New aFRR design

Workshop – 23rd of September 2019

Introduction

The new aFRR design

Scope

The design in this study facilitate the opening of the aFRR market to all technologies independent of the voltage level they are connected and independent of the type of aFRR provider *.

Important changes:

- Contractual opening of the aFRR product to all technologies;

- Separated procurement aFRR and FCR;

- A daily separated procurement aFRR;

- Allowing portfolio based participation;

- A balancing energy gate closure time for the submission of aFRR energy bids close to real time;

- A merit order activation;

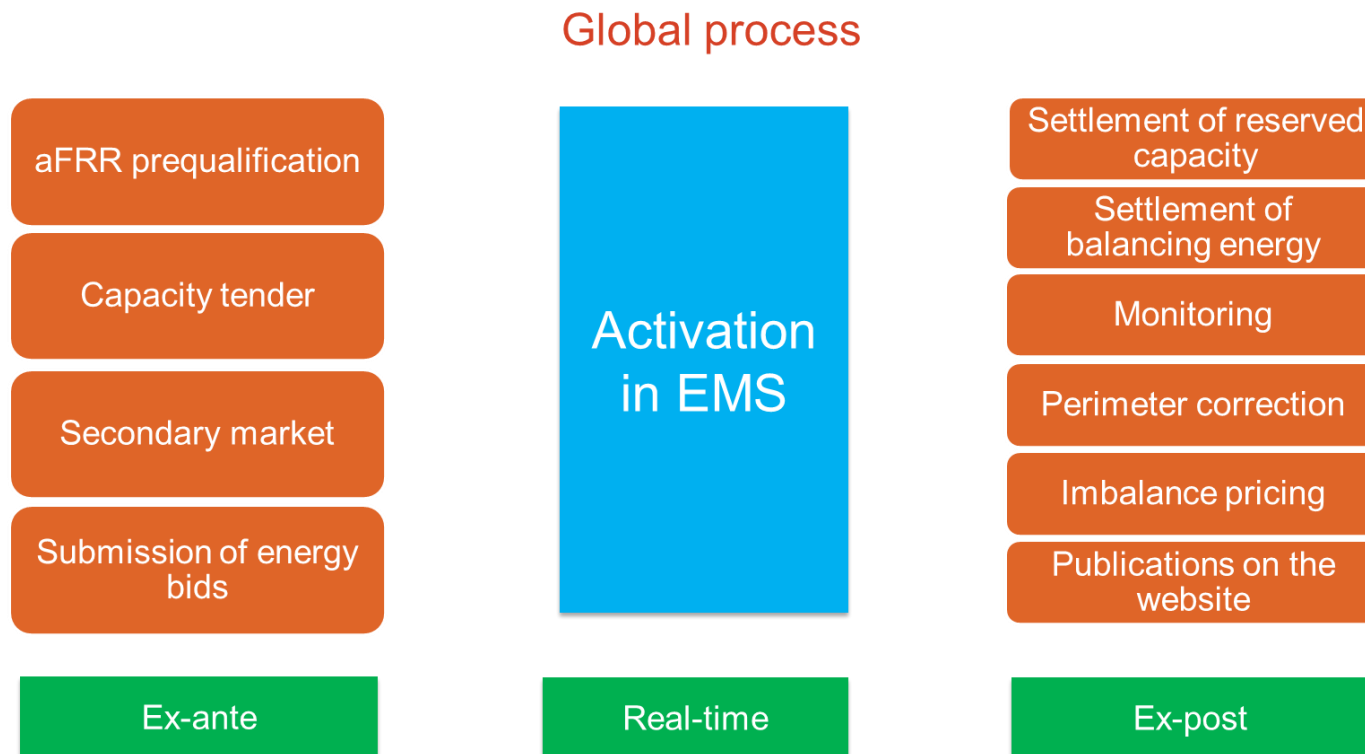- Pass through regime in ToE rules

Timings

- The prequalification will start at the beginning of May 2020

- The go-live of the new aFRR design is foreseen in July 2020

*subjected to the restrictions in FSP-DSO contract

History of the new aFRR design

- Public consultation of new aFRR design in October 2018

- Public consultation of implementation plan for new aFRR design in November 2019

