Working Group Balancing

Wednesday 23/10/2019

Agenda

1. Approval of the MoM of previous WG Balancing
2. LFC BOA & LFC means
3. T&C VSP
4. Status Updates projects
   - Offshore integration
   - mFRR T&C
   - iCAROS
5. aFRR capacity tender
6. Publication of close to real time data
7. Real Time DGO allocation forecasting
8. AOB & next meetings

1. Approval of the MoM of previous WG Balancing

Working Group Balancing 23 October 2019

Comments of REstore on winter product

FEBELIEC ~~and RESTORE~~ advocates to maintain the winter product.~~,~~ FEBELIEC and REstore requires ELIA not to wait for an urgent adequacy situation to occur before ~~developing~~ deploying the contractual and regulatory framework, in order to attract sufficient volumes when there's a need. REstore believes market parties should be informed as early as possible, given the barriers identified last winter (hardware installation, contracting time, etc.).

[…]

~~RESTORE states that they can't find volumes if no capacity remuneration is paid for this product.~~
When asked about the volumes announced last winter, REstore responded that the announcement was based on the premises of a timely implementation and a specific product design (i.e. including a capacity remuneration). This product design ultimately did not materialize, contributing to lower volumes being offered.

Proposal Elia: amendment accepted

Comments of Eneco on open points new design aFRR (1/2)

Extract of the minutes:

- Clarification is requested on the risk of having Imbalance Prices of 1000€/MWh.

  ELIA answers that this is improbable thanks to the mechanism of average weighted price.

Request from Eneco to better reflect the discussion:

- Current cap: ~100€/MWh;
- New Cap: 1000€/MWh => 10 times higher than now;
- As communicated by Elia in the last Balancing Working Group, the aFRR is saturated 1 to 2 times a day;

➔ Based on those information, a market player could *rationally* decide to offer its aFRR volume at 1000€/MWh. In doing this, he will gain on 2 fronts: on the reservation and 1 or 2 activations a day at very high price.

➔ We would be far away from an economical optimum but based on recent activation prices of mFRR it cannot be ruled out.

➔ The impact on the imbalance tariff is indeed mitigated by the mechanism of average weighted price but on the other hand the raise of the cap could incentivize some market players to increase their activation price.

Comments of Eneco on open points new design aFRR (2/2)

To clarify Elia's position, we would like to remind that:

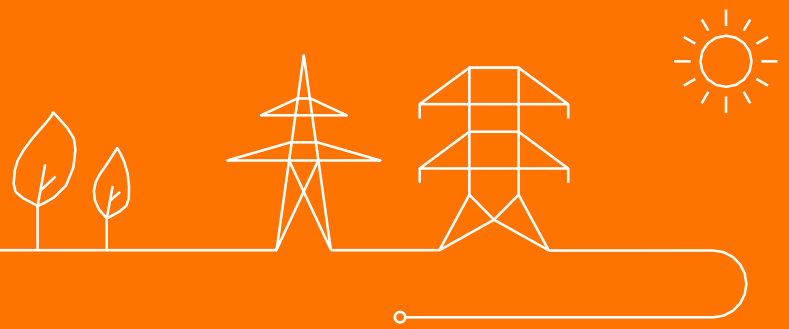
- The price of a bid must be justified. Bidding at an unreasonable price could trigger a reaction from the regulator.
- With the application of weighted average pricing, an imbalance price close to 1000 €/MWh is only possible in case most of the aFRR bids are offered at this price. Current experience with mFRR shows that bids with high prices only concern a small part of the bids.

➔ Elia therefore believes that there's a limited risk of having such high imbalance prices due to aFRR activation with the proposed design

Proposal Elia: amend the minutes with Eneco's comments and Elia's answer

2. Public consultation on the LFC block operational agreement v.2 and the LFC Means v.1

Working Group Balancing 23 October 2019



Overview

1. **CONTEXT :** Regulatory framework

2. **LFC BOA :** Methodology for dimensioning the FRR reserve capacity

3. **LFC MEANS :** Methodology for determining the FRR balancing capacity

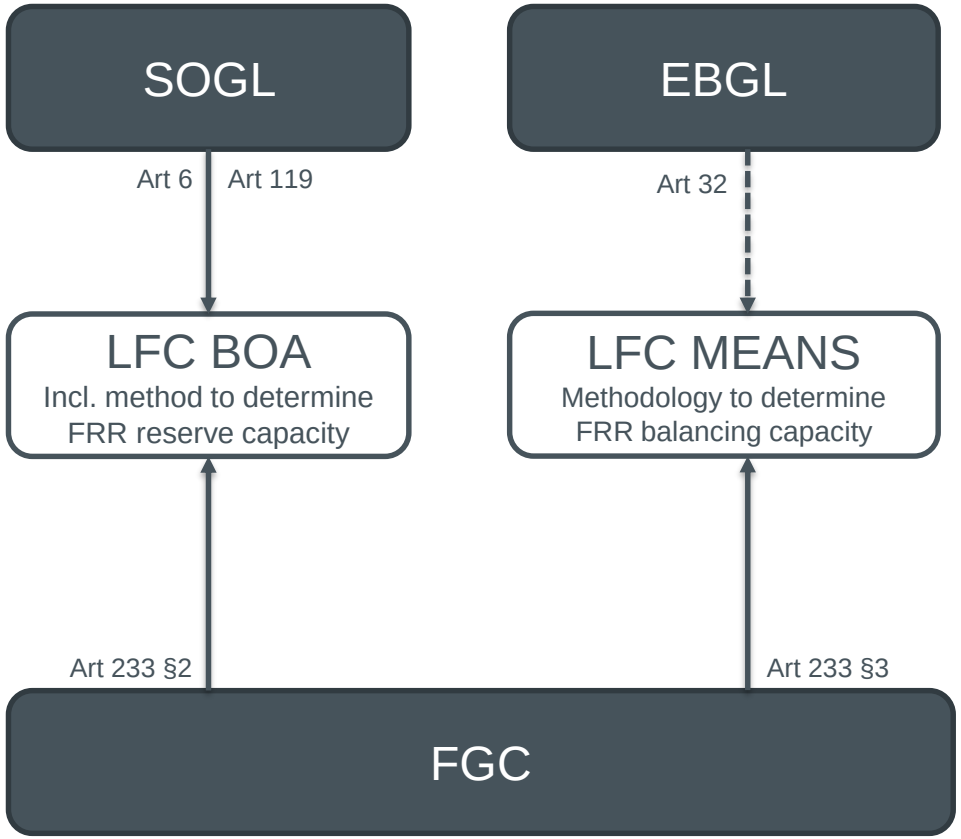
4. **(Expected) RESULTS**

Regulatory framework

Legal framework

Pursuant to the European network guidelines, the yearly "Dossier Volume" determining the methodology and the calculation of Elia's balancing capacity will be replaced by the LFC BOA and the LFC MEANS as from 1 January 2020.

- **Pursuant to Article 228 §2 FGC, as well as Article 119(1) and Article 6(3)e SOGL, Elia specifies in the LFC BOA the methodology for FRR (aFRR and mFRR) dimensioning, as well as processes related to Load-Frequency Control.**
  - A first version of the LFC BOA has entered into force on 27/08/2019, after public consultation and approval of the CREG
  - The request for amendment is subject to consultation containing a new methodology for the dimensioning of the FRR reserve capacity needs
  - This proposal is compliant with the dimensioning principles in Article 157 SOGL
- **Pursuant to Article 228 §3 FGC, Elia specifies the methodology for the allocation of the FRR reserve capacity needs to Elia's contracted balancing capacity while taking into account reserve sharing and non-contracted reserve capacity in accordance with Article 32 EBGL.**
  - A first version of this document (LFC Means) is subject to the public consultation



Frequency Restoration Reserves (FCR)

Determined by ENTSOe as 78 MW for Belgium in 2020 and published on the website of Elia: https://www.elia.be/en/grid-data/balancing/capacity-volumes-needs

Frequency Containment Reserves (FCR) is the joint responsibility of all TSOs of RG Continental Europe (determined by ENTSO-E)

- Joint action to stabilize frequency after occurrence of an imbalance in the Synchronous Area
- Methodology is specified in the Synchronous Area Operational Agreement (SAOA)

For 2020: total FCR reserve capacity is determined at 3000 MW FCR within RG Continental Europe.

- Simultaneous outage of two of the largest power plants in RG CE.
- Split amongst TSOs is defined by ratio of the (generation + consumption) of the LFC block compared to the (generation + consumption) of the Synchronous Area

Planning

- **Public consultation is organized between October 4 - November 4, 2019 (www.elia.be > public consultations)**
  - **RfA LFC BOA (new dimensioning methodology)**
  - **LFC Means (new document)**
  - Explanatory notes
  - LFC BOA with track changes on former version

Subject to consultation

- **Foreseen to be submitted to CREG mid-November together with consultation report (FR – NL – ENG)**

- **After approval by CREG :**
  - Prolongation of the balancing capacity of 2019 until entry into force T&C BSP mFRR (foreseen on February 3, 2019)
  - New / update of FRR/aFRR/mFRR dimensioning methodology as from entry into force T&C BSP mFRR

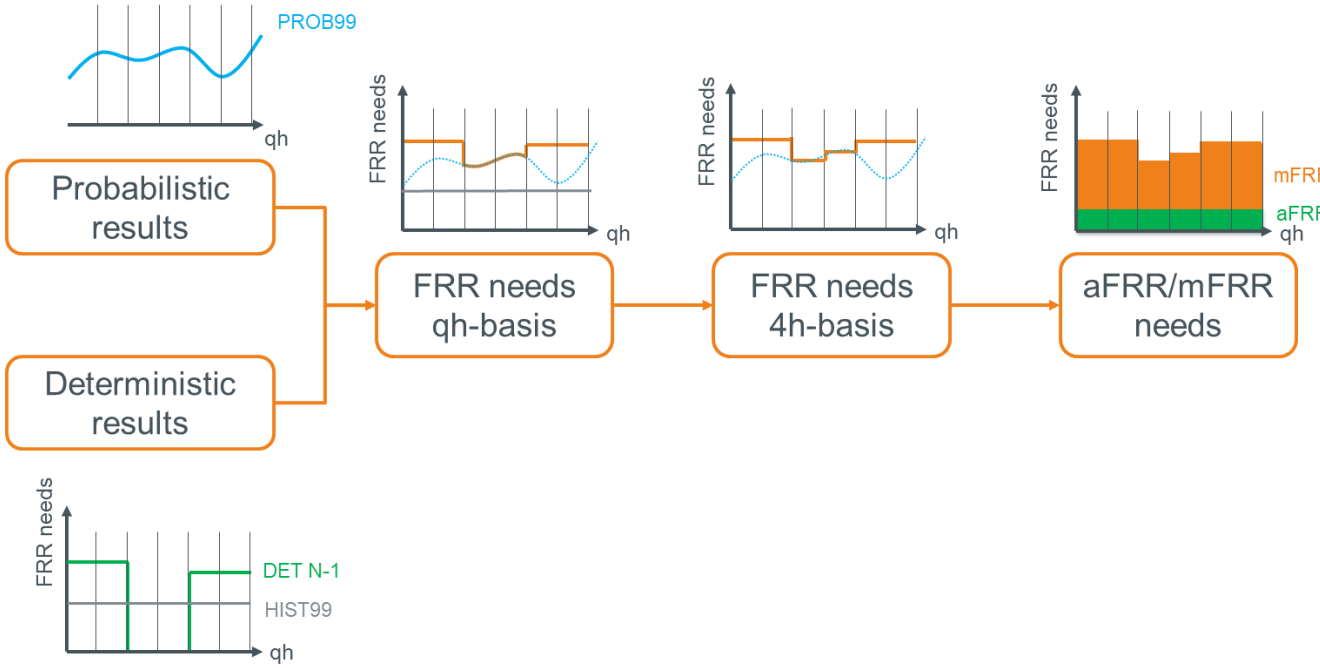
LFC BOA : Methodology for dimensioning the FRR reserve capacity

