



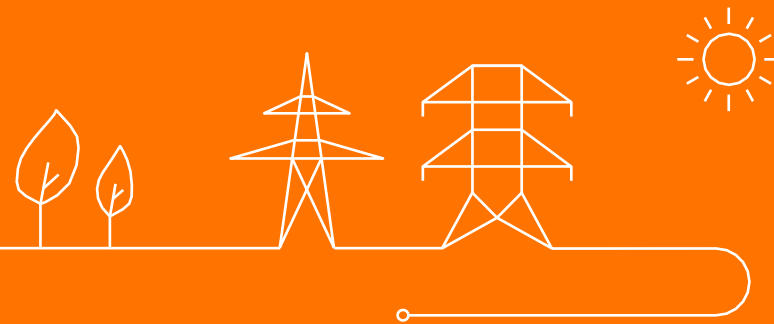
# aFRR evolutions / PICASSO Stakeholder workshop

12/10/2023

# Agenda

- Feedback from last stakeholder workshop
  - Alignment of Go-live planning auction in D-1 and 5' FAT
  - Baseline methodologies
  - Conditions to connect to the aFRR-Platform
- Connection to the aFRR-Platform
  - Measures at European level
  - Local mitigation measure and way forward
- aFRR LV
- Next steps

# Stakeholder feedback



## Scope & planning – implementation impact for BSPs

Design evolution	Implementation impact for the BSPs	Planning
Possible local mitigation measures for PICASSO	Will depend on the measures	12/06/2024
5' FAT (Full Activation Time)	Mandatory – possible impact on offered volumes	18/12/2024
Move aFRR capacity auction to D-1	Mandatory – operational impact	01/10/2024
Incentive 2021: RT baseline	Optional implementation	12/06/2024
Incentive 2022: activation method	Optional implementation	12/06/2024
CCMD: ind. correction model, opening LV	Optional implementation	12/06/2024

Proposal to merge the go-lives in order to avoid 2 changes related to the aFRR capacity auctions in a short time. If the merging is agreed by market parties, the proposed date is **11/12/24**, which would delay the entry into force of aFRR dynamic dimensioning for ~2 months.

## Alignment of Go-live planning auction in D-1 and 5' FAT

- Elia has received no feedback from stakeholders on the proposal to merge the 2 go-lives
- Elia would like to have a clear view on the preference of the market parties for this merged go live date
- Therefore, without feedback by 20/10, Elia will plan the go-lives separately, allowing the implementation of aFRR dynamic dimensioning on the 1<sup>st</sup> of October 2024

## Baseline methodologies

- Elia has received some feedback on the proposal made to add the following requirement to the (current) baseline method:  
*“the submitted baseline must be calculated independently from the aFRR reference set point”*
- Elia is still analyzing this feedback and will evaluate whether other not this additional requirement will be included in the next Proposal for Amendment of the T&C BSP aFRR

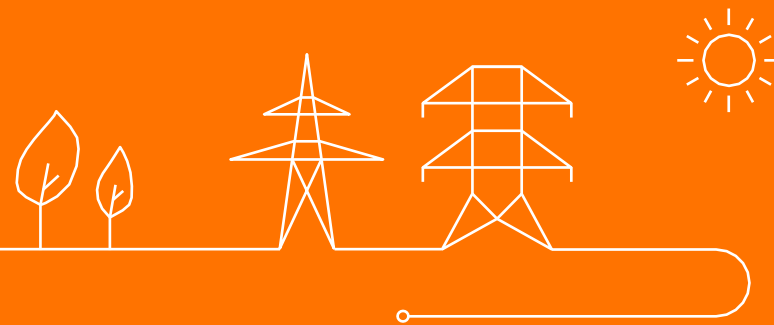
## Conditions to connect to the aFRR Platform

- Next to the reactions during the 1<sup>st</sup> stakeholder workshop, Elia didn't receive additional feedback from stakeholders since then
- Based on all previous discussions and on the reactions during the 1<sup>st</sup> workshop, Elia understands the expectations from the market to be the following:

Provided the risk of increase of activation costs, in particular the risk related to the Belgian merit-order list, is sufficiently mitigated (or eliminated), Elia should connect to the aFRR-Platform as soon as possible

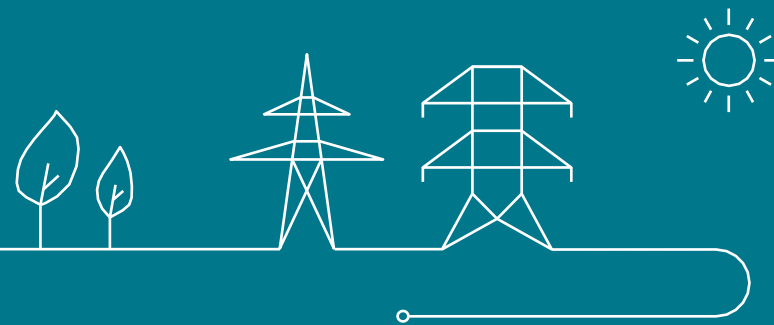
- This will be further addressed in the workshop today

# Connection to aFRR-Platform





# Measures at European level



## Measures at European level

- Under CREG's and Elia's impulse, the dynamics of the discussions at European level have evolved in a good direction and efficient measures are expected to be proposed by TSOs
- The following measures are being publicly consulted at European level (public consultation launched today!)
  - Harmonized bid price cap
  - Modification of the price formation of the AOF
  - Elastic aFRR demand



