



WG Balancing Design & Solutions of 13/11/2025

Hybrid meeting

13/11/2025

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

- 09:30 – 09:35: Welcome and approval MoM
- 09:35 – 09:55: Update Roadmap 2025-2028
- 09:55 – 10:15: Overview Balancing incentives 2026
- 10:15 – 10:25: Monitoring of Proof-of-Concept for economic use of FRR
- 10:25 – 11:10: Incentive on LV prequalification
- 11:10 – 11:30: T&C BRP – feedback on the public consultation
- 11:30 – 12:10: aFRR & mFRR capacity auction design evolutions
- 12:20 – 12:30: AOB
 - 12:30 – 13:30: *Lunch*
- 13:30 – 15:00: Interactive info session: **Imbalance price formula evolution 2026 #2**
 - 15:00 – 15:30: *Break*
- 15:30 – 17:00: Interactive info session: **Outcomes of the Incentive on the economic optimization of the use of balancing products**



Minutes of Meeting for approval

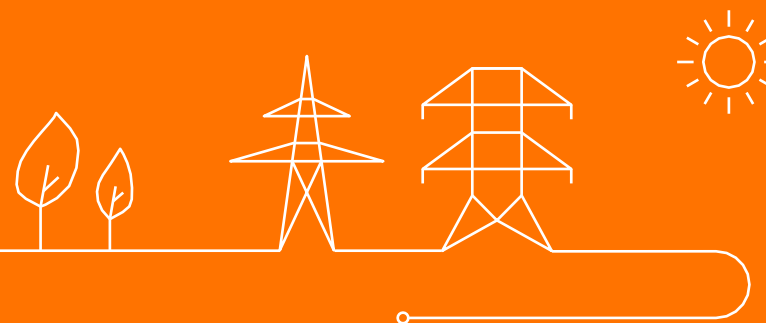
Minutes of Meeting of WG Energy Solutions of 02/10/2024

- Comments: /
- Suggestion to approve.

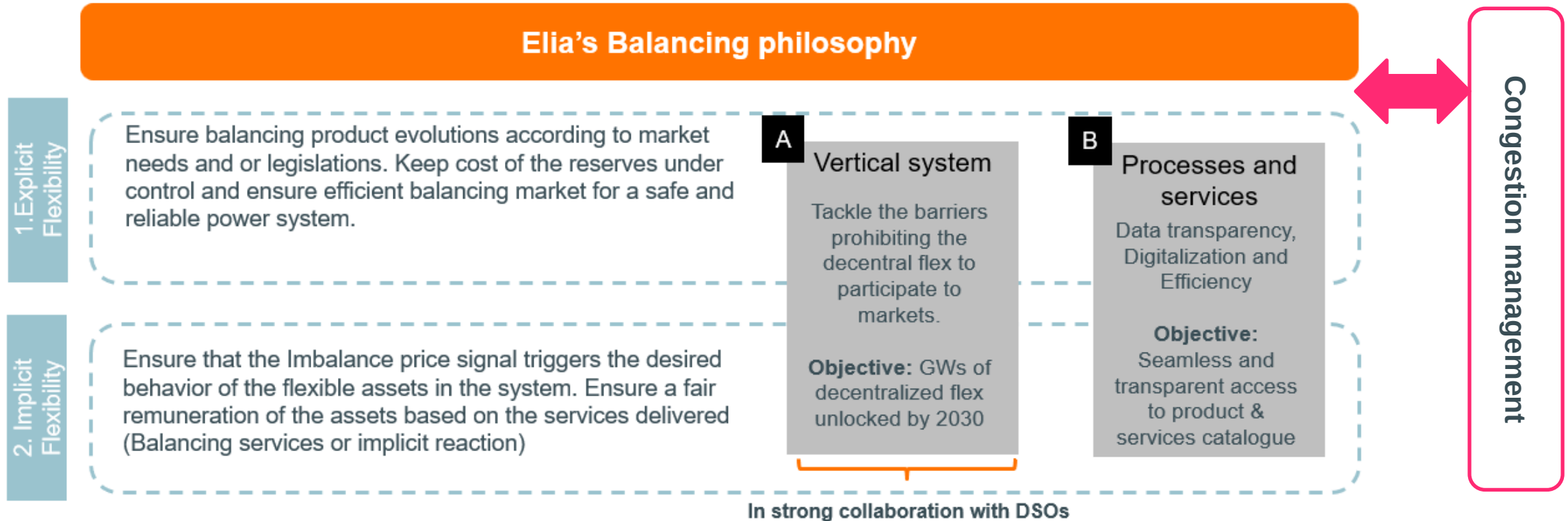


Update on Roadmap 2025-2028

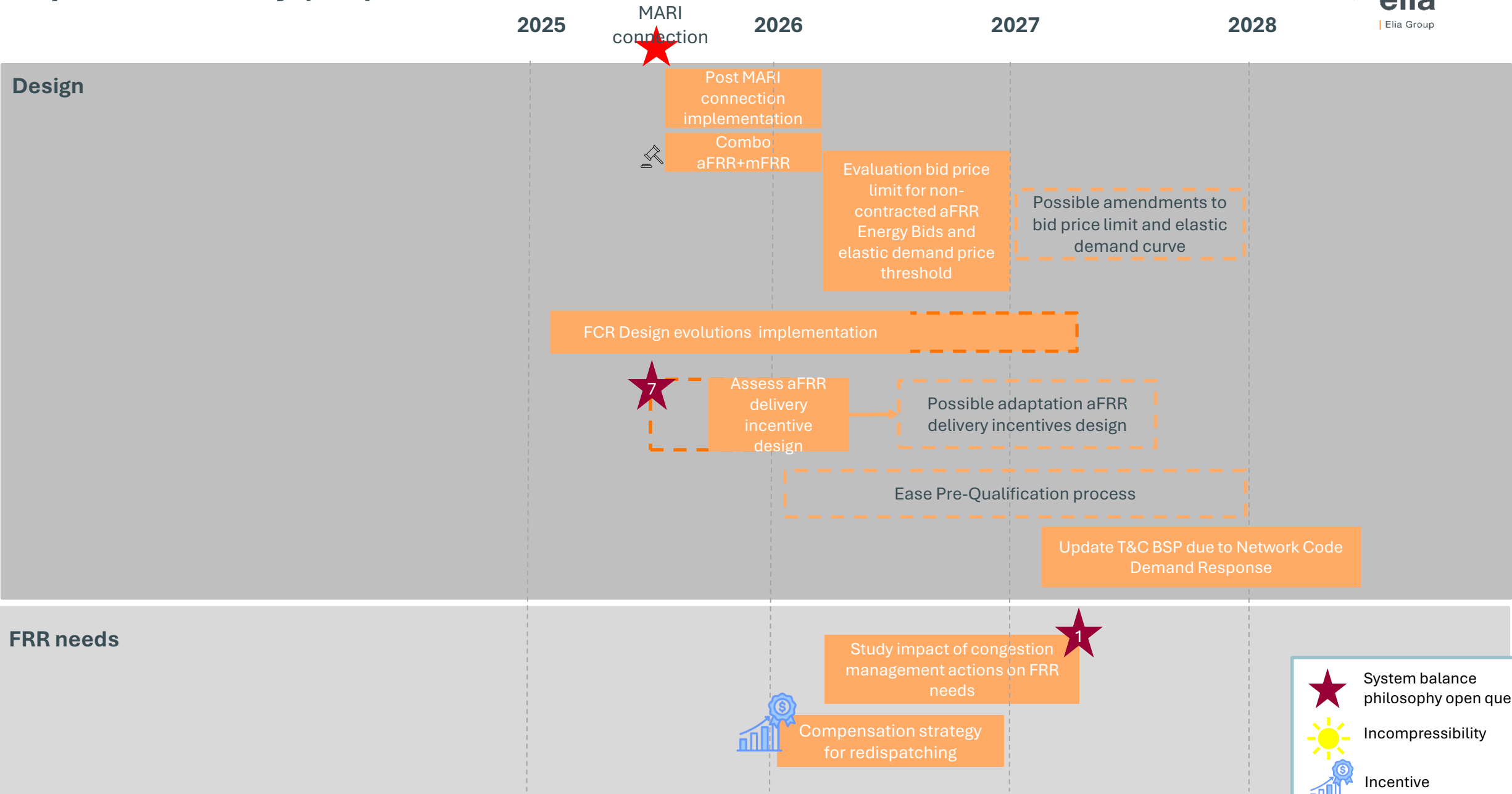
Martine Verelst



One **balancing philosophy**, Two core activities and two focus areas, while integrating the **interface between Balancing and Congestion**



Explicit flexibility (1/2)



Explicit flexibility (2/2)

2025

2026

2027

2028

FRR procurement

Study evolutions aFRR capacity auction design.