High level overview of the dynamic dimensioning methodology (1)

A. FRR reserve capacity is determined based on a <u>probabilistic methodology</u> in line with Article 157(2)b of the SOGL covering 99.0% of the LFC block imbalance risks

B. Taking into account two <u>deterministic minimum thresholds :</u>

- Always larger as the dimensioning incident in line with Article 157(2)e and Article 157(2)f
- Always covering 99.0% of historic LFC block imbalances in line with Article 157(2)h and Article 157(2)i



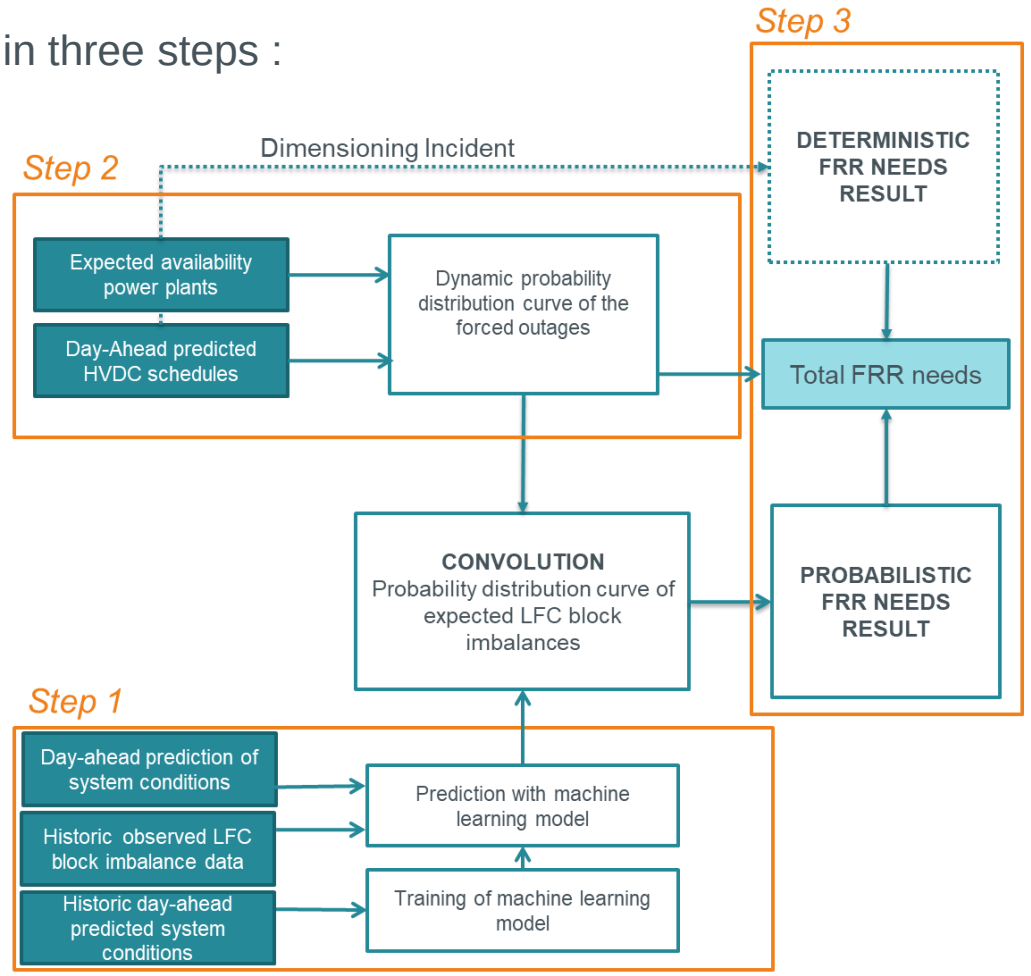
The required positive and negative reserve capacity on FRR is calculated by Elia <u>each day before 7 AM</u> for every period of 4 hours of the next day

High level overview of the dynamic dimensioning methodology (2)

The FRR needs for every quarter-hour of the next day are calculated in three steps :

- **Step 1: calculation of the prediction risk**
  - M-1 training of machine learning algorithms
  - D-1 prediction of the FRR needs
- **Step 2: calculation of the outage risk**
  - D-1 available Pmax of power plants
  - D-1 direction & available Pmax/Pmin of NEMO Link
- **Step 3: calculation of the FRR needs**
  - Convolution of the prediction and outage risk
  - Taking into account the deterministic minimum thresholds
    - ➢ Including the N-1 (dynamic, aligned with outage risk)

Machine learning algorithms are fully described in the LFC BOA and explanatory note



aFRR/mFRR dimensioning method

1. **Still based on the same 'static' methodology as previous years**
   - I.e. cover 79% of expected 15' LFC block imbalance variations
     - based on absolute values (symmetric aFRR dimensioning)
     - upscaling with incremental renewable capacity (and upscaling parameters)
     - **NEW:** time series are aligned with FRR dimensioning (2 years)
   - aFRR needs are found to increase towards 151 MW due to increasing SI variations

2. **Besides other elements which can be improved, the current methodology does take account current quality indicators calculated by ENTSOe concerning ACE / FRCE**
   - Elia is therefore investigating a new methodology for aFRR dimensioning
   - Elia proposes to freeze the aFRR reserve capacity at 145 MW until it can present a new / updated methodology (foreseen for end 2020)

3. **'Dynamic' mFRR needs finally determined over every period of 4 hours as the difference between the FRR needs and aFRR needs**
   - mFRR+ = FRR^{+} - aFRR
   - mFRR- = FRR^{-} - aFRR

In 2018, Elia remained well under the minimum FRCE-criteria set by SOGL and SAOA :

- Level 1: Number of time intervals that 15' average FRCE exceeds 166 MW cannot be larger as 30% of the time
  ➔ < 8% of the time

- Level 2: Number of time intervals that 15' average FRCE exceeds 88 MW cannot exceed 5% of the time
  ➔ < 2% of the time

Although these criteria are likely not the only basis for dimensioning, Elia recognizes that there is a relation which should be investigated.

LFC MEANS : methodology for determining the FRR balancing capacity (to be procured)

Methodology to determine Elia's balancing capacity

Based on the same methodology as previous years

- **Determination of maximum contribution of sharing**
  - Operational contracts with NGET / RTE / TENNET
  - Limitations are set in the LFC BOA (difference between DET N-1 and HIST99)
  - Taking into account the operational constraints (network limitations after ATC ID)

Maximum shared mFRR that can be considered close to guaranteed is determined at:

- mFRR+ : 50 MW
- mFRR- : 350 MW

- **Determination of maximum contribution of non-contracted balancing energy bids**
  - Included 'coordinable' thermal capacity (except for units providing contracted mFRR)
  - Includes storage and bidladder
  - Includes wind power (for downward FRR)

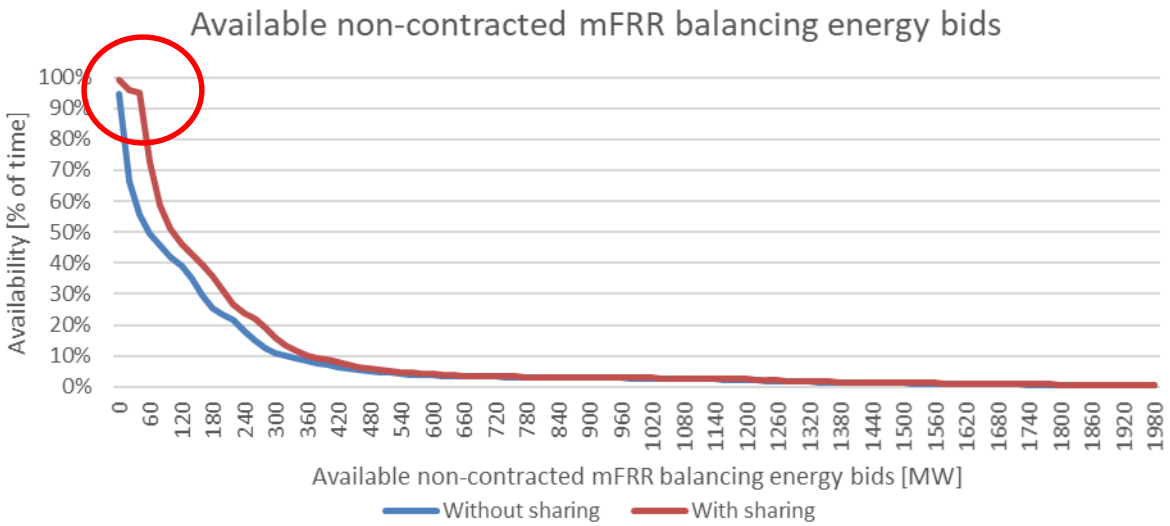
Maximum capacity of non-contracted energy bids mFRR that can be considered is as guaranteed is :