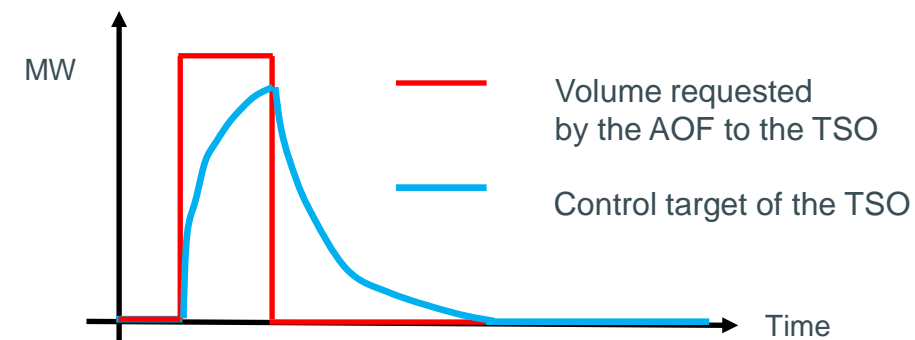
## Bid price caps

- Current EU harmonized temporary bid price cap of +/- 15.000 €/MWh based on the Pricing Methodology will last until 07/'26, after which the price cap is increased to +/- 99.999 €/MWh.
- Main aim of cap: limit consequences of strategic bidding (with bid prices above marginal costs), given the inelastic demand side & oligopolistic supply side.
- The proposal from the TSOs is to apply following bid price caps on aFRR and mFRR
  - Set the permanent price cap at +/- 15.000 €/MWh
  - Until 07/2026, set a temporary price cap to +/- 10.000 €/MWh
- These values are still high from the perspective of the Belgian aFRR market. A harmonized cap however needs to fit the very different market structures in the different Participating TSOs and to consider some hierarchy with the price caps in SDAC and SIDC (to avoid undue arbitrages between these markets).
- While not sufficient to cover the main risks identified for the Belgian market in the short-medium term, it does mitigate the risk of high activation costs due to high demands from neighboring TSOs (in particular after 07/'26)

## Improving CBMP determination by the AOF (\*)

### Current situation

- The determination of the CBMP for positive (negative) energy by the AOF is currently set by the highest (lowest) price of all aFRR bids selected by the AOF in the same uncongested area.
- As the aFRR bids selected by the AOF are only used as input of the local LFC controllers, this leads to situations where the CBMP does not reflect the price of the bids that are locally activated.
- The operational experience with the aFRR Platform shows high activations costs and occurrences of price spikes, which are partly explained by fast varying demands. It is precisely in situations of fast varying demands that the difference between the calculated CBMP and the price of the locally activated bids are the highest.
- In this case, the already provided aFRR will be remunerated with a high CBMP, while the BSPs having set this high CBMP did not receive any activation signal due to the proportional-integral behaviour of the load frequency controller and will hence not receive any remuneration although their bid was selected (for short time) by the AOF



# Improving CBMP determination by the AOF

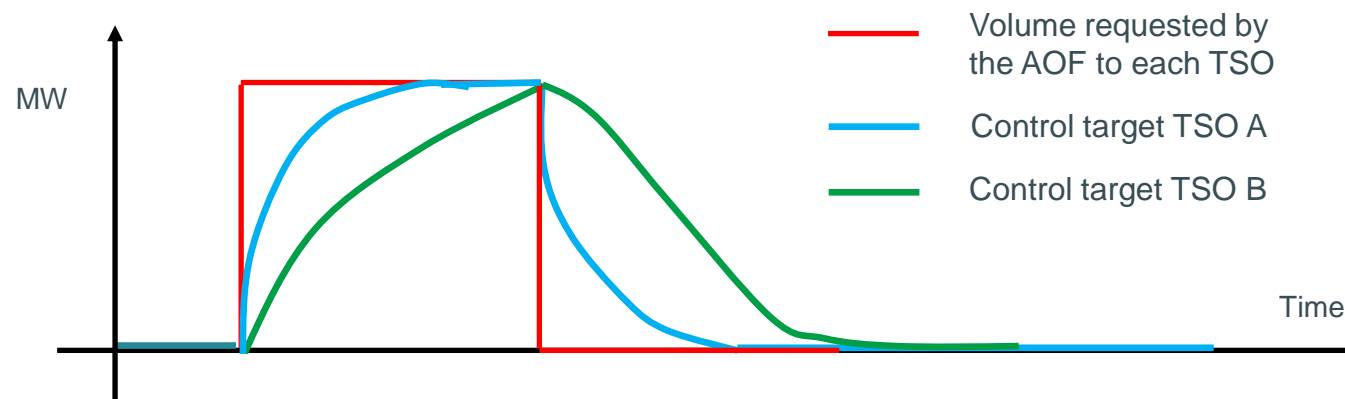
## Objective of the proposed change

- The proposed measure aims to **avoid an aFRR CBMP based on the price of an aFRR Energy bid that is selected by the AOF for a period that is too short to result in an activation request of that bid from the TSO to the BSP**, leading to unnecessarily high costs.
- **All other steps of the AOF algorithm remain unchanged** compared to the current situation, in particular:
  - The bid selection is unaffected;
  - The determination of power interchange between LFC areas is unaffected;
  - The determination of the uncongested area is unaffected.
- The following explanations and examples relate to upwards aFRR Energy Bids

## Improving CBMP determination by the AOF

### Part 1 – determining the CBMP based on local LFC output

- The CBMP in an uncongested area will be determined based on the **highest price of all aFRR Energy bids selected by the local LFCs in that same uncongested area.**
- For this part of the price determination the AOF compares the local LFC output to the local merit order lists, and, in the direction of the volume of aFRR Energy bids selected by the AOF, determines the CBMP as the highest of the respective prices on the merit order lists.

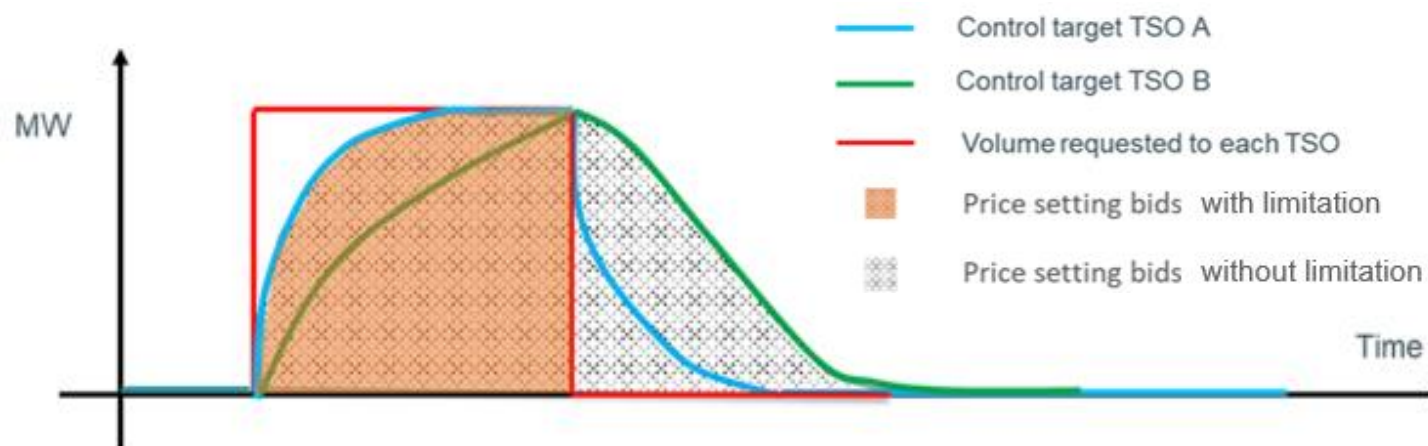


Assumption in the figure: TSO A and TSO B have the same LMOL and different LFC settings