- Organization of serveral workshops regarding the new aFRR design and implementation plan in the course of 2018 and 2019:
  - 24th of April 2018: new aFRR design: pre-processing
  - 15th of May 2018: new aFRR design: post-processing
  - 11th of September 2018: new aFRR design
  - 19th of November 2018: implementation plan
  - 15th of May 2019: aFRR capacity tender

Global aFRR process

Global process

Ex-ante	Real-time	Ex-post
aFRR prequalification	Activation in EMS	Settlement of reserved capacity
Capacity tender		Settlement of balancing energy
Secondary market		Monitoring
Submission of energy bids		Perimeter correction
		Imbalance pricing
		Publications on the website

Transfer of Energy
- Elia foresees a postponement of the choice to implement a ToE for aFRR.
- Elia will re-evaluate the need to implement a ToE for aFRR in the course of 2019.

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aFRR design; open points

New proposal capacity tender methodology:

- ❑ Step 1 @ D-2: independent total cost optimization for the 24-hour block for aFRR up and aFRR down together (e.g. 140MW)
- ❑ Step 2 @ D-1: a merit order selection for upward and downward reserves separately and pure divisible 4-hour bids (e.g. 5 MW)
- ❑ Rules to gradual <u>increase volumes</u> selected via step 2 in case of low prices in step 2 and sufficient available volumes

New proposal regarding a 'moving' price cap (1000 €/MWh) and the application of 'weighted average imbalance pricing ' with respect to aFRR activation prices in order to mitigate balancing risks

Both proposals were positively received by all/most members of the WG Balancing

Goal of this workshop is to present:
- Final details on the volume allocation rules
- The participation with energy limited resources
- Other topics

Capacity tender
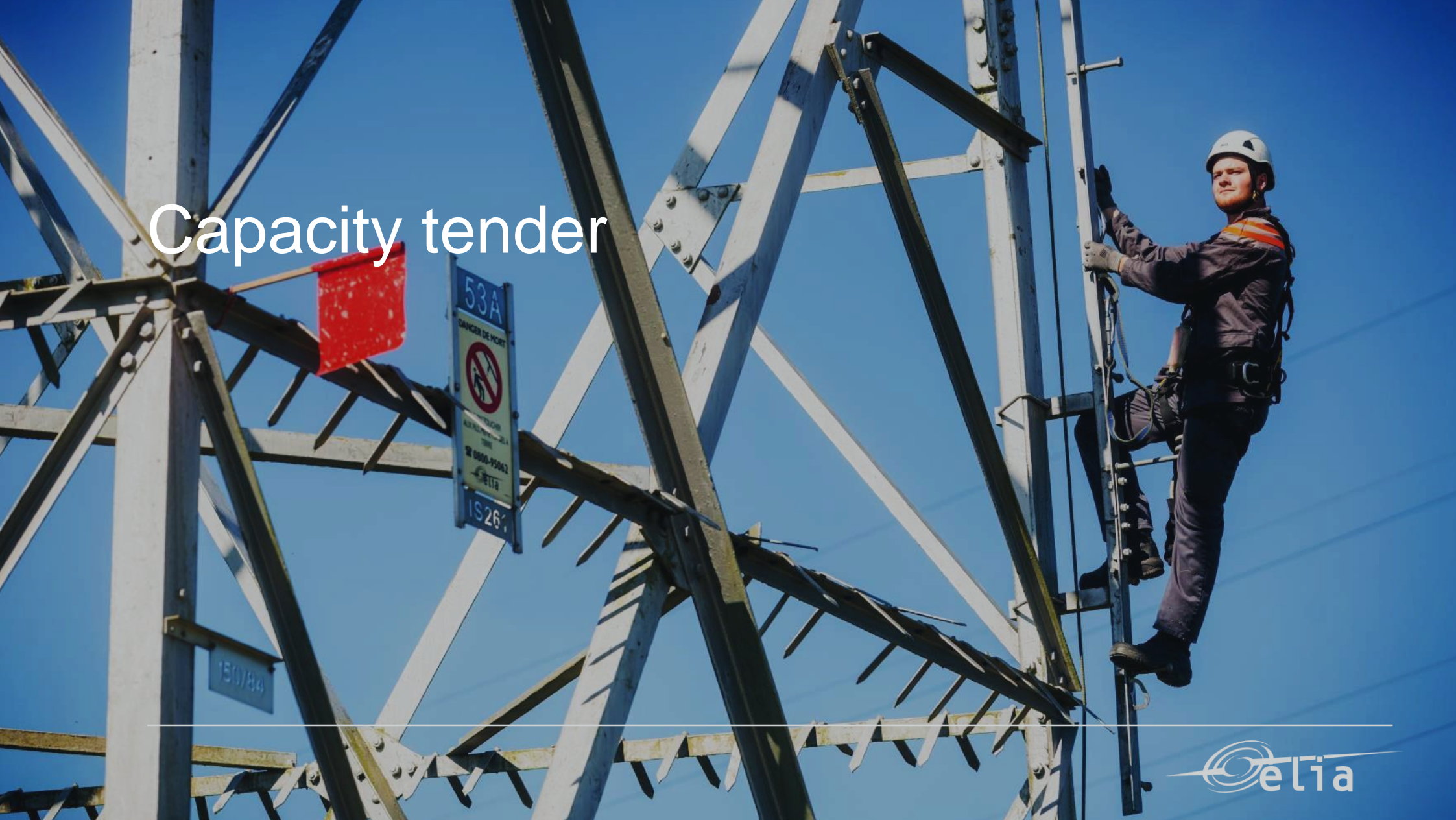
Two-step approach for the aFRR capacity tender