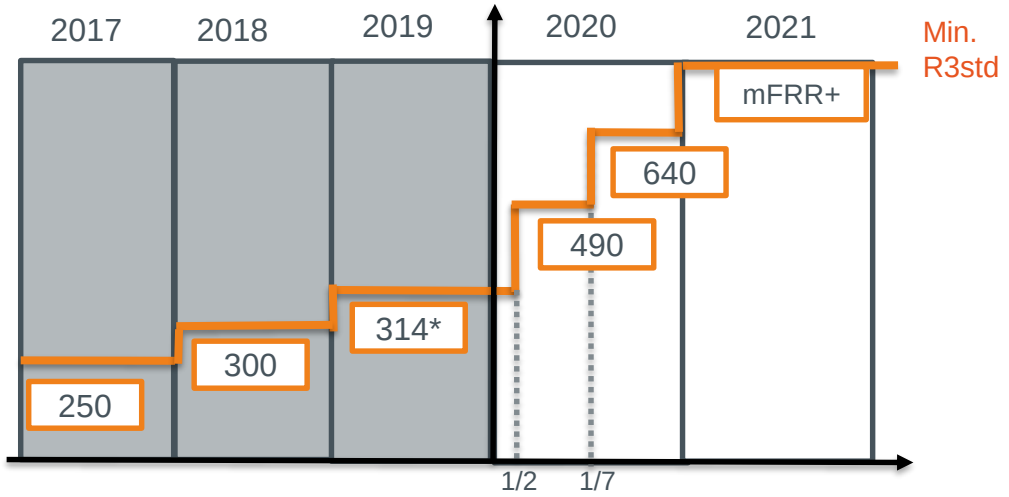
- mFRR+ : close to zero
- mFRR- : substantial

➔ Cfr. next slides

- **Account available ATC ID (sharing) to take into correlations with the non-contracted balancing energy bids**

Minimum volume mFRR standard (+ phase out of mFRR flex)





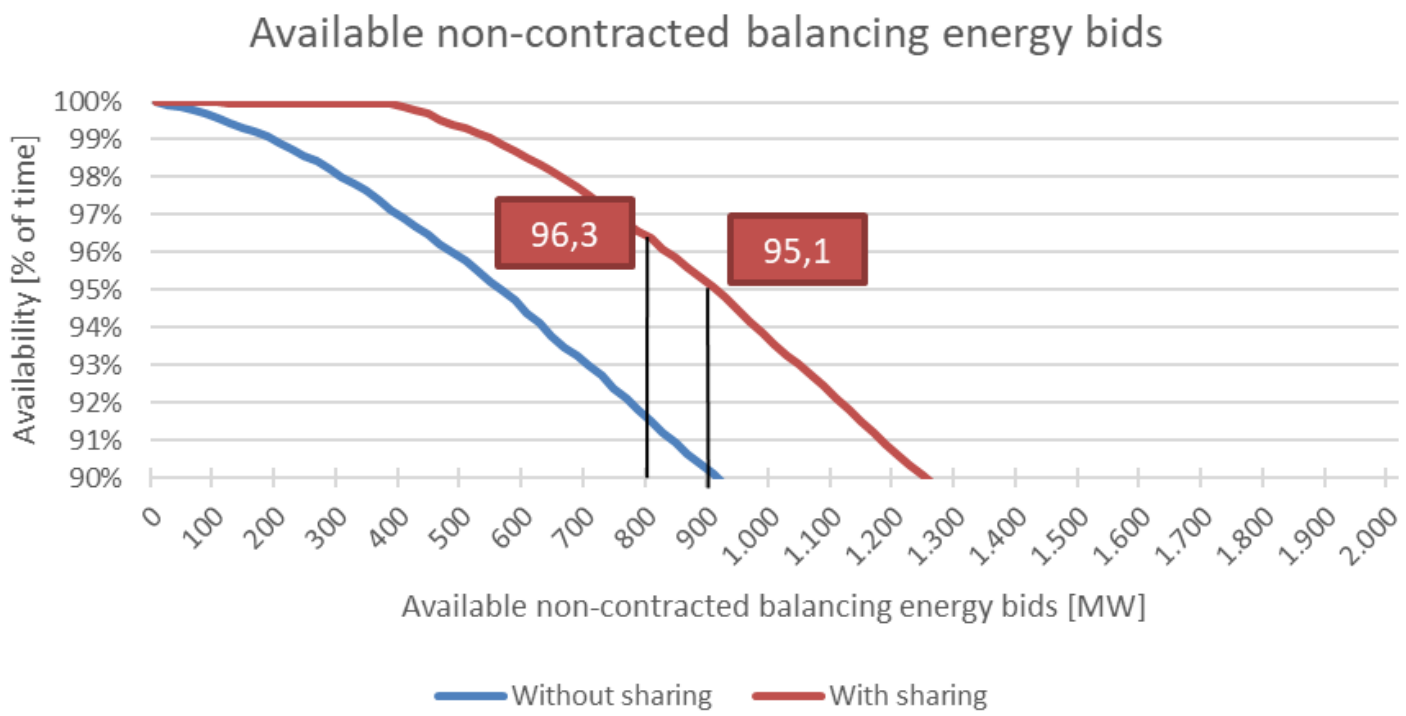
Based on an analysis of historical data between July 2017 to June 2019, the capacity that can be taken into with acceptable reliability is very close to zero.

Taking into account that partial procurement for mFRR is impossible, no non-contracted energy balancing bids can be taken into account in the determination of the balancing capacity

Besides 50 MW of FRR reserve sharing, mFRR needs are covered with mFRR balancing capacity : mFRR standard and mFRR flex

To anticipate the phase out of mFRR flex, the minimum volume for mFRR standard is gradually increased, starting with 490 MW as from entry into force of the T&C BSP mFRR

FRR down : no mFRR^{-} procurement



- Based on an analysis of historical data between July 2017 to June 2019, it is shown that a capacity of 900 MW and 800 MW was available in respectively 95,1% and 96,3% of the time
- In a dynamic dimensioning, Elia concludes coverage of the FRR needs without procuring balancing capacity taking into account expected system evolutions (e.g. Bidladder,…)

(Expected) RESULTS

Determination of the aFRR/mFRR balancing capacity

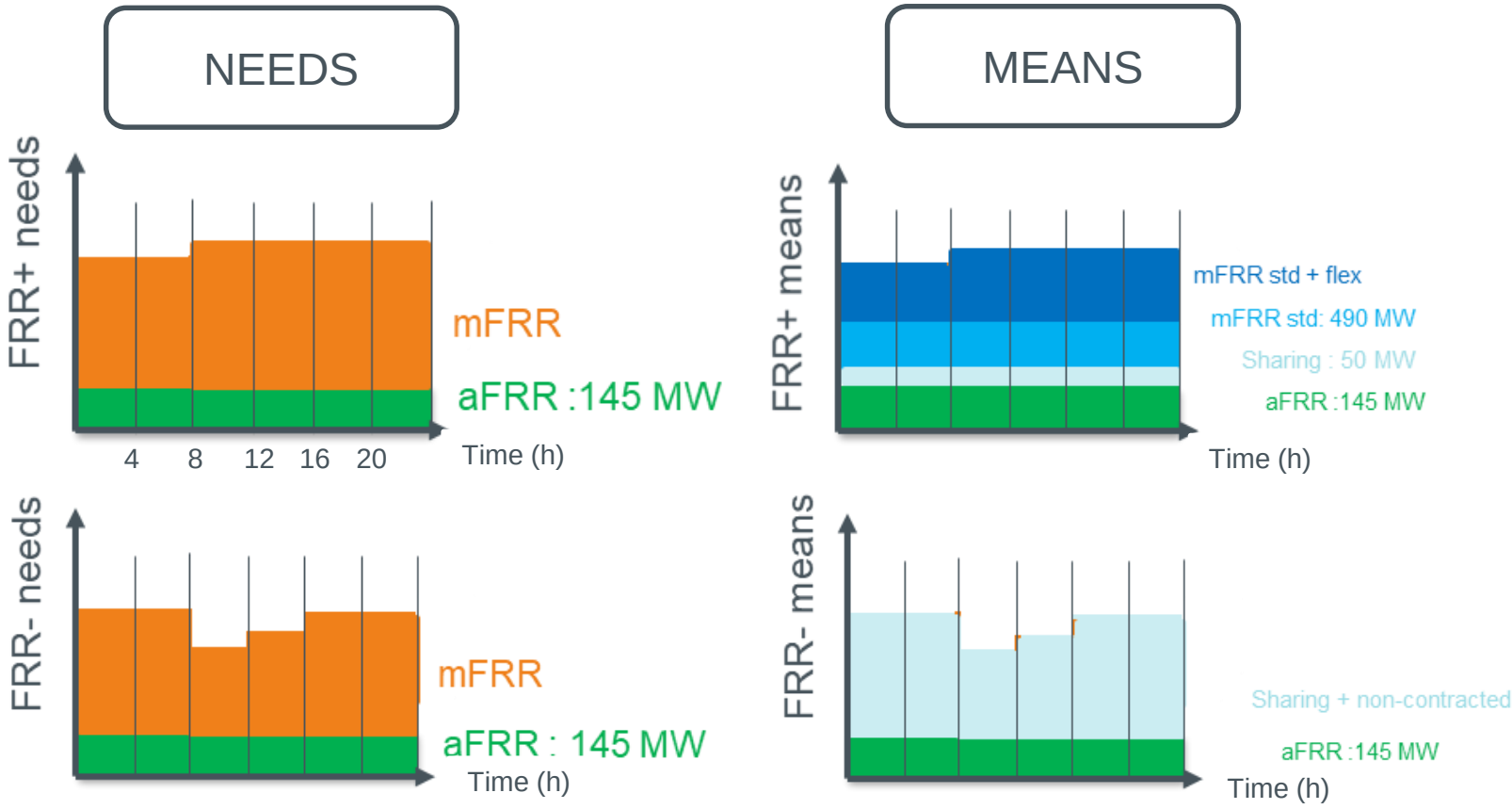
Prolongation of the FRR balancing capacity of 2019 until entry into force T&C BSP mFRR :

- aFRR : 145 MW
- mFRR : 844 MW with a minimum of 314 MW mFRR standard

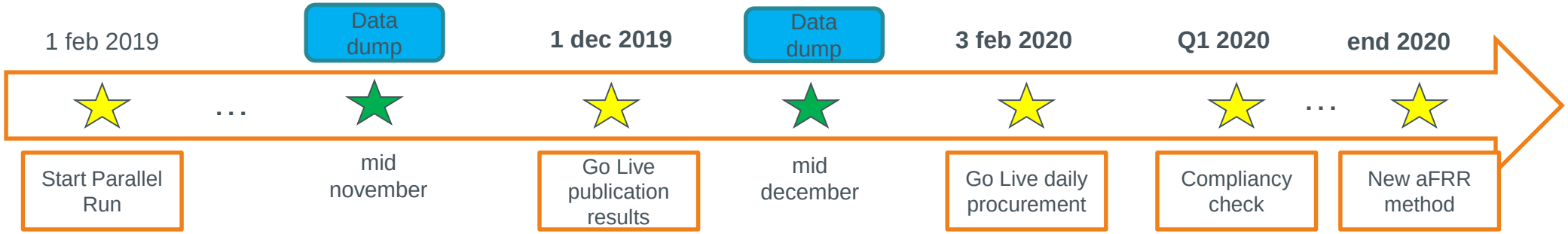
New volumes as from the entry into force of the T&C BSP mFRR :

