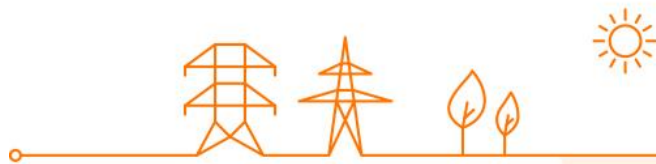


CONSULTATION REPORT

2nd public consultation on MOGII System integration study

December 23, 2020



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1. Introduction

Between the 1st of October and the 1st of November 2020, Elia organized a 2nd public consultation on its study on the integration of additional offshore capacity¹. This consultation aimed to receive feedback from the stakeholders on the mitigation measures described in the report. This feedback is taken into account in the final report of the 2020 study, which also describes the way forward towards the tendering process.

Elia received 3 non-confidential answers to the public consultation from the following parties:

- Belgian Offshore Platform, hereafter referred to as “BOP”
- Febeg
- Febeliec

This consultation report contains the overview of feedback from the stakeholders, and the answers of Elia thereon. For the full responses of the stakeholders Elia refers to the individual feedback responses.

All relevant, information on this consultation is available on the consultation webpage¹. Elia has submitted the updated report together with the consultation feedback and the consultation report to the CREG.

¹ Consultation webpage: <https://www.elia.be/en/public-consultation/20201001-public-consultation-on-integration-of-additional-offshore-capacity---mitigation-measures>

2. General remarks

2.1. Taking into account comments from the 1st consultation

FEBELIEC feedback	Elia response
<p>Febeliec wants to refer to its comment on the first Elia consultation on the MOG II Integration Study. Febeliec regrets that when reading the updated study, it does not really see many changes in the document, except for the part on the mitigation measures. Febeliec hopes that this does not mean that all its comments, as well as those from other stakeholders, have had almost no effect, as this would raise serious questions about the purpose and sense of consultations. Indeed, these require a lot of time and effort from concerned parties and it would be a shame if these consultations were only conducted to comply with legal or regulatory obligations and not from a real interest in the opinion and valuable expertise, experience and knowledge of all stakeholders. Febeliec trusts that it will receive a complete consultation report, clearly identifying why comments have not been taken into account, and also clearly asks that the regulatory approval is conducted with a clear view of what was taken on-board, with also an indication of which elements were not taken on board.</p>	<ul style="list-style-type: none"> • Elia greatly appreciates the efforts of stakeholders to provide constructive feedback to the public consultations and does its utmost to take all relevant feedback into account. • Elia reminds that 3 stakeholder workshops have been organized before the 1st public consultation. Therefore, the report from June already included feedback received from the stakeholders. • An answer has been provided for all comments received, including those that did not lead to a modification of the report. Elia does not plan to update the consultation report. • Elia strives to adequately take into account the relevant comments from all parties involved and to reach a balanced position when positions do not converge.

2.2. Cost allocation of reserve capacity

FEBELIEC feedback	Elia response
<p>Febeliec reiterates a request it has voiced already numerous times regarding the attribution of the cost of the reservation of balancing reserves. If for example this cost were to be invoiced to BRPs, instead of grid users, based on their share in the use of contracted balancing reserves by Elia, this would create an additional incentive for BRPs to hold or contract sufficient flexibility in their portfolio, as those BRPs with sufficient flexibility, which would thus be balanced within their portfolio, would pay less than those BRPs which would always have to fall back on Elia for residual balancing. By doing so, dutiful BRPs would be able to be distinguished from the others and would also be able to provide different commercial conditions to their customers, as they would only have to charge through lower costs for Elia's balancing reserves for their clients. Thus, by charging</p>	<p>Elia refers to its previous consultation report:</p> <p>“Elia reminds that the producers are also charged a significant part of the capacity reservation costs.</p> <p>In addition, the BRP is incentivized to limit its imbalance, and even to help the system, through the alpha component. The alpha component is efficiently targeting the individual performance of each BRP.</p> <p>Finally, cost allocation of balancing capacity is not specifically related to the MOG II system integration and falls out of the scope of the study.”</p>

the costs of balancing reserves via BRPs, Elia would give an additional incentive to the well-behaving BRPs and give an additional financial incentive to other BRPs to perform better, by a.o. contracting extra flexibility. In the end, this would presumably also reduce the need for Elia to contract ever more balancing reserves, which would benefit all consumers. Febeliec strongly asks that Elia and CREG attentively consider such option, in order to avoid that consumers would need to pay for an ever-increasing level of balancing reserves, by providing an additional investment signal to BRPs to invest in flexibility in the market.

2.3. Assumptions and future update of the study

FEBELIEC feedback

When looking at the report and as already indicated during the first consultation, Febeliec can only wonder whether Elia is not too conservative in its approach, and as such creates both a framework where BRPs might feel less inclined towards balancing their portfolio in all possible conditions, including non-planned but predictable outages or losses in generation capacity. This is for Febeliec very worrisome, as this might lead to ever larger volumes of contracted balancing reserves by Elia, which are paid for by consumers through their grid tariffs. Febeliec regrets that this point does not seem to have been taken on board as no modifications have been made. Febeliec insists that it is adamant to create the strongest possible signals in order to incentive BRPs to balance their portfolio.

Febeliec wants to reiterate that it, after the first version of the study and its comments on this topic, remains very negatively surprised and disappointed that Elia considers BRPs only to cover 50% of their obligation instead of 100%, especially while it mostly consists of unplanned but predictable events, with a “worst case scenario” where BRPs cover only 35% or one third of their obligation and also a “best case scenario” where they merely cover 65% or two thirds of their contractual obligation as a BRP. Febeliec finds this a very clear example of an over-cautious approach by Elia, which leads to a higher need for balancing reserves, at the cost of consumers, as this almost automatically tends to lead

Elia response

Elia refers to its answer in the previous consultation report, where this comment from Febeliec was answered in detail.

to violations and thus additional (costly) measures.
Febeliec finds this approach unacceptable.

Febeliec feedback

Febeliec understands that it is indeed maybe to soon to be able to take definitive decisions and supports an update of the study in a later period (with 2022 proposed by Elia).

FEPEG and BOP Feedback

We suggest that Elia continues to improve/adapt the proposed measures in the future in a open and collaborative state of mind with the stakeholders. The uncertainty today is too big in any way to already have a “fixed” view on what would be included in the tenders. What is the advantage of already today fixing the measures in great detail? We do not see the benefits of “locking in” already too many measures.

In particular, we would like to see Elia re-assess the extent of the underlying issues before the tendering of the offshore concessions, as we are of the opinion that Elia has been conservative in its assessment of how various initiatives and trends in the energy market that already exist today, will lessen the challenges of the offshore integration for the Grid Operator.

BOP Feedback

Elia recognizes that there are many uncertainties with respect to the extent of the actual problem (cf. e.g. §6.1), i.e. the impact of additional offshore capacity on the system:

- Park construction (technologies / capacity / density / ...)
- Technical developments of turbines
- Market developments such as the increase of flexibility in the system and daily procurement that are likely to reduce the problem significantly
- BRPs reaction / forecasting tools / ...
- Impact of alpha
- Etc.

Despite these uncertainties, a list of mandatory measures with fixed criteria is being proposed. BOP is of the opinion that it is too early to define these measures

Elia response

Elia refers to the previous consultation report.

Elia reminds that future market evolutions have been taken into account in the assumptions. It’s very clear that the set of mitigation measures proposed in the report would not be sufficient to safely integrate 4GW offshore or more in the current state of the market. Elia acknowledges that the assumptions used have been challenged by stakeholders, but notes that there were no sufficient elements provided that would justify a modification of the assumptions. Elia would like to better understand which assumptions have been assessed in a too conservative way and why BOP and FEPEG seem to consider that the planned update of the study before the tendering process will not effectively address this.

In addition, Elia reminds that the drawback of defining mitigation measures before the tenders is precisely that there are some uncertainties on the state of the market and on the state of technology. While we are now about 6-8 years before the commissioning of the wind parks of the 2nd wave, the update of the study will be publicly consulted about 1.5 years from now. Therefore, even if some uncertainties will be reduced by the update of the study, it’s to be expected that uncertainties will remain. In addition, the chosen technologies, the installed capacity, etc. will still be unknown.

and criteria, or that, alternatively, a clear process for re-evaluation of said measures should be included in the design.