- **Methodology:** 2 step approach:

    o Step 1 @ D-2 (only business days): independent total cost optimization for the 24-hour block for aFRR up and aFRR down together (e.g. 130MW)

    o Step 2 @ D-1 (all days): a merit order selection for upward and downward reserves separately and pure divisible 4-hour bids (e.g. 15 MW)

- **Volume allocation rules:**
    o Rules to increase or decrease the volume to be sourced in step 1 and step 2

Two-step approach for the aFRR capacity tender

- **Step 1:**
  - This tender will only be organized on business days.
  - Total cost optimization for the up and down direction together
  - The volume to be sourced in the upward direction can be different than the volume in the downward direction (not necessarily symmetrical)
  - 24-hour blocks
  - Bids are offered in €/MW/h
  - Minimum bid size: 1MW
  - Granularity of the bid: 1MW
  - Maximum step size of 10MW for each direction
  - Total cost rule is applicable
  - All bids are indivisible
  - No combinability of capacity bids
  - Obligation to split up symmetrical bids into smaller symmetrical and asymmetrical bids
  - The volume incremental rule must be applied for each direction separately.
  - In case a BSP offers more than his prequalified volume, Elia will cancel those bids.
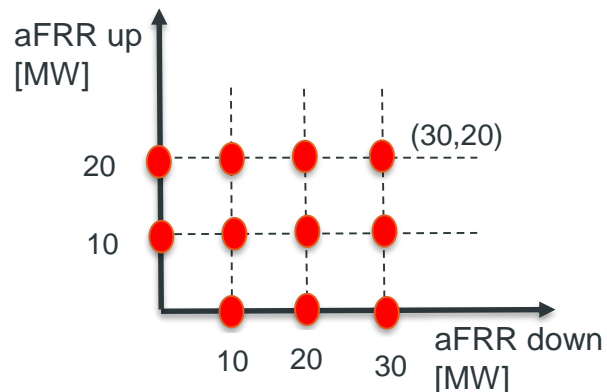
2 step approach

- **Step 2:**
  - o Tender will be organized on all days (week + week-end)
  - o Merit order selection separately for the upward and downward direction
  - o The volume to be sourced in the upward direction can be different than the volume in the downward direction (not necessarily symmetrical)
  - o 4-hour blocks
  - o Bids are offered in €/MW/h
  - o Minimum bid size: 1MW
  - o Granularity of the bid is 1MW
  - o All bids are fully divisible up to 1MW
  - o All bids are combinable
  - o In case a BSP offers more than his prequalified volume, Elia will cancel the most expensive bids until the offered volume is smaller or equal to the prequalified volume of the BSP.
  - o In case a BSP has offered volume for step 1, he is obliged to also offer the same volume for step 2 (capped to the volume to be sourced in step 2)
    - o Elia will perform an ex-post verification
    - o The BSP will be excluded in case of consecutive missing MWs.