- aFRR : 145 MW
  - mFRR+ : Dynamic with minimum level* mFRR standard set at 490 MW
  - Minimum level* increased to 640 MW as from July 1, 2020
  - Phase out mFRR flex as from January 1, 2021

**Minimum level cannot exceed the required mFRR balancing capacity*



Next steps

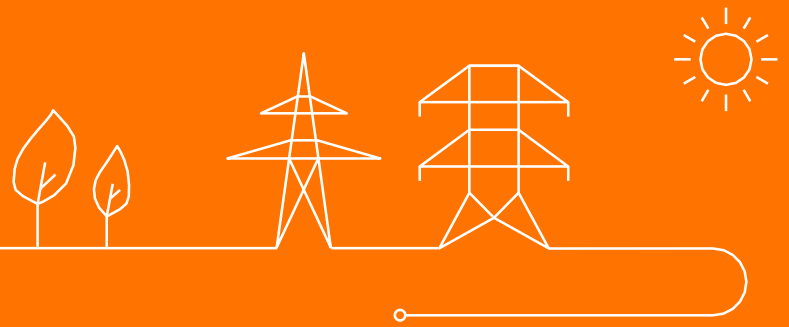


- **Elia will publish a data dump of the parallel run (PROB99, DET N-1, FRR needs) for up- and downward FRR**
  - In order to make a consistent database, parallel run is re-simulated ex post to take into account new parameters proposed in the LFC BOA (e.g. outage probabilities), as well as including corrections and improvements during the parallel run

- **Elia will start publishing day-to-day balancing capacity on the website of Elia as from December 1 (volumes to be contracted)**

3. T&C VSP: Voltage and Reactive Power Control service – Design reminder

Working Group Balancing 23 October 2019



Voltage and reactive Power Ancillary Service - Context and timelines

- New “target” design was proposed for the **voltage and reactive power control ancillary service**
- **Design note** finalized in November 2018 after public consultation

Changes requested in the grid codes and Electricity Law

- Publication of **new FGC** in April 2019

E-law and RGC have not yet been changed

- T&C VSP available by May 2020

Based on target design and in line with current legal framework

- The Go-live is planned in January **2021**

Voltage and reactive Power Ancillary Service – Summary of the New design

➢ The **main changes** introduced in the new design are (// design note 2018):

Subject – New grid codes	AS IS	Target design
Contracting process	Tender	Not specified
Role	/	Voltage Service Provider
Contract	Non Regulated	Regulated
Service provision	Voluntary	Mandatory for: - New PGM, SPGM, PPM, SPM type C, D - Existing units type C, D and some type B - HVDC interconnections
Volume to be provided	No obliged volume	"Technical capacity"
Voluntary participants	All participants voluntary	Transmission-connected DSO, CDS, demand facilities on top of obliged partie

Subject – E-law	AS IS	TO BE
Contracting process	Tender	Tender or standard contract
Prices	Free prices with possibility of Royal Decree	Regulated price(s)

Subject - Others	AS IS	TO BE
Remuneration	Delivered MVAr	Requested MVAr*
Relation with MVAr tariff	/	Access point holder pays tariff + correction in case of activation of the service ➔ Mutual agreement between ACH and VSP behind a same Access Point*
Penalty	Proportional to non delivered MVArs	Administrative penalties if the service is not correctly delivered

* In agreement with "solution 1" presented in Chapter 8 of the design note

Voltage and reactive Power Ancillary Service – Status of the New design

- The new **Federal Grid Code and general requirements** are available
- **Electricity Law (Art. 12 quinquies) and Regional Grid Code did not change**

✓

Subject – New grid codes	AS IS	TO BE
Contracting process	Tender	Not specified
Role	/	Voltage Service Provider
Contract	Non Regulated	Regulated
Service provision	Voluntary	Mandatory for transmission-connected : - New PGM, SPGM, PPM, SPM type C, D - Some existing units type B, C, D and (see next slide) - HVDC interconnections
Volume to be provided	No obliged volume	"Technical capacity"
Voluntary participants	All participants voluntary	Open to demand facilities, DSO and CDS (see next slide)

✕

Subject – E-law	AS IS	TO BE
Contracting process	Tender	Tender or standard contract
Prices	Free prices with possibility of Royal Decree	Regulated price(s)

✓

Subject - Others	AS IS	TO BE
Remuneration	Delivered MVAr	Requested MVAr*
Relation with MVAr tariff	/	Access point holder pays tariff + correction in case of activation of the service ➔ Mutual agreement between ACH and VSP behind a same Access Point*
Penalty	Proportional to non delivered MVArs	Administrative penalties if the service is not correctly delivered

A **tender** will be launched for 2021 but with **mandatory bidding at free prices** and the possibility of royal decree

Voltage and reactive Power Ancillary Service – Participation

	Grid user	Federal level		Regional level	
		Participation	FGC articles	**Participation**	General requirements rfG
Elia grid	New Type B,C,D SPGM	Obliged	Art. 89 +234	Obliged	Art. 4.3.1/5.5.1/-
	New Type B,C,D PPM	Obliged	Art. 93 & 99 +234	Obliged	Art. 4.4.2/5.6.2/-
	New Type B, C, D SPM	Obliged	Art. 93 & 99 +234	Voluntary	No RGC yet
	New HVDC interconnector	Obliged	Art. 104 +234	n.a.	
	New generators connected on a HVDC link	Obliged	Art. 106 + 234		
	New HVDC conversion stations at isolated extremity	Obliged	Art. 107 +234		
	New offshore generators with onshore connection points	Obliged	Art. 117 & 118 +234		
	New offshore generators with offshore connection points	Obliged	Art. 130 & 131 +234		
	Existing generator type C,D	Obliged	Art. 62 to 68 +234	Voluntary	No RGC yet
	Existing generator type B **that have already provided the service**	Obliged	Art. 62 to 68 (To be agreed with system operator) +234	Voluntary	
	Direct clients demand facilities	Voluntary	Art. 234	Voluntary	
Non- Elia grid	DSO	Voluntary	Art. 234		
	CDSO	Voluntary	Art. 234		

Voltage and reactive Power Ancillary Service – Voltage Service Provider

- The VSP should be the de facto provider of the MVAR service towards Elia
- According to **Art. 234 of the FGC**, the VSP is
  - The grid user
  - Any third party designated buy the Grid User following a designation procedure

VSP role

Technically: help Elia regulate voltage by managing third party assets

Contractually: Be the contractual counterpart for delivery of AS v-à-v Elia

Operationally: operate assets to provide the service

Financially: Receive remuneration & pay penalties

Voltage and reactive Power Ancillary Service – Remuneration

Subject - Others	AS IS	TO BE
Remuneration	Delivered MVAr	Requested MVAr*

- New remuneration principle based on the theoretical requested MVArs
- Computation of requested MVARs based on:
  - Measurement of the voltage at Access point
  - Technical characteristics of the delivery point (droop curve)
  - Manual activation requested by Elia

Voltage and reactive Power Ancillary Service – Link with MVAr tariff

Subject - Others	AS IS	TO BE
Relation with MVAr tariff	/	Access point holder pays tariff + correction in case of activation of the service ➔ Mutual agreement between ACH and VSP behind a same Access Point
Penalty	Proportional to non delivered MVArs	Administrative penalties if the service is not correctly delivered

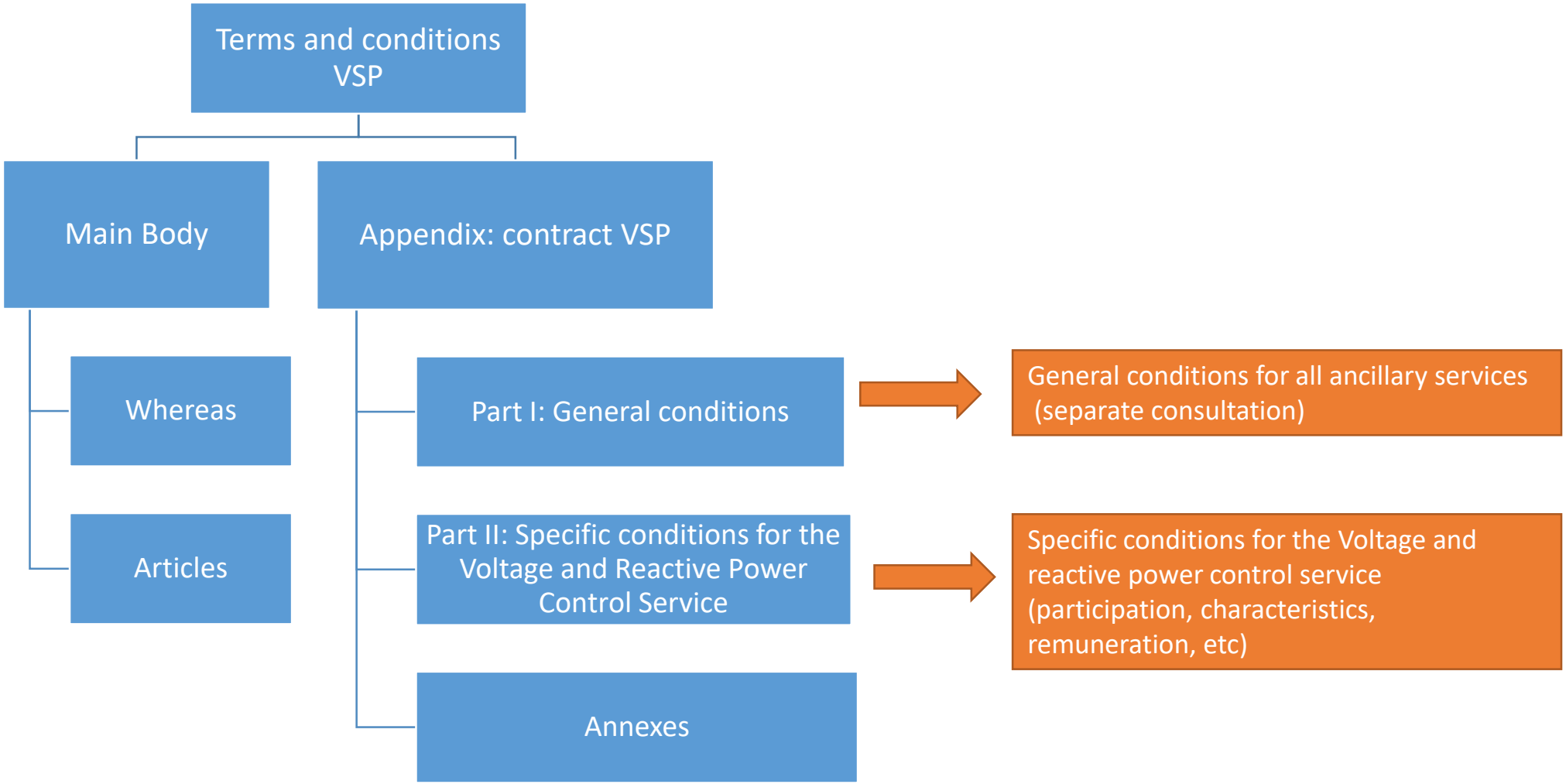
Relation with MVAr tariff

- Specific case when a ACH and a VSP are behind the same access point (e.g. CDS with a local production)
- A mutual agreement between ACH and VSP behind a same Access Point is necessary

Penalty mecanism

- The tariff will be applied to access points with offtake **and** injection of active power including access point providing the Voltage and Reactive power control service
- A party could face to a **double penalty** if it is subject to tariff and activation control penalty for the Voltage and Reactive power control service
- Design proposal: The penalty of the activation control of the MVAr ancillary service will be adapted. Administrative penalties will be applied in case of non-respect of the MVAr service specifications.