At this early stage, BOP would like to continue discussing the need for and the merits of the proposed measures, rather than limiting the debate to the practicalities of the design parameters.

BOP Feedback

Limiting the update of the study to an update of the underlying assumptions when justified by new elements might be a missed opportunity. We understand that the update study will build on the work that has been done in the current study, but considering also methodological changes when justified by changing circumstances seems fair, in order to avoid confirmation bias.

Elia response

Elia would like to underline the efforts committed this year to develop the methodologies and to discuss them with the stakeholders. Based on the feedback from stakeholders during the first public consultation and related workshops, Elia considers the methodologies used are suited and intends to use them for the update. It's not clear what kind of methodological changes are expected by BOP.

BOP feedback

BOP recognises and supports Elia's intention to re-evaluate the overall need for, as well the detailed design (timing, cap, etc.) of the proposed measure (amongst others based on possible increased intra-day liquidity). However, BOP is of the opinion that having the measure already "in-principal approved" by the User Group to preventively curtail offshore wind farms without remuneration, would reduce the incentive to actually develop or incentivize the alternatives such as increased intra-day liquidity.

Elia response

Elia does not intend to stop pursuing initiatives and taking new ones to develop intra-day markets for instance, as these measures are complementary with the measures defined in this project and also serve other purposes than offshore integration.

2.4. Periodic reassessment

BOP feedback

All measures should be up for re-evaluation on a regular basis, e.g. every 2 years, to confirm the actual need of the measure. If the need is no longer confirmed, the measure is to be automatically deactivated. Such an approach allows for more flexibility in time to introduce new measures and avoids overregulation when the need is no longer there.

Elia response

Market design is evolving and Elia agrees it can't be stated today that the measures considered will still be relevant all over the lifetime of the future wind parks. Elia commits to perform a reanalysis when there are sufficient elements indicating that the measures in place do not appear to be relevant (either not necessary, not well calibrated or not sufficient).

2.5. Nature of the measures and place of proposed measures in a system with high RES integration

BOP Feedback

The study attempts to quantify the system risk due to the integration of additional offshore wind capacity, and BOP appreciates this effort. The study however falls short in (1) listing a wide variety of possible mitigation measures (including changes to market design), (2) ranking these measures (and potentially eliminating some) based on a cost-benefit analysis from a societal perspective, (3) examining their cumulative impact, and (4) justifying the specific design parameters of the measures.

The identified issue, i.e. a fluctuating and intermittent electricity generation profile with the possibility of fast ramping events in both directions that requires a flexible energy system, is not specific to offshore wind but rather a feature of several renewable energy sources, and given the energy transition, an important aspect of the energy market of tomorrow. A system-wide view in managing these fluctuations has to be taken, rather than imposing ad hoc, technology specific measures.

The proposed mitigation measures that take this long-term view and focus on the market design and functioning, are listed as “actions to be investigated by Elia”. A large number of the proposed measures are measures implying constraints for wind energy. BOP is of the opinion that focus should be put on the market design solutions, and that measures implying constraints for offshore wind energy should only be considered as transitory measures for the short-term. The design of such measures should reflect this.

This would mean that, with respect to the measures implying constraints for wind parks, Elia can only activate a measure based on objective criteria/triggers and with a predefined cap.

FEPEG and BOP feedback

We would like to better understand the system-wide view that Elia is developing to deal with an energy system with a high penetration of renewable energy, and the place of the proposed measures in this vision.

Elia response

Elia proposed several mitigation measures but did not receive concrete proposals from stakeholders during the workshops and the public consultations to complete the list if judged necessary.

Elia doesn't agree there is no balance between the measures to be investigated by Elia and constraints for the wind parks. Elia is frontrunner in adapting market design, among other to accommodate the integration of additional RES. In particular, we refer to all initiatives taken in the framework of IoE, aiming at anticipating a paradigm change where demand will follow generation. In addition, Elia takes the necessary steps to be compliant with EBGL and CEP.

The measures “to be investigated by Elia” allow to limit the “constraints imposed to parks and/or BRPs”. In that sense, those measures are complementary.

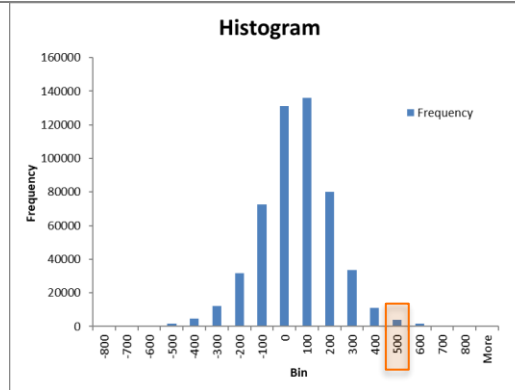
In addition, Elia repeats that, when possible, the measures have been designed not to have a negative impact on the wind parks and the BRPs when it's not absolutely necessary for operating the grid safely. For example, preventive curtailment will not be applied by default but only in cases Elia estimates there is a risk for the system which might not be fully covered by reserves and by the BRPs. In other words, these mitigation measures are to be considered as a guardrail to bridge the possible remaining gap allowing to safely operate the system under extreme conditions.

2.6. BRP’s responsibility, level-playing field and technological neutrality

<p>FEPEG and BOP feedback</p> <p>We wish to underline that it is the BRP’s responsibility to balance injection and off-take within its portfolio. The BRP is incentivized to fulfil this obligation as he is exposed to the imbalance price while additional liabilities are foreseen in the regulatory framework. The mitigation measures should not hamper the BRP to fulfil its obligations in any way. Elia should at all times ensure a level playing field between BRP’s without offshore wind production and BRP’s with offshore production in their portfolio and Elia should observe the principle of non-retroactivity of the mitigating measures related to the existing offshore parks.</p> <p>The mitigation measures should therefore be coherent and not create any distortion between different actors and/or technologies.</p>	<p>Elia response</p> <p>About the BRP responsibility and level-playing field, Elia refers to the previous consultation report.</p> <p>About technological neutrality, the specific risks identified are coming from offshore wind parks, as demonstrated in Elia and DTU’s reports. As an example, ramps of 2.5GW in 1 hour time (occurring about 3 times a year) is considerably higher than what is observed with all other technologies combined. It’s not discriminatory to address a risk coming from a specific technology by imposing measures to that technology.</p>
<p>FEPEG Feedback</p> <p>FEPEG remains convinced that Elia should rely on the BRP’s being sufficiently incentivized by the imbalance price to fulfil their obligation. Elia shouldn’t intervene in the responsibility of the BRP to balance its portfolio. If, nevertheless, Elia does want to intervene, Elia should establish clear, transparent and coherent rules which ensure a level playing field between the different actors & technologies.</p>	
<p>BOP feedback</p> <p>A BRP should be sufficiently incentivized to balance its portfolio, but it remains the BRP’s prerogative to choose the appropriate means to fulfil its balancing obligation. The provided incentives should be market-based, technology-neutral and applied at the level of the BRP’s portfolio, rather than the current proposed measures that are asset-based, technology-specific and applied at the connection point or for some, as proposed in the report, at the turbine level.</p>	
<p>FEPEG and BOP feedback</p> <p>FEPEG and BOP consider the preventive curtailment of wind parks and imposing ramping rate limitations as an intervention in or constraint to the task of the BRP to balance its position. We are therefore not in favor of such measures. We favor a holistic and evidence-based</p>	<p>Elia response</p> <p>The need for mitigation measures has been demonstrated in the report of June and mitigation measures have been defined in such a way to preserve the security of supply while limiting the societal financial consequences to the strict minimum.</p>