## Improving CBMP determination by the AOF

### Part 2 – limiting the CBMP by the AOF selected volume

- In the 2<sup>nd</sup> step, the CBMP is limited to the price corresponding to the aFRR demand in the uncongested area on the CMOL, i.e. the current CBMP.
- Local controllers can have different settings in order to effectively balance the local LFC areas. In case the CBMP would be solely determined by the LFC output, faster controllers would set the price at the start of an imbalance, and slower controllers would set the price after the imbalance has been solved, due to the lagging effect of the controller.

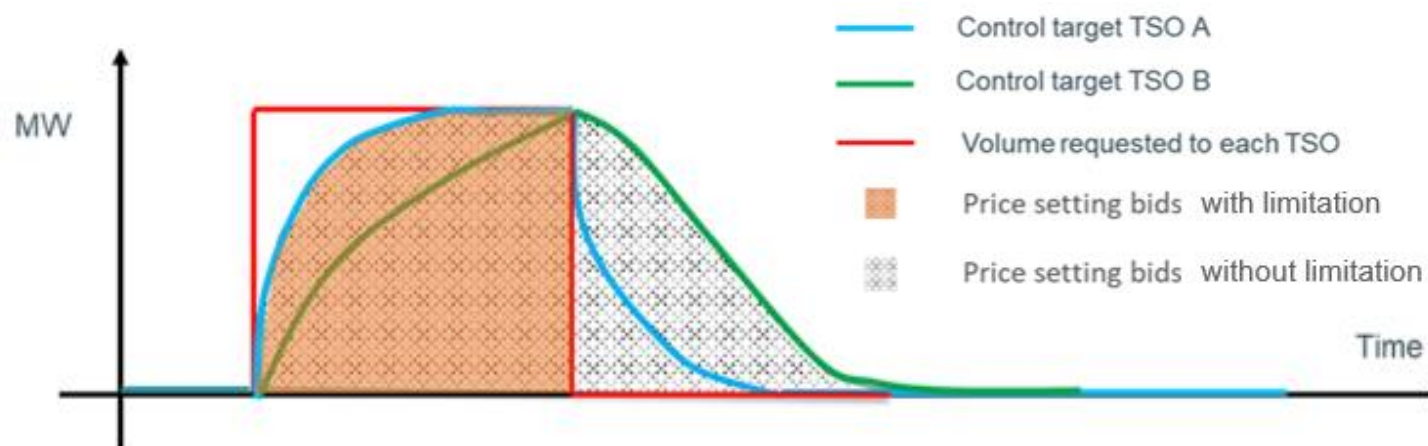


Assumption in the figure: TSO A and TSO B have the same LMOL and different LFC settings

## Improving CBMP determination by the AOF

### Part 2 – limiting the CBMP by the AOF selected volume

- The limitation allows to:
  - Reduce cross-border impact of differences in controller settings. With the limitation, bids that are no longer selected by AOF will not affect the CBMP
  - Prevent that the CBMP is determined by bids that are unforeseeably activated (e.g. due to local unavailabilities of bids or controller overshoots); without this step, local unforeseeably activated bid will have a negative impact on the CBMP of the whole uncongested area
  - Further reduce price peaks' duration and activation costs

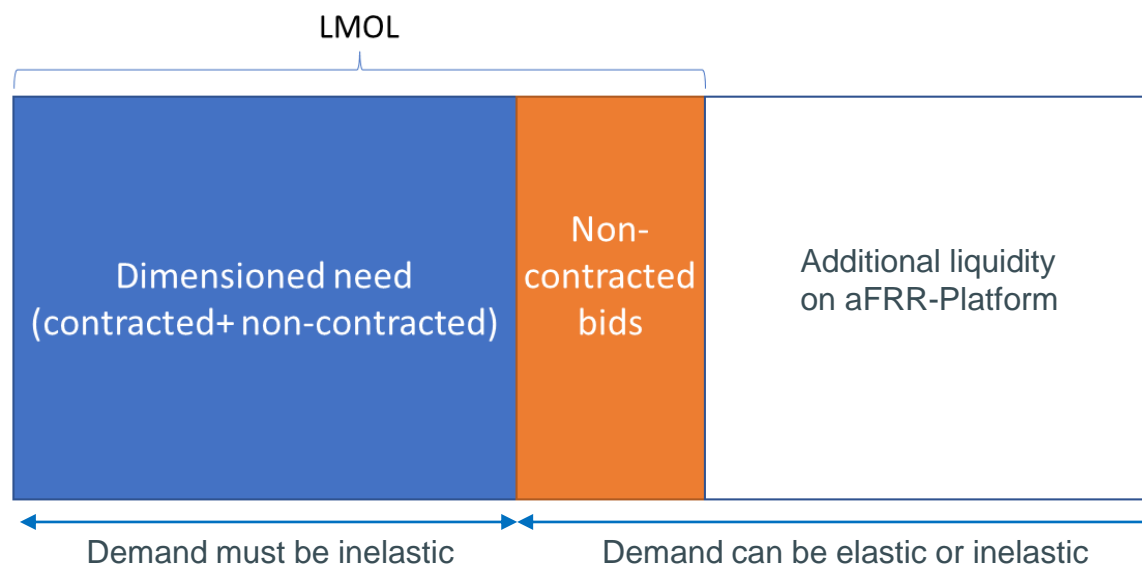


Assumption in the figure: TSO A and TSO B have the same LMOL and different LFC settings



