WG Balancing of 24th March 2022

Hybrid meeting

24/03/2022

For a smooth teleconference with 30+ people …
Some rules apply

- Please put yourself on mute at any time that you are not speaking to avoid background noise.
- If you receive a call, please ensure that you do not put this meeting **on hold.**
  - You can quit and reconnect later on.
  - You will be muted or kicked out of the session, if necessary.
- You will be requested to hold your questions for the end of each presentation.
  - Should you have a question, please notify via Teams or speak out if you are only via phone.
  - Share your question (with slide number) in advance so all participants may follow
  - Before you share your question, please announce yourself.
- If you have a poor internet connection, please dial-in.
- Finally, please be courteous and let people finish their sentences.
  - It is practically impossible to follow when 2 people are speaking at the same time in a teleconference.

Agenda

13:00 – 13:10: Introduction and minutes

13:10 – 13:20: Introduction to MOG 2 TF – Workshop on balancing and market integration

13:20 – 13:50: Incentives: high level presentation of the scope, aim and ambition (Part 2)

- Improve the quality of input data for congestion management
- Evolution Daily Balancing Schedules

13:50 – 14:40: CCMD: system operations benefits

Break 10 min

14:50 – 15:40: EU Balancing Program update

- Feedback public consultation T&C BSP aFRR
- Feedback public consultation Balancing Rules
- aFRR go lives : status & next steps

15:40 – 16:05: 2021 Year overview

AOB

Relaxation of DA Balance Obligation

Approval LFCBOA:

- Exceptional balancing measures with Explicit bidding
- Implementation of Nemo Flow Forecast

Minutes of Meeting for approval

Minutes of Meeting of Workshop on System Balance Philosophy on 20th of January 2022:

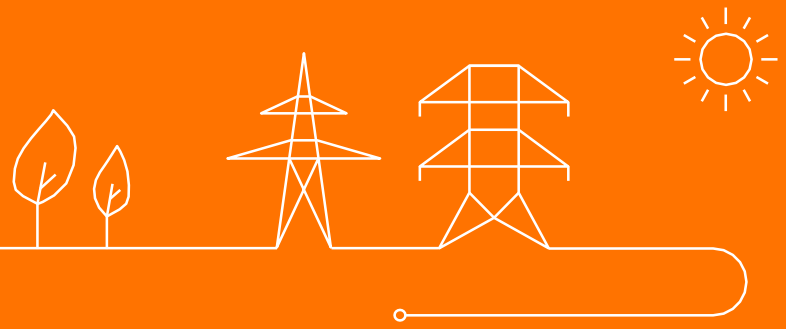
- No comments received from the stakeholders.

Minutes of Meeting of WG Balancing on 27th of January 2022:

- No comments received from the stakeholders.

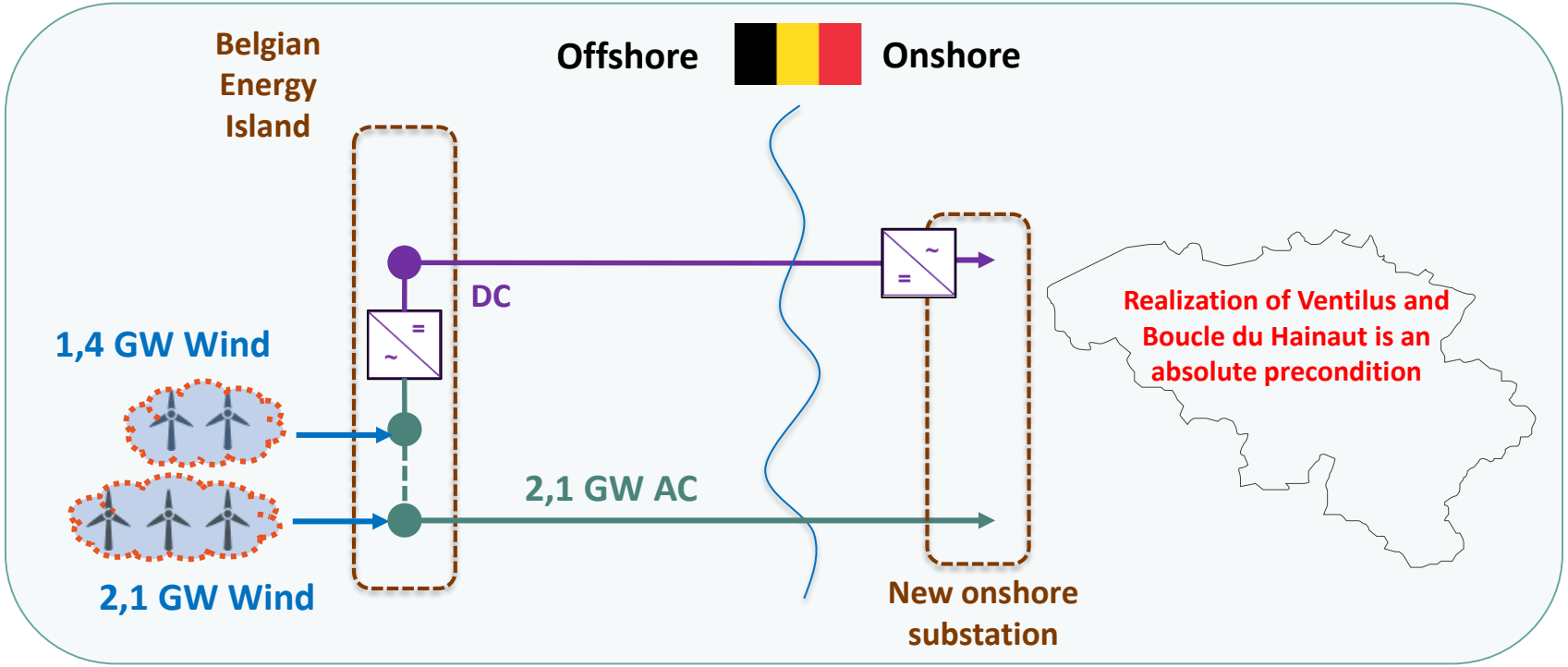
Introduction to MOG 2 TF:
Workshop on balancing and market integration

Presented by Benjamin Genêt



Slide from Belgian Energy Island – Stakeholder conference on 28 January

Princess Elisabeth zone
Modular offshore Grid 2



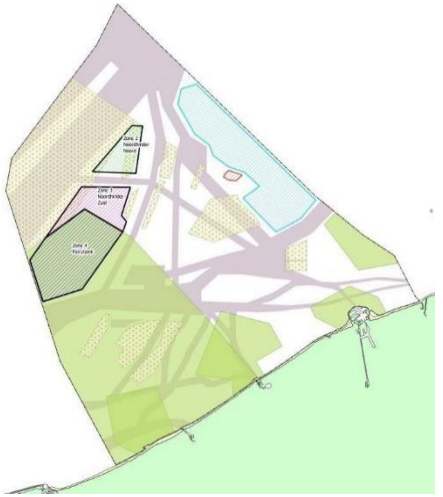
As previously communicated and agreed with stakeholders, Elia will resume its offshore system integration study taking into account the additional capacity of the Princess Elisabeth Zone. The scope of the study will also be enlarged to other market design consideration (e.g. delineation of bidding zones). Further communication will follow in Elia's Balancing Working Group.

Relevant documentation can be found via the following links:

- https://www.elia.be/en/public-consultation/20201001-public-consultation-on-integration-of-additional-offshore-capacity---mitigation-measures
- https://www.elia.be/-/media/project/elia/elia-site/users-group/ug/workshop/documents.zip
- https://www.elia.be/en/users-group/plenary-meetings/20211213-meeting

Task force MOG II

- On 18/02, an invitation was sent to former participants of the task force MOG II
  - The task force is resuming its work after having been put on hold
  - Higher ambitions: from 4.4 GW offshore wind to 5.8 GW
  - Broader scope
    - System and balancing integration
    - Market integration
    - Connection requirements (voltage management, protection philosophy…)
  - First workshop:
    - 1st April, from 9:00 to 11:00 (teleconference)
    - Focus: planning, scope and approach of the balancing and market integration aspects
      - Assumptions regarding the new simulations for the offshore system integration study – feedback possible until April 22nd
      - Introduction to market design considerations (e.g. delineation of bidding zones for hybrid interconnectors)
  - Registration: usersgroup@elia.be



How to balance the system with such level of offshore capacity?

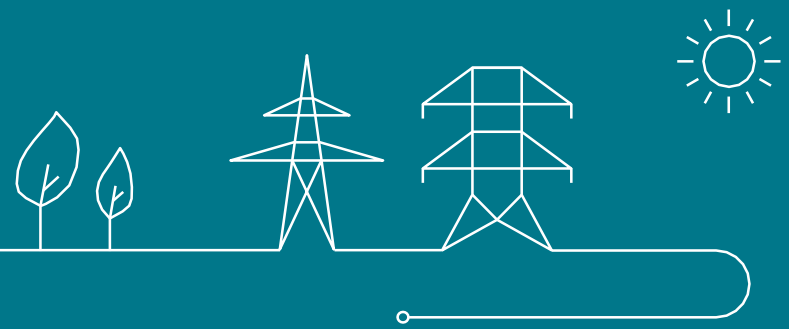
How to most efficiently integrate the offshore capacity into the market?

What are the grid connection requirements?

Incentives: high level presentation of the scope, aim and ambition (Part 2)

Improve the quality of input data for congestion management

Presented by Cindy Bastiaensen



Context

Incentive 2019: ‘Improvement of transparency with regards to the detection and management of Congestion’

- Information on the quality of the forecasts used as operational input data for the creation of the Individual Grid Models (IGM): wind, solar, CIPU, load, PST positions
- Information on the quality of output data: flows on 150kV – 380 kV network
- Information about the timing, power, location, and purpose for activations of Costly Remedial Actions by Elia

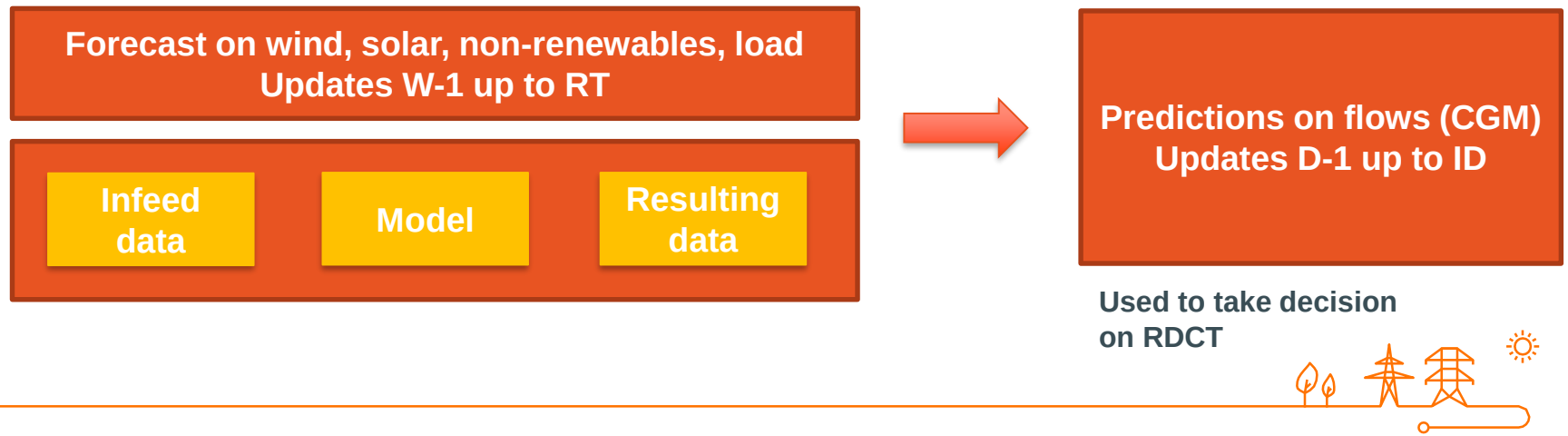
Public reports available on Elia website: link

Offshore wind production

	D-2	D-1	ID_1	ID_2
Mean of the absolute error [MW]	150,36	149,20	162,75	119,16
Mean of the absolute error (% of installed capacity)	7%	7%	7%	5%
Mean of the relative error (% of actual production)	-64%	-200%	-139%	52%
Standard deviation [MW]	363,34	288,77	244,88	237,73
Maximum errors [MW]	1782,49	1652,65	1375,71	1148,07
Absolute P95 error [MW]	784,37	708,99	644,98	546,30
Mean of the installed capacity [MW]			2121,82	

Goal

- Transparency on current IGM and CGM modelling practices
- Transparency on forecast quality of input and output data
- Root-cause analysis on deviations in forecast compared to Real Time
- Look into solutions to improve the forecasts
  - Short-term implementation
  - Long-term roadmap



Some first ideas

Infeed data	PISA database completeness and increase update frequency in operational tools
Model	Extended use of AI/ML Align model EMS/Power Factory
Resulting data	Combine output of suppliers Continuous monitoring and benchmarking of performance of suppliers
Top-down	Flow forecast → Collaboration with external consultant
Future	Reflect on needs to take into account increase of RES, new type of loads and new behavior
Bottom-up	Nodal forecast of load → Collaboration with external consultant

Timing and next steps

January – June: work on presentation/report for workshop/consultation

Proposal

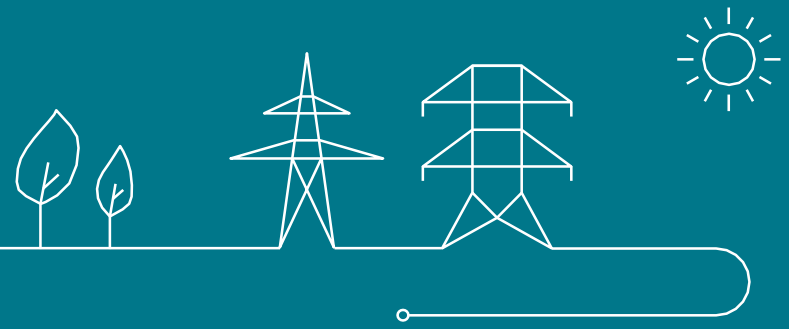
- 30/5: workshop: as is description, root-cause analysis and proposal of solutions
- 10/6: launch of public consultation

September - December: integrate input from public consultation in the report and start implementation/build roadmap

December: final report

Evolution Daily Balancing Schedules

Presented by Kris Poncelet



Context

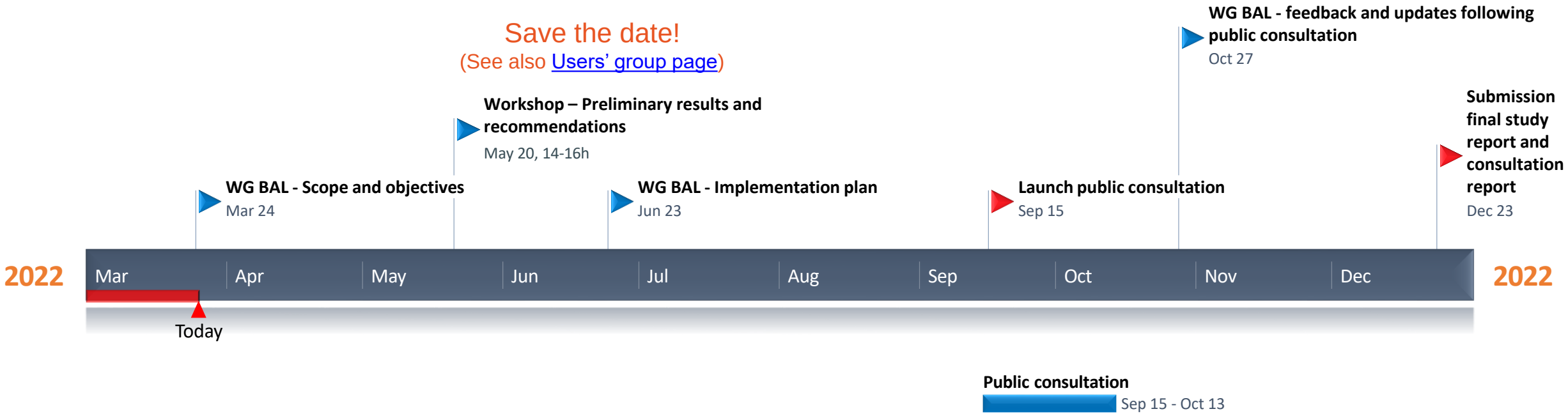
- The BRP currently submits Daily Balancing Schedules, consisting of:
  - Nominations related to physical Injections and Offtakes in different locations of the grid and the (generation) schedules, and
  - Nominations related to Commercial Trade schedules.
- The SA (currently = BRP) submits the schedules for DP_{su} (former CIPU units) to Elia.
- The role of the BRP and the context in which it provides its Daily Balancing Schedules are changing significantly:
  1. BRP = SA will evolve into BRP ≠ SA in the context of iCAROS evolutions;
  2. Ongoing gradual relaxation of the day-ahead balance obligation;
- These evolutions raise a number of questions on the nominations currently submitted by the BRP, such as:
  - How should the Nominations related to physical Injections and Offtakes evolve considering that the schedules of production units will be provided by the SA in the future?
  - What are the needs and requirements for each type of Nomination (e.g., timing of submission, granularity) in relation to the Elia processes in which the Nominations are used? Are there opportunities for simplifications?
  - What are the needs of market participants (and Elia) in terms of transparency and publications (e.g. publication of the aggregated imbalances at the end of the DA timeframe)?