<p>approach to market interventions, supported by cost-benefit analysis, to ensure that interventions are done at the level, and by the party, who is best suited to do so from a societal cost-benefit perspective. Elia should not assume or impose a “free” measure (from Elia point of view). A measure which is “not free” from Elia point of view would have the benefit of being used with caution.</p>	<p>Elia didn't receive alternative proposals to measures defined in the report, except for the related cost allocation.</p> <p>Notwithstanding the legal compliancy of such a measure, a possibility would be to increase the volume of reserves. However:</p> <ul style="list-style-type: none"> • From a technical point of view, it would not efficiently mitigate all extreme conditions to be expected • From a financial point of view, given the financial impact of the measures defined, Elia does not believe a detailed CBA is necessary to demonstrate that it would result in a sub-optimal solution. <p>Elia does not intend to use the measures without caution and has no interest to do so. A detailed process will be defined for preventive curtailment. Ramping limitations would be applied automatically when necessary for system security (in case of high imbalance).</p>
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<p>FEPEG and BOP feedback</p> <p>FEPEG and BOP would also like to emphasize the importance of levelling the playing field between market actors and technologies. This is especially relevant for the proposal of the ramping rate limitation. To the extent that offshore park operators are not able to reasonably forecast the risk to take into account in their business case, they are exposed to risks which do not exist for other market actors for which there are no non-remunerated ramping rate limitations.</p>	<p>Elia response</p> <p>Elia refers to previous consultation report.</p> <p>Triggering the ramping restriction on the SI allows to apply it only when it's strictly needed for system security, but we certainly understand that it leads to an uncertainty on the resulting production loss.</p> <p>It's to be noted that the threshold for triggering the ramping rate limitation has been increased from 300MW to 500MW SI in the light of the feedback received during the 4th stakeholder workshop, considerably reducing the impact for the wind parks as illustrated in the figure below. The figure shows the frequency of occurrence of 1-minute SI values between September 2019 and September 2020. While a SI of 300MW or more is reached about 10% of the time, increasing the threshold to 500MW allowed to reduce occurrences by a factor 8.</p>
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On the basis of this threshold, Elia has quantified the impact on the basis of historical data, which showed a very limited impact in terms of production loss for the wind parks.

2.7. Need for correct incentives for Elia to solve the problem

BOP feedback

BOP proposed to make all measures cost-reflective for Elia, so that the grid operation at all times deploys the most cost-effective measure, from a societal point of view.

** full argumentation in BOPs feedback*

Elia response

Elia does intend to apply the most cost-effective measures and to do this with caution. A detailed process will be defined for preventive curtailment. Ramping limitations would be applied automatically when necessary for system security (in case of high imbalance).

Regarding cost allocation, Elia reminds that:

- Socializing the costs would not be cost-reflective for Elia, as those costs would be transferred into the tariffs.
- Remunerating ramping restriction and preventive curtailment would socialize costs caused by a risk specifically created by offshore wind parks
- Remunerating ramping restriction and preventive curtailment would not provide the correct signals to the market, as it would not incentivize market parties to take the right decisions (spontaneous self-curtailment if needed, instead of waiting for Elia to apply the measure and remunerate it)
- Eventually, cost allocation is a decision of the regulator.

2.8. Subsidy schemes

FEPEG feedback	Elia response
<p>Is it a correct incentive for properly undertaking corrective actions such a preventive curtailment, ramp rate limitation...An overall overhaul of the subsidy scheme should be studied in parallel to avoid market distortions (such as injection when prices are – very – negative).</p> <p>As a general remark, the document does not describe any penalty mechanism.</p>	<p>It's a valid point to avoid conflicting incentives between subsidy/support system and the mitigation measures defined in the study. This should be remain an attention point for the parties involved in the definition of the support scheme.</p> <p>Regarding penalties, Elia considers this as part of the detailed design of the measures. This detailed design is expected to be developed shortly before the commissioning of the wind parks.</p>

2.9. Consistency with other projects

FEPEG feedback	Elia response
<p>FEPEG would like to underline the importance of, overall, keeping a helicopter view of all the various projects/ideas/incentives. It is essential that all the new ideas/project/regulations to be implemented in the short term should be evaluated in light of existing regulations. Also, new ideas/project/regulations should be evaluated TOGETHER.</p> <p>At the moment, certain NEW projects are in conflict with reach other or Current/Soon implemented legislation/market rules. Some examples:</p> <ul style="list-style-type: none"> • Would removal of DA balancing help MOG II integration? • Is neutralization time proposed in MARI/iCAROS in line with BRP coverage requested here? • Is Alpha component (and Omega factor) helping BRP's to integrate offshore in the portfolio? <p>→ How are all the projects in line with the Federal Grid Code and EU regulations?</p> <p>FEPEG urges Elia to draft consistent rules across the different projects.</p>	<p>Elia is coherent in her studies and foreseen evolutions as Elia allows more and more freedom to market players:</p> <ul style="list-style-type: none"> • BRPs will have the opportunity to optimize and organize their portfolio across DA and ID timeframes with the project “DA balance obligation”; • BRPs will have the opportunity to take ID opportunities with the freedom of dispatch. <p>Except for the requirement on high wind speed technologies, the mitigation measures proposed in the MOGII system integration study which impact the BRPs let the market react and only foresee an intervention from Elia as a last resort: when it's strictly necessary for operational security and that the BRPs have not covered the risk.</p> <p>In addition, the impact of the 2nd wave of offshore is duly taken into account in the different studies mentioned by FEPEG.</p> <ul style="list-style-type: none"> • In the DA balance obligation connections have been made and the two studies are consistent. In the DA balance obligation study, the projections of a possible impact of the DA balance obligation on the SI are based and aligned on the scenarios described in the MOG II study. • Neutralization time in iCaros: Elia refers to its answer in the consultation on iCaros. In

particular, a scheduling agent can deviate from its last schedule as far as there is no congestion. Elia will ask a scheduling agent to “return to its last schedule” only if its deviation creates a congestion, in which case this is of course crucial for the grid.

- Neutralization time in MARI: this remark has already been raised by FEBEG and will be further discussed with stakeholders during the workshops on the planned connection to the MARI platform.
 - Alpha component: Elia reminds that the Alpha component was adapted precisely because of the integration of the 1st wave of offshore wind parks. The study on the integration of the 2nd wave confirms that offshore BRPs are expected to face high imbalances. Elia understands that this will have to be taken into account by a BRP considering taking or adding offshore capacities in its portfolio. On the other hand, it's of utmost importance for the grid security that those BRPs take their responsibility and effectively manage the imbalances resulting from the assets in their portfolio. From that point of view, the alpha gives a clear signal to the market.
 - The design of the proposed omega component takes into account the existing market design, including the currently applicable alpha component. For instance, being applicable only during negative system imbalances, it ensured that the omega component does not distort appropriate balancing incentives (which is needed a.o. for offshore integration). Moreover and fundamentally, the alpha and omega components serve different purposes:
 - The alpha component incentivizes against large and persisting system imbalances (both negative and positive) that could otherwise lead to an increase in the requirement of upward reserves and/or a need to contract downward reserves.
-

- The purpose of the omega component is to incentivize market players to ensure that sufficient capacity is available whenever the system approaches a scarcity situation and the remaining margin becomes tight.

However, note that the omega component currently only concerns an alternative scarcity pricing proposal by Elia, from a feasibility point of view. In Elia's preliminary scarcity pricing report that was submitted for public consultation, several open questions regarding the desirability of this – and by extension any – scarcity pricing mechanism have been raised. At this stage, no implementation decision regarding any scarcity pricing mechanism has been made

The “other way around”, future market evolutions are duly taken into account in the assumptions used in the MOGII System Integration project. This being said, if stakeholders have input to feed the discussion on the assumptions to be considered in the updated study, these will be analysed with interest by Elia.

Regarding the regulations, all rules drafted must be compliant and have to be approved by the regulator. This analysis is systematically performed by Elia for each individual project. If FEBEG provides a well-argued position showing that some rules violate the Federal Grid Code or the EU regulation, Elia will of course analyse FEBEG's position.

3. Clarification on impact of storm events on reserve needs

BOP feedback

In the feedback received in the consultation report of the first consultation of this 4.4GW offshore integration study (section 5.1, page 12), it is clarified that historic LFC block imbalances during storms are taken into account in the daily reserve dimensioning, but storm events are not taken into account as dimensioning incident or forced outage.