## Elastic demand

- Principle: allow each TSO, on a voluntary basis, to define an elastic aFRR demand beyond its dimensioned volume
- It guarantees that we have at least access to our dimensioned volume and allows to benefit from the liquidity on the aFRR platform, with the exception of cases where selected bids have a price beyond a given threshold
- Following slides show some examples of the impact of elastic demand on the activated volumes and prices

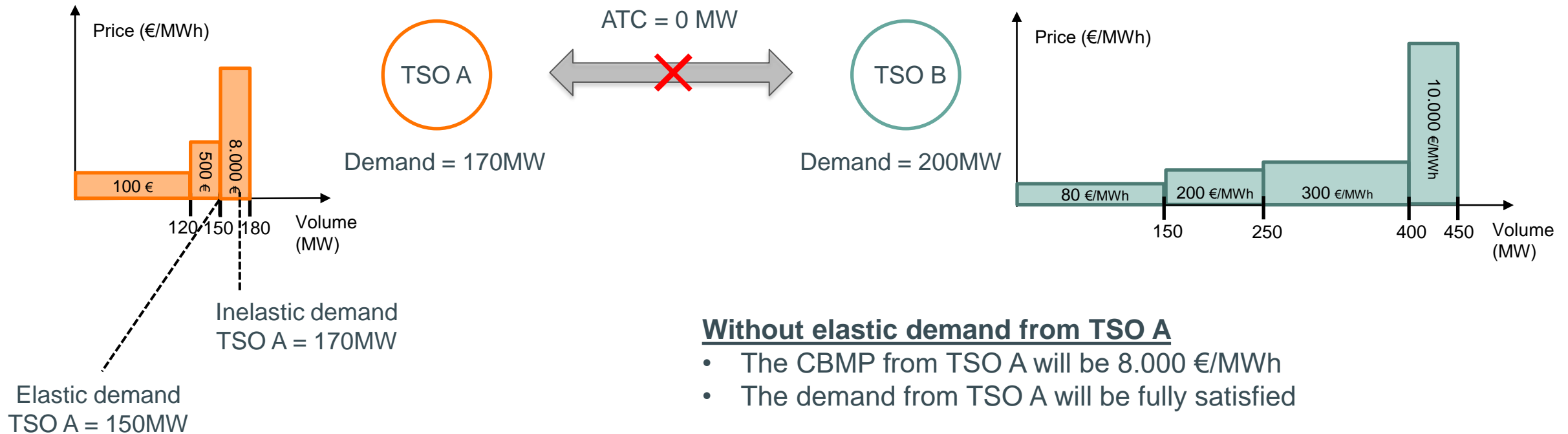


## Elastic demand – examples: assumptions



- Examples assume upward demands from TSO A and TSO B and the LMOLs illustrated above
- TSO A has a dimensioned need of 120MW
- TSO A defines an elastic demand with following parameters
  - ✓ The demand is elastic beyond the dimensioned need
  - ✓ The price threshold is 1.000€/MWh
- TSO B only has inelastic demand

## Elastic demand – example 1: TSO A is isolated



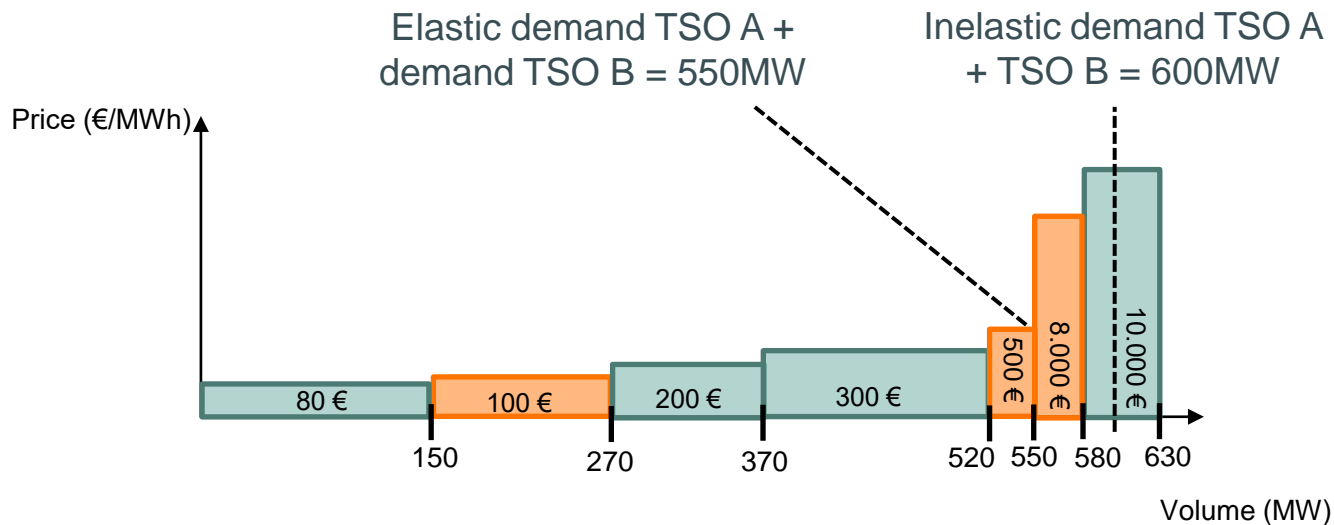
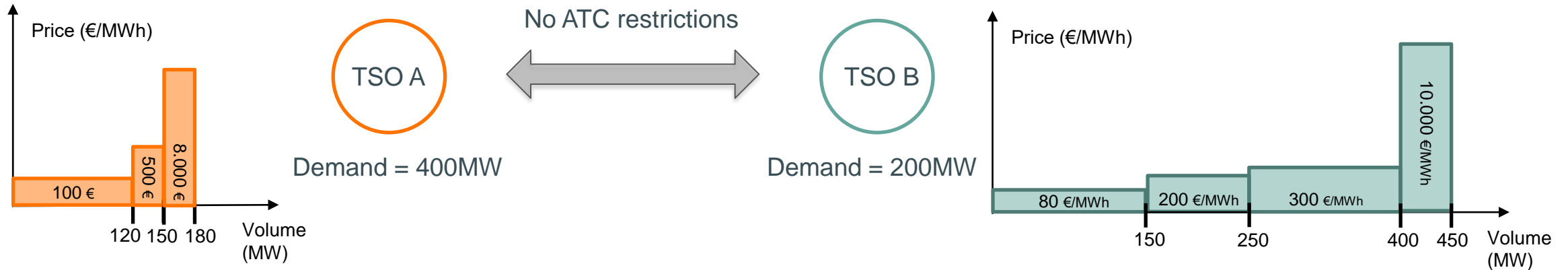
### Without elastic demand from TSO A

