in 2018.

The Combo design aFRR and DA/ID proposes a Combo activation only if all Delivery Points that are part of a pool that participate in a Combo activation have an Opt-out or Pass-through contractual regime. As a result, only some constellations are allowed (see section 6.5.5).

As the Multiple FSP design is an additional layer, the design proposes to keep the same assumption and allow only Multiple FSP Delivery Points with a contractual regime of Opt-out or Pass-through.

The principles regarding prequalification (aFRR) and registration are already described in previous subsection 7.2.1 and are the same in case of aFRR.

Remark: During the prequalification phase the FSPs need to align on the maximum flexibility volume. A detailed impact analysis on the NFS (to determine the PQP) and DSO-procedures has to be done in order to assess the exact impact on DSO's.

As all Delivery Points are assumed to be in an Opt-out or Pass-through contractual regime, $E_{delivered}$ is not calculated. A baseline must however be provided for the activation control and the availability tests of the aFRR product.

The baseline for aFRR is determined by the aFRR provider. The baseline which is expected one minute in advance is provided to Elia on a 4 second basis. In case of a Combo activation of aFRR and another product (in this case DA/ID product, but also in case of mFRR), this aFRR forecasted baseline need to take into account the activation of the other product.

This implies in case of multiple FSPs on this Delivery Point, the FSP which delivers the aFRR product needs to be aware of the activation of the other FSP. In other words FSPs need to align and coordinate on their activations to provide a correct forecasted baseline on a 4" basis but also for the calculation of High X of Y* baseline as described in section 7.2.4.3

PART II: MARKET STUDY

This second part of the document focuses on the market aspects relative to ToE in DA/ID, the "Combo" and the "Multiple FSPs". The purpose of this market study is to:

- Gather the experienced feedback from the existing ToE-framework in Belgium[67] and in other countries if relevant and identify lessons learned for the extension of the ToE to the DA/ID markets as well as for the Combo and the Multiple FSP analysis.
- Analyse the economic opportunity of the extension of the ToE in DA/ID markets, as well as the possibility of a Combo activation and Multiple FSP activation,

The results of this market study are taken into account for the design described in Part I.

In a first step Elia launched a survey in order to gather relevant feedback from market parties regarding the already implemented ToE for mFRR[68] as well as their expectations and/or concerns on the opening of ToE to DA/ID markets. The survey can be consulted in Annex 1. This survey was sent to all members of the Workgroup Balancing on 03/04/2019 and answers have been received during the month of April.

Elia received answers from the following market parties:

1. EUROPEAN COMMODITIES
2. FEBEG
3. FEBELIEC
4. NEXT KRAFTWERKE
5. RESTORE
6. SCHOLT ENERGY SERVICES (Confidential)

The non-confidential answers on the survey are published in Annex 2. All answers (including the confidential answers) are transferred to the CREG.

In parallel of this survey, Elia started the design of ToE on DA/ID markets, taking into account relevant feedback along the way.

Elia also organised two workshops on 01/04/2019 and 15/05/2019 during which the overall design proposal relative to ToE on DA/ID, and to more specific aspects such as Combo activations and Multiple FSP activations where presented.

Market parties were encouraged to provide additional input and feedback during this pre-consultation workshops. This process led to a first design proposal (see part 1 of this note) which took into account the gathered feedback by the stakeholders.

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[67] Transfer of Energy entered into force in 2018 for the market of non-reserved tertiary reserves and follows a phased approach as explained in section 5 of the ToE-rules.

[68] Transfer of Energy turned into force for non-reserved tertiary reserves in June 2018 and for reserved tertiary reserves in December 2018.

Secondly Elia requested the support of Compass Lexecon[69] who performed an analysis of the existing Belgian ToE mechanism (applicable for the mFRR market segments) as well as an analysis of the participation of the Demand Response and its key enablers in France (where ToE for the DA/ID is applicable since 2014 under the name of the "NEBEF Mechanism") and in the PJM-region. This study (hereafter called the "Compass Lexecon-study") is published in Annex 4.

The feedback received by the stakeholders, combined with the available data from Elia on the participation of the Demand response to markets segments where ToE is applicable, and the Compass Lexecon-study, have been used to look back and draw conclusions on the existing and already implemented ToE mechanism on mFRR-markets and to look forward and identify relevant lessons learned for a possible extension of ToE to DA/ID markets.

The conclusions on the existing ToE mechanism are described in section 8: "Feedback regarding the application of ToE in mFRR markets" and the relevant lessons learned for the extension of the ToE in DA/ID (including the Combo and the Multiple FSPs activation dimensions) are described in section 9: "Expectations for ToE in DA/ID".

[69] https://www.compasslexecon.com/

8 Feedback regarding the application of ToE on the Belgian mFRR market

The objective of this section is to look back on the ToE as it is implemented today and identify lessons learned that can be relevant when looking ahead to a possible extension of ToE in DA/ID markets, as explained in the next section.

This section is structured as follows:

- Input received from stakeholders, via the survey on experienced feedback (see subsection 8.1);
- Insights from the Compass Lexecon-study for Belgium (see subsection 0);
- Elia's observations and conclusions (see subsection 0).

8.1 Feedback of market parties

The first subsection starts by describing a summary of the feedback received during the survey from market parties regarding the existing application of ToE on the mFRR market segment (both non-reserved and reserved mFRR market) [70]:

1. ToE has an added value by offering an additional channel to Grid Users to valorize their flexibility and increases dynamics of the balancing market.

Elia received following feedback from stakeholders regarding the added value of ToE:

- RESTORE is of the opinion that ToE provides consumers additional negotiation power in their supply contracts. This implicit value is not visible and cannot be measured by looking at the actual volume posted on the platform;
- RESTORE underlines that the implementation of ToE mechanism in mFRR markets did have a concrete and positive impact to ensure fair market access to all participants;
- For FEBELIEC it is very important to remark that the success of the introduction of ToE in balancing markets is not measured only by the volumes but also (and even more so) by the impact it has had on the market, by opening a discussion on participation of Grid Users to demand response services and products. Not only does the option of ToE create an additional channel for valorizing flexibility, it also increases bargaining power of consumers with Suppliers, BRPs and aggregators. Moreover, the discussions on ToE have led directly to the introduction of the Opt-out and Pass-through solutions, have created visibility and in general increased, according to FEBELIEC, the dynamics in the balancing market (in the strategic reserve market it has not yet been applied due to other circumstances), to the benefit of all Grid Users through a lower system cost;

[70] All non-confidential feedback received from market parties is published in Annex 2. A summary of the topics which are considered as out of scope for this study are summarized in Annex 3.

- FEBEG is of the opinion the current ToE project has in their view not yet shown its added value in terms of market functioning.

2. Administration and registration are considered as heavy among others due to the confidentiality principle

Elia received following feedback from stakeholders regarding the administration and registration process:

- RESTORE witnesses that the procedure is very lengthy and complex, although recognizing a lot of pragmatism by CREG to cope with the deadlines. The current ToE procedure exposes BSPs to the risk of not being able to securely access the ToE regime in time for key milestones such as mFRR and strategic reserve tenders or specific market events. More over the current procedure gives little resilience and agility regarding a Supplier switch of the grid uses;

- FEBEG is of the opinion the ToE framework is a project with a heavy administrative burden that has required considerable resources from both BRP/Suppliers as well as Elia and the regulator, which plays an active and recurrent role in the application of the ToE formula;

- FEBEG is of the opinion the DSO/FSP contract, together with the NFS is unreasonable and disproportionate, creating a hurdle for market participation of demand response;

- FEBEG stated the cause of the administration burden corresponds to the confidentiality of the contracted flexibility that needs to be ensured according to the regulatory framework. However, given its indirect costs and administrative and financial impact on certain market participants, one should assess if the confidentiality principle is still justified in the sense that it brings additional flexibility in the market. Additionally, FEBEG would like to remind that the confidentiality is only ensure in one way, meaning that BRPsource/Suppliers are not authorized to receive to detailed data about the activated flexibility in their portfolio by other FSPs, while FSPs seems to be informed about the Suppliers/BRPsource of their customers.

3. Low liquidity on bidladder could be explained by the lack of guaranteed revenue and by the fact that mFRR product specifications are stringent;

Elia received following feedback from stakeholders regarding the low liquidity on bidladder:

- RESTORE is of the opinion that the bidladder has a very stringent product design e.g. ramp-rate up and down, penalty risk versus gain, no minimum activation duration, no reservation fee;

- FEBEG is of the opinion the extreme lack of liquidity in the mechanism up to date – despite tense market moments – contradicts the original assertion that demand response is held back by market participants behavior;

- FEBEG assesses that there is no solid business case to participate to the bidladder. A market party is not willing to invest in a system (IT, processes, etc.) which does not ensure a return on investment; the pre-contracted mFRR ensures at least the reservation fee to cover such costs;

- FEBELIEC strongly wants to reiterate the fact that the development of ToE is a no regret solution, as it is a one-shot development that can reap benefits ad vitam on top of the effect that is has on the market dynamics;

- EUROPEAN COMMODITIES is of the opinion vocation of bidladder is not to be as liquid as a power exchange and the participant have no obligation to put their flexibility. EUROPEAN COMMODITIES also assumes many potential participants are deterred by the timing of mFRR and some flexibility could be unlocked by the new ToE.

4. Alternative mechanisms (Opt-out and Pass-through) have an added value but Pass-through mechanism needs to be simplified

Elia received following feedback on alternative mechanisms (Opt-out and Pass-through):

- RESTORE supports the simplification of the ToE mechanism applied for Delivery Points with-Pass-through contracts, consisting in removing certain flows (removing the energy supplied correction of the BRPfsp and removing the payment of the ToE from FSP to Supplier) and fully supports its implementation both for mFRR and DA/ID;

- FEBEG is of the opinion the current exchange of data regarding Pass-through contracts does not match the invoicing process of Suppliers and demands Elia to provide these data earlier;

- FEBELIEC would like to invite Elia and CREG to consider all three solutions as they are not mutually interchangeable, different options can cater better for the specific situation of different consumers, they all create options for increasing the valorisation of flexibility and are all long term no regret solutions. For FEBELIEC it is clear that all three solutions have their place and should be allowed.

8.2 Main observations of Compass-Lexecon

The principal findings of Compass-Lexecon regarding the experienced feedback in Belgium are summarized here-below. The entire analysis regarding the mFRR in Belgium is available in slides 13 to 18 of the Compass Lexecon-study (see Annex 4).

The introduction of ToE in the market segment of non-reserved mFRR in June and reserved mFRR in December 2018 has introduced a coherent and instrumental framework that respects the Electricity Law and CREG's principles.

The introduction of ToE for the mFRR market allowed independent BSPs to bid on reserved and non-reserved mFRR with the same conditions than other market parties (activation price, merit order). It provided a level playing field between CIPU and non-CIPU units[71].

Nevertheless no important effect has been observed regarding additional[72] volumes offered and unlocked by the ToE[73]:

- The volumes of (non CIPU) energy bids for non-reserved mFRR[74] are very limited (only 6 MW offered a price of 583 EUR/MWh during August and September 2018[75]);
- The share of reserved mFRR capacity from non CIPU didn't increase[76] after the introduction of ToE in December 2018;
- The (non CIPU) energy bids relative to reserved mFRR are submitted at high prices[77].

The observations regarding the volumes described here above could be explained by two elements.

- Firstly, market parties seem to have a preference for guaranteed revenues (such as for example reservation fees), while the ToE alone doesn't provide such guaranteed revenues. Indeed, reserved mFRR, which offers a reservation fee, has a high DSR market share (+- 50%) while non-reserved mFRR has little volume;

[71] See slide 15 of the Compass Lexecon-study.

[72] On the top of volumes already participating since 2013, before the introduction of ToE on the reserved mFRR, via the former "R3 non CIPU" (ex R3 DP) product.

[73] See slide 16 of the Compass Lexecon-study.

[74] Free bids

[75] The volumes offered for non-reserved mFRR since the opening of this market segment to ToE where limited to one bid of 6 MW offered 26 times in August and September. This bid was composed by one Delivery Point under the ToE contractual regime. This bid at 583 EUR/MWh has been activated one time on 20th of September 2018 between 19h15 and 20h00. As from December 2018 the concerned Delivery Point was fully integrated in reserved mFRR energy bids.

[76] The volumes of reserved mFRR non-CIPU capacity didn't increase after the introduction of ToE compared to before its introduction. In addition, the total prequalified volume for participation to the reserved mFRR non-CIPU slightly decreased just after December 2018.

[77] Prices from several hundreds of euros to thousands with min. offered price is 250 EUR/MWh, volume-weighted average is 2.322 EUR/MWh and max. offered price is 10.120 EUR/MWh between December 2018 and May 2019.

- Secondly, the complexity of the ToE mechanism, including the initial administrative requirements[78] adds an additional hurdle. Before the introduction of ToE, non-CIPU units could already participate in mFRR reserved via a third party aggregator without needing a consent of BRPsource/Supplier and without an activation prices which is as such less complex.

Note that it was observed that the number of active FSPs decreased after December 2018.

However, ToE remains valuable per se as it fosters competition and provides a neutral and transparent framework for all market parties[79] :

- It allows FSPs (and Grid Users) to offer flexibility with or without the consent of the Supplier/BRPsource;
- It provides a transparent process whereby data and calculations are centrally handled while safeguarding the confidentiality among market parties;
- It provides to the Grid Users the alternative to valorize their flexibility with different parties and therefore increases their negotiation power.

[78] See slide 17 of the Compass Lexecon-study.

[79] See slide 18 of the Compass Lexecon-study.

8.3 Elia observations and conclusions

The **Transfer of Energy brought a sound market design for the participation of demand response** to the reserved and non-reserved mFRR market segments:

- First of all, a level playing field has been created between CIPU and non-CIPU assets allowing both of them to participate with the same conditions and to receive an activation fee;
- Next, ToE (together with the alternative mechanisms such as Opt-out[80]) provided a new way to access the market for the BSPs and Grid Users. It allows them to participate via different ways (via the Supplier/BRPsource or independently from them) while ensuring that the impacts of an activation on the BRPsource and the Supplier are neutralized or compensated;
- Finally, the Grid User is able to valorize his flexibility via a market party of his own choice. This liberty of choice generates additional negotiation power for the Grid User towards his own existing Supplier and/or new market players. As a result, ToE might also have contributed to the development and valorization of implicit flexibility (flexibility of the Grid User used by the Supplier/BRPsource in order to remain balanced, for instance during periods with adequacy issues).

The above elements are thus considered the main success factors of ToE. **Nevertheless it has to be nuanced with** the following aspects:

- Elia notices that **stakeholders consider the ToE as a very complex mechanism** that requires specific knowledge. Moreover, ToE goes hand in hand with a very heavy administration workload, starting from the initial set-up up (negotiations on financial compensations,…) up until the day to day business processes (monthly financial transactions between FSP and Supplier, follow up of banking guarantee,…).

  ⇨ Elia acknowledges that the ToE is complex and hopes that the administrative procedure will gradually require less effort once parties are accustomed to ToE (via a learning curve). However, Elia finds it of upmost importance to strive for a fairly simple design lowering entry barriers for new participants.

- The **ToE didn't bring additional volumes** to the market of non-reserved mFRR (Bidladder): market parties seem to prefer reserved mFRR, which offers a reservation fee, over non-reserved mFRR while the volumes of reserved mFRR from non CIPU units didn't increase. Besides that the reserved and non-reserved mFRR bids are associated with high prices and come at the end of the merit order implying that they are rarely activated.

  The fact that ToE didn't increase the liquidity of non-CIPU volumes in the non-reserved and reserved mFRR markets could be explained (according to stakeholders feedback and Compass Lexecon's study) by the mFRR design requirements (f.e. activation timings which

[80] Among all the registered Delivery Points (225) for the reserved and non-reserved mFRR, 86 Delivery Points are operated under the ToE contractual regime and 139 under an alternative mechanism which suggest that those alternative mechanism do play there role as also suggested by market parties. The 86 Delivery Points operating under ToE represent 75% of the total Maximum Available mFRR volumes (615MW).

cannot be respected by "slow" assets), by the the fact that ToE alone doesn't provide enough guaranteed revenues[81] and by the complexity of ToE.

> ⇨ The financial risks (no guaranteed revenue) would be similar for the ToE in DA/ID as for the ToE in non-reserved mFRR.
>
> ⇨ Opening ToE to DA/ID markets would nevertheless allow the participation of demand response not capable to answer to the technical specifications of mFRR.

- **Finally, as a consequence of the previous conclusion, it is observed that the Combo possibility has never been used.** Indeed, a Combo design was proposed as from December 2018 in order to allow a simultaneous activation of non-reserved mFRR and/or reserved mFRR Flex and/or reserved mFRR standard. This Combo possibility would allow FSPs to bid together with their reserved mFRR flexibility their additional mFRR flexibility which was not retained in the mFRR capacity auction.
  This possibility was never used, since once ToE was extended to the reserved mFRR the flexibility offered for non-reserved mFRR moved towards the reserved mFRR[82]. One possible explanation to that could be that FSPs and Grid Users try to keep the number of activations per Delivery Point limited (especially if they participate to reserved mFRR Flex). Indeed, offering a Delivery Point (partially) on non-reserved mFRR and on reserved mFRR increases the risk to activate this point. Elia invites involved parties to provide additional information to clarify this assumption.

[81] See Key takeaway 3 of the stakeholder survey.

[82] The Delivery Point used in the bid of 6MW offered in August and September on the Bidladder Platform for the non-reserved mFRR was fully integrated in reserved mFRR energy bids since December 2018.

9 Expectations on ToE in DA/ID markets

This section focusses on the expectations and recommendations for the extension of ToE to the DA/ID markets. The goal of this section is to look forward and to determine if opening ToE in DA/ID markets is feasible, keeping in mind the existing ToE (as already discussed in section 8).

