



# Procurement strategies for a dynamic allocation of FRR Means

## 2<sup>nd</sup> stakeholders' workshop

May 10<sup>th</sup>, 2022

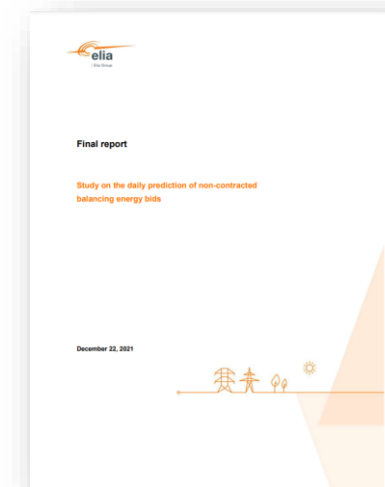


# Elia recently showed that upward mFRR non-contracted bids could be predicted, creating a potential to optimise balancing capacity procurement but with many uncertainties following upcoming system evolutions

Elia is investigating the possibility to optimize the allocation of the required reserve capacity needs to contracted and non-contracted balancing means through a dynamic calculation of the available balancing means.

In December 2021, Elia published a study testing whether non-contracted balancing energy bids can be predicted for the next day. The study's main conclusions were:

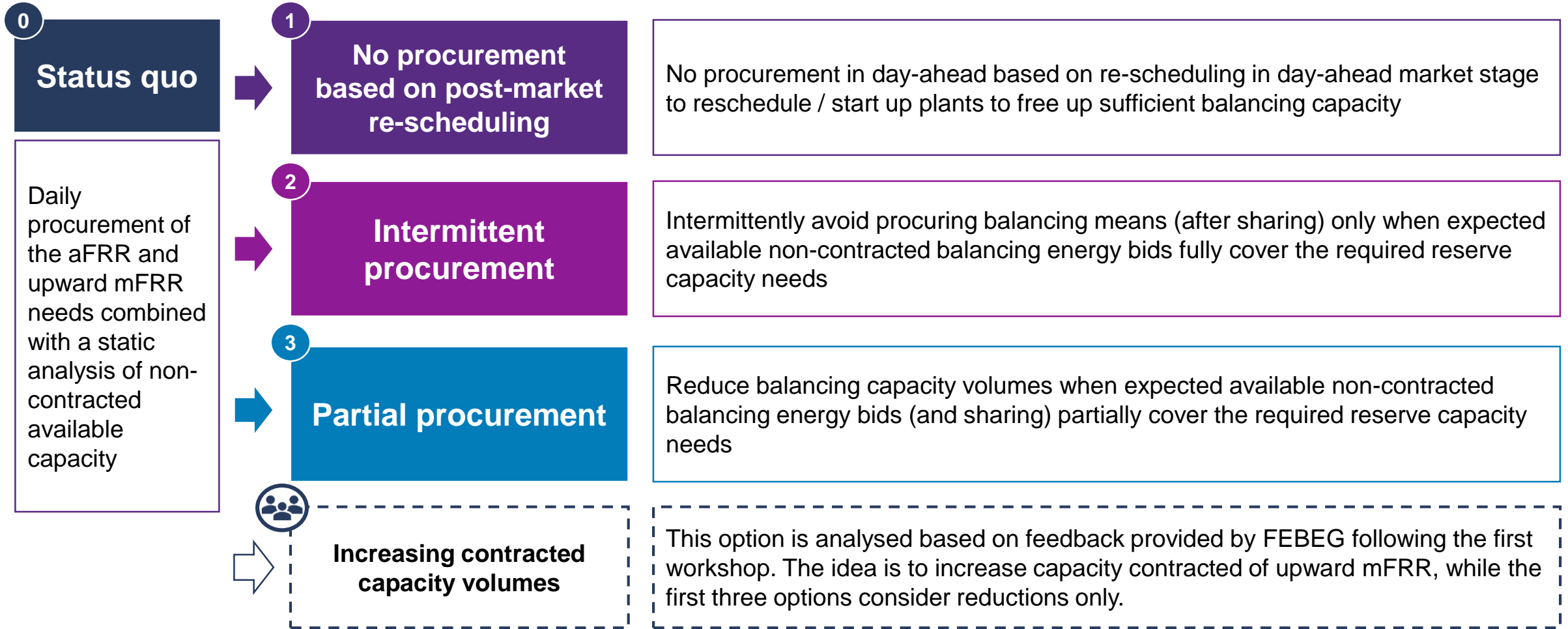
- **aFRR**: no substantial volumes of aFRR non-contracted balancing energy bids can be predicted, due to low liquidity and the limited time series available at the time of the study.
- **Downward mFRR**: confirmation of Elia's current approach not to procure downward mFRR balancing capacity as observed non-contracted balancing means almost cover the full downward mFRR capacity needs.
- **Upward mFRR**: available data has shown that a potential volume of 500 MW (including reserve sharing) can be predicted with a reliability of 99.0%, on average, while a volume of 1000 MW can be ensured for 14% of the time. **It is confirmed that there is a potential value for this prediction tool** but many uncertainties are present following upcoming system evolutions (evolution to explicit bidding, reduction of the full activation time and implementation of the EU balancing energy platforms).