Do we understand it correctly that this results in a small increase in the daily reserve needs for all days of the year as a result of the effect of the average (annual) probability of storm events on the LFC block imbalance, rather than significantly increasing reserve needs in the daily dimensioning of days where the forecast indicates a high probability for a storm event? Can Elia please confirm or clarify? If confirmed, it seems not very efficient, nor cost-effective to increase the needs on days without any chance for a storm. The related means and costs could more valuably assigned during days with a high probability for a storm event

Elia response

Indeed, in the previous consultation report, Elia clarifies that storm events are not considered as dimensioning incident nor forced outage, but that the LFC block imbalances occurring during storm events can impact the result of the probabilistic method.

However, the understanding that this would result in a small increase in FRR needs for all days of the year is not correct. Elia has a dynamic dimensioning methodology where FRR/mFRR needs are dimensioned on daily basis and published the latest at 7 AM D-1, and this for every period of 4 hours during the next day D. In the probabilistic methodology, machine learning methods allow to capture relations between the day-ahead forecasts and the observed LFC block imbalances. As storms are assumed to coincide with high day-ahead predicted wind conditions, the machine learning models are expected to relate such LFC block imbalances only to days with high wind power forecasts (and other forecasted conditions which may indicate a storm, e.g. little PV available). Note however that the effect, even during such days, is expected to be small due to the frequency of storm events in combination with a 99% reliability level.

Elia agrees with BOP that accounting the imbalance risk of storm during all hours of the year would not be cost-efficient. This is one of the advantages of its dynamic dimensioning method.

4. Storm tool

FEPEG feedback

As mentioned in the previous position paper, FEPEG supports the current storm procedure as it improves information exchange between the BRP and Elia on storm forecast and mitigation measures, but reminds that it remains the responsibility of the BRP to choose – at all times – the appropriate means to fulfill its balancing obligation. The Federal Grid Code mentions that BRP's have an obligation of means (vs obligation of results) to balance their positions which is and should remain an

Elia response

Elia refers to its answer in the first public consultation, as this chapter has not changed.

Elia reminds that the following updates of the storm tool indeed went live in November 2020:

- The day-ahead schedules (CIPU nominations) and updates in intraday have been integrated (IDPCRs) in the Storm Tool for the determination of the volume at risk due to a storm.

obligation of means. BRP's may freely use the data source that he considers relevant. This source can obviously be different from the one using by the TSO.

Based on the first experiences with the storm tool, some shortcomings and potential improvements have been identified. Therefore, FEBEG encourages Elia to improve the storm tool:

- Elia should ensure that the proposals for improvement of the storm tool, following the feedback received by the stakeholders, will be implemented before the new go-live (1 November 2020). Elia committed to integrate the day-ahead schedules (CIPU nominations) and the updates in intraday (IDPCR) of wind parks.
- As the storm tool will most probably become a remaining tool, Elia should invest in robustness and user-friendliness (where BOTH Elia and BRP's would use these API's)

- A B2B/API has been developed to facilitate the provision of the mitigation measures by the BRP's (in addition to the current B2C).

5. Alpha

FEBEG feedback

At several occasions, in the previous position paper, FEBEG has expressed its concerns and reservations with regard to the introduction of an alpha component in the imbalance price. We wish to repeat the main issues:

The sole function of the imbalance price is to reflect the real-time supply/demand equilibrium of the system. The formation of real time energy prices should only be market based. Hence, FEBEG opposes to any regulated administrative 'incentivizing components' such as the 'alpha component' being used in imbalance pricing. Therefore, FEBEG prefers the alpha component to be put at '0' for the following reasons:

- Distortion of the price signal
- Distortion of the level playing field between countries
- Contradictory to measures to reduce the occurrence of price spikes

FEBEG therefore strongly opposes a further reinforcement of the alpha component.

Elia response

Elia refers to its answer in the first public consultation, as this chapter has not changed.

Regarding the link with the iCAROS rules, we refer to the discussions ongoing in the framework of this project. In particular, it's not because a Scheduling Agent cannot update his schedule after the scheduling deadline that he cannot deviate from it in real-time. Elia will only enforce the SA to return to its initial schedule in case this deviation causes or aggravates a congestion risk. So there is not by default an impact on the alpha.

In addition, we like to warn Elia that according to currently debated/presented iCaros rules, a SA may not update its schedule for the coming 30' (due to neutralization time). So by definition this will result in a higher Alpha.

6. Coordination of cut-in phase

FEBEG feedback

As this moment the dispatch of Elia is managing the coordination of the cut-in of offshore parks. Elia announces its intention to evolve towards an automated process to coordinate the cut-in. FEBEG supports such an evolution, but wants to point that it is important for market parties – especially in order to be able to assess the impact of potentially non-remunerated ramping limitations – to have an insight in the rules that will be applied by the dispatch or the automated process: these rules should be clear, transparent and non-discriminatory.

We refer to the overall remarks above, related to the role of the BRP's and the willingness of FEBEG to collaborate with Elia before enforcing new restriction to wind parks, which could be to pessimistic and too early to accurately estimate at the moment. Specifically regarding the Cut-In Phase coordination we have the following remarks.

Regarding the new parks, we are not in favor of a possible ramping rate limitation (for reasons mentioned above and below in this position paper: too early to carve in stone the measures and level playing field between BRP's an offshore vs other technologies). If, after duly consideration and additional analysis, it appears to Elia that such would be crucial to safely operate the grid, FEBEG would ask for a CAP and a financial compensation on energy lost/not injected. Elia should not assume or impose a "free" measure (from Elia point of view). A measure which is "not free" from Elia point of view would have the benefit of being used with caution.

BOP Feedback

In BOP's previous reaction, we requested more clarity for the coordination of the cut-in phase after a storm for the existing wind parks.

Elia response

Elia would like to better understand how the proposal for the cut-in phase fails to be clear, transparent and non-discriminatory.

Regarding the role of the BRP, Elia refers to its answer in §**Error! Reference source not found.**

Regarding the ramping limitation, Elia refers to its answer in §12.

Elia response

The T&C OPA and SA have recently been consulted with the market and the scope of the MOGII system integration project is to analyze the impacted of extended offshore capacity on the balancing of the grid. Therefore,

The T&Cs OPA currently mention (art II.16) the following:

- II.16.3 If the OPA does not fulfill his obligations of Article II.16.1 & II.16.2, Elia may impose conditions on the availability of the concerned Power Park Module. This includes unilaterally adapting its Outage Status and/or Pmax available as soon as a cut-out occurs. If Elia updates its Pmax available, Elia will use the minimum value of the observed power of the Offshore Power Park Module during the last hour.
- II.16.4 When a storm event has ended, the OPA shall first coordinate with Elia and get the approval of Elia to change the Outage Status and/or Pmax available of an Offshore Power Park Module.

The T&Cs SA currently mention (art II.14) the following:

- II.14.3 Pursuant to article 252 of the Federal Grid Code, the cut-in phase of an Offshore Power Park Module following a forecasted (or ongoing) storm event must be approved by Elia, and coordinated by the Parties. When the storm risk has ended, the SA will not submit a new Daily Schedule as long as the OPA and Elia have not coordinated the cut-in phase, and as long as Elia has not validated a change in Outage Status and/or Pmax available.
- II.14.4 If the SA does not meet his obligations under Article II.14.3, Elia may impose conditions on the cut-in phase and/or Daily Schedule of the concerned Offshore Power Park Module.

In case Elia does trigger Art. II.14.4 of the T&Cs SA, it remains unclear exactly how Elia will implement the cut-in coordination in terms of, for example, timing, and BOP urged Elia, in the previous consultation, to define clear parameters and provide clear guarantees to the sector on how and when this coordination will take place.

BOP would like Elia to reconfirm that any intervention from Elia that would impede the offshore wind parks to cut-in after a storm (1) can only be triggered by incorrect behaviour of the OPA with regards to his obligations of article II.16.1 & II.16.2 of the T&Cs OPA or incorrect behaviour of the SA with regard to his obligations under

Elia answered to BOP's request in the context of 3 to 4.4 GW installed.

For the sake of clarity:

- The current process allows Elia to coordinate and approve the cut-in phase also when the SA and the OPA fulfil their obligation, as per Article II.14.3. Imposing conditions on the cut-in phase of offshore wind parks will only occur if required to ensure the safe operation of the electricity system.
- The proposed measure would replace the related existing provisions in the T&C OPA and SA. As mentioned in the report: "Whenever a new park is ready to cut-in after a storm, the Scheduling Agent (SA) will update its daily schedule according to the contractual provisions for schedule update (Neutralization time, ...) in order to inform Elia about its intention to cut-in. The park will then be allowed to come back automatically (without prior manual approval of Elia) as defined in its schedules."

