

CONSULTATION REPORT

1st public consultation on MOGII System integration study

October 1, 2020



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1. Introduction

Between the 8th of June and the 8th of July 2020, Elia organized a public consultation on its study on the integration of additional offshore capacity¹. The consultation aimed to receive feedback from the stakeholders on the impact assessment and on the mitigation measures described in the report. This feedback is taken into account in the report submitted for a 2nd public consultation, starting on October 1, 2020.

The 2nd consultation will be dedicated to the mitigation measures.

Elia received 4 non-confidential answers to the public consultation from the following parties:

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

In addition, Elia received an answer related to the high voltage infrastructure developments necessary for connecting the additional offshore capacity. As this topic is out of scope of the study, the person was redirected to the concerned Elia experts.

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. The consultation report follows the same structure as the study report, except for the first section, which contains the general comments on the study.

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/20200608_public-consultation-on-the-integration-of-additional-offshore-capacity

2. General remarks

2.1. Project approach

BOP feedback	Elia response
<p>BOP approves of Elia’s pro-active approach in assessing the impact of the new offshore concessions, and strongly agrees that any impact, in terms of operational or technological limitations on the new wind parks, must be fully clarified before the tendering process.</p> <p>BOP however calls for keeping options open in this early development phase and only use the initial results and findings for directional purposes rather than (binding) design objectives, to allow for full optimization of the new developments zones and optimally benefit from future technology advancements. BOP urges Elia to firmly commit to updating the study in 2022 and launching a new public consultation in any case.</p>	<p>Elia commits to update the study in due time considering the planning of the tendering process :</p> <ul style="list-style-type: none"> • The <i>CorWind</i> model from DTU will be validated on the basis of the most recent data available and it will be checked whether significant technological evolutions of wind turbines are expected compared to the assumptions made in the present study. On this basis, updated time series will be simulated if relevant. • The other assumptions made in the study, in particular the ability of BRPs to balance the grid, will be verified and updated if needed, as well as the resulting analyses. Among others, the updated adequacy and flexibility study and the return of experience of 2.3 GW installed capacity of offshore wind, together with the current “storm procedure” and the revised Alpha component of the imbalance price, could lead to updated assumptions. <p>In addition, at least the following information will be confirmed or further developed:</p> <ul style="list-style-type: none"> • The final minimal requirement of HWS technology • The precise requirements for the ramping rate restrictions (communication, reaction time, trigger, etc.) • The cap for non-remunerated preventive curtailment <p>On this basis, Elia will launch a new public consultation.</p> <p>Remarks:</p> <ul style="list-style-type: none"> • Elia notes that some assumptions will still be needed in the update of the study. • When possible, the mitigation measures are already defined in such a way that they would have less or no impact on the wind parks equipped with storage technologies. As an example, preventive curtailment would not be applied to wind parks that plan to use possible production during a heavy storm to produce H₂.

2.2. Cost allocation of contracted reserve capacities

Febeliec feedback

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 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.

Elia response

Elia reminds that the producers are also charged a significant part of the capacity reservation costs.

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.

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.

3. Offshore generation profiles

3.1. CorWind Model validation

BOP feedback	Elia response
<p>BOP suggests to recalibrate the models in the current study with the latest available datasets covering the 2019-2020 winter once the WRF data gets available for this period, and recalibrate the models in the update study in 2022 with data at least until the end of 2021 covering the fully installed 2.3GW offshore wind zone..</p>	<p>Regarding the available data by the time we will update the calibration, Elia acknowledges that it would be preferable to include also the 2021 data. As the availability of this data does not only depend on Elia, nor on DTU, Elia will do its utmost best effort to include the 2021 data, but cannot yet commit that this will be the case.</p>

3.2. Assumptions used in the DTU study

3.2.1. Installed capacity per development zone

BOP feedback	Elia response
<p>An installed capacity is assumed per development zone: Noordhinder Noord (700MW), Noordhinder Zuid (550MW), Fairybank (850MW):</p> <ul style="list-style-type: none"> • What is the basis for these assumed installed capacity per zone? • What explains the difference in power density? 	<p>The precise capacity per development zone is not yet defined and is not an Elia decision. This assumption was determined for the purposes of this study in the event 3 platforms of 700MW would be built, in which case Noordhinder Noord would be connected to 1 out of the 3 platforms, which could be located in an optimal position for this development zone. The remaining 1400MW capacity is distributed between Noordhinder Zuid and Fairybank.</p> <p>The assumption indeed leads to a quite high density for Noordhinder Noord. This can have an impact on the capacity factor of this specific zone, but the objective of the study is to evaluate the power variations, which will not be very much impacted.</p>

3.2.2. Turbine's availability

BOP feedback	Elia response
<p>The simulations assume 100% of availability of the turbines. It is mentioned that an availability factor could not be applied as a static factor in the modelling, because it would change other statistics. (cf. 2.4.2). However, accounting for an availability factor influences the results, as it will lower the ramps in the events in absolute terms.</p>	<p>There is no reduction considered for unavailability of wind turbines in the analyses on flexibility needs, reserve capacity needs and impact on real-time system operation. The reasons are the following:</p> <ul style="list-style-type: none"> • Full installed capacity ramps are seen in data during a few hours; • The availability factor in the future is unknown, also but not only for the additional installations;

<p>BOP requests Elia to confirm whether an availability factor was introduced or not, when using the DTU time series in the determination of the flexibility needs, the reserve capacity needs and the impact on real-time system operation.</p> <p>In case an availability factor has not been introduced by Elia, can the impact on the needs be approximated by (1-availability factor) and thus all needs be lower by f.i. ~5% when assuming an availability factor of 95%?</p>	<ul style="list-style-type: none"> • Overplanting is not to be excluded for the additional installations. <p>Therefore, it would not be appropriate to include an availability factor for the purposes of this study, nor to post-process the results which would artificially decrease the evaluation of extreme events.</p> <p>Another element justifying this choice is the slight underestimation of the 0.1 and 99.9 percentiles in the model validation. This means that the likelihoods of extreme events may be underestimated in CorWind. The simulated data have not been adjusted, because the reason for these differences cannot be clearly identified.</p>
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3.3. Results of DTU’s study

3.3.1. Results for 1 hour ramping events expressed in GW

<p>BOP feedback</p> <p>It is explained that storm events are excluded from the data for the results presented in section 2.5.3 (cf. first sentence on page 28). How can the cut-in phase of storm events then be the explanation for the tendency of the ramp PDF to be skewed slightly to the right (cf. last sentence of the same paragraph)?</p>	<p>Elia response</p> <p>This is corrected in the report, as indeed the section 2.5.3 excludes the storm events. The reason why the PDF is still slightly skewed to the right after filtering out the storm events has been analyzed more in detail with DTU. There appears to be no clear reason why slightly more large up-ramps are observed compared to down-ramps (on non-storm days), but also no reason to doubt it. However, the difference is not very big.</p>
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3.3.2. Statistical analysis on system imbalance