[Link here.](#)

One of the main conditions to harness predictions of upward mFRR non-contracted capacity is whether appropriate procurement mechanisms can be found to deduct this capacity from the balancing capacity to be procured. The following presentation explores different mechanisms to do so.

# Three potential options were identified for analysis towards different criteria including operational risk and economic efficiency





**In your view, have all the relevant options been identified in order to optimise procurement of upward mFRR capacity?**

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# Identification of a set of criteria to evaluate market design options

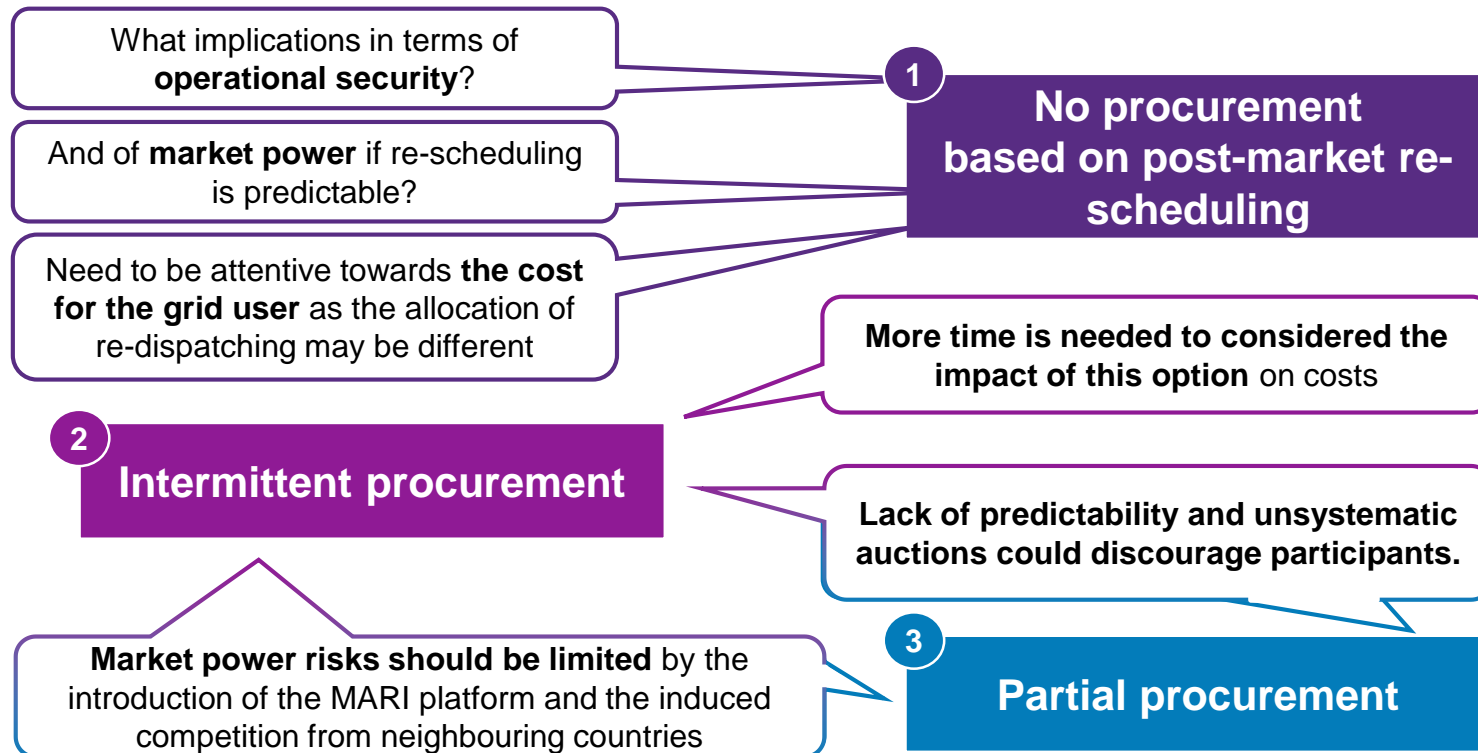
1	Operational security	<ul style="list-style-type: none"><li>Does it guarantee a sufficient amount of reserves and an adequate level of operational security?</li></ul> <p><i>Decisive criterion</i></p>
2	Economic efficiency	<ul style="list-style-type: none"><li>Does it provide efficient dispatch incentives?</li><li>Does it provide efficient long-term incentives to provide flexibility?</li></ul>
3	Cost for grid users	<ul style="list-style-type: none"><li>Is it likely to reduce costs for grid users?</li></ul>
4	Market functioning	<ul style="list-style-type: none"><li>Does it negatively impact the efficient functioning of market mechanisms for balancing and price formation and wholesale market?</li><li>Does it provide a clear and stable framework for market participants?</li></ul>
5	EU / Belgium compatibility	<ul style="list-style-type: none"><li>Is it compatible with EU / Belgian legislation?</li></ul> <p><i>Decisive criterion</i></p>

**!** 'Post-market re-scheduling' would be a significant departure from current arrangements as well as the EU target model. No fundamental issues were found for the other options.