The objective is to analyze possible evolutions of the nomination process and to provide a recommendation on the preferred evolution

The objective is translated into a work plan consisting of 5 steps:

1. Describe the current process for the DA and ID submission of the Daily Balancing Schedules by the BRP and the submission of schedules by the SA (incl. format, timing of submission, granularity)
2. Provide an overview of the existing processes for which Elia makes use of the data submitted by BRPs and SAs, and the corresponding required timing and granularity of the provided data (e.g., congestion/security analyses conducted by Elia using generation schedules and/or other nominations as input)
3. Identify and analyze the impact of recent and future evolutions on the process for the submission of the Daily Balancing Schedule
    a) Identify possible additional information required by Elia in order to fulfill its tasks in an effective way in the future (incl. timing of submission and the party responsible for the submission)
    b) Identify possible additional information required by BRPs in order to efficiently fulfill their obligations between day-ahead and real-time and/or information required by other parties in order to achieve an efficient and transparent market functioning (incl. timing of submission and the party responsible for the submission)
    c) Evaluate possible opportunities to remove or simplify the process of the submission of the Daily Balancing Schedules
4. Propose the adaptation, removal or addition of the submission of the Daily Balancing Schedules to ensure the needed and identified data
5. Assess the effort required for the implementation of the proposal and propose a realistic implementation plan

Indicative planning

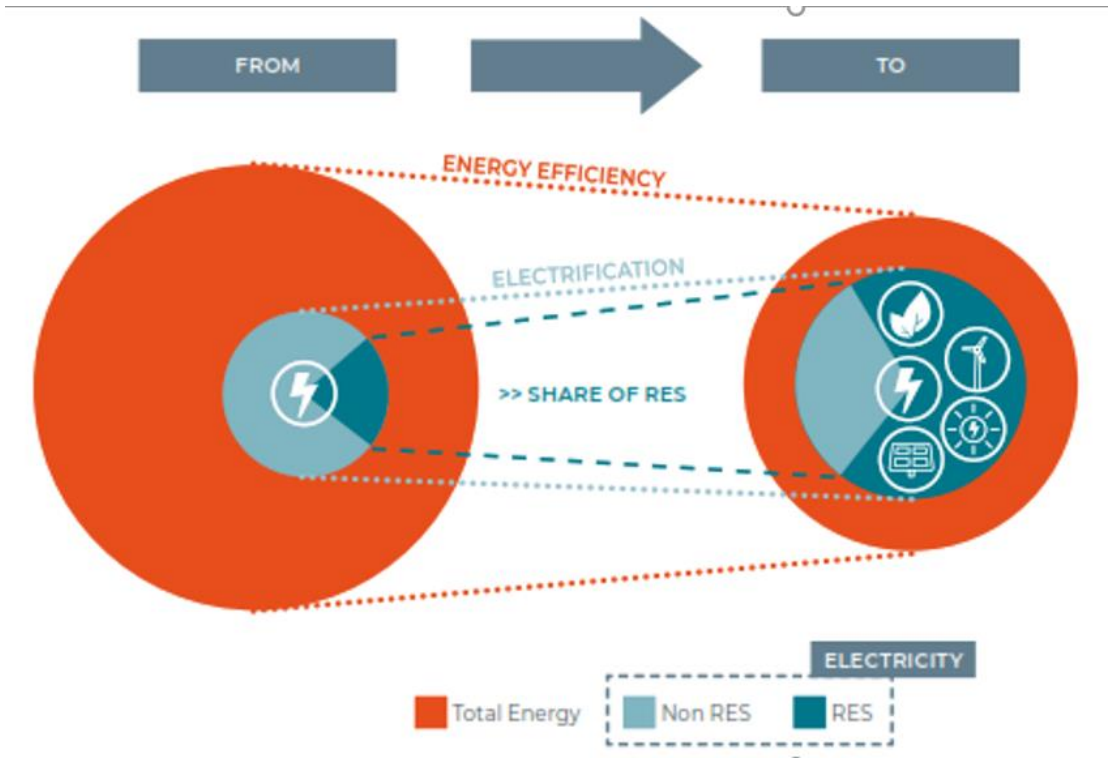


CCMD: Value Creation Model

Presented by Kristof De Vos

Introduction

General context: increasing electrification and RES integration are main building blocks in the roadmap for a net zero society



Elia 2021, roadmap to net zero (link)

- The share occupied by electricity in final consumption will increase with electrification
- Renewables will increase both in the overall energy mix and in the electricity mix
- Digitalization and market design will facilitate an active participation of consumption

RES deployment
To achieve the 2030 targets

38-40%
of RES at EU by 2030

Electrification of uses
Sustainable and Smart Mobility Strategy

100 European cities
Will be climate neutral by 2030

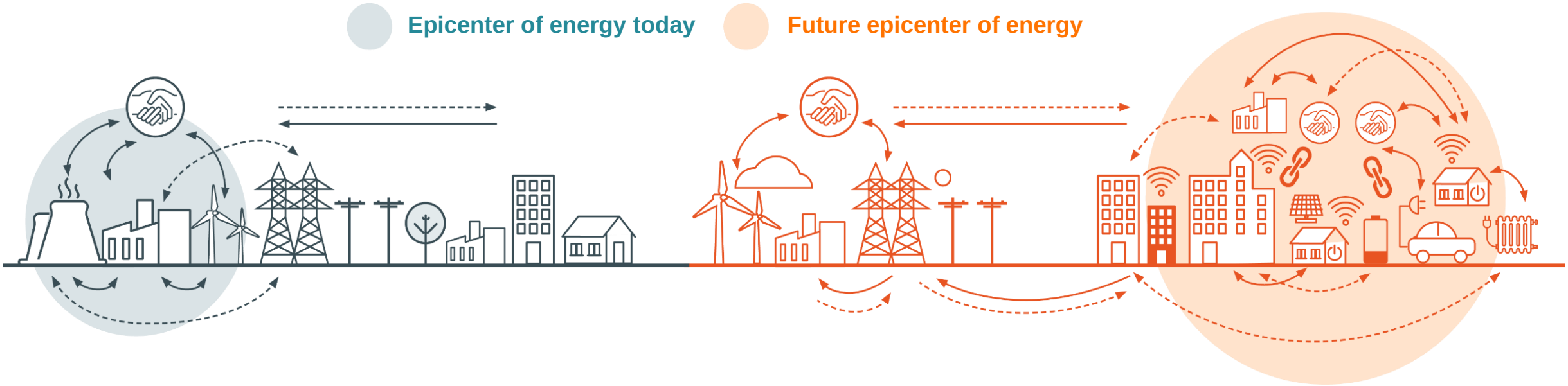
30 million
Electric vehicles in Europe by 2030

Digitalization & connectivity
EU Smart metering Benchmark

92%
smart meter penetration by 2030

17%
Annual growth of IoT devices

A paradigm shift is happening to manage consequences of this market trends



Generation follows consumption → **Demand will follow generation**

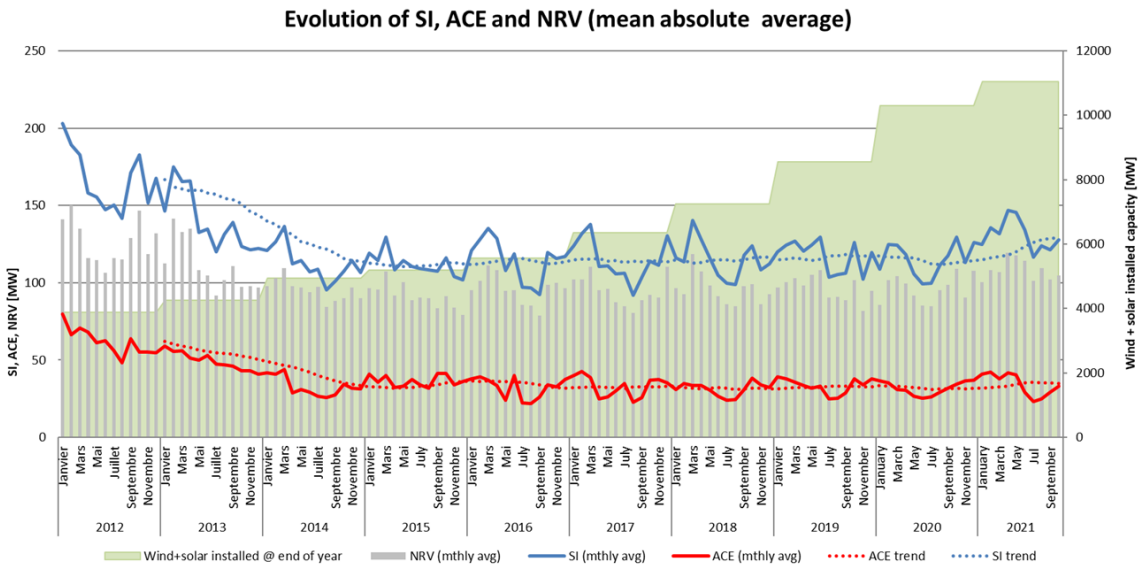
A market reform is needed to realise this paradigm shift

➔ **Elia's consumer-centric market design vision**

➔ **Digitalisation of the sector is another enabler for this goal**

Reactive balancing model as a key enabler to unlock flexibility: Building further on a successful experience

- *Reactive balancing has proven successful in practice, allowing an overall decrease and stabilization of the system imbalance (and area control error - ACE) despite a significant increase in RES production*
- *Elia's formula of success :*
  - *Adequate price signals*
  - *Transparency*
  - *Enlarged level playing field*

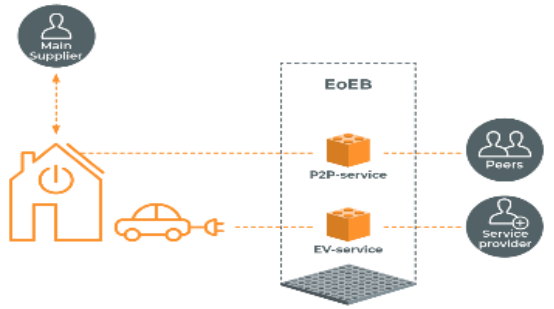


How to keep up the good trend?

Further bring down non-price barriers!

CCMD

Exchange of Energy Blocks (EoEB)



From competition in front to behind the meter

A real-time market price to reveal the true value of flexibility to consumers

Adequate price signals up to the end-consumer

Efficient reserve management will become a key aspect in the energy transition

Increasing flexibility needs

Driven by generation mix

DIMENSION smartly

Manage FRR needs through dynamic dimensioning

Covered by flexibility means

Price-based (implicit)

Volume-based (explicit)*

** SOGL minimum = dimensioning incident*

Non-contracted FRR

Contracted FRR

Implicit contribution

Increase local flexibility through:

- adequate price signals (RTP)
- enhanced balancing capabilities (EoEB)

⇨ Bring the new flex assets to the market via **CCMD**

MAXIMISE non-contracted reserves

Manage FRR means through taking into account:

- free bids
- cross-border flexibility

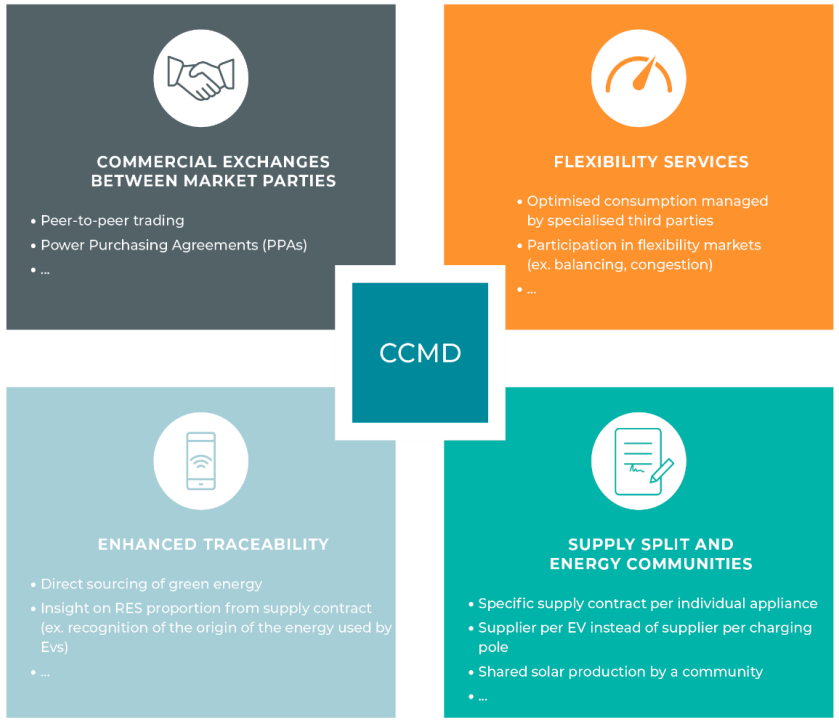
MINIMISE COSTS of contracted reserves

⇨ Bring the new flex assets to the market via CCMD
⇨ Reduce "**technical" entry barriers**

Increase competition

Price x Volume

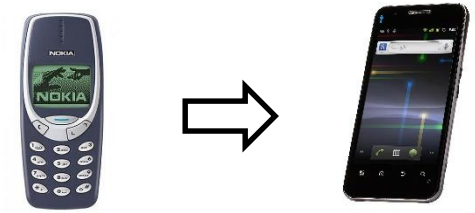
Consumer Centric Market Design……. Consumer wins twice!