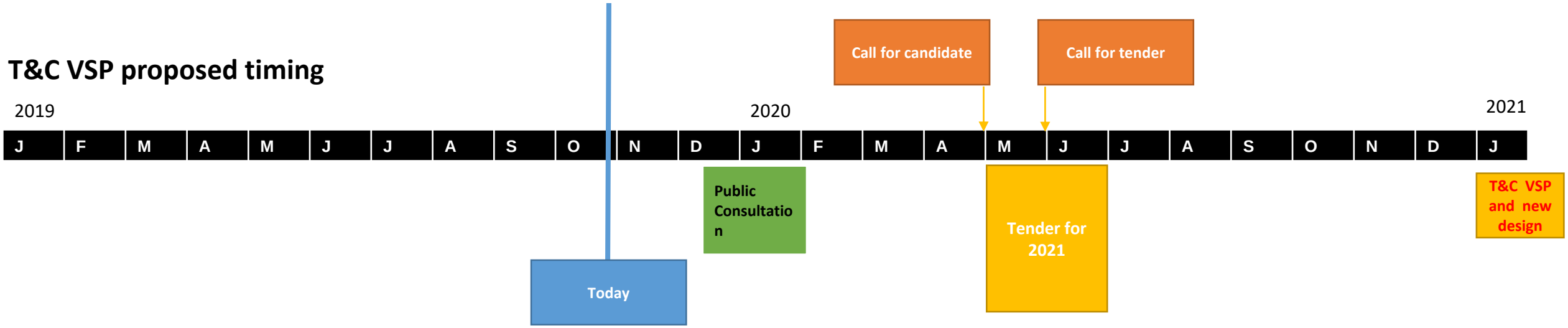
T&C Voltage Service Providers – Structure



T&C VSP: indicative Planning

- ✓ **T&C VSP will include the new design for the voltage and reactive power control ancillary service**
- ✓ **Public consultation of the T&C VSP is planned in January 2020 (at least 4 weeks)**
- ✓ **Tender for 2021 will take place in May 2020**

T&C VSP proposed timing



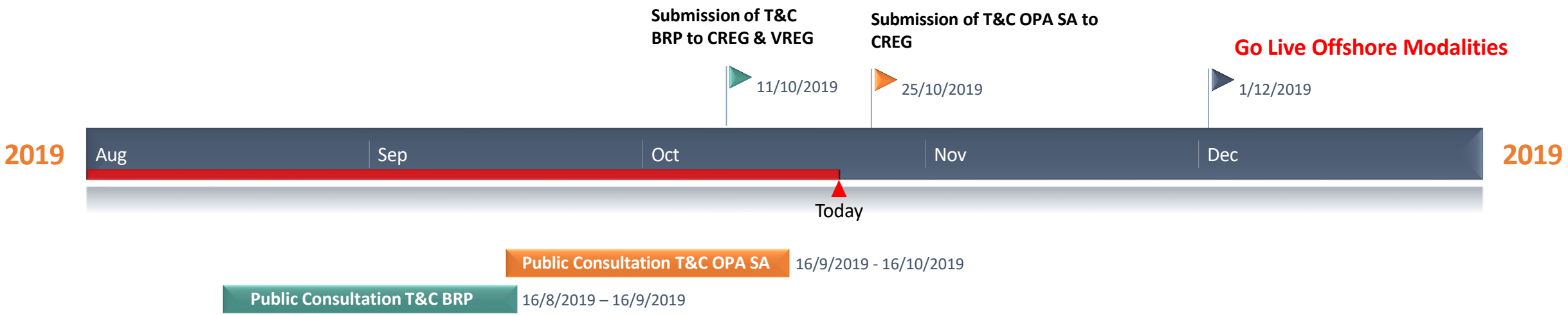
4. Status updates

Working Group Balancing 23 October 2019

4. Status updates – Offshore integration

Working Group Balancing 23 October 2019

Offshore Integration: status and timings



On request of market party and as the timing is quite short, Elia proposes to postpone the go-live of the offshore modalities **to the 1st of December 2019** in its proposal to the CREG

Offshore Integration: Publication of storm events

- ✓ **Publication of storm events**
  - As soon as a storm event is detected in the next 36h, a **storm alert** will be communicated
    - On the Elia website (“Wind-power generation data” webpage)
    - Via a RSS feed
    - On JAO website
  - Updates of the storm alerts will be available on the Elia website
  - Storm event **timings** (cut-out and cut-in phase) and **total storm impact per quarter-hour** will be published on the Elia website

Current selection

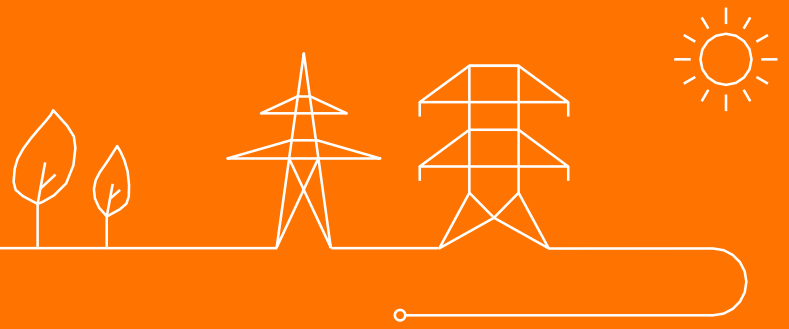
Export

Storm Alert Wind Power Generation Drop

Start time	End time	Drop (MW)
2019-09-11 16:30	2019-09-11 16:45	50,00
2019-09-11 16:45	2019-09-11 17:00	50,00
2019-09-11 17:00	2019-09-11 17:15	50,00
2019-09-11 17:15	2019-09-11 17:30	50,00
2019-09-11 17:30	2019-09-11 17:45	50,00
2019-09-11 17:45	2019-09-11 18:00	50,00
2019-09-11 18:00	2019-09-11 18:15	20,00
2019-09-11 18:15	2019-09-11 18:30	20,00
2019-09-11 18:30	2019-09-11 18:45	20,00
2019-09-11 18:45	2019-09-11 19:00	20,00
2019-09-11 19:00	2019-09-11 19:15	70,00
2019-09-11 19:15	2019-09-11 19:30	70,00
2019-09-11 19:30	2019-09-11 19:45	70,00
2019-09-11 19:45	2019-09-11 20:00	70,00
2019-09-11 20:00	2019-09-11 20:15	70,00
2019-09-11 20:15	2019-09-11 20:30	70,00
2019-09-11 20:30	2019-09-11 20:45	70,00
2019-09-11 20:45	2019-09-11 21:00	70,00
2019-09-11 21:00	2019-09-11 21:15	70,00
2019-09-11 21:15	2019-09-11 21:30	70,00
2019-09-11 21:30	2019-09-11 21:45	70,00
2019-09-11 21:45	2019-09-11 22:00	70,00

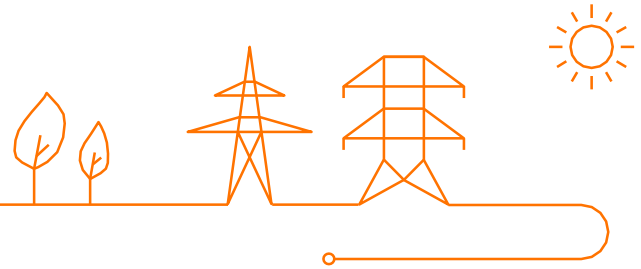
4. Status updates – mFRR 2020

Working Group Balancing 23 October 2019



Agenda

1. Public consultations & planning
2. Proposal T&C under consultation
   - Specific point: New design proposal “MW not made available” penalty (mFRR + aFRR)
3. Proposal Balancing Rules under consultation



Public consultations launched

Request for amendment of T&C BSP mFRR version 1 (June 2018) received from CREG on 3 October 2019 (CREG decision (B)2000)

PLANNING:

T&C BSP mFRR	Balancing Rules
Public consultation (link) 4 October – 4 November	**Public consultation (link)** 11 October – 8 November
Working Group Balancing 27 November Present status & consultation feedback	
Submission to CREG by 3 December	
For go live February 2020: **CREG decision** expected by end December 2019	
Proposed Go-live new mFRR 2020 3 February: first daily capacity auction 4 February: first energy bidding/delivery	

Proposal Balancing Rules under consultation

Main changes compared to current version (from 1/12/2018):

- Delete paragraphs added in the previous version for **the winter product** (Slow non-CIPU)
- Coherence with new **Federal Grid Code** (mainly update of article numbers)
- Coherence with **LFC Block Operational Agreement**
- Modifications in line with the proposal for the **tariffs 2020-2023**
- Update in accordance with new timings for regional auctions for **FCR**
- Small change **imbalance netting** in accordance with implementation framework (expected NRA approval January 2020)
- Updates with respect to **Transparency** & Monitoring

! Intermediary version: changes introduced for mFRR because of regulated T&C but still non-regulated GFA for FCR and aFRR.