<p>BOP feedback</p> <p>DTU performed its analysis on the data from January 2018 to October 2019 where the installed offshore wind power capacity is increasing from 877MW to 1535MW. (cf. Page 179 – 11.1.2 BRPs).</p> <p>Cf. Page 38: “The analysis was aimed to better understand how the BRP’s reactions will evolve with extended offshore wind power capacity.”</p> <p>What are the lessons learned from the DTU analysis?</p>	<p>Elia response</p> <p>The results have been presented in the stakeholder workshop on the 9th of March and are detailed in DTU's report annexed to the Elia report.</p>
<p>BOP feedback</p> <p>Cf. Page 38: “Given the other evolutions that have taken place in parallel with the increase of offshore capacity until end of 2019, there were however no very clear correlations identified.”</p>	<p>Elia response</p> <p>Elia acknowledges that this should be better described in the report. The sentence does not specifically refer to the evolutions in the balancing markets, but more generally to any evolution or specific situation in the</p>

What other evolutions in parallel with the increasing capacity is Elia referring to before the end of 2019? The new tariffs, with introduction of the revised Alpha component, was introduced as from 1/1/2020 and the new storm procedure went live in January 2020.

system that has an impact on system imbalance. More fundamentally, Elia does not believe that the trends observed for an evolution from ~800MW to ~1500MW can be used as reference to extrapolate too much higher capacities.

<p>BOP feedback</p> <p>“Therefore, the scenarios on the BRP’s reactions were identified based on other analyses described in Sections 4 and 5.”</p> <p>Please clarify this conclusion to exclude the DTU analysis.</p>	<p>Elia response</p> <p>The analysis from DTU was useful to build knowledge on BRP’s reactions, but during the discussions and reflexions, Elia came to the conclusion that the analyses presented in chapters 3 and 5 would provide a more sound approach to define the assumptions. The results from DTU are published mainly for transparency reasons. It’s to be noted that DTU’s analysis doesn’t result in scenarios for the future configuration, as they do not take into account future evolutions as well as the effect of the alpha factor.</p>
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<p>Febeliec feedback</p> <p>Febeliec also read in the document that “a main conclusion is that, at least until the end of 2019, significant differences between BRPs were observed” with respect to individual BRPs imbalances and their forecast errors. Febeliec regrets that no transparency is given on which BRPs did perform correctly (or rather, which did not perform adequately)</p>	<p>Elia response</p> <p>Elia considers that it's not in its attributions to publish information related to performance of individual market parties.</p>
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3.3.3. Predictability of storm events

<p>BOP feedback</p> <p>The figures in the DTU study further quantify the BOP position that storm events are difficult to predict, in particular the start and end of storms, and related forecast errors should therefore be included in the dimensioning of the reserves (both in terms of volume, and technical capabilities of reserves with respect to reaction and activation speed).</p>	<p>Elia response</p> <p>Elia refers to the answer given in §5.1 of the present consultation report and to previous discussions in the framework of the current storm procedure. In particular, while forecasts indeed show errors on the start and end, as well as on the precise impact of the storm, the occurrence is usually well predicted.</p>
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4. Impact on flexibility needs

4.1. Considering storm events in flexibility needs

BOP feedback	Elia response
<p>§3.2 page 43: “Considering the offshore wind technologies, the impact of cut-out technologies are not investigated as the storms are excluded from the data”</p> <p>As mentioned before, BOP is of the opinion to include storm events in the data for determination of the flexibility needs as well as the reserve dimensioning.</p>	<p>Elia refers to its answer in §5.1 of the present consultation report.</p>

4.2. Installed capacity for wind and solar power towards 2030

BOP feedback	Elia response
<p>§3.2.1 Table 9: installed capacity for wind and solar power towards 2030</p> <ol style="list-style-type: none"> 1. The central scenario mentions 3GW offshore wind capacity in 2026: Does this mean this capacity is available as of 1st of January 2026? And 4.4GW as of 1st of January 2028? 2. The central scenario mentions 3.6GW offshore wind capacity in 2027: How is this figure related to the new projects which are required before the new connection capacity (Ventilus, Boucle du Hainaut) will be available and the phasing of the MOG2 project? 3. The HIGH RES scenario: The only difference with the central scenario for offshore wind is 700MW additional capacity as of 2025 instead of 2026; This is not an ambitious HIGH RES scenario: 3GW as of 2024 and 4.4GW as of 2026 at the latest would be a better and realistic assumption. 	<ol style="list-style-type: none"> 1. The methodology indeed supports one fixed installed capacity per year (as well in the needs as in the means). Elia assumes the maximum capacity to be installed in 2026 as valid for the whole year (even if this capacity will only be realized at the end of the year) 2. The installed capacities for offshore of the adequacy and flexibility study are updated for 2026 and 2028. As 2027 is not explicitly simulated and by lack of specific information, it was set equal to the original values of the HIGH RES scenario. Note that some rounding issues have been corrected for the non-simulated years in the table with the installed capacities. 3. The projections for 2026 and 2028 used for offshore already align with the HIGH RES scenario used in the adequacy and flexibility study. These scenarios are considered still relevant. Elia reminds that the permitting and construction process of the infrastructure projects need to be considered in the planning.

4.3. Methodology used for evaluating the impact on flexibility needs

Febeliec feedback	Elia response
<p>Elia refers to the methodology of its latest (and only) adequacy and flexibility study for the relevant scenarios. Febeliec does not want to list all its numerous comments on the methodology of this study (and several other adequacy studies by Elia), which was not formally consulted upon towards stakeholders, but strongly wants to refer to all those comments and voice its concerns and reserves towards the methodology. Febeliec as such cannot approve the methodological approach taken by Elia for the study underlying the current consultation, but will nevertheless present its comments under the premise of the applied (but not approved) methodology.</p>	<p>Elia wants to react that the methodology to assess flexibility is a new methodology as from the latest adequacy and flexibility study. The methodology was discussed in a workshop with the stakeholders, and Elia invited stakeholders to provide feedback on the methodology in one of the latest stakeholder workshops.</p>
Febeliec feedback	Elia response
<p>As mentioned above, Febeliec will not go in detail into the model and calculations of DTU. Nevertheless, Febeliec notices that DTU is able to provide meteorological data for the period 1982-2018 (yet not 2019), while Elia in its most recent adequacy studies does not seem to be able to propose more recent data than 2016.</p>	<p>In the latest adequacy and flexibility study, the flexibility needs assessments were conducted with historic time series data of for observed wind power generation and predictions for 2017 and 2018. This is now updated to 2018 and 2019 in the framework of this study. However, in the adequacy assessment, climatic variability is modelled using historical climate data of 34 historical winters. The concerned winters are those between 1982 and 2016. Data related to hydro inflows, irradiation, wind speed and temperature among others are consolidated in the ENTSO-E Pan-European Climate Data set (PECD). This study will be based on the latest published methodology and data from the MAF (Mid-term Adequacy Forecast) study.</p> <p>The Pan-European Climate Database (PECD) is a database developed by ENTSO-E which consists of re-analyzed hourly weather data which are used to compute load factors for variable generation. PECD datasets are prepared by external experts using industry best practices, thus ensuring a representative estimation of demand, variable generation and other climate-dependent variables. DTU is indeed one of the provider, nevertheless ENTSO-E releases the package only when everything has been collected and it is true that the last published data ends in 2016.</p>