More/better services

More efficient system operations

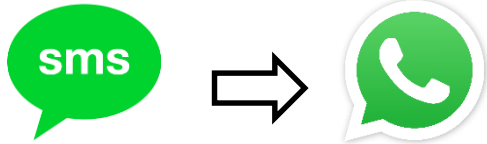
High value for the customer



From

To

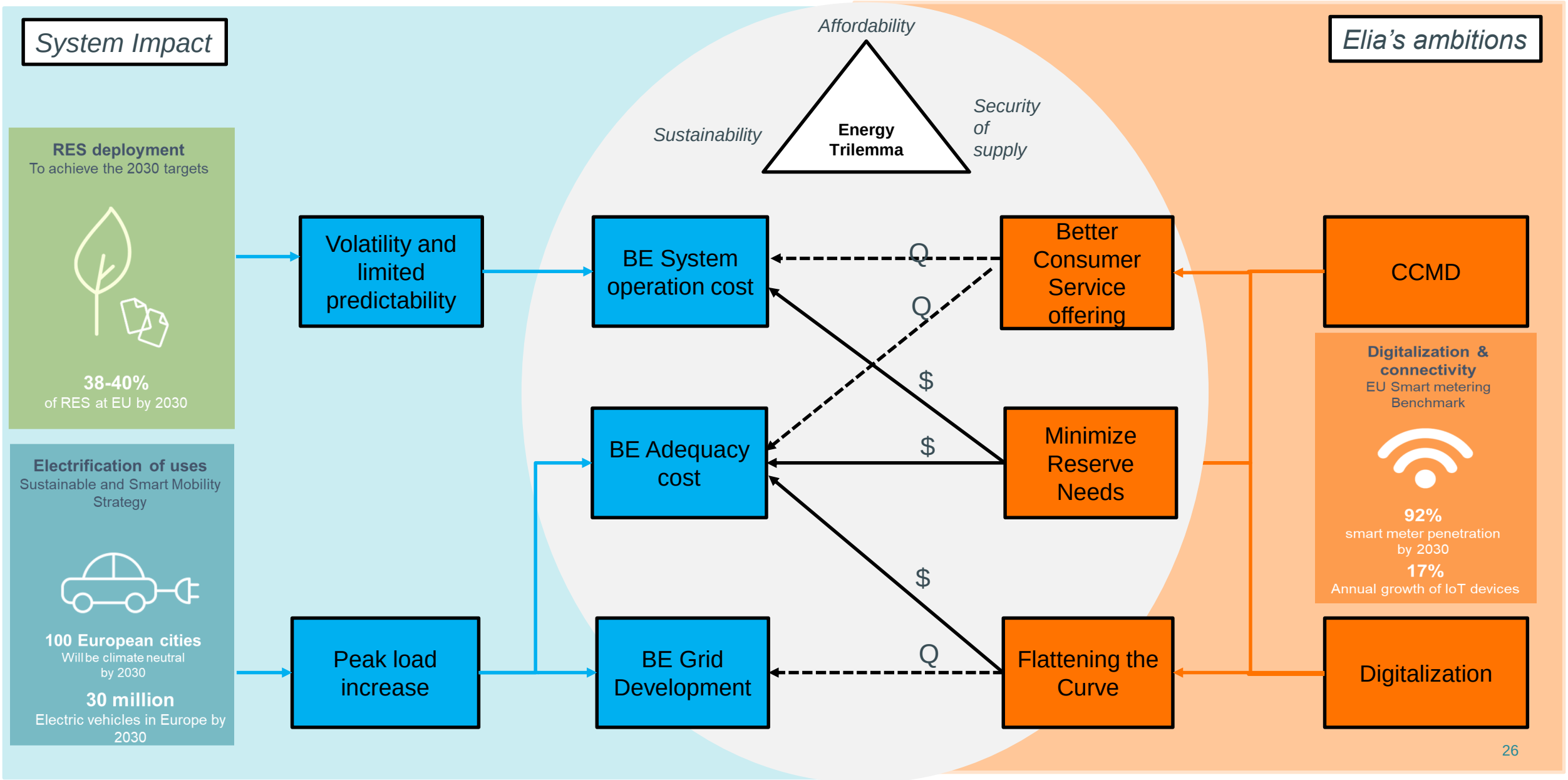
Moderate value for the customer



From

To

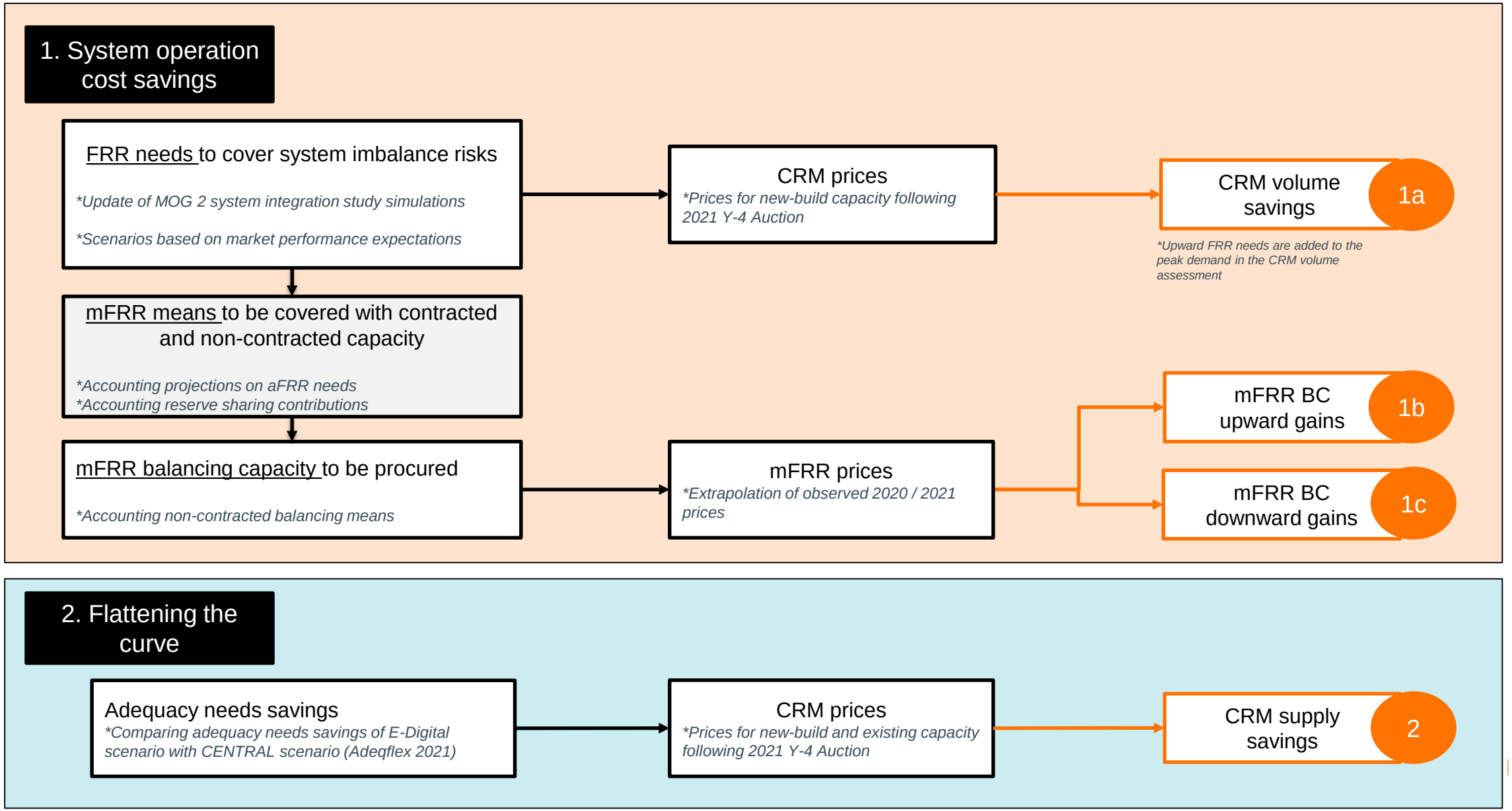
CCMD Value Capture Model



Q: Qualitative Benefits assessment ; $: Quantitative Benefits assessment

Quantification exercise

Quantification method



Scenario framework

Reserve capacity estimations

Simulation of future FRR needs based on the methodology presented in the MOG 2 system integration study

Business As Usual 'BaU'

- Assumes no substantial innovations in Belgian market design
- Deterioration of reactive balancing capabilities following decreasing predictability of system imbalance prices and opposite price incentives*

Maximum Potential 'Pot'

- Digitalisation (incl. smart meter roll out)
- Full market opening through EoEB, maximum transparency and a RTP reflecting Belgian system conditions

*When imbalance price is set equal to cross-border marginal price irrespective of Belgian system conditions

Reserve gains

Balancing capacity prices

Extrapolations of observed balancing capacity prices

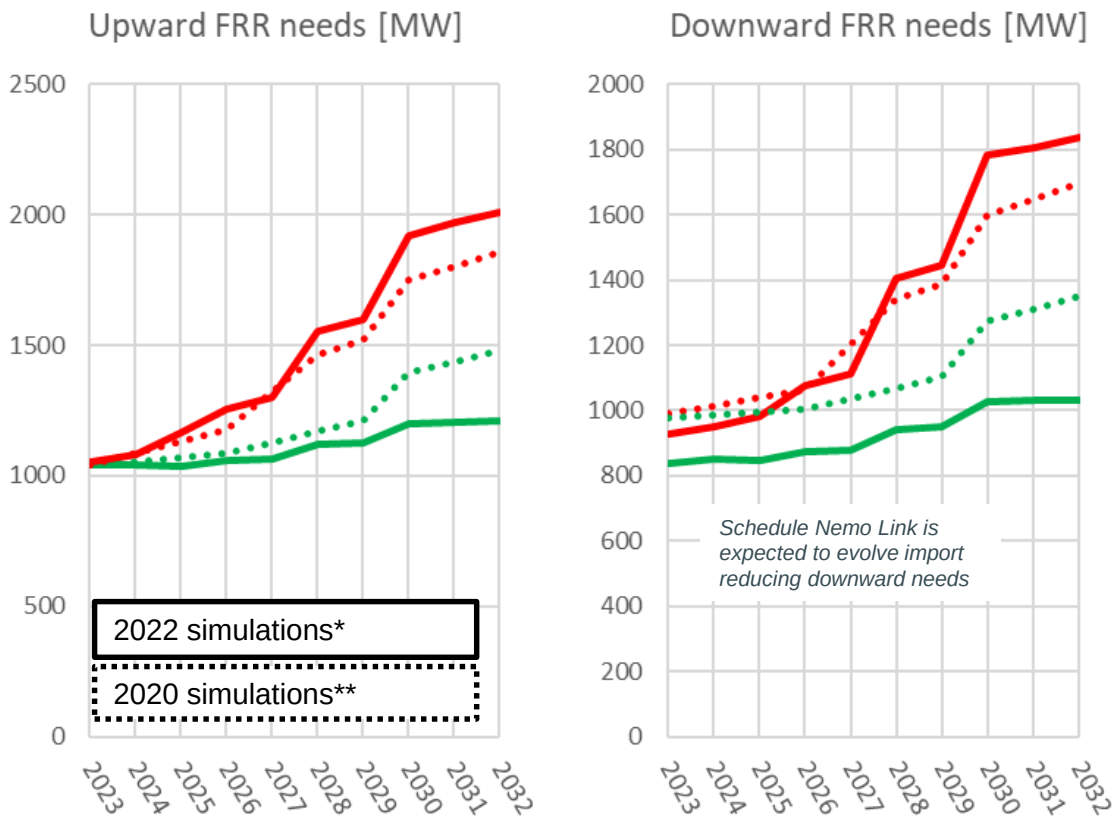
Higher bound
Extrapolation of observed 2021 prices

Lower bound
Extrapolation of observed 2020 prices

- *Extrapolations based on price elasticity following observed balancing capacity offers*
- *Taking into account expected balancing capacity evolutions (related to BaU and Pot scenario)*
- *Taking into account price effects following increased competition following CCMD (Pot scenario)*

In depth (1): assumption updates on FRR needs simulations

Simulations based on baseline 2018-2019 and installed generation mix and Nemo Link schedules based on Adeqflex 2019 (Simulations 2020) and 2021 (Simulations 2022)



Simulation 1 – 2020 : fixed improvement factors 2023-28, focus on offshore

Worst Case CENTRAL
- 0%/y forecast improvement
- 0%/y SI improvement
- 35% BRP balancing offshore
- 35% BRP balancing onshore / pv

Reference case CENTRAL
- 1%/y forecast improvement
- 1%/y SI improvement
- 50% BRP balancing offshore
- 35% BRP balancing onshore / pv

Best case CENTRAL
- 1%/y forecast improvement
- 1%/y SI improvement
- 65% BRP balancing offshore
- 35% BRP balancing onshore / pv

Simulation 2 – 2022 : modification improvement factors 2023-23, focus on SI evolutions

BaU
- -1%/y SI improvement
- *Deterioration of reactive balancing capabilities following decreasing predictability of system imbalance prices without CCMD*

Pot
- 65% BRP balancing onshore /PV
- Improvement of ability to balance decentral renewable generation (onshore / PV) with CCMD

**2022 simulations were conducted for all years 2023-2032*
***2020 simulations were conducted for 2023, 2026, 2028 (and extrapolated to 2032 assuming 5.8 GW offshore)*

In depth (2): assumption on price evolutions

Higher bound

2021 average price observations[1]

Lower bound

2020 average price observations

Price elasticity observations[2]

BaU Volume effect

Pot Volume effect Price effect[3]

mFRR up balancing capacity price BaU – Higher bound

mFR down balancing capacity price BaU – Higher bound

mFRR up balancing capacity price Pot – Higher bound

Pot – Higher bound ; N / A : no volumes[4]

mFRR up balancing capacity price BaU –Lower bound

mFRR down balancing capacity price BaUt – Lower bound

mFRR up balancing capacity price Pot – Lower bound

Pot – Lower bound : N/A – no volumes

Price elasticity observations 2021

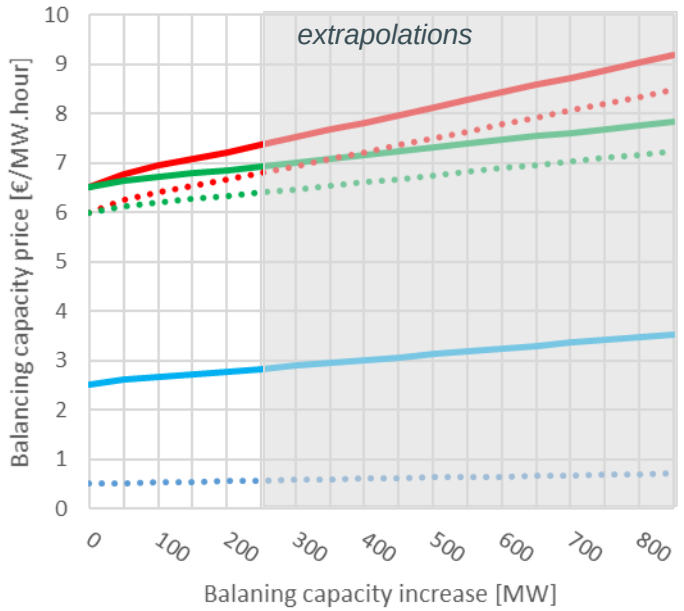
Price projections 2022-2036

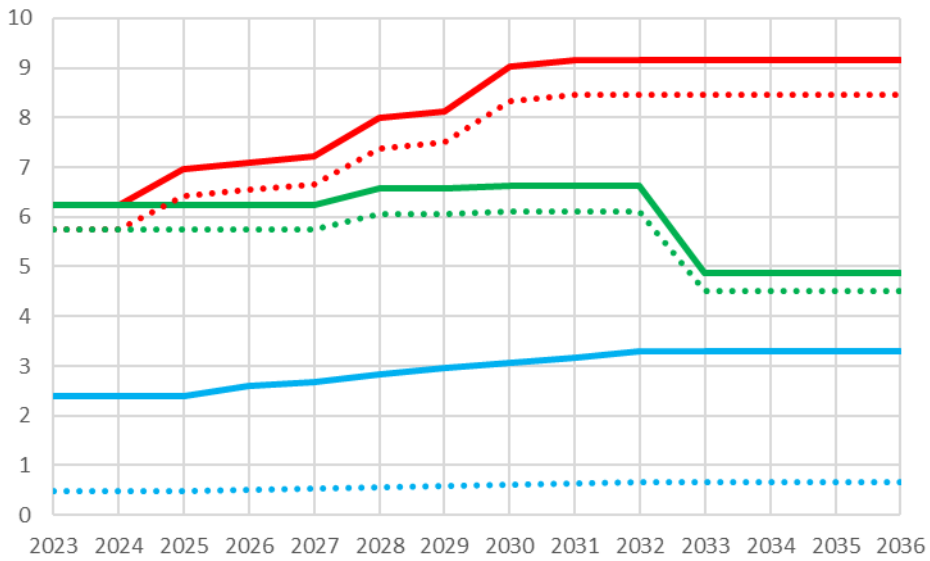
[1] Price projections are based on extrapolations of BE (mFRR BC up) and NL (mFRR BC down)

[2] Price elasticity is based on simulating the average price of incremental volumes up to 200 MW (2021 offers received)

[3] Price increase following additional volumes is reduced in the 'Pot' scenario following increased competition of CCMD

[4] No balancing capacity procurements are assumed in the 'Pot' scenario (cf. next slides)