- The CBMP from TSO A will be 8.000 €/MWh
- The demand from TSO A will be fully satisfied

### With elastic demand from TSO A

- The CBMP will be 500 €/MWh
- TSO A will limit the output of the controller to aFRR energy bids  $\leq$  CBMP in order to prevent automatic activation of the bid at 8.000 €/MWh, which is not selected by the aFRR-Platform
- TSO A has an unsatisfied demand of 10 MW

## Elastic demand – example 2: high demand from TSO A



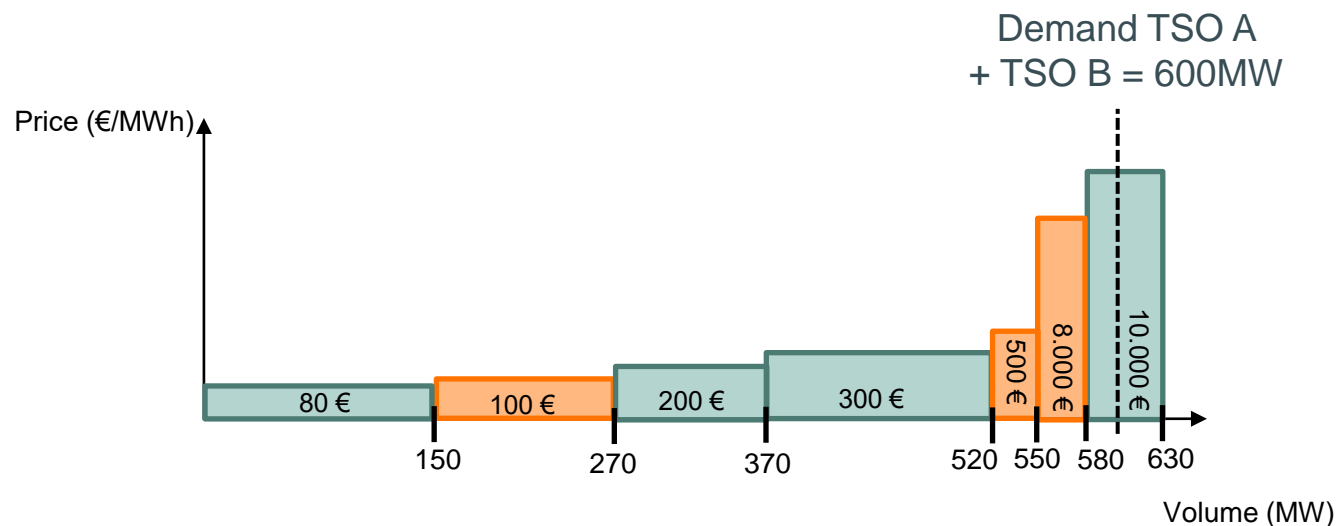
### Without elastic demand from TSO A

- The CBMP will be 10.000 €/MWh
- Both demands are fully satisfied

### With elastic demand from TSO A

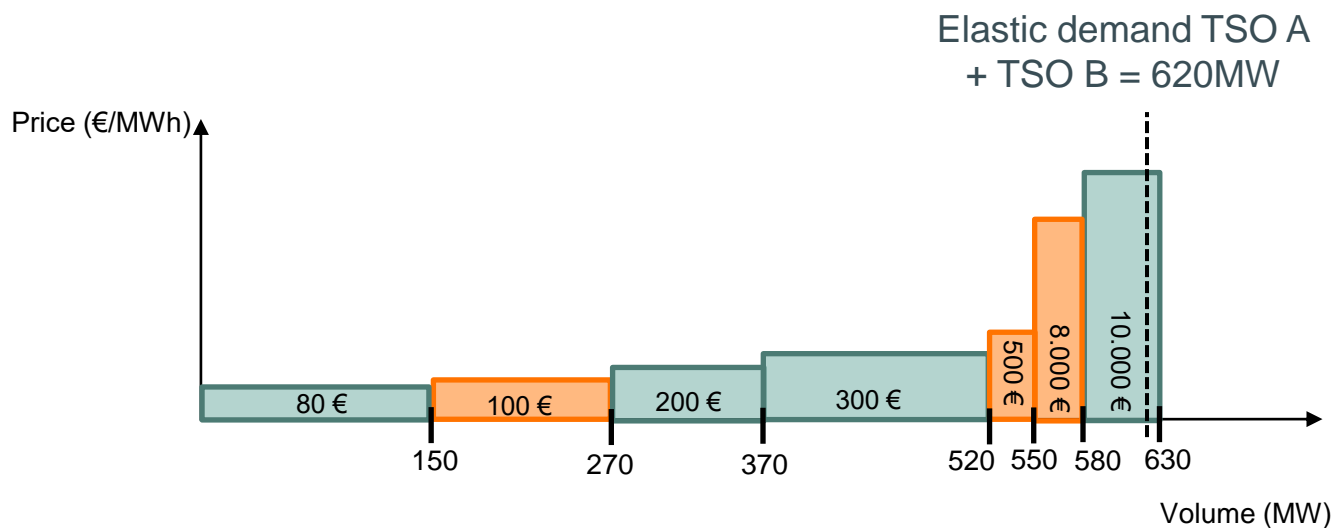
- The CBMP will be 500 €/MWh
- TSO A has an unsatisfied demand of 50 MW  
➔ 350MW are satisfied at a price < threshold

## Elastic demand – example 3: low demand TSO A & high demand uncongested area



- As TSO B only has inelastic demand, the aFRR-Platform selects all bids up to 600MW  
 → CBMP of 10.000 €/MWh and activation of the bids at the end of the LMOL of TSO A
- In this case
  - ✓ Elastic demand of TSO A has no impact
  - ✓ TSO A exports aFRR