This section is structured as follows:

- Input received from stakeholders, via the survey on experienced feedback (see subsection 9.1);
- Main observations of the Compass Lexecon-study (see subsection 0);
- Elia's observations and final conclusions (see subsection 9.3).

9.1 Feedback of market parties

The first subsection starts by describing a summary of the feedback received during the survey from market parties regarding an extension of ToE to DA/ID markets and an according design[83]:

5. ToE to DA/ID - while others are more skeptical - provides the same benefits as for the balancing market
Elia received following feedback from stakeholders regarding benefits for ToE in DA/ID: - RESTORE believes fair access for all market parties to flexibility of consumers is a key feature for a well-functioning market, as has been recognized in other countries and at the European level; - FEBELIEC is convinced that success factors of ToE in mFRR markets remain in the day-ahead and intraday markets: ToE in DA/ID is a no regret solution on the short but definitely on the longer term, as more and more Grid Users will have the possibility to market their flexibility. This also aligns strongly with the long term plans on Belgian and European level and the unlocking of the full potential of flexibility; - RESTORE believes ToE for DA and ID will be a key enabler for access to DR in the future CRM, as a mean to demonstrate and validate the availability of engaged DR capacity during stress events.
Elia received following feedback from stakeholders which are more skeptical towards an extension of ToE to DA/ID market: - FEBEG does not see any benefits to the extension of the ToE mechanism to the DA/ID markets. Suppliers already offer a range of contracts that allow customers to react to prices in the DA and ID timeframe. Extending the ToE mechanism to these timeframes

[83] All non-confidential feedback received from market parties is published in Annex 2. A summary of the topics which are considered as out of scope for this study are summarized in Annex 3.

rather enlarges the scope of potential contractual conflicts between supply contracts with DA and ID flexibility and the ToE process;

- FEBEG mentions Suppliers generally have some flexibility in their portfolio for the sake of managing their balancing perimeter optimally and react to unpredictable circumstances. In that light, it is beneficial to be BRP/Supplier and FSP at the same time as it allows to valorize flexibility in multiple ways. The reduction of such flexibility from its portfolio through unsolicited activations during the DA/ID timeframe is therefore detrimental for the Supplier and comes at a cost.

6. Opening ToE to DA/ID markets creates possibilities for "slow" assets which do not find their way to the DA/ID through the currently existing schemes.

Elia received following feedback from stakeholders regarding the assets that would participate:

- EUROPEAN COMMODITIES states this could unlock some flexibility potential existing among GU too small or too "budget minded" to have a contract with ID possibilities. This could also enable some GU to make a "try" without having to commit for a 1-year supply contract;

- RESTORE is of the opinion that during the winter 2018/2019, in the absence of ToE independent FSPs were not able to come up with a viable commercial solution for sites willing to offer their flexibility to the markets;

- RESTORE expects to participate with assets currently participating in the reserve markets as well as assets that currently cannot match specifications of these products e.g. longer notification time or longer reaction, minimum activation duration required,…

7. It remains unclear to which extent additional flexibility volumes could be expected with ToE to DA/ID markets.

Elia received following feedback from stakeholders regarding the expected volumes that would be offered in DA/ID markets with ToE:

- NEXT KRAFTWERKE is of the opinion there is no reason to assume that ToE for DA/ID unlocks significantly more volume than the opportunity to bid with ToE on the bid ladder. In fact it should be assumed that the volume will rather be equal or less – meaning that a part of the volume on the bid ladder might also be moving to DA/ID, but there will be no additional volume tapped;

- NEXT KRAFTWERKE states not categorically object to the ToE for DA/ID but think that it will not deliver a volume that justifies the development costs and the administrative costs for the end user. Furthermore there is precious time lost as Elia binds resources on

this development. NKW does not think that the development of ToE for DA and ID should be a priority for Elia;

- RESTORE answered it is difficult to predict if the same non-CIPU assets would be used for DA/ID markets and for balancing markets;

- RESTORE expects to use ToE to take part to DA or ID market, especially when market conditions will be such that DR volumes could be needed.

8. Market parties expect that flexibility volumes will be offered on DA/ID markets at high prices.

Elia received following feedback from stakeholders regarding the expected prices of the flexibility volumes offered in DA/ID markets:

- EUROPEAN COMMODITIES states that most of the flexibility would be on the upper side of the usual value of the DA spectrum (>200EUR/MWh);

- FEBEG states as the value of flexibility increases closer to real-time, there is little reason to expect that a ToE framework would be any more effective in markets that are further away from real-time than the current ToE framework for balancing;

- FEBEG states it would also potentially extent the market dynamics visible on the R3 flex product – with very high energy prices – to the DA and ID markets. Market participants active through the ToE process have only a limited potential exposure to imbalances. As such, the inherent moderation in pricing the energy that comes from the potential exposure to such imbalance prices is largely removed. A similar pricing dynamic could develop on the DA and ID markets, which would have broader consequences on much larger markets;

- FEBELIEC is not directly concerned, but wants to stress that at market prices above 500, but definitely above 1000 €/MWh, many consumers that are exposed to market price signals and have the possibility to react (either through their contracts or in the future through a.o. ToE) will no longer consume electricity as this price level will start to be higher than the opportunity costs involved in not consuming this electricity. This effect will only continue to increase as prices increase, to the level of VoLL where consumers should be indifferent to consume or not consume. The basic premise is that consumers are however exposed to price signals and that they can react to these, implying the significance of ToE in DA/ID or alternatives;

- RESTORE recalls that most of DR capacities will be positioned on the right-hand side of the merit order, since most consumers do extract from electricity a value that is much higher than its price. Therefore they expect to offer volumes with associated opportunity costs, and therefore prices of several hundreds or thousands euros per MWh.

9. Future design needs to be pragmatic and not overdesigned; and should prevent gaming possibilities

Elia received following feedback from stakeholders regarding the complexity of the future design of ToE in DA/ID markets:

- FEBEG states that the existing mechanism cannot simply be copied and will require some adjustments to the existing mechanism. FEBEG is of the opinion the risk exists that these adjustments create additional complexity and administrative burden;
- With respect to the design feedbacks and lessons learned, FEBELIEC wants to reiterate its plea not to overdesign ToE, as this will frighten potential participants and create a (presumably and hopefully temporary) extra administrative/regulatory hurdle;
- FEBELIEC is and has always been a strong supporter of the avoidance of gaming by market actors, but also believes in the possibilities of post-hoc penalisation and in any case trusts in the capacity of the regulator to counteract such behaviour. FEBELIEC strongly wants to urge to apply intelligent ways to counteract gaming by increasing the chances of being caught and by removing the incentives for doing so, for example by introducing sufficient random elements making gaming constructions less interesting and by applying very severe penalties in case of proven gaming;
- RESTORE is of the opinion care is needed not to unnecessarily complexify the DA/ID product so as to make it easy to use, e.g. with respect to submetering, activation controls, etc.

10. Market parties suggest to have an additional baseline methodology.

Elia received following feedback from stakeholders regarding the proposed baseline methodology of ToE in DA/ID markets:

- EUROPEAN COMMODITIES suggest the possibility to have the choice between different baselines depending of the profile of the customer and of the occurrence of specific events;
- RESTORE states the proposed High X of Y method is a well-known methodology for which already good feedback in Belgium and other countries is available. However, RESTORE underlines that enabling only this method will be a blocker to unlock the full potential of DR to take part to DA and ID. They therefore ask Elia to allow additional baselines to be available, for example based on forecast or on the average offtake prior to the activation (with some finetuning to avoid gaming opportunities).

11. The possibility to make Combo-activations is considered as a positive feature by stakeholders

Elia received following feedback from stakeholders regarding the possibility to offer simultaneously in balancing and DA/ID markets with the same Delivery Point (Combo-activation):

- FEBEG answers: generally, participation to one market should not preclude the participation to other markets. In this way, flexibility can be valorized optimally and react to changing market circumstances;
- FEBELIEC states the combination of offering flexibility both in DA/ID and in the balancing timeframe is also very important. This will require attention in the definition of baselines, but it would be an aberration if consumers, as opposed to generators, would only be able to valorize flexibility in one single timeframe. This would also go against the strive for more flexibility in the system and would lead to sub-optimal outcomes;
- RESTORE is of the opinion a single asset can have part of its volume that fit the balancing service specifications and another part of its volume that does not fit the specifications of the balancing products but still can be sold on DA/ID;
- RESTORE is of the opinion there can be cases whereby it consist different assets behind the same Delivery Point but which for which it is too costly to develop a submeter solution.

12. Multiple FSP does not make unanimity: it is supported by some stakeholders who consider that it could facilitate switching of FSPs and reducing the "locking effect" while it is expected to be too complex by others

Elia received following feedback from stakeholders supporting a simultaneous activation of Multiple FSPs on a Delivery Point:

- EUROPEAN COMMODITIES considers that mFRR and DA/ID are different business with different timelines and should thus give the possibility to access different FSP. So at least a FSP mFRR and FSP DA/ID should be authorized for a single DP;
- FEBELIEC is of the opinion that Delivery Points should be able to prequalify with multiple FSPs if they would want to, in order to allow for more flexible switching between offers of FSPs in the DA/ID markets. Moreover, for FEBELIEC it is of very high importance that a Grid User for a Delivery Point is not locked to one of FSP over different timeframes;
- FEBELIEC is of the opinion especially the possibility to have different FSPs in the balancing timeframe as compared to DA/ID is important and will avoid the creation of new lock-in effects comparable to those that ToE tries to solve.

Elia received following feedback from stakeholders on the expected complexity of a Multiple FSP activation:

- FEBEG wants to avoid unnecessary complexity, only one FSP should be active on a Delivery Point. Otherwise, the scope of potential conflicts on activation, volumes and settlement increases exponentially;

- RESTORE states such a solution largely depends on the framework and the cost of implementing submeters.

9.2 Main observations of Compass Lexecon

The expectations from opening ToE to DA/ID markets are discussed in slide 19 of the Compass Lexecon-study (see Annex 4).

The key takeaways of ToE in existing balancing markets should also be applicable for the ToE in the DA/ID markets:

- Massive participation is not expected as the DA/ID market does not guarantee capacity revenues. As a consequence bids are expected to be made at high prices so participants could cover their costs;

- It is impossible to determine expected volumes but due to the less stringent technical requirements of the DA/ID product new assets could be attracted to participate.

This implies that a proportionate, simple and robust design should be preferred for opening ToE to DA/ID markets[84].

9.2.1.1 Specific insights on the ToE mechanism in France

This subsection describes the main findings of the Compass-Lexecon Study relative the DSR in France which correspond to slide 20 to slide 31 of the Compass Lexecon-study.

- Participation of DSR to the mFRR market in France dates back to 2003 and increased after 2009 following the implementation of a dedicated call for tenders for the demand response in 2008. The opening of ToE to mFRR in 2014 has also contributed to facilitate this participation[85];

- In 2014, RTE also opened the ToE to the DA/ID markets (with the "NEBEF-mechanism");

- DSR biddings and therefore activations on both NEBEF and mFRR remain however low[86]. Moreover NEBEF activations are correlated to peak spot prices[87] which happen more often in winter periods;

- The key driver of DSR participation to the French market is the existence of capacity-based revenues[88]. Indeed DSR participates actively to the capacity market, to the reserved mFRR and to a dedicated call for tender[89] for the demand response.

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[84] See slide 10 of the Compass Lexecon-study.

[85] See slide 28 of the Compass Lexecon-study.

[86] NEBEF activations amount only to 0,06% of the exchanged volumes on the French spot market in 2017, see slide 29 of the Compass Lexecon-study.

[87] See slide 29 of the Compass Lexecon-study.

[88] An overview of these revenue streams is visualized in slide 22 of the Compass Lexecon-study.

[89] As a support to the DSR associated with an obligation to bid on mFRR or DA/ID.

If capacity-based revenues are compared with energy-based revenues for French Demand Response Aggregators on a market basis, 90% of their revenues are capacity based[90]. This suggests that participants prefer guaranteed revenues to cover their costs as they are more secure and the business case of DSR relies more on capacity payments;

- Finally participants of the NEBEF-mechanism benefit from the fact that it also provides them a possibility to proof DSR availability in the French capacity mechanism[91].

⇨ The NEBEF mechanism in France has been a facilitator for the deployment of the Demand Response but not a "game changer".

9.2.1.2 Insights on demand response participation in PJM-region

This subsection describes the main findings of the Compass Lexecon-study for the markets in the PJM-region which correspond to slides 32 to 39 of the Compass Lexecon-study.

DSR participation to the PJM market dates back to the nineties and was significantly reinforced in 2007 with the joint introduction of the capacity market and of an independent aggregator model[92].

Multiple revenue streams are today open for DSR: a capacity market, wholesale energy markets (including DA/ID markets) and a market for ancillary services.

DSR capacities registered on PJM's capacity market have a must-offer requirement on the wholesale energy markets. This means this capacity should be at disposal of PJM all the time through energy bids that are offered with an activation price. This activation price is for 95% of the offered capacity higher then 1000 $/MWh which results in insignificant low energy activations[93].

⇨ Similar to France, almost all market revenues of Demand Response in the PJM Region are today based on capacity-based revenues and Demand Response energy bids are offered at high prices. In addition, many stakeholders have indicated to PJM they do not actively participate in the energy market because of the limited revenue opportunities[94].

[90] See slide 31 of the Compass Lexecon-study.

[91] See slide 24 of the Compass Lexecon-study.

[92] See slide 36 of the Compass Lexecon-study.

[93] See slide 37 of the Compass Lexecon-study.

[94] See slide 39 of the Compass-Lexecon-study.

9.3 Elia observations and final conclusions

Elia's main conclusions, are summarized in this section. Those are based on all the relevant insights from the mFRR experienced feedback, the stakeholders' feedback on the ToE in DA/ID and the main observations in France and PJM described in previous sections as well as Elia's own analyses..

1. Elia recognizes that an extension of the ToE-framework to DA/ID markets could create **new possibilities** for market actors and have **positive effects**:

   - Independent FSPs can valorize demand side flexibility on the DA/ID market independently from the Supplier/BRPsource (who are corrected for any impact via the ToE-mechanisms);

   - Grid Users have several options[95] for the valorization of their Flexibility. This liberty of choice generates additional negotiation power for the Grid User towards his own existing Supplier and/or new market players and could also contribute to the development of implicit flexibility;

   - Opening of ToE to DA/ID markets would provide an additional access to the flexibility that cannot participate via the existing frameworks (f.e. Grid Users willing to participate with independent FSPs and with "slow" assets).

   This first conclusion is also reflected in some stakeholders' feedback[96].

2. It is however **difficult to determine and quantify the volumes** that could be unlocked in the DA/ID market via a ToE-framework.

   Just like for the non-reserved mFRR market segment, the DA/ID market does not provide enough guaranteed revenues[97] therefore additional volumes that would be unlocked thanks to ToE could remain marginal.

   Moreover, demand would be offered at high prices[98] and during stressed periods (as it is observed for the mFRR in Belgium but also in France and in the PJM markets and as stated by stakeholders[99]).

[95] Independent FSP, FSP associated to or even FSP who is the same party as the Supplier/BRPsource in case of explicit participation and direct valorization with the Supplier/BRPsource in case of implicit participation.

[96] See Key-takeaway 5 of the stakeholder survey.

[97] See section 8.3.

[98] Note that according to the Compass-Lexecon Study (see slide 12) prices above 100- 200€/MWh are less exceptional in Belgium than in France and PJM.

[99] See Key takeaway 8 of the stakeholder survey: the minimum expected offering price by market parties is 200EUR/MWh. For information the Belpex DA Spot Price exceeded 200EUR/MWh, 0 hours in 2019; 20 hours in 2018 and 5 hours in 2017. Moreover during these years Belpex DA Spot Price never exceeded 500EUR/MWh.

3. Opening ToE to DA/ID markets is **in line with the European directives [100] of the "the Clean energy for all Europeans Package"** (CEP)[101]. Conform those directives, Member States are expected to create a framework in order to allow final customers, including those offering demand response through aggregation, to participate alongside producers in a non-discriminatory manner in all electricity markets. Opening ToE to DA/ID markets can create a new channel to valorize the flexibility by means of an independent FSP and is thus aligned with this directive.[102].

4. The extension of ToE to DA/ID market could have an added value due to its **facilitating role in the implementation of a CRM**:
   - Indeed, in Belgium the federal energy strategy[103] foresees to put in place a "Capacity Remuneration Mechanism" (here after called CRM[104]) on the Belgian energy markets. In general, a CRM provides a market-wide, technology neutral and timely incentive to capacity providers. An extension of ToE to DA/ID markets creates a credible level-playing-field among all technologies in terms of market access, which allows general and technology-neutral CRM market rules;
   - ToE in DA/ID markets, as further facilitator of demand response participation in the energy market, is a key improvement to the energy market as it enables competition and liquidity in those markets and thereby it can actively contribute to adequacy and flexibility needs. Indeed, as a CRM is under no circumstance a replacement of the energy market but instead a complementary measure, improving the energy market functioning remains crucial. In particular, a better-functioning energy-only market may reduce the missing-money problem;
   - ToE in DA/ID markets could provide an additional monitoring opportunity to check demand response availability[105].

[100] This directive needs to be transposed into national law by the end of 2020 and will be officially published during the summer of 2019 but can already be consulted at the following website.

[101] The CEP con be consulted on the EU's website.

[102] This was also mentioned by stakeholders, see Key-takeaway 5 of the stakeholder survey.

[103] This federal energy strategy, announced by the Federal Government on March 30, 2018, provides for new long-term measures to ensure security of supply for Belgium.

[104] The Federal Government has decided to provide in the Electricity Law the establishment of such a CRM.

[105] This was also suggested by a market party, see Key-takeaway 5 of the stakeholders survey.