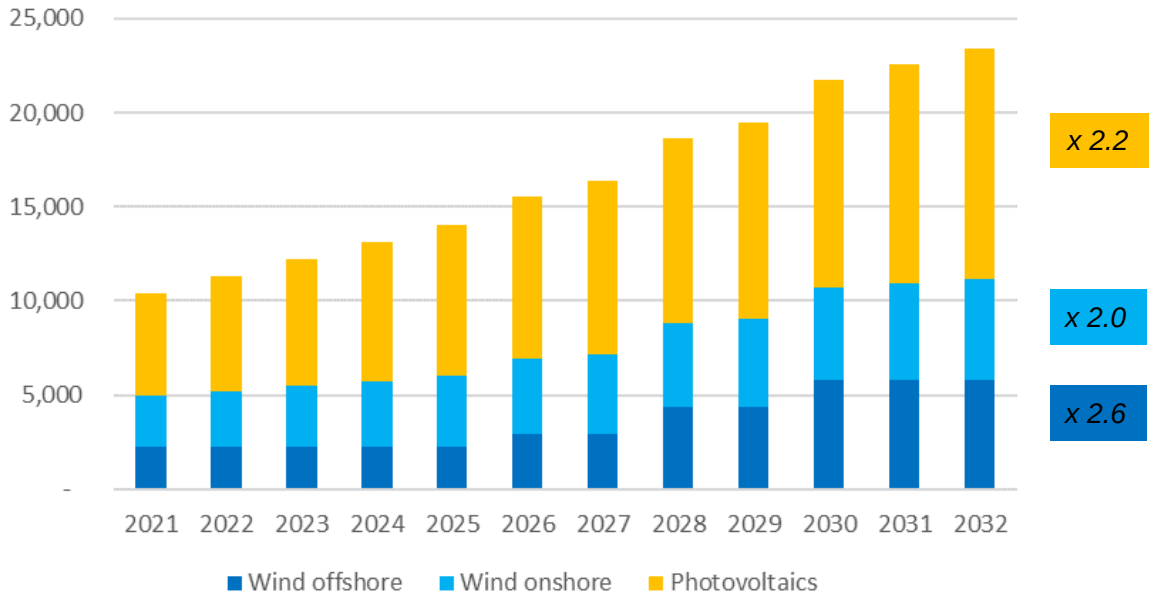




System operation cost savings

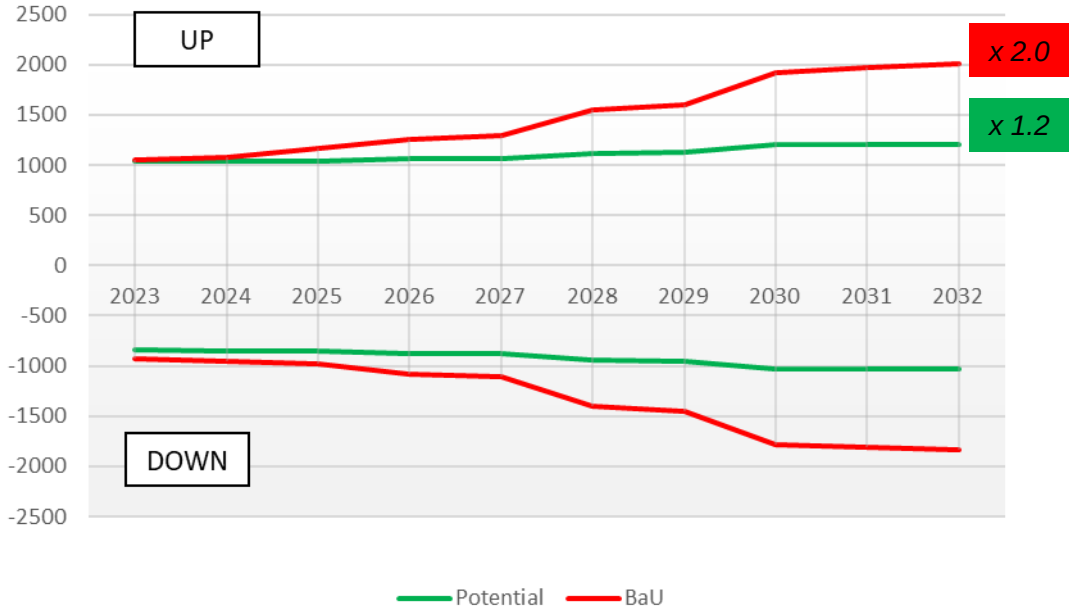
Several studies of Elia (Adequacy and Flexibility Study, MOG 2 System Integration) demonstrate increasing reserve capacity needs following variable renewable generation. New simulations based on latest renewable scenario estimate *x 2.0* in the 'BaU' market integration scenario or *x 1.2* in the 'Pot' senario

Expected renewable production capacity [MW]



*Adequacy and flexibility study 2021

Expected reserve capacity requirements [MW]



**Update of the MOG 2 system integration study simulations*
**Including update of generation mix and Nemo Link schedules based on Adeqflex 2021*
**Update of market performance indicators*

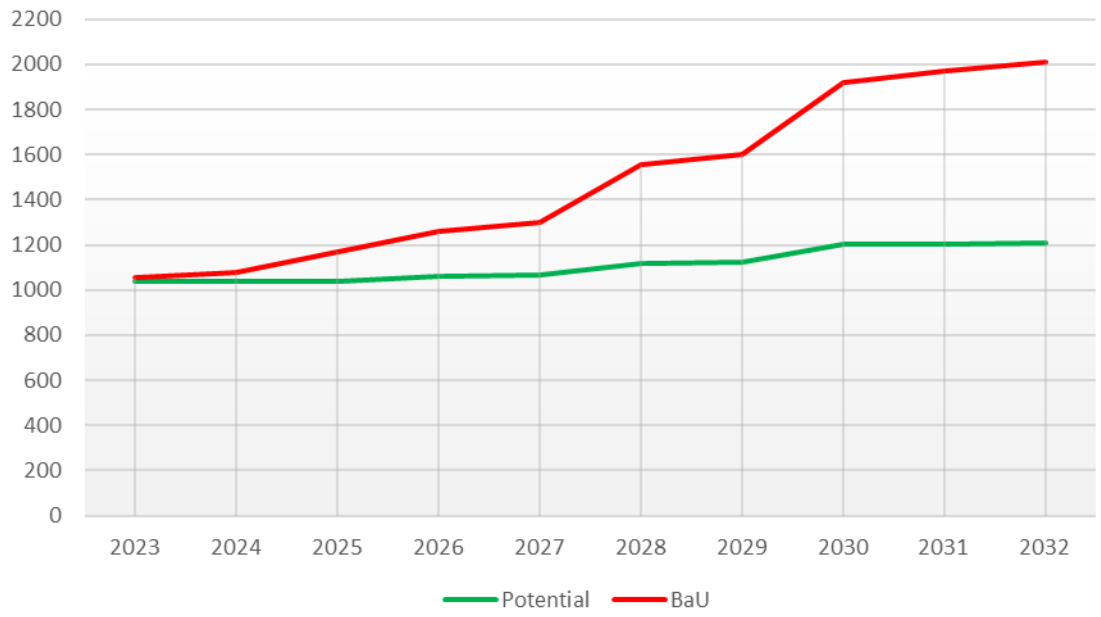
Under current market requirements, these additional reserve requirements will impact system operation costs in terms of additional balancing capacity procurements, as well as additional volumes to be rewarded in the CRM

Reducing additional reserve capacity requirements trough CCMD will reduce the volumes to be rewarded in the CRM by means of avoiding additional new-build capacity

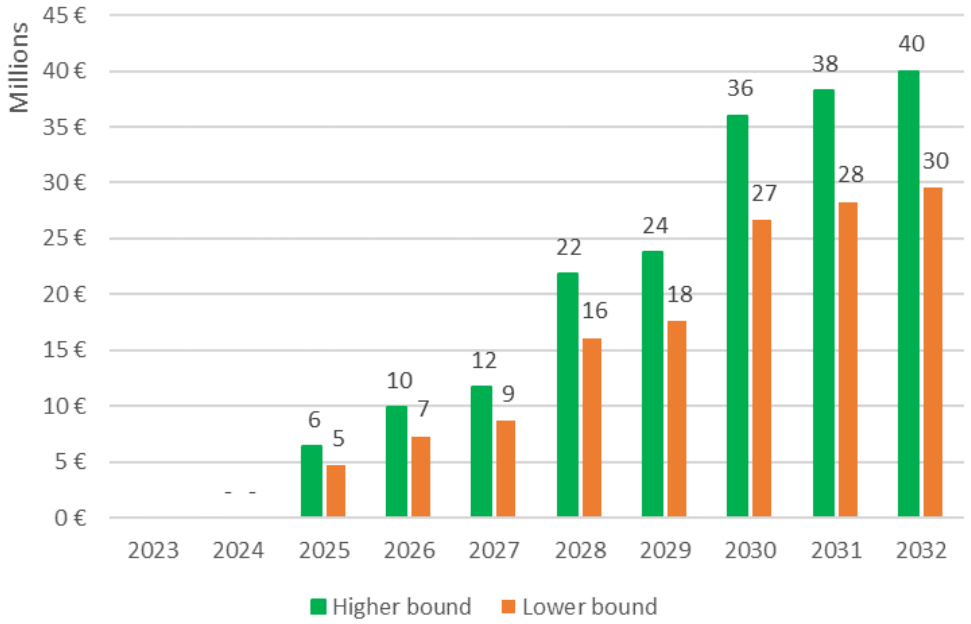
System operation cost savings

CRM volume savings 1a

Expected upward reserve capacity requirements [MW]



Expected CRM volume savings [€]



**Valorization based on price for new-build capacity (Auction Y-4 2025/26)*
**Higher bound : price cap new build @ 50000 €/MW.year*
**Lower bound : average price of selected offers for new build @ 37000 €/MW.year*

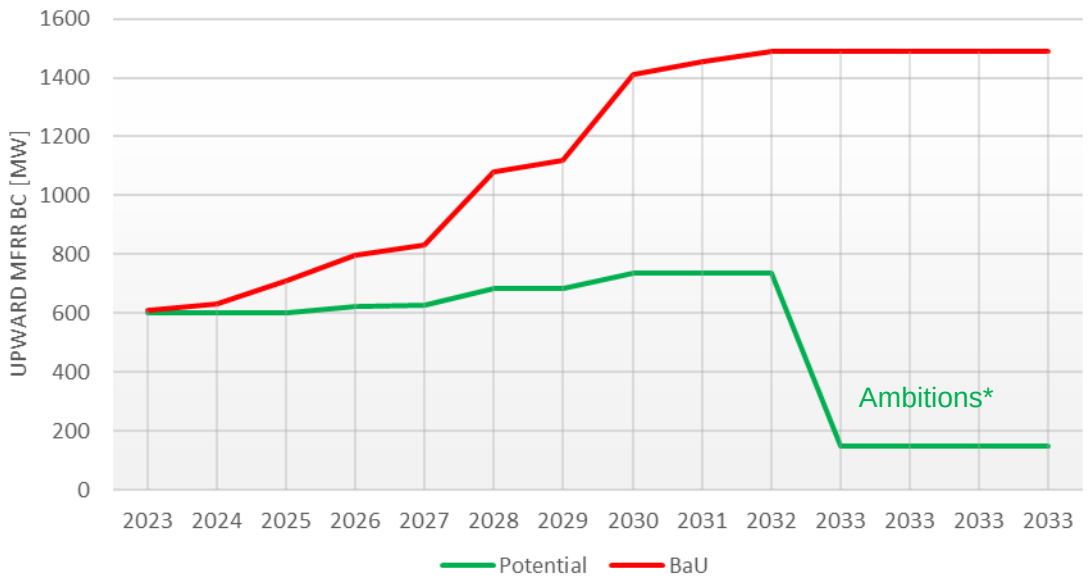
Reducing additional reserve requirements trough CCMD will almost stabilize upward mFRR balancing capacity procurements and realize substantial procurement gains after 2032.

System operation cost savings

mFRR BC upward gains 1b

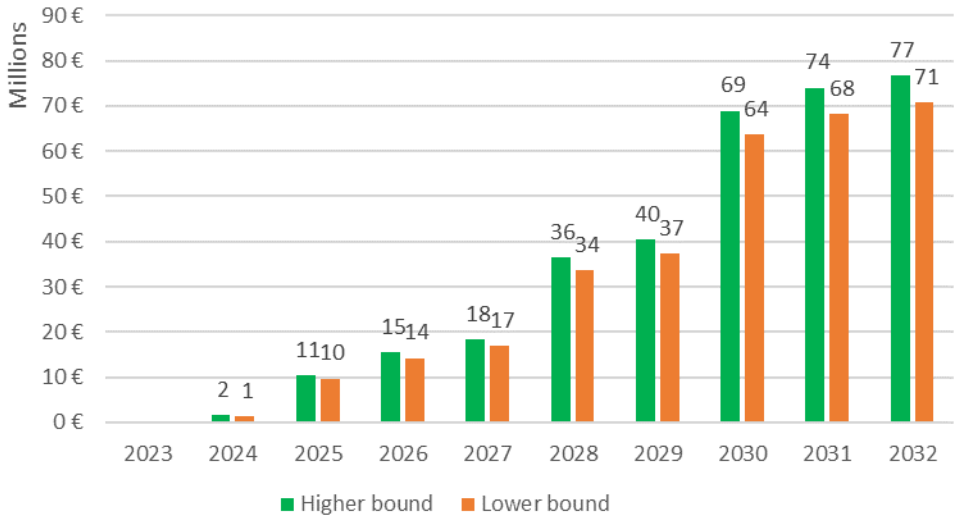
Elia's adequacy and flexibility study shows that in the reference scenario (including participation of some decentral capacity), upward flexibility needs are expected to be operationally covered up to 85% of the time in 2032. Elia's ambition is to target full coverage after 2032 and try to avoid upward mFRR procurements ***for most of the time****.*

Expected upward reserve procurements [MW]



**Elia assumes that even after 2032, some balancing capacity reservations will remain necessary (e.g. during scarcity / near-scarcity periods).*

Expected upward reserve procurment savings [€]



**Valorization based on extrapolation of observed average prices*
Higher bound : 2021
Lower bound : 2020

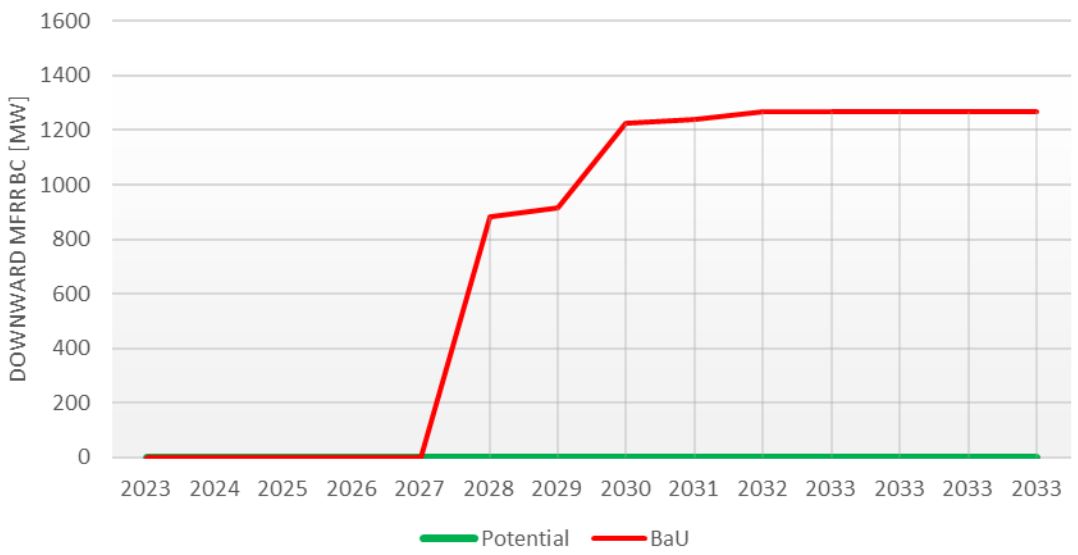
Reducing additional reserve requirements trough CCMD can avoid downward mFRR balancing capacity procurements.