Public consultation webpage: proposal Balancing Rules + supporting document

https://www.elia.be/en/public-consultation/20191011-consultation-publique-balancing-rules

Proposal T&C under consultation

Main changes since version 1 (June 2018):

- Important evolutions
- New design proposal for “R3 2020”
- Change in T&C structure
- Update in terminology and alignment with other regulation

For more information: see slides workshop 23/9/2019 on

https://www.elia.be/en/electricity-market-and-system/system-services/keeping-the-balance/mfrr

Public consultation webpage: proposal T&C BSP mFRR + supporting document

https://www.elia.be/en/public-consultation/20191004-public-consultation-on-the-terms-and-conditions-for-the-mfrr

Specific point
New design proposal “MW not made available” penalty (mFRR + aFRR)

$$P_{mFRR\ Made\ Available}(Month\ M) = \sum_{All\ CCTU\ of\ Month\ M} P_{mFRR\ Made\ Available}(CCTU)$$

$$P_{mFRR\ Made\ Available}(CCTU) = \#CCTU_{non-compliant} * MW_{not\ made\ available} * CP_{WA}$$

- Elia adapted the proposal based on the feedback from the stakeholders during the workshop on 23/9.
- New proposal:
  - Penalizes the actual volumes of “MW not made available” (and not an average value per day)
  - Makes the distinction between ‘rare events’ and ‘structural occurrences’ of not offering in line with the obligation

Example (supporting document) : penalized volume

	qh	obligation	energy bid	MW not made available per qh	Total MW not made available	Total MW not made available Per hour
CCTU 2	49	100	0	100	100	25
	50	100	100	0		
	51	100	100	0		
	52	100	100	0		
	53	100	100	0		
	54	100	100	0		
	55	100	100	0		
	56	100	100	0		
	57	100	100	0		
	58	100	100	0		
	59	100	100	0		
	60	100	100	0		
	61	100	100	0		
	62	100	100	0		
	63	100	100	0		
	64	100	100	0		

	qh	obligation	energy bid	MW not made available per qh	Total MW not made available	Total MW not made available Per hour
CCTU 3	49	100	0	100	1600	400
	50	100	0	100		
	51	100	0	100		
	52	100	0	100		
	53	100	0	100		
	54	100	0	100		
	55	100	0	100		
	56	100	0	100		
	57	100	0	100		
	58	100	0	100		
	59	100	0	100		
	60	100	0	100		
	61	100	0	100		
	62	100	0	100		
	63	100	0	100		
	64	100	0	100		

Example (supporting document): penalty price

Day	CCTU	Awarded Capacity (MW) mFRR Standard	Price (€/MW/h)	(€/h)
D	1	100	€ 3,00	€ 300
D	2	100	€ 3,20	€ 320
D-1	1	90	€ 3,00	€ 270
D-5	1	50	€ 3,30	€ 165
D-5	3	50	€ 4,80	€ 240
D-5	4	50	€ 5,20	€ 260
D-5	5	50	€ 6,00	€ 300
D-6	1	60	€ 2,80	€ 168
D-10	1	100	€ 2,70	€ 270
D-10	2	100	€ 4,60	€ 460
D-10	3	100	€ 6,50	€ 650
D-10	4	100	€ 8,90	€ 890
D-18	2	80	€ 4,80	€ 384
D-18	3	80	€ 5,10	€ 408
D-18	4	80	€ 8,50	€ 680
D-18	5	80	€ 7,30	€ 584
D-29	1	100	€ 3,00	€ 300
D-29	2	100	€ 3,50	€ 350
D-29	3	100	€ 4,80	€ 480
D-29	4	100	€ 7,50	€ 750
D-29	5	100	€ 6,20	€ 620
D-29	6	100	€ 5,00	€ 500
Total =		**1870**		**€ 9.349**

Weighted average price = [€9.349]/ [1870 MW/h] = € 5,00

The financial value of the penalty is based on the **concerned BSP**'s average **balancing capacity price** for awarded mFRR Capacity the concerned mFRR Capacity **Product** (mFRR Standard or mFRR Flex) during the **last 30 days**. The average is a **weighted average**: the volume of awarded capacity for CCTU(x) serves as a weight for the price of awarded capacity for CCTU(x) in order to determine the average price for the CCTU's of the entire period.

Exception: for a **BSP without awarded capacity** in the concerned period of 30 days, the penalty price is equal to the **average price of the capacity auction** corresponding to the CCTU(x)

Example (supporting document): penalty calculation

Penalty if no previous days with "MW not made available"

Penalty CCTU 2

= 2 * 25 MW/h * €5/MW/h

= €250

Penalty CCTU 3

= 2 * 400 MW/h * €5/MW/h

= €4000

Penalty if 10 CCTU with "MW not made available" during 29 previous days

Penalty CCTU 2

= (10 + 2) * 25 MW/h * €5/MW/h

= €1500

Penalty CCTU 3

= (10 + 2) * 400 MW/h * €5/MW/h

= €24000

Specific point
Adapted factors for “Missing MW” penalty (mFRR + aFRR)

- Adapted together with review of the “MW not made available” penalty (see previous slide).
- Return to original philosophy in **a**FRR design note: alpha for 1st failed availability control = half of the alpha for the 2nd failed availability control

PREVIOUS PROPOSAL

- Alpha:
  - **MW made available: alpha = 1**
  - **Missing MW:**

    1,2 (penalty for 1st failed availability control)

    1,5 (penalty for 2nd failed availability control)

NEW PROPOSAL

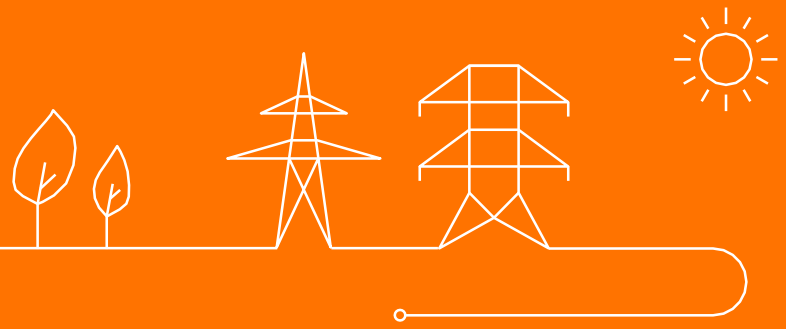
- Alpha:
  - **MW made available: ‘no more alpha’ (see previous slide)**
  - **Missing MW:**

    0,75 (penalty for 1st failed availability control)

    1,5 (penalty for 2nd failed availability control)

4. Status updates - iCaros

Working Group Balancing 23 October 2019



Public Consultation - focus on translating current design (focus PGM ≥ 25 MW) to new roles and responsabilities specified in SOGL (not in line with iCAROS design) - submission end Oct 19

1. Public consultation
   - Two // public consultations
     - A public consultation regarding the Terms and Conditions for Outage Planning Agent (T&C OPA), Terms and Conditions for Scheduling Agent (T&C SA) and the Rules for Coordination and Congestion Management.
     - A public consultation regarding the general conditions that will apply for the Terms and Conditions for all ancillary services.
   - Timing of public consultation : 16/09 until 16/10/2019
   - WS iCaros with market parties 25/09/19
2. Submission of revised Terms and Conditions for Outage Planning Agent (T&C OPA), Terms and Conditions for Scheduling Agent (T&C SA) and the Rules for Coordination and Congestion Management based on public consultation 25/10/2019 to CREG

Terms & Conditions OPA / SA

Non-regulated Contracts

General Terms and Conditions for Ancillaries and Grid Losses

- CIPU Contract
- CIPU Offshore Contract

Regulated Contracts

T&C OPA

Contract OPA

- General Conditions
- **Specific Conditions OPA**
- **Annexes (incl. Party specific information)**

T&C SA

Contract SA

- General Conditions
- **Specific Conditions SA**
- **Annexes (incl. Party specific information)**

- ✓ Transposition of current CIPU Contracts rules and obligations to new Contracts OPA and Contracts SA in line with the roles and responsabilities set in SOGL
- ✓ No change of the AS IS procedures, Elia tools or IT connections to the Elia tools

Summary of submitted T&C OPA (including OPA Contract) and T&C SA (including SA Contract)

- **Regulation of planning, scheduling and redispatching** : transposition of current non-regulated CIPU Contract to regulated OPA and SA

- **Use of new SOGL terminology**

- **Fusion of CIPU and CIPU Offshore in the respective OPA and SA Contracts**

- **Integration of one novelty :** storm risk integration as specified in articles 245 and 252 of the Federal Grid Code

- **BRP still plays roles of OPA and SA during this first step of transition to the final target (in the iCAROS design)**

Summary of submitted Rules for Coordination and Congestion Management

Concretely:

1. Rules for the Coordination of Technical Units — TITLE 3
   - Procedure before D-1: outage planning, MR/MNR
2. Rules for the National Management of Congestion — TITLE 4
   - Procedure in D-1/ID: means for Remedial Actions, compensation mechanism, Red zones
3. Rules for the international Management of Congestion and coordination interconnections* — TITLE 4 Art. 15
4. Overview of publication and reporting regarding Congestion Management — TITLE 5

* as far as not described in European methodologies implemented in accordance with SOGL or CACM or if related to aspects to be defined on a national level in support of those European methodologies;

Individual feedback received in writing to public consultation

- 4 responses – all non confidential
  - Febeliec
  - Febeg
  - Belgian Offshore Platform
  - Statkraft

5. aFRR Capacity tender

Working Group Balancing 23 October 2019

Current proposal for the aFRR capacity tender

Two-step approach for the aFRR capacity tender

- **Methodology:** 2 step approach:
    - Step 1: **intermediate step**
      @ D-2 (only business days): independent total cost optimization for the 24-hour block for aFRR up and aFRR down together (e.g. 130MW)
    - Step 2: **target model**
      @ 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:**
    - Rules to increase or decrease the volume to be sourced in step 1 and step 2

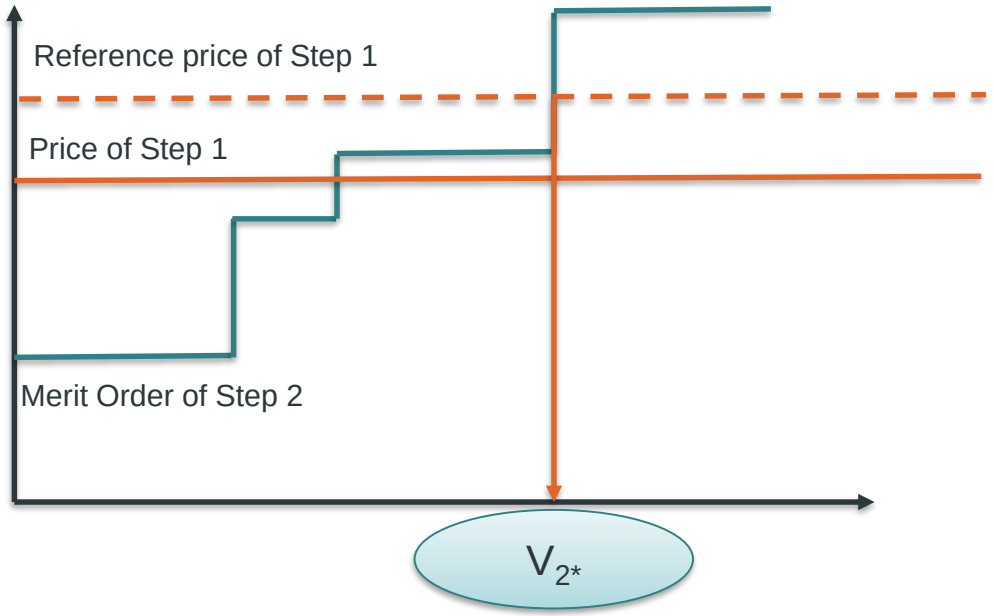
Reminder: The global objective is to evolve to the target model (Step 2) in a cost efficient way while enabling new entry in the aFRR market.
After 1 year an evaluation is foreseen to check whether :
→ whether there is a fair competition between step 1 & step 2
→ whether there are no undue market entry barriers