# Market participants provided feedback during the stakeholder workshop held by Elia on 21 April 2022 – more feedback was received afterwards

During the first workshop, participants provided preliminary feedback on the options:



Workshop participants



Suggestions received (FEBEG) after the workshop

1. Including an **additional option** to increase capacity procurement
2. Accounting for **changes in cross-border exchanges** on reserve sizing and procurement
3. Assessing options in light of **past extreme events**
4. Including **indirect costs on BRPs** in the evaluation
5. Considering **adequacy impacts** of these options
6. Considering the **impact of intermittent/partial on free bid availability**



Overall participants suggested not to discard options too quickly if it could, at a later stage, reduce significantly costs for consumers



# Increasing procurement of mFRR capacity implies raising network reliability standards for operational security, which is a separate question

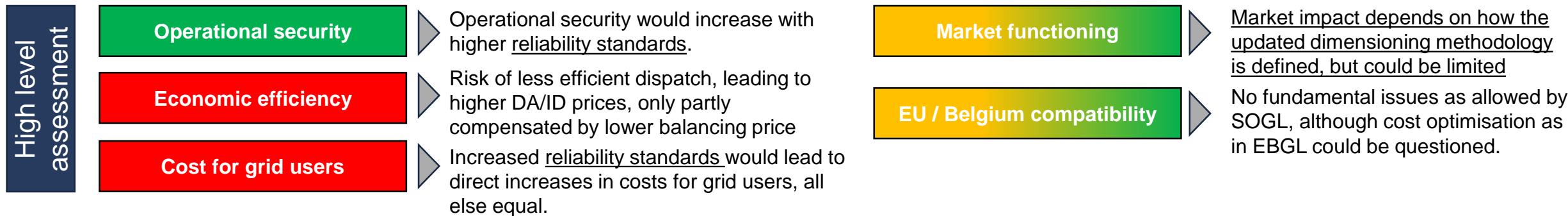


## Increasing contracted capacity volumes

Following the first workshop, we received feedback that the options considered only focused on reductions of FRR capacity contracting, while an additional option could focus on increasing such contracting.

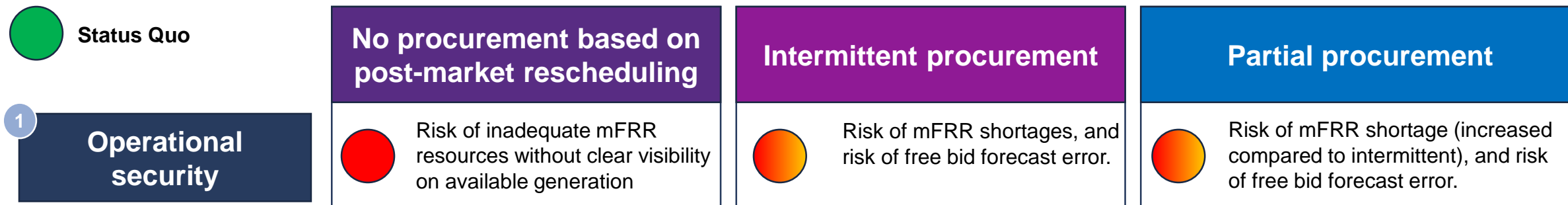
### Implications:

- Today, Elia contracts its need for mFRR upward capacity (after taking into account sharing) following a dimensioning taking into account :
  - a probabilistic method pursuing a 99% reliability level.
  - a deterministic method covering the dimensioning incident.
- ➔ This methodology has shown to provide operational security and is in line with minimum European legal requirements (system operation guidelines).
- Increasing contracted capacity for mFRR implies raising the network reliability level beyond minimum legal requirements,
- **While the options considered are assessed against the status quo procurement methodology, we consider that increasing the volume related to the dimensioning of the mFRR needs, or re-assessing the pursued reliability levels, falls outside of the scope of this study,**



The suggested option would involve an increase of operational security through a higher reliability standard in the dimensioning methodology. This **falls outside of the scope of this study**, but would lead to higher costs for the power system, and grid users in particular.

# Assessment of procurement options as regards operational security



- Compared to the status quo, **all the considered options tend to increase operational security risks.**
- As regards the no-procurement approach, **situations of lack of non-contracted means will likely be frequent** based on current liquidity (cf. study 2021), while the current generation mix does not guarantee that Elia will have **access to adequate resources to re-schedule plants when needed** (slow start-up times of conventional thermal units e.g. CCGT, available capacity already fully used e.g. during near-scarcity events).
- Intermittent and partial procurement approaches raise concerns if the expected available free bids are no longer there in practice which is possible as:
  - **Forecasting the availability of free bids is not an easy task** and it is difficult to reach adequate volumes available at ‘firm’ availability level (cf. current forecast analyses at 99.0% instead of 99.9% or higher) and anticipate radical changes.
  - Intermittent and partial procurement could have an **impact on dispatch behaviour** and corresponding free bids’ availability, leading to operational security risks (due to capacity not started up in the absence of balancing capacity contract).