System operation cost savings

mFRR BC downward gains 1c

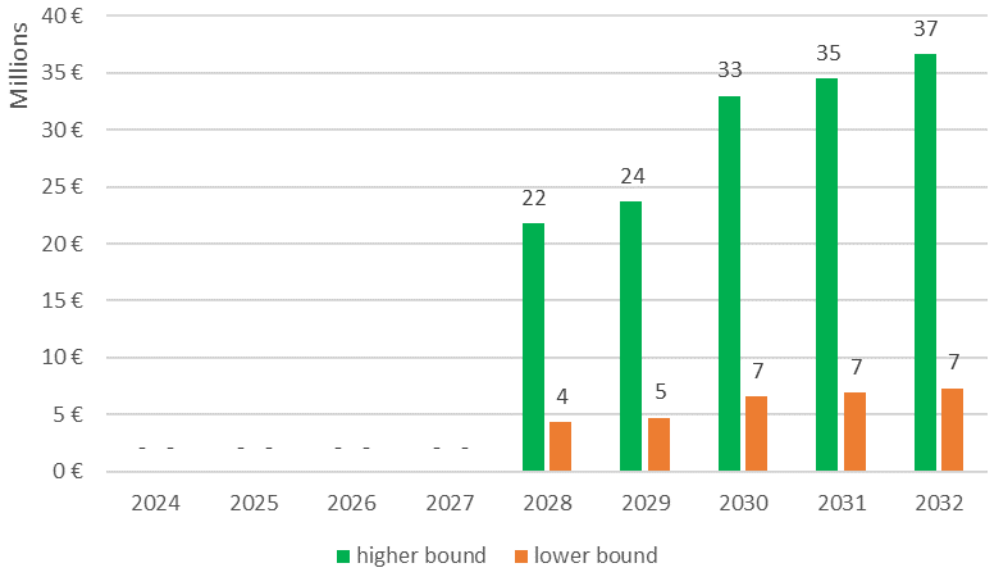
Elia's adequacy and flexibility study shows that the downward flexibility needs are expected to be operationally covered for 96% of the time in 2032. Elia's ambition is to continue to achieve full coverage and avoid downward mFRR procurements.

Expected downward reserve procurements [MW]



**Elia assumes an all or nothing procurement*

Expected downward reserve procurement savings [€]

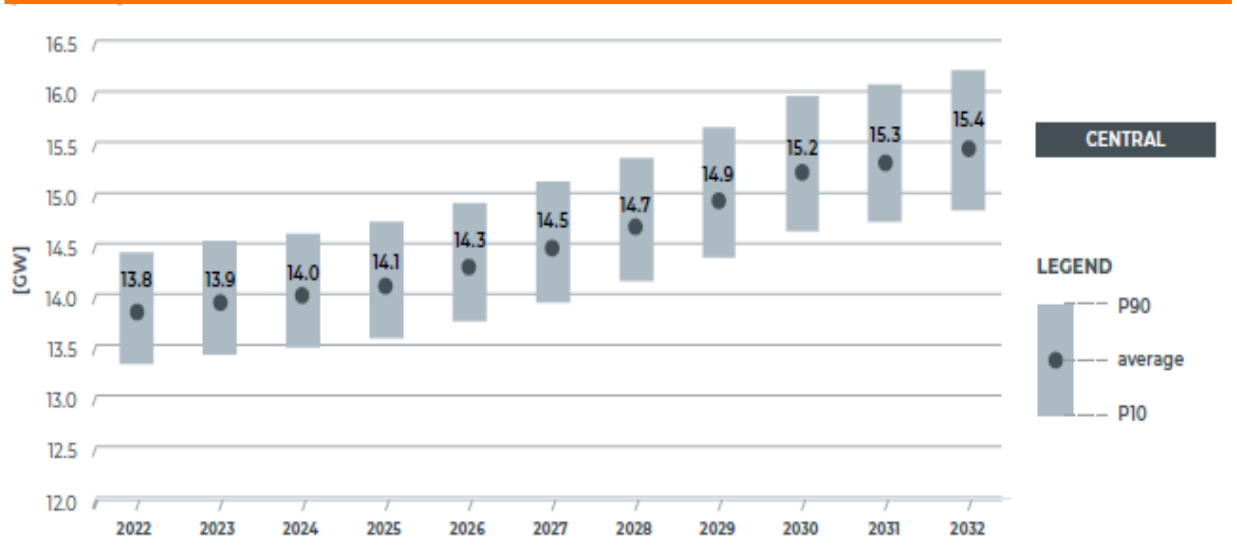


**Valorization based on extrapolation of observed average prices in the Netherlands*
Higher bound : 2021
Lower bound : 2020

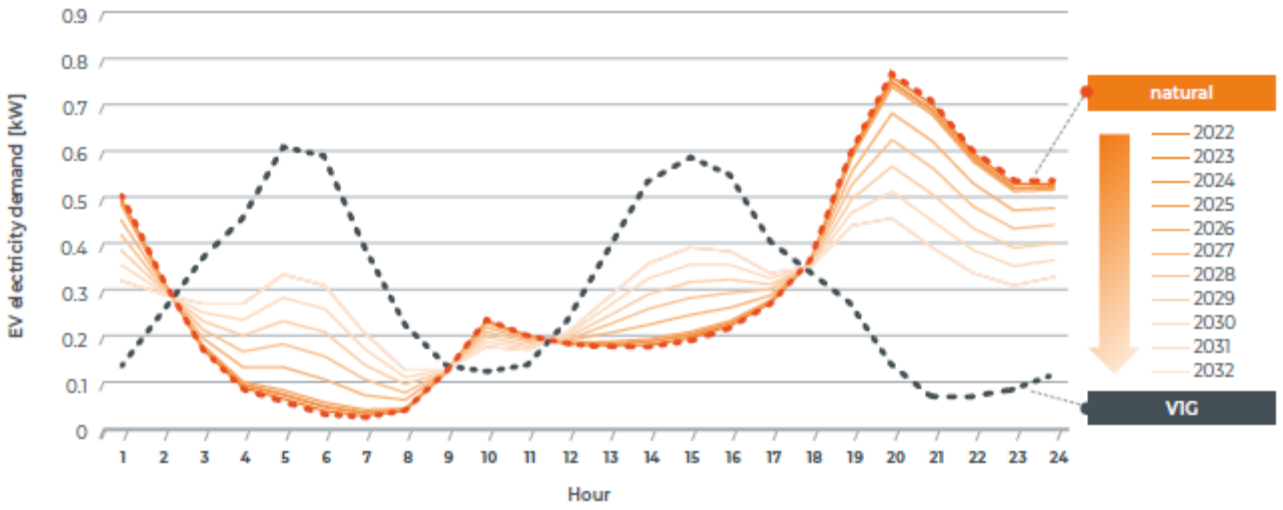
Flattening the curve

The Adequacy and flexibility 2021 study demonstrates increasing peak load in a BaU scenario where smart electrification remains limited (only part of the electric vehicle fleet and no heat pump control)

Distribution of the peak demand for the ‘CENTRAL’ scenario



Natural versus smarter (V1G charging)



Adequacy and flexibility study 2021

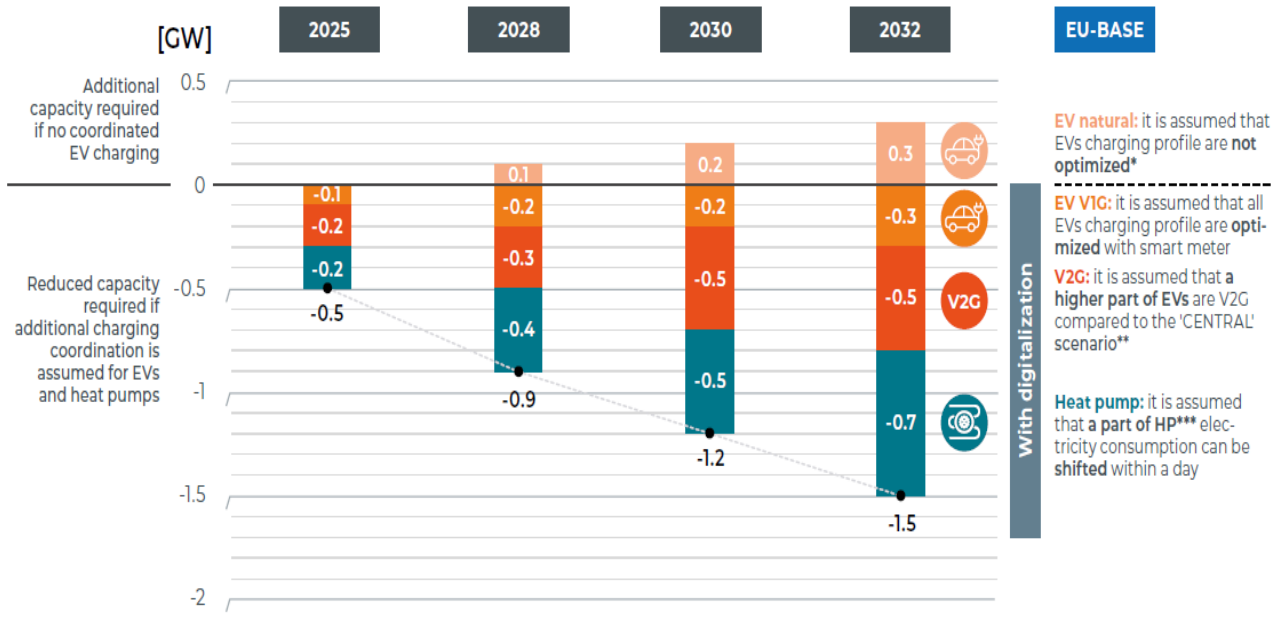
Under current market requirements, this additional peak demand will impact adequacy in terms additional volumes to be rewarded in the CRM

The adequacy needs of the system can be reduced following peak demand reductions “flattening the curve” or “increased competition” at the supply side

Flattening the curve

CRM supply savings 2

Elia’s adequacy and flexibility study shows that in a E-digital scenario with additional smart control of electric vehicles and heat pumps, additional adequacy needs reductions can be achieved. These volumes can participate at the demand side (flattening the curve) or the supply side (increase competition)



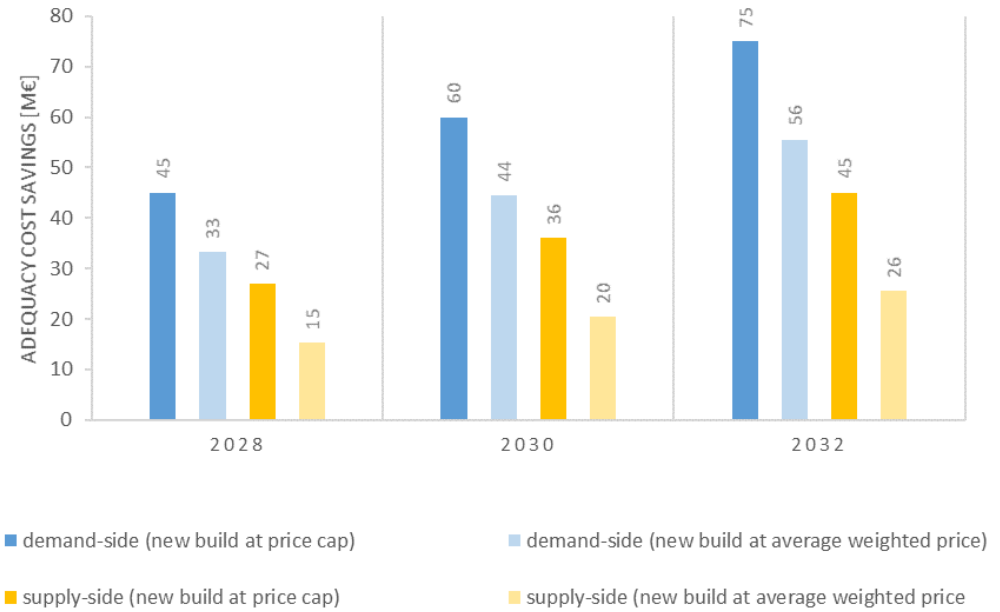
* A part of EV are already assumed to be gradually V1G in the 'CENTRAL' scenario. In this configuration, it is assumed that all EVs follow natural charging profiles

** The penetration of EV with V2G technology is doubled compared to the 'CENTRAL' scenario

*** A proportion of HP can be shifted within a day with the same trend than V2G (follows the penetration of smart meter)

Bid volume weighted average bid price (EUR/MW/year)	Price Cap	Submitted bids	Selected bids
Subject to intermediate Price Cap	20	20	20
Not subject to intermediate Price Cap	50	44	37

CRM Y-4 Auction results 2025-26



Decentral capacity facilitated by CCMD are estimated to bring substantial gains in terms of system integration cost (adequacy and reserve needs) compared to the "BaU"

1. System operation cost savings
   - A. CRM volume savings
   - B. Upward mFRR balancing capacity savings
   - C. Downward mFRR balancing capacity savings
2. Adequacy savings
   - D. Flattening the curve

Gains M€ / year [MIN - MAX]	2025	2028	2030	2032	2035
1.A. CRM volume savings	*5 - 6*	*16 - 22*	*27 - 36*	*30 - 40*	*30 - 40*
1.B. Upward mFRR BC savings	*10 - 11*	*34 - 36*	*64 - 69*	*71 - 77*	*104 - 113*
1.C. Downward mFRR BC savings	-	*4 - 22*	*7- 33*	*7 - 37*	*7 - 36*
2 .D Flattening the Curve	-	*15 – 45*	*20 - 60*	*26 - 75*	*26 - 75*
TOTAL	*15 – 17*	*69 – 125*	*118 – 198*	*134 - 229*	*167 - 246*

**Based on extrapolated prices from 2021 (higher bound) and 2020 (lower bound)*

Additional gains on grid investment savings and improved customer services will complement these expected benefits.

Summary - Elia is proposing to invest in an ambitious program to unlock decentral flexibility by means of its CCMD.

1

Several studies of Elia (Adequacy and flexibility 2021, MOG 2 system integration) demonstrated the risk of increasing system operation and adequacy costs following variable renewable generation and electrification in a 'Business As Usual' market integration scenario (with limited 'smart' electrification)

2

New decentral capacity unlocked* by decentral flexibility by means of CCMD can bring substantial gains in terms of system operation and adequacy costs. Maximum potential benefits for the Belgian consumer may amount up to :

- 15 – 17 M€ per year up to 2025
- 118 – 198 M€ per year up to 2030
- 167 – 246 M€ per year up to 2035

Additional benefits in terms of grid investment savings and improved consumer services.