This being said, if market parties are willing to implement the proposal made in the MOGII system integration report earlier, Elia is open to discuss this.

In the meanwhile, Elia obviously does its utmost best to allow offshore wind farms to come back as soon as possible, it's not our intention to prevent wind parks to come back without reason.

article II.14.3 of the T&C's SA; and (2) will only be used in exceptional circumstances when required for safety of the grid.

BOP feedback

In the current proposal, the default situation for existing wind parks will be that they are able to come back online according to a predetermined linear ramping rate. The study report (page 89) mentions that each park will be able to come back online within a period of 1 hour (whereas most parks are capable of coming back online in a time span of 5-10 minutes). We kindly ask Elia to clarify what the ramping rate would be (or how it will be calculated) for an individual existing wind parks?

Elia response

The proposal is that the wind parks would be allowed to increase production linearly to full power in 1 hour time.

BOP feedback

BOP is surprised to observe however, that this proposed ramping limitation in the context of a cut-in coordination would occur irrespective of whether it is required for system security, without any compensation to the relevant OPA or SA, and without the clarification that this can only be imposed in case of incorrect behaviour of the OPA/SA with regards to his obligations, as per the relevant T&Cs.

If this is indeed Elia's intention, BOP would like to voice its concern with regards to such an ex-post change with regards to the recently approved storm procedure and T&Cs OPA and SA.

Elia response

Elia made this proposal to address the requests from BOP in the 1st consultation. It's probable that the presence of the future parks will increase the need for cut-in coordination in the future. Therefore, even though Elia will do its utmost best to allow wind parks to come back on the grid as soon as possible, the current process involves human intervention during potentially highly critical moments, which might lead to situations where more time will be needed before parks are allowed to come back online.

If BOP is of the opinion that a link with the system security is needed also in this specific case, the existing parks have the possibility to adopt the regime foreseen for the future wind parks.

Elia understands from further bilateral discussions with BOP that existing wind parks might be willing to adopt the regime for the future wind parks but do not have the technical ability to do so. In this case, an equivalent approach could be discussed based on the control possibilities from those parks, which would have to be specified to Elia. This approach should however be based on the same real-time signal as the one sent for the new wind parks. It's to be noted that Elia received a proposal from BOP shortly before the publication of the final report. This proposal will be further analyzed and discussed after the publication of the report, with a view to integrate the outcome of the discussions in the updated study.

<p>BOP feedback</p> <p>Wind farms are high-capable units that should not be made slow-capable because of the limited resources within Elia to manage a contractual process adequately (as seems to be the suggestion on page 88 of the report). Existing wind parks should be incentivized, through a properly functioning market, to offer their downward flexibility to the market or to Elia on par with all other technologies, rather than being limited by Elia without any compensation for their BRP.</p> <p>The default situation should be that the existing offshore wind farms can come back online as per their technical capability and that BRPs are responsible for managing these events in their portfolio. Only in order to safeguard the safety of the network, Elia should be allowed to impose restrictions on asset-level, and these restrictions should only be applied to those BRP/OPA/SA that did not fulfil their contractual obligations. If Elia wishes to apply such restrictions as a general measure, to all relevant BRP/OPA/SA (irrespective of their behaviour), they should be remunerated.</p>	<p>Elia response</p> <p>Elia reminds that cut-in situations are expected to occur about twice a year on average. The measure does not make the wind parks “slow-capable”.</p> <p>In addition, Elia reminds that the market of reserves is now fully accessible to all technologies, including offshore wind. However, considering DTU’s results (see figure 43 of DTU’s report and figure 12 of Elia’s report), activating decremental bids instead of coordinating the cut-in phase of wind parks properly would have 2 adverse effects:</p> <ul style="list-style-type: none"> • A very high volume of downwards reserves might need to be activated manually by the operator. • Even if it would be decided to use downward reserves, those could potentially not be fast enough to follow the very steep upward rampings observed during cut-in phases.
<p>BOP feedback</p> <p>If existing wind farms opt into the cut-in coordination process applicable to the new offshore wind farm, it is unclear whether the applicable ramping rate limitation will be the linear ramp in one hour, or that the 15MW/min limitation for the entire fleet of new parks will also have to be shared with the existing parks that ‘opt in’ the proposal for the new parks.</p> <p>Could Elia please confirm that the ramping rate limitation for the wind farms that “opt in” will only be applicable after a cut-out related to a storm event and thus not be applicable in non-storm situations with a positive system imbalance above the trigger.</p>	<p>Elia response</p> <p>If the existing wind parks opt for the regime of the future parks:</p> <ul style="list-style-type: none"> • The corresponding ramping rate will be defined in pro-rata, in addition to the limitation imposed to new parks. In other words, as 15MW/min applies to 2.1GW additional capacity, a park of 210MW will be allowed to increase 1.5MW/min, same ramping rate as the future parks. This indeed needs to be clarified in the report, thank you for the good question. • It is worth mentioning that, as explained in the report, opting for the new option, will only be applicable during cut-in phases, not during non-storm events.
<p>BOP feedback</p> <p>In Elia’s proposal, new wind parks will be able to come back online according to their capabilities, but a ramping rate limitation will be applicable in case of a certain system imbalance (+500MW as currently proposed). In the proposal, the ramping rate limitation will have to be</p>	<p>Elia response</p> <p>See previous answer</p>

shared between the new wind parks pro-rata their installed capacity. Our feedback on the ramping rate limitation measure, is provided in a separate section below.

BOP wonders how this general measure of a ramping rate limitation is to interact with the coordination of the cut-in after a storm event. Is it Elia’s intention to replace the storm cut-in coordination with the general ramping rate limitation measure? Will the T&Cs OPA & SA therefore only be applicable to the existing parks?

7. Incentivize reactions to real time price

FEPEG feedback

As mentioned in the previous position paper, Elia is putting in place an ecosystem allowing market parties to develop new services for the end-consumer. FEPEG supports this initiative which can increase the flexibility but, on the other hand, such model will also add complexity in market functioning which will be a challenge for the forecasting tools.

Elia response

Elia refers to its answer in the first public consultation, as this chapter has not changed.

8. mFRR activation decision in context of extreme events

FEPEG feedback

Elia is considering to modify the criteria for the activation of mFRR and to introduce the ‘direct activations of mFRR to cope with extreme variations of wind power’. FEPEG doesn’t oppose such evolutions, but reiterates its request for clear and transparent rules for the activation of mFRR. For more details we refer to the previous position paper.

Elia response

Elia refers to its answer in the first public consultation, as this chapter has not changed.

9. Measures related to forecast

FEPEG feedback

As mentioned before, FEPEG supports the proposed measures related to the forecasts, but wonders to what extent it would not be possible to provide even more information to the BRP’s:

- It’s not clear if the real-time wind speed’s which will be measured by the wind turbines from

Elia response

Elia refers to its answer in the first public consultation, as this chapter has not changed.

In the meanwhile, Elia has taken initiatives towards other European TSOs to propose a collaboration aiming at improving forecasts, including by exchanging data. However, the data received would be used in the

another park (close surrounding of the park to be forecasted) will be at the disposal of the BRP's.

- Could Elia also consider providing information on 'variation of production' or metering in real-time measured for neighboring parks in Belgium and in others country (FR, NL, ...). This could allow BRPs to do a better forecast and to anticipate the risk (with agreement between BRPs to disclose data).

models, but not shared with all market parties in order to respect confidentiality.

BOP Feedback

Improving forecasting tools leads to better information and we support such evolution. In the past however, incorrect forecasts and alerts have disturbed the market, which cannot be the intention. BOP does not oppose Elia's initiative to invest in its forecasting models and in further developing and finetuning these and invites Elia to continue to regularly request feedback from the market. As Elia states itself, the forecasting alerts should be merely indicative and can never form the basis of ex-ante interventions by Elia that have an effect on market participants. BRP's are responsible for maintaining the balance in their balancing perimeter and should remain maximally incentivised to develop the best forecasting tools possible.