Study economic optimization FRR procurement



Possible development of new auction design/strategy



Study on FRR downward procurement

Possible implementation of findings of the study on FRR downward procurement

Study dynamic procurement



Possible implementation dynamic procurement



Study economic optimization FRR activation strategy



Possible development of an AI based model

POC based on heuristic rules

Possible implem.
mFRR
Elastic
Demand



System balance philosophy open question

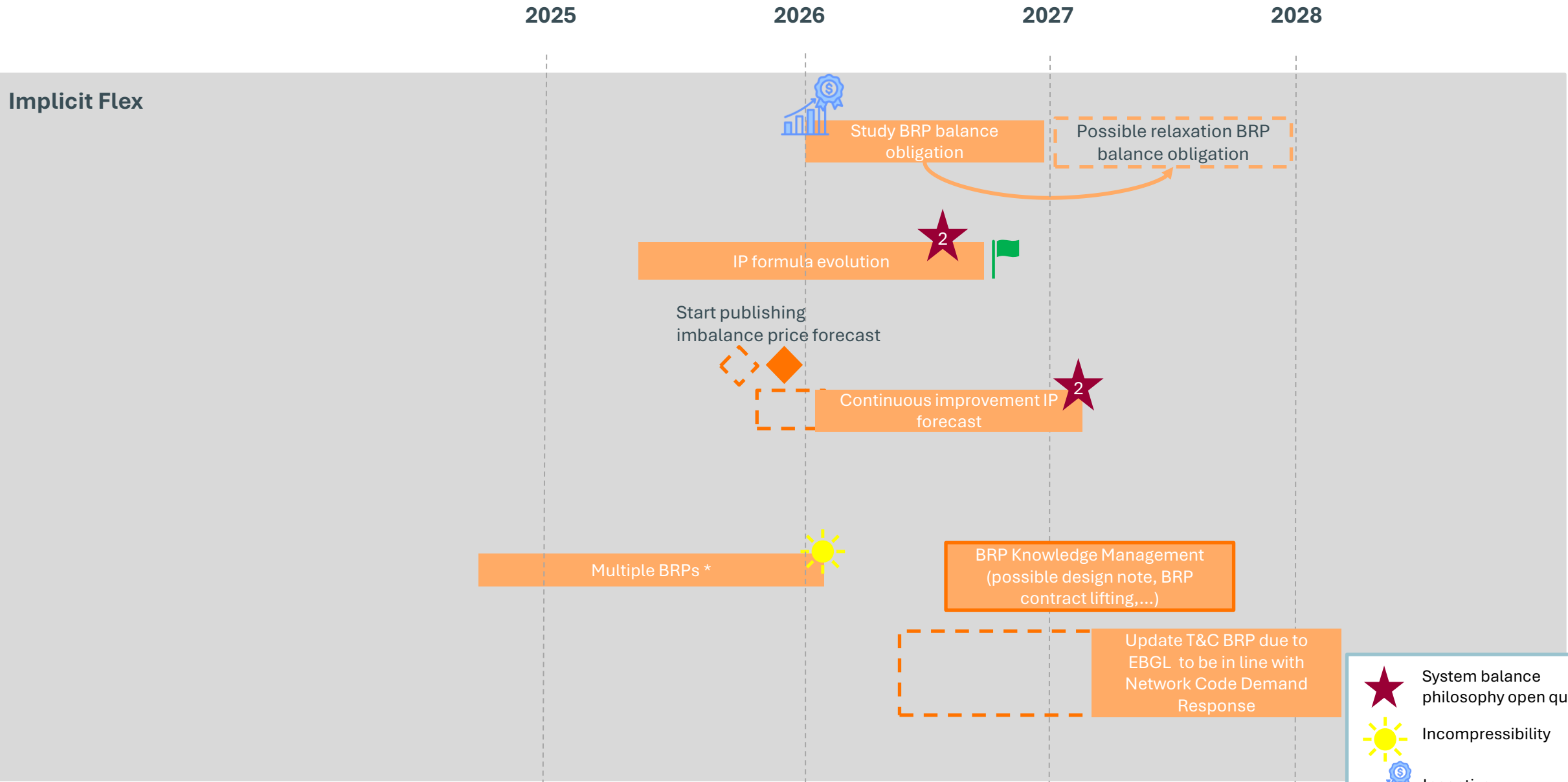


Incompressibility



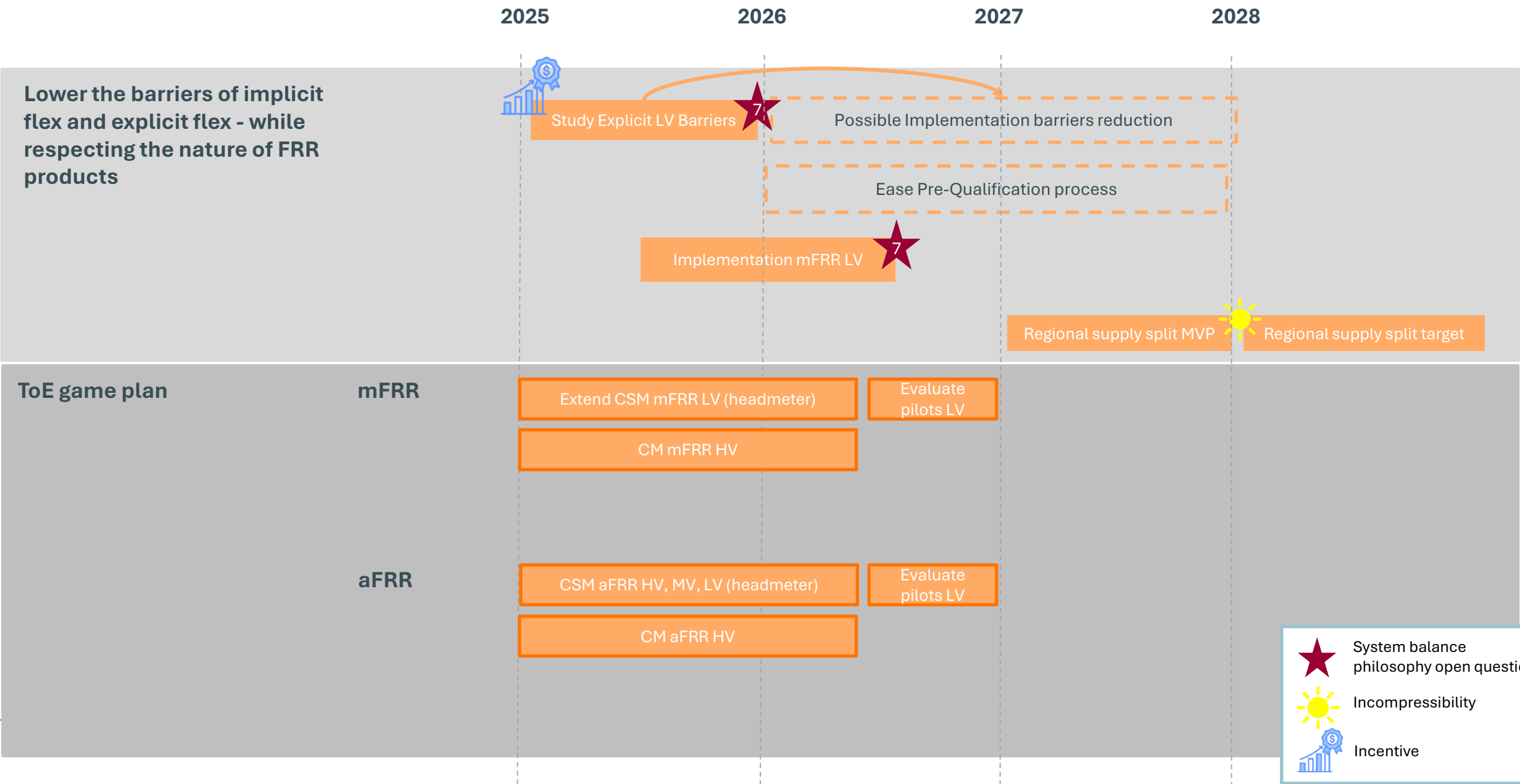
Incentive

Implicit Flexibility

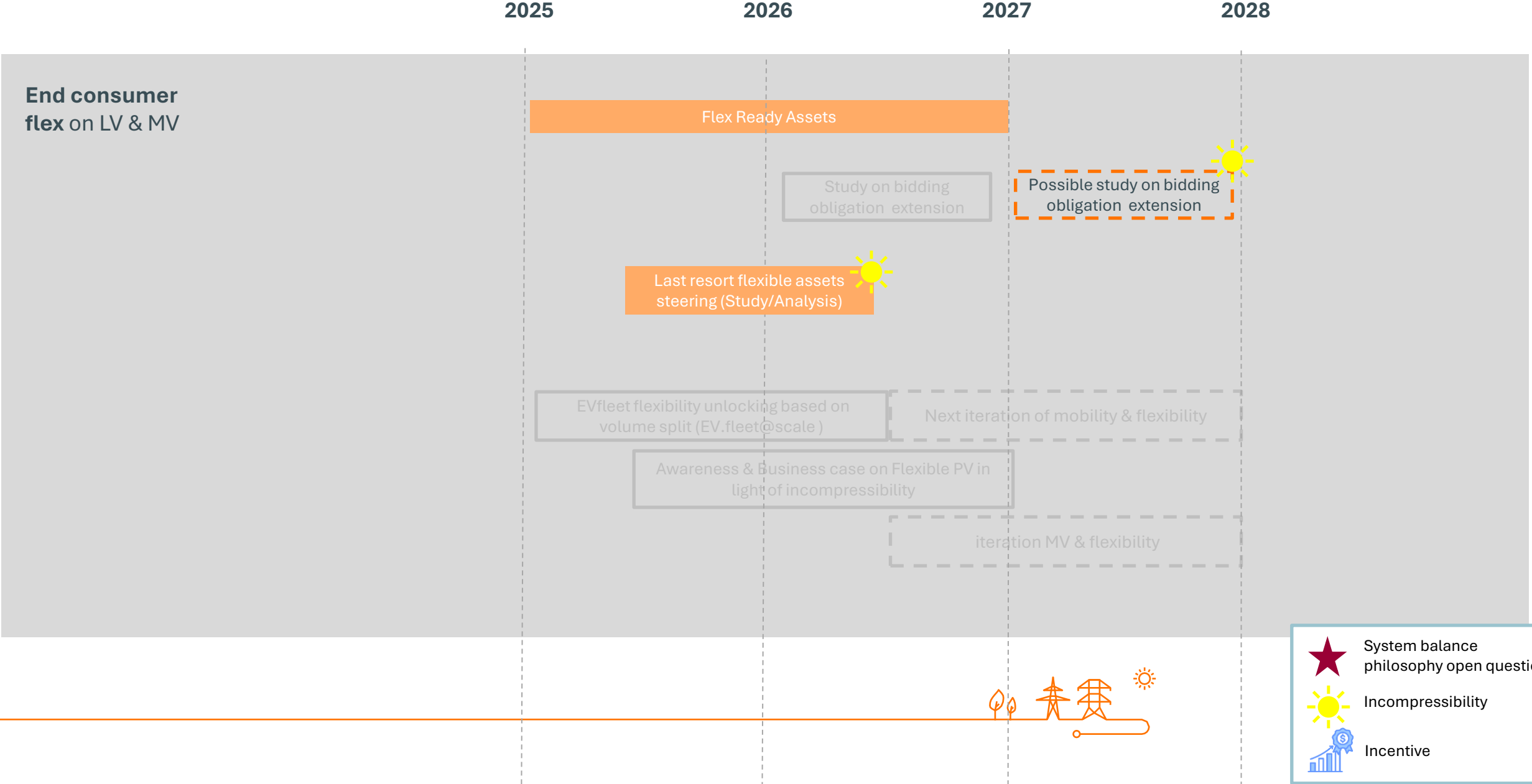


* Only awaiting Access Contact validation

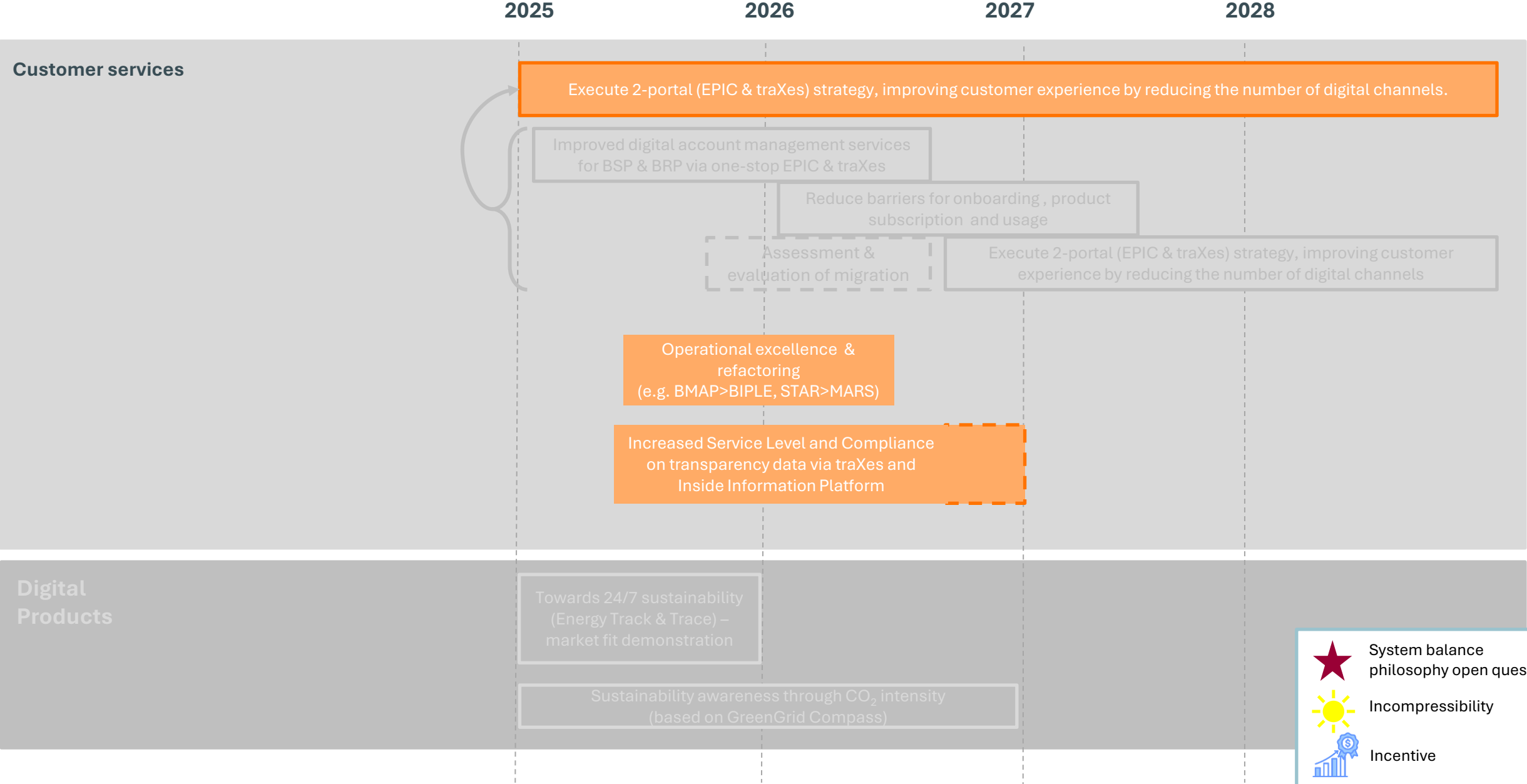
Vertical System



Vertical System

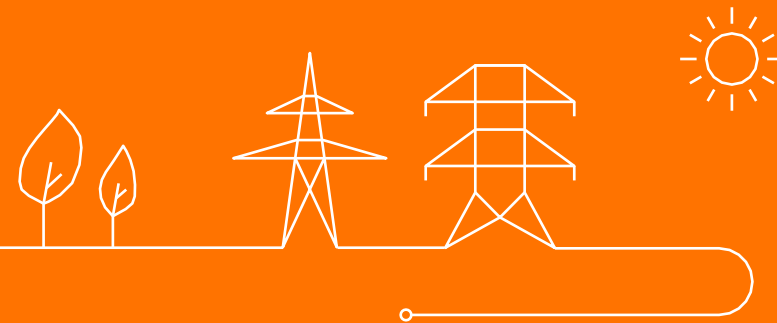


Processes and Services



Overview balancing incentives 2026

Martine Verelst



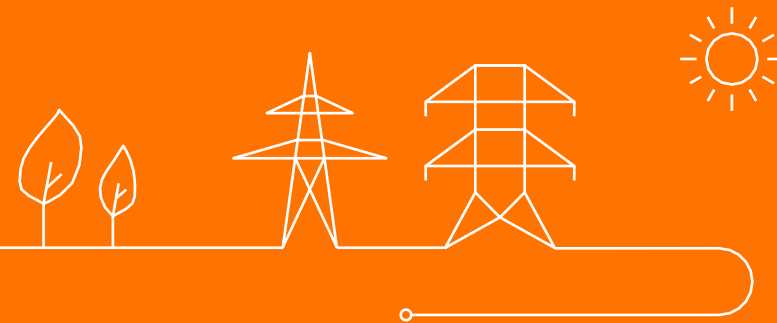
Overview Balancing Incentives 2026

Incentives	Public consultation	Will be followed in
Analyse van de mogelijkheden voor een optimalisatie van de aankoop van aFRR en mFRR balanceringscapaciteit	At the latest by 30 October 2026	WG BD&S
Analyse de la pertinence et de la faisabilité de relaxer l'obligation d'équilibre en temps réel des BRPs et, le cas échéant, élaboration d'un cadre pour cette relaxation	At the latest by 30 October 2026	WG BD&S
Strategies de compensation des actions de redispatching	25 September – 25 October 2025	WG BD&S/WG MIGO
Conception du processus de validation locale de l'ATC pour les plateformes d'équilibrage	At the latest in September 2026	WG MIGO
BSP ICT Onboarding – Onderzoeken & implementeren van alternatieven voor huidige TASE2/ICCP verbinding	Report to MPs at the latest by 30 June 2026	WG BD&S
Stimulans voor de bevordering van de liquiditeit van de aFRR-balanceringsmarkten	n/a	WG BD&S
Stimulans ter bevordering van de Europese aFRR-marktkoppeling	n/a	WG BD&S
Stimulans Data provision improvement	n/a	WG BD&S



Economic optimization of the use of FRR – Monitoring of the Proof-of-Concept

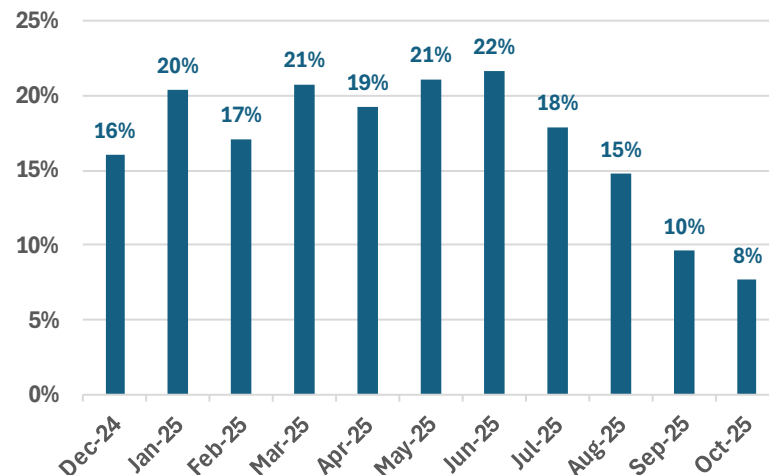
Tanguy Port



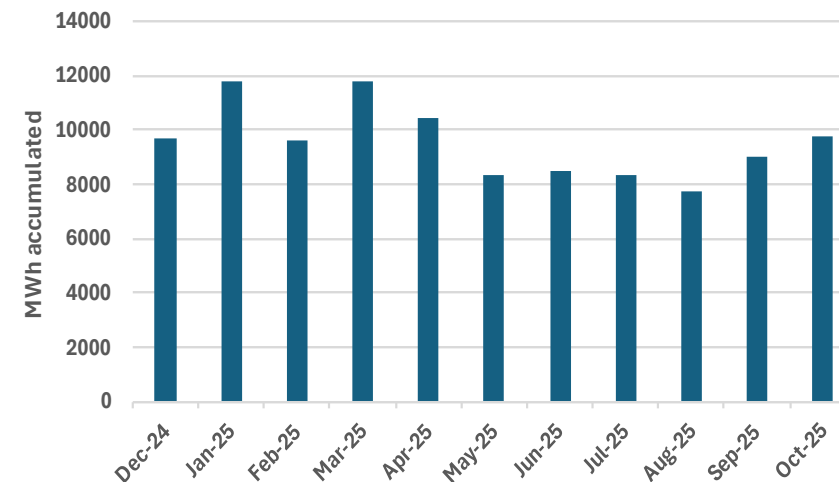
Economic use of FRR: proof-of-concept (PoC) monitoring 23/07/2025 – 28/10/2025

- **mFRR SA activations decreased significantly** thanks to the PoC
- FRCE did not evolve significantly, which confirms that the **PoC does not have a negative impact on operational safety**
- It is difficult to differentiate market conditions from financial benefits brought by the PoC
- A methodology to evaluate PoC benefits is presented two slides further

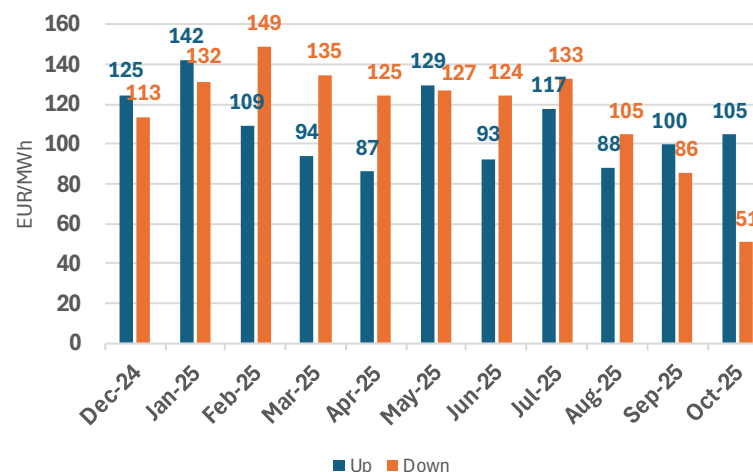
% of quarter hours where a mFRR SA demand is submitted