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:



Calculation to be performed:

- For each 4-hour block
- For each direction

Interpretation of V_{2*}

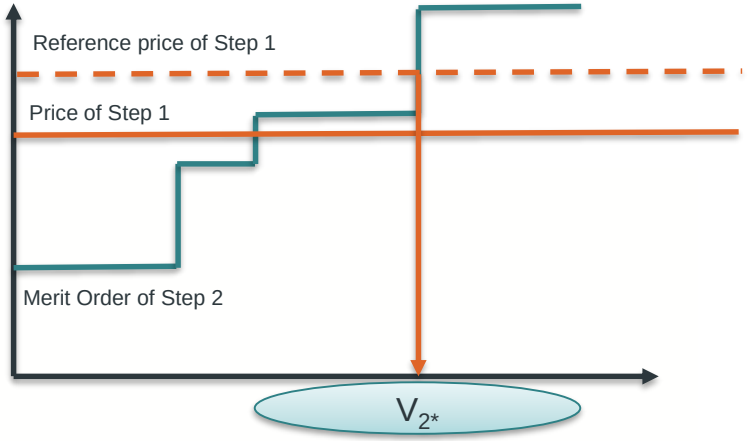
Volume that should have been sourced in step 2, taking into account the price of step 1 and the bidding curve of step 2

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

Calculation of V_{2*} for a specific block of 4-hour of day D.

- Merit order of step 2 of the concerned block of 4 hours of day D
- Price of step 1 is the price of the most expensive selected bid of step 1 of day D
- Reference price of step 1 → increase of “Price of Step 1 of day D with 20%.

Volume allocation rule (2)



- $V_{2,*}$ is calculated:
  - For each direction (upwards and downwards <u>separately</u>)
  - 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 x days

- $V_{2*,avg}$ = average volume of the last days
  - Volume for weekdays from Monday to Friday: the last **<u>10 weekdays</u>** are considered

    → average based on 6 * 10 V_{2*} values per direction
  - Volume for week-end/bank holidays: the last **<u>4 week-end days/ bank holidays</u>** are considered

    → average based on 6 * 4 V_{2*} values per direction

- **$V_{2,new} = V_{2*,avg}$**

New volume to be sourced in Step 2

Feedback stakeholders
informal consultation on volume allocation

Received Feedback

Elia has received Feedback of the following stakeholders:

- Centrica
- FEBEG
- FEBELIEC
- Next Kraftwerke
- Rent-a-Port

Feedback on the two-step approach

Feedback of stakeholders:

- Stakeholders appreciates the evolution towards a more balanced aFRR design and supports the two-step approach.
- The two-step approach is seen as a good compromise for allowing the development of new entrants and to keep the cost increase limited (a strong cost increase of the cost of the aFRR capacity tender would be unacceptable for certain stakeholders).
- Elia has received other alternatives for Step 1 (e.g. a combination of merit order selection and total cost)

Feedback Elia:
For Elia and most of the stakeholders the implementation of the two-step approach remains the best choice. All stakeholders consider the last proposition as acceptable.

Sometimes alternative propositions are suggested by stakeholders for step 1 which are not feasible (too complex without clear added value). Step 1 is only an intermediate solution which should disappear on mid-term.

Feedback on the volume allocation rules

Feedback stakeholders on the minimum volume of 10MW in Step 2:

- For some stakeholders, the minimum volume of 10MW in Step 2 is too low and should be increased. A price cap could be added to limit the risk of cost increase.
- Other stakeholders are concerned about the minimum volume as this volume could need to be procured at a very high cost.

Feedback Elia:
Elia is of the opinion a starting value of 10MW in Step 2 is sufficient to open the market for new entrants. If proven competitive, the volume of Step 2 will quickly increase.

Feedback on the volume allocation rules

Feedback Stakeholders on the calibration of the volume V2*:

- Proposal to calibrate the volume V2* based:
  - on the average price and not on the marginal price of Step 1 and to even decrease the mark-up of 20%.
  - On a volume weighted ceiling for additional MWs added to Step 2 (starting at 50% and going down to 0%) in stead of a fixed value.
- Elia has received a remark that the obligation to bid in the non-selected volume of Step 1 to Step 2 is very difficult for CCGTs that are not running. The start-up and must-run costs must be determined on 1MW which leads to extremely high prices and this lead to complicated calculations.
  In order to ensure sufficient liquidity in Step 2, it is proposed to add a rule a rule creating minimal overcapacity on the offered volume on each of the 4-hour blocks before increasing the volume should allow enough liquidity on the 4-hour blocks.

Feedback Elia:

Step 2 is the long-term vision to which Elia aims to converge so all type of assets should adapt their bidding strategy for Step 2.

The creation of a minimal overcapacity before the volume in Step 2 can be increased is suboptimal and will lower the volume increase in Step 2. This is not acceptable.

The “mark-up” of 20% will be kept to support the development of the target model. It is logical to apply this mark-up of 20% on the most expensive selected bid of Step 1.

Feedback on the volume allocation rules

Feedback of stakeholders on the volume allocation to step 2

- Some stakeholders appreciates the bidirectional system for the volume allocation
- For others, all volumes should be shifted to step 2 at the latest at the end of 2020 and the volume decrease of step 2 should remain exceptional.
- Most of the stakeholders ask a monitoring of the aFRR capacity tender (prices, volume, bidding behaviour, …)

Feedback Elia:

Due to the price increase of 20% of the reference price of Step 1, an increase of volumes in Step 2 will be encouraged. However, a decrease of the volume in Step 2 should still be possible.
Elia confirms that Step 2 is the target model and that hence volumes sourced via step 2 should gradually increase over time.

The market shall be closely followed up and a revision of the proposed design need to be considered when it appears that bidding behavior is blocking an efficient market functioning between step 1 & step 2. At least a re-evaluation needs to be done after one year

Other topics

- Feedback of stakeholders on the GCT of Step 1:
  To put the gate closure time for the step 1 on 16h00.

Feedback Elia:
Elia is currently investigating the possibility to shift it to 16h00.

- Elias has received feedback on other topics than the aFRR capacity tender

→ The goal of the informal consultation was to receive remarks on the volume allocation rules. Other remarks will be answered during the consultation of the T&C BSP aFRR (if remarks are re-introduced).

Conclusions

The objective is to gradually evolve in a cost efficient way to the **target model (Merit Order with 6 time 4 hours blocks)**. The proposed solution should avoid undue barriers for new entrants to start delivering aFRR.

Elia believes the **2-step approach is the right way forward** and will propose this in the formal consultation process of the T&C aFRR since it is a good compromise solution accepted by all stakeholders.

To provide comfort about the longer term vision, Elia will in the framework of the public consultation confirm the target model.

<u>Updates:</u>

- Make explicit that the market should be closely followed up and a revision of the proposed design need to be considered when it appears that bidding behavior is blocking an efficient market functioning. At least a re-evaluation need to be done after one year
- Elia is investigating a GCT of Step 1 at 16h00.

Additional information

Additional information

Elia has published an example of the profiles for the simulation test on the website of Elia

Automatic Frequency Restoration Process (aFRR/R2)

By offering balancing flexibility for automatic activation, Balancing Service Providers (BSPs) enable Elia to restore frequency.

Elia uses **the secondary reserves** (R2/aFRR) on a continuous basis in both directions to restore a frequency of 50 Hz.These reserves have a fast response time is quick and remains active as long as necessary.

Product design

The flexibility used for automatic frequency restoration must comply with the aFRR design. It differs from the FCR and th mFRR balancing services primarily in the fact that **Elia activates aFRR automatically by sending a set-point every eight seconds** and that the requested energy is to be activated **within 7.5 minutes.**

A grid user supplying secondary reserves must therefore **be equipped to communicate** with the Elia dispatching center.

General balancing page

Relevant documents

Design note

aFRR workshop (23/09/2019)

Example of the profile for simulation test aFRR

6. Publication of close to real-time data

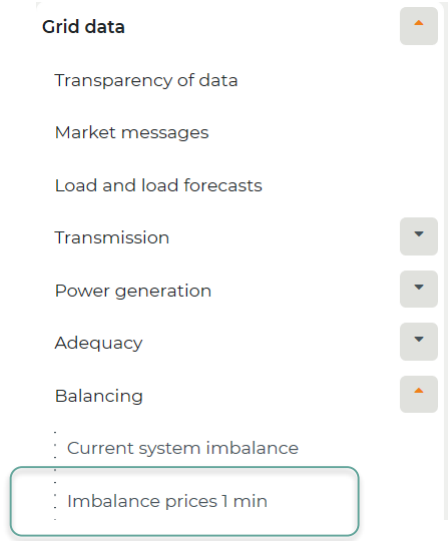
Working Group Balancing 23 October 2019

Publication of close to real-time data.

Elia has launched this publication on the 27th of August:

- **Cumulative activated** volumes (on top of the already existing instantaneous values) and **prices.** The publication of both prices and volumes can be found here.
- **Cumulative imbalance prices** and its components which are available here.
- This information can also be consulted in the **B2B services**.
- In the course of September, it is made possible to export the data on the **data download** webpage. The data is available from the 1st of September on.

Publication of close to real-time data.