⇨ Taking into account, on one hand, all the above mentioned benefits of the ToE in DA/ID markets (positive effects and the alignment with European and Belgian energy strategy) and, on the other hand, the fact that massive use of the mechanism is unlikely, a market design which matches such expectations should be a lean design. This is moreover supported by stakeholders who want to keep it robust, simple and not overdesigned[106].

The proposed design[107] for the extension of ToE to DA/ID markets builds further up on the existing and established ToE-framework. Elia believes thus that the proposed design is aligned with this expectation.

5. The **risk of overdesigning** emerges however with the complexities **regarding simultaneous Combo and Multiple FSP** activations on the same Delivery Point.

    a. **Combo activations add complexity** on the proposed design by allowing simultaneous activations in different services on the same Delivery Point.

    Elia described in section 6 the design that should be applicable for a Combo activation between balancing products and the DA/ID market and indicated the additional complexities and implications that go with it (such as the application of one unique master-baseline). **Elia notices that, although the principle of Combo activations is welcomed by stakeholders, the effective usage and economic viability of such an additional feature remains uncertain up to now**.

    Indeed, Elia observes today that, although a Combo has been developed between non-reserved and reserved mFRR, the entire share of the registered flexibility of Delivery Points participating to the mFRR non-CIPU is offered for the reserved mFRR. With other words, Elia observes that market players seem to favour, when possible, a capacity remuneration compared to activation remunerations, and seem to prefer being exposed to a limited number of activations. This results in zero cases where Delivery Points are offered simultaneously in reserved and non-reserved mFRR bids (see section 0).

    ⇨ Based on this, Elia wonders if the Delivery Points which participate to (non-) reserved mFRR would indeed, on the top of their participation to mFRR also participate to DA/ID, where no capacity remuneration can be expected. Therefore Elia invites involved parties to provide more insight on the additional potential of a simultaneous participation of Delivery Points in DA/ID and (non-) reserved mFRR. What would be the potential share of 'slow flexibility' (not capable to be offered in mFRR), that comes on top of the contracted 'fast flexibility' for mFRR ,taking into account that existing sub-metering solutions do not require a Combo design.

[106] See Key takeaway 9 from the stakeholders survey in section 9.1 and Compass-Lexecon observation in section 0.

[107] See part 1 of this document.

b. Allowing **multiple FSPs** to activate simultaneously on a same Delivery Point **creates**, on top of the Combo design, **another additional layer of complexity with constraints for involved parties** (Grid User and FSPs who have to be coordinated and to collaborate in order to "share" efficiently the flexibility behind a Delivery Point) (see section 7). This complexity and constraints could make this solution not interesting for FSPs especially if it doesn't provide any substantial benefit compared to the existing sub-metering solutions. Those remarks have also been raised by some stakeholders[108].

Some stakeholders plea for the implementation of a Multiple FSP feature in order to avoid lock-in effect and to facilitate switching of FSPs. Elia believes that the switching of one FSP will become more complex than it is today, on a Delivery Point where several FSPs (who have to collaborate, potentially with multilateral agreements between them) are involved. Elia is moreover not convinced that Multiple FSPs would contribute to reduce the lock-in effect: indeed the need for coordination between FSPs brought by the Multiple FSP design could increase the exclusivity applied by FSPs and at least need that the FSPs already in place in a Delivery Point accept to change their current contractual conditions to and to coordinate themselves with the new FSP.

Elia also wants to remind that today a kind of Multiple FSP situation already exists as a Grid User has the possibility to valorise one part of his flexibility on a Delivery Point with an independent FSP and to choose to valorise the remaining part of flexibility on that Delivery Point implicitly with his Supplier/BRPsource (on the DA/ID or even till the real time).

Moreover, as for the Combo, no indication is provided by stakeholders regarding the concrete cases and associated volumes of Delivery Points technically capable to be operated by more than one party for different purposes and for which a sub-metering solution is not possible/suitable[109].

⇨ Elia invites therefore stakeholders to provide concrete examples of situations where Multiple FSPs is a must have so that Elia can target a design and an implementation plan that fits to needs and priorities.

To conclude this market study, taken into account the above conclusions, Elia recommends to further analyze and develop the extension of ToE to DA/ID markets but has at this moment concerns regarding the real benefit and opportunities of the Combo and Multiple FSP design, at least for an immediate implementation.

[108] See Key-takeaway 12 from the stakeholders survey.

[109] See Key-takeaway 8 from the stakeholders survey.

ANNEX 1: SURVEY TOE IN DA/ID FOR STAKEHOLDERS

The following survey was sent to all stakeholders of the Workgroup Balancing:

The goal of this survey is to receive feedback from market parties regarding the existing ToE in balancing market segments as input for the ToE design study 2019, which is aiming at the extension of the ToE mechanisms (TOE, Opt-out…) to ID/DA markets. Out of scope are elements which are the competence of the CREG (i.e. default transfer price, mechanism for financial guarantees,…).

Disclaimer: Elia will not mention the name of the parties who answered when publishing the results unless specific authorization of concerned party.

Under what type of market role are you answering the following questionnaire?
BRPsource/Supplier?
Independent aggregator/FSP? Grid-user? BRPfrp? (Several roles can be chosen)

Regarding the existing ToE:

1. What are according to you the relevant design feedbacks and lessons learned from the implementation of the ToE mechanisms (ToE, Opt-out, if existing Pass-through) to the mFRR markets (first without and afterwards with reserved capacity) that we should take into account when extending those ToE mechanisms to the DA/ID markets?

2. Which ToE mechanism (ToE, Opt-out, if existing Pass-through) do you use or would you use the most and why? What is or would be in your portfolio the ratio of each of those mechanisms?

3. Do you have in your portfolio today any flexibility, which you use in the DA/ID and up to RT markets within the existing framework? For example flexibility used by an aggregator to a BRP(buyer) for the portfolio optimization/balancing of BRPbuyer by the means of a specific agreement (Opt-out like) with the BRPsource. If yes, could you provide us with more details on volumes, assets, mechanism, your role …

4. Do you see any reason why liquidity on bidladder (non-reserved mFRR) is low compared to the reserved mFRR? Is this reason also valid for ToE on DA/ID markets?

Regarding the opening of ToE to ID/DA markets

5. What main benefits or disadvantages do you expect from opening DA/ID markets to the ToE mechanisms (ToE, Opt-out, or if existing Pass-through)?

6. If you are an independent aggregator or a Grid User with some flexibility, do you expect to use a ToE mechanism when participating in DA/ID markets?
   If not, please explain why? For ex, do you already participate with your own BRPsource (in implicit Opt-out)? Do you prefer using this flexibility to balancing markets? Are there technical/economical (for ex. revenue streams linked to DA/ID prices)/administrative limitations in your process that hamper you participating?

For which minimal conditions would you participate and if this were met can you provide us with an answer on question 7a. to 7g.?

7. If you do expect to use a ToE mechanism and considering the current DA/ID markets and prices:
    a. Which volumes would you offer and by when? What would be the maximum and average offered volume? Which part of the maximum offered volume in ID/DA markets will be volumes:
        i. Not yet valorized in the markets?
        ii. Currently valorized by you own BRPsource/Supplier?
        iii. Currently valorized in balancing markets? If any which product?
    b. Would you participate on a regular base to this ID/DA markets? If yes how often? on a daily, weekly, monthly, yearly base? Do you have limitations regarding the maximum # of activations per year? If yes could you explain?
    c. For which price range of the market would you consider offering volumes in ID/DA markets? (> 50€/MWh, > 500€/MWh or > 1000€/MWh > 5000€/MWh)
    d. Which type of non-CIPU assets would participate in DA/ID markets? Injection or offtake assets?
    e. If the same non-CIPU assets would be used for DA/ID markets and for balancing markets what would be the ratio/volume, that would participate to DA/ID and to balancing?
    f. Are the existing and already implemented baseline methodologies sufficient for your operations? If not, please explain why? Do you have any considerations that we should take into account regarding the DA/ID markets?
    g. Is it necessary when opening DA/ID markets to the ToE mechanisms to allow a simultaneous participation to ID/DA markets and to balancing markets? If yes explain why and in what context?
    h. Is the fact that only one FSP is allowed on a Delivery Point a blocking factor for your operations or in the opposite would the fact to allow multiple FSPs per DP create undesired side effects? If you consider such a possibility necessary, can you illustrate this need with an example? What would you recommend as possibilities and what would be the priority of such evolution? If you consider that allowing multiple FSPs per DP would create distortions please explain and illustrate.

ANNEX 2: ANSWERS OF STAKEHOLDERS ON THE SURVEY

Elia received following answer from EUROPEAN COMMIDITIES:

We are answering as BRPsource/supplier with possibility to become FSP/BRPfrp after implementation if the new rules regarding DA/ID

1:

2:

3: We have in our portfolio and among our commercial contacts some potentially significant volumes (total >100MW). Most of these are not yet used in the ToE mechanism because of the timing required by ToE.

4: Vocation of bidladder is not to be as liquid as a power exchange and the participant have no obligation to put their flexibility. We also assume many potential participants are deterred by the timing of mFRR and some flexibility could be unlocked by the new ToE

5: We only expects benefits: this could unlock some flexibility potential existing among GU too small or too "budget minded" to have a contract with ID possibilities. This could also enable some GU to make a "try" without having to commit for a 1-year supply contract. The ToE looks like the best option as a specific supply contract is not needed and enable thus GU who are still using Endex related contract to access the shorter term market with only an upside possibility.

7:

C: We have almost on full range of price available but most of the flexibility would be an the upper side of the usual value of the DA spectrum (>200EUR/MWh). Consumption increase are not permitted by a lot of processes and the interpretation of the CREG of the law put generating plant our of the scope. We consider this interpretation as counterproductive as it would enable the participation of some renewable producer with storage capabilities.

F: baseline are not an easy question but, as it was discussed during the workshop, we would suggest the possibility to have the choice between different baselines depending of the profile of the customer and of the occurrence of specific events (planned maintenance, return from holiday period especially in winter time etc.) We consider than a single baseline choice cannot capture the complexity and diversity of profile and would thus lead to a suboptimum as some GU would offer less flexibility than theoretically available.

H: We consider that allowing multiple FSP Is absolutely mandatory. Otherwise it would put the existing mFRR FSP in a situation of quasi monopoly with the ability to block customer to access other flexibility markets. We consider that mFRR and DA/ID are different business with different timelines and should thus give the possibility to access different FSP. So at least a FSP mFRR and FSP DA/ID should be authorised for a single DP.

Elia received following answer from NEXT KRAFTWERKE:

- **General feedback on ToE - major design flaw**
  The current ToE which utterly locks the existing flexibility with the current aggregator blocking all competition.

  This is because it is not possible to perform a prequalification test with a new aggregator while be under contract with another one. Therefore there are minimum of one but often two month in which the installation owner does not earn. The loss of one month of income is in most cases sufficient to make a change impossible.
  We always understood that Elia is afraid of such lock-ins. This was also one of the main arguments for Elia to develop the new I/O energy platform which would make a lock due to hardware costs for the consumer less likely. To put this in perspective: The lock in of a control box at an installation and the installation costs has never been a hindrance for a change even though these costs go up to a few thousand Euros for special cases. The lock in due to the lost income because of the ToE is for larger installations of totally different dimension.

  Instead of increasing the competition, the ToE is a blocking point and cements the current positions in the market.

  We think that it should be Elia's first concern to remove market barriers for smaller players, to allow free and full competition. In this spirit the removal of this design flaw should be utmost priority for Elia (and the CREG) before any other ToE developments are made.

- **Use of ToE DA/ID**
  We do not categorically object to the ToE for DA/ID but we think that it will not deliver a volume that justifies the development costs and the administrative costs for the end user. Furthermore there is precious time lost as Elia binds ressources ot this development. We do not think that the development of ToE for DA and ID should be a priority for Elia.

- **What is to be expected on the DA/ID market**
  There is no reason to assume that any the ToE for DA/ID unlocks significantly more volume than the opportunity to bid with ToE on the bid ladder. In fact it should be assumed that the volume will rather be equal or less – meaning that a part of the volume on the bid ladder might also be moving to DA/ID, but there will be no additional volume tapped.

Febeliec answer to the Elia questionnaire on Transfer of Energy in Day-ahead and Intraday markets

Febeliec would like to thank Elia for this consultation on the transfer of energy (ToE) in Day-Ahead and Intraday markets. Febeliec would also like to refer to the discussion during the task force, the comments made during the discussion on the introduction of ToE in mFRR/SDR and to the interview with FTI-CL on this topic on the request of Elia.

Febeliec answers this questionnaire as representative of the industrial consumers, taking into account discussions and interactions with its members, some of which are already participating in ToE schemes in the balancing market. Febeliec members are all grid users (consumers), but some also play the role of BRP, (own) supplier, BSP, FSP, …

Febeliec understands that the discussion in the task force will not cover those elements that are the competence of the CREG, but notably the standard transfer price discussion will nevertheless be an important element of the overall discussion on ToE in DA/ID and will have to be treated in parallel, as also other topics under competence of the CREG.

1. What are according to you the relevant design feedbacks and lessons learned from the implementation of the ToE mechanisms (ToE, opt-out, if existing pass-through) to the mFRR markets (first without and afterwards with reserved capacity) that we should take into account when extending those ToE mechanisms to the DA/ID markets?

For Febeliec it is very important to remark that the success of the introduction of ToE in balancing markets is not measured only by the volumes but also (and even more so) by the impact it has had on the market, by opening a discussion on participation of grid users to demand response services and products. Not only does the option of ToE create an additional channel for valorising flexibility, it also increases bargaining power of consumers with suppliers, BRPs and aggregators. Moreover, the discussions on ToE have lead directly to the introduction of the opt-out and pass-through solutions, have created visibility and in general increased, according to Febeliec, the dynamics in the balancing market (in the strategic reserve market it has not yet been applied due to other circumstances), to the benefit of all grid users through a lower system cost. Febeliec is convinced that this can also be the case in the day-ahead and intraday markets and that it is again a no regrets solution on the short but definitely on the longer term, as more and more grid users will have the possibility to market their flexibility. This also aligns strongly with all the long term plans on Belgian and European level and the unlocking of the full potential of flexibility. Febeliec also wants to indicate for the day-ahead and intraday markets that the success of ToE will not only be measured by the volumes that are traded under a ToE regime but (and more so) by the better market functioning and more dynamic interaction, by the increase of the elasticity of the demand curve, thus leading to benefits for the entire system and a positive impact on the total system cost.

With respect to the design feedbacks and lessons learned, Febeliec wants to reiterate its plea not to overdesign ToE, as this will frighten potential participants and create a (presumably and hopefully temporary) extra administrative/regulatory hurdle. Febeliec is and has always been a strong supporter of the avoidance of gaming by market actors, but also believes in the possibilities of post-hoc penalisation and in any case trusts in the capacity of the regulator to counteract such behaviour. Febeliec strongly wants to urge to apply intelligent ways to counteract gaming by increasing the chances of being caught and by removing the incentives for doing so, for example by introducing sufficient random elements making gaming constructions less interesting and by applying very severe penalties in case of proven gaming.

2. Which ToE mechanism (ToE, opt-out, if existing pass-through) do you use or would you use the most and why? What is or would be in your portfolio the ratio of each of those mechanisms?

This question is as such not directly applicable to Febeliec, but Febeliec would like to invite Elia and CREG to consider all three solutions as they are not mutually interchangeable, different options can cater better for the specific situation of different consumers, they all create options for increasing the valorisation of flexibility and are all long term no regret solutions. For Febeliec it is clear that all three solutions have their place and should be allowed.
Febeliec would also like to indicate Elia that it is for many if not most market actors near to impossible to indicate any values here, as even the design is not yet finalized and it thus is impossible to grasp the full implications of the ToE in DA/ID solution. Moreover, Febeliec reiterates its previous comments on the definition of success of ToE and on the long

term effects on market dynamics. This ToE solution nor the opt-out and pass-through solutions are created for the short term, for Febeliec they are intrinsically part of the market design and will continue to deliver value ad vitam once their development and implementation has been done.

3. Do you have in your portfolio today any flexibility, which you use in the DA/ID and up to RT markets within the existing framework? For example flexibility used by an aggregator to a BRP(buyer) for the portfolio optimization/balancing of BRPbuyer by the means of a specific agreement (opt-out like) with the BRPsource. If yes, could you provide us with more details on volumes, assets, mechanism, your role …

This question is not directly relevant for Febeliec. Nevertheless, many Febeliec members today already valorise their flexibility, also in DA/ID, through a myriad of ways as can be seen in the bid curves via their BRP (or because they are themselves BRP), as can also be observed in the bid curves. Also in the balancing market Febeliec members are clearly directly or through aggregation participating today to the market.

4. Do you see any reason why liquidity on bidladder (non-reserved mFRR) is low compared to the reserved mFRR? Is this reason also valid for ToE on DA/ID markets?

Febeliec wants to refer to its previous comments on this point. Febeliec also strongly wants to reiterate the fact that the development of ToE is a no regret solution, as it is a one-shot development that can reap benefits ad vitam, on top of the effect that is has on the market dynamics as described above.

5. What main benefits or disadvantages do you expect from opening DA/ID markets to the ToE mechanisms (ToE, opt-out, or if existing pass-through)?

Febeliec wants to refer to its previous comments on this point. In any case, in the future system that is being envisaged by policy makers in Belgian as well as on the European level, it is undeniable that flexibility will have a major role to play and as such opening DA/ID markets to consumers to valorise their flexibility will always be a no regret option, without even the risk of stranded investments. Febeliec reiterates also its plea to not chose between ToE, opt-out and pass-through, as they cater for different problems and will thus each benefit grid users in different contexts.

6. If you are an independent aggregator or a grid user with some flexibility, do you expect to use a ToE mechanism when participating in DA/ID markets?