5. Impact on reserve needs

5.1. Considering storm events in reserve needs

BOP feedback	Elia response
<p>In the day-ahead time frame prediction of storm events is inaccurate as once again proven in the DTU study. Therefore these events should not be eliminated from the data used to determine the reserve capacity.</p>	<p>This response treats also BOP’s feedback in §4.1.</p> <p>In the adequacy and flexibility study, these periods were not excluded from the analysis.</p> <p>The probabilistic methodology used for reserve capacity dimensioning is based on historic LFC block imbalances of which only periods with missing data and forced outage of conventional units or Nemo link are excluded. This means that LFC block imbalances during storms are taken into account in the reserve dimensioning. In contrast to the probabilistic approach, storm events are not taken into account as dimensioning incident or forced outage due to their inherently different nature (as elaborated in former consultations on the LFC Block operational agreement).</p> <p>This being said, it is correct that DTU did not include the storm events in the data used for the evaluation of the impact on the reserve needs. The reason is that the High Wind Speed Technologies are not taken into account in the filter for upscaling the 2018-2019 data. This means that we would get conservative results, as some of the existing parks don’t have HWS technologies installed. Note that however:</p> <ul style="list-style-type: none"> • The impact on the flexibility needs are expected to be very limited. Storm events are indeed not frequent, hence the 99.9% occurrence will be impacted to a limited extend. • The flexibility needs during extreme events such as storms are separately investigated in Chapter 5. • The impact on the reserve needs are expected to be negligible due to a 99.0% reliability level in the FRR reserves dimensioning methodology.

5.2. Assumptions

5.2.1. Available flexibility means

Febeliec feedback	Elia response
<p>FEBELIEC also sees that Elia in the document is often (very) conservative towards a.o. remaining cross-border capacity, reserve sharing across borders (e.g. iGCC, MARI, PICASSO), the intraday timeframe contribution towards balancing portfolios, etcetera. While Febeliec does not want to object fundamentally against caution, as it is clear that Elia needs to ensure residual balance, it strongly wants to avoid that Elia is too conservative in its approach, by pancaking all possible effects, without looking at the probability of occurrence, thus risking to over-dimension the needs for balancing reserves. Elia in other consultations (e.g. aFRR needs methodology) already confirmed that some of its earlier conclusions were over-cautious, leading to an overestimation of the needs for balancing reserves. As these come at a cost for consumers, Febeliec urges Elia to very attentive to avoid such over-dimensioning and not take a margin on top of a margin on top of a margin.</p>	<p>There is a difference between making long-term projections and dimensioning the required reserve capacity and the balancing capacity to be procured. Elia does it utmost effort to avoid over-dimensioning by implementing close-to-real-time calculations to minimize the uncertainty impacting reserve needs, as well as counting on probabilistic availability of non-contracted energy bids and reserve sharing. Elia therefore wants to refer to the proposals made to increase the contribution of mFRR sharing in the calculation of the balancing capacity, and its study towards a new or improved methodology for aFRR dimensioning, as presented in the WG BAL of 24/09/20.</p> <p>However, to make long-term projections, Elia has to make certain assumptions. Note that the assumptions on the parameters for the flexibility study have been consulted upon. Note also that new insights allow Elia to re-assess certain assumptions. Analyses made on the availability of remaining cross-border capacity during high wind periods indicate that the Balancing Platforms MARI and PICASSO might deliver higher flexibility means during storms and high ramps. However, the availability of this flexibility for our needs remains uncertain and is never guaranteed, as it also depends on the availability of foreign non-contracted balancing capacity on these platforms and its use by the other participating TSOs.</p>

5.2.2. Ability of BRPs to balance their portfolio

In this chapter, all feedback received on the assumptions related to ability of BRPs to balance their portfolio are gathered. This includes the assumptions made for defining the impact of additional offshore capacity on reserve needs as well as the on real-time system operations.

Febeliec feedback	Elia response
<p>Febeliec is 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. Moreover, Febeliec is even more surprised that Elia considers a “worst case scenario” where BRPs cover only 35% or one third of</p>	<p>Elia points out that the aim of the long-term projections is to make an impact assessment of a 2nd wave offshore wind power. These scenarios do not necessarily reflect the hope or wishes of ELIA and FEBELIEC, but do represent cases which can occur in practice.</p>

<p>their obligation, but also a “best case scenario” where they only 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. Febeliec finds this approach unacceptable. [...] When this leads to the conclusion that still additional balancing reserves need to be contracted [...]</p>	<p>The reference case is built on what we actually observe ‘as is’ and is complemented with a better and worst performance. If market parties can provide additional insights to fine-tune these scenarios, Elia warmly welcomes this information and will assess if it will have to update its scenarios in future studies.</p> <p>The results show the sensitivity of this parameters towards reserve needs. This confirms the importance of future BRP balancing and justifies mitigation measures for improving portfolio balancing. Note that in a perfect world, BRPs would not face imbalances and the reserve capacity will be determined by the dimensioning incident. This calculation can be made on request of the stakeholders but question is what the added value is of such perfect world analyses.</p> <p>Elia also disagrees that additional balancing reserve needs are necessarily to be contracted. It calculates the reserve needs but final capacity to be contracted is also determined by the availability of sharing capacity and non-contracted balancing energy bids.</p>
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Febeliec feedback	Elia response
<p>Febeliec notes that the historical behaviour is used as a basis for defining scenarios, yet wonders how all the (recent) efforts are taken into account in the upscaling, such as for example the impact of the alpha component, the storm risk solution or the new procurement of balancing energy. The document also states that “the BRP reaction during the Ciara storm in February 2020 showed a very significant improvement with a minimum coverage of 80% of the power drop” and wonders how this has been included in the study. Moreover, and as already mentioned before, Febeliec cannot agree with the statement “so even if the value of 50% could appear to be conservative”, as for Febeliec this is definitely conservative from the system perspective and in the other way as intended in the document which starts from the BRP perspective (who in February 2020 seemed to be able to cover 80% or thus even above the best case scenario of 65% considered in the study), leading to unnecessary and undue yet costly capacity reservations.</p>	<p>Elia refers to previous response and reminds that the Ciara storm was well predicted and occurred on a Sunday, which is not necessarily representative of the conditions of the grid during other moments in the week (the position tends to be naturally long on Sundays). Elia however considered a coverage of 80% as most optimistic scenario for storm events, which actually leads to a capability of BRPs to balance their portfolio in a configuration with 4GW offshore or more which is higher than the average performance currently observed. This is done to take into account further evolution of the market, as the revised alpha and the storm procedure were both live when the Ciara storm occurred. Finally, a distinction must be made between the analysis of BRPs’ reaction for extreme events and the one in normal conditions.</p> <p>Note that in normal conditions, the central scenario (50% BRP balancing ability) already assumes that BRPs are able to compensate additional variable RES in the system to maintain a stable balancing power. This may include the help of increasing flexibility in their portfolio</p>