Timings for the capacity tender and publication of volumes

| Delivery day (D)	Volume publications	Step 2 (D-1 @9h00)	Step 1 (D-2 @ 14h30)
Monday	Thursday	Sunday	**Friday**
Tuesday	Thursday	Monday	**Friday**
Wednesday	Thursday	Tuesday	Monday
Thursday	Thursday	Wednesday	Tuesday
Friday	Thursday	Thursday	Wednesday
Saturday	Monday*	Friday	Thursday
Sunday	Monday*	Saturday	**Friday**

* This publication takes place at the latest on Wednesday, taking into acount bank holidays

Volume allocation rule (1)

Goal:
- Determine the volume to be sourced in step 1 and step 2
- An average volume is calculated based on the volumes and prices of the previous tenders

Fundamental calculation:

Reference price of Step 1

Price of Step 1

Merit Order of Step 2

V_{2*}
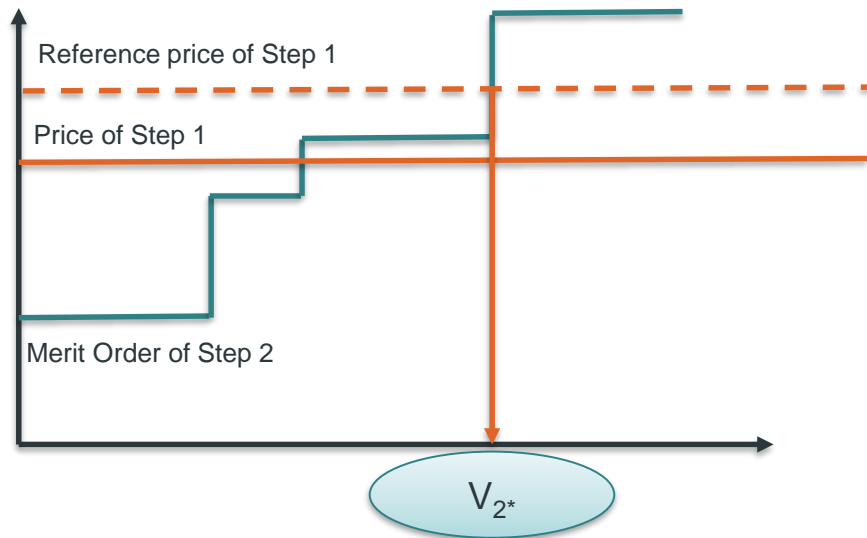
Calculation to be performed:
- For each 4-hour block
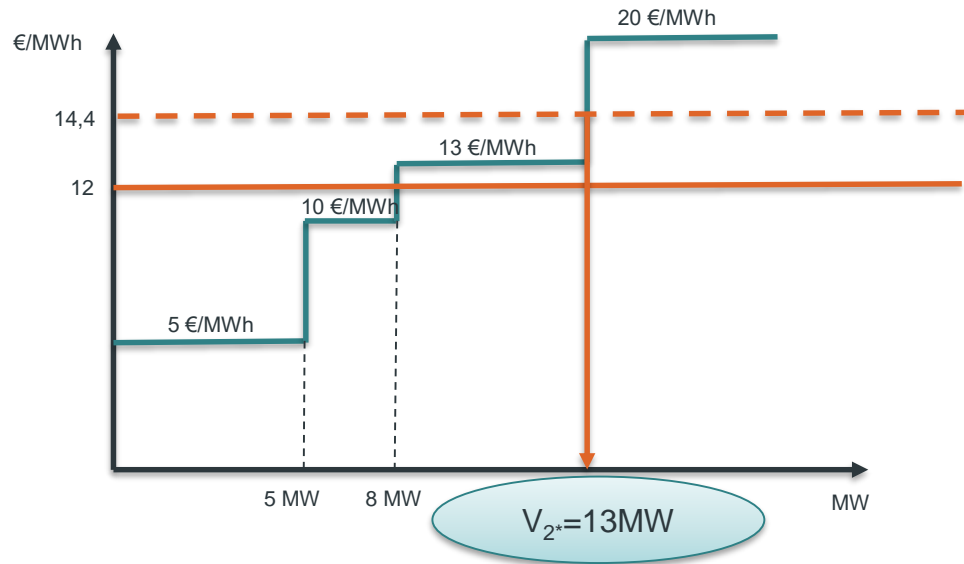- For each direction