## Elastic demand – example 4: high demand from TSO A & uncongested area



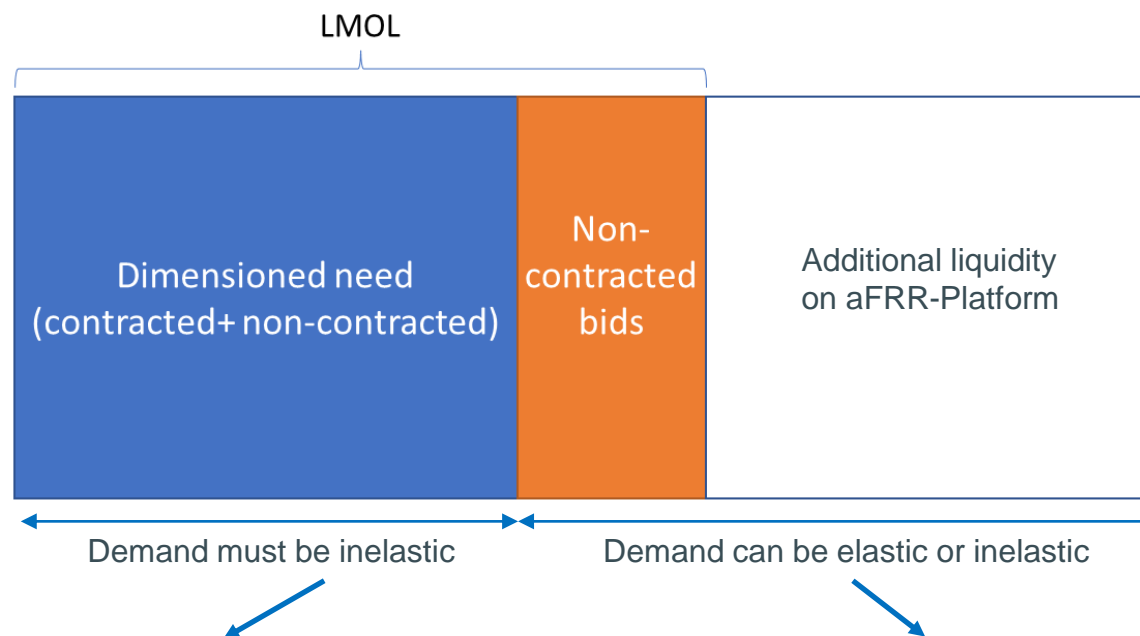
### Without elastic demand from TSO A

- The CBMP will be 10.000 €/MWh
- The unsatisfied demand (270 MW) will be distributed to TSO A and TSO B

### With elastic demand from TSO A

- The CBMP will be 10.000 €/MWh
- TSO A will have a satisfied demand of 120 MW → unsatisfied demand of 280 MW
- TSO B will have its 500 MW demand satisfied
- TSO A will export 60MW to TSO B → impact on TSO-TSO settlement and FRCE calculation

## Combination of local price cap on contracted bids and elastic demand



As Elia's contracted volume currently corresponds to the dimensioned need, sufficient aFRR energy bids at a price below the local price cap are available to cover the inelastic part of our demand

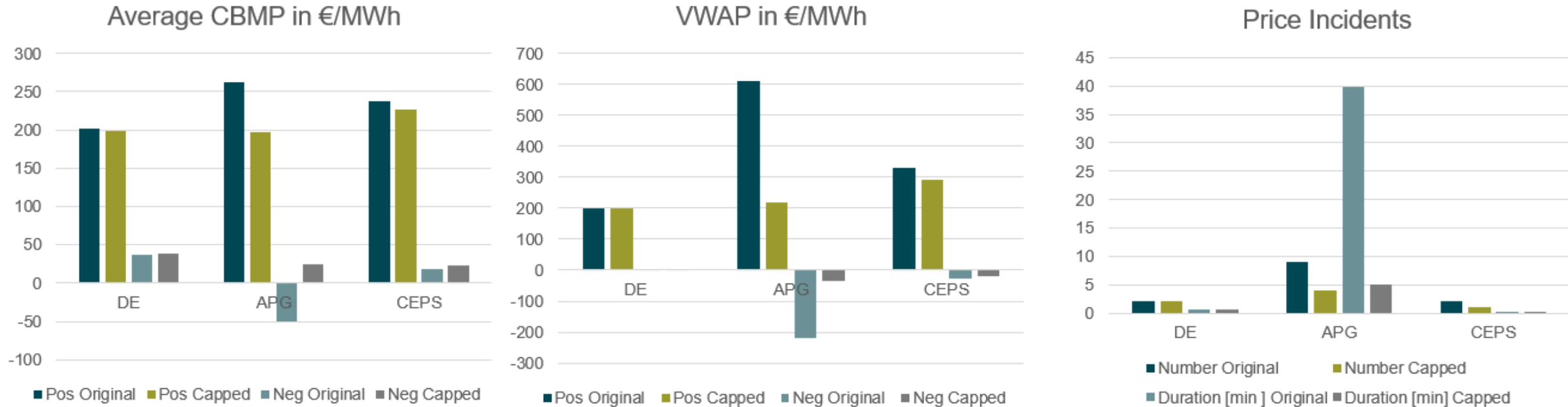
Free bids in Belgium can have a price above the local price cap, but in that case they will only be activated in case of high demands from other TSOs

- ➔ Very high prices limited to situations of high demands from other Participating TSOs
- ➔ Free bids > price cap have a much low activation frequency than in the current setup

# Elastic demand

## Simulation results

# MARCH 6<sup>TH</sup> TO MARCH 11<sup>TH</sup> - PRICES



The simulations relate to 1 specific week with following parameters

- The volume is set to the LMOL sent by the TSO (not to the contracted volume as planned by Elia)
- No demand satisfied beyond the LMOL (not linked to the bid prices as planned by Elia)