Extending the forecasting tools with public ramping alerts or a ramping risk indicator could provide additional information to the market and could incentivise the development of the market for fast flexibility, and therefore BOP does not oppose this in principle.

BOP wonders however why the proposed ramping alert is limited to offshore wind? Would it not be possible and more informative if a general market ramping-rate is published?

Elia response

Elia thanks BOP for supporting the measure and remains very much open to stakeholder's input in order to continuously improve the forecasts.

Elia however reminds that the forecasts can legitimately be used as a basis for actions to be taken in order to guarantee system security (example: storm process).

The study of DTU and the resulting analyses from Elia highlighted to what extent ramping events of offshore parks will become challenging for the BRPs and for Elia. This is explained by the very high density of the Belgian offshore wind parks. As a result, offshore is expected to be the main contributor to ramping events, so it will be the principal focus.

However, Elia welcomes the suggestion and will further analyze with forecast providers if the concept could be extended to other production means.

10. High wind speed technologies

FEPEG Feedback

Firstly, we would like to refer to the General Comments above, as it seems too early to fix at the moment in detail certain technological requirements. Overall, we also wish to repeat the general remark the risk of pancaking of costs should be monitored: it should be checked if not

Elia response

Elia fully agrees with FEPEG that the requirement should not lead to an excessive restriction of the market. This is the reason why minimum requirements have been

only a very limited number of equipment suppliers will be able to install wind turbines with high wind speed technologies.

proposed in the updated version of the report, in order to give the opportunity to market players to react.

BOP feedback

BOP observes that the market is fast implementing HWRT technologies, and that this technology is becoming a customary feature for most turbine manufacturers. However, there are important differences in the workings of such technology, depending on the manufacturer and WTG model.

Furthermore, BOP would like to point out that HWRT is a feature on WTG level, whereas interventions from the grid operator should be limited to criteria at the wind park level at the Connection Point within the meaning of Article 1, definition 28 of the Federal Grid Code, similarly to the current approach whereby the technical requirements are applicable at the Connection Point. Can Elia elaborate on the legal provisions these turbine restrictions are based on?

The positive features of HWRT can be achieved via several, behind the meter, options. For example, ramping down in anticipation of a wind farm’s cut-out can also be managed by the power plant controller. A wind farm can also consist of a combination of WTGs with and without HWRT, and/or with and without behind the meter storage options, with together would still achieve the required behaviour in high-wind situations at the connection points.

Furthermore, BOP wants to avoid that a requirement for a certain HWRT technology or particular specifications at turbine level, would drive the turbine-decision of developers, significantly limiting the developer’s negotiation power and thus driving up costs. In addition, a turbine-level specification could also impede behind-the-meter innovations.

BOP suggests to specify the required behaviour at the Connection Point, and keep such requirements sufficiently broad and general, but leave the specific design and functionalities at the WTG level with the developer.

Elia response

Elia would like first to highlight that it is not necessary to define the requirements at the connection point, the reason this is done for reactive power capabilities for Type B generation is to ease the compliance. Manufacturers issue their compliance certification with respect to a single Power Generation Module for example for FRT, or RoCoF immunity requirement.

Nevertheless, Elia welcomes BOP’s proposal, as it provides more freedom to the park developer (mix of turbine technologies, H₂ or battery installations behind the meter, etc.), while answering Elia’s concern of smoothening the shutdown profile during a storm event at the connection point.

Unless the change in the assumptions leads to different conclusions in the updated study, the minimum requirements proposed at the turbine level in the report will be translated into a minimum requirement at the connection point.

The expected behavior would be assessed during the Grid compliance process, and conformity will have to be proven either by relying on the individual turbine characteristic or globally considering the overall Power Park Module behavior at the connection point.

The report will be adapted in that sense.

BOP Feedback

Elia response

Elia finds the proposal of BOP interesting.

<p>Regarding the specific design of this measure, the key parameters to consider are the starting point and endpoint of the curve on the power axis, in combination with the slope of the curve, rather than the starting point and endpoint of the curve on the wind speed axis. Whether the HWRT kicks in at 20m/s, at 25m/s or at 28m/s is rather irrelevant, as long as the power decrease is gradual enough. In our opinion, a more appropriate specification would be:</p> <ul style="list-style-type: none"> • An offshore wind farm must be designed so that the injected power at the connection point will decrease linearly to (at least) 50% of the installed capacity (excl. power boost) of the offshore wind farm, before a sudden cut-out will occur in high-wind situations. • The gradual decrease of power at the connection point must start at average wind speeds of at least 5m/s lower than the average wind speed at which a sudden cut-out occurs. 	<p>The first point is in line with the request of Elia to have a slope that “should lead the profile to decrease gradually below a Normalized Power of 0.5 before shutting-down completely”.</p> <p>The second point would allow us to quantify the slope of decrease that was not yet quantified.</p> <p>The wind speed implying sudden cut-out remains important to us in order to limit the impact of storm events on the offshore production loss, but not imposing a minimum value for the start of the decrease could allow a larger diversity of assets what would smoothen the decrease of power.</p> <p>Should BOP be willing to decrease the wind speed value at which a sudden cut-out occurs, then this should be discussed in the very beginning of the update of the study, in order to take this into account when defining the cap on preventive curtailment.</p>
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<p>FEBELIEC feedback</p> <p>On the discussion on the high wind speed moderate technology, Febeliec understands that this would lead to an increase of both the number and duration of violations. Febeliec can of course not condone a situation where an increasing risk of violations would lead to higher balancing reserves, at a cost detriment to consumers. However, Febeliec would like to see a CBA analysis taking into account a much larger system perspective, as consumers not only have to pay for balancing reserves, but also for the subsidies for the offshore wind. As such, there is presumably a trade-off between costs in both parts, with an optimal level. Based on the information at hand, it is however impossible to discern where such optimum would be and if it would result in a clear outcome or a more balanced result. Such information would in any case be very valuable to be included in a future update of this study.</p>	<p>Elia response</p> <p>As the costs of these technologies are not public and the gains resulting from HWS technologies will also depend on the capability of the BRP to balance its portfolio (HWS technologies reduce the risk of high imbalances for the BRP), Elia cannot perform a CBA. Therefore, Elia proposed a minimum requirement and provided an opportunity to market players to react. It’s to be noted that the minimum requirement is close to the technologies which are already installed in European offshore wind parks and appears therefore to be reasonable.</p> <p>Considering the fact that, following the suggestion from BOP, the minimum requirement will be set at the connection point rather than on the turbines, the developers will have additional possibilities to optimise the characteristics of the wind parks, making a CBA less relevant.</p>
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11. Preventive curtailment

11.1. General remark

BOP feedback	Elia response
<p>BOP remains of the opinion that non-remunerated preventive curtailment anticipating storm events should be removed as a possible mitigation measure as it</p> <ul style="list-style-type: none"> (i) Interferes with the prerogative of the BRP to manage the assets in its portfolio; (ii) It attached financial consequences to a forecast by Elia (i.e. the storm tool); (iii) Provides incorrect incentives to the grid operator, as it is not cost-reflective; (iv) disincentivizes further development allowing turbines to weather storms increasingly well, or developments towards combined offshore wind and storage projects; (v) goes against the EU and national legal and policy principles underpinning renewable energy development. 	<p>Elia refers to its answer in the first public consultation and to the previous answers in this consultation report regarding the cost-reflectivity of the measure.</p> <p>Elia would like to better understand how the measure disincentivizes developments, as the measure will be applied only when needed. For example, if a wind park is combined with a storage facility behind the meter which allows to eliminate the risk for the system, then the park will not be curtailed by Elia. In fact, remunerated curtailment would disincentive these developments.</p>
BOP and FEBEG feedback	Elia response
<p>BOP and FEBEG consider the preventive curtailment of wind parks and imposing ramping rate limitations as an intervention in or constraint to the task of the BRP to balance its position.</p>	<p>Elia refers to its answer in §Error! Reference source not found.</p>