⇒ **These operational security concerns need to be addressed before considering the implementation of such options. Further quantitative studies on availability and predictability of free bids should confirm sufficient liquidity of non-contracted balancing energy bids before these strategies can be considered.**





# We received feedback highlighting that partial/intermittent procurement could reduce available free bids capacity



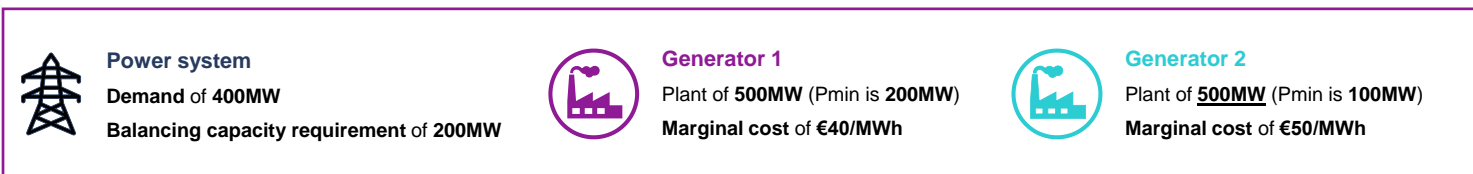
**Decreasing contracted capacity might decrease the offers of non-contracted bids.**

For example, a CCGT that was partially selected in FRR auction – consequently with its costs of running that should be paid – will offer non-contracted energy bids.

However, decreasing FRR capacity might lead to less units of this type to be selected and consequently lower amount of non-contracted bids.



- This risk has been well recognized and presented in the previous workshop (see WS sides 20, 21, 33, 34). It shows that indeed, intermittent and partial procurement could reduce capacity available to provide mFRR in real time, by influencing dispatch decisions
- However, at this stage it is unclear how often these situations would materialise in practice, and whether this could be taken into account in the prediction of non-contracted bids.



## Scenario 1 – mFRR ‘full’ capacity auction

- To meet the demand and balancing capacity requirement, both plants need to be dispatched to provide 400MW of energy (300MW for Generator 1 and 100MW for Generator 2) and 200MW of reserve.
- In the mFRR tender (ex. if equilibrium price at €48/MWh):
  - Generator 1 will provide 175MW of reserve at €8/MW, its opportunity cost
  - Generator 2 will bid in the balancing capacity auction in order to cover the cost of producing 100MW and sell it below its marginal cost => it will provide 25MW of reserve at €8/MW

Available non-contracted bids in the balancing market would amount to **400MW**.

## Scenario 2 – no mFRR capacity auction

- Taking into account free bids, in an intermittent procurement case, the TSO could decide not to procure any mFRR capacity in this situation, as the expected 400MW of free bids far exceeds its 200MW requirement.
- In such a case,
  - Generator 1 produces 400MW and provide 100MW of reserve in the mFRR Energy market
  - Generator 2 would therefore neither produce nor provide balancing capacity.

In such a case, available balancing capacity would only be 100MW and would not meet the balancing capacity requirement.



# We received questions regarding operational security issues linked to relying on past data, as well as the evolution of cross-border trading

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Generally, is looking at past free bid availability indicative of their future availability? Could algorithms predict shocks?



- This risk has been well recognized and presented in the previous workshop. It shows (see WS slides 23, 35), there is indeed a risk of forecast free bids errors, which would lead to lower operational security for partial and intermittent procurement options. This is considered in the operational security analysis. Note also that forecast errors are in both directions and could also lead to underestimation of free bids.

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Is the assessment presented robust to evolutions in cross-border exchanges, such as:

- Core flow based methodologies with additional countries?
- Interconnector saturation periods, limiting their use for balancing exchanges and reserve sharing?
- Introduction of PICASSO and MARI platforms?



- This risk has been well recognized and presented in the study conducted by Elia in 2021. It stresses the need to update the quantitative analyses after the introduction of the EU balancing platforms.
- As detailed in the presentation, when considering cross-border contribution, the availability of interconnector capacity needs to be assessed and taken into account. It adds to the equation additional uncertainty to factor in.
- The introduction of the CORE flow based methodology may introduce a change, which impact may be difficult to predict based on previous data.
- The introduction of the PICASSO and MARI platforms could trigger additional liquidity accessible to ELIA, but also other TSOs may dip into balancing resources in Belgium (although local resources could be allocated to local needs).
- Therefore, mFRR bids available on the MARI platform – coupled with available cross-border capacities – could be taken into account through partial procurement, but adequate assessment needs to be performed to evaluate such contribution, and this can only take place once the platforms are operational.
- In addition, as explained, it could though be only to a limited extent as, if Elia requests volumes higher than submitted too frequently, this may trigger reactions and suspicions of freeriding.
- We have dedicated analysis slides on this point, [here](#).

# We received a question asking whether the options had been stress tested against past situations of extreme balancing activations



## Has Elia assessed the different options in light of extreme balancing activations?

Were underneath events still far from creating very serious grid issues (jeopardizing the SoS)? The following 2 dates – although we could investigate other events – were particularly extreme and can be used as stress tests:

21/04/21 – 640 MW mFRR activated + 400 MW TSO sharing

01/04/22 – 550 MW mFRR activated for 4 Qhs



- **Specific ‘stress tests’ are in general not conducted as the objective of Elia’s reserve dimensioning and balancing capacity determination is to cover the LFC block imbalances under ‘normal’ conditions (including covering the dimensioning incident).**
  - Events in which available means fall short of the LFC block imbalance are not unlikely following using a 99.0% reliability criterion and an N-1 dimensioning incident.
  - Such events result in a ACE / FRCE, or if applicable, in the activation of the exceptional balancing measures.
- “ In the two cases referred to, system imbalance was adequately covered by the availability of sufficient mFRR means, including available non-contracted balancing means (non-contracted balancing energy bids and reserve sharing activations). ”
- **The objective of dynamic procurement mechanisms is in first place to accurately predict the availability of non-contracted balancing means in order to make sure that the required reserve capacity is adequately covered**
  - However, Elia agrees that setting reliability level of the forecasts too low will result in more and more situations where required reserve capacity will not be adequately covered.