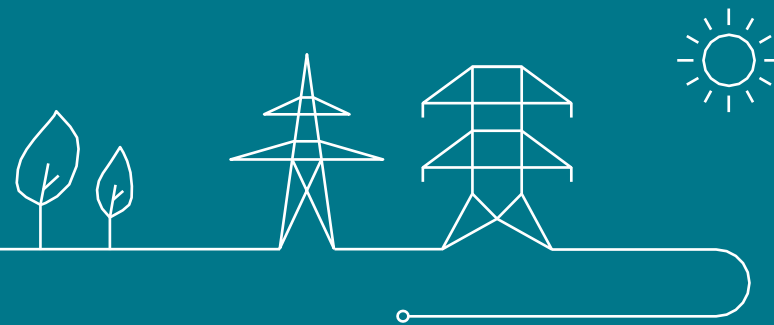
## Measures at European level

### Next steps

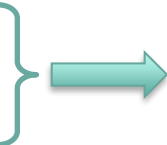
- While the measures are not sufficient to cover the risks identified for the Belgian balancing market and can't be assumed to be implemented by the EBGL deadline for the connection of the TSOs to the aFRR-Platform, there are nonetheless an important part of the puzzle for the efficient functioning of the Belgian market
- Therefore, Elia encourages stakeholders to react to the European public consultation
- A dedicated stakeholder workshop will be organized at European level. Elia also remains available to answer questions from stakeholders



# Local mitigation measure



## Reminder proposal made in stakeholder workshop 19/9

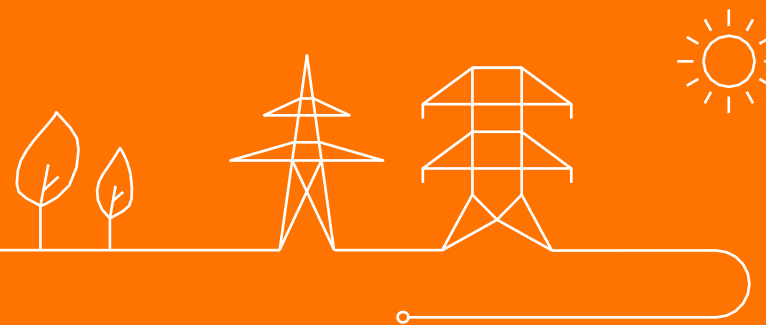
- Elia confirms willingness to connect in June 2024, and this independently of
  - The evolution of the discussions on the European mitigation measures
  - The connection of RTE
  - The ATC sharing by TenneTNL

Even though those are planned close to our connection, the objective is to remove as much uncertainties as possible for our go-live date
- Elia plans to include a local price cap on Contracted aFRR Energy Bids in the Proposal for Amendment of the T&C BSP aFRR
  - Price level → use of the current price cap of +/-1.000€/MWh
  - Temporary character → the price cap would be applied for given period, extendable on the basis of analyses
- Elia will continue advocating for the implementation of mitigation measures at European level, with a particular emphasis on elastic demand
- For the period between Elia's connection and the implementation of elastic demand, Elia plans to propose to maintain the current price cap on all aFRR Energy Bids

## Further discussions with the CREG

- As presented during the stakeholder workshop of 19/9, Elia and the CREG are aligned on the implementation of a price cap on Contracted aFRR Energy Bids, in combination with the introduction of elastic demand.
- A price cap on all aFRR Energy Bids, as proposed by Elia in previous workshop, to bridge the gap between Elia's connection to the aFRR Platform and the implementation of elastic demand however appears not to be legally acceptable for the CREG.
- Elia has been looking for alternatives, with the objective not to delay the connection to the aFRR Platform but no solution has been identified yet. Elia and CREG will continue looking for legally acceptable alternatives allowing a connection to PICASSO in June 2024.
- If no such alternative can be found, ELIA and CREG will discuss a possible delay of the connection until the introduction of aFRR elastic demand on PICASSO.

# aFRR LV



## Context

- The T&C BSP aFRR is currently open to all voltage levels. However, in practice, the FSP-DSO contract prevents low-voltage Delivery Points (i.e., Delivery Points connected to a voltage level of 1kV or below) to participate
- The constraint in the FSP-DSO contract is expected to be removed in the future (see [Synergrid public consultation](#))
- With the opening to low-voltage assets, the number of Delivery Points could drastically increase

## Objectives of the proposed amendments

- Remove key barriers for participation for low-voltage Delivery Points as soon as possible
- Mitigate the impact on the different tools related to the possible drastic increase of data flows while maintaining a fit-for-purpose system for BSPs

Note that the proposal aims to enable an opening of aFRR to LV Delivery Points as soon as possible and in a pragmatic way. As such, Elia does not exclude the need for further amendments to the T&C BSP aFRR in the future.

# Overview of contractual elements impacted

- There will be **no changes for Delivery Points that are not connected at low-voltage level** (i.e., Delivery Points connected at a voltage level above 1kV).
- **For Delivery Points that are connected  $\leq 1\text{kV}$ , certain specific rules will apply related to:**
  - Conditions for Delivery Points
    - Metering requirements
    - Requirement to aggregate low-voltage Delivery Points into a group
    - EMS Strategies
  - Baseline and Prequalification test
  - Energy Bid Submission
    - Group of low-voltage Delivery Points to be included in an aFRR Energy Bid
    - Minimum size for the group of low-voltage Delivery Points



# Conditions for Delivery Points - Metering requirements

Recall:

- Currently, metering accuracy requirements are defined for different ranges of connecting power
- The lowest range of connecting power corresponds to all assets with a connecting power < 100kVA.
- For assets in this category, MID-compliant metering is required.

For assets connected at low-voltage:

- These assets are (and need to be) aggregated when included in aFRR Energy Bids, resulting in smaller relative errors on an aggregated level
- No energy transactions are performed based on the aFRR power meters at this point
- Imposing too stringent requirements on metering accuracy could be a barrier for participation

Considering this, **Elia plans to perform amendments of the metering requirements for assets connected at low-voltage\***. Note that an amendment of the metering requirements does not require an amendment of the T&C BSP aFRR but would require amendments to other regulated documents (Synergrid C8-06).

\*It must be noted that Elia is working on a more broad review of the metering requirements for aFRR.



# Conditions for Delivery Points – requirement for aggregation

- Onboarding large amounts of Delivery Points with the current processes could be operationally heavy for the BSP
- Including large amounts of Delivery Points in aFRR Energy Bids could be operationally heavy for the BSP
- A possible drastic increase of the number of individual Delivery Points and related data flows would have a significant impact on different tools involved in the aFRR service (e.g., bid submission, activation control etc.)



The **operational processes for BSPs** as well as the **impact on IT tools could be drastically reduced when grouping low-voltage Delivery Points** and working with aggregated information on the level of the group in certain processes/tools.