11.2. Restrictions to renewables and barriers to investments

BOP feedback	Elia response
<p>In accordance with article 5, (b) of the Electricity Act, the Grid Operator is tasked with ensuring the coordination of production installation whereby priority should be given to production installations producing energy from renewable sources. The EU Regulation 2019/943 is clear in its requirement towards grid operators that they need to make sure their grids are capable to transport renewable energy, and to take fitting and market related operational measures to limit the amount of curtailment of renewable energy production to a minimum and to make sure that their grids are sufficiently flexible in order to manage these effectively (art. 13).</p> <p>EU and national policy initiatives also rather lean towards removing the barriers to investment for the development</p>	<p>Elia reminds that the projects to develop the grid infrastructure necessary to accommodate the future wind parks are ongoing. Indeed, without the <i>Ventilus</i> project, no additional offshore capacity can be connected to the grid. The project <i>Boucle du Hainaut</i> is necessary to connect the first 700MW of the 2nd wave without flexible access and to connect the remaining 1.4GW.</p> <p>As far as the measures defined in the project are defined, Elia has quantified their impact on curtailment and considers that there are limited to a minimum. Elia struggles to understand how the measures proposed are a barrier to investment.</p>

of Offshore Wind Energy. Reference can be made to the federal governmental agreement of 29 September 2020, which focuses on the capacity of the grid to accommodate the second, and maybe third, wave of offshore wind energy, not on restrictions on the developers' side. The EU Offshore Wind Energy Roadmap as developed by the EU Commission in anticipation of its dedicated Strategy on the subject clearly refers to removing barriers to investments for offshore wind energy. The combination of measures, such as the non-remunerated preventive curtailment regime, designed in 2020 for offshore wind farms being operational in 5-8 years under the pretence that this would not have a substantial impact on the offshore wind farms financial model is a clear example of a restrictive measure that should be avoided.

11.3. Impact on lifetime span of design of foundations

BOP feedback

In addition, BOP would like to point out that curtailment has an impact on the lifetime span of the design of foundations (and potentially WTG tower) especially when not damping due to operation, especially during high wind situations. A wind farm therefore imposes a limit on the number of curtailments that can be implemented. The risk of an additional 75h of curtailments (and potentially higher, as there is no overall cap), should not be disregarded in this context. A wind turbine is designed to have its rotor in rotation for all windspeeds according with the power curve. Same for the turbine tower and foundation. The rotor in rotation is serving as a consistent oscillation. As from the moment the turbine is standing still, the forces of wind and waves are not damped by this consistent oscillation resulting in a much higher impact and fatigue. The lifetime consumption of a preventive curtailment (which is by definition during quite high winds) is thus many times higher than if the turbine can continue normal operation. During tower and foundation design, this will need to be taken into account, leading to a heavier and thus more costly design. Besides the link with the structural integrity of the foundation and turbines, there is also a link with the certification of the WTG. The industry goes towards

Elia response

Elia reminds that the 75h are spread over 5 years. Elia notices that in some situations, parks decide themselves to preventively curtail. In addition, the curtailment would be imposed when a storm is expected. Let's assume the curtailment occurs too early. This means that the wind speeds will be lower than during the effective storm events where the parks will automatically shut down, leading to lower forces.

30y lifetime certification, which trades off against fatigue and start/stop events.

11.4. Trigger of curtailment

BOP feedback

What is the actual trigger of the curtailments?

The study mentions that the trigger would be based on the storm tool; however, the study does not mention what the trigger would actually be, nor which BRPs would subsequently be curtailed. Can Elia please confirm the following:

1. preventive curtailments shall only be applied in case the estimated “unmitigated balancing risk” is larger than the estimated “available reserves” as per the storm tool; and
2. preventive curtailments shall only be applied to those BRPs that contribute to the “unmitigated balancing risk” and to the extent of their perceived contribution.

Elia response

The questions from BOP are legitimate and Elia started to think about how the measure could be applied in practice. It quickly appeared that this would come down to start the design of the process now, including the decision on the most appropriate timing to trigger the preventive curtailment, as this will determine the information available to take the decision.

This being said, Elia confirms that the objective is to apply the measure only when it's strictly necessary and to the wind parks which are actually expected to cause a risk to the system.

11.5. Determination of the cap

BOP feedback

How is the cap of 75 hours determined?

From the study, it is not clear how the cap of 75 hours is determined. The number is not clearly related to the quantitative analysis of the historical and simulated storm events elaborated in the previous sections and annexes of the report. It is therefore also unclear how this measure can be re-evaluated later on.

The term “75 equivalent full production hours” is confusing, as it can be interpreted as “full load hours” which we understood is not the intention of Elia. Full load hours are hours were the installed capacity is producing at “full load”, i.e. at the top of the production curve.

As far as BOP understands however, it is Elia's intention to set the cap at 75 hours of “curtailment of the entire installed capacity of a wind farm”, irrespective of what could have been produced. Therefore, a requested curtailment during 1 hour of 25% of the Installed Capacity would only counts towards the cap for 15

Elia response

Currently, Elia has evaluated the amount of heavy storm events on an annual basis and has considered an average duration of a needed curtailment.

Elia acknowledges that a clear method to define the cap needs to be defined towards the tendering process, taking into account what we know about technologies installed (which will depend on the minimum HWS technologies requirements) and quality of forecasts.

What is meant by “75 equivalent full load production hours” refers to the power reduction imposed by Elia. Depending on the risks for the system and the available reserves, Elia could impose a partial curtailment. In that case, the duration accounted for would indeed be reduced proportionally. So indeed the interpretation from BOP is correct: “a requested curtailment during 1 hour of 25% of the Installed Capacity would only counts towards the cap for 15 minutes, irrespective of how much the wind farm would have been able to produce during that hour”. This clarification is added in the updated report.

minutes, irrespective of how much the wind farm would have been able to produce during that hour.

Can Elia please confirm BOP's understanding in this regard, and further clarify this in the study?

11.6. Remuneration

BOP feedback

Why no remuneration?

The Elia proposal defends non-remuneration of preventive curtailment based on a limited financial impact, however:

- Elia will manage the 75h cap wisely, and therefore only preventively curtail during the start of the storm in order to coordinate the slow start units, and not during the entirety of the storm as Elia is fully aware that the wind farm will not be producing (or producing less) in the midst of the storm. Offshore wind farms will therefore face the 75h almost entirely at full load, and this will thus account for about 0.5% of the annual production. This is not a negligible number.
- Remunerating preventive curtailment ensures correct balances and incentives for the grid operator when choosing between “reducing at the source” or “finding solutions in the reserves market”.
- Determining a system for remuneration is not complicated, and many examples that Elia uses today, already exist, including the D-bid mechanism and the remuneration for the MOG-unavailability.
- Preventive curtailments drive up the design cost to guarantee the lifetime of the foundations and turbines.

Elia response

Firstly, Elia has nor the intention nor any interest in “gaming” on the timing of the preventive curtailment. When designing the process in detail, the triggers will be defined in a transparent way.

Elia needs to cover the full storm until the end, in order to avoid a shortage in case several parks were planning to cut-in earlier than appears to be possible.

Therefore, the number of 0.5% is very highly overestimated, as it considers:

- That the future parks will produce yearly 3000 hours equivalent power
- That preventive curtailment will be applied exclusively when the wind parks would have been producing
- That the full cap will be used

The available or estimated reserves will be used in the process when triggering preventive curtailment, as only the residual risk needs to be covered by preventive curtailment. In addition, remunerating preventive curtailment would not provide the correct incentives to the wind parks and would socialize costs caused by a risk specifically created by offshore wind parks.

BOP feedback

BOP understands how preventive curtailments could assist in managing storm-episodes. However, Elia seems to suggest that in order for these measure to be most effective, they should be applied as a general measure to all involved BRP/OPA/SA (i.e. irrespective of their behaviour). If this is the case, they should be remunerated. Elia already has the option to curtail offshore wind farms for grid stability purposes, via the existing mechanism of Decremental Bids; and BOP

Elia response

Regarding the use of decremental bids, Elia refers to its answer on cut-in coordination in §0.

wonders why this mechanism is not used in such situations.