and adequate market mechanisms. Furthermore, the 65% coverage is considered as the best case scenario where future evolutions are assumed to have a larger impact on the ability of BRPs to balance the system.

Febeg feedback

Elia investigates the best case in which the BRP ability to balance offshore prediction errors amounts up to 65%, whereas the 90% percentile reveals that the BRP can cover 74% DAH forecast errors. How is the value of 65% calculated by Elia?

Elia response

Note that this remark seems to be based on a misinterpretation of the figures given in the report. Historically, it is found that when analysing the 1% largest day-ahead forecast errors, in 90% of the time, the BRPs with offshore wind in their portfolio were able to cover more than 26% (i.e. less than 74% translates in a BRP portfolio imbalance) of the total forecast error. However, when analysing the LFC block imbalances, it is found that all BRPs together (also those without offshore in their portfolio) can cover more than 51% of this forecast error in 90% of the time. Although these historic observation are not necessarily a prediction for the future, it is reasonably expected that the system will maintain the same performance, even with increasing renewable capacity, and this figure is taken as reference case. The 65% BRP balancing ability in best case is a qualitative estimation where the performance will be further improved taking into account the listed system evolutions.

Febeg feedback

Scenarios on the ability of BRP's to balance their portfolios in the future should not be based on data of the historical behavior (2018 & 2019) of the BRP's. In fact, these data don't take into account the impact of the measures put in place (alpha component, storm tool...) while the extension of the offshore wind power capacity as such – and the related potential impact on the position of BRP's - will also have an impact on the behavior of BRPs.

Elia response

Elia agrees that future scenarios should not be based on historic observation only, but these are valuable as a starting point on which future expected evolutions can be imposed. As there are at the same time trends which challenge balancing the system (increasing variable renewables), there are other evolutions (market mechanisms and new flexibility providers) which help maintaining the future balance. In the reference scenario, it is assumed that these two trends cancel each other out and that the BRPs are able to maintain the same balancing quality as today (and this with increasing flexibility needs). To provide insight in how the reserve needs would be impacted if the market would perform better, i.e. increasing this capacity to 65%, a 'best case' scenario is developed.

Elia is very interested in having the market's views on how BRPs will be able to balance their portfolio in the future configuration which may provide insight if the

market will more likely evolve towards a worst, central or best case scenario. Any relevant input can be considered in the update of the study before the tendering process.

Febeg feedback

It can be observed that the forecast error decreases with the extension of the offshore capacity. This is explained by the increase of geographical distribution (on aggregate, it is easier to forecast a larger than a smaller region). Why is this conclusion not taken into account in the assessment of future behavior of BRPs?

Elia response

For its assessment of the flexibility and reserve capacity needs, Elia has based itself on the estimated forecast data and real-time observations provided by DTU. The simulation of these time series have taken into account the 'smoothing effects' of expanding offshore wind over larger geographical areas, as described in §2.3.3 of the report (and explained more in detail in DTU's report). The forecast errors that remain are therefore to be covered with flexibility in the BRP's portfolio, or in the system.

BOP feedback

BOP requests Elia to compare the modelled BRP response (figure 38) of best and worst case BRP reaction to the historical behaviour of specific events (e.g. figure 36 and 37) to get a better understanding of the model assumptions.

Elia response

Figures 36 and 37 are examples used to illustrate the different “coverage levels” observed during storm events. A list of similar figures for relevant events is provided in Annex B of the report. Based on these events, the historical market performance has been evaluated. In a 2nd stage, this historical market performance has been adapted to take into account the factors that are expected to influence future market performance: increasing variable renewables, improved market mechanisms and new flexibility providers.

Important remark: when evaluating the impact on the reserve needs, the focus lies on the average market performance. In contrast, when looking at extreme events, the differences in market performance (in function e.g. of forecasts, moment of occurrence, etc.) is also relevant when defining mitigation measures.

6. Impact on real-time system operations

6.1. Assumptions on BRP coverage

All feedback related to this topic is treated in §5.2.2 of the present consultation report.

6.2. Validation criteria

Febeliec feedback	Elia response
<p>With respect to section 5.3.2.1 and the SOGL-derived obligations, Febeliec is very negatively surprised to see that Elia considers itself to have to cover 25% of the deviation of the Continental Europe Synchronous Area, which seems very high also in light of the size of the Belgian LFC block, resulting in a very large need for balancing reserves (the Belgian LFC block does not entail 25% of the Continental Europe Synchronous Area, but rather under 3% as can be derived from the FCR obligation). Febeliec wonders why Elia does want to take up such high share, as this results in higher costs for consumers in Belgium, and would want to see a full analysis on this calibration.</p>	<p>It must be understood that, in the context of this study, the value of 25% is used to derive imbalance threshold that are not deemed acceptable for the security of the system. If this value was to be decreased, the validation criteria would be lower, leading to more violations and hence a higher need for mitigation measures as defined in Section 6 of the report.</p> <p>For the sake of clarity, the 25% threshold is not used in the balancing reserves dimensioning methodology. It is only used in the analysis of the impact of extreme events and is based on SOGL article 152 of SOGL.</p> <p>It's to be noted that the mitigation measures primarily intend to mitigate the risk of violation of the validation criteria identified in section 5 of the report (impact on real-time system operation), even if most of them are also expected to have a positive impact on the absolute average value of the system imbalance, mitigating the increase of reserve capacity needs as analysed in Section 4.</p>
<p>BOP feedback</p> <p>Although 25% seems high compared to the 3% contribution of Belgium to the common pool, it is a rather low number as it implies that the system can handle four extreme events occurring simultaneously. What would be the likelihood of that?</p>	<p>Elia response</p> <p>The limit is fixed as red flag zone of possible contribution to a critical situation from a single control block within the continental synchronous area. The threshold is indeed already quite large comparing to the respective size of the Belgian control block, but by no mean this could imply that the system can still afford simultaneously another three extreme events.</p> <p>It is important to mention that such violations might coincide with imbalances in other adjacent LFC blocks, notably due to storms or ramping events, or during commonly observed deterministic frequency deviation during hour shifts with large impact on frequency. This could lead to serious threat to the system security of the synchronous area.</p>