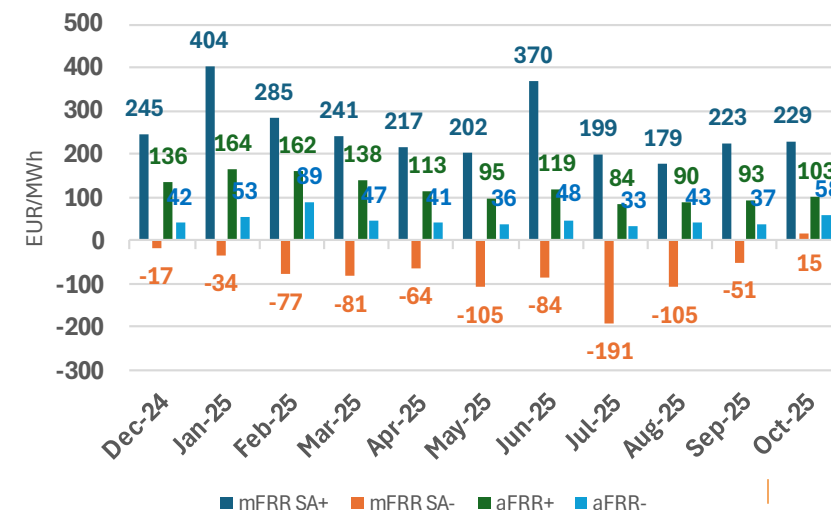
FRCE evolution



Average spread between aFRR & mFRR CBMPs in moments Elia submitted a mFRR SA demand*

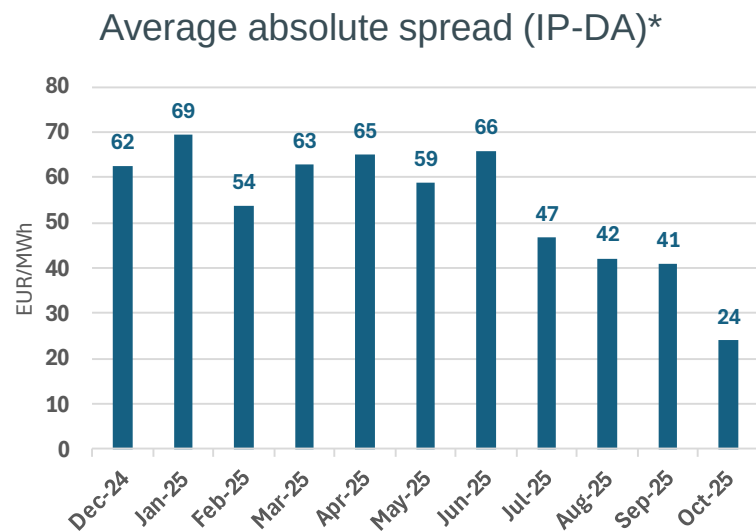


Average aFRR & mFRR activation price evolution*



* Disclaimer: calculations made with imbalance price formula components

Economic use of FRR: proof-of-concept (PoC) monitoring 23/07/2025 – 28/10/2025



- The attractiveness of the imbalance price decreased consequently

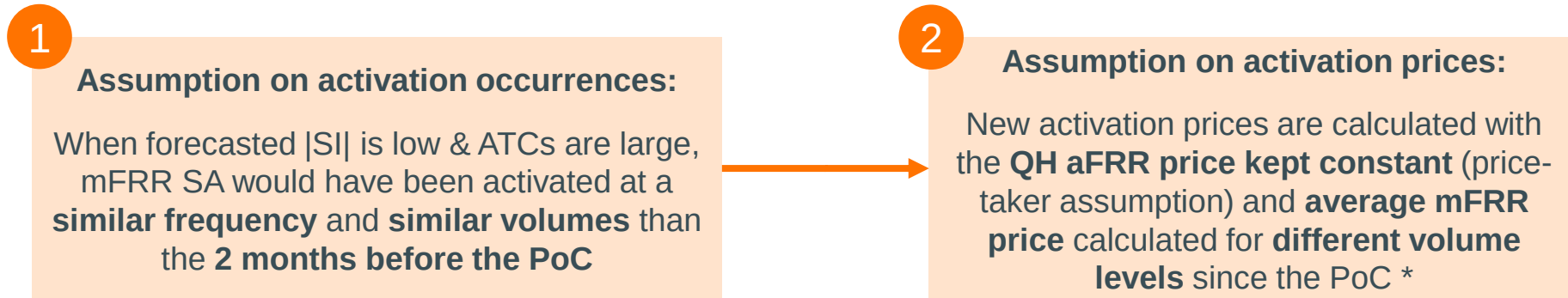
ATC leftovers after intraday DE + FR + NL
23/07/2025 – 28/10/2025

Percentile	Export (MW)	Import (MW)
5%	313	2
10%	701	122
15%	980	259
20%	1202	350
25%	1387	407
30%	1569	493
35%	1738	573
40%	1920	647
45%	2105	736
50%	2305	833
55%	2521	925
60%	2725	1017
65%	2939	1117
70%	3170	1229
75%	3435	1359
80%	3752	1503
85%	4173	1721
90%	4751	2062
95%	5450	2648
99%	6482	4333

- Residual ATCs for balancing are more frequently limited in import direction
- The seasonality may impact ATC leftovers (i.e. in winter, ATC leftovers might reduce compared to the PoC period)

Economic use of FRR: proof-of-concept (PoC) monitoring 23/07/2025 – 28/10/2025

Methodology to compute high-level benefits



Results

- Savings of ~ **1.5 to 2 MEUR** over 23/07/25–28/10/25 (3 months) → savings of ~ **6 to 7 MEUR** (extrapolated to a full year)
- The PoC contributes to **reducing the gap between implicit and aFRR** → supports **Elia's system balance philosophy**

Next steps

- Continue the regular monitoring of the PoC
- Other next steps will be presented in the afternoon session at 3.30PM

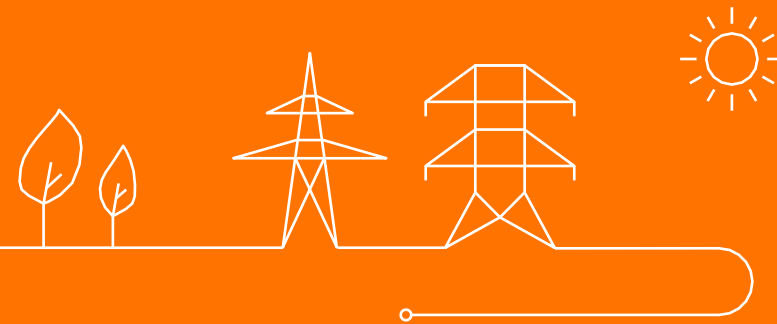
Disclaimers

- This KPI shall be considered as a proxy with large uncertainty
- Assumptions made to allow the computation of such proxy are strong
- Market conditions affect importantly the KPI. It is not excluded that the current value changes importantly due to changing market conditions in the coming months

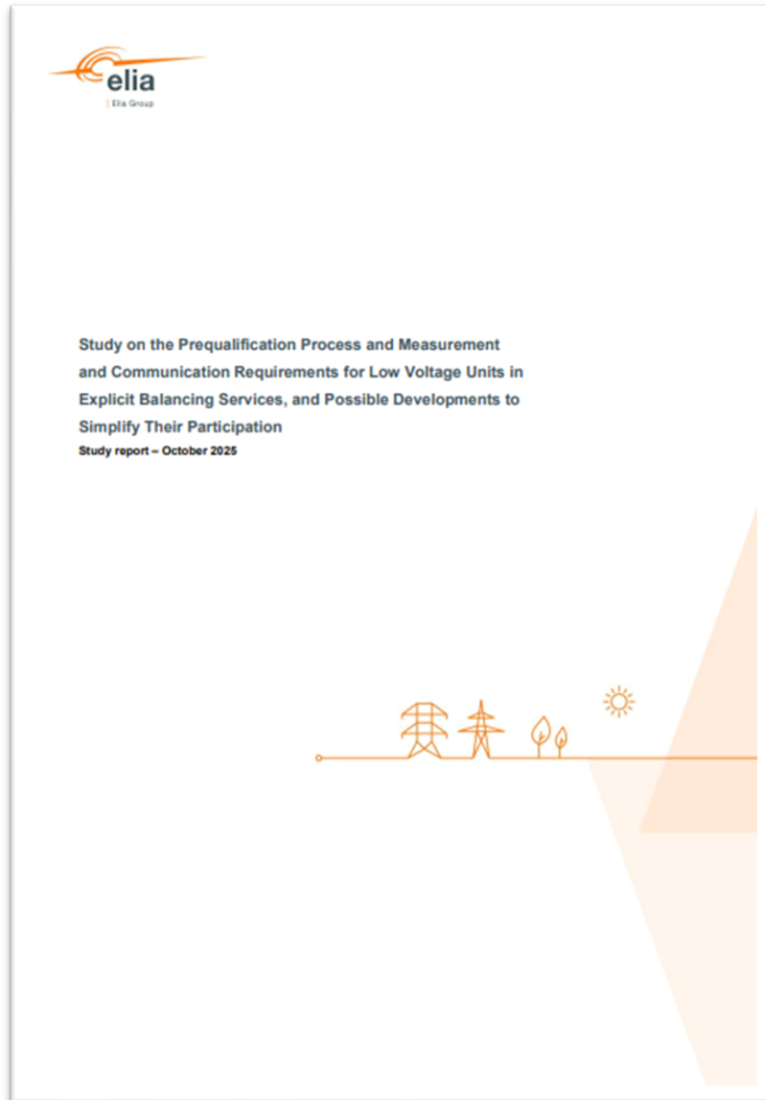
* Disclaimer: calculations made with imbalance price formula components. The mFRR CBMP assumption is obviously not accurate over the QH.

Incentive Study on barrier to LV explicit balancing

Arnaud Debray

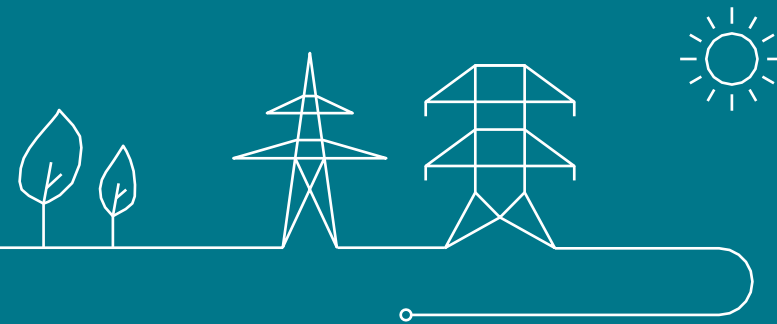


Agenda

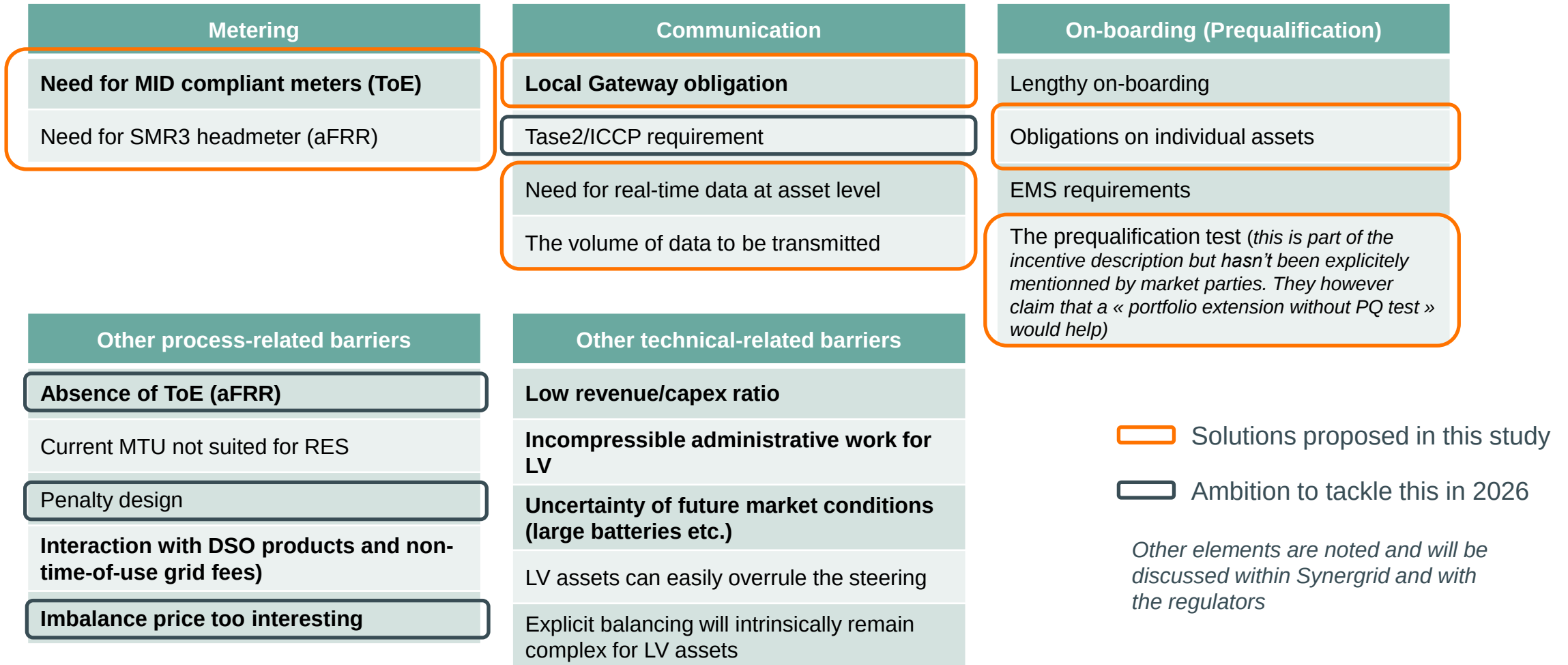


1. Introduction
2. Status of low-voltage in Belgium
3. **Barriers hindering participation of low-voltage assets in the explicit balancing**
4. Measurement and metering requirements for low-voltage Balancing
 - Description of the current requirements
 - **Barrier 1: Need for an enabled SMR3 head meter**
 - **Barrier 2: Need for a MID-compliant private submeter**
5. Data Communication requirements for low-voltage Balancing
 - Description of the current requirements
 - **Barrier 3: Local Gateway obligation**
 - **Barrier 4: High volume of real-time data**
6. Onboarding new Low-voltage Delivery points in a balancing portfolio
 - Description of the current requirements
 - **Clarification of the scope of the POC**
 - **Barrier 5: Inadequate private meter commissioning process for low-voltage assets**

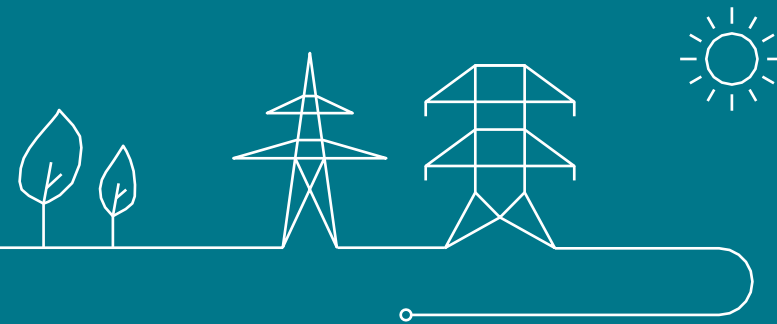
Overview of the barriers mentionned by market parties



Updated overview of the barriers mentioned by market parties

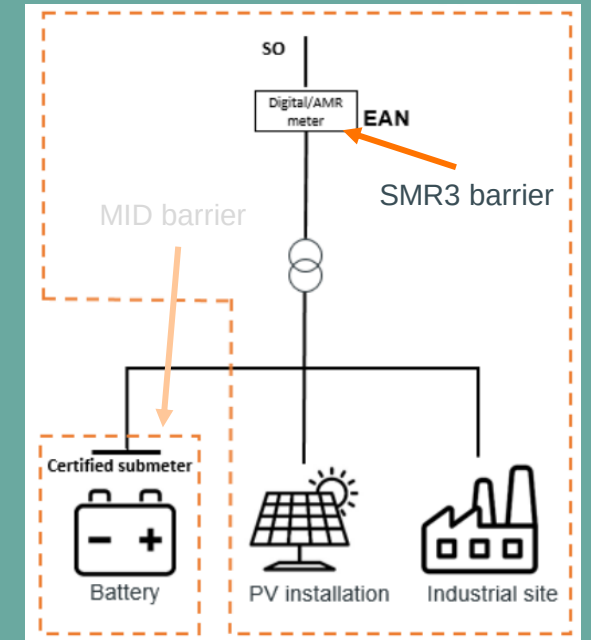


Barriers related to metering



Need for SMR3 headmeter

N/A for FCR



Need for an SMR3 head meter (1)

- At Elia level (T&C): The presence of an SMR3 meter is not imposed
- At regional level (FSP-DSO contract): The headmeter shall of the type with quarter-hourly measurement and these quarter-hours shall be used in the allocation

The actual requirements is not the need for SMR3 headmeter, but the need for QH data used in the allocation.