11.7. Question that arise if preventive curtailment does go ahead

BOP feedback

- Preventive curtailment by a BRP (for which OWFs should be remunerated) as communicated in the storm tool as a ‘mitigation measure’ must count towards the 75h cap. If they are not, this is a perverse incentive for BRPs not to take preventive action.
- The storm tool indicates that the non-mitigated risk is larger than the available reserves; therefore, Elia looks to preventive curtailments to reduce the non-mitigated risk. How will Elia decide on which offshore wind farms will be preventively curtailed?
 - Example 1: There is no clear “culpable” BRP. Every single BRP of the new OWFs has communicated mitigating measures for 80% of the production loss that Elia has forecasted per park, as they believe the storm to be less severe than what Elia forecasts. It is the sum of the remaining 20% that makes that the non-mitigated risk remains larger than the available reserves. Who will Elia “punish” with curtailments?
 - Example 2: The “culpable” BRP has already reached its cap. There is 1 BRP of a new offshore wind farm that has not provided Elia with sufficient information on mitigating measures. However, for that BRP, its cap of 75h has already been reached. Can Elia guarantee that the BRPs who have provided sufficient mitigation measures will not be preventively curtailed? Even though this means Elia will need to remunerate the BRP “responsible” for the issue, whereas curtailing all the other BRPs would not cost Elia anything?
 - Example 3: The non-mitigated risk is entirely due to the existing wind parks (who would not be curtailed) and/or a low availability of reserves due to other market players / market events. Who will Elia preventively curtail?

Elia response

The approach proposed by BOP could lead to a situation where a BRP could decide to voluntarily curtail a park while not strictly necessary from a system point of view, based for instance on the market prices or maintenance needs. As Elia intends to define the cap based on the system needs (considering the available reserves), taking additionally into account the voluntary curtailment would lead to an increase of the cap. It’s to be noted that BRPs still have an incentive to voluntarily curtail their park, as they are exposed to potentially high imbalance prices in case of shutting down of a wind park.

It’s too early to provide precise answers on how the measure would be applied in practice. However, following principles can already be set:

- The measure will be applied proportionally to the new wind parks expected to cause a risk for the system
- A park which is not expected to cause a risk for the system will not be curtailed. This includes parks with technologies allowing them not to cause a risk (HWS, storage behind the meter) as well as parks for which the BRP has taken the necessary measures to compensate the risk and has communicated them to Elia
- The trigger will be applied in a transparent way

11.8. Conclusions

BOP Feedback	Elia response
<p>To summarize, BOP is not opposed to preventive curtailments as such, triggered by a clear system indicator. However, BOP requests that such measure (1) is remunerated, if applied across the board, or (2) capped, but then only applied to BRPs based on their performance.</p>	<p>It's of course the objective to define a clear process for triggering preventive curtailment. As explained before, it's however considered preferable to do this shortly before the commissioning of the wind parks.</p> <p>Elia's objective is to meet the 2nd request:</p> <ul style="list-style-type: none"> • The preventive curtailment is capped. • It's the objective to apply it only when a specific wind park causes a risk to the system which would not be compensated by the BRP. Practical modalities will very much depend on the timing of the decision to preventively curtail.

12. Ramping rate limitation

FEBEG feedback	Elia response
<p>Firstly, we would like to refer to the General Comments above, and we repeat again that FEBEG considers the preventive curtailment of wind parks and imposing ramping rate limitations as an intervention in or constraint to the task of the BRP to balance its position.</p> <p>As regards the ramping rate limitation, we are of the opinion that parks cannot assess the impact on their business plan upfront, for the following reasons:</p> <ul style="list-style-type: none"> • the trigger for ramping rate limitation is an uncertain factor making it difficult for market actors to predict the number of times a ramping rate limitation will be applied; • market actors have no insight in the rules that Elia will apply for the coordination of the cut-in. <p>Concretely, how much energy will be lost by imposing a 15 MW/min restriction per MW per year, we like to see a remuneration for the losses, or at least a cap on this loss of energy. In addition we would like to add that, according to FEBEG, the ramp rate limitation should be expressed in percentage or in MW/min, it is not clear whether this is at BE level, park level, ...overall, its better use metrics which are disconnected to the size of the park</p> <p>FEBEG also would like know why the System Imbalance trigger is set as of 500 MW?</p>	<ul style="list-style-type: none"> • Elia agrees that using the SI as trigger implies an uncertainty on the consequences for the wind parks. This is however the drawback of applying it only when it's strictly needed for the system security. • Elia remains open to explain the rules for cut-in coordination, but trusts that these are clearly defined in the report. • Regarding the remuneration or the cap <ul style="list-style-type: none"> • Elia reminds that the impact has been evaluated (on 2018 historical data) to 0.2 hours equivalent full power per year. • In addition, should there be decided to define a cap and should this cap be exceeded, lost energy would have to be remunerated, with the resulting consequences mentioned before: socializing costs and providing wrong signals to the market. • Metrics: the objective is to have a ramping rate which is proportional to the size of the wind park. The 15MW/min value is the ramping rate for all new wind parks together and it's distributed among the future wind parks proportionally to their installed capacity.

- The reasons to set the trigger as of 500MW is extensively explained in the report.

BOP feedback

BOP remains of the opinion that non-remunerated ramping rate limitations should be removed as a possible mitigation measure as it, based on the same arguments as BOP's opposition against preventive curtailments.

However, BOP wonders how the ramping rate limitation of 15MW/min will be implemented in practice. In the proposal, the value is to be understood as the sum of the power increase of all new wind parks. In this respect, BOP sees several practical difficulties:

- If the ramping rate limitation of 15MW/min is to be shared by 2.2 GW or full 4.4 GW (in case the existing wind parks "opt in"), the time for an OWF to come back online is increased from the current 5-10 minutes to 2h30 or 5h00 respectively. This could be a significant loss of production.
- Since the ramping rate is to be shared amongst offshore wind parks, it is unclear how this will be implemented. Is a pre-set ramping speed defined once upfront, or will the speed be determined dynamically, based on the behaviour of the parks at the moment of the limitation (e.g. if 1 park is not ramping up, can another park double its speed?).

With respect to the proposed design of the mitigation measure, BOP is in favour of Elia's attempt to limit the use of the measure to extraordinary situations, defined by a clear indicator or trigger.

However, as the System Imbalance trigger is a market-wide indicator, to which all connected assets contribute, BOP wonders why the ramping rate limitation is only applied to the offshore wind sector. The proposed measure is not technology-neutral.

To summarize, BOP is not opposed to a ramping rate limitation, triggered by a system-wide indicator. However, BOP requests that it is either remunerated or capped, and that it should be applied in a technology-neutral manner.

Elia response

Elia confirms that the 15MW/min are to be shared only among the (up to) 2.1GW of future wind parks to be installed. Would some of the existing parks decide to opt in for the cut-in phase, the 15MW/min will be increased pro-rata of the installed capacity of those parks. With this method, the **maximum** duration for the parks to go from 0MW to full power will thus be 2h30, in the worst case where the SI is above the trigger for the whole duration of the power increase, which is very unlikely as it would mean that the SI is constantly higher than 500MW during these 2h30.

Elia considers this measure as a pre-set configured once upfront. Elia will not send a real-time signal to the parks to inform them of the power that is remaining every minute. Nevertheless, Elia could agree to leave parks build agreements together allowing one park to take the power of another park that would decide not to cut-in as soon as the total output is correct. Elia will not develop tools to support this initiative.

13. BRP position coverage

FEPEG feedback

We refer to some elements put forward in the General Remarks. Overall, past data cannot be used to extrapolate how BRP's will balance the system in the future. Some of the reasons are an increasing volatile imbalance prices (full integrated merit order implementation), some BRP's of offshore parks left the Belgian market while others have joined or got more experienced, etc.

FEPEG would like to underline that the current proposed design of MARI & iCaros will jeopardize the possibility that BRP's cover their own position:

- Units above a threshold must be offered
- Explicit bidding will neutralize these capacities resulting in a lag of 2 QH where BRP's may not take corrective actions
- Alpha factor (depends on SI & how long SI is) will undoubtedly increase, without any possible way for BRP to react.

Elia response

The uncertainty about the BRPs' capability to balance their position is one of the reasons why we work with scenarios and why we propose to update the study. However, in 2022 we'll base our analyses on data until 2021, so it will remain an assumption for the future.

Regarding the link with currently proposed design in MARI and iCAROS, Elia refers to ongoing discussions on those projects.