Interpretation of V_{2*}
Volume that should have been sourced in step 2, taking into account the price of step 1 and the bidding curve of step 2

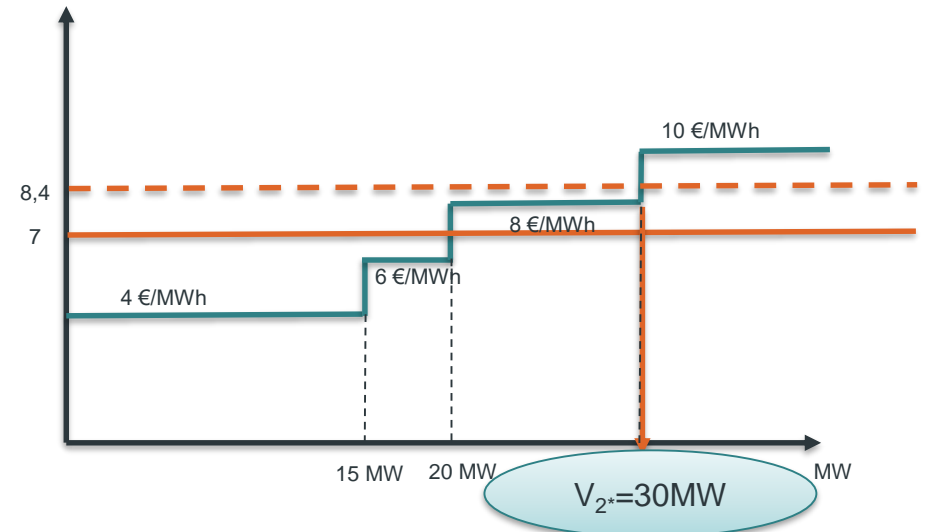Average of V_{2*} of the last 14 days is taken

- Merit order of step 2
- Price of step 1 is the average price of the most expensive selected bid of step 1
- Reference price of step 1 → increase of "Price of Step 1" with **20%.**

Volume allocation rule (1)

Example 1

€/MWh

20 €/MWh

14,4

13 €/MWh

12

10 €/MWh

5 €/MWh

5 MW   8 MW

$V_{2*}=13MW$

MW

Example 2

10 €/MWh

8,4

8 €/MWh

7

6 €/MWh

4 €/MWh

15 MW   20 MW

$V_{2*}=30MW$

MW

Volume allocation rule (2)

- $V_{2,*}$ is calculated:
    - For each direction (upwards and downwards)
    - for each 4-hour block (6 blocks per day)
    - for each day (one price for step 1 per day)
    - → 6*2 times per day the calculation of V_{2*}

- This calculation is repeated for the last 14 days

- $V_{2*,avg}$ = average volume of the last days
    - Volume for weekdays from Monday to Friday: the last 10 weekdays are considered
      → average based on 12 * 10 V_{2*} values
    - Volume for week-end/bank holidays: the last 4 week-end/ bank holidays are considered
      → average based on 12 * 4 V_{2*} values
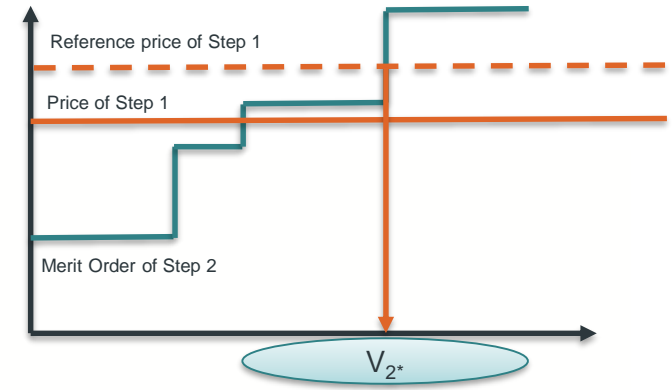
Volume allocation rule (2)