		Before 2026	As of 2026
FCR	/	N/A	
aFRR	Wallonia	Existence of QH data: ✗	Existence of QH data: ?
		QH data in allocation: ✗	QH data in allocation: ✗
		Households eligible to Flex: ~0	Households eligible to Flex: ~0
	Brussels	Existence of QH data: ✗	Existence of QH data: ?
		QH data in allocation: ✓	QH data in allocation: ✓
		Households eligible to Flex: ~0	Households eligible to Flex: ~0
	Flanders	Existence of QH data: ✓	Existence of QH data: ✓
		QH data in allocation: ✗	QH data in allocation: ✓
		Households eligible to Flex: ~140k	Households eligible to Flex: ~1,8M

Need for an SMR3 head meter (2)

- At Elia level (T&C): The presence of an SMR3 meter is not imposed
- At regional level (FSP-DSO contract): The headmeter shall of the type with quarter-hourly measurement and these quarter-hours shall be used in the allocation

The actual requirements is not the need for SMR3 headmeter, but the need for QH data used in the allocation.

Recommendation of Elia:

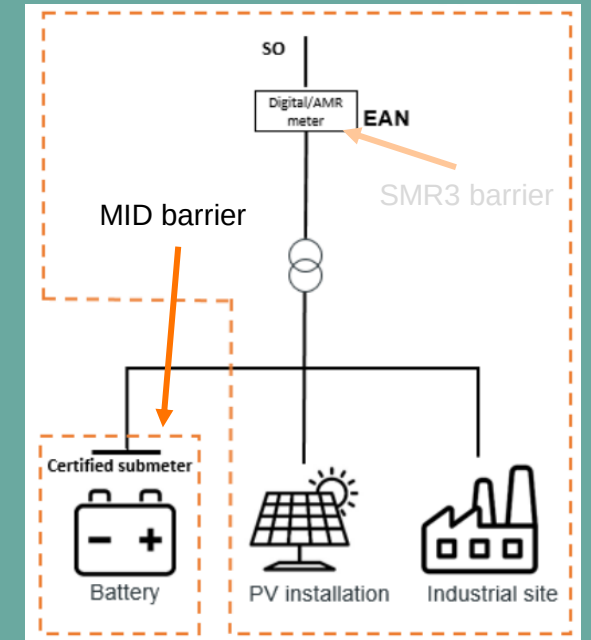
It must be emphasized that quarter-hourly allocation of head meter data is required to participate to aFRR and not necessarily SMR3 regime. Elia reiterates the importance of a swift deployment of smart meters and the application of quarter-hourly allocation by default as opposed to RLPs/SPPs.

Elia advocates for an alignment of the regional regulation in Wallonia with the Flemish one, in order for all quarterly-hours data to be taken into account in the allocation process. Alternatively, the application of the implicit consent as done in Brussels would also lift the barrier



Need for MID compliant meters

As soon as there is ToE



Current Status

- The current reading of MID leads to the following applicability:

	With ToE	Without ToE
FCR (ToE N/A)	MID is not applicable	
aFRR	MID is applicable	MID is not applicable
mFRR	MID is applicable	MID is applicable

- MID imposes a measurement accuracy of 3.5% or better which is hard to reach for embedded meters and cancels the accuracy requirement relaxation introduced by Elia a few years ago.
- Furthermore, MID introduces a few additional requirements such as the presence of a screen displaying the measurements (which is most often a problem for embedded meters)
- **Consequently, MID is expected to significantly hinder the participation of LV assets in the aFRR and mFRR market** as it prevents the use of embedded meters and results in the need to install an additional meter



How MID will impact the development of flexibility

Technologies present in our grid	Presence of MID meter today	Future outlook
Batteries	Low	Highly competitive market => expected to remain low
EV's (private charging poles)	Low/Medium	Mandatory since this year when repayment by the employer
EV's (public charging poles)	High	Already mandatory
Solar inverters	Low	Focus on lowest cost possible, MID not a priority of manufacturer. Expected to remain low.
Heat pump & E-boilers	Low	Low interest from OEMs

- From our interactions with OEMs, it seems that installing an MID certified meter represents an overcost of:
 - ~50€ if embedded in the device
 - 300€ + Installation costs



Is MID a fair barrier? Is it fit-for-purpose?

Ensuring a qualitative delivery of
flexibility services

Guaranteeing a fair remuneration of
grid users

Giving an incentive to OEMs in
including qualitative measurements
systems in their assets



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Giving an incentive to OEMs in
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systems in their assets

- The law of large numbers shows that when pooling a large number of flexible assets, the **collective measurement accuracy improves**, as individual deviations tend to cancel each other out.
- Baselines can introduce an error margin of 10% (when decomposing the quality factor). Additionally, Elia allows a tolerance of 15% on the total delivered service. Comparatively, **imposing a 3,5% MPE on the measurement is too stringent**.



Is MID a fair barrier? Is it fit-for-purpose?

Ensuring a qualitative delivery of flexibility services

Guaranteeing a fair remuneration of grid users

Giving an incentive to OEMs in including qualitative measurements systems in their assets

- Elia has no view on the agreements between the FSPs and the GUs:
 - If the remuneration is not a 1-1 matching with the delivered flexibility (eg: allocation key), **increasing individual measurement accuracy would not lead to a fairer remuneration**
 - If the remuneration is a 1-1 matching with the delivered flexibility, it must be reminded that flexibility is a **calculation between a measurement and a baseline**
- Participating in flexibility services is done on a voluntary basis (and can generate a revenue). **Excluding people because they would lose a little part of the accessible remuneration goes against the initial purpose of MID**



Is MID a fair barrier? Is it fit-for-purpose?

Ensuring a qualitative delivery of
flexibility services

Guaranteeing a fair remuneration of
grid users

Giving an incentive to OEMs in
including qualitative measurements
systems in their assets

- Most grid users are unaware of MID certification when purchasing appliances
- Discussions with OEMs reveal that few inverters are compliant or likely to become compliant, given the fiercely competitive market
- **Considering this, Elia believes that enforcing MID would not lead to an increased adoption of MID meters, but simply less DPs participating to explicit flexibility**



Conclusion

- Elia believes MID is not fit for purpose and will investigate ways to get rid of this barrier

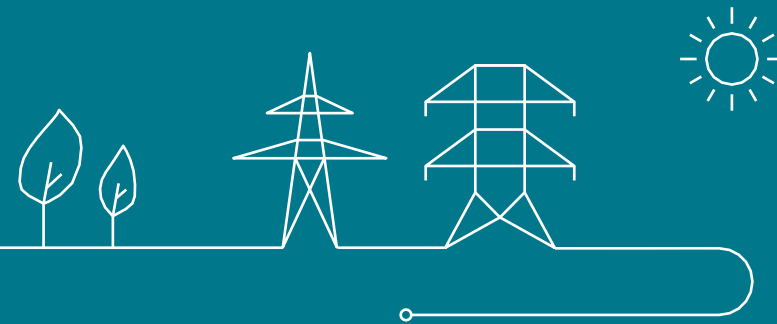
Recommendation of Elia:

To avoid hindering flexibility development, Elia recommends pursuing several actions concurrently:

- In the short term, it is crucial to clarify, in cooperation with the regulatory and legislative bodies, the applicability of MID for explicit balancing under ToE CSM when only aggregated data is used.
- In the medium term, Elia proposes working with the regulatory and legislative bodies to explore the use of the directive's optionality clause, potentially allowing participation with non-MID compliant meters in Belgium.
- Looking ahead, Elia suggests developing an advocacy coalition to drive changes at the EU level, either through sector-specific provisions in the Network Code on Demand Response or by seeking a modification of the MID directive itself. This comprehensive, staged approach is essential to ensure that regulatory frameworks do not unnecessarily hinder the rollout of flexibility services in Belgium.



Barriers related to communication requirements



Local Gateway

Why considering a switch to central gateway?

- The Local Gateway has been mentioned **as one of the key barriers** to the development of LV flexibility as the associated cost for the gateway installation and operation entirely kills the business case
- For this reason, Elia and the DSOs **temporarily allowed the central gateway concept**. This temporary authorization has been extended every year since then. All BSPs active in LV are currently using central gateway
- Local gateway doesn't give full guarantee that the data hasn't been manipulated. It makes it slightly more complex, but the **manipulation at the source may still happen**.

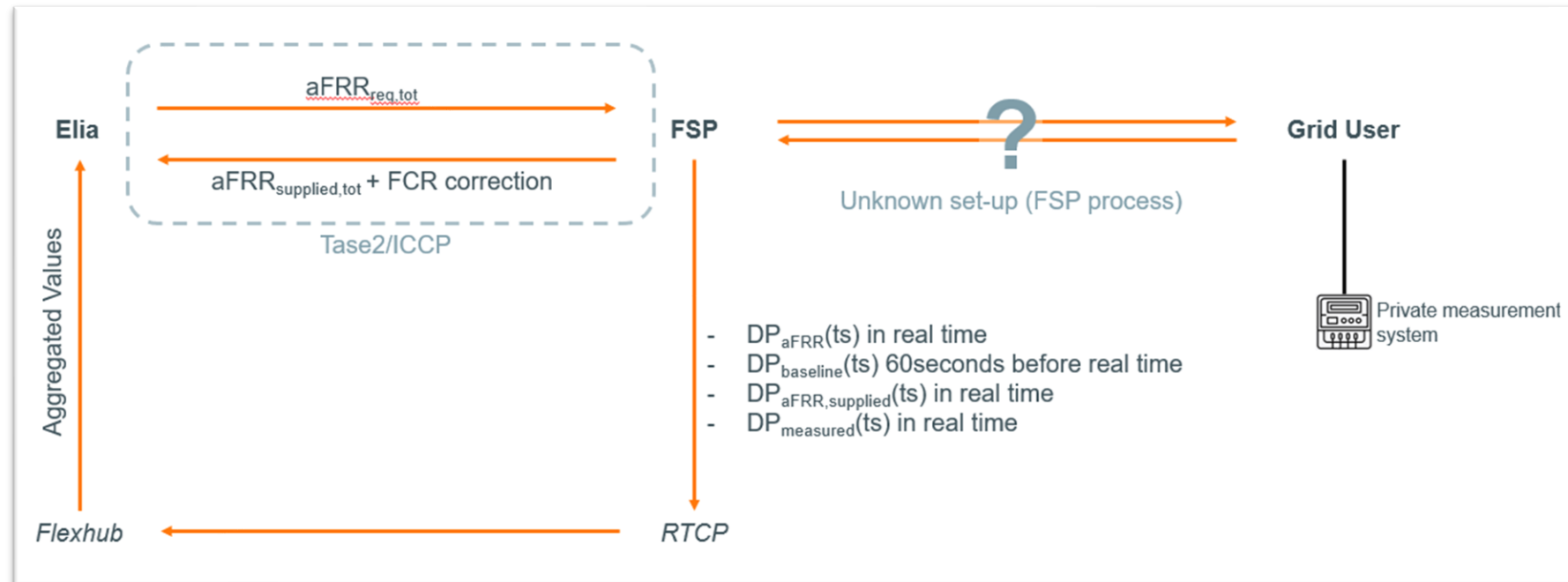
Given the above, Elia recommends switching toward central gateway as standard set-up and to implement a data validation control



High volume of real-time data

High volume of real-time data as an additional barrier?

- Some market actors reported that Elia's requirements were rather stringent imposing high volumes of data to be sent in real-time at individual asset level. Further analysis reveals that this element is highly dependent on the different communication technologies
- Our Market design imposes some limitations in the possible approaches:
 - (Declarative) Baselines must be sent in real-time
 - Disaggregated data per LVDP is needed or ToE volumes computation



Conclusion

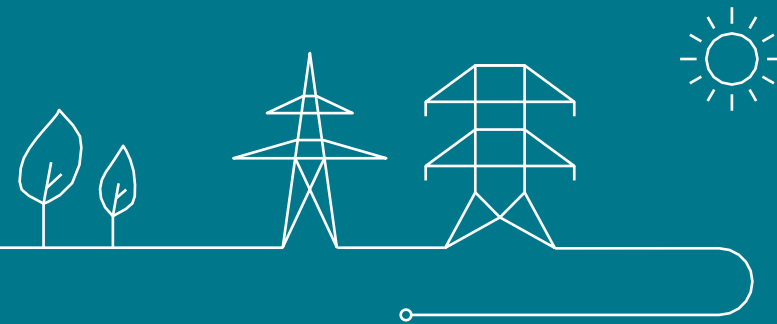
Recommendation of Elia:

Elia recommends maintaining the real-time capability requirement at individual level but implementing event-driven communication for all delivery points in order to reduce the volume of data to be transmitted.

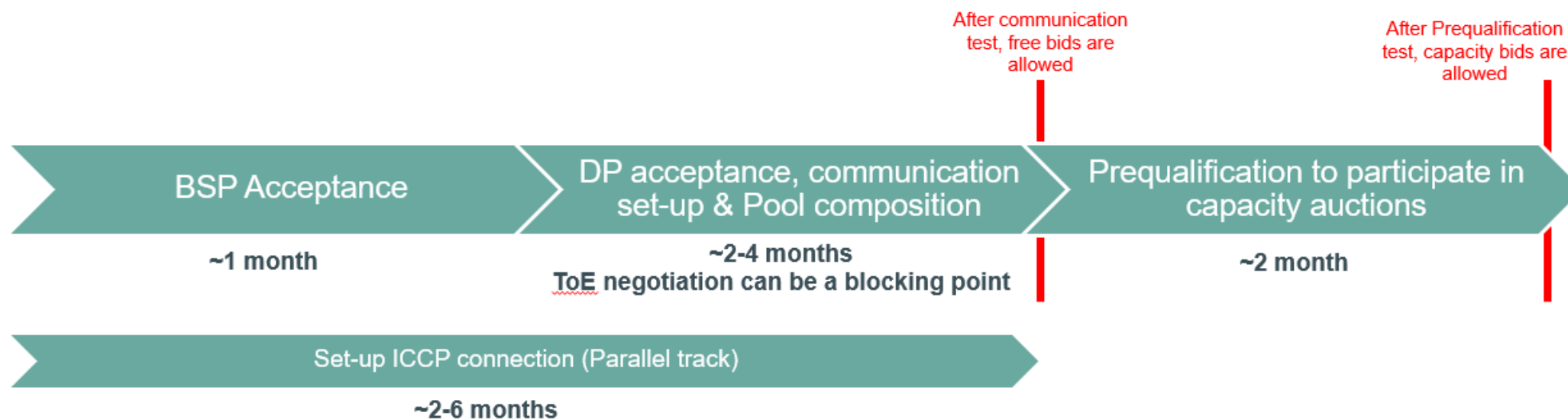
Elia invites stakeholders to respond specifically to this section to clarify whether, in a central gateway set-up, the application of event-based messaging provides sufficient additional benefits to consider implementation.