If not, please explain why? For ex, do you already participate with your own BRPsource (in implicit opt-out)? Do you prefer using this flexibility to balancing markets? Are there technical/economical (for ex. revenue streams linked to DA/ID prices)/administrative limitations in your process that hamper you participating? For which minimal conditions would you participate and if this were met can you provide us with an answer on question 7a. to 7g.?

Febeliec refers to the previous answers.

7. If you do expect to use a ToE mechanism and considering the current DA/ID markets and prices:

Febeliec refers to its previous answers. For most of these questions, Febeliec is not directly concerned and cannot answer for each specific situation that exists at its members. Nevertheless, Febeliec remains available to discuss this topic with Elia and to help provide input.

a. Which volumes would you offer and by when? What would be the maximum and average offered volume? Which part of the maximum offered volume in ID/DA markets will be volumes:

i. Not yet valorized in the markets?
ii. Currently valorized by you own BRPsource/supplier?
iii. Currently valorized in balancing markets? If any which product?
b. Would you participate on a regular base to this ID/DA markets? If yes how often? on a daily, weekly, monthly, yearly base? Do you have limitations regarding the maximum # of activations per year? If yes could you explain?
c. For which price range of the market would you consider offering volumes in ID/DA markets? (> 50€/MWh, > 500€/MWh or > 1000€/MWh > 5000€/MWh)

Febeliec refers to its previous answers. Febeliec is not directly concerned, but wants to stress that at market prices above 500, but definitely above 1000 €/MWh, many consumers that are exposed to market price signals and have the possibility to react (either through their contracts or in the future through a.o. ToE) will not longer consume electricity as this price level will start to be higher than the opportunity costs involved in not consuming this electricity. This effect will only continue to increase as prices increase, to the level of VoLL where consumers should be indifferent to consume or not consume. The basic premise is that consumers are however exposed to price signals and that they can react to these, implying the significance of ToE in DA/ID or alternatives.

d. Which type of non-CIPU assets would participate in DA/ID markets? Injection or offtake assets?
e. If the same non-CIPU assets would be used for DA/ID markets and for balancing markets what would be the ratio/volume, that would participate to DA/ID and to balancing?
f. Are the existing and already implemented baseline methodologies sufficient for your operations? If not, please explain why? Do you have any considerations that we should take into account regarding the DA/ID markets?
g. Is it necessary when opening DA/ID markets to the ToE mechanisms to allow a simultaneous participation to ID/DA markets and to balancing markets? If yes explain why and in what context?
h. Is the fact that only one FSP is allowed on a delivery point a blocking factor for your operations or in the opposite would the fact to allow multiple FSPs per DP create undesired side effects? If you consider such a possibility necessary, can you illustrate this need with an example? What would you recommend as possibilities and what would be the priority of such evolution? If you consider that allowing multiple FSPs per DP would create distortions please explain and illustrate.

Also on this last question, Febeliec is not directly concerned, but has some important remarks. As prequalification will have to be done in advance and will require a certain period of time, Febeliec is of the opinion that delivery points should be able to prequalify with multiple FSPs if they would want to, in order to allow for more flexible switching between offers of FSPs in the DA/ID markets. Moreover, for Febeliec it is of very high importance that a grid user for a delivery point is not locked to one of FSP over different timeframes. It should be possible for a delivery point to participate via one FSP in DA, another in ID and yet another in balancing (and SDR). Especially the possibility to have different FSPs in the balancing timeframe as compared to DA/ID is important and will avoid the creation of new lock-in effects comparable to those that ToE tries to solve. The combination of offering flexibility both in DA/ID and in the balancing timeframe is also very important. This will require attention in the definition of baselines, but it would be an aberration if consumers, as opposed to generators, would only be able to valorise flexibility in one single timeframe. This would also go against the strive for more flexibility in the system and would lead to sub-optimal outcomes.

POSITION

Subject:	Elia Survey ToE mechanisms (TOE, opt-out...) to ID/DA markets: FEBEG answers
Date:	25 April 2019

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"The goal of this survey is to receive feedback from market parties regarding the existing ToE in balancing market segments as input for the ToE design study 2019, which is aiming at the extension of the ToE mechanisms (TOE, opt-out...) to ID/DA markets. Out of scope are elements which are the competence of the CREG (i.e. standard transfer price, mechanism for financial guarantees,...).

Disclaimer: Elia will not mention the name of the parties who answered when publishing the results unless specific authorization of concerned party.

0. *Under what type of market role are you answering the following questionnaire? BRPsource/supplier? Independent aggregator/FSP? Grid-user? BRPfrp? (Several roles can be chosen)"*

The FEBEG answer is mainly from the perspective of a BRPsource/Supplier, even though its members also assume other roles in the market.

Regarding the existing ToE:

1. *What are according to you the relevant design feedbacks and lessons learned from the implementation of the ToE mechanisms (ToE, opt-out, if existing pass-through) to the mFRR markets (first without and afterwards with reserved capacity) that we should take into account when extending those ToE mechanisms to the DA/ID markets?*

FEBEG: The ToE framework is a project with a heavy administrative burden that has required considerable resources from both BRP/suppliers as well as Elia and the regulator, which plays an active and recurrent role in the application of the ToE formula. The complexity of the project shows the difficulty of integrating a strongly regulated mechanism in a market-based environment. The current ToE project has in our view not yet shown its added value in terms of market functioning, and contains numerous flaws, some of which are mentioned below as lessons learned. But more generally, we continue to question the need for such a distortive mechanism. Moreover, the extreme lack of liquidity in the mechanism up to date – despite tense market moments – contradicts the original assertion that demand response is held back by market participants behavior. In light of the challenges experienced during the implementation of the original ToE framework and its current functioning, it seems more appropriate

to conduct a review of the current mechanism instead of its further extension to other markets.

As the Day-ahead and Intraday markets differ significantly from the Balancing timeframe in terms of products, counter-parties, geographic scope and market size, a simple copy-paste of the current ToE design elements such as price formula and baseline is not possible. We therefore reiterate the need for an evaluation of the current ToE framework before a decision on its extension is taken.

FEBEG questions why existing Day-Ahead Market and Continuous Intraday Market are not sufficient to foster Demand Side Management:

- If a party is in need of some extra volumes, they can be requested using the usual bidding mechanisms of DAM/CIM.
- In extension of the latter, a "pass-through"-like contract is sufficient to offer extra flexibility in the DAM/CIM. Such users are already willing to shed their offtake whenever spot prices reach a certain level.
- Moreover, the ToE extension towards DA/ID seems to create a non-level-playing field between parties. The mechanism requires the BRPsource still having to pay the requested fees for accessing DAM/CIM (fixed + variable costs), while other parties access the same volumes "Over-The-Counter" without paying such fees. Those fees should be included as part of the compensation formula.

Regarding the Transfer of Energy, the contract Elia-Supplier for the exchange of data related to the Transfer of Energy states that the supplier will have access to the volumes of supplies energy on a quarter-hourly basis in an aggregated way at the end of the month M+2. This information is provided for each access point with a contract for 'valuation of deviation' to allow suppliers to correct the settled volumes with the activated flexibility volumes in order to avoid double payment. The timing for the provision of this information is however not in line with the timing of the normal process of invoicing of the customers' consumption: the consumption of month M is normally invoiced around the 20th of M+1, and this is based on the validated metering data (received at the latest M+10days). If suppliers have only access to the activated flexibility volumes by access point at the end of M+2, they can only send a final invoice after the reception of these data, which means that the first invoice is pro-forma until reception of the final data which will lead to a new invoice correcting the first one. It is therefore necessary that Elia provides these data at the latest at M+10days on the FTP server so that suppliers can send correct invoices right away.

A striking example of the exaggerated administrative burden linked to the current ToE mechanism is the contract between the DSO and the FSP. This contract – together with the NFS – contains a lot of additional responsibilities and obligations while it excludes

certain commercial activities. At the same time it is not sufficiently demonstrated that this contract is necessary, except for some practical arrangements on the exchange of information and confidentiality. A lot of conditions for the participation of access points are already included in the C9-01 and are thus abundant. As a result, this contract is unreasonable and disproportionate, creating a hurdle for market participation of demand response.

Another cause of this administration burden corresponds to the confidentiality of the contracted flexibility that needs to be ensured according to the regulatory framework. However, given its indirect costs and administrative and financial impact on certain market participants, one should assess if the confidentiality principle is still justified in the sense that it brings additional flexibility in the market. Additionally, FEBEG would like to remind that the confidentiality is only ensure in one way, meaning that BRPsource/suppliers are not authorized to receive to detailed data about the activated flexibility in their portfolio by other FSPs, while FSPs seems to be informed about the suppliers/BRPsource of their customers.

The financial neutrality of the supplier subject to a ToE also needs to be reinforced. For this reason, the ToE formula needs to be adapted at a minimum for the pass-through contracts, as well as belpex-hourly indexed customers as the weight on DA and forward indexation for such customers is not in line with sourcing contracts. Also, it is necessary to receive data per customer for the Belpex-hourly indexed customers (like it is the case for Pass-through customers) as this would help monitor the impacts for that kind of contracts. In any case, the ToE formula and the definition of the baseline will certainly have be reviewed if ToE is extended to ID and DA.

There is furthermore need for more transparency towards the BRPsource/Supplier on the tests performed by Elia. It is crucial that the BRPsource/Supplier is notified and remunerated for tests as it is for actual activations.

2. *Which ToE mechanism (ToE, opt-out, if existing pass-through) do you use or would you use the most and why? What is or would be in your portfolio the ratio of each of those mechanisms?*

FEBEG: As an association, FEBEG cannot answer this question.

3. *Do you have in your portfolio today any flexibility, which you use in the DA/ID and up to RT markets within the existing framework? For example flexibility used by an aggregator to a BRP(buyer) for the portfolio optimization/balancing of BRPbuyer by the means of a specific agreement (opt-out like) with the BRPsource. If yes, could you provide us with more details on volumes, assets, mechanism, your role …*

FEBEG: Suppliers generally have some flexibility in their portfolio for the sake of managing their balancing perimeter optimally and react to unpredictable circumstances. In that light, it is beneficial to be BRP/Supplier and FSP at the same time as it allows to valorize flexibility in multiple ways. The reduction of such flexibility from its portfolio through unsolicited activations during the DA/ID timeframe is therefore detrimental for the supplier and comes at a cost.

4. *Do you see any reason why liquidity on bidladder (non-reserved mFRR) is low compared to the reserved mFRR? Is this reason also valid for ToE on DA/ID markets?*

FEBEG: The low liquidity on the bidladder seems to contradict the initial assertion of the ToE framework that behavior of market participants suppressed demand response in the market. It is therefore questionable whether the ToE framework – which specifically aims to resolve this asserted barrier – is an effective tool to foster demand response. On the other hand, as the value of flexibility increases closer to real-time, there is little reason to expect that a ToE framework would be any more effective in markets that are further away from real-time than the current ToE framework for balancing.

Additionally, FEBEG assesses that there is no solid business case to participate to the Bid Ladder. A market party is not willing to invest in a system (IT, processes, etc.) which does not ensure a return on investment; the pre-contracted mFRR ensures at least the reservation fee to cover such costs. For FEBEG, the extension of the ToE mechanism to the DA/ID markets is prone to the same lack of business case to cover the necessary implementation costs.

Regarding the opening of ToE to ID/DA markets

5. *What main benefits or disadvantages do you expect from opening DA/ID markets to the ToE mechanisms (ToE, opt-out, or if existing pass-through)?*

FEBEG: We do not see any benefits to the extension of the ToE mechanism to the DA/ID markets. Suppliers already offer a range of contracts that allow customers to react to prices in the DA and ID timeframe. Extending the ToE mechanism to these timeframes

rather enlarges the scope of potential contractual conflicts between supply contracts with DA and ID flexibility and the ToE process.

It would also potentially extent the market dynamics visible on the R3 flex product – with very high energy prices – to the DA and ID markets. Market participants active through the ToE process have only a limited potential exposure to imbalances. As such, the inherent moderation in pricing the energy that comes from the potential exposure to such imbalance prices is largely removed. A similar pricing dynamic could develop on the DA and ID markets, which would have broader consequences on much larger markets.

The initial proposals of design principles for the ToE in DA/ID are inspired by the existing ToE in the balancing timeframe. It's obvious and important to stress that the existing mechanism cannot simply be copied, but will require adjustments, e.g. baseline, etc. The risk exists that these adjustments will create additional complexity and administrative burden.

6. *If you are an independent aggregator or a grid user with some flexibility, do you expect to use a ToE mechanism when participating in DA/ID markets? If not, please explain why? For ex, do you already participate with your own BRPsource (in implicit opt-out)? Do you prefer using this flexibility to balancing markets? Are there technical/economical (for ex. revenue streams linked to DA/ID prices)/administrative limitations in your process that hamper you participating? For which minimal conditions would you participate and if this were met can you provide us with an answer on question 7a. to 7g.?*

FEBEG: As an association, FEBEG cannot answer this question.

7. *If you do expect to use a ToE mechanism and considering the current DA/ID markets and prices:*

FEBEG: As an association, FEBEG cannot answer this question. Moreover, we would caution strongly on any responses that would be given to these questions as crucial market design elements such as price formula, imbalance risk and baseline are not yet clear. Additionally, we strongly believe that market dynamics – more than artificial and regulated mechanisms – are the main driver for the development of demand response. Therefore, the answer to these questions would always be conditional on future market developments.

a) *Which volumes would you offer and by when? What would be the maximum and average offered volume? Which part of the maximum offered volume in ID/DA markets will be volumes:*

i. Not yet valorized in the markets?

FEBEG: As an association, FEBEG cannot answer this question.

ii. Currently valorized by you own BRPsource/supplier?

FEBEG: As an association, FEBEG cannot answer this question.

iii. Currently valorized in balancing markets? If any which product?

FEBEG: As an association, FEBEG cannot answer this question.

b) *Would you participate on a regular base to this ID/DA markets? If yes how often? on a daily, weekly, monthly, yearly base? Do you have limitations regarding the maximum # of activations per year? If yes could you explain?*

FEBEG: As an association, FEBEG cannot answer this question.

c) *For which price range of the market would you consider offering volumes in ID/DA markets? (> 50€/MWh, > 500€/MWh or > 1000€/MWh > 5000€/MWh)*

FEBEG: As an association, FEBEG cannot answer this question.

d) *Which type of non-CIPU assets would participate in DA/ID markets? Injection or offtake assets?*

FEBEG: As an association, FEBEG cannot answer this question.

e) *If the same non-CIPU assets would be used for DA/ID markets and for balancing markets what would be the ratio/volume, that would participate to DA/ID and to balancing?*

FEBEG: As an association, FEBEG cannot answer this question.

f) *Are the existing and already implemented baseline methodologies sufficient for your operations? If not, please explain why? Do you have any considerations that we should take into account regarding the DA/ID markets?*

FEBEG: We would strongly argue for a thorough review of the baseline methodology, as the scope for changes in customer consumption are larger in a DA/ID timeframe, compared to the real-time balancing timeframe. It has to be ensured that normal customer reaction – e.g. in the framework of a supply contract with DA or ID exposure – is not doubly valorized or cannibalized by the ToE framework.

g) *Is it necessary when opening DA/ID markets to the ToE mechanisms to allow a simultaneous participation to ID/DA markets and to balancing markets? If yes explain why and in what context?*

FEBEG: Generally, participation to one market should not preclude the participation to other markets. In this way, flexibility can be valorized optimally and react to changing market circumstances.

h) *Is the fact that only one FSP is allowed on a delivery point a blocking factor for your operations or in the opposite would the fact to allow multiple FSPs per DP create undesired side effects? If you consider such a possibility necessary, can you illustrate this need with an example? What would you recommend as possibilities and what would be the priority of such evolution? If you consider that allowing multiple FSPs per DP would create distortions please explain and illustrate.*

FEBEG: To avoid unnecessary complexity, only one FSP should be active on a delivery point. Otherwise, the scope of potential conflicts on activation, volumes and settlement increases exponentially.

REstore

ELIA survey regarding the Transfer of Energy in ID/DA markets

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REstore comments

25th April 2019

Key points

- REstore considers the current ToE procedure can be amended in order to (i) widen the scope of eligible assets, (ii) simplify the whole process, and (iii) reduce the risks for the BSPs

- REstore considers all ToE schemes available for mFRR are useful, given the variety of situations faced in the market

- REstore considers the extension of ToE to DA and ID is a must, that will have a very positive impact on the market, and this even if volumes are likely to be mainly concentrated on few tensed periods like the winter 2018/2019

- REstore welcomes the proposed High X of Y baseline method proposed, but asks Elia to allow for additional methods in order not to limit access to ToE on DA and ID for some assets not eligible to High X of Y

Regarding the existing ToE:

1. What are according to you the relevant design feedbacks and lessons learned from the implementation of the ToE mechanisms (ToE, opt-out, if existing pass-through) to the mFRR markets (first without and afterwards with reserved capacity) that we should take into account when extending those ToE mechanisms to the DA/ID markets?

The current ToE procedure that has been implement is a key enabler for a fair access to the mFRR market for all providers. However, we do see some room to improve the current procedure, which as is (i) cannot be equally applied to all delivery points, (ii) is more complex than needed in certain cases, and (iii) is administratively both very heavy and source of risks for the BSPs:

(i) Current mechanism does not apply equally to all delivery points

The Belgian law limits the scope of application of ToE to "demand" assets, a scope that has been more accurately defined by CREG as delivery points that have an average positive annual offtake. The law and CREG's decision therefore exclude the possibility to apply ToE mechanism to delivery points with a negative offtake, *i.e* that are injectors, leaving only the opt-out solution.

Within the scope of the new aFRR design discussion, the opportunity to develop a model for net injectors with a pass-through contract has been proposed and validated by Elia, as well as the possibility and relevance to extend this model to mFRR, therefore allowing an alternative solution to obtain ToE for such delivery points.