7. Mitigation measures

7.1. General comments

7.1.1. Principle of non-retroactivity of the obligation to apply mitigating measures

BOP feedback	Elia response
<p>BOP agrees with Elia and emphasizes that the new mitigation measures should not have any impact on the existing parks.</p>	<p>Elia acknowledges that the principle of non-retroactivity of the obligation to apply mitigating measures is important, but needs to be well understood. The market will indeed continue to evolve for all market parties (including existing offshore wind parks). This is the case for the balancing markets (imbalance price, balancing products), as well as for other markets. However, this study results in technical and operational constraints for the wind parks, with the objective to include them in the tendering process of the new concessions. While the future wind parks will have the possibility to take these constraints into account in their business plan, this would obviously not be the case for the existing wind parks. In addition, some of the measures are impossible or very expensive to apply to already commissioned installations. Concretely, the measures aimed at are the following:</p>
<p>FEPEG feedback</p>	<p>§6.4.1: HWS technologies</p>
<p>Elia should adhere the principle of non-retroactivity of the mitigating measures in order not to endanger the business plan of the existing offshore parks: in this context FEPEG wants to remind that some measures, e.g. increasing the alpha component, will also increase the risk for existing offshore parks</p>	<p>§6.4.2: Preventive curtailment</p>
<p>FEBELIEC feedback</p>	<p>§6.4.3: Ramping restrictions</p>
<p>FEBELIEC would like to react to the statement that these measures should not have an effect on existing offshore wind farms. While it might be unadvisable to modify the terms of the subsidy scheme for the existing offshore wind farms, it is clear that general changes to the balancing market (e.g. alpha factor or European platforms) should also be applicable to those BRPs with offshore wind farms in their portfolio.</p>	

7.1.2. Level playing field

FEPEG feedback	Elia response
<p>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.</p>	<p>Elia agrees that a level playing field should be ensured between BRPs and between technologies, and is of the opinion that it was duly taken into account in the study.</p>
<p>BOP feedback</p>	<p>Elia however acknowledges that the application of ramping rate limitations in case of negative prices or maintenance would not be technologically neutral, as the risk is identical for offshore parks compared to other technologies. Therefore, Elia removed from the updated report the use of ramping limitations in those specific cases. The measure however remains applicable for curtailment before a storm event, as the density of the offshore wind parks significantly increases the risk of simultaneous curtailment.</p>
<p>What mitigation measures for similar risks (not necessarily linked to offshore wind) have been taken by our neighboring countries? What is the chance of an unforeseen outage of a nuclear reactor? What is the chance of a breakdown of an HVDC-link? Such events would cause significant down-ramps instantaneously. Are similar mitigation measures in place for these assets?</p>	

<p>BOP would like to warn against regulation that disadvantages one technology.</p>	<p>Regarding the other measures, it's to be noted that an unexpected outage of generation unit (e.g. nuclear power plant) or a HVDC-interconnector (e.g. Nemo Link) is covered by means of reserve capacity in line with Article 157 of the SOGL, and the LFC Block operational agreement. In contrast, a storm or ramp event is, as demonstrated in previous studies not as instantaneous and unpredictable as the loss of a generation unit or HVDC-interconnector. For this reason, it was decided not to be treated as a dimensioning incident or forced outage in FRR dimensioning. Elia also wants to refer to its previous answers given in the public consultations on the LFC Block operational agreement. However, it does want to stress that forecast errors, also during storms and ramps, do weigh on the reserve dimensioning if large LFC block imbalances occur during these moments.</p> <p>Elia recalls that a benchmark is planned with other TSOs. However, the existing Belgian offshore production zone has a very high density compared to other TSOs, even when including the new area, in comparison with the size of Elia's LFC block. This leads to a higher variability in the power injected in the grid.</p>
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7.1.3. Risk of over-regulation

BOP feedback	Elia response
<p>BOP sees several evolutions that will inevitably decrease the underlying problem over time:</p> <ul style="list-style-type: none"> • As the electricity market is becoming increasingly more flexible and fast-responding, this will facilitate the integration of additional renewable energy sources; • As forecasting models improve, and BRPs gains experience with the offshore environment, the variability will be better forecasted, so that the market can adequately react. <p>BOP therefore urges Elia not to overregulate and impose long-term strict technical measures on one technology without taking into account</p> <p>(i) the level playing field between technologies,</p>	<p>Elia took care to define the mitigation measures in a way which reduces the financial impact as much as possible for all market players</p> <p>Elia reminds also that the evolution of the electricity markets is taken into account in the scenarios on BRPs reactions and that the assumptions will be verified and adapted if necessary before the tendering process.</p> <p>Finally, most mitigation measures are designed in such a way that they will be applied only when needed (ramping restriction, preventive curtailment,...).</p>

(ii) the inherent trends in the electricity market that would inevitably decrease the problem, and

(iii) the fact that the imposed regulation will influence the tender-prices for the full duration of the concession, i.e. creating a long-term cost impact for a potentially only short-term problem.

BOP would like to warn against regulation that disadvantages one technology, or that imposes technical limitations that in the long-run might not be required.

7.1.4. Elia and BRP’s responsibilities

BOP feedback

BOP questions the mitigating measures proposed in this study, as they seemingly mix up the responsibility of BRPs on the one hand, and the TSO on the other hand. A BRP is responsible for balancing its perimeter on a best-effort basis, and cannot be held responsible for managing system risks. Moreover, BOP would like to point out that simply pushing costs away from Elia, does not make the cost disappear, and might even have the perverse effect of discouraging crucial investments in renewable energy.

Elia response

This concern is not shared by ELIA. Mitigation measures appear to be necessary to guarantee system security. Some of them have an impact on the BRPs, but the proposed mechanisms confirm BRP’s responsibility and only foresees an intervention from ELIA (ex-ante) in exceptional circumstances (system security) and limit the financial impact for the BRPs and the parks as much as reasonably possible.