(+ discussions are taking place with DSOs on facilitating onboarding of large amounts of Delivery Points)

## Proposed amendments in the T&C BSP aFRR

**Delivery Points connected at a voltage level  $\leq 1$  kV need to be grouped**

**Multiple groups can be used but each group must have a minimum size of 100 kW\*** when used for one of the following processes:

- Baseline test
- Prequalification test
- Submission of aFRR Energy Bids
- ! Note: the BSP can develop its pool of Delivery Points also when the size of the group is still below 100 kW. However, at that point, the group cannot be used for the above processes.

\* The size of the group of low-voltage Delivery Points in the upward direction (respectively downward direction) is calculated as the sum of the  $DPaFRR_{max,up}$  (respectively  $DPaFRR_{max,down}$ ) of the DPs composing the group.

# EMS for Limited Energy Reservoir Delivery Points

Recall:

- **Each Delivery Point with Limited Energy Reservoir should be included in an energy management strategy**
- **The energy management strategy aims to prove the ability of a Delivery Point with Limited Energy Reservoir, on its own or together with other Delivery Points of the Pool, to comply with requirements for provision of the aFRR Service**
- Information related to energy management strategies that are allowed and not allowed and corresponding data needs are described in the document "[aFRR Energy Management Strategy Requirements](#)". **The list of energy management strategies described in this document is not exhaustive** meaning the BSPs could propose a strategy currently not described in the EMS requirements.

In this context, Elia **asks interested BSPs** with low-voltage DPs with Limited Energy Reservoir **to reach out to discuss their energy management strategies.**

Based on these discussions, Elia may adapt the EMS requirements and communicate in a transparent way to all market parties



# Baseline test

- Recall:
  - the baseline test must be succeeded before a Delivery Point can participate to a Prequalification test
  - The baseline test can be performed on the level of the Delivery Point or on the level of the Providing Group

## Proposed amendments in the T&C BSP aFRR

**For Delivery Points that need to be grouped, the baseline test is performed on the level of the entire group of low-voltage Delivery Points or on the level of the Providing Group containing the entire group of low-voltage Delivery Points .**

**Each group of low-voltage Delivery Points must have a size  $\geq 100$  kW for performing the baseline test**



# Prequalification test

Recall:

- A prequalification test is needed to increase the volume a BSP can offer in the capacity auctions
- The prequalification test can be performed on the level of the Delivery Point or on the level of the Providing Group

## Proposed amendments to the T&C BSP aFRR

**For Delivery Points that need to be grouped, the prequalification test is performed on the level of the entire group of low-voltage Delivery Points or on the level of the Providing Group containing the entire group of low-voltage Delivery Points.**

**Each group of low-voltage Delivery Points must have a size  $\geq 100$  kW for performing the prequalification test**

Note: the specific rules related to Delivery Points joining or leaving the pool of the BSP remain unchanged, namely:

- Adding a new Delivery Point to the pool of the BSP does not change the volume a BSP can offer in the capacity auctions
- When a Delivery Point is removed from the pool of the BSP, the volume the BSP can offer is decreased by the  $DP_{aFRR,cb}$

Further note that the BSP can freely switch low-voltage Delivery Points between groups after prequalification without impacting the volume the BSP can offer in the capacity auctions.

# Energy bid submission for bids including LV DPs

Recall:

- When submitting an aFRR Energy Bid, the BSP must enter a list of Delivery Points included in the aFRR Energy Bid
- Including large amounts of Delivery Points in aFRR Energy Bids could be operationally heavy for the BSP and have a significant impact on Elia tools.

## Proposed amendments to the T&C BSP aFRR

**For Delivery Points that need to be grouped, the BSP must enter the group instead of the individual Delivery Points when submitting an aFRR Energy Bid**

**The group of low-voltage Delivery Points must have a size  $\geq 100$  kW in the appropriate direction**

### Illustration

DP Group Size UP	DP Group Size DOWN	Accepted in an upward bid?	Accepted in downward bid?
100kW	100kW	✓	✓
50kW	0kW	✗	✗
100kW	0kW	✓	✗
100kW	50kW	✓	✗

## Red zones / CRI Filtering

- No CRI Filtering will temporarily be applied for groups containing Delivery Points connected at voltage levels  $\leq 1$  kV
- Elia nevertheless wants to highlight that with the increased participation of assets on the low-voltage level, CRI filtering will likely have to be applied (possibly in combination with rules on aggregation/grouping of Delivery Points) in the future to avoid aggravating congestions.

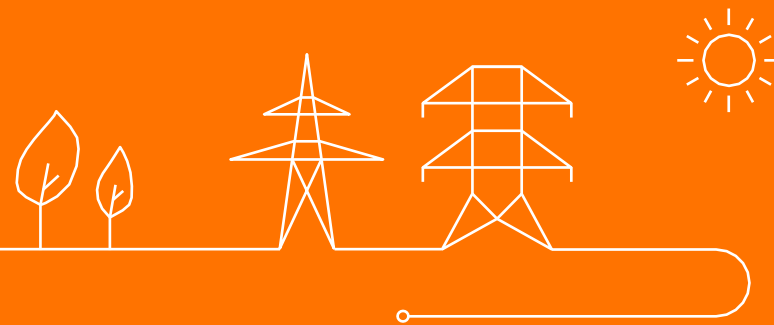


# Contractual elements that are not impacted

- Conditions for BSPs
- Requirements related to Opt-out or Pass-through agreements & combinability conditions
- Communication Requirements:
  - ! BSPs still need to submit values for each individual DP and per 4" time step (e.g.,  $DP_{aFRR}$ ,  $DP_{measured}$ ,  $DP_{baseline}$ )
- Procurement of aFRR capacity
- Activation control:
  - ! Activation control remains to be based on the individual DPs in the group (and possible other DPs in the Providing Group) for which  $DP_{aFRR} = 1$
- Baseline test
- Remuneration and penalties



# Next steps





## Next steps

- Feedback requested to stakeholders by 20/10 on at least the following points:
  - The alignment of the go-lives of the auction in D-1 and the 5' FAT
  - The conditions associated to participation of aFRR LV
- Elia will take this feedback into account for drafting the PfA of the T&C BSP aFRR
- Elia will further discuss with the CREG to find the best solution to bridge the gap between the planned connection in June 2024 and the implementation of the elastic demand
- Elia encourages market parties to react to the public consultation of ENTSO-E on the mitigation measures at European level

**Thank you.**