Volume calculation for weekday:
- Volume for weekdays from Monday to Friday: the last 10 weekdays are considered

- $V_{2,new} = V_{2*,avg}$
  - If $V_{2*,avg}$ is larger than the current volume for step 2 (Mon-Fri) → increase of volume for step 2 (Mon-Fri) for the next week
  - If $V_{2*,avg}$ is smaller than the current volume for step 2 (Mon-Fri) → decrease of volume for step 2 (Mon-Fri) for the next week

- **Additional rules per direction:**
  - Volume in step 2 cannot be lower than 10MW

  - The volume in step 2 should be increased (decreased) by at least 5MW at a time.

  - The volume increase (decrease) in step 2 is limited to 10MW at a time.

- Remaining volume will be sourced in step 1 (i.e. 145 MW - $V_{2,new}$)

Volume calculation for weekend-day:
Analogous to the calculations for weekdays

Volume allocation rule (2)

Example in the upward direction

€/MWh

14,4

12

5 €/MWh

10 €/MWh

13 €/MWh

20 €/MWh

5 MW   8 MW

MW

$V_{2*}=13MW$
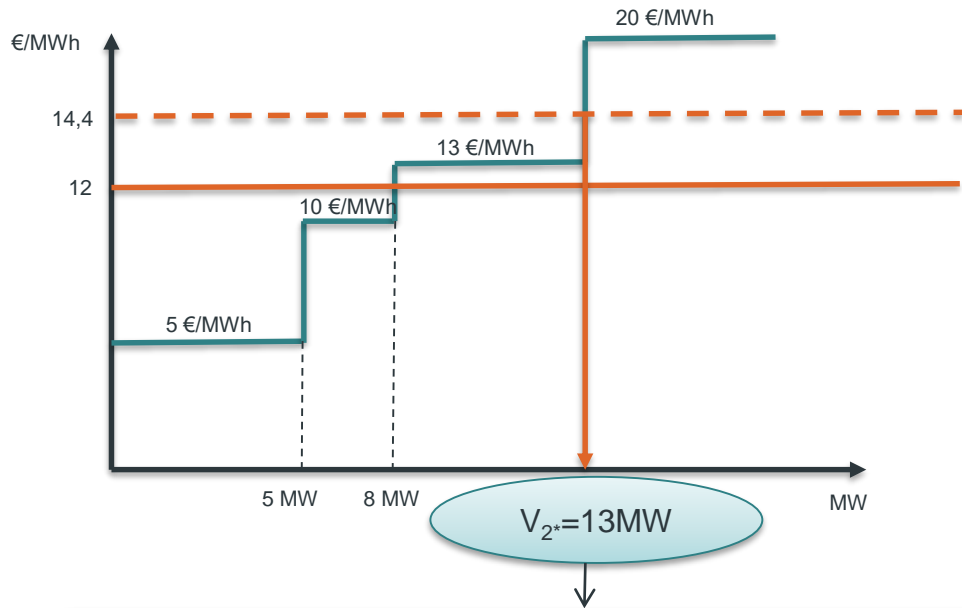
- Case 1:
  - average volume is 12MW (assumption)
  - Current volume is 10MW
  - $V_{2,new}$ = 10MW since increase of 2MW is smaller than the minimum step increase (i.e. 5MW)
- Case 2:
  - average volume is 8MW (assumption)
  - $V_{2,new}$ =10MW since minimum volume required in step 2 is 10MW