Finally, as the objective is to include the recommendations in the tenders, Elia would like to receive additional input on how the mitigation measures defined in the report will discourage investments.

7.1.5. Basis for defining mitigation measures

Febeliec feedback

On the mitigation measures implying constraints for wind parks and/or concerned BRPs, Febeliec is of the impression that these are to remain part of the contractual negotiations between those parties, yet it should be very clear that market signals should encourage those parties to come up with agreed solutions to ensure that the BRPs are able to fulfil their legal obligations. As such, it should be clear that the involved actors could agree on the presented mitigation measures or find alternative solutions, yet it would be unacceptable for Febeliec that nothing would be done and the responsibility and cost be pushed to Elia and society.

Elia response

The mitigation measures have been defined in function of the needs for the system, independently of the contractual agreements between parks and BRPs.

In addition, regarding the alternative solutions that involved actors may find, the measures have indeed been designed to be applied only when necessary. For example, a wind park which would decide to install a high-performance HWS technology will only be submitted to preventive curtailment for very extreme storm events.

7.2. Current storm procedure

BOP Feedback	Elia response
<ul style="list-style-type: none"> • BOP encourages improved communication between Elia and the offshore BRPs in order for Elia to better estimate the additional risk for the grid in case of a storm. • BOP does not support the current system of a public notice, based on Elia’s internal weather and wind production forecasting tool. • The incentive for offshore BRPs to minimise their forecasting error, and maximise their ability to deal with such errors, should be entirely provided by the imbalance price. BOP opposes any additional measures, such as the option of Elia to prevent an offshore windfarm from coming back online after a cut-out, as they place an excessive burden on the development of renewable energy and are not conducive to the development of the electricity system of the future. BOP would like to refer to a key task of the TSO pursuant to Art. 8.5 (c) of the Electricity Law, i.e. to limit as much as possible all restrictions related to electricity produced by renewable energy sources. 	<p>Elia refers to previous exchanges on the storm procedure. Elia is of the opinion that the measures proposed are very reasonable in regard to the challenges that an additional offshore capacity represent for the operation of the grid.</p>
FEBEG feedback	Elia response
<p>FEBEG 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 fulfil its balancing obligation which is and should remain an obligation of means.</p>	<p>Elia welcomes FEBEG’s feedback and agrees with these principles. Elia reminds in that regard that it must guarantee system security.</p>

7.3. Alpha

BOP feedback	Elia response
<p>Missing in this chapter, is a comparative study of measures adopted by other EU countries to incentivize BRP’s to remain in balance, also in view of possible integration and harmonization of balancing markets across the EU.</p>	<p>A benchmark is planned to be performed. However, it will be focused on the measures related to high offshore wind integration. It is not foreseen to perform a benchmark with all EU countries on the incentives for BRPs to remain in balance.</p>

BOP feedback

The alpha component is an ‘incentivizing component’ incorporated into the imbalance price to urge BRP’s to remain in balance. BOP is more in favour of market-based formation of real-time energy prices and measures that attract additional (ramping) flexibility to the market, as this will be required in the system of the near-future with 100% of renewable energy.

BOP suggests to perform a benchmarking study of (market-based) instruments as developed in other European countries to find and assess possible alternatives to the alpha component.

Elia response

Elia reminds that the alpha is considered as necessary because the activation costs do not fully reflect the costs of balancing reserves for the system. It’s based on a single price principle, meaning that a BRP whose imbalance is not correlated to the global system imbalance will not have to bear extra costs. Elia further refers to the consultation report of the "tariefdossier".

In addition, Elia reminds that discussions have taken place on European level in the framework of the Methodology for the harmonisation of the main features of imbalance settlement. The alpha factor is compliant with this methodology. However, a full benchmark requires a detailed analysis of other markets to be able to perform a meaningful comparison. Elia would welcome any input from BOP on such analyses.

FEPEG feedback

At several occasions, FEPEG has expressed its concerns and reservations with regard to the introduction of an alpha component in the imbalance price. FEPEG therefore strongly opposes a further reinforcement of the alpha component. A possible increase of the alpha component should only be considered after a thorough cost-benefit-analysis taking into account the following elements:

- The introduction of the alpha component seems to have a negative impact on the imbalance costs of BRP’s. However, as the modification of the alpha component has only recently been introduced, it’s too early to draw conclusions and to only assess the impact of the offshore deviation separately: currently it is difficult for BRP’s to evaluate the wind imbalance impact individually, since data of historical observed and forecasted wind speeds are missing. Therefore, Elia should provide feedback and return of experience of alpha before the second public consultation.
- FEPEG also wants to point out that the risk of large imbalance costs will be covered by the BRP’s and that the additional cost due to the alpha component will be reflected in the prices of the reserves (mFRR capacity bids). An

Elia response

- Elia reminds that there is no decision to increase the alpha factor at this stage. A further fine-tuning of the alpha factor is one of the available options to further stimulate a proper market reaction if it would appear necessary to do so.
Elia agrees to provide a feedback on the return of experience of the alpha factor the latest by the update of the study in 2022. Data available up to now is quite limited and not as relevant as with 2.3GW offshore capacity installed.
- Elia understands FEPEG’s remark on the impact of the alpha factor on mFRR costs. However, the prices seen since the introduction of the new alpha factor do not seem to confirm this. In addition, as dynamic dimensioning of reserves has been introduced, the expected benefits of the alpha factor on the system imbalance should reduce the reserve needs.
- Elia understands FEPEG’s remark on the possible loss of effectivity of the alpha factor at a certain point and recalls that this is taken into account in the design of the alpha factor (S-curve). It must be noted that a modification of the alpha factor would be proposed based on a

increase of the costs of reserves as a result of an additional risk induced by Elia is probably not the result Elia is looking for.

- The alpha component has also its limitations as an incentive as from a certain point – given the fact that flexible resources are limited – the alpha component will no longer be able to trigger the activation of additional flexibility and thus lose its effectivity: it will then only have the character of an additional penalty for the BRP's.

prior analysis which takes into account the state of the market at the moment of the proposal.

In addition, the design of the alpha factor in itself is also designed to may attract new flexibility in the system.

FEBELIEC feedback

Febeliec is pleased to see that Elia states that “as flexibility and the ability to react to (close to) real time prices penetrates more and more towards retail consumers (enabled by the roll out of smart meters and revised commercial offerings), the potential of reactive balancing is expected to increase towards the future” and asks that Elia actively incorporates this in all its work and studies, including its adequacy studies, in order to avoid to unduly create an artificial additional need for flexibility which could result in being very costly to consumers.