3

Given the above, investing in an ambitious program to unlock decentral flexibility by means of its CCMD seems a necessity to Elia

**CCMD unlocks flexibility trough the exchange of energy blocks (a decentralised exchange between consumers and many other parties, on & behind the meter) combined with a real-time market price to reveal the true value of flexibility to consumers*

EU Balancing Program update

Presented by Cécile Pellegrin

Stakeholder management interactions

- *Public Consultations*
  - *T&C BSP aFRR -> Consultation finalized and proposal submitted to CREG*
  - *Balancing rules -> Consultation finalized and feedbacks analyzed*

  *=> As announced during last WG BAL, answers on the feedbacks and possible resulting adaptations will be presented today [**see here after**]*

- *Next planned interactions:*
  - *Final confirmation of aFRR Go live (step 1) early April, after last readiness check [**see here after**]*
  - *aFRR Energy Management Strategy (EMS) Requirements*

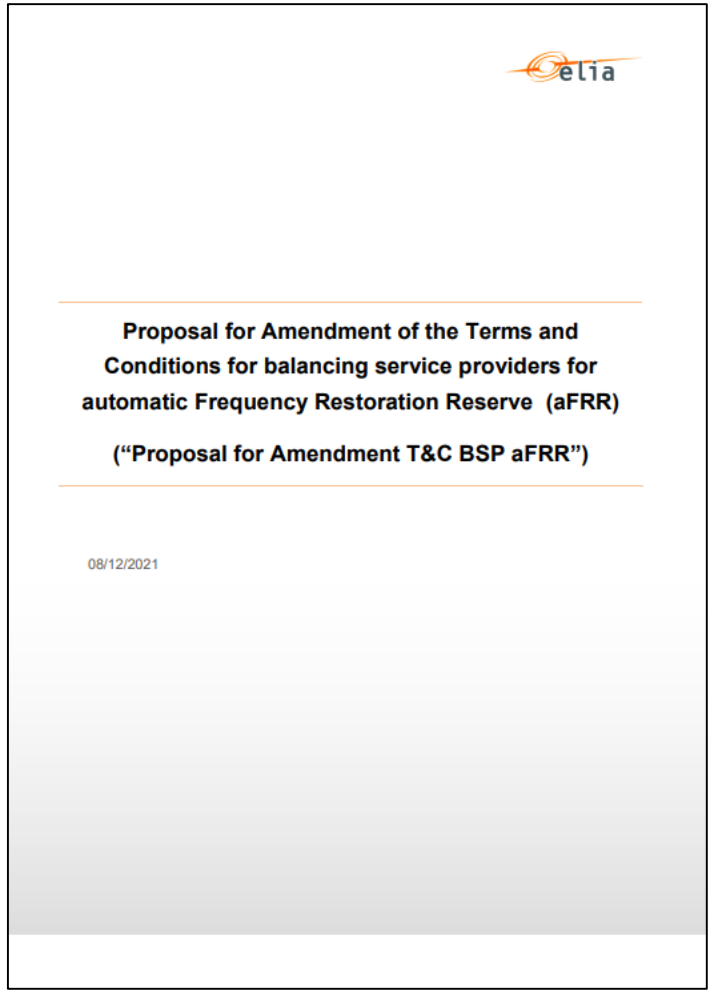
    Feedbacks received from several stakeholders after the workshop of 24/02. Some new elements appeared, which require further analysis. The requirements will be drafted on this basis and will be informally consulted
  - *Updated mFRR design note (REMINDER)*

    Questions, if any, to be addressed to KAM Energy or Thomas Oldenhove (feedbacks expected by end of April at the latest). Depending on the questions received from stakeholders, a workshop could be organized if needed
  - *BSP Testing environment for mFRR and iCAROS phase 1*
  - *BSP Facilitations : adhoc meeting to be organized in June*

Feedback public consultation T&C BSP aFRR

Presented by Philippe Magnant

T&C BSP aFRR Consultation



- *Elia organized a public consultation of the proposal for amendement of the T&C BSP aFRR from 8 December 2021 to 18 January 2022*

- *Elia received non-confidential answers from:*
  - *FEBEG*
  - *Febeliec*
  - *Centrica Business Solutions*
  - *RAP-Green and SRIW*

- *Elia received 2 confidential answers*

Reminder – main changes introduced by Elia compared to the current version of T&C BSP aFRR

- Go live step 1:
  - New aFRR capacity design
  - New Energy bidding structure
  - Delivery points with Limited Energy Reservoir
  - Baseline control for DPs participating to FCR and aFRR
  - Activation control in case of jumps
  - Activations of contracted aFRR Energy Bids for Redispatching
- Go-live step 2: Modifications required for the connection to PICASSO
  - Switch to marginal price
  - Price cap modification
  - Definition of fallback scenarios

Main feedback from public consultation

- Assets with **Limited Energy Reservoir** :

Stakeholders' feedback	Elia's feedback
FEBEG's feedback: The proposed **definition** of the Limited Energy Reservoir seems **not consistent** with the definition of the term used in the T&C of FCR	Elia is aware that the definitions of LER differ between FCR and aFRR. The reason is that the consequences of being "LER" differ: • In the **FCR** market, being categorized as "LER" allows the BSP **not to deliver the FCR service in certain circumstances**, in accordance with SOGL article 156 (9) • In the **aFRR** market, the purpose of the EMS is to **guarantee that the service will be delivered continuously in any circumstances**. ➔ the FCR definition of LER (see below), can't be applied to aFRR. "*A Delivery Point for which the full activation of FCR for the time frame contracted by ELIA might, even in case of an active energy reservoir management, lead to a limitation of its capability to provide the full FCR activation due to the depletion of its energy reservoir(s) taking into account the effective energy reservoir(s) available at the beginning of that time frame.*"

Note: additional feedback on assets with Limited Energy Reservoir has been clarified during the EMS workshop of 24/02

Main feedback from public consultation

- **aFRR capacity design – RC factor**:

Stakeholders' feedback	Elia's feedback
➢ **Centrica** points out that the **process to revise downwards the 20% mark up** on the reference price used for the per-CU auction should be **more transparent and subject to consultation**. ➢ **RAP-Green and SRIW**: in the proposed T&C, CREG may unilaterally decide to modify this RC factor. We find this unacceptable. ▪ RC factor should be updated only subsequent to an **evaluation by Elia based on KPIs** and provided to the CREG and subject to **discussion with the stakeholders** ▪ **We don't agree with a cap to 120%** ➢ **Febeliec** remains **strongly opposed to the RC factor** as it only increases the cost for aFRR balancing capacity. Febeliec insists it is very diligently and frequently analyzed by both Elia and the regulator and **phased out as soon as possible** and in any case immediately when it is believed that it is either not delivering any value or being misused for gaming purposes or windfall profits.	The compromise of the RC factor results from **long interaction process with stakeholders and with the CREG** and is a delicate balance. Elia reminds that: ▪ The initial proposal was not have an RC factor. It has been introduced following claims for market parties intending to bid in "per-CCTU" that they would not be able to grasp a fair remuneration compared to "all-CCTU bidders". ▪ Elia identified market-functioning related risks when introducing an RC factor. Therefore, while the RC factor was introduced, **it is necessary to have a process to reduce the RC factor if deemed necessary by the CREG**. The process to review the RC factor has been agreed on with the CREG. Depending on the situation, it can't be excluded that a revision of the RC factor would need to be applied quickly. It's however clearly not the objective to modify the RC factor every week.

Main feedback from public consultation

- **Remuneration before connection to PICASSO**:

Stakeholders' feedback	Elia's feedback
Febeliec: ▪ **as long as the Belgian aFRR market is not coupled to the European platforms**, Febeliec strongly insists that the **price caps (+ and – 1000€/MW) remain in place** to safeguard against opportunistic bidding behavior (not based on real costs) in case liquidity would be insufficient after the switch to these new T&C BSP aFRR (see also above). ▪ Elia introduces the Cross-Border Marginal Price (CBMP) as of the second phase of implementation, but this creates some **confusion towards the applicable price in the first phase**. This should maybe be clarified or specified a bit better (Febeliec assumes that all remains the same as currently in place before phase 1 but this is not completely clear).	Elia confirms this understanding. As long as Elia is not connected to the aFRR Platform, the remuneration is the same as today: • Paid-as-bid • Price cap of +/- 1.000€/MWh

Main feedback from public consultation

- **Modifications after BE GCT**:

Stakeholders' feedback	Elia's feedback
FEBEG: ELIA allows BSPs to adjust their aFRR energy bids under certain circumstances up to 5minutes before the start of delivery period. However ELIA does not guarantee that this change will be taken into account. Should a delivery point which is included in a non-contracted aFRR Energy Bid have a **technical malfunction**, the unit might still be activated by the PICASSO platform even if it was announced as unavailable 5 minutes before the start of the delivery period. To FEBEG, **ELIA should be able to avoid aFRR activations on non-contracted bids which have been updated 5min before the delivery**.	Elia gives the possibility to market parties to request a decrease of the volume of their bids after BE GCT in certain circumstances. It's of course Elia's objective to avoid activation beyond the newly provided volume. However, **it can't be excluded that those modifications are not taken into account by the aFRR-Platform**. If Elia accepts the volume reduction request in that case, it would lead to an **inconsistency between the merit order used by the aFRR-Platform and the merit order used by Elia's LFC controller**, socializing related costs and potentially leading to an increase of Elia's FRCE. The modification of the volume bid on the BSP's request is performed on a **best effort** basis, with no guarantee that the change will be (timely) taken into account by the platform; these risks will be borne by the BSP and not socialized.

Main feedback from public consultation

- **Red zones**:

Stakeholders' feedback	Elia's feedback
FEBEG: ▪ In the proposed T&C ELIA requests the BSP to make **best effort** to update their aFRR Energy bids and shift the aFRR obligation to other DPs whenever the BSP's Energy Bids are impacted by a Red Zone. In contrast to the current aFRR T&C **ELIA can request the BSP to demonstrate the actions taken**. This makes it **important to have a mutual understanding of what constitutes "best effort"**. ▪ From FEBEG's point of view, ELIA has the means to make the aFRR reallocation between two units of a BSP through redispatch. The non-constrained unit can be redispatched by ELIA to an operating level suitable to take over an aFRR obligation. When this is done the BSP can adjust their aFRR Energy bids	These elements do not fundamentally change compared to the current version of the T&C BSP aFRR. ▪ The notion of best effort is already included in the current T&C. **It corresponds to an obligation of means, not an obligation of results**. The fact that it is now explicitly mentioned that the BSP has to be able to demonstrate it is a **clarification of the process**. ▪ Elia is currently analyzing how to handle the impact of filtering on the available FRR volumes

Main feedback from public consultation

- **Order of activation of aFRR and mFRR bids**:

Stakeholders' feedback	Elia's feedback
Febeliec urges Elia to (re)start a reflection **on order of activation of aFRR and mFRR bids**. In light of ever increasing balancing costs, it would be interesting and important to **reassess the current approach** by Elia to always first activate aFRR before mFRR bids, as often (much) **cheaper mFRR bids** are available yet not activated, thus leading ever more frequent to a steep (but potentially unnecessary) increase of balancing costs for consumers. Febeliec insists that this point is also taking into account in all reflections on the balancing philosophy by Elia.	This topic is currently being analysed by Elia and will be further discussed with market parties before the connection to PICASSO. However, following elements need to be considered: • **Proactive activation of mFRR can lead to overshoots**. • **aFRR is an automatic product** ➔ and activations of bids with high prices cannot always be avoided • **Economic optimization becomes even more difficult when connecting to PICASSO**, (CBMP depends also on aFRR demand from each PICASSO TSOs and ATC constraints) • **The connection to MARI has an additional impact**, as MARI will increase the delay between the decision to activate mFRR and the actual mFRR delivery

Main feedback from public consultation

- **Penalty for activation control**:

Stakeholders' feedback	Elia's feedback
FEBEG: Currently, penalties are only calculated considering **monthly** average deviations and monthly total remunerations. This leads to a discrepancy between the quality of aFRR delivered and the corresponding penalties. Due to the complexity of the subject FEBEG does not, at this point in time, propose concrete changes to the T&C aFRR in this regard. Nonetheless, **we invite ELIA to review and analyse** these findings and associated risks and to find a solution together with market participants	• Elia acknowledges that there might be **areas of improvement** in the determination of the penalties for activation control. • As stated by Febeg, this is a complex topic and it will **need to be extensively discussed together with all market parties as well as with the regulator**. • In addition, the penalty is defined in the same way for the other balancing products, it will need to **remain aligned** if a modification is considered. ➔ Therefore, Elia proposes to **gather inputs from the market parties and perform the analysis during the next design evolution**.

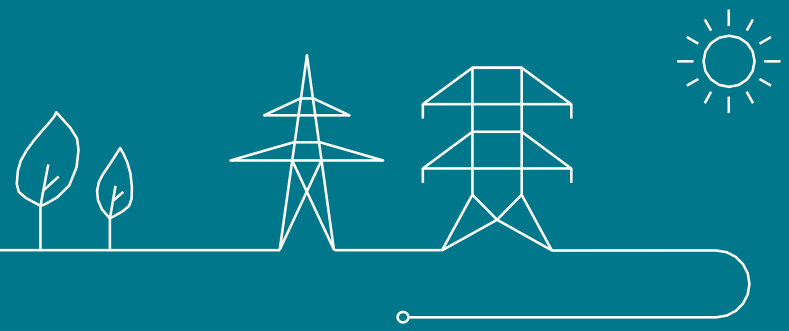
Main feedback from public consultation

- **Activation for Redispatching**:

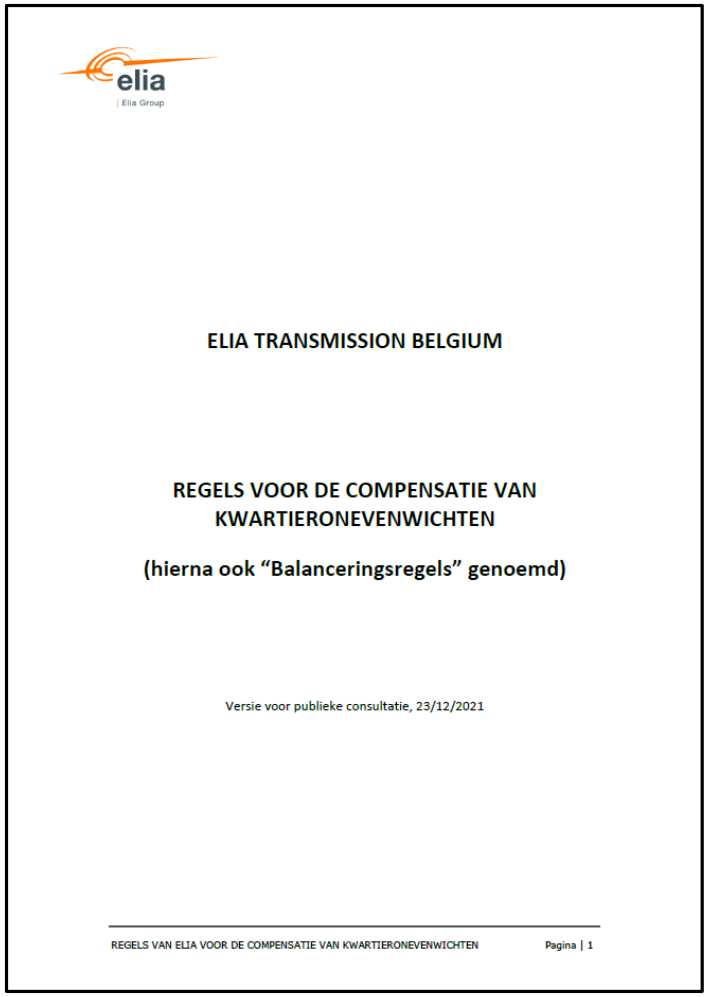
Stakeholders' feedback	Elia's feedback
FEBEG: When a DP is delivering aFRR for redispatch the capacity of that bid and the potentially linked bid will become unavailable for balancing purposes. This could mean: • **More expensive bids** will have to be **activated** for aFRR • The unavailability of the linked bid can lead to **opportunity costs** Hence both BRPs and BSPs are facing part of the costs of congestion instead of the TSO. Additionally this raises questions on the dimensioning of FRR reserves. Therefore **FEBEG requests ELIA to monitor these effects and ensure a maximum transparency**. Should these effects be structural and/or considerable ELIA would need to review this approach	Elia reminds that contracted FRR bids will only be activated for redispatching purposes as a **last resort**, when no other means are available to the system operator. **Elia agrees to monitor the process**, should it be used in a structural way. Linked bids: ▪ Only existing link for aFRR is the link between UP and DOWN ▪ BSP's bid is continuously activated and remunerated at the maximum between its bids price and the CBMP, which ensures that there is no opportunity cost for the BSP. ➔ no loss of opportunity. However, Elia acknowledges that **bids using the same DP_{SU} in the same direction do not have to be set as unavailable. This will be modified in the T&C BSP aFRR.**

Feedback public consultation Balancing Rules

Presented by Caroline Bosschaerts and Philippe Magnant



T&C BSP aFRR Consultation



ELIA TRANSMISSION BELGIUM

REGELS VOOR DE COMPENSATIE VAN KWARTIERONEVENWICHTEN

(hierna ook “Balanceringsregels” genoemd)

Versie voor publieke consultatie, 23/12/2021

REGELS VAN ELIA VOOR DE COMPENSATIE VAN KWARTIERONEVENWICHTEN Pagina | 1

- *Elia organized a public consultation of the Balancing Rules from 23 December 2021 to 2 February 2022*

- *Elia received non-confidential answers from:*
  - *FEBEG*
  - *Febeliec*

Reminder – main changes introduced by Elia compared to the current version of the Balancing Rules

- New approach to calculate the **System Imbalance** after connection to aFRR platform
- Updates of publications on Elia website and on reporting to the CREG after connection to aFRR Platform
- New formula to calculate the **aFRR component of the imbalance price** after connection to aFRR platform (illustrated for the case of negative average system imbalances on the figure below) :

	1	2	3 & 4
Price	$VoAA_{up}$	CBMP	N/A
Volume	aFRR SD	aFRR SD	N/A

Main feedback from public consultation

- On the new approach to calculate the **System Imbalance** :

Stakeholders' feedback	Elia's feedback
➢ FEBEG **agrees with Elia proposal** ➢ No comment from Febeliec	No change in the proposal

- On **publications** :

Stakeholders' feedback	Elia's feedback
➢ On the publication of data on the Elia website, Febeliec notices that Elia will now only publish "**complimentary**" information to what is on the ENTSO-E website, but insists that it should be possible for market parties to **find all relevant data on the Elia website** (so without having to consult different sources), which can easily be done from an operational (website) perspective.	With the connection to PICASSO, data with a **4 seconds granularity** will be published on the **ENTSO-E Transparency Platform**. This will be the case for the CBMP and for the imported and exported aFRR volumes for each TSO. Considering the very high amount of data and its availability on the ENTSO-E Transparency Platform, it has been decided not to copy all this data on each individual TSO website. **Elia proposes to add on its website the relevant links to the ENTSO-E Transparency Platform**.