**Do you agree that operational security is a concern, or a risk, for implementation?**

**Do you have any suggestions for mitigation of this risk ?**

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# Assessment of procurement options as regards efficiency and costs

	No procurement based on post-market rescheduling	Intermittent procurement	Partial procurement
<p>1 Status Quo</p> <p>2 Economic efficiency</p> <p>3 Cost for grid users</p>	<p>Dispatch efficiency could improve, but frequent rescheduling can result in inefficiencies.</p> <p>Lower procurement cost but costly re-dispatching/ start up, which could increase further.</p>	<p>Could increase liquidity in the wholesale market. Remedial actions in case of reserve shortage could create inefficiencies.</p> <p>Some mFRR procurement reduction, but at times of lower mFRR prices, and risk of costly remedial actions</p>	<p>Could increase liquidity in wholesale market. Remedial actions in case of reserve shortage could create inefficiencies, and long term incentives to provide flexibility could be reduced. Partial procurement would reduce procurement costs, but could be overrun by higher remedial costs. Impact on LT incentives could have upward effect on costs in the future.</p>

- Limiting procurement in advance of the day-ahead wholesale market **may improve the efficiency of the dispatch, as long as rescheduling or other remedial actions by ELIA in case of insufficient non-contracted means are limited.** Therefore, based on current liquidity (cf. study 2021), this would not be the case for the no-procurement approach and higher levels of free bids' predictability would be necessary in case of intermittent and partial procurement so that these actions may not be too frequent.
- Should these actions be limited, thanks to sufficient liquidity and adequate forecasting, intermittent and partial procurement may reduce costs for grid users.** However, there is a correlation between high free bids' availability – leading to no mFRR capacity auction in the intermittent procurement option – and low mFRR capacity prices. As a result, **cost savings would likely be limited in the intermittent procurement option, and lower than expected in the partial procurement.**
- The downside of reducing procurement costs is that it could have **adverse effects in the longer run in terms of incentives to maintain or develop flexibility** (thus mainly for partial procurement).



## We received questions regarding the analysis of indirect costs, including costs for BRPs. The efficiency criterion considered overall costs.

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- **Did Elia/CL analyse the impact of the 3 options on indirect balancing costs? those costs that BRPs are exposed to and that will be passed through to the final customers.**
- Units having opportunity costs on EPEX are offered at higher capacity prices than those with limited OC. Hence, these units would be the first ones to suffer from intermittent or partial procurement. Nevertheless, those units would most probably have lower activation costs and consequently, they would not drag the balancing costs (imbalance tariffs) to extreme levels. Similarly, we would expect the units with low EPEX opportunity costs to have large activation costs. With partial or intermittent procurement, they would set more frequently the imbalance price and consequently inflate the total indirect costs .

- These “indirect costs” are part of the efficiency analysis, where we look at real-time dispatch costs. Impacts were analysed in details, including with specific slides in annex.
- **Keeping low marginal cost units for the balancing market** may indeed lower balancing prices (and imbalance tariffs) but will likely lead to a higher cost dispatch in real time (see following slides). On the contrary, with intermittent or partial procurement – and, as mentioned in the evaluation, if no inefficient remedial actions are to be taken by ELIA in case of lack of mFRR means – imbalance tariffs may increase, but wholesale prices are likely lower, and the overall dispatch is likely to be more efficient.
- Moreover, **the increased imbalance tariffs may increase incentives to reduce imbalances**, to the benefits of the overall system.

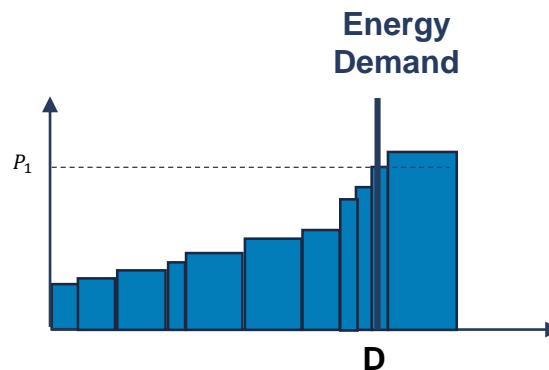


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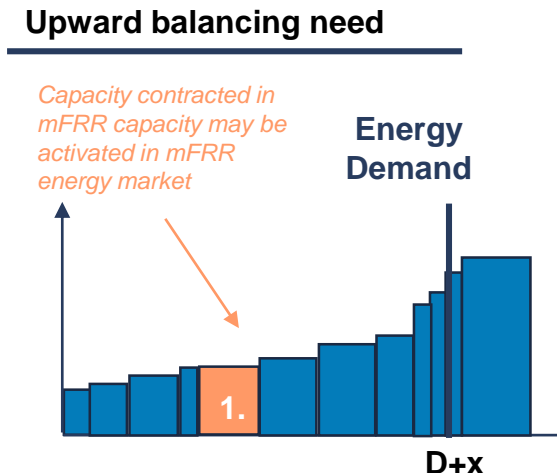
Status Quo