Publication of the imbalance prices and its components on a 1 minute basis

Situation at 21/10/2019 from 16:56 to 17:54

Quarter	Minute	Quality status	NRV (MW)	SI (MW)	α (€/MWh)	MIP (€/MWh)	MDP (€/MWh)	SR (€/MWh)	SI < -I C (MW)	POS (€/MWh)	NEG (€/MWh)
17:45 > 18:00	17:54	Non-validated	216,950	-208,706	2,09	**135,00**	7,90			135,00	137,09
17:45 > 18:00	17:53	Non-validated	232,518	-221,149	2,14	**135,00**	7,90			135,00	137,14
17:45 > 18:00	17:52	Non-validated	253,695	-243,049	2,22	**135,00**	7,90			135,00	137,22
17:45 > 18:00	17:51	Non-validated	274,406	-271,222	2,34	**135,00**	7,90			135,00	137,34

Publication of close to real-time data.

The cumulative activated volumes and prices on a 1 minute basis

Situation at 21/10/2019 from 17:03 to 18:02

				Strategic Reserve	Upward regulation Volume							Downward regulation Volume			
Quarter	Minute	Quality status	NRV (MW)	SR (MW)	GUV (MW)	IGCC+ (MW)	R2+ (MW)	Bids+ (MW)	R3 Std (MW)	R3 Flex (MW)	Inter-TSO Import (MW)	GDV (MW)	IGCC- (MW)	R2- (MW)	Bids- (MW)
18:00 > 18:15	18:02	Non-validat...	343,396		**345,327**	137,572	57,755	150,000				1,931	0,000	1,931	
18:00 > 18:15	18:01	Non-validat...	334,922		**337,818**	139,708	48,110	150,000				2,896	0,000	2,896	
18:00 > 18:15	18:00	Non-validat...	316,744		**322,492**	134,417	38,075	150,000				5,748	0,000	5,748	
17:45 > 18:00	17:59	Non-validat...	187,701		**236,894**	14,842	72,052	150,000				49,193	31,906	17,287	

Situation at 21/10/2019 from 17:08 to 18:07

				Strategic Reserve	Incremental Prices							Decremental Prices			
Quarter	Minute	Quality status	NRV (MW)	SR (€/MWh)	MIP (€/MWh)	IGCC+ (€/MWh)	R2+ (€/MWh)	Bids+ (€/MWh)	R3 Std (€/MWh)	R3 Flex (€/MWh)	Inter-TSO Import (€/MWh)	MDP (€/MWh)	IGCC- (€/MWh)	R2- (€/MWh)	Bids- (€/MWh)
18:00 > 18:15	18:07	Non-validat...	268,571		**135,00**	60,47	60,47	135,00				5,22	5,22	5,22	
18:00 > 18:15	18:06	Non-validat...	289,409		**135,00**	60,47	60,47	135,00				5,22	5,22	5,22	
18:00 > 18:15	18:05	Non-validat...	311,763		**135,00**	60,47	60,47	135,00				5,22	5,22	5,22	

7. Real Time DGO Allocation Forecasting

Working Group Balancing 23 October 2019

Agenda

- Feedback on public consultation
- Project Status
- Planning & Next Steps

Feedback on public consultation

- Consultation from 08/06/2019 to 08/07/2019

- Reactions received from
  - European Commodities
  - Luminus
  - Engie Electrabel
  - FEBEG

- Positive feedback from participants

Feedback on public consultation: General Methodology

- FEBEG
  - Proposes usage of EAVs per BRP to improve the prediction
  - Asks if monthly performance assessment can be communicated to BRP
- European Commodities
  - Asks about sensitivity to imbalance prices, in particular for values above 100€/MWh
- Luminus and Engie Electrabel support FEBEG answer

- Elia acknowledges there is no opposition to the general methodology
- The feedback received suggests adding additional variables to the model
- Elia confirms that the performance report can be sent individually to the BRP interested in getting this information.

Feedback on public consultation: Pilot phase

- 2 volunteers for participating to pilot phase

- Elia stresses that the purpose of the pilot phase is to test the IT infrastructure and the reception of messages by BRP. During this pilot phase, mock data might be used, and the resulting estimation of DGO Allocation might not be relevant.
- Test the accuracy of the predictions is possible for selected periods

⇒ We launch today a new call for volunteers for the Pilot Phase

Feedback on public consultation: Data Quality Preferences

- FEBEG
  - Prefers to receive an estimation, along with the data quality indicator, at all times.
  - Would like to get confirmation that this service will be offered free of charge to BRP
- European Commodities
  - Prefers to receive an estimation, along with the data quality indicator, at all times. If possible, the missing data should also be communicated
- Engie Electrabel
  - Prefers to receive an estimation, along with the data quality indicator, at all times

- Elia acknowledges the preference for receiving an estimate at all times, along with a quality indicator.
- Data quality indicator is BRP dependent, it takes into account the weight on the prediction quality of each of the variables. Providing the missing variables is redundant with the data quality indicator.

Feedback on public consultation: Elaboration of BRP ID-Card

- FEBEG
  - Would like to know if the BRP ID card can be changed several times per year, following major changes in BRP portfolio.
- Luminus
  - would like to participate to the elaboration of their ID-Card
- Engie Electrabel
  - Prefers an automatic ID Card determination, with possibility to made modifications afterwards.

- Optimization of the BRP ID Card is a computational intensive exercise and that the analysis of results requires significant resources. Therefore, Elia can only do this exercise once per year.
- Manual amendments to the BRP ID card are possible, but that this might not guarantee the optimality of the amended BRP ID Card
- Manual changes should be kept to a maximum of 2 changes per year

Feedback on public consultation: Additional feedback

- FEBEG
  - Stresses that the real-time estimation of the DGO Allocation will be very helpful for BRP for estimating their real-time balancing position
  - However, they would like to point out that this estimation must not be used for settlement purposes or other juridical processes (i.e. defining responsibilities or triggering actions)
  - Expresses that the DGO allocation process should evolve towards a continuous process, eventually a real-time process
- European Commodities
  - Appreciates the constructive approach of Elia towards balancing responsibilities.

- Elia appreciates the feedback from FEBEG, in particular about the usage of the real-time DGO Allocation estimation. This remark must be stressed with all BRP
- Regarding the shortening of the DGO allocation process, Elia reminds this will be tackled by DGO with MIG6 and Clearing House Atrias

Reporting Example

Model performance

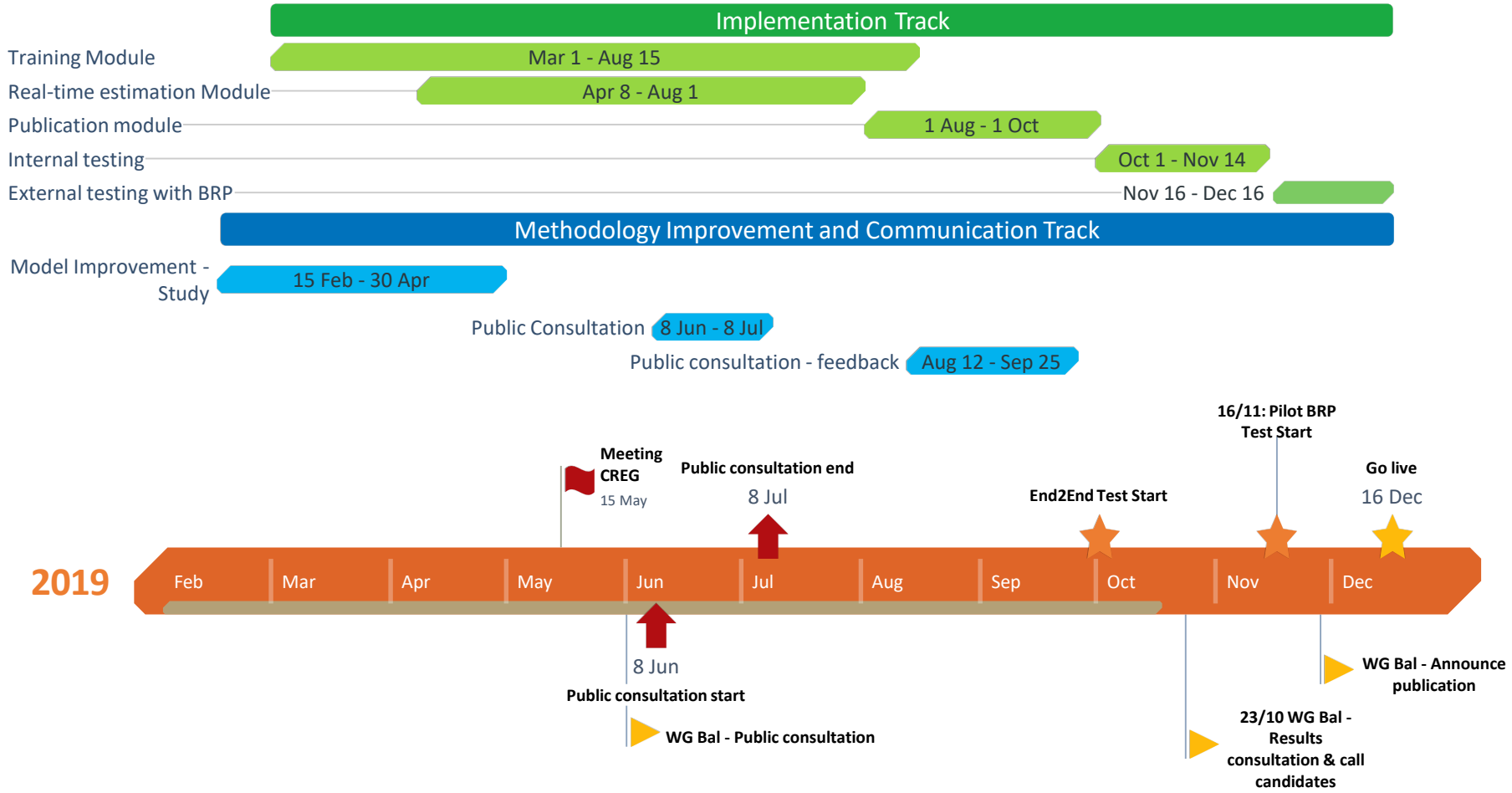
Model	Net Allocation (avg)	MAE	MAE (%)	RMSE	SD	P99	P99 (%)	Max	Max (%)
Benchmark	156.223	3.723	2%	4.805	4.53	13.147	8%	16.52	11%
Trained	156.223	3.723	2%	4.805	4.53	13.147	8%	16.52	11%

BRP Features activated for training

Feature	Active
infeed	No
windOnshore	No
windFarm	No
solarProvince	No
solarDgo	Yes
nomination	Yes
slp	Yes
totalLoad	Yes
pricesImb	Yes
pricesRef	No
weather	No

Project Status

Project is on track



Next Steps

- WG Balancing 23nd October 2019
  - Call for candidates for pilot phase
- Elia official report on public consultation
  - 25th October 2019
- 16-Nov – Beginning of pilot phase
- 16-Dec – Go Live

8. AOB and next meetings

Working Group Balancing 23 October 2019

Thank you.