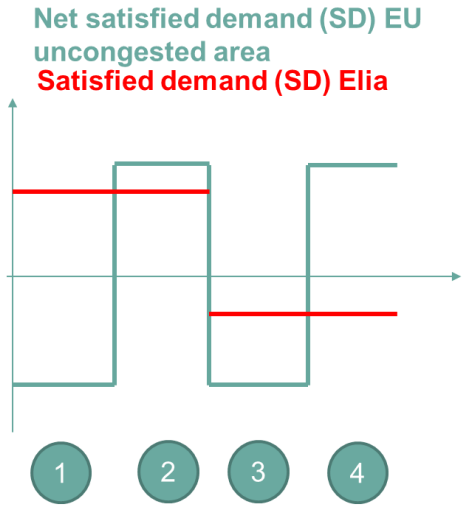
Main feedback from public consultation

- On the new formula to calculate the **aFRR component of the imbalance price** :

Stakeholders' feedback	Elia's feedback
➢ FEBEG suggests **an alternative proposal** : $IP^{\square} = \frac{\sum oc\,[(abs(aFRR\ SD\ oc,j))\ x\ CBMP\ oc,j]}{\sum oc\ (abs(aFRR\ SD\ oc,j))}$ which it considers more appropriate because : • It includes all optimization cycles, striving to better indicate when a (strong) implicit reaction is useful and when it isn't • It uses the CBMP for each optimization cycle, striving to find a EU optimum from a social welfare perspective ➢ Febeliec is adamant that a **strong link between the Belgian imbalance and the Belgian imbalance price** is essential, even if this implies that BRPs and BSPs will be exposed to different price signals	**Elia does not agree to use the Cross Border Marginal Price as price signal when** the direction of the CBMP does not correspond to the direction requested by Elia, or when it does not correspond to the direction that helps solving the average Belgian SI over the ISP (see justification in slide 59). Elia however **agrees to use all the optimization cycles** in the formula (see details in slide 60). Elia also acknowledges that its current proposal does not allow to capture full netting benefits and **is willing to improve** the calculation of the imbalance tariff in that respect, by **proposing an evolution of the additional "alpha" component** (see details in slide 61).

Elia's new proposal taking into account feedback of public consultation

New formula to calculate the aFRR component of the imbalance price (illustrated for the case of negative average system imbalances on the figure below):



	1	2	3 & 4		3 & 4
Price	$VoAA_{up}$	CBMP	N/A	➔	$VoAA_{up}$
Volume	aFRR SD	aFRR SD	N/A		abs (aFRR SD)

- The price signals used in the calculation of the Marginal Incremental (resp. Decremental) Price are:
  - the CBMP when the aFRR satisfied demand is positive (resp. negative) and when the aFRR platform selects at least one aFRR Energy bid in the upward (resp. downward) direction
  - the VoAA in the upward (resp. downward) direction for all the other OCs (no matter the direction of the aFRR satisfied demand)

- The weight associated to each optimization cycle is based on the absolute value of the aFRR Satisfied Demand (as suggested by FEBEG in its answer to the public consultation)

Justification of Elia's proposal – Why using VoAA for some OCs?

✓ Compliant with EU regulation:

- ISH articles 9.1 and 9.2 stipulate the following boundary conditions which are respected if the VoAA is used when Elia's demand is fully netted :

> *9.1 (resp.2) In case there is no positive (resp. negative) balancing energy activated for this connecting TSO, then **the value of avoided activation** of balancing energy calculated in accordance with Article 10, **shall be the lower** (resp. upper) **bound** for the imbalance price for negative (resp. positive) imbalance.*

- Several articles/whereas of EBGL/ISH/CEP convey the idea that the market participants should be incentivized to be balanced or help balance the local system, which is respected if the VoAA is used when Elia's demand is netted :

> *The pricing method for standard products for balancing energy should **create positive incentives** for market participants in keeping and/or **helping to restore the system balance of their imbalance price area***

✓ Ensures operational security - using VoAA when Elia's demand is netted prevents providing incentives :

- for uncontrolled deviation from XB scheduled flows which creates a risk of ATC violation
- for creating system imbalances that exceed the local available reserves, hence degrading the ACE if netting opportunity is suddenly lost which, in turn, can increase the balancing capacity to be procured

✓ Ensures better price predictability which is a necessary condition to support Belgian reactive balancing model at large scale

Using VoAA when Elia's demand is netted prevents unstable price signal, oscillating between CBMP in one direction and local marginal price in the other direction as the borders saturate

Justification of Elia's proposal – Why taking all OCs into account?

1 first minute			14 last minutes					
SI	$CBMP_{up}$	$VoAA_{up}$	SI	$CBMP_{up}$	$VoAA_{up}$	Average SI	Imbalance price initial proposal	Imbalance price new proposal
-1400	450	80	99.9	250	80	-0.1	450	265.1
-1400	450	80	1	250	80	-92.4	450	446.3
-1400	450	80	-1	250	80	-94.3	448.0	448.0

1. Price signal is strongly attenuated when SI significantly switches direction during the ISP

2. While ensuring price continuity if the SI oscillates around 0

3. And while continue providing a price signal which does not incentivize BRPs to aggravate the Belgian SI

An evolution of the additional “alpha” component could help capture additional netting opportunities, without impacting grid security or balancing capacity

When Elia demand is netted, the Imbalance Price which applies is calculated as:

IP = VoAA + α

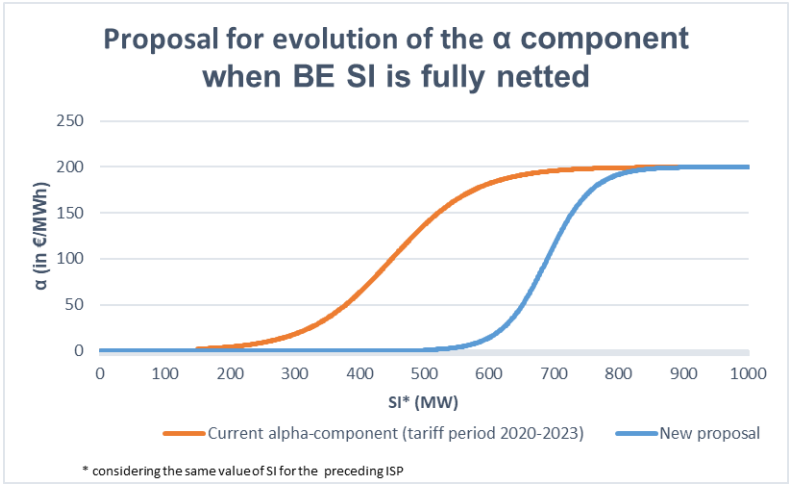
Neutral price signal which does not incentivize the BRPs to improve or aggravate the Belgian System Imbalance

Price signal which, in case of SI larger than 150MW incentivizes the BRPs to reduce the Belgian System Imbalance

As soon as the Belgian System Imbalance exceeds 150MW, the Imbalance Price starts incentivizing the BE BRPs to reduce the BE System Imbalance even when the BE System Imbalance is netted in a cost-effective way*.
➔ This α design can result in a loss of opportunity to reduce the Imbalances costs in a context where the balancing markets (and especially the mFRR market) are integrated at EU level

Elia believes that a ‘delayed’ version of the alpha component, that, in case the Belgian system imbalance is fully and efficiently netted, only applies for larger system imbalances, could help capture additional netting opportunities, without jeopardizing the grid security or increasing the balancing capacity to be procured.

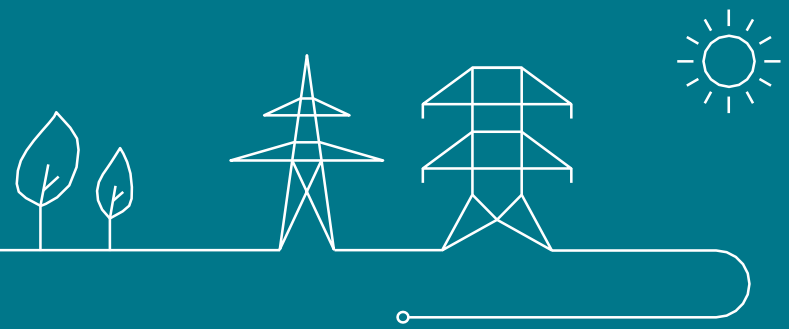
➔ Elia would like to propose a new revision of the parameters of the alpha component before the MARI Go-live.



* The main idea of the netting is to avoid activating reserves, there is no economical optimization behind and in Picasso netting that are inefficient from an economical perspective are possible. In this case netting is more expensive than stimulating local resources to activate themselves

aFRR go-lives: status and next steps

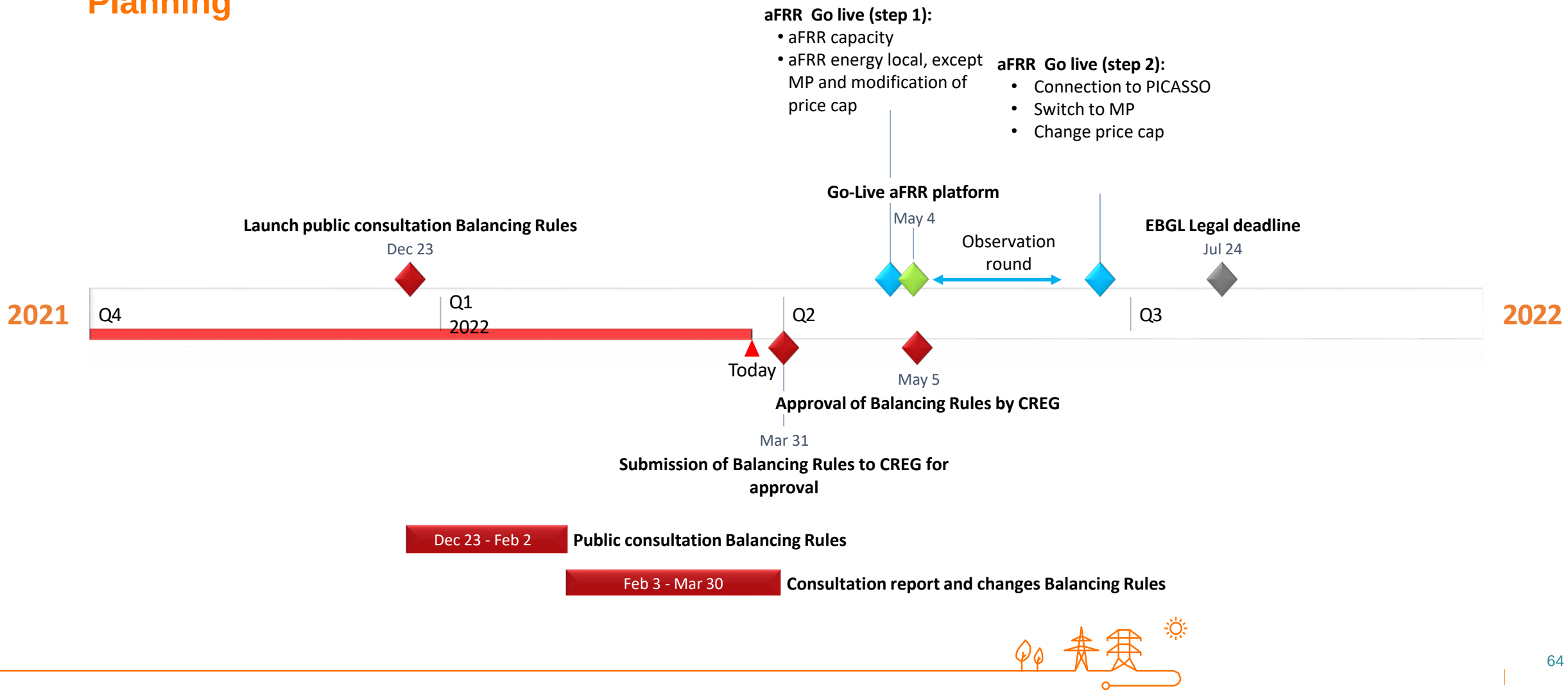
Presented by Philippe Magnant



aFRR go-live step 1

- Go-live planned on 27 April 2022. This date is subject to:
  - Approval of T&C BSP aFRR by the CREG on 24 March
  - Technical readiness of Elia
  - Technical readiness of BSPs
- In order to avoid a signficant loss of liquidity after the go-live, BSPs are requested to confirm technical, operational and commercial readiness to their KAM Energy by 30/03 EOD for a readiness check. Risks identified should be communicated.
- Based on this input and on the other conditions for the go-live Elia will confirm the date beginning of April

aFRR go-live step 2
Planning



aFRR go-live step 2

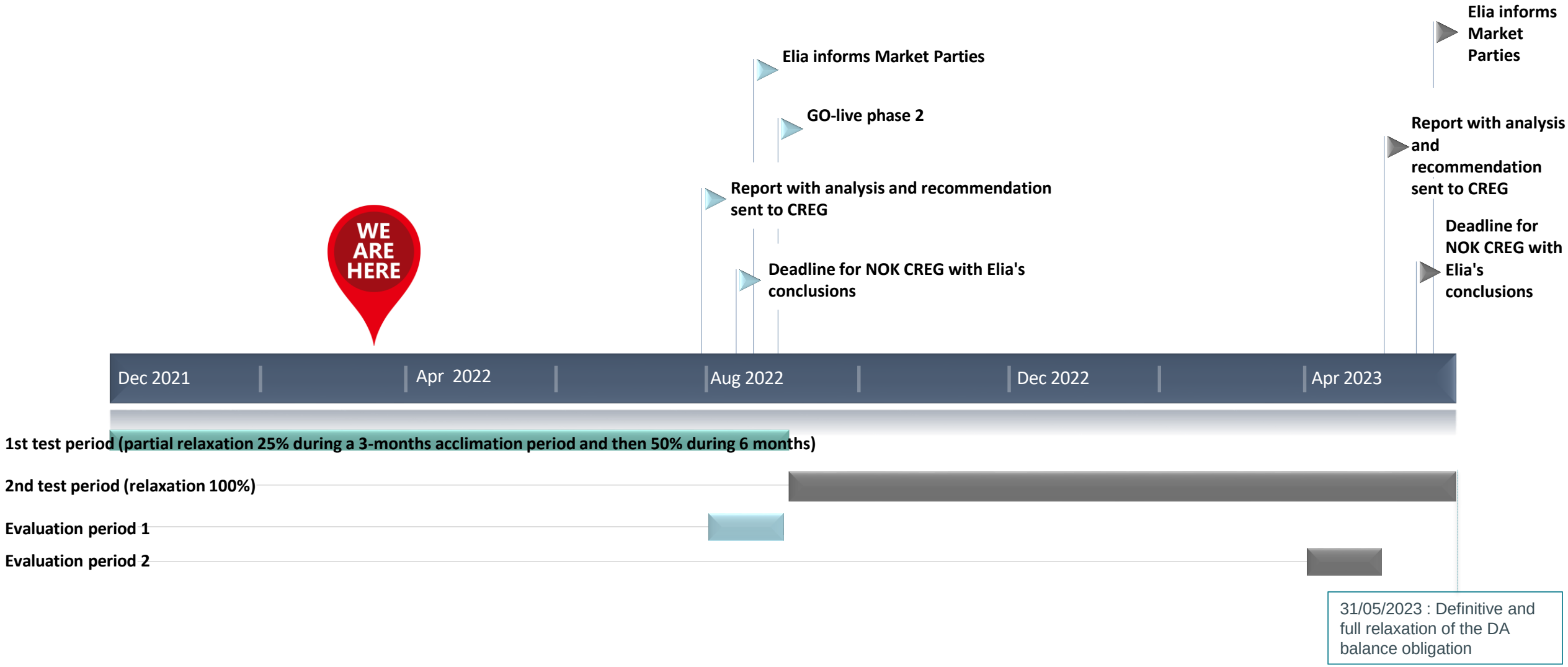
- German TSOs announced earlier this week they are postponing their connection to PICASSO on the 22nd of June. The planning of the EU TSOs, including Elia, needs to be adapted based on this new element
- Elia still plans to introduce the balancing rules by the end of March, based on the compromise solution presented (see previous slides)
- Elia is aware of the risk related to the approval of the balancing rules. However:
  - Elia has taken all feedbacks received to the best of its abilities, while guaranteeing operational security
  - Clarity on the calculation of the imbalance price is needed in order to prepare the analyses that will be performed before PICASSO go-live
- Elia reminds that the approval of the balancing rules is a prerequisite for the connection to PICASSO
- 2nd condition for a successful go-live: an evaluation confirming that the connection to PICASSO does not lead to a blocking point for the efficient functioning of the Belgian balancing market
  Note: this evaluation will highly depend on available ATCs

AOB

AOB – Relaxation of DA Balance Obligation

Presented by Caroline Bosschaerts

Implementation plan – reminder



Status & next steps

In accordance with the implementation plan described in the T&C BRP, **the 3-months acclimation** period with a Maximum Authorised Day-Ahead Imbalance equal to 25% of the BRP portfolio size **ended at the end of February**. Since the **beginning of March** BRPs are allowed to have Day-Ahead Imbalances **up to 50%** of their portfolio size.