Barriers related to on-boarding



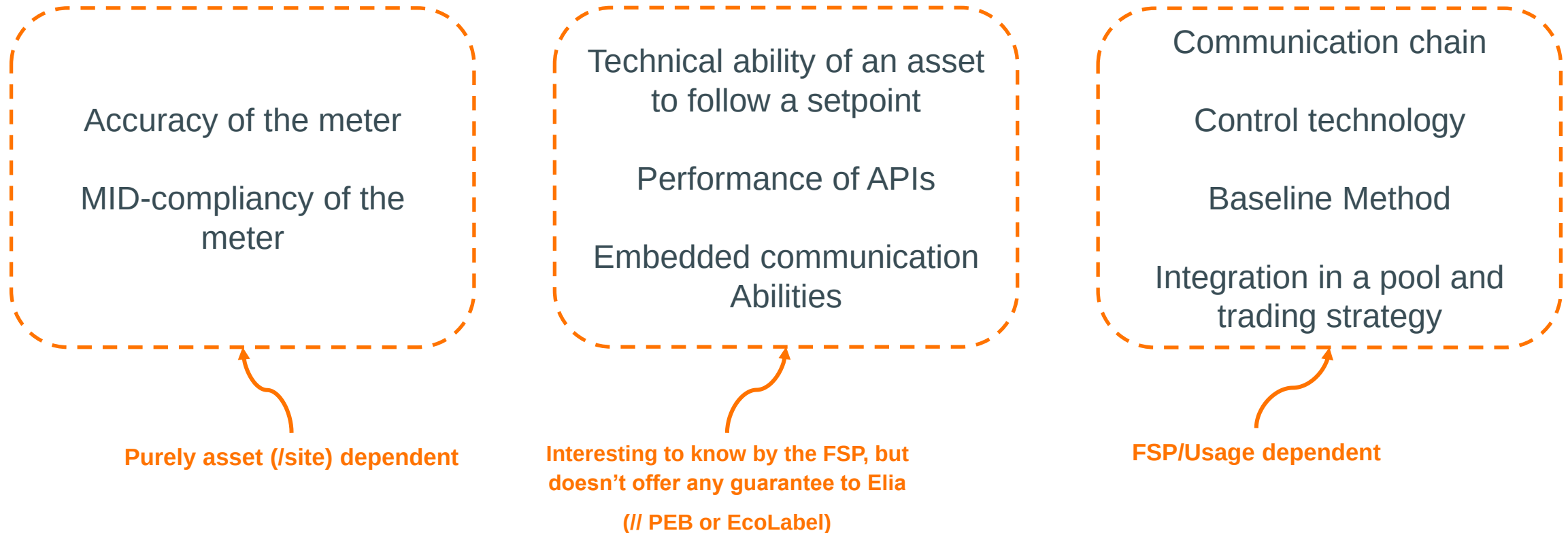
BSP on-boarding* process



*on-boarding: entire process for a delivery point to join the market and start offering bids

Why type-prequalification shouldn't be applied blindly

Creg expects “Propositions to simplify the prequalification process for low-voltage units, including the possibility of prequalifying by unit type via manufacturers”



Why type-prequalification shouldn't be applied blindly

Creg expects “Propositions to simplify the prequalification process for low-voltage units, including the possibility of prequalifying by unit type via manufacturers”

Accuracy of the meter

MID-compliance of the
meter

Purely asset (/site) dependent

CORE POC

Technical ability of an asset
to follow a setpoint

Performance of APIs

Embedded communication
Abilities

Interesting to know by the FSP, but
doesn't offer any guarantee to Elia
(// PEB or EcoLabel)

Flex ready devices

Communication chain

Control technology

Baseline Method

Integration in a pool and
trading strategy

FSP/Usage dependent

Process study



At asset level: Meter homologation

- In FCR:
 - an « internal » procedure is in place and used for >1year (POC stage)
 - The procedure is not clear nor documented
 - **The success of LV FCR demonstrates a clear interest/Impact**
- In aFRR, good progress has been realized already by the SOs:
 - There is a clear procedure documented in a Synergrid document
 - A public database of homologated meters exists
 - **Interest/Impact will likely remain low until other barriers are resolved**


Synergrid
Voice of the networks

Home / Homologation / Electricité / Compteurs intégrés aFRR

LOGIN

- Compteurs intégrés dans le cadre d'un point de livraison aFRR raccordé au réseau de distribution

C8/09 list of devices with embedded meters as part of an aFRR service delivery point connected to the Distribution Grid

1	2	3	4	5	6	7	8
SYNERGRID reference number (POWxxx-yy)	BRAND NAME	SERIES REFERENCE	MODEL REFERENCE	EMBEDDED METER REFERENCE	RATING		SYNERGRID approval date
					Power of measured process [VA]	Accuracy of embedded meter [%]	

Recommendation of Elia:

Elia suggests extending the procedure currently defined on Synergrid’s website for aFRR to also include FCR. This would also lead to an extension of the certified asset database. For the avoidance of doubt, this certification specifically targets services for which MID is not required and does not replace the MID requirement where applicable.

Elia Position on current PQ test

- PQ test is not indicated as a major barrier for LV by market participants
- There are some other concerns raised related to PQ tests more generally (not only LV):
 - It can be costly, especially for mFRR (no remuneration)
 - It generates a loss of opportunity (lead time)
 - It can create a BSP lock-in effect
- NC DR is coming but still uncertain

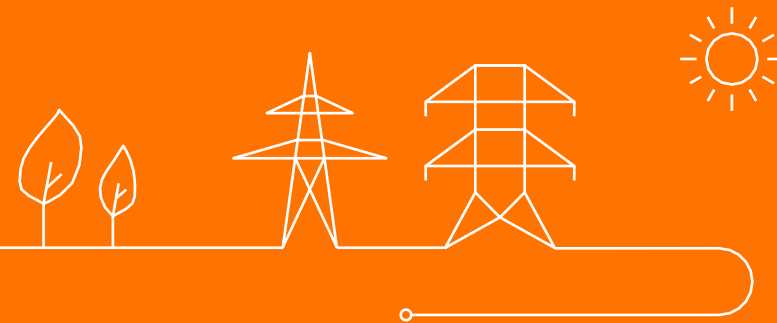
Recommendation of Elia:

Considering the above, and the fact that prequalification impacts all voltage levels, Elia cannot take a final decision on a review of the prequalification process. Elia is however willing to reassess in the short term the need for PQ tests as well as the possibilities to simplify/limit the applications of a prequalification test and this for all voltage levels. This element is included in the 2026 roadmap and Elia expects the teams to start the work as soon as this incentive study is finished (i.e. Q1 2026).

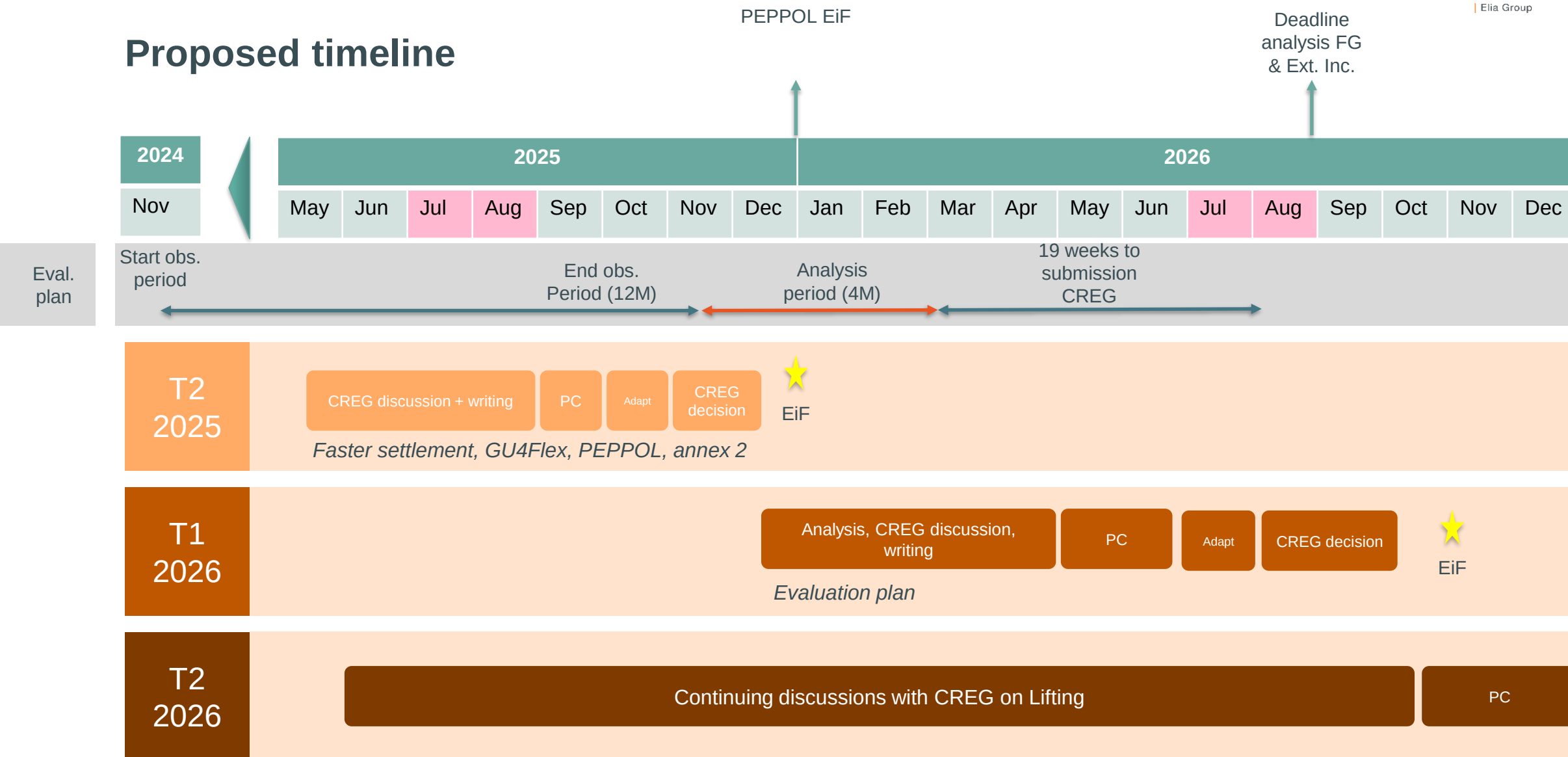


T&C BRP – feedback on the public consultation

Simon Serrarens



Proposed timeline



Content of the public consultation

- Public consultation on the T&C BRP, from 03/09/2025 till 03/10/2025 included
- T&C BRP – revision 2 2025 includes amendments concerning:
 1. Incentive Faster Settlement
 2. GUFlex (perimeter correction)
 3. Peppol
 4. Contact details
 5. Remaining changes
- Elia received 2 non-confidential responses, from FEBEG and FEBELIEC
- There were no confidential responses
- The feedback received centered around changes related to the Incentive Faster Settlement and GUFlex



Feedback GUFlex



Market party	Feedback received	Response Elia
Febeliec	Febeliec does not oppose the introduction of the concept of Modulated Volume in order to cope in the future with flexible connection agreements. However, this should in no way be considered as an approval of any design of such flexible connection agreements as many issues are still to be resolved.	The implementation of CREG's decision (B)2899 requires amendment of several regulated documents , a.o. the T&C BRP, the connection contract and the rules for coordination and congestion management.
FEBEG	FEBEG is strongly supporting the proposal to foresee the possibility to make a perimeter correction in the context of flexible connection provided it is combined with a grid user contribution based on the day-ahead market price. However, we also consider it to be somewhat strange that we are to give feedback on the consultation on T&C BRP (which enables the perimeter correction) before the finalization of the overall design around flexible connections (which will determine the modalities).	In the TF Grid Flex of 12 September, Elia presented the related timing for these amendments. A proposal for the Grid User's contribution and the 'Modulated Volume' and a planning to pursue the discussion with market parties has also been presented. Elia acknowledges it is too early for market parties to provide feedback on the complete design resulting from decision (B)2899. However, the design includes aspects to be taken in up different regulated documents. While the correction of the BRP perimeter is already clearly defined, other aspects are still under discussion with market parties in the Task Force. Elia understands that while market parties approve and are in favour of the introduction of a perimeter correction, they do not consider the full design to be approved as certain aspects are still to be clarified.
FEBEG	We also wish to clarify that our support for a BRP correction cannot be used as an implicit approval of the market design on flexible connection (GU contribution) and following updates of connection contracts. They are still under discussion and largely challenged by the market participants.	While Elia understands that it is difficult for market parties to provide complete feedback on a part of the design, it's important to be aware that including the perimeter correction in this revision is necessary no to delay the implementation of decision (B)2899. Indeed, the next revision is driven largely by the Evaluation Plan of the Imbalance Price and is not expected to be completed according to the "GUFlex planning". Note that the amendments as proposed in the T&C BRP are in line with the Code of Conduct.
FEBEG	The Concept of 'Modulated Volume' is not accurately defined in T&C BRP (as we understand it will be done in the connection contract) which does not allow us to make remarks on the content. It is difficult to make accurate assessments on the process of activation, the baseline methodology, ... since this discussion is also ongoing with market participants.	Elia wishes to assure market parties that the design resulting from decision (B)2899 is still under discussion in the TF Grid Flex, including the Grid User contribution and the full definition of the concept 'Modulated Volume' , which are still subject to discussion with market parties. Elia confirms that the market will have an opportunity to react following due regulated process.
FEBEG	FEBEG is urging Elia to thus prioritize the needed amendments to the connection contract , to complete the overall design. Any changes on the connection contract must be fully aligned with the CREG decision (B)2899 from April 10th, 2025 which clearly refers to the Day-Ahead market as reference.	[Update after the Public Consultation] : Following discussions with the CREG , the formulation of the provisions related to BRP perimeter correction resulting from GFlex activations have been adapted in order to better reflect the division of competences. The principle remains unchanged: in a 1st stage the BRP perimeter correction will only be applied at federal level (because it can only be done when a GU contribution or equivalent is applicable), and the intention is to extend to the regional level in a 2nd stage.

Feedback Incentive Faster Settlement (1/3)

Market party	Feedback received	Response Elia
Febeliec	Regarding the modifications made for the faster settlement, Febeliec would like to refer to the many comments it made during the discussions on faster settlement, in particular to the need to have a very close follow-up of the new approach, to ensure that a good balance is maintained between more flexibility for BRPs regarding financial obligations and the financial security presented to the TSO and ultimately the grid users who are exposed to grid tariffs with regard to sufficient guarantees. Febeliec strongly insists to a very stringent and diligent follow-up by Elia and CREG to this effect, with if necessary fast modifications to ensure that grid users are not financially exposed to the more lenient approach which is being introduced.	Elia wishes to assure Febeliec that the updated financial guarantee is the result of thorough analysis, as set out in the design note presented in 2024 of the Incentive Faster Settlement. Within this design note, Elia demonstrated that the new financial guarantee system allows the financial security for Elia to follow risk more closely in the market, by carefully calibrating the weights of an invoice-based financial guarantee of invoices of the past three months, and by using the observed imbalance price for the position-based financial guarantee. A reduction in financial guarantee was realized, not by reducing the financial security for Elia, but by reducing the payment term and the general faster settlement approach. The incentive design note shows that there is an increase in coverage of the risk for Elia, while realizing a reduction in financial guarantee for the BRP. Elia assures the market parties that in the coming years it will continuously monitor the provisional allocation system, and further reduce the payment process as soon as possible. The financial guarantee system is inherently linked to this, will be monitored as well and adjusted as necessary.