Looking at the functioning of ToE mechanisms in mFRR, REstore considers that another alternative exists to also allow for certain net injectors even without pass-through contracts to still benefit from a ToE model: indeed, as long as the access point fulfills the net offtake criteria established by CREG,

REstore believes that any net injector delivery point at sub-level could apply for ToE even with sub-metering. REstore considers that, given the advantages of the use of a sub-meter, adapting the CREG definition to widen the scope would benefit the system and allow a more efficient ToE mechanism.

This solution however leaves unanswered the case of net injection assets behind net injections access points and which do not have a pass-through contract.

(ii) Current mechanism is more complex than needed in certain cases

In case of pass-through contracts, the application of ToE requires, as it is structured today, certain changes in the supply contract of the consumer involved, in order to avoid a redundant financial flow: the supplier has to correct the volume subject to imbalance payment from the volumes under ToE when settling the deviations from nominations with the end-consumer and in certain cases also the nominated energy that is paid.

REstore witnessed that this can open complex and unnecessary discussions between the consumers and their supplier, and trigger amendments to the supply contract that go beyond the scope of ToE. Therefore, REstore supports the simplification of the ToE mechanism applied for delivery points with pass-through contracts, consisting in removing certain flows:

- Removing the energy supplied correction of the BRPfsp, leaving him with no injections and in negative imbalance following an activation (only energy requested as offtake)
- Removing the payment of the ToE from the FSP to the supplier

Removing the latter will avoid the supplier having to correct the ToE volumes while settling the pass-through volumes with his consumer, the consumer then being able to receive the payment for the activation and settle it bilaterally with the FSP.

REstore believes this simplification is highly relevant and will have positive consequence beyond the sole simplification of the process, and fully supports its implementation both for mFRR and DA/ID ToE schemes.

(iii) Current mechanism is administratively both very heavy and source of risks for the BSPs

After this first months of implementation, REstore witnesses that the current ToE procedure is very lengthy and complex, although recognizing a lot of pragmatism by CREG to cope with the deadlines. Between the first contact established between an FSP and a supplier, several key steps must be followed before being able either to find an agreement, or to fallback towards a CREG decision for application of the fallback ToE price formula.

In the context on an increasingly complex market, with numerous suppliers active and with complex legal structures, the current ToE procedure exposes BSPs to the risk of not being able to secure access to ToE in time for key milestones such as mFRR tenders, strategic reserve tenders, or specific events on the market. For example, having to find the relevant legal entity and the right contact person at that legal entity that hold the supply contract can be overly complex and put at risk the entire procedure.

Also, the current procedure gives little resilience and agility to cope with situations where a site under ToE would change its supplier without the BSP being informed: would the new supplier not have a ToE agreement with the BSP, the time needed to sign one with the new supplier can put at risk the participation of the delivery point to a tender, and lead to lost revenues.

REstore therefore considers it is useful to consider how to (i) clarify the remaining grey areas regarding the different steps foreseen in the ToE procedure (from when certain delays start to run for example), and (ii) allow for agility for the cases where the standard ToE procedure would put at risk the participation of a delivery point because of specific deadline, for a tender for example.

2. Which ToE mechanism (ToE, opt-out, if existing pass-through) do you use or would you use the most and why? What is or would be in your portfolio the ratio of each of those mechanisms?

(CONFIDENTIAL)

3. Do you have in your portfolio today any flexibility, which you use in the DA/ID and up to RT markets within the existing framework? For example flexibility used by an aggregator to a BRP(buyer) for the portfolio optimization/balancing of BRPbuyer by the means of a specific agreement (opt-out like) with the BRPsource. If yes, could you provide us with more details on volumes, assets, mechanism, your role …

(CONFIDENTIAL)

4. Do you see any reason why liquidity on bidladder (non-reserved mFRR) is low compared to the reserved mFRR? Is this reason also valid for ToE on DA/ID markets?

First, REstore underlines that the implementation of ToE mechanism in mFRR markets did have a concrete and positive impact on these market in Belgium. It does fully play its role to ensure a fair access to all participants to the market, being the supplier of a delivery point as much as an independent FSP.

Secondly, the bidladder has a very stringent product design e.g. ramp-rate up and down, penalty risk versus gain, no minimum activation duration, no reservation fee. Hence the assets often do not fit in the technical specifications or the value that can be captured is rather limited. In the day-ahead or intraday market players are capable of structuring their own products bi-laterally in a much more flexible way. However, care will need to be taken not to over complexify the product in order to make it easy to use e.g. with respect to submetering, activation control, etc.

<u>Regarding the opening of ToE to ID/DA markets:</u>

5. What main benefits or disadvantages do you expect from opening DA/ID markets to the ToE mechanisms (ToE, opt-out, or if existing pass-through)?

First, REstore welcomes the timing of this survey, following the highly tensed situation faced by the Belgian grid during the winter 2018/2019, which highlights the key value ToE can bring on the DA and ID markets.

Indeed, during the last winter independent FSPs did not have any possibility to valorize flexible assets on DA or ID aside of bilateral deals with the suppliers of these consumers. In the context of high market prices, the price signal was well understood by flexible consumers, willing to value their ability to change their consumption patterns and offer MWs to the market. However, in the absence of ToE, independent FSPs were not able to come up with a viable commercial solution for those sites, as they could not buy the unused energy of such flexible assets and sell it to other market parties without prior consent and agreement with the supplier of those sites.

Furthermore, as with the bidladder, there is also an implicit value of these implementations of ToE in the sense that it provides consumers additional negotiation power in their supply contracts. Of course, this value is not visible and cannot be measured by looking at the actual volume posted on the platform.

Therefore, implementing ToE to DA and ID will, as for mFRR, ensure a fair access to all parties to the flexibility of those consumers, independently from the role of supplier. REstore believes this is a key feature for a well-functioning market, as has been recognized in other countries and even at European level.

Finally, ToE for DA and ID will be a key enabler for access to DR in the future CRM, as a mean to demonstrate and validate the availability of engaged DR MWS during stress events.

6. If you are an independent aggregator or a grid user with some flexibility, do you expect to use a ToE mechanism when participating in DA/ID markets?

Yes, we do expect to use ToE to take part to DA or ID market, especially when market conditions will be such that DR volumes could be needed. We will use ToE to ensure that we can valorize the flexibility of our customers directly on the market, not relying on the supplier of those sites as sole possible buyer.

If not, please explain why? For ex, do you already participate with your own BRPsource (in implicit opt-out)? Do you prefer using this flexibility to balancing markets? Are there technical/economical (for ex. revenue streams linked to DA/ID prices)/administrative limitations in your process that hamper you participating? For which minimal conditions would you participate and if this were met can you provide us with an answer on question 7a. to 7g.?

7. If you do expect to use a ToE mechanism and considering the current DA/ID markets and prices:

a. Which volumes would you offer and by when? What would be the maximum and average offered volume? Which part of the maximum offered volume in ID/DA markets will be volumes:

i. Not yet valorized in the markets?

ii. Currently valorized by you own BRPsource/supplier?

iii. Currently valorized in balancing markets? If any which product?

b. Would you participate on a regular base to this ID/DA markets? If yes how often? on a daily, weekly, monthly, yearly base? Do you have limitations regarding the maximum # of activations per year? If yes could you explain?

c. For which price range of the market would you consider offering volumes in ID/DA markets? (> 50€/MWh, > 500€/MWh or > 1000€/MWh > 5000€/MWh)

As a general remark, REstore recalls that most of DR capacities will be positioned on the right-hand side of the merit order, since most consumers do extract from electricity a value that is much higher than its price. Therefore, we expect to offer volumes with associated opportunity costs, and therefore prices, of several hundreds or thousands of euros per MWh.

d. Which type of non-CIPU assets would participate in DA/ID markets? Injection or offtake assets?

All assets that currently are participating to the reserve markets as well as assets that currently cannot match the specifications of these products e.g. longer notification time or longer reaction, minimum activation duration required,…. It can be both injection and offtake assets.

e. If the same non-CIPU assets would be used for DA/ID markets and for balancing markets what would be the ratio/volume, that would participate to DA/ID and to balancing?

This is difficult to predict as it will depend on the supply / demand fundamentals of the balancing market tenders as well as the expected prices levels on the DA/ID market.

f. Are the existing and already implemented baseline methodologies sufficient for your operations? If not, please explain why? Do you have any considerations that we should take into account regarding the DA/ID markets?

The proposed High X of Y method is a well-known methodology for which already good feedback in Belgium and other countries is available. However, REstore underlines that enabling only this method will be a blocker to unlock the full potential of DR to take part to DA and ID: some sites, in particular with low reproducibility of their patterns, will not be eligible to High X of Y. We therefore ask Elia to allow for additional baselines to be available, for example based on forecast or on the average offtake prior to the activation.

REstore understands some fine tuning will be needed to avoid the most obvious gaming opportunities when bringing those methodologies to DA and ID (since they are currently most used for balancing services), but believes that they should remain workable, in order not to hamper participation of DR assets.

g. Is it necessary when opening DA/ID markets to the ToE mechanisms to allow a simultaneous participation to ID/DA markets and to balancing markets? If yes explain why and in what context?

Yes given that a : (i) a single asset can have part of its volume that fit the balancing service specifications and another part of its volume that does not fit the specifications of the balancing products but still can be sold on DA/ID (ii) there can also be cases whereby it consist different assets behind the same delivery point but for which it is too costly to develop a submeter solution.

h. Is the fact that only one FSP is allowed on a delivery point a blocking factor for your operations or in the opposite would the fact to allow multiple FSPs per DP create undesired side effects? If you consider such a possibility necessary, can you illustrate this need with an example? What would you recommend as possibilities and what would be the priority of such evolution? If you consider that allowing multiple FSPs per DP would create distortions, please explain and illustrate.

This largely depends on the framework and the cost of implementing submeters.

ANNEX 3: ADDITIONAL REMARKS NOT DIRECTLY LINK TO TOE IN DA/ID

This annex provides an overview per topic of the feedbacks received by stakeholders which are not directly linked to the present study, either because the topic is linked to the design of other products than the ToE in DA/ID or because the remarks are relative to elements that are CREG's competence and out of scope of the present study. Elia takes note of this feedback for the other products where they are relevant.

1. Prequalification and availability tests relative to reserved mFRR

Elia received following feedback from stakeholders regarding the prequalification for mFRR:

- FEBEG asks more transparency towards the BRPsource/Supplier on the tests performed by Elia. It is crucial that the BRPsource/Supplier is notified and remunerated for tests as it is for actual activations.

- NEXT KRAFTWERKE states it is not possible to perform a prequalification test with a new aggregator while be under contract with another one and thinks that it should be Elia's first concern to remove market barriers for smaller players, to allow free and full competition. In this spirit the removal of this design flaw (should be utmost priority for Elia (and the CREG) before any other ToE developments are made.

2. Net-injection

Elia received following feedback from stakeholders regarding net-injection:

- Looking at the functioning of ToE mechanisms in mFRR, RESTORE considers that another alternative exists to also allow for certain net injectors even without Pass-through contracts to still benefit from a ToE model: indeed, as long as the Access Point fulfills the net-offtake criteria established by CREG, RESTORE believes that any net injector Delivery Point at sub-level could apply for ToE even with sub-metering. RESTORE considers that, given the advantages of the use of a sub-meter, adapting the CREG definition to widen the scope would benefit the system and allow a more efficient ToE mechanism.

3. Compensation price formula

Elia received following feedback from stakeholders regarding the compensation price formula:

- FEBEG is of the opinion the ToE extension towards DA/ID seems to create a non-level-playing field between parties. The mechanism requires the BRPsource still having to pay the requested fees for accessing DAM/CIM (fixed + variable costs), while other parties

access the same volumes “Over-The-Counter” without paying such fees. Those fees should be included as part of the compensation formula.

- FEBEG is of the opinion that the financial neutrality of the Supplier subject to a ToE also needs to be reinforced. For this reason, the ToE formula needs to be adapted at a minimum for the Pass-through contracts, as well as belpex-hourly indexed customers as the weight on DA and forward indexation for such customers is not in line with sourcing contracts. Also, it is necessary to receive data per customer for the Belpex-hourly indexed customers (like it is the case for Pass-through customers) as this would help monitor the impacts for that kind of contracts. In any case, the ToE formula and the definition of the baseline will certainly have be reviewed if ToE is extended to ID and DA.

ANNEX 4: COMPASS LEXECON-STUDY

Presentation for Elia

DSR participation in power markets: a review of Transfer of Energy experiences

Public Report

June 2019

DISCLAIMER

CONTENTS

Context

DSR CAN BRING MULTIPLE VALUES TO POWER SYSTEMS

Demand-Side Response ("DSR") can bring four kinds of values to power systems:

Type of value	Driver	Revenue stream
Adequacy value	Value of the guaranteed capacity available in the system to balance supply and demand	Capacity markets
Energy value	Value of avoided energy production (e.g. peaking plants) in case of DSR activation	Short-term energy markets (DA/ID)
Flexibility value	Value of flexibility services for frequency control (according to DSR features)	TSO frequency control services
Network value	Value of avoided network investments, value of congestion management & voltage control	Network tariff, TSO local control services

Our report focuses on the DSR contribution to the supply-demand equilibrium, i.e. on the adequacy, energy and flexibility values.

DIRECT ACCESS TO POWER MARKETS IS A KEY ENABLER TO REVEAL THE DSR VALUE

Flexible grid users can value their supply-demand flexibility in two ways :

	Valuation vector	Valuation principle
Portfolio valuation	Portfolio of the electricity supplier	The supplier makes use of the flexibility directly in its portfolio (e.g. to avoid buying energy on the wholesale market) and gives the user compensation in exchange for flexibilities.
Direct market bids	Relevant markets	The user uses its flexibilities to bid on relevant markets, directly or through an FSP[1].

[1] FSPs (for "Flexibility Service Providers") are service providers who aggregate flexibilities to optimize bids on the relevant markets and share this value with the flexible grid users they contract. They can be suppliers or "independent aggregators" acting independently from suppliers.

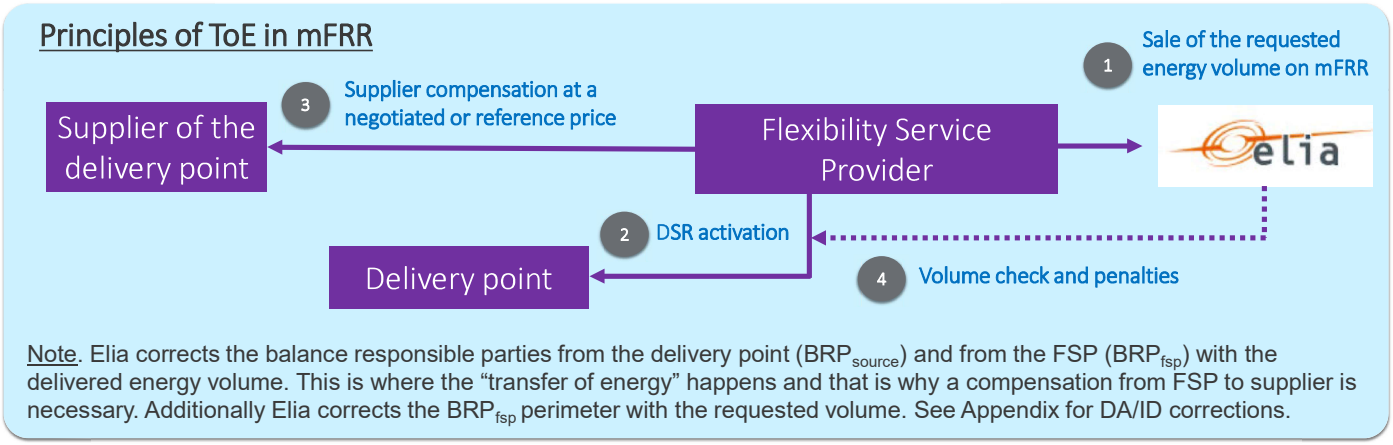
The Clean Energy Package requires that market design enables flexible users or flexibility service providers (FSPs) to access relevant revenue streams (capacity markets, power markets or TSO frequency control services) independently from suppliers, in order to grant fair competition for flexibility and thus help to foster DSR.

Source: art. 17 of the 2019 directive on common rules for the internal market for electricity.

IN BELGIUM, DIRECT BIDDING OF DSR ON THE MARKET INDEPENDENTLY FROM THE BRP_{SOURCE} REQUIRES "TRANSFER OF ENERGY"

In order to enable direct bidding of DSR on the market independently from the BRP_{source} and supplier of the concerned asset, a dedicated "Transfer of Energy" ("ToE") mechanism has been developed in Belgium.

This mechanism has been implemented on Elia's manually activated frequency restoration reserves ("mFRR", without and with capacity reservation) in June and December 2018 respectively:



Note. Elia corrects the balance responsible parties from the delivery point (BRP_{source}) and from the FSP (BRP_{fsp}) with the delivered energy volume. This is where the "transfer of energy" happens and that is why a compensation from FSP to supplier is necessary. Additionally Elia corrects the BRP_{fsp} perimeter with the requested volume. See Appendix for DA/ID corrections.

This mechanism enables DSR activations by an FSP at a delivery point without requiring authorization from the supplier and the BRP_{source} while being neutral for them.

Approach

OUR REPORT PROVIDES FEEDBACK ON THE EXISTING BELGIAN TOE AND A REVIEW OF DSR IN OTHER MARKETS

Elia is currently considering extending this mechanism to short-term energy markets (day-ahead and intraday markets) which could be another relevant revenue stream for DSR.

To help design this new mechanism, Compass Lexecon has been engaged by Elia to provide:

1. feedback on the existing Belgian mFRR ToE mechanism in order to identify lessons learned and expectations ahead for the ToE in DA/ID; and
2. a review of DSR participation and key enablers in other power markets, with a focus on ToE in France.