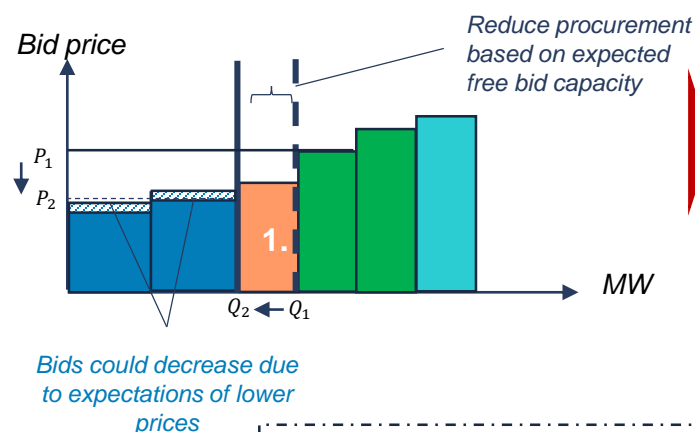
Wholesale market



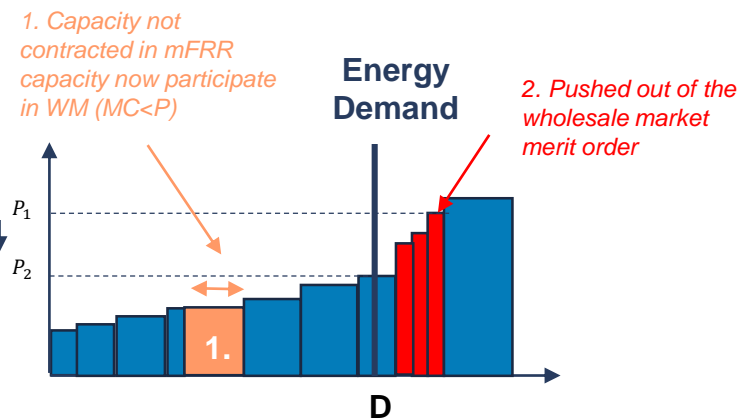
Real-time dispatch



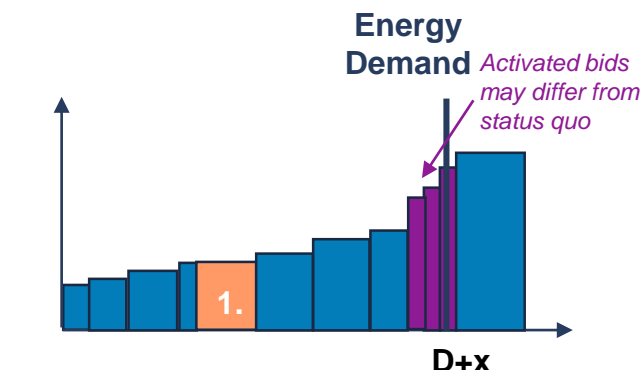
Partial procurement



Wholesale market



Real-time dispatch

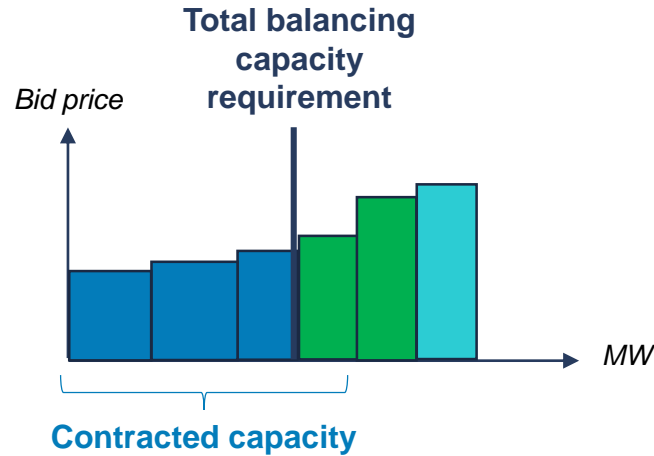


- In case of upward needs in the mFRR energy market (and not in intraday or through implicit balancing, low marginal cost bid may be activated and overall dispatch coherent and efficient.

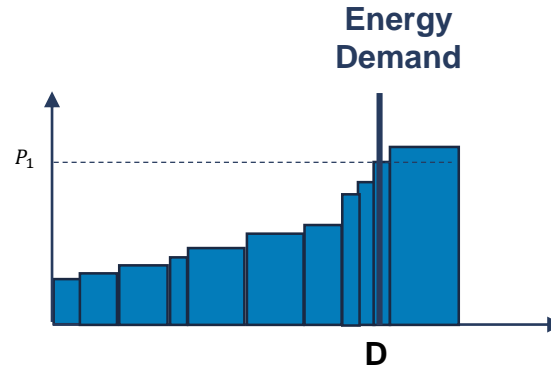


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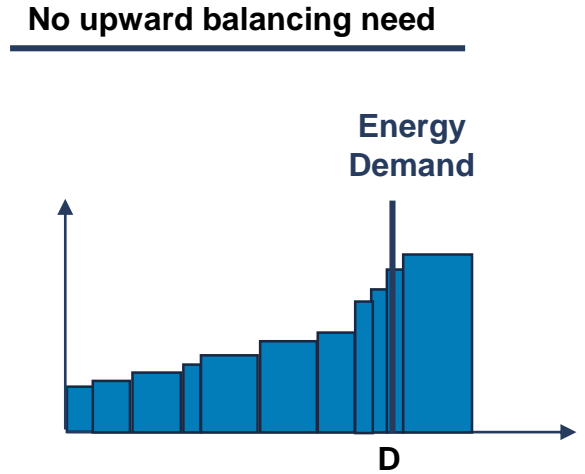
Status Quo