Feedback Incentive Faster Settlement (2/3)

Market party	Feedback received	Response Elia
FEPEG	FEPEG regrets that Elia did not retain FEPEG's request (see FEPEG's reaction to the public consultation of September 2024) to keep the current system and grant BRPs the choice to remain under the current system or to move towards the new approach. Elia is clearly choosing to facilitate the wishes of certain BRP's while ignoring the impact on other BRP's, as the proposals will – as stated in previous FEPEG position - (1) lead to a faster payment, (2) increased administrative burden, (3) higher financial guarantees and (4) need to increase credit limits. FEPEG therefore deeply regrets that the compromise proposal to keep the current system next to the new approach is not considered. FEPEG opposes the reduction of the payment term of the base invoice to 14 calendar days and requests it to remain 30 calendar days. This period is necessary to perform the control of the invoice, and any objection must be sent before the due date of the invoice. At the very least, the term to contest invoices should be maintained at 30 calendar days after receipt of the invoices.	Elia acknowledges that FEPEG proposed the idea of having BRPs select between the current settlement approach and the new one. Elia does not believe it's a viable option to allow BRPs to select their settlement regime. Allowing a BRP to select their settlement regime would likely lead to a self-selection effect. Elia acknowledges indeed point 1; there is a faster payment, both by the BRP, but also by Elia. For point 2, there will indeed be an increased administrative burden, in the sense that an additional invoice type is added (the provisional invoice), to be analyzed and treated by the BRP. However, Elia does not agree with point 3. Within the incentive, Elia studied the financial guarantee amounts in the current and in the proposed new system; where the finding was that the current system indeed came with a risk for Elia. Within the Incentive report, Elia asked market parties to indicate a preference for a faster settlement without decrease in payment term; though with a financial guarantee that would slightly increase, or a faster settlement with reduction in payment from 30 to 14 days, with a related decrease in financial guarantee of 11% on average. Since no market party expressed a clear preference for either scenario, Elia proposed to continue with the latter, as discussed in the Working Group Balancing of 16/12/'24. In context of writing the corresponding changes in the T&C BRP, Elia reran the analysis on the data of 2025 to date; where again the results show that on average the financial guarantees will be lower. Additionally, the financial guarantee will decrease for nearly all BRPs. Related to point 4 made by FEPEG, on the need for increased credit limits, Elia understands that this need arises for certain BRPs, who might have temporarily larger required financial guarantee amounts than today. While Elia believes that (temporarily) larger guarantee amounts are justified if these follow from risks in the market (the incentive report showed that the current system is relatively inflexible to risk); Elia can understand that these credit limits imply a cost for the BRP. Elia therefore agrees with the suggestion made later in the FEPEG response, to allow BRPs to fulfill their financial guarantee obligation through a combination of one or more bank guarantee(s) and/or cash deposits. The related amendments to the T&C BRP have been made in art. 18.1. Finally, Elia cannot agree with the request by FEPEG to retain a contestation term at 30 days for the base invoice, while the payment term would be 14 days. Elia puts at disposal the means for the BRP to better follow up on their invoice, since Elia has introduced a provisional publication of imbalance volumes. The volumes for a certain delivery day are made available to the BRP at day + 11 WD. In the current system, the BRP simply receives this invoice at M + 30 WD. Therefore, even though the payment term is reduced, Elia considers that in the proposed system the BRP actually has quite a bit more time to analyze the data and point out any errors if they should arise. Elia notes that the payment term is comparable to the situation in neighboring countries. Elia also points out that if, despite the additional controls that were implemented by Atrias and Elia of the provisional allocations, and the expected analysis by the BRP of both the provisional and base invoice, there would still be an error in the volumes, the system still provides for a final fall back in the form of a regularization invoice. Elia is also bringing the date of the regularization invoice closer to the delivery period in order to ensure that any error is resolved more quickly (regularization of month M in M +7 months).



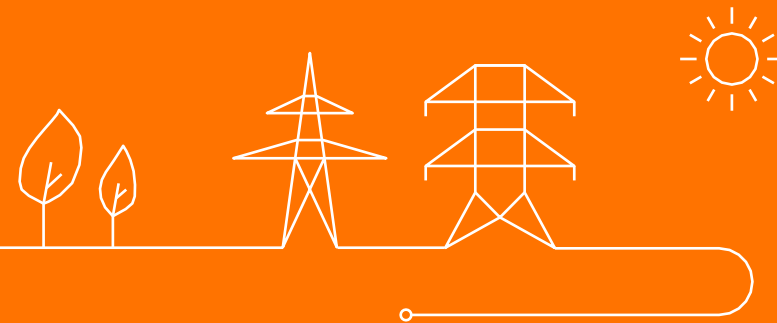
Feedback Incentive Faster Settlement (3/3)

Market party	Feedback received	Response Elia
FEBEG	FEBEG requests Elia to put in place a flexible system, allowing a combination of several bank guarantees and a cash deposit to cover the full required amount, similar to the system applied in CRM. Indeed with the proposed method of calculation of the bank guarantee (especially the link with the monthly imbalance price), huge variations of the required amount can occur. In a period of energy crisis it may be difficult to obtain in due time one new or amended bank guarantee for a suddenly much higher amount.	Elia agrees and has adapted the T&C BRP accordingly.
FEBEG	FEBEG requests that in the event of a decrease of the bank guarantee in place, Elia, at the request of the BRP, would send a formal letter of partial release directly to the issuing bank (as in the CRM) and provide the BRP with a copy of this letter for follow up. This is very important since the bank accepts to release (part of) a guarantee only on the request of the beneficiary of the guarantee.	Elia agrees with this request from FEBEG. At the explicit request of the BRP, and if the BRP is allowed to decrease their financial guarantee as described in the T&C BRP, Elia will provide written confirmation to the BRP of Elia's consent as beneficiary, that the bank guarantee can be lowered, within 5 working days after such request by the BRP. The corresponding change has been made in the T&C BRP, art 18.4.5.



aFRR & mFRR capacity auction design evolutions

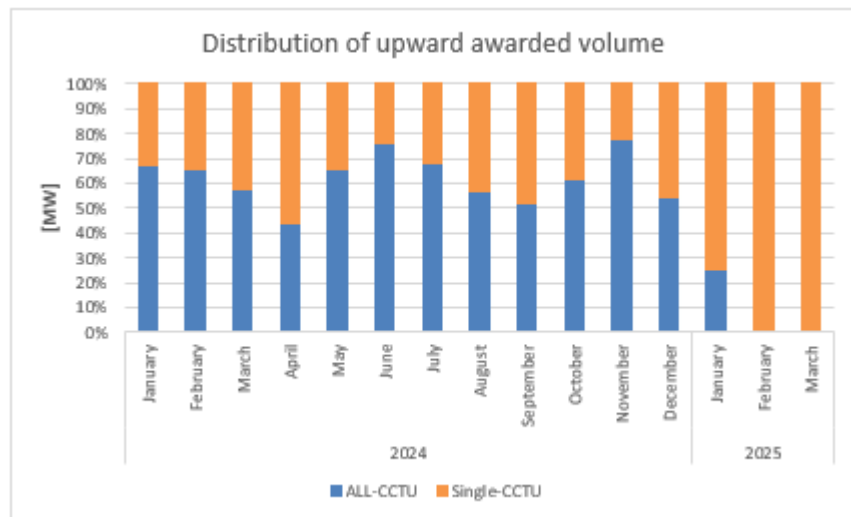
Kris Poncelet



Assessment possible future revision of the aFRR capacity auction

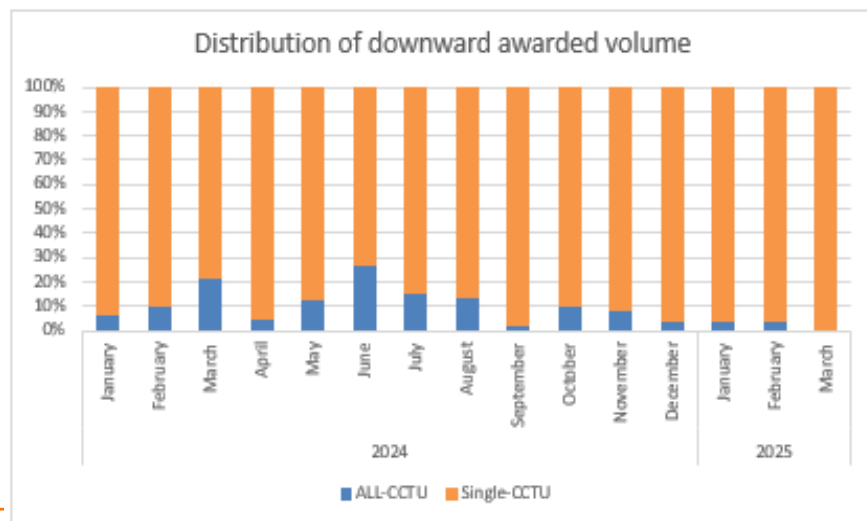
- Elia intends to **assess the need for possible future revisions of the auction for aFRR capacity.**
- **The main motivation for the evaluation is the increasing liquidity in the aFRR capacity auctions and more particular the increasing participation (including battery assets) in the Single-CCTU product.** In January 2025, the average submitted volume of aFRR Capacity in the single CCTU product for the upward direction was 143 MW compared to 68 MW in January 2024. It is expected that the volumes of flexibility capable of delivering aFRR at reasonable costs will further increase in the course of 2025 and 2026.
- These **ongoing evolutions trigger certain questions related to the aFRR Capacity auction design**, such as:
 - Will there still be a need for an All-CCTU product?
 - Will there be a need for additional complexity in the Single-CCTU product (e.g., indivisibility, bid curves, exclusive groups, ...)?
 - Is there still a need to trade off total capacity cost minimization and enabling development of the market?
 - Will there be a need for more granular CCTUs in the future (e.g., related to participation of RES, more volatility in the energy markets)?
- **Elia intends to perform this assessment in the course of 2025 and in interaction with the stakeholders.** Based on the outcome, Elia will recommend possible future evolutions. In such a case, Elia also intends to assess the desired timing (and possible preconditions) for those evolutions.
- To gather some preliminary market feedbacks, **Elia would like to conduct bilateral meetings in February with interested market parties. Elia therefore invites interested market parties to contact their KAM Energy.**

The increase of liquidity in the Single-CCTU product led to an increase in awarded Single-CCTU volumes...



- ⇒ Throughout 2024, the share of volumes awarded from the All-CCTU product remained rather stable
 - ⇒ Significant ALL-CCTU share in the upward direction.
 - ⇒ Highly limited All-CCTU share in the downward direction

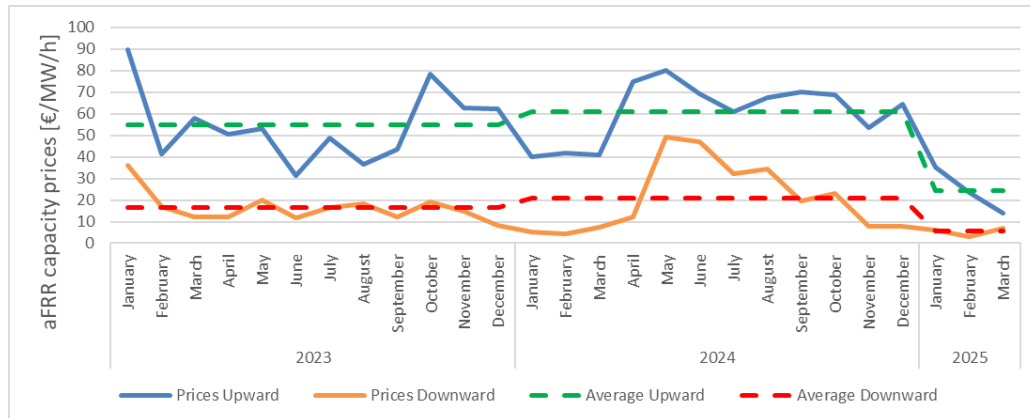
- ⇒ As of 2025, the share of upward volumes awarded in the Single-CCTU product have drastically increased.



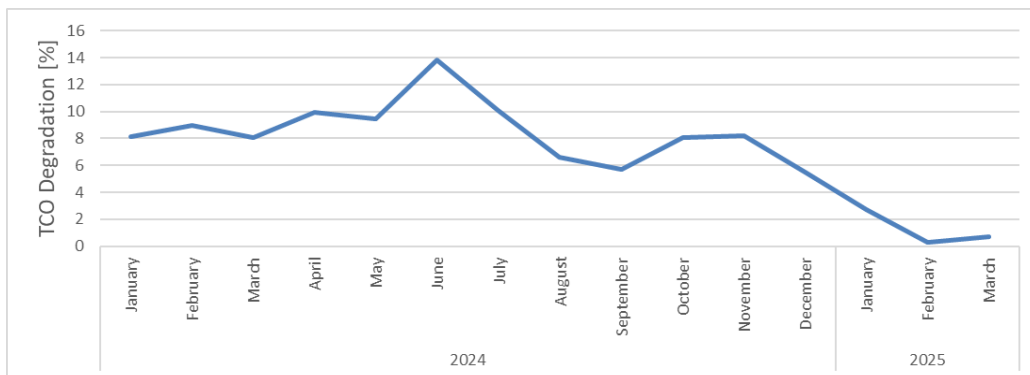
- ⇒ Considering the recent and anticipated evolutions, **Elia will analyze in 2025 the possible evolutions of the aFRR capacity auction**



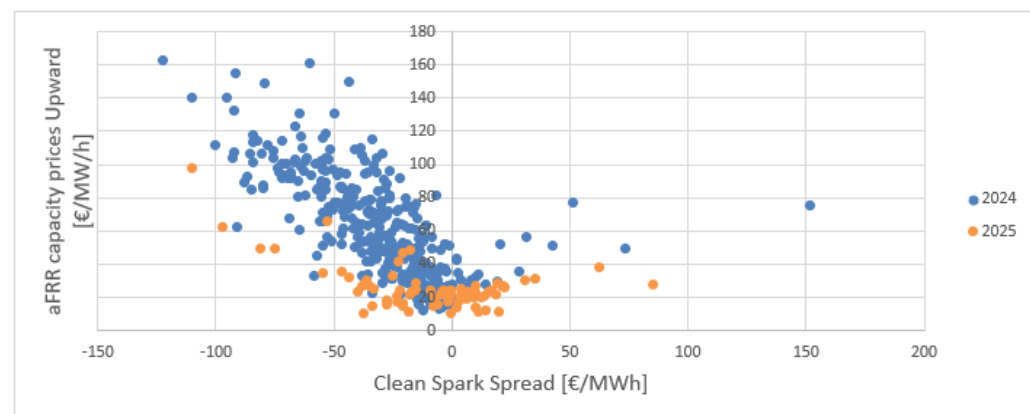
... which result in significantly lower capacity prices/costs start 2025



While aFRR capacity prices (and costs) slightly increased in 2024 (relative to 2023), a **significant decrease in aFRR capacity prices and costs is observed early 2025** due to more and more competitive Single-CCTU bids



The strong increase of periods with only Single-CCTU bids awarded resulted in an **average TCO degradation factors close to 0% since the start of 2025**



While 2024 upward aFRR capacity prices were still strongly correlated with the clean spark spread (CSS), this **correlation with the CSS seemed to have largely disappeared in the beginning 2025, reflecting a shift in technology determining the aFRR capacity price in the upward direction**