Approach

1 Feedback on existing Belgian ToE and expectations ahead

- Interviews with experts from Elia (market design, customer relations, metering)
- Interviews with representatives from various markets parties (FSPs, grid users, suppliers)

2 Review of DSR participation in other relevant power markets

- Choice of two cases with well-developed DSR on various markets: France and PJM[1]
- Focus on mFRR and DA/ID ToE in France
- Analysis of market data, market rules and interviews with Compass Lexecon experts

1 PJM is a US regional grid operator acting in 13 states and serving 65 million customers.

Executive summary

SUMMARY OF THE LESSONS LEARNED FROM EXISTING TOE AND EXPECTATIONS IN BELGIUM

The first developments for DSR participation to balancing services date back to 2013, well before ToE introduction in 2018, via the so-called "R3-non CIPU" (previously "R3-Dynamic Profile") product. It didn't enable remuneration for activation unless FSPs made private bilateral agreements with the supplier/BRP_{source}.

The successive moves towards full access of the DSR to the (non-reserved and reserved) mFRR including insertion on the merit-order and activation-remuneration, via the ToE, requires a more complex mechanism and has had nuanced effects.

Despite low additional volumes, the existence of mFRR ToE is valuable for grid users and FSPs as it provides them with more possibilities to access the market without being limited to agreements with their supplier and/or BRP_{source} .

mFRR ToE provides	However
▪ a coherent and instrumental framework for DSR energy remunerated activation ▪ a process whereby Elia handles data and calculations in a confidential way	▪ mFRR ToE has not triggered much additional volume ▪ mFRR energy bids are priced very high

Implications for DA/ID ToE :

- Developing DA/ID ToE is valuable *per se*, but the effort towards this goal should be proportionate as the use of the mechanism will likely not be massive, moreover operational challenges and costs are significant.
- On the basis of the existing mFRR ToE, a robust and simple design for DA/ID extension should be sought to avoid creating barriers.

SUMMARY OF THE LESSONS LEARNED FROM DSR REVIEW IN FRANCE AND PJM

1 Guaranteed revenues are key for DSR development

- DSR needs a predictable and stable revenue stream to cover fixed costs (training, IT, maintenance).
- That is why capacity-based payments (e.g. derived from services provision to the TSO or a capacity mechanism) play such an important role for DSR.
- For example, in France and PJM, most DSR value (~90 %) is derived from capacity-based payments. These payments come with an obligation to offer on energy markets (either DA/ID or reserves), but bids are usually very high and activations are random and scarce.
- In short, the business case for DSR is more "capacity-based" than "energy-based".

2 ToE can support DSR development, but not trigger it alone

- DSR participation has been observed without ToE (cf. France mFRR between 2009 and 2014 – i.e. after capacity payments on mFRR but before ToE), suggesting that ToE is not a necessary condition to unlock DSR potential.
- Symmetrically, the possibility of participating in energy markets (through ToE) alone does not provide a sufficient revenue stream for DSR (cf. Belgium on mFRR, France and PJM on DA/ID). Indeed, the volatility of energy activations does not generate significant and predictable revenues.

Conclusions:

- In France, the implementation of ToE mechanisms enabling direct market participation of DSR with remuneration of activation has been a facilitator but not a game-changer in terms of additional DSR volumes on the market.
- The implementation of ToE alone has little chance of triggering massive use. Indeed, ToE alone doesn't guarantee revenue streams for DSR. Other potential sources of revenues (e.g. capacity payments, for example via by reserved ancillary services to the TSO or a capacity mechanism) play a key role for the overall development of DSR.

THESE LESSONS CAN APPLY TO BELGIUM, BEARING SPECIFICITIES IN MIND

France and PJM market studies were selected for their relevant experiences in DSR independent aggregation or ToE, but a number of differences with Belgium on (1) market design, (2) market size and (3) price structure suggest caution in interpreting the market studies results.

1

Market design

- Being European markets based on self-scheduling/dispatch, the French market framework is quite similar to the Belgian one, but with some differences (no reactive balancing).
- On the contrary, the PJM market model is markedly different as it is based on centralized scheduling/dispatch and locational pricing. It has different ancillary services products and no physical balancing obligation.

2

Market size

In terms of peak load and demand, Belgian market size is significantly smaller than France and PJM.

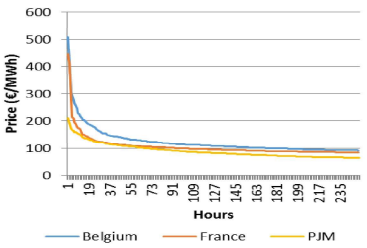
Market size	Belgium	France	PJM
Peak Load	~13-14 GW	~95 GW	~165 GW
Annual demand	~80 TWh	~475 TWh	~775 TWh

3

Price structures also differ:

- On the Belgian Day-Ahead market, prices above 100-200 €/MWh are less exceptional than in France/PJM.
- This may give more room for DSR activation.

Source: Day-ahead hourly price distribution (average 2016-2018) on the 250 peak hours, ENTSO-E



1. Lessons learned from the Belgian ToE experience in mFRR and expectations ahead

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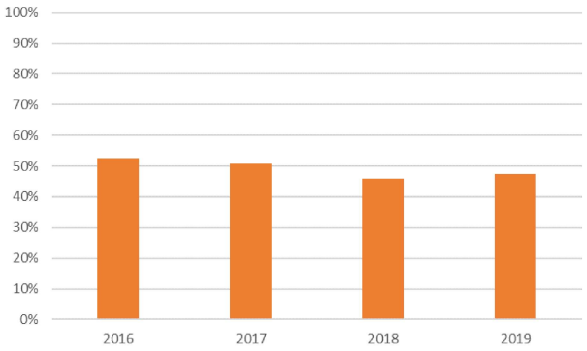
DSR PARTICIPATION IN BALANCING IS A LONG STORY…

DSR has participated in balancing services well before ToE introduction

- The "R3 flex non-CIPU" product enabled DSR participation in mFRR without an activation price.
- Due to its activation constraints and the lack of activation price, this product was kept at the end of the merit order list and in practice activated 3-4 times/year.
- The non-CIPU contribution to reserved mFRR capacity has been substantial, providing ~50% of the volumes procured by Elia in 2016-2019.

Share of reserved mFRR provided by non-CIPU



Data source : Elia

However, no scheme provided FSPs a guarantee of getting paid for energy activations

- Indeed, before ToE Elia didn't implement any energy corrections in BRP_{source} and BRP_{FSP} perimeters.
- Without ToE energy corrections, FSPs didn't have any guarantee of getting paid in case of energy activations. Only bilateral arrangements with BRP_{source} or the grid user (in case of pass-through contracts) enabled FSPs to get paid.
- As a consequence, non-CIPU units were not able to participate in free bids reflecting their activation costs. Thus, they were not interested in participating in standard R3 because it would have been difficult for them to get paid in case of activation. They only participated in the dedicated "R3 flex non-CIPU" product with limited activations.

Note: See annex on imbalance corrections for more details on financial flows with and without ToE.

… BUT ONLY TOE CAN PROVIDE THE NECESSARY LEVEL PLAYING FIELD FOR ALL TECHNOLOGIES

The EU Balancing target is to develop standard and technology-neutral products.

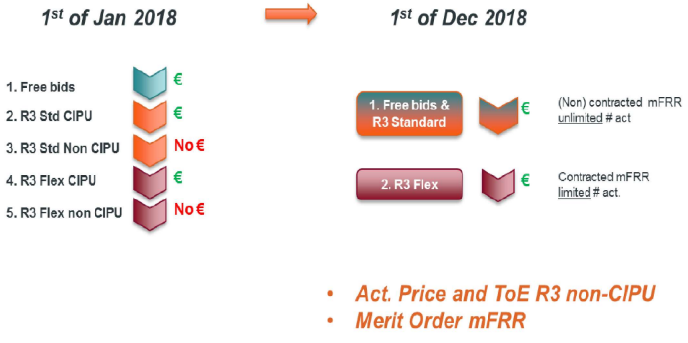
Source: Commission Regulation 2017/2195 of 23 November 2017 establishing a guideline on electricity balancing, in particular recitals 8 and 14, and Article 3.1.f.

Thus, a complete level playing field was needed for mFRR products, hence the introduction of ToE and the harmonization of CIPU and non-CIPU mFRR products.

That is why mFRR participation rules for non-CIPU units changed in 2018:

- Products definitions were adapted to remove distinctions between CIPU and non CIPU in bidding for mFRR products.
- ToE was introduced to enable an energy activation price for non-CIPU mFRR bids:
  - ✓ on non-reserved mFRR in June 2018 ("BidLadder" project)
  - ✓ on reserved mFRR in December 2018

Evolution of mFRR products in 2018



Sources: Elia's Design note on the mFRR product evolutions, Elia's ToE rules of June and December 2018, Elia's final note on BidLadder

THE OPENING OF TOE TO mFRR HAS HAD NUANCED EFFECTS

ToE introduction to non-reserved mFRR in July and reserved mFRR in December 2018 has introduced a coherent and instrumental framework…

- The developed contractual framework is complete, consistent and respects the Electricity Law and CREG's recommendations.
- The operational processes cover all business cases and identified risks.
- Thus, it is fully possible for FSPs to bid for non-reserved and reserved mFRR.

… but hardly any effect has been observed on the offered volume

- The share of mFRR provided by DSR has not increased (see slide 14).
- Almost no offer has been made on non-reserved mFRR (BidLadder)[1].
- Since the opening of ToE on reserved mFRR, energy bids corresponding to "mFRR flex", which are mandatory, are submitted at a very high price[2].
- The number of active FSPs decreased.

Sources: Electricity Law (art. 19), CREG's study on flexibility. Interviews with Elia's experts. The figures are from Elia.

Note: This slide is based on data between June 2018 and May 2019.
[1] 6 MW were offered in August-September at a price of 583 €/MWh
[2] Weighted average of 2322 €/MWh and maximum up to 10 120 €/MWh over Dec. 2018-May 2019

THE LACK OF ADDITIONAL NON-RESERVED mFRR VOLUME MIGHT BE DUE TO AN INCREASE IN COMPLEXITY WITHOUT REVENUE GUARANTEE

1

ToE alone does not guarantee DSR any revenues:

- Guaranteed revenues are important to:
  - ✓ cover the grid user's and FSP's costs and risk for DSR development (commands, IT, training …).
  - ✓ incentivize grid users to engage into this activity which can compete against their core business (e.g. manufacturing).
- Given that there are not enough price spikes to guarantee substantial revenues from energy activations, complementary revenues in the form of fixed remuneration for services provision to the TSO or capacity payments are needed to ensure DSR profitability.
- That is a key reason why in Belgium, reserved mFRR has a high DSR market share (~50%) while hardly any DSR volume is bid on non-reserved mFRR.

2

The ToE system is more complex than mFRR DSR products without energy activation price beforehand:

- ToE requires market design knowledge.
- The administrative requirements for FSPs are significant:
  - ✓ Each delivery point has to be covered by agreements.
  - ✓ In case no agreement is found on a compensation price between FSP and supplier, the FSP has to ask CREG to apply the regulated fall-back solution but this requires time and induces complexity.
  - ✓ ToE requires FSPs to find a BRP that is ready to take up balancing responsibility.
- The administrative requirements are also significant for suppliers, as the contracts between Elia and suppliers require a lot of information from suppliers.

Sources: Interviews with Belgian market parties. ToE rules, December 1st 2018. The figures are from Elia.

HOWEVER, TOE IS VALUABLE *PER SE* AS IT FOSTERS COMPETITION

ToE provides a neutral framework

- It allows FSPs to operate without being required to have the consent of the supplier or BRP_{source} of the delivery point and to strike a bilateral deal on a compensation price.
- It provides a fall-back price in case FSPs and BRP_{source} don't strike a bilateral deal.

ToE provides a transparent process

- ToE provides a process whereby Elia handles data and calculations
- It also respects confidentiality to protect commerciality sensitive information, which is by nature impossible in bilateral negotiations.

ToE fosters competition

- It offers grid users a valuable alternative in discussions with their suppliers to monetize the activation of their flexibility on energy markets.
- This optionality is valuable even if no additional volumes are bid most of the time: its value is revealed in scarcity episodes.

Sources: Interviews with Belgian market parties.
ToE rules, December 1st 2018.

EXPECTATIONS FOR DA/ID TOE OPENING

1

Volumes that could be attracted on DA/ID ToE are uncertain :

- DA/ID technical requirements are less demanding than mFRR's (15-minute activation time, activation duration potentially limited to 15' whereas some delivery points have processes that have to be interrupted for at least 2 hours).
- However, according to some stakeholders, a mitigation effect is that many large grid users are already exposed to DA/ID market prices through supply contracts, which limits their remaining flexibility potential.

2

Key takeaways from mFRR ToE should be largely applicable to DA/ID ToE:

- Without guaranteed revenues, participation will likely not be massive despite the higher technical potential.
- Bids are expected to be made at a high price (from a few hundred to a few thousand €/MWh) reflecting investments and activation costs.

3

DA/ID ToE fits well with existing and potential market mechanisms :

- DA/ID ToE fits well with mFRR ToE thanks to the mFRR capacity tender timing evolution (daily sourcing) planned for 2020: it will be possible to offer successively (i) on reserved mFRR capacity tenders, (ii) on DA, and finally (iii) on ID and non-reserved mFRR tenders.
- Finally, DA/ID ToE is compatible with a potential capacity mechanism in Belgium, and could pave the way for DSR participation in such a mechanism.

Source: Interviews with Belgian market parties, Compass Lexecon analysis.

2. Main takeaways from other DSR market experiences

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SUMMARY OF THE LESSONS LEARNED FROM DSR REVIEW IN FRANCE

1

All possible revenue streams are open for DSR on the French market:

Capacity-based

- ✓The capacity market
- ✓The contracted reserves: FCR, aFRR, reserved mFRR
- ✓A call for tenders dedicated to DSR [1]

Energy-based

- ✓NEBEF: ToE in DA/ID markets
- ✓Activation of reserved or non-reserved mFRR with ToE on the Balancing Mechanism

[1] Support to DSR with an obligation to bid on mFRR or DA/ID

2

Capacity-based revenues have been a key driver of DSR participation in the French market alongside the ToE arrangements :

- DSR actively participates in the capacity market.
- On mFRR, DSR has become a key component of operating reserves and is supported by a dedicated call for tenders. This was the case even before ToE introduction of mFRR.
- The energy activated on DA/ID markets and mFRR remains marginal and volatile.
- Hence, almost all DSR revenues come from guaranteed revenues.
- Thus, the opening of energy markets (ToE) has been a facilitator but not a game-changer for DSR.

OVERVIEW: ALL REVENUE STREAMS ARE OPEN FOR DSR, WHETHER CAPACITY-BASED OR ENERGY-BASED

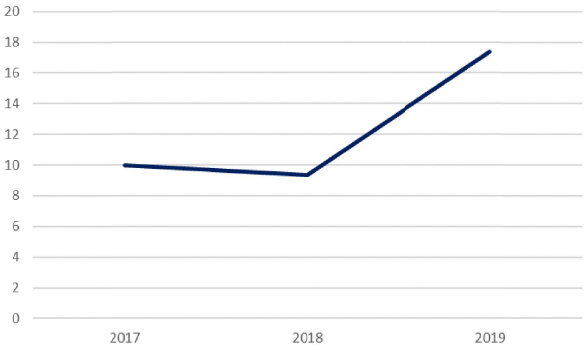
All possible revenue streams are open for DSR on the French market.

	Energy markets	Balancing services: mFRR	Balancing services: FCR/aFRR
Capacity-based payments €/kW	Capacity Mechanism 2017	Calls for tenders: - Reserved mFRR 2007 - Dedicated call for tenders for DSR 2008	- FCR: European call for tenders - aFRR: ongoing experimentation 2014
Energy payments €/MWh	NEBEF 2014 with ToE	Balancing Mechanism: activation of mFRR (reserved and non-reserved) 2003 (2014 with ToE)	Activation of FCR/aFRR 2014 with ToE

Note:
- The dates indicate the opening to DSR participation.
- The Capacity Mechanism can be combined with any kind of revenue streams. Source: RTE Capacity Mechanism rules.
- As FCR and aFRR energy activations are symmetrical in volume, financial stakes associated with their activation are very limited. Source: RTE.
- Reserves contracted by RTE are mutually exclusive. Source: RTE FCR/aFRR market rules, RTE reserved mFRR market rules.

THE FRENCH CAPACITY MECHANISM (1/2): A MARKET-WIDE AND TECHNOLOGY NEUTRAL SCHEME

Yearly capacity mechanism reference price (k€/MW)



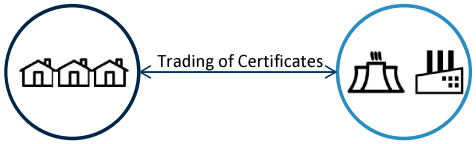
Data source: EPEX SPOT.
As defined by CRE, the reference market price is the arithmetic mean of the prices of auctions taking place before the delivery year.

Notes:
[1] A correction for temperature applies.
[2] "PP1" period: 10-15 weekdays between November and March, except Christmas period, 10h/day (7h-15h and 18h-20h).
[3] "PP2" period: 10-25 weekdays between November and March, except Christmas period, 10h/day (7h-15h and 18h-20h).
Source: RTE Capacity Mechanism market rules.

Infographic: Compass Lexecon, The Noun Project.

The French Capacity Mechanism creates a market between suppliers and capacity holders:

- Electricity suppliers and network operators must hold capacity guarantees to cover the normalized[1] peak consumption of their customers and loss on a given "PP1" reference period[2] for each individual year, and are subject to penalties if they do not.
- French and foreign capacity holders (generators, DSR operators) are granted guarantees by RTE on the basis of all their available capacities for a given "PP2" reference period[3]. Checks and non-availability penalties apply.