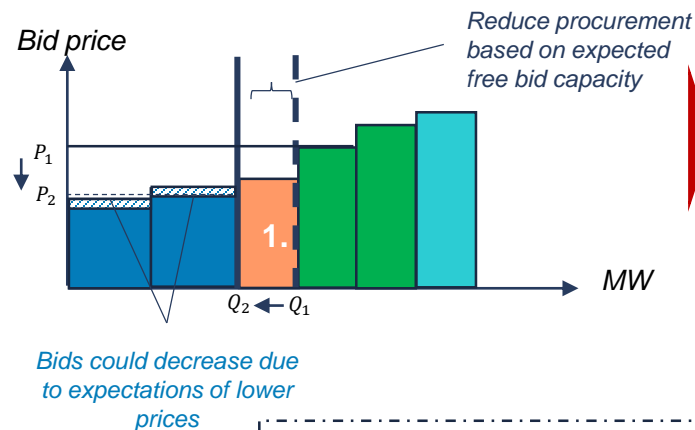
Wholesale market



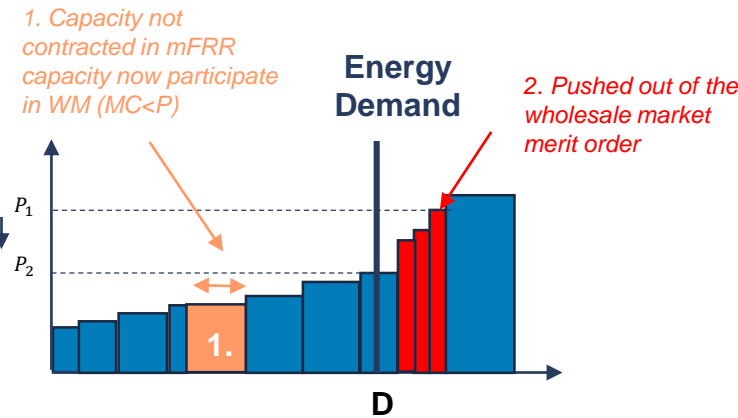
Real-time dispatch



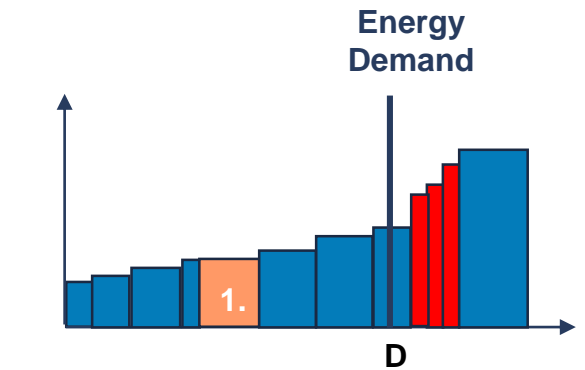
Partial procurement



Wholesale market



Real-time dispatch



- However, in case there is no upward need in the mFRR energy market, then the low marginal cost bid will not be dispatched and will be replaced by more expensive energy.





# We received questions on the impacts of the different procurement methods on the capacity mechanism, as well as on security of supply

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- What would be the impact of these options on the Capacity Remuneration Mechanism (CRM) costs?
- What would be the impacts on security of supply if some capacities leave the market?
- If so, what are the wholesale market/ mFRR procurement impacts of these capacity exits?

- **Reduced procurement of mFRR upward capacity** could imply lower revenues for some flexible capacities. This may increase their missing money, which in turns **could impact CRM costs**. Note that these additional costs should not be higher than the cost reductions in mFRR capacity procurement.
  - Note that **the missing money is also impacted by mFRR energy prices, which are likely to increase** with lower procurement volumes of mFRR capacity. As a result, this would lower the impact on CRM costs.
- **On principle level, adequacy is ensured by the CRM and not mFRR capacity procurement.** Including adequacy considerations in the mFRR procurement methodology risks overlapping incentives in an uncoordinated way with the CRM.
  - Note that units which do not participate in the CRM might be leaving the market following reduced AS revenues (but closures need to be announced in advance).

# Assessment of procurement options as regards market impact



Status Quo

4

Market functioning

## No procurement based on post-market rescheduling



More instability and complexity in the wholesale market. Potentially discriminant to decentralised generation.

## Intermittent procurement



No regular auctions guaranteed, creating uncertainty and resulting in operational errors.

## Partial procurement



Procurement volumes less predictable. Market power and mFRR energy prices could increase.