Elia response

Elia confirms that it is important to take into account the contributions of new flexibility providers in its studies on adequacy and flexibility. It refers to scenarios described in the adequacy and flexibility study 2019 concerning future installed capacity of demand response, battery storage, combined-heat and power,... and accounts these technologies in terms of adequacy and flexibility.

7.4. Coordination of cut-in phase

BOP feedback

It remains unclear exactly how Elia will implement the cut-in coordination in terms of, for example, timing, and BOP urges Elia to define clear parameters and provide clear guarantees to the offshore parks on how and when this coordination will take place. BOP suggests the following:

- A strong guarantee from Elia that it will do its utmost best to allow OWF to come back online as soon as possible, with a firm deadline of 60minutes after the offshore BRP informed Elia that the park is ready to come back online;
- If the park is not allowed to come back online 60min after the BRP has so requested, Elia shall reimburse the BRP for missed revenue (which, for the avoidance of doubt, includes the BRP's required compensation to the OWF)

Elia response

Elia understands BOP's concerns and has made a proposal in the updated report, submitted for public consultation.

- a non-discrimination rule, whereby Elia will treat all parks equally in order not to excessively burden one park over another;

Establishing a clear and transparent framework around cut-in coordination is paramount and in line with the TSO's obligation to restrict the limitations to renewable energy to the fullest extent possible.

In this respect, attention need to be paid to guarantee that the existing wind parks will not be impacted by the coordination rules for new wind parks

7.5. Incentivize reactions to real-time prices

BOP feedback

Given the fast changing energy landscape, BOP sees an increasingly important role for such incentives and new technologies. Therefore, as these initiatives improve the flexibility of the market, Elia should reassess, every few years, the risk for the system of the offshore integration and remove the mitigating measures as soon as they are no longer in proportion to, or required for the underlying problem, in line with art. 8.5 (b) and (c) of the Electricity Law.

Elia response

Elia understands BOP's concern and agrees with the principle that mitigation measures should only be applied when really needed. Elia considers this concern to be addressed as much as reasonably possible when analysing individually each mitigation measure impacting parks and / or BRPs:

- HWS needs to be installed from the beginning and cannot be reviewed
- Preventive curtailment and ramping restriction will be applied only when needed
- The communication processes defined in chapters 6.2.1 and 6.2.4 are expected to be needed even when the access to flexibility is improved

BOP feedback

Elia is putting in place an ecosystem allowing market parties to develop new services for the end-consumer. FEBEG 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

This is indeed an additional factor that will have to be taken into account in prediction algorithms. Elia is however convinced of the potential benefits of this new market design.

7.6. mFRR activation triggers

<p>BOP feedback</p> <p>For extreme events, direct activation of mFRR means are a suitable option to anticipate for large changes and deserves future investigation. We are looking forward to the first results of the study on System Imbalance Predictions. These results should be included in the problem assessment underlying this study. BOP therefore reiterates its request to update this study in 2022.</p>	<p>Elia response</p> <p>As mentioned in §2.1, Elia commits to update the study in 2022. Provided Elia has sufficient return of experience with system imbalance prediction algorithms in extreme events by that time, it will be taken into account in the updated study.</p>
<p>FEPEG feedback</p> <p>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.</p> <p>In the proposal for new balancing rules, the definition of the 'trigger' for Elia to start activating mFRR has changed.</p> <p>As Elia is aware, FEPEG is concerned that the activation of aFRR could lead to price spikes in the imbalance prices although still cheaper mFRR bids are available. The occurrence of imbalance price spikes in such situations is dependent of the actual decision of Elia to start activating mFRR. Aside the concern on price, FEPEG wonders if the change in criteria, where prevention of aFRR saturation is not any longer a criteria as such, does not have an impact on system security.</p>	<p>ELIA response</p> <p>Elia refers to the consultation report of the balancing rules, where the current activation principle of mFRR are described: "<i>Elia will continue to apply the rules applicable today for the activation of mFRR. The section in the Balancing Rules has only been rewritten to better reflect the ongoing practices....</i>"</p> <p>As for a possible future evolution of the activation principles, this will be evaluated in the (public) study on system imbalance prediction algorithms, which is planned next year.</p>

7.7. Enhanced forecast functionalities

<p>BOP feedback</p> <p>Improving forecasting tools lead to better information and cannot be opposed. However, in our opinion, it is not up to a TSO to send out public alerts that might disturb the market, even if the publication are for indicative purposes only. It is the responsibility of a BRP to respect the balance in its portfolio to the best of their abilities. And therefore the BRPs are to be incentivized to further develop reliable forecasting tools.</p>	<p>Elia response</p> <p>Elia being responsible for the residual balancing of the grid, and in its role as a market facilitator, it provides information to the market in order to allow a better market reaction. In that sense, the aggregated data for all offshore parks is already published on Elia's website. Putting information at disposal of the market does not prevent BRPs to develop reliable forecasting tools. The obligation for BRPs which have offshore wind in their portfolio to have their own forecasting tool is unchanged. This being said, data which is specific to a park or to a BRP can not necessarily be published for all market parties.</p>
<p>NEXT KRAFTWERKE Feedback</p> <p>We appreciëren de voorgestelde maatregelen gerelateerd aan de (bijkomende) voorspellingen inzake storm alerts, ramp rates, etc en de publicatie van deze informatie. Ze stelt alle marktspelers (ook zij dit niet actief zijn offshore) in staat adequaat te reageren op de day-ahead, intraday, en onbalansmarkt. We vragen om volledige transparantie bij deze publicaties: de informatie moet voor alle BRPs op hetzelfde moment beschikbaar gemaakt worden, niet enkel de BRPs die actief zijn op offshore parken. Ook als Elia voorspellingen maakt voor individuele parken, moet deze informatie gelijktijdig met andere marktspelers gedeeld worden.</p>	
<p>BOP feedback</p> <p>Extending the forecasting tools with public ramping alerts or a ramping risk indicator might further trigger undesired/unnecessary market reactions. However, if such tools are to be developed, they could form part of the private communication between offshore BRPs and Elia.</p>	<p>Elia response</p> <p>Publishing the information is increasing transparency and allows all BRPs (not only the concerned offshore BRPs) to be better prepared to react to the system imbalance.</p>
<p>BOP feedback</p> <p>BOP suggests that Elia discusses with the BRPs the possibility to publish the aggregated production forecasts of the offshore BRPs in case of forecasted storms. This would inform the market of an increased risk of imbalances, but based on the actual forecasts of the BRPs.</p>	<p>Elia response</p> <p>ELIA is of the opinion that it's important to have independent publications, but remains open to BRPs suggestions for forecast improvements.</p>
<p>FEBELIEC feedback</p> <p>Febeliec takes note of Elia's proposal of possible upgrades for the forecasts, and asks in any case to include recent data (with recent data not being 2016 data</p>	<p>Elia response</p> <p>The forecast providers are selected based on the performance of their forecasting models applied on the</p>

<p>in 2020), such that new patterns and new technologies will be duly taken into account.</p>	<p>Belgian production means. The current forecast provider uses the data of the last 3 months as reference.</p> <p>Regarding the technologies, Elia clarifies that the power curves of the wind turbines are simulated in the models used, including the behaviour during high wind speeds.</p>
<p>FEPEG feedback</p> <p>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:</p> <ul style="list-style-type: none"> • It's not clear if the real-time wind speed's which will be measured by the wind turbines from 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). 	<p>Elia response</p> <ul style="list-style-type: none"> • The objective of the measure is to upgrade the forecasting tools. Therefore, output of the models will be communicated to market parties, but not necessarily the input data. However, if market parties are willing to share additional information, Elia is open to discuss this. • Discussions with neighbouring wind parks will be initiated, provided that market parties are open to share information.