Electricity Suppliers / Network Operators

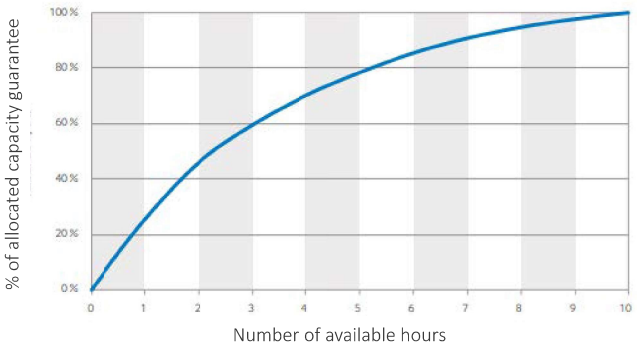
Have an obligation to secure / buy guarantees to cover peak consumption of their customers and losses. If they do not cover this there is a penalty.

Electricity Generators / DSR

Certified plants and DSR providers are granted free guarantees by RTE. If the availability commitment is not reached there is a penalty.

THE FRENCH CAPACITY MECHANISM (2/2): TWO OPTIONS FOR DSR PARTICIPATION

Derating factor for DSR capacities with an energy constraint



DSR contribution in the French capacity mechanism

Delivery year	2017	2018	2019
Certified DSR capacity (MW)	1600	2234	2239
Total certified capacity (MW)	90818	90411	87700
DSR market share	1.8 %	2.5 %	2.6 %

The first option for DSR valuation on the Capacity Mechanism is by reducing the supplier's obligation:

- To do so, DSR will have to be activated during the "PP1" periods.
- Each MW activated during these periods will reduce the obligation proportionately to the activation time (e.g. 0.1 MW for 1 MW activated during 1 hour out of 10 PP1 hours).

The other option is to value DSR on the mechanism:

- Another possibility is to certify and bid DSR capacity.
- The certification will be based on the availability of the unit during the "PP2" periods. No delivery obligation exists.
- The certification will take into account DSR limits through a de-rating factor: to get the full value of a 1MW peak capacity, the DSR unit should be able to deliver 1MW during 10 hours.

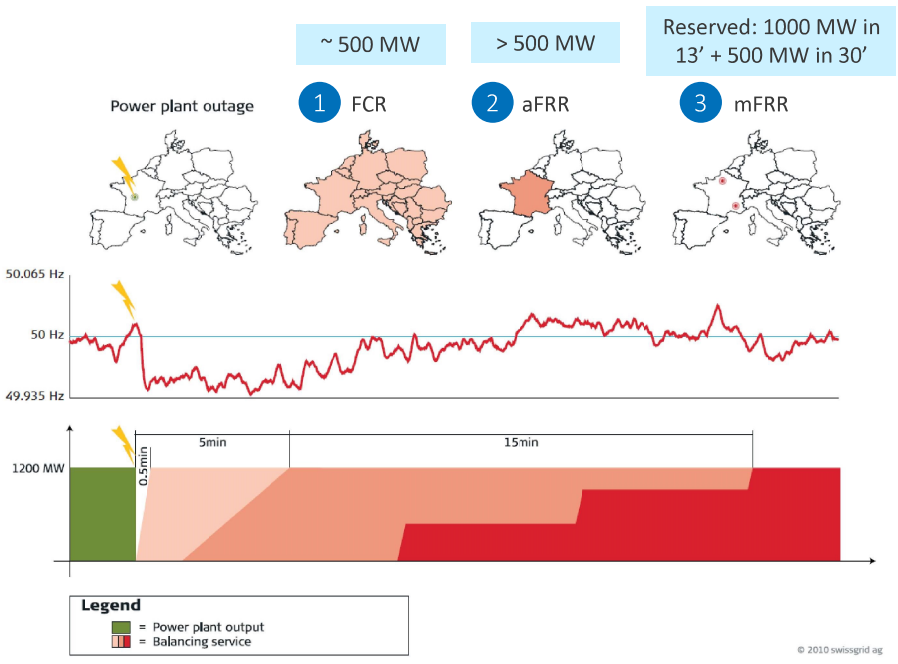
DSR certified volumes are significant but the market share remains limited

- Since the start of the capacity market in 2017, DSR market share is stable.
- It represents about 2% of certified capacity (~2 GW out of ~90 GW certified capacity).

Sources: RTE register of certified capacities (June 3rd 2019), RTE Capacity Mechanism market rules

RTE OPERATES THREE DIFFERENT MARKETS FOR RESERVED BALANCING SERVICES

Overview of Balancing services and procured volumes in France



Sources: Infographics adapted from Swissgrid, concepts from ENTSO-E, volumes from RTE.

1 FCR is contracted via the European call for tenders.

2 aFRR is contracted nationally on the basis of a compensated regulated obligation.

RTE collects and activates all mFRR bids on the so-called "Balancing Mechanism":

3
- Reserved mFRR consists of 1000 MW that can be activated in 13 minutes and 500 MW that can be activated in 30 minutes. This is open to French generators and DSR.
- Non-reserved mFRR consists of additional bids
  - ✓ Generators are obliged to offer their remaining available capacities with technical conditions and a free offer price
  - ✓ French DSR and foreign market parties can make offers if they wish

RESERVED BALANCING SERVICES: DSR HAS BECOME A KEY SUPPLIER OF RESERVED mFRR

Compensation of balancing services

		2015	2016	2017	2018
1	FCR (€/MW/h)	~18	~18	~15	~13
2	aFRR (€/MW/h)	~18	~18	~18	~18
3	13' reserved mFRR (k€/MW/y)	36,0	28,6	24,3	10,0
	30' reserved mFRR (k€/MW/y)	21,0	18,2	16,4	5,1

Source : Press releases from RTE, RTE FCR/aFRR market rules (incl. previous versions), RTE reserved mFRR market rules (incl. previous versions), RTE presentation on DSR, CRE.

DSR has been able to participate in reserved balancing services since 2007, with a gradual opening:

- In 2007, the call for tenders for reserved mFRR was opened to DSR capacities aggregated with generators. In 2011, it was opened to DSR pure players.
- In 2014, FCR and aFRR were opened to DSR participation. In 2017, an experiment on non-telemetered participation was launched.

DSR participation depends on reserves categories:

1. FCR – In 2017, DSR made a contribution of 14%.
2. aFRR – The contribution of DSR is smaller (about 1% to 2% in 2016).
3. mFRR – Since 2014 DSR contribution has been rather stable and accounts for about 33% or more of the contracted tertiary reserve (mainly with the 13' reserve). Price have been driven down recently by higher competition.

DEDICATED CALLS FOR TENDERS WITH CAPACITY PAYMENTS ALSO SUPPORT DSR DEVELOPMENT

Main results of the DSR calls for tenders since 2009

	2009-2013	2014	2015	2016	2017	2018
Contracted capacity (including non-telemetered DSR)	100-400 MW	450 MW	1 200-1 800 MW	2 100 MW	750-1 400 MW	733 MW
Number of suppliers	n.d.	9	6	7	13	7
Total compensation	n.d.	n.d.	n.d.	~30 millions of euros	n.d.	11,2 millions of euros
Prices	n.d.	n.d.	n.d.	14,3 €/kW (average price)	20,7 €/kW (max price)	15,3 €/kW (average price)

Sources : Press releases from RTE, RTE presentation on DSR, Call for tenders conditions, EC approval, Article L271-4 of the Energy Law, Government Energy Plan to 2028.

[1] DSR capacities can participate in all these mechanisms together, but in that case the Capacity Mechanism and reserved mFRR prices are subtracted from the DSR CFT price. There is however a bonus of 2 k€/MW for participation in reserved mFRR.

RTE also launches dedicated calls for tenders to support DSR development :

- This scheme was introduced in winter 2008-2009 to support the development of DSR capacities.
- Following the 2015 energy transition law, a call for tenders can be set when DSR capacities do not meet the long-term system security requirements or government objectives.
- The government has set a goal of 4.5 GW of DSR capacities for 2023 and 6.5 GW for 2028.

This support scheme is transitory and non-stackable with other capacity payments :

- This scheme has been approved by the EC as compatible State Aid. It is limited to end of 2023 and to 4-6 years for a given DSR capacity.
- This support scheme is designed to be a complement to other mechanisms: it is not stackable with capacity mechanism and reserved mFRR compensations.[1]

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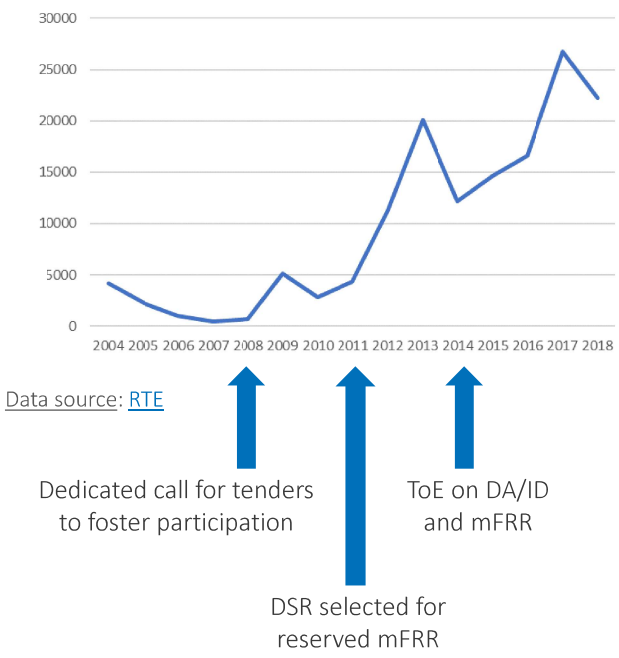
ENERGY ACTIVATION ON mFRR HAS GRADUALLY INCREASED OVER TIME

Load reductions activated on mFRR (MWh)



mFRR has been open to DSR participation since its beginning in 2003 but participation really started in 2009 :

- DSR volumes have not participated significantly in the first years in non-reserved mFRR.
- Participation really started to increase after 2009 following the opening of reserved mFRR to DSR and the launch of a dedicated call for tenders to foster DSR participation in mFRR.

ToE has reinforced DSR participation in mFRR :

- Before 2014, DSR participation in mFRR was only possible without ToE: FSPs had to seek the consent of the supplier/BRP_{source} to be remunerated for activation.
- The opening of ToE to DA/ID and mFRR in 2014 has contributed to the tendency of increased DSR participation in mFRR.

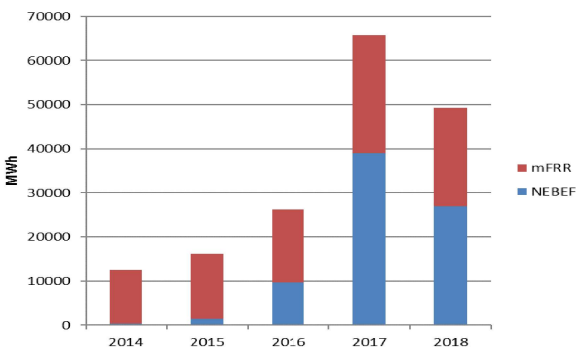
A France

YET ENERGY ACTIVATED ON NEBEF AND mFRR REMAINS VOLATILE AND LIMITED

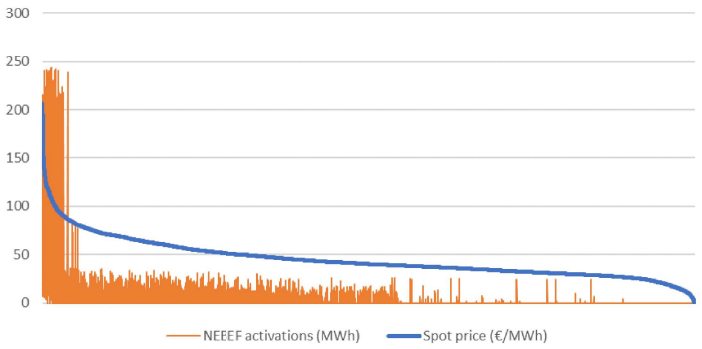
Activated DSR volumes are volatile:

- Activated DSR on NEBEF (DA/ID markets) or on mFRR by RTE can vary to a large extent according to prices, generating uncertain incomes.
- DSR volumes are strongly concentrated during winter on both schemes.
- The analysis of 2017 data shows that bids are activated from ~40 €/MWh at a limited volume, and that massive activations occur above ~80 €/MWh.

DSR activations on NEBEF and mFRR



Relationship between spot prices and NEBEF activations, hourly data, 2017



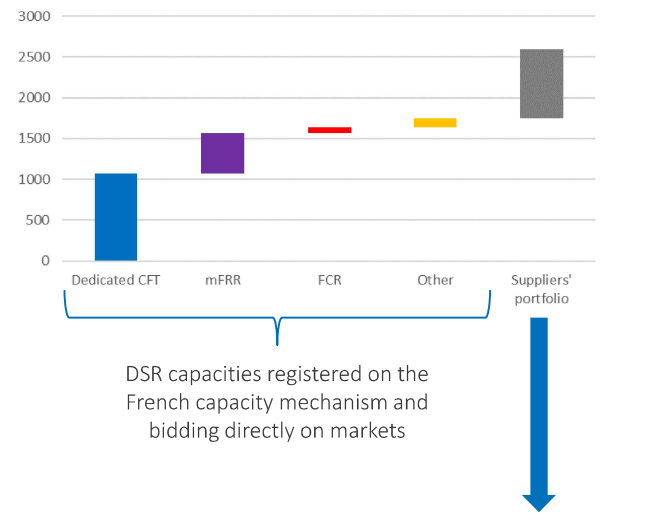
DSR volumes activated on NEBEF and mFRR remain limited:

- For 2018, the total volume was 49 GWh, down from 65 GWh in 2017. This amounts only to 0.04% of the ~ 110 TWh exchanged on the French spot market in 2018.
- DSR NEBEF and mFRR volumes follow the same variations: no internal cannibalization between the two revenue streams is observed.

Data sources: RTE mFRR activations, RTE NEBEF activations, CRE.

DSR DIRECT MARKET PARTICIPATION FOCUSES ON THE CAPACITY MARKET, RESERVED mFRR AND DEDICATED CFT

French DSR capacities in winter 2016-17 (MW)



Sources: RTE, DSR presentation and 2018 Outlook

Of the ~2.5 GW available to RTE today, more than half is valued directly on markets…

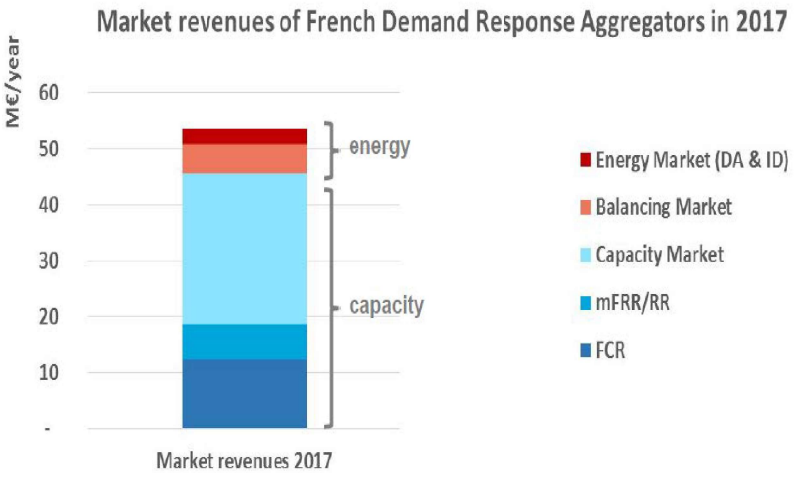
In its 2018 Outlook, RTE estimates that ~2.5 GW of DSR capacities is available in France:

- DSR capacities valued by suppliers in their portfolio[1] amount to ~0.8 GW.
- DSR capacities bid directly on the markets account for the rest (~1.7 GW).

… and is mainly participating in the dedicated DSR call for tenders and the reserved mFRR combined with the Capacity Mechanism.

[1] These DSR capacities historically represent "tariff-based" DSR capacities, i.e. direct consumer reaction to time-varying electricity supply tariffs. This DSR type has shrunk from ~6 GW at the end of the 1990s to less than 1 GW today because these tariffs have been suppressed.

THE BUSINESS CASE FOR DSR RELIES HEAVILY ON GUARANTEED REVENUES



Note: Dedicated call for tender not included.

Source: Presentation by RTE, 4th Annual Ancillary Services and Demand Response Management Forum, January 17th and 18th, 2019, Berlin.

Market revenues for DSR are mostly capacity-based

- RTE assesses that in 2017, market revenues for DSR accounted for ~ 50 M€ (excluding the dedicated DSR call for tender).
- Energy-based revenues represent only 10%, and capacity-based revenues (either from the Capacity Mechanism or from reserved balancing services) represent 90% of total DSR revenues.

The business case for DSR relies heavily on guaranteed revenues

- A possible explanation is that capacity-based revenues are more secure as their activation doesn't depend on market conditions.
- It seems that guaranteed revenues are needed for grid users and FSPs to invest.

2. Main takeaways from other DSR market experiences

B PJM

SUMMARY OF THE LESSONS LEARNED FROM DSR REVIEW IN PJM

1 Three categories of revenue streams are open for DSR in PJM :

- The Capacity Market
- The wholesale energy markets: Day-ahead, intraday and real time
- The ancillary services markets (capacity reservation and activation): Day-Ahead Scheduling Reserves (DASR), real-time Synchronized Reserves (SR) and real-time Regulation (Reg)

2 DSR participation in the PJM market has developed with the joint introduction of the Capacity Market and of an independent aggregator model :

- In PJM, curtailment service providers (CSPs) aggregate the demand of retail customers, register that demand with PJM, submit the verification of demand reductions for payment by PJM, receive the payment from PJM and typically share a large portion of the payment with retail customers (70% or more).
- Revenues paid to CSPs for DSR have risen dramatically since the concomitant inception in 2007 of the PJM Capacity Market and CSP model.