Example in the downward direction

€/MWh

8,4

7

4 €/MWh

6 €/MWh

8 €/MWh

10 €/MWh

15 MW   20 MW

MW

$V_{2*}=30MW$
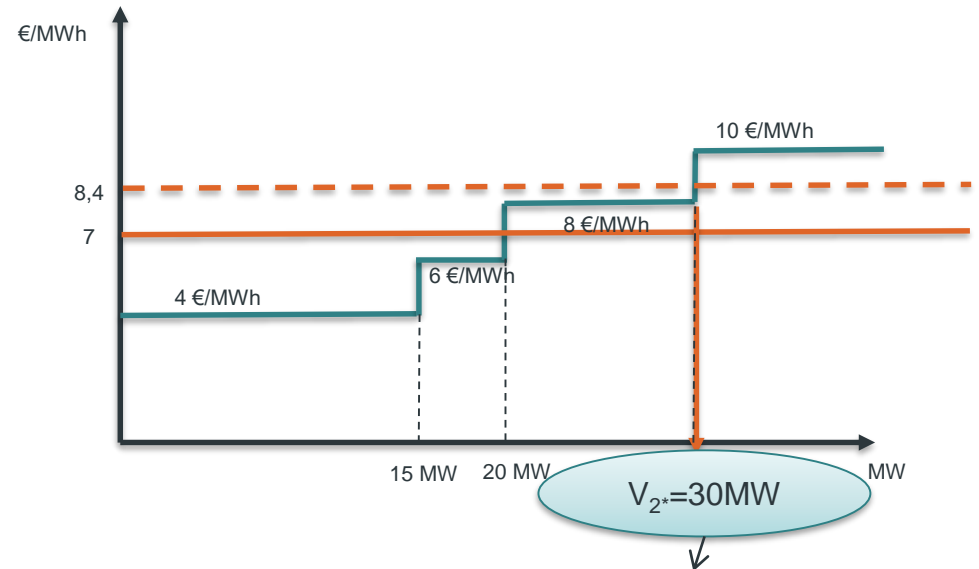
- Case 3:
  - average volume is 25MW (assumption)
  - Current volume is 10MW
  - $V_{2,new}$ = 20MW since maximum increase at a time is 10MW
- Case 4:
  - average volume is 25MW (assumption)
  - Current volume is 15MW
  - $V_{2,new}$ = 25 MW

Timings of the tender
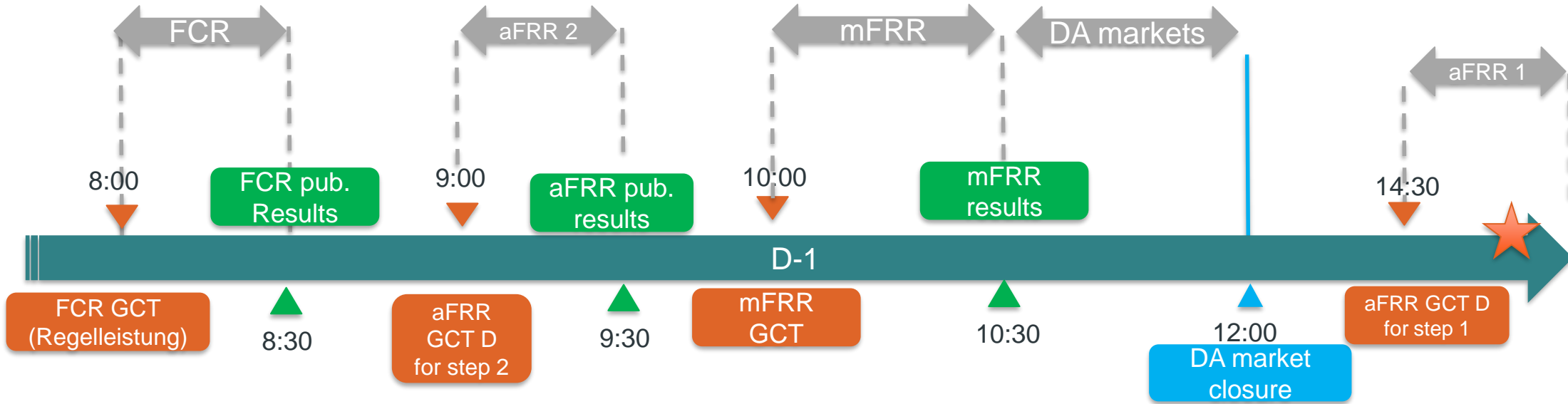
- Second round step 1 @ D-2 17h30
- Second round step 2 @ D-1 15h00
- In case not sufficient volume after second round step 1 → missing volume will be sourced in step 2 together with the already attributed volume of step 2.