In the meantime

- Elia engaged in bilateral discussions with many BSPs
- The liquidity in the aFRR Capacity auctions (and in particular in the Single-CCTU product) has stabilized.
- CREG requested in Decision (B)3047 to perform an amendment of the aFRR capacity auction design such that more than the minimally required aFRR capacity would be procured in case this would be economically justified.
- CREG supported in public consultation document (PRD)685E/95 Elia's proposal to analyze in 2026 the possibilities to optimize the procurement of aFRR and mFRR balancing capacity, and requested to also put in question certain design elements such as the paid-as-bid clearing and the concepts of "RC factor" and "TDC factor"

Objective of today's presentation

- Present the assessment performed by Elia
- Present main feedback received from stakeholders in bilateral discussions
- Present Elia's resulting proposal for evolutions of the capacity auction design

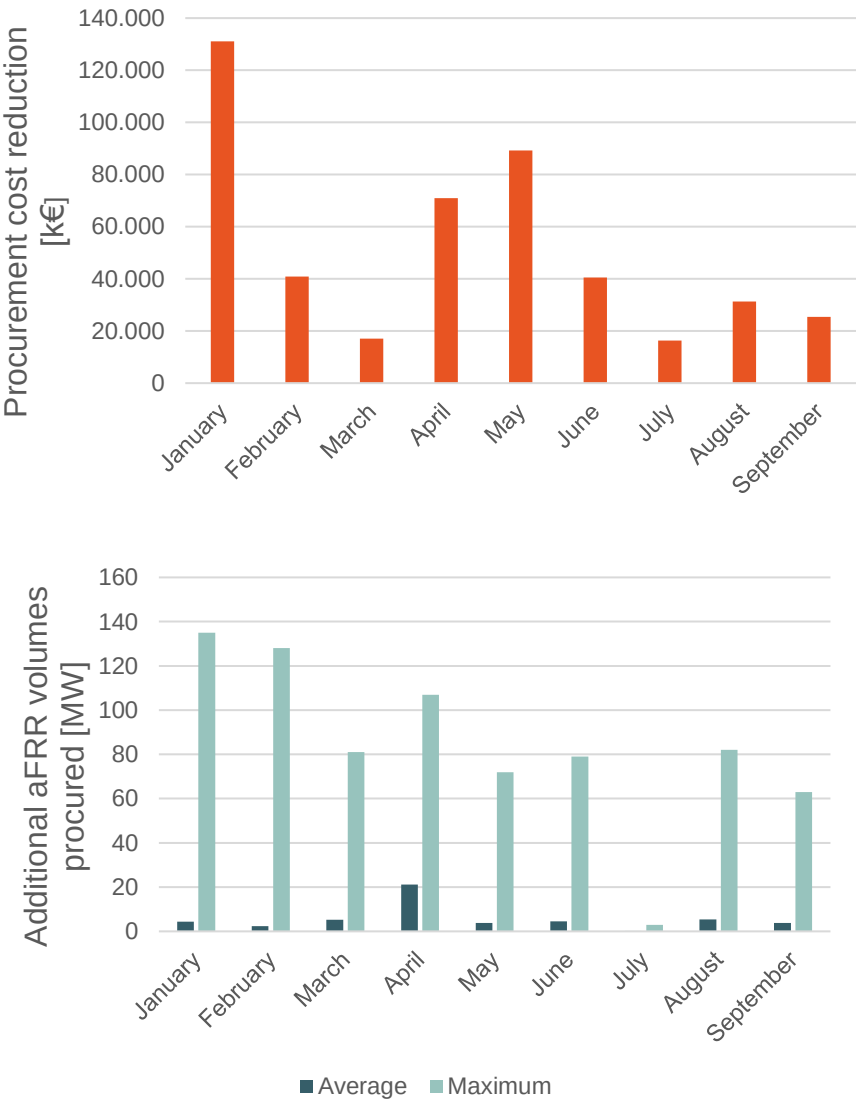
Scope of the assessment

Considering the input provided by BSPs and CREG, Elia has performed an assessment on **following aspects**:

- **Increase procured aFRR capacity when economically justified:**
 - Can more aFRR capacity be procured in moments the marginal price for aFRR capacity is below the marginal price for mFRR capacity?
- **Deviation from total cost minimization:**
 - Is there still a need to trade off total capacity cost minimization and enabling development of the market (RC factor and TDC factor)?
- **Relevance of maintaining the All-CCTU product:**
 - Is there still a need for the All-CCTU product in the future?
 - Can the All-CCTU product be safely removed at this moment?
- **CCTU granularity:**
 - is there a need for more granular CCTUs?
- **Bid complexity:**
 - Is there a need for additional complexity in the Single-CCTU product?
- **Paid-as-bid remuneration:**
 - Are market conditions appropriate to evolve to a paid-as-cleared remuneration for capacity?

Increase procured aFRR capacity when economically justified (1/1)

- Context: For some CCTUs, the marginal price for upward aFRR capacity has been observed to be below the marginal price for upward mFRR capacity.
- In these moments, procuring more aFRR Capacity (and consequently less mFRR Capacity) has the following benefits:
 - Reduction of total aFRR and mFRR procurement costs (~ 460 k€ between Jan and Sep 2025)
 - Further improvement of regulation quality by securing higher aFRR volumes
 - Increased market opportunities for BSPs in the aFRR capacity markets
- With the expected increase of assets capable of providing aFRR, it could be expected that the gains estimated above would further increase in the future.



Increase procured aFRR capacity when economically justified (2/2)

- The potential benefits could be captured through a joint aFRR and mFRR capacity auction, which could look as follows:

- Objective function: minimize aFRR + mFRR procurement costs*
- Constraints:
 - Volume of aFRR procured $\geq$ aFRR Needs
 - Volume of aFRR + mFRR procured $\geq$ FRR Needs**

- Such an evolution has a prerequisites:
 - Aligning the aFRR and mFRR Capacity Gate Closure Time
 - The evolution towards total cost minimization (i.e., removal of the RC and TDC factors currently applicable for aFRR)

Elia recommends an evolution towards a joint aFRR and mFRR Capacity auction

* In the context of the balancing incentive « Analyse van de mogelijkheden voor een optimalisatie van de aankoop van aFRR en mFRR balanceringscapaciteit », Elia will further assess the potential and possibilities of adapting the objective function to take into account possible benefits of additional aFRR procurement on activation costs and/or regulation quality.

** After taking into account reserve sharing agreements in accordance with the LFC Means

Deviation from total cost minimization

- In the current aFRR auction, there is a mechanism to deviate from the minimal cost solution by “favoring” the selection of single-CCTU bids. This mechanism was successful in fostering the development of liquidity in the single-CCTU market segment. This mechanism however leads to:
 - a degradation of the total cost of aFRR procurement (TCO degradation)
 - a complex aFRR capacity auction design (creation of virtual All-CCTU bids, auction consisting of 6 steps)
- **As the liquidity of the single-CCTU segment has significantly increased since early 2025, Elia believes there is no reason anymore to deviate from pure total cost minimization.**

Elia therefore recommends to evolve towards an auction based on pure total cost optimization as this would:

- **Lower procurement costs**
- **Drastically simplify the capacity auction design**
- **Enable evolving towards a joint aFRR/mFRR capacity**

Relevance of maintaining the All-CCTU product (1/3)

- The All-CCTU product differs from the Single-CCTU product in the following ways:
 - All-CCTU bids span an entire day
 - All-CCTU bids are mutually exclusive (i.e., only one All-CCTU bid per BSP can be selected)
 - All-CCTU bids are indivisible
- The All-CCTU aFRR capacity product has been designed to enable (large) generation units that would not be dispatched based on DA prices to spread their start-up and must-run costs over a longer period (24 hours) and over a minimal volume (bid indivisibility), and hence to limit bid prices.
- The **removal of the All-CCTU aFRR capacity product** would have the following **benefits**:
 - Slight further reduction of the auction complexity
 - Increase auction transparency
 - It must however be noted that the main complexities in the current aFRR Capacity auction stem from the deviation from total cost optimization rather than from the combination of Single-CCTU and All-CCTU aFRR Capacity Bids
- However, the **(early) removal of the All-CCTU aFRR capacity product could lead to insufficient volumes and/or high aFRR capacity prices in moments with limited Single-CCTU liquidity**
 - In 2025, insufficient Single-CCTU aFRR Capacity bids in upward (respectively downward) direction have been observed for 3.4% (0.9%) of time

Relevance of maintaining the All-CCTU product (2/3)

- Considering the current levels of liquidity in the Single-CCTU aFRR product, the **removal of the All-CCTU aFRR capacity product at this moment would hence come with the following risks:**
 - Risk of increasing aFRR procurement costs
 - Risk of periods with insufficient liquidity and second gates
- Stakeholders confirmed during bilateral discussions that, while the removal of the All-CCTU aFRR Capacity product is supported, there is no urgency in removing the All-CCTU aFRR capacity product and that uncertainties need to be well considered (e.g., a future increase of aFRR Needs, the possibility of (IT) issues preventing the participation of a BSP, ...)

Elia proposes to maintain the all-CCTU aFRR product for now and monitor the further evolution of liquidity in the Single-CCTU product to consider a removal of the all-CCTU product in the future

Relevance of maintaining the All-CCTU product (3/3)

- Illustration of a joint aFRR/mFRR capacity auction with Single-CCTU aFRR Bids, All-CCTU aFRR Bids and Single-CCTU mFRR bids:

- Objective function: minimize aFRR + mFRR procurement costs*

- Constraints:

$$\bullet \sum_{i=1}^{\#Single-CCTU \ aFRR \ Up \ Bids \ (t)} Awarded \ volume_{i,t} + \sum_{j=1}^{\#All-CCTU \ aFRR \ Bids} Awarded \ volume \ Up_j \geq aFRR \ Up \ Needs_t \quad \forall t \in CCTUs$$

$$\bullet \sum_{k=1}^{\#Single-CCTU \ aFRR \ Down \ Bids \ (t)} Awarded \ volume_{k,t} + \sum_{j=1}^{\#All-CCTU \ aFRR \ Bids} Awarded \ volume \ Down_j \geq aFRR \ Down \ Needs_t \quad \forall t \in CCTUs$$

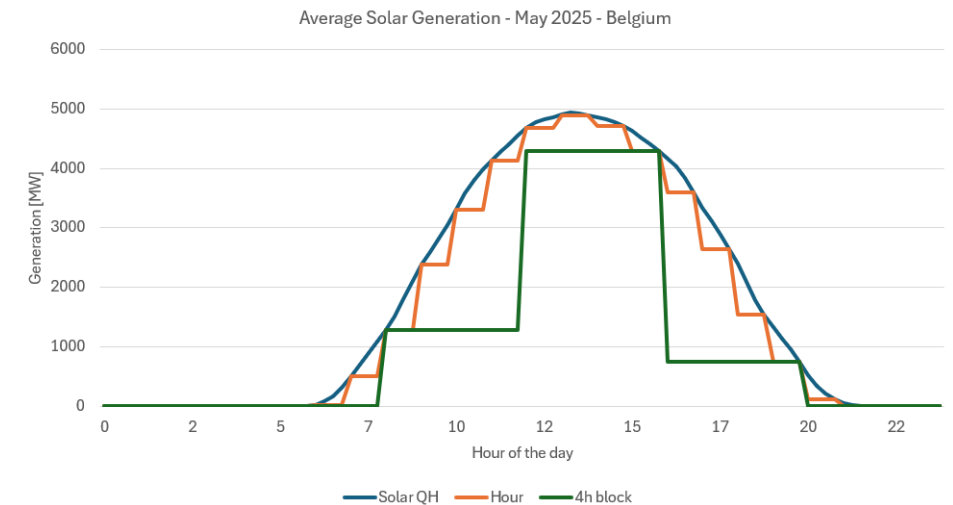
$$\bullet \sum_{i=1}^{\#Single-CCTU \ aFRR \ Up \ Bids \ (t)} Awarded \ volume_{i,t} + \sum_{j=1}^{\#All-CCTU \ aFRR \ Bids} Awarded \ volume \ Up_j + \sum_{l=1}^{\#Single-CCTU \ mFRR \ Up \ Bids \ (t)} Awarded \ volume_{l,t} \geq FRR \ Up \ Needs_t^{**} \quad \forall t \in CCTUs$$

* In the context of the balancing incentive « Analyse van de mogelijkheden voor een optimalisatie van de aankoop van aFRR en mFRR balanceringscapaciteit », Elia will further assess the potential and possibilities of adapting the objective function to take into account possible benefits of additional aFRR procurement on activation costs and/or regulation quality.

** After taking into account reserve sharing agreements in accordance with the LFC Means

CCTU granularity (1/2)

- Currently, Elia procures aFRR and mFRR capacity in blocks (CCTUs) of 4 hours each
- Procuring capacity in 4-hour blocks might not be suitable for all technologies due to:
 - Non-constant availabilities during the 4-hour period (cf. illustration PV)
 - Non-constant (opportunity) costs during the 4-hour period (e.g., expected day-ahead/intraday market prices can vary strongly within 4 hours)
- **As such, Elia considers the current 4-hour CCTUs could lead to i) no or lower volumes being offered in the aFRR/mFRR capacity auction due to non-constant availabilities, and ii) possible suboptimalities in capacity reservation as BSPs might need to average their (opportunity) costs**



CCTU granularity (2/2)

- A benchmark with other countries reveals **some other countries already have more granular CCTUs**:
 - France and the Nordic countries have hourly aFRR and mFRR Capacity products
 - Spain has quarter-hourly capacity products
 - Germany and Austria have 4-hour capacity products but are enabling the possibility to introduce an additional 15-minute product
- During bilateral discussions, an **evolution towards more granular CCTUs seemed to be generally supported by the stakeholders**

Elia proposes an evolution towards quarter-hourly CCTUs for both mFRR and aFRR

Elia proposes an evolution towards quarter-hourly products as this seems the least constraining in case of varying availabilities and is most aligned with wholesale energy markets. However, the largest benefits of an increase in granularity would already be captured by evolving towards hourly capacity products and Elia would therefore welcome market feedback on the preferred future granularity (hourly or quarter-hourly).

Bid complexity Single-CCTU product

- **Single-CCTU aFRR and mFRR Capacity Bids are currently fully divisible and no linking of bids is possible** (e.g., block bids, exclusive groups of bids)
- A benchmark reveals different practices in different countries:
 - No bid complexities in the German-Austrian capacity market
 - Higher degrees of bid complexities in the French, Nordic and UK markets
- During bilateral discussions, **stakeholders expressed diverging views with respect to bid complexities**
 - Certain stakeholders indicated a preference to avoid bid complexities as the introduction of bid complexities would lead to increased complexity, lower transparency and potential gaming opportunities
 - Other stakeholders expressed an interest in having some bid complexities (e.g., exclusive groups of bids) although it did not seem strictly needed and/or a high priority
- **Elia believes additional bid complexity would only need to be put in place if clear benefits of/needs for this complexity could justify the drawbacks** of increased complexity, reduced transparency and possible gaming opportunities. **Based on current information at the disposal of Elia, Elia does currently not see clear needs to introduce bid complexities.**

Elia proposes to not introduce bid complexities for the Single-CCTU aFRR and mFRR Capacity products.

Elia is however open to re-evaluate the proposal in case clear needs/use cases would be provided that could justify the introduction of bid complexities.

Paid-as-bid remuneration for aFRR and mFRR Capacity

- aFRR and mFRR Capacity is currently remunerated based on a paid-as-bid scheme.