- **In case of no procurement based on post-market rescheduling, market instability may appear in case of frequent ELIA interventions** to maintain sufficient level of mFRR means, which would be likely in the current situation.
- In intermittent and partial procurement, the absence of recurrent mFRR capacity auctions and the variability of volumes may affect the visibility of market participants in the market unless there are clear patterns (e.g. no mFRR capacity auctions in summer or at night, or stable volume reduction over predefined periods).
- Therefore, **unless there are clear patterns, the market environment would become less predictable and stable and this could discourage market participation** and result in operational errors at market side. It could be detrimental to its functioning in the short and long run and increase market power in the balancing energy market.



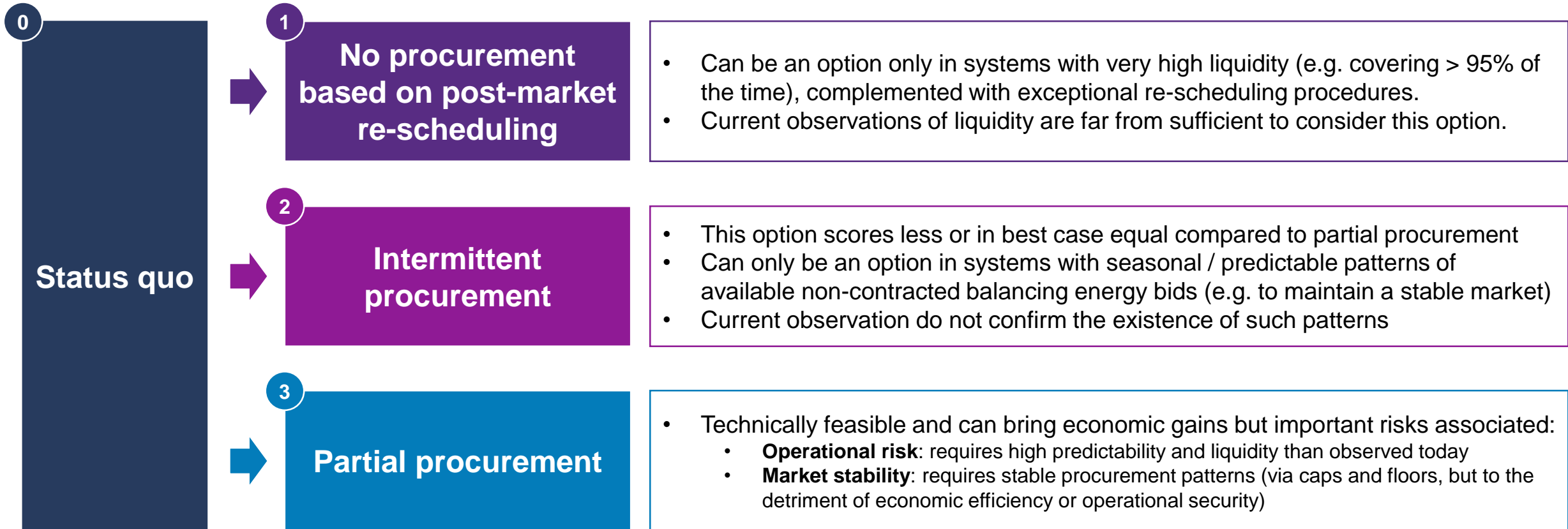
**Do you agree that market functioning is a concern, or a risk, for implementation?**

**Do you have any suggestions for mitigation of this risk ?**

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# Partial (or intermittent to a lesser extent) procurement could unlock cost savings to grid users, conditional to resolving operational security and market stability issues



# If solutions are found to limit operational risks and market issues, partial procurement would be the most promising mechanism to further consider by Elia and stakeholders for upward mFRR

Compared to the status quo, a partial procurement mechanism of upward mFRR could bring the most benefits to system users...

- **Costs of procurement of upward mFRR could decrease** for Elia when reducing its procurement volumes, leading to cost savings for grid users.
- Partial procurement can **increase economic efficiency** of the electricity system, as procuring less capacity frees up resources for the electricity market.

... provided that solutions are found to the operational and market issues identified:

- Partial procurement **leads to higher operational risk** as there could be instances where Elia could face mFRR capacity shortages.
- **Market participants could face higher uncertainty** if procurement volumes become partial, and so less predictable.
- The economic benefits of partial procurement could be limited by two factors:
  1. **Remedial actions** to deal with operational security issues could hinder the economic benefits of the mechanism.
  2. Reduced volumes of procurement and ex-ante announcements of mFRR energy volumes expectations could increase **market power** of certain market participants, leading to higher prices in the mFRR energy market in the end.
  3. **Lower long-term incentives** could have a negative impact on the availability of flexibility, including only due to the announcement of such a potential measure.

For partial upward mFRR procurement to be implemented, mitigation measures could be investigated to limit its drawbacks:

## Operational security issues

- Partial procurement **volumes could include a buffer** to limit operational risk and risks of forecast error
- In cases where operational issues are triggered, **Elia could activate bids available on the MARI platform beyond submitted bids (and reserve sharing)**, provided that these are available and this doesn't happen too often
- **Another fallback solution** could be available to Elia in cases of operational issues, such as starting-up CCGTs, but this may not be available and should remain exceptional

## Market issues

- Patterns in free bids availability should be investigated further, to test **whether partial procurement cycles** could improve visibility/ stability for market participants
- **Gradual implementation of partial procurement** could ease the transition to this mechanism for market participants and Elia, in a learning-by-doing approach



**Which option has the largest potential for implementation?**

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