Publication of data

Aggregated data

Example:

Tendering Period	Delivery Period	Service Type	Total Contracted Volume[MW] (average V2*)	Average Price[€/Mw/h]	Marginal Price[€/Mw/h]	Total Offered Volume[MW]	V2*
D-2	D	downward	135	12	20	310	
D-2	D	upward	140	10	20	310	
D-1	D 00:00 -04:00	downward	10	15	25	200	5
D-1	D 00:00 -04:00	upward	5	20	25	170	10

Individual data   Currently under assessment
- Only for step 2 of the auction process (merit order selection)
- Anonymous
- Bid price and bid volume

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Participation with energy limited resources

Participation with energy limited resources

- Energy limited resources with a **MW schedule (CIPU):** enough energy for the **availability test (30min)** at any time on a **unit based level**.

- Energy limited resources **without a MW schedule (non-CIPU):** enough energy for the **availability test (30min)** <u>at any time</u> on **portfolio level (bid level).**

- Energy limited resources with **a MW schedule (CIPU):** enough energy for the simulation test of the **prequalification test (90min)** on a **unit based level**.

- Energy limited resources **without a MW schedule (non-CIPU):** enough energy for the simulation test of the **prequalification test (90min)** on **portfolio level**.

- An **Energy Management Strategy** will be required.

Energy Management Strategy for energy limited resources.

- **assets with limited energy resources** must always have determined **a valid charging strategy** (ex. use of other assets from his portfolio, intraday market …). Elia does not consider the use of the imbalance market as valid charging strategy.
  - o Elia will request details of the supplier's proposed energy management strategy;
    - Type and characteristics
    - Site description
    - band for (dis)charging battery (power content/power bands)
    - Battery energy content and energy used for charging/discharging (energy content)
    - Frequency rate for use of EMS (continuously, each 5min, each 15min,…)
    - To which providing group the asset belong
    - When (dis)charging, this should be taken into account in the baseline
  - o Elia will verify the feasibility of the proposed energy management strategy during the prequalification process.
  - o The aFRR provider is responsible for the correct sizing of his assets, knowing the energy management strategy he will apply and the other useful assets he might have in its portfolio. (verification during the prequalification process).

Other points

Technical requirements for metering devices for non-CIPU

Connected to TSO-net:

- Private metering devices must be able to provide power measurements on a 4 second basis

- Technical requirements are aligned with the existing technical requirements for energy measurements as specified in the Technical Regulations for Distribution network.

- Both technical requirements related to private metering devices for aFRR and mFRR are in line

Aansluitingsvermogen	Spanningsniveau waarop de meetinrichting aangesloten is	Minimaal vereiste van de onderdelen in nauwkeurigheidsklasse de meetinrichting			
		TP	TI	Wh-meter	VArh-meter
≥ 5 MVA	HS	0.2	0.2	0.2	A
≥1 MVA tot 5 MVA	HS	0.2	0.2	C	A
≥ 250 kVA tot 1 MVA	HS	0.5	0.5	B	A
	LS(uitzonderlijk)	nvt	0.5	B	A
≥ 100 kVA tot 250 kVA	HS	0.5	0.5	B	A
	LS	nvt	0.5	B	A
< 100 kVA	LS zonder TI	nvt	nvt	A	A

Tabel 2: Nauwkeurigheidsklasse van de onderdelen van een meetinrichting

Connected to DSO-net:

Metering requirement and technical requirements are still under discussion.

Penalties

- Penalties for MW not made available (not offering reserved capacity).

- Penalties for missing MW during availability control

Aligned with mFRR

Next steps

Next steps

- Elia will publish an updated version of the design note in the course of October

- The drafting of the T&C BSP aFRR will be started in the coming months

- More information will be communicated via the WG balancing.

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