Benefits paid-as-cleared remuneration

- Efficient allocation of capacity reservation
- Reduced efforts for BSPs to forecast marginal prices
- Increased market attractiveness and transparency
- Level playing field (all BSPs would benefit equally in periods with elevated marginal prices)

Drawbacks paid-as-cleared remuneration

- Prone to market power and abuse
- Could lead to higher costs for balancing capacity and hence consumers

- The drawbacks related to a paid-as-cleared capacity remuneration strongly depend on the liquidity and market concentration.

KPIs Jan-Oct 2025:		aFRR Up	aFRR Down	mFRR Up
	Liquidity - CCTUs with pivotal BSP [%]*	33.4%	34.9%	87.3%
	Potential procurement cost increase in case of paid-as-cleared remuneration [M€]**	4.8 M€	7.7 M€	14.1 M€

While Elia recognizes the theoretical merits of an auction design based on paid-as-cleared remuneration, **Elia believes the current market liquidity and market concentration in the aFRR and mFRR Capacity auctions is not sufficient to safely evolve towards a paid-as-cleared capacity remuneration**

* A BSP is considered pivotal for the CCTU in case the offered volume is not sufficient to cover the needs after removal of that BSP's bids. For aFRR, the volumes related to All-CCTU Bids are not considered here as these bids are frequently offered at significantly higher prices.
** Recalculation based on actual bids and assuming the marginal price is unchanged.

Proposed evolutions

- **Evolve to a joint auction for aFRR and mFRR (minimizing costs to secure the required aFRR and FRR)**
 - ❑ Decrease capacity costs
 - ❑ Increase depth and attractiveness of the aFRR capacity market
 - ❑ Secure additional aFRR Energy Bids
 - ❑ Simplify the aFRR auction
- **Evolve from 4-hourly to quarter-hourly CCTUs**
 - ❑ Remove barriers for participation due to non-constant availabilities
 - ❑ Avoid inefficiencies in procurement due to averaging of (opportunity) costs

Possible longer-term evolutions

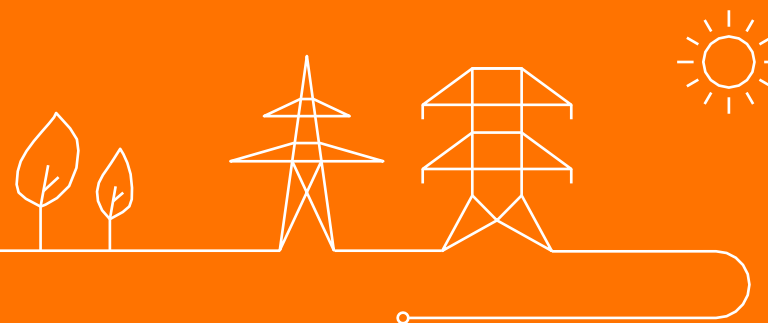
- **Removal of the All-CCTU aFRR product**
 - ❑ Further simplifies the auction design and increases transparency
 - ❑ Liquidity is not considered sufficient yet to remove the All-CCTU product at this stage
- **Evolve to Paid-as-cleared remuneration**
 - ❑ Liquidity and competitiveness are not considered sufficient yet to evolve towards paid-as-cleared remuneration at this stage

Next steps

- Elia welcomes additional feedback on the proposed aFRR and mFRR capacity auction evolutions
 - ⇒ Please contact your KAM Energy
- Implementation possibilities and timeline will be further investigated by Elia
- Key feedback (and implementation planning) will be presented in the WG BD&S of 18th of December

Status on DFD project

Aline Mathy



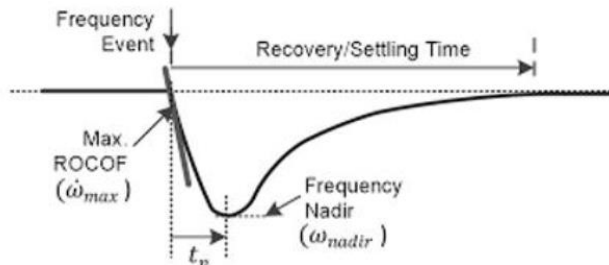
The mitigation measure aimed at avoiding ENTSO-E's penalty

Context:

- Discussions at ENTSO-E level to penalize TSOs contributing too much for DfD.
- The potential penalty is an obligation to contract (60%) more FCR.
- The penalty is not yet into force and no date is announced yet.

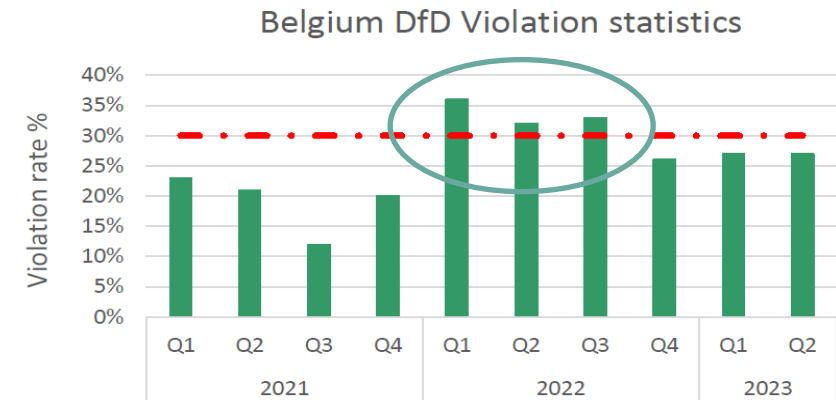
Rules:

- Elia contributes to a DfD if its ACE > 217 MW at the DFD Nadir
- A TSO is not supposed to contribute for more than 30% of DFDs during one quarter



Trigger for Elia's initiative:

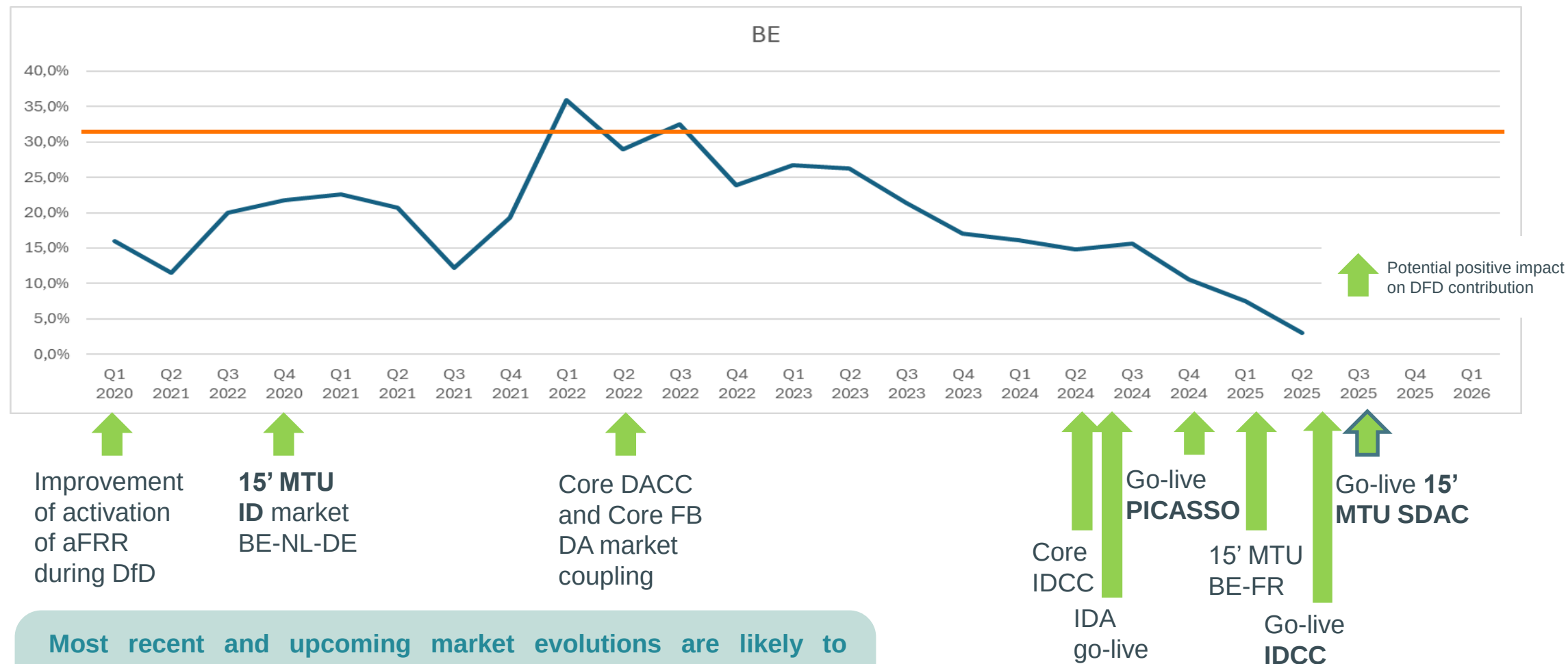
In 2022 Elia exceeded the 30% threshold of DFD contribution for 3 quarters.



The goal of the initiative was to find a mitigation measure that would allow to remain below the threshold in order to avoid the ENTSO-E penalty.



Elia contribution to DFD is constantly decreasing



Most recent and upcoming market evolutions are likely to positively impact DFD contribution of ELIA. The most impactful evolution being the Go-live **15' MTU SDAC** that should transform large variations around the hour change into smaller variation at each QH.

Some large units will come back and fast response units will connect to the system. A close follow-up is needed to assess the impact they might have on DFD contribution.

Next steps

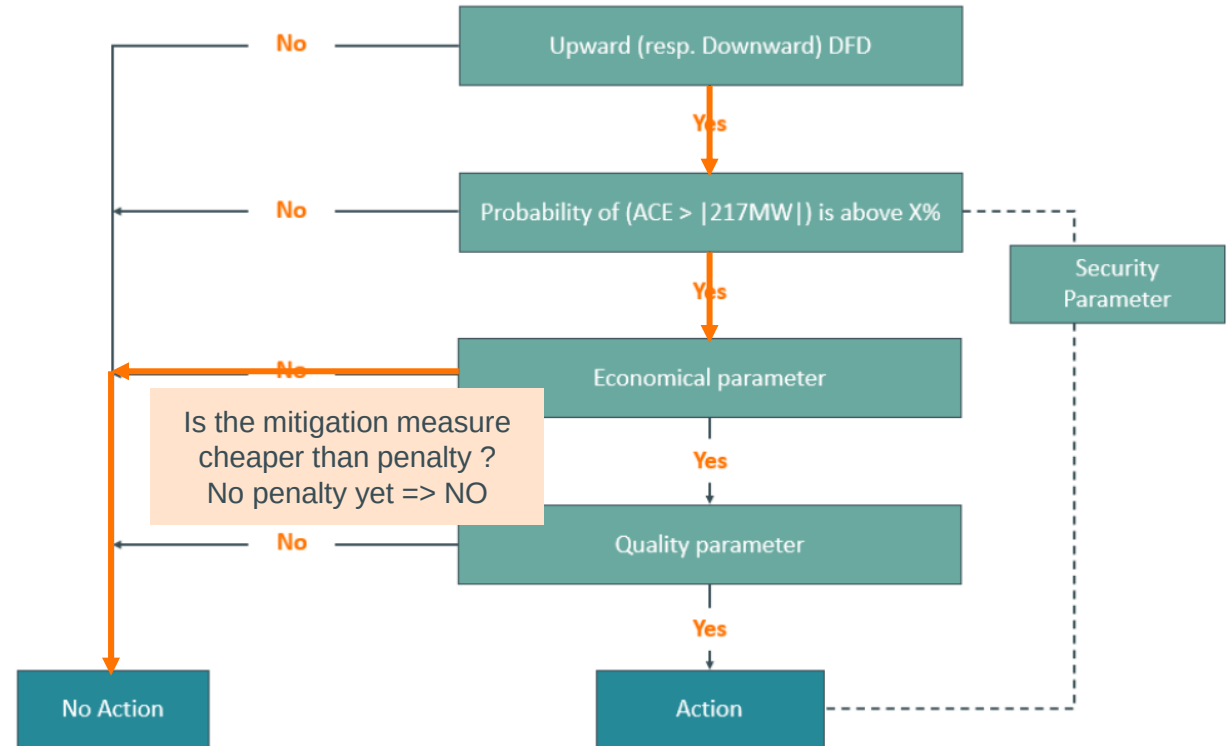
Elia's contribution to DFDs is constantly decreasing and external factors should mainly confirm the trend in the near future.

Applying a mitigation measure would always come with a cost while a penalty is not yet of application on ENTSO-E side. No view is available on when the penalty would be applied and how long the TSOs would have to apply solution before facing the penalty.

⇒ **We propose to not apply any mitigation measure currently**

Nevertheless, the work done can be easily stored and the topic could be re-opened in case a penalty is clearly defined on ENTSO-E side or in case DFD contribution would go up again.

⇒ **We propose to closely monitor the evolution of ENTSO-E discussions as well as the contribution of Elia to DFDs**



On top of that, our engineer made sure that the whole analysis can be re-run by just “pushing on a button” in order to re-generate the same outputs anytime we want to re-perform the analysis.

Improvements done since last update

Models

DFD forecast

Clustering: separate analysis for upward and downward DFDs - **Improved the performance of the model on upward DFDs.**

Seasonality - No trend can be identified based on the season. Training set should be long enough to contain a representative number of DFDs.

Training Set Length optimization done separately for upward/downward DFDs and ACE – General small improvement

Residual correlation analysis to assessing the Randomness of Prediction Errors – No correlation identified

ACE forecast

Weighting High Aces More: Enhancing Model Accuracy Through Prioritization – **Improved the performance of the ACE forecast**

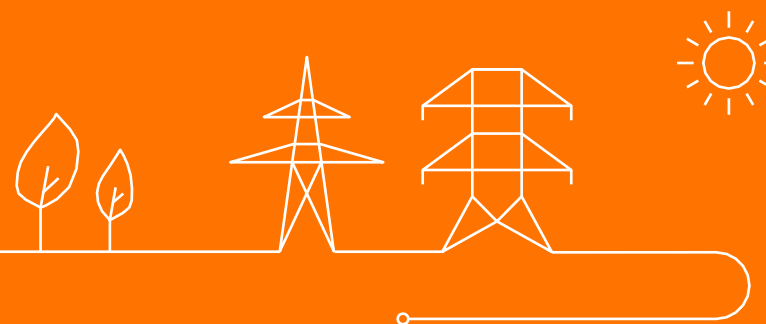
Models were run on a longer timeframe as well (not just one month) to confirm the observations and performances.

Measures

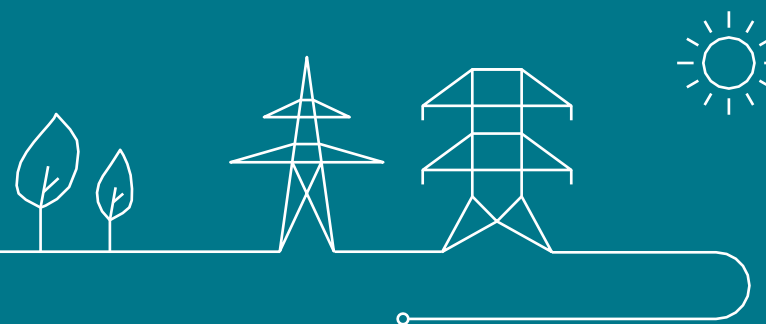
Product characteristics adapted to the new design (FAT, ...)

AOB

Alexandre Torreele



WG next dates



2025 WG Energy Solutions

- Thursday 06/02/2025 09:00 – 17:00
- Friday 04/04/2025 09:00 – 17:00
- Thursday 19/06/2025 09:00 – 17:00
- Thursday 02/10/2025 09:00 – 17:00
- Thursday 13/11/2025 09:00 – 17:00
- Thursday 18/12/2025 09:00 – 17:00