According to **Elia's first observations** :

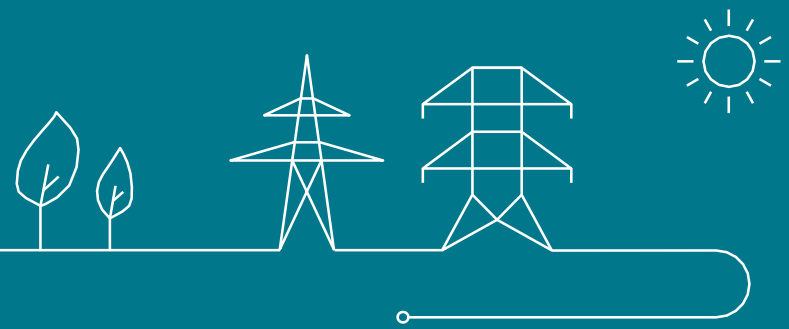
- ***A few BRPs adapted their behavior*** *and actively use the possibility to have imbalances in Day-Ahead, even though the largest part of BRPs only use this possibility occasionally.*
- *The **global DA imbalance remained** most of the time **limited**(<200MW). Larger DA imbalances were occasionally observed but these DA imbalances **never jeopardized** the security, efficiency or reliability of the grid.*
- *Besides, even when larger DA imbalances were observed, BRPs **managed to close their position** during the ID timeframe so that RT System Imbalances were small.*

Next Step : Detailed and formal evaluation of the first 9-months test period of the relaxation of the Day-ahead balance obligation will be prepared in the coming months in order to assess whether it is appropriate to further relax the DA balance obligation as from September 2022.

AOB – Approval of LFC BOA –

Exceptional balancing measures with Explicit bidding

Presented by Kristof De Vos



Approval of the LFC BOA on February 10, 2022

As presented in the WG BAL May 6, 2021, Elia proposed a framework for its procedures for exceptional balancing events

- Introduction of an escalation procedure (in case the reserve capacity needs are not covered)
- Specification of the exhausted reserve procedure (in case of exceptional risks, cf. storm risk procedure)
- An update of the measures taken in case of a high FRCE

A few other incremental modifications were proposed as well :

- Improvement of the Nemo Link direction forecast
- Replace the mFRR 15.0' FAT with 12.5' FAT

- A public consultation was held between 15/6/2021 until 16/7/2021
- The consultation report was published together with Elia's submission of the proposal to CREG on 30/9/2021

Elia's proposal was approved by CREG on 10/02/2022.

- Implementation of the Nemo link direction forecast is foreseen on April 1, 2022
- Implementation of exceptional measures and FAT reduction foreseen together with entry into force of next T&C mFRR (explicit bidding)

AOB – Approval of LFC BOA:
Implementation of Nemo Forecast Flow

Presented by Didier Chim

Proposed improvement of Nemo Link direction forecast (1)

Presented on 6th May 2021

In its continuous efforts to improve its dimensioning processes, Elia discovered an opportunity to improve the performance of the Nemo Link scheduled direction forecast, hereby improving the performance of FRR dimensioning.

- The forecast of **the scheduled flow direction** is an input to determine the **forced outage risk** and dimensioning incident **in Elia's dynamic FRR dimensioning.**

- The Nemo Link schedule is based on a day-ahead market **price forecast of BE and GB prices** delivered by an external service provider :

  - *Price_BE – Price_GB ≥ 7 €/MWh, the interconnector is considered in import ;*
  - *Price_BE – Price_GB ≤ -7 €/MWh, the interconnector is considered in export ;*
  - *-7 €/MWh < Price_BE – Price_GB < 7 €/MWh, the interconnector is considered as uncertain and both import and export direction are covered*

- To **improve the performance** of the forecast (cf. next slide), it is proposed to **replace** the day-ahead **price forecast** with a day-ahead real-time **flow forecast** on Nemo Link.

  - *Import flow forecast ≥ 50 MW, the interconnector is considered in import ;*
  - *Export flow forecast ≤ 50 MW, the interconnector is considered in export ;*
  - *Flow forecast < 50 MW, the interconnector is considered as uncertain and both import and export direction are covered*

Proposed improvement of Nemo Link direction forecast (2)

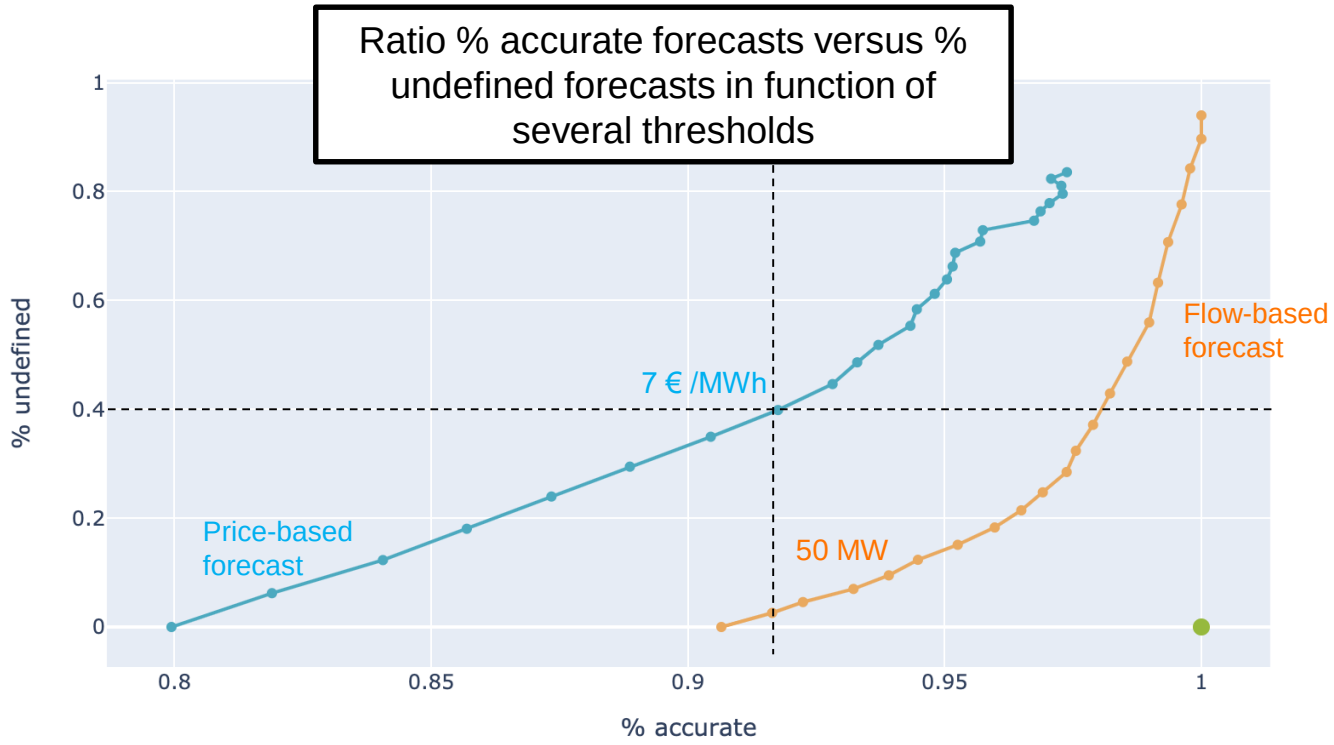
BETTER ACCURACY

For every possible threshold (between 50 MW and 600 MW) the new prediction method provides a better forecast in terms of ratio accuracy and undefined

TRESHOLD FIXED AT 50 MW

A multi-objective optimization minimizes the absolute distance to the perfect solution.

- The best threshold is found to be 50 MW.
- This value is found to be robust over the entire period observed



The Nemo Link Flow forecast will be implemented for the dimensioning of Reserve of the 1st of April 2022.

AOB – Next WG Balancing

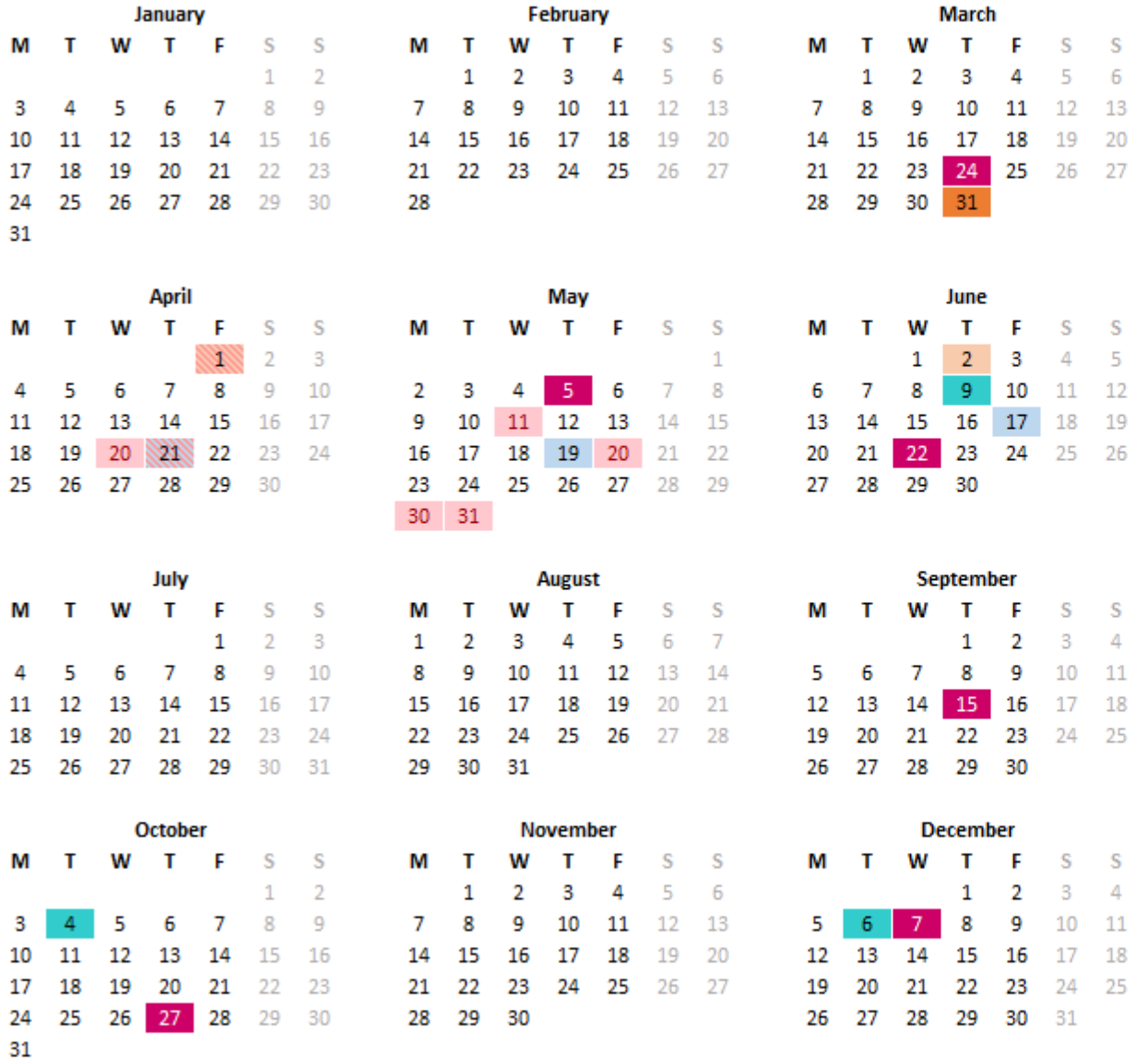
Presented by Didier Chim

Next WG Balancing

- WG Balancing 05/05/2022 9:00 – 13:00
- WG Balancing 22/06/2022 9:00 – 13:00
- WG Balancing 15/09/2022 9:00 – 13:00
- WG Balancing 27/10/2022 9:00 – 13:00
- WG Balancing 07/12/2022 9:00 – 13:00

Dates will be upload into the agenda of the WG Balancing page and usergroups.

Overview of WGs and related workshops



January

M	T	W	T	F	S	S
					1	2
3	4	5	6	7	8	9
10	11	12	13	14	15	16
17	18	19	20	21	22	23
24	25	26	27	28	29	30
31						

February

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14	15	16	17	18	19	20
21	22	23	24	25	26	27
28						

March

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21	22	23	24	25	26	27
28	29	30	31			

April

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18	19	20	21	22	23	24
25	26	27	28	29	30	

May

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16	17	18	19	20	21	22
23	24	25	26	27	28	29
30	31					

June

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20	21	22	23	24	25	26
27	28	29	30			

July

M	T	W	T	F	S	S
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18	19	20	21	22	23	24
25	26	27	28	29	30	31

August

M	T	W	T	F	S	S
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8	9	10	11	12	13	14
15	16	17	18	19	20	21
22	23	24	25	26	27	28
29	30	31				

September

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			1	2	3	4
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12	13	14	15	16	17	18
19	20	21	22	23	24	25
26	27	28	29	30		

October

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10	11	12	13	14	15	16
17	18	19	20	21	22	23
24	25	26	27	28	29	30
31						

November

M	T	W	T	F	S	S
	1	2	3	4	5	6
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14	15	16	17	18	19	20
21	22	23	24	25	26	27
28	29	30				

December

M	T	W	T	F	S	S
			1	2	3	4
5	6	7	8	9	10	11
12	13	14	15	16	17	18
19	20	21	22	23	24	25
26	27	28	29	30	31	

WG Balancing	WG SO EMD	Usersgroup	WG Adequacy	WG Belgian Grid
24/03/2022	31/03/2022	09/06/2022	21/04/2022	01/04/2022
05/05/2022		04/10/2022	19/05/2022	02/06/2022
22/06/2022		06/12/2022	17/06/2022	
15/09/2022				
27/10/2022				
07/12/2022				

Workshops	
MOG II	01/04/2022
Analysis and implementation of FCR evolutions conform art. 154(2) of SOGL	20/04/2022
study on the procurement strategies for a dynamic calculation of FRR means -	21/04/2022
study on the procurement strategies for a dynamic calculation of FRR means -	11/05/2022
Evolutions of BRP nominations	20/05/2022
Optimisation of input data for congestion management purposes	30/05/2022
Possibilities for combo (simultaneous activation) of DPs for FCR/aFRR/mFRR ar	31/05/2022
aFRR 5 min FAT – impact analysis and recommendations	