3 Most DSR revenues are obtained from the capacity market, with energy activation being merely an upside:

- The main revenue stream is the capacity market.
- As it is mandatory, these DSR capacities are then offered into the energy markets at very high prices (often capped), and almost never activated. Thus, revenues associated with energy activations are low.
- Participation in ancillary services is heterogeneous and rather limited.

B PJM

BROAD DESIGN PRINCIPLES AND DIFFERENCES WITH THE EUROPEAN MARKET DESIGN

PJM's market design differs from the European one:

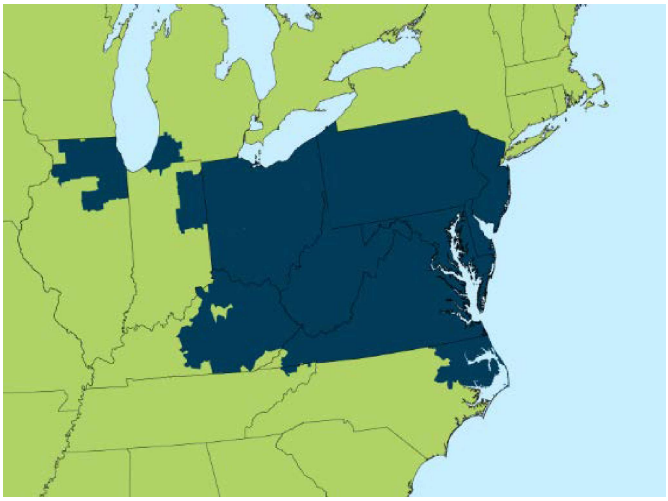
- Market parties do not have a physical dispatch requirement.
- Market parties trade in PJM's wholesale markets in different timeframes (forward, day-ahead and intraday). These wholesale markets are purely financial (contracts for differences), there is no obligation to deliver traded volumes physically.
- All prices are locational marginal prices reflecting transmission constraints ("nodal" pricing).
- The physical real-time market dispatch is done by PJM on a 5' basis based on real-time bids submitted by market parties in PJM's centralized real-time market.
- Imbalances between the market parties' financial position on the day-ahead market and the real-time position are settled at the real-time prices.

Due to these significant differences, PJM market study lessons for Belgium should be considered with caution

Sources :
- General information: Compass Lexecon US based on PJM market rules
- Figures: PJM 2017 annual report
- Map: PJM website

PJM at a glance

- PJM is a US regional grid operator acting in 13 states and serving 65 million customers.
- It has 178 GW of generating capacity and the peak load reaches 166 GW.
- The annual energy amounts to 773 TWh.



B PJM

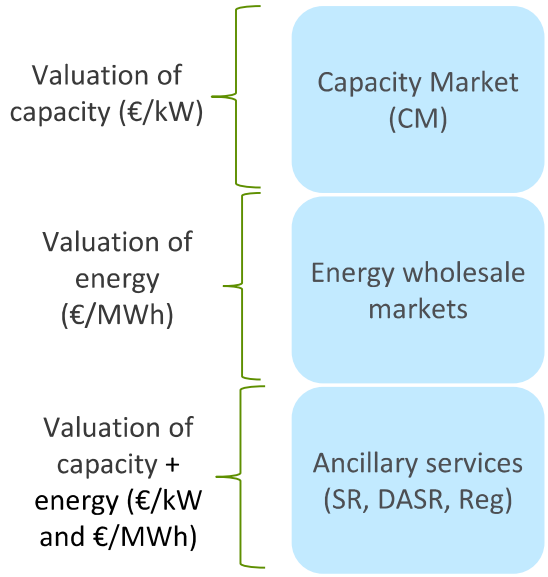
THREE POSSIBLE REVENUE STREAMS FOR DSR, WHETHER CAPACITY-BASED OR ENERGY-BASED

The Curtailment Service Providers model is similar to FSPs:

- Retail customers[1] who wish to participate in demand response have access to PJM's wholesale electricity market through agents that are PJM members, known as curtailment service providers (CSPs). CSPs can be both utilities or independent companies.
- CSPs aggregate the demand of retail customers, register that demand with PJM, activate DSR, submit the verification of demand reductions and are paid by PJM.
- In order to compensate suppliers, PJM will create and apply to them negative Load Response bids for DSR that clears in the DA market (which is a kind of ToE arrangement).
- Thus CSPs have a role comparable to FSPs in Belgium.

Demand response may be offered in three markets :

- The Capacity Market (CM), that can be stacked with either of the two other markets
- The wholesale energy markets: Day-ahead, intraday and real-time
- The ancillary services: Day-Ahead Scheduling Reserves (DASR), real-time Synchronized Reserves (SR) and Regulation (Reg).



[1] Retail Customer: The end use customer that purchases electricity from a state licensed distribution company or a state licensed alternate supplier at a retail rate.

Sources: PJM CSP definition and list, PJM DR strategy, PJM market rules

SINCE THE INTRODUCTION OF THE CAPACITY MARKET, DSR PARTICIPATION IN PJM HAS BEEN SIGNIFICANT

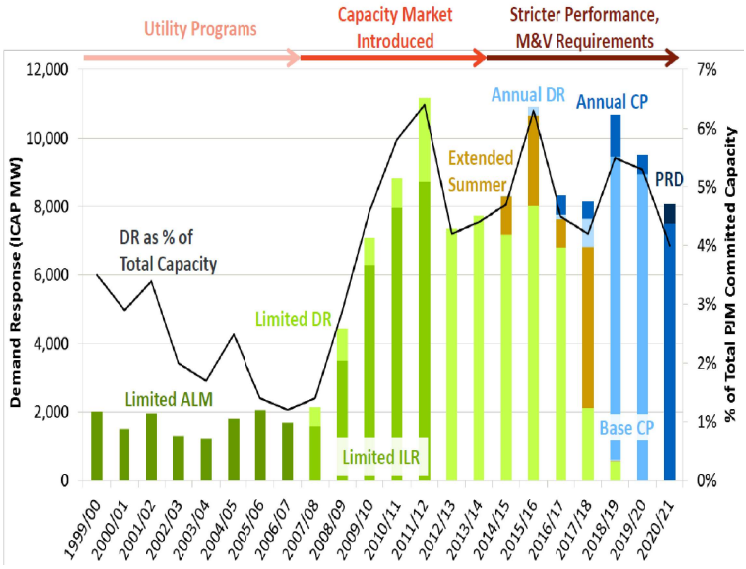
There are different kinds of products enabling DSR participation in PJM markets. These products have evolved over time.

DSR has taken off after the introduction of the Capacity Market and of the CSP model :

- Since the 2009/2010 delivery year, DSR has represented 4-6% of the overall amount of capacity procured.
- After 2009/2010, DSR grew rapidly following the joint implementation[1] of the Capacity Market and of the CSP-based model.
- Growth has slowed down with the changes implemented since then, including stricter performance, measurement and verification requirements.

[1] This makes it hard to identify the key driver between DSR market design and the Capacity Market implementation.

PJM Demand Response Committed MWs by Delivery Year

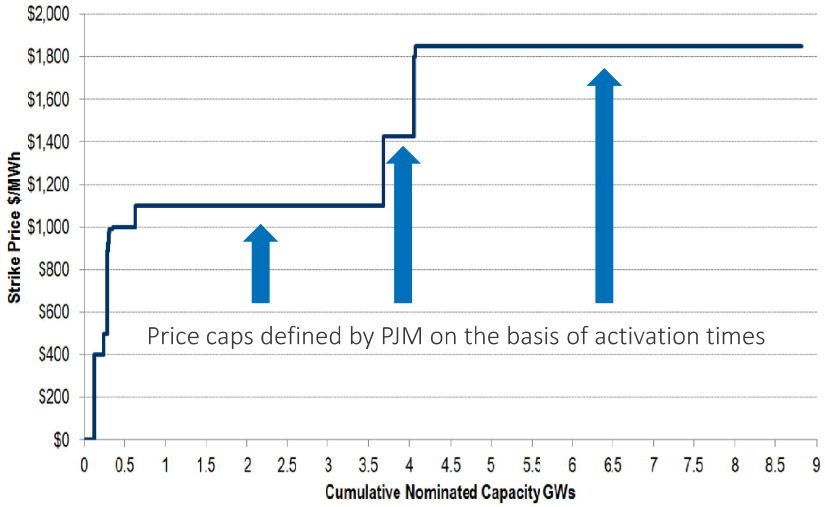


Source: PJM DR strategy

Note: PRD: Price Responsive Demand; CP: Capacity Performance; ILR: Interruptible Load for Reliability; ALM: Annual Load Management.

DSR CAPACITIES BIDDING ON THE CAPACITY MARKET MUST PROVIDE ACTIVATION BIDS BUT BID VERY HIGH

DY 18/19 Confirmed Load Management Full DSR Registrations Energy Supply Curve



Note: The energy offer price cap for load management resources varies based on the associated activation times as follows: 120 minutes = $1,100/MWh; 60 minutes = $1,450/MWh; and 30 minutes = $1,849/MWh.

Sources: PJM 2018 Load Response Activity Report, PJM DR strategy

DSR capacities registered on the Capacity Market have an obligation to bid to PJM…

- DSR capacities receiving a capacity payment are required to make activation bids to PJM: in PJM's centralized dispatch model, all must-offer capacity should be at PJM's disposal at all times.
- To this end, they provide an energy offer (strike) price for the delivery year.

… and bid at a very high level

- The energy offer price is typically established at the energy offer price cap.
- For the delivery year 2018/19, virtually all the DSR capacities registered on the Capacity Market have an offer price at or above 1,000 $/MWh.
- Given PJM's price distribution, only a few hundred MWs have a chance to be regularly activated, which is insignificant (<< 1% of peak load). Thus, these DSR capacities are available mainly for scarcity or emergency situations.

DSR PARTICIPATION IN ANCILLARY SERVICES IS QUITE HETEROGENEOUS AND LIMITED

DSR can provide three kinds of ancillary services:

- DSR is currently allowed to provide Day-Ahead Scheduling Reserves (DASR), Synchronized Reserves (SR) and Regulation (Reg).
- These markets are by nature of limited size compared with the energy and capacity markets.

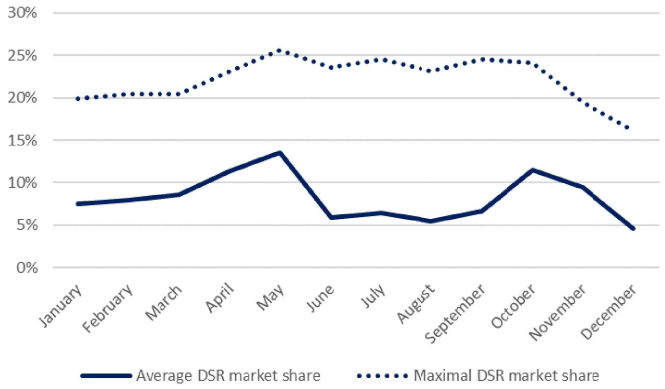
Current DSR participation in the ancillary services markets is heterogeneous:

- In 2018, DSR share was on average 8% and up to 25% for SR, but only ~2 % in the regulation market – this difference seems to reflect requirements that are well suited to manufacturing in SR and not in Regulation.
- DSR currently does not participate in the DASR market because of limited revenue opportunities.

DSR is subject to a participation limit:

- DSR may only provide up to 25% of the overall DASR and Reg amounts and up to 33% of the SR requirement.
- The participation limit on DSR was developed by stakeholders based on performance concerns and might be adjusted.

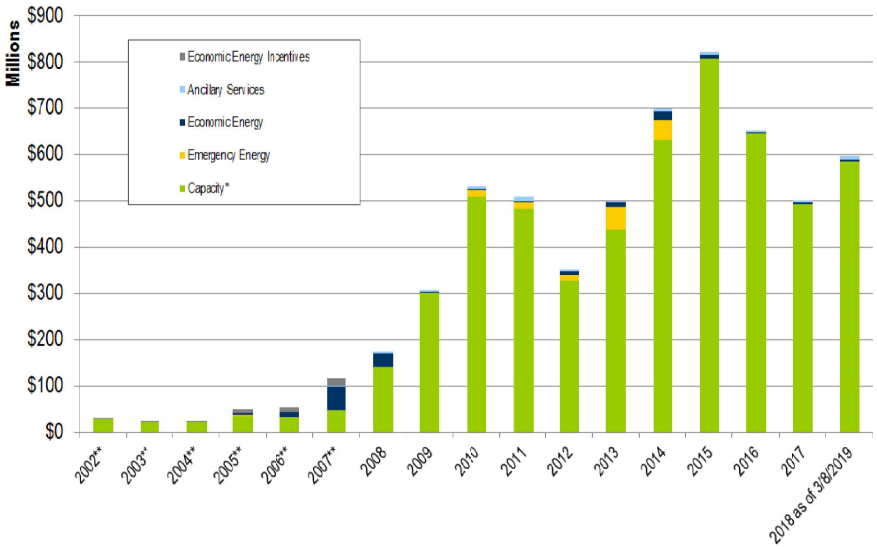
DSR market share in Synchronous Reserve for 2018



Source of the data: PJM 2018 Load Response Activity Report

MOST DSR REVENUES ARE CAPACITY-BASED

PJM Estimated Revenue for Economic and Load Management DSR Markets



Sources: PJM 2018 Load Response Activity Report, PJM DR strategy

DSR revenues have risen sharply thanks to the CSP model and the Capacity Market:

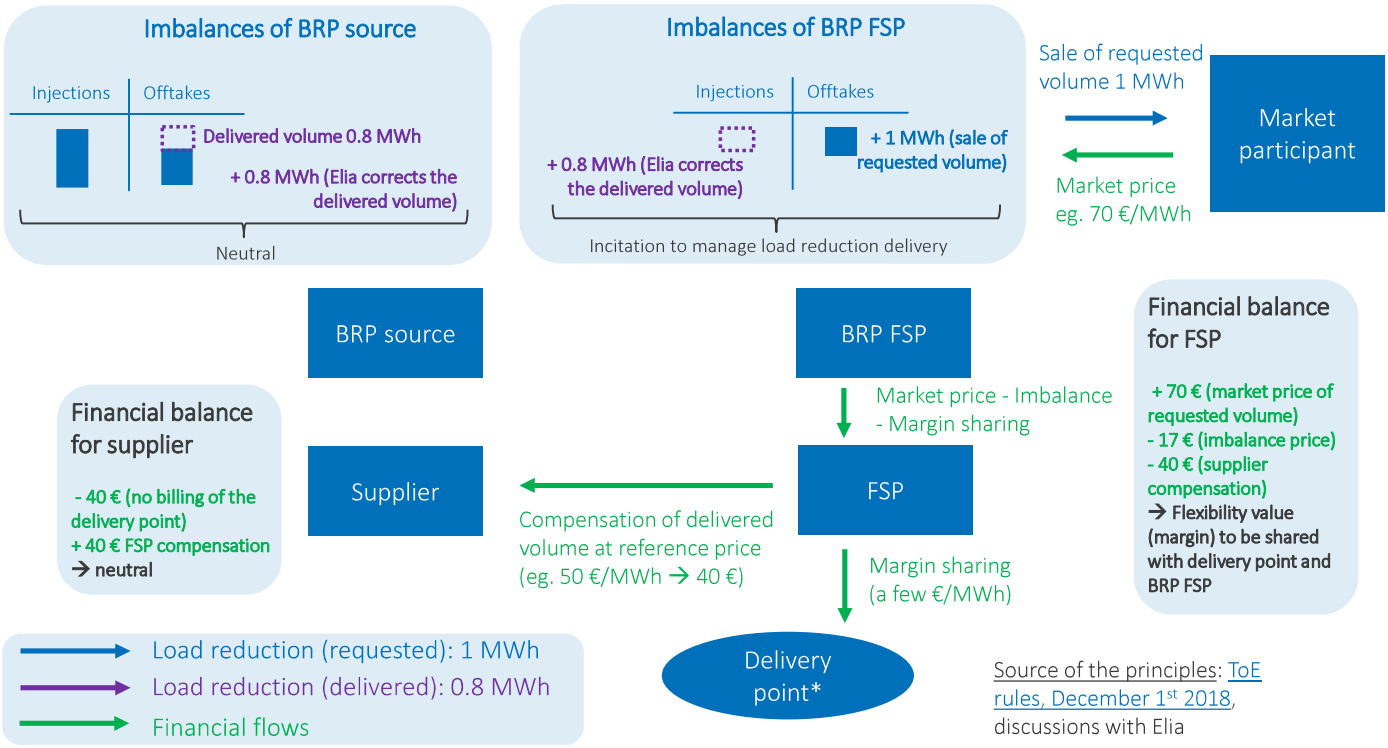
- Revenues paid to CSPs for DSR have risen dramatically since the concomitant inception in 2007 of the PJM Capacity Market and CSP model, particularly revenues related to capacity payments.
- PJM considers that the CSP model of DSR participation in PJM wholesale markets has been successful.

Revenues are overwhelmingly capacity-driven:

- The Capacity Market is by far the main revenue stream, accounting for almost 100% some years.
- Many customers and CSPs have indicated to PJM that *"they do not actively participate in the energy market as economic DSR because of the limited revenue opportunities."*

Appendices

TOE IMBALANCE CORRECTIONS FOR DA/ID WILL REFLECT MARKET PARTIES' RESPONSIBILITIES



Source of the principles: ToE rules, December 1st 2018, discussions with Elia

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