7.8. High wind speed technologies

<p>BOP feedback</p> <p>Although HWRT technologies have a positive impact on the ramping down events during days with high wind speed, it will not solve potential issues in extreme (ramping) events, as described in §2.6.</p> <p>BOP sees 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. BOP wants to avoid that a requirement for a certain HWRT technology or particular specifications, would drive the turbine-decision of developers, significantly limiting the developer's negotiation power and thus driving up costs.</p> <p>BOP is of the opinion that the use of HWRT is already incentivised through technical grid compliance requirements, but that it is important to leave the decision on the HWRT specifications to the park developers who</p>	<p>Elia response</p> <p>The results of the study has shown that HWS technologies don't solve all the issues, but are contributing significantly to the mitigation of the system's risks. Therefore, we believe it's important to define a minimum requirement in terms of turbine behaviour in high wind conditions.</p> <p>However, the objective is clearly to avoid limiting the market and to define minimum requirements which allow to limit impact on costs (if any) of this mitigation measure. In the updated report submitted for public consultation in October, Elia has defined requirements that appear to be already widely available on the market and currently installed in existing parks around the world. Elia invites stakeholders to provide a well-argued position if the requirements appear to restrict the market.</p> <p>The minimum requirements will be verified again during the updated study before the tendering process.</p>
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will install the most cost-effective option, considering their incentive to optimise their investment. If a HWRT technology is to be made mandatory, BOP urges that the specifications are kept broad and general (and define a minimum capability rather than a target) in order not to influence the choice of turbine manufacturer.

FEPEG feedback

FEPEG wants to warn for the risk of pancaking of costs: it should be checked if not only a very limited number of equipment suppliers will be able to install wind turbines with high wind speed technologies.

7.9. Preventive curtailment of wind parks and ramping rate limitations

FEBELIEC feedback

FEBELIEC would like to get a better understanding of this concept (*note: referring to preventive curtailment*), especially related to the remuneration. It is important to understand which actor would curtail preventively, also to ensure that the related costs are not pushed towards Elia and society, in case the related BRP did not obtain sufficient flexibility in his portfolio. In no way could Febeliec accept that profits are privatised and costs socialised, referring also to the moral hazard discussed above.

Elia response

Preventive curtailment is not remunerated by Elia up to the cap. Remuneration beyond the cap, should it be needed, will be further evaluated during the detailed design.

BOP feedback

Preventive curtailment should be removed as a possible mitigation measure as it

- (i) disproportionally shift the responsibility of the TSO to the BRP and producer
- (ii) does not take into account further technological developments allowing turbines to weather storms increasingly well and
- (iii) goes against the EU and national legal principles underpinning renewable energy development text.

Elia response

- (i) Elia believes the measure is reasonable, considering the relatively low cap on the amount of hours, the fact that the turbines would probably not even have been producing most of the time when they are curtailed and the possibility for the BRPs to avoid curtailment when they can demonstrate they are sufficiently prepared.
- (ii) The specific HWS technology of each wind park will be modelled in the storm tool. Therefore, a park will not be curtailed when it's not needed.
- (iii) The concept of priority of dispatch is not put into question. The issue we address here is the specific situation where offshore wind is causing the risk.

FEPEG feedback

FEPEG 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

Elia response

This concern is not shared by ELIA. The proposed mechanisms confirm BRP's responsibility and only

balance its position. Although the modalities of the preventive curtailment or ramping rate limitation are still missing, FEBEG would like to refer to its initial comments to the first proposal of Elia on curtailment of wind parks

foresees an intervention from ELIA (ex-ante) in exceptional circumstances threatening system security.

While an alternative solution to preventive curtailment of wind parks could be found for an installed capacity of 2.3GW, the analyses of the MOGII system integration study have shown that it's necessary to develop the preventive curtailment mechanism for an extended capacity. Elia has taken great care to limit the financial impact for all market players as much as reasonably possible.

It's to be noted that ramping rate restrictions are applied in compliance with RfG regulation Article 15(6)(e): "the relevant system operator shall specify, in coordination with the relevant TSO, minimum and maximum limits on rates of change of active power output (ramping limits) in both an up and down direction of change of active power output for a power-generating module, taking into consideration the specific characteristics of prime mover technology".

FEBEG feedback

FEBEG is of the opinion that it is the responsibility of the BRP's to manage the cut-off/cut-in of wind parks. The BRP is incentivized to fulfil this obligation as he's exposed to the imbalance price while additional liabilities are foreseen in the regulatory framework.

If, nevertheless, Elia would identify a system risk related to the offshore generation, it should definitely intervene in order to ensure the security and stability of the grid using the tools it has at its disposal. At its own discretion Elia can at all times – proactively or in real-time - redispatch – i.e. activate decremental and incremental bids with perimeter correction to shift injection – to mitigate system risks.

For these reasons, FEBEG is not in favor of preventive actions taken by Elia whether it be a curtailment or ramping rate limitation as they merely aim at shifting risks and costs to the offshore parks and BRP's.

Elia response

Elia agrees that the BRPs are responsible for their imbalance and takes continuously initiatives to incentivize appropriate reactions from BRPs.

However, as stated by Febeg and considering the power variations that will occur with an extended capacity, Elia needs to guarantee operational security of the grid. Using redispatching would shift the costs implied by offshore to the end consumer.

In the case of preventive curtailment, the low cap allows to limit the financial impact for the market parties.

Regarding the ramping rate limitation, Elia will apply it only when the SI is positive (see updated report). Therefore, limiting the ramping rate will either limit the imbalance of the BRP, or "force" it to help the system, in which case it will be remunerated (with the exception of cases where the average imbalance during the imbalance settlement period (1 quarter hour) is opposite to the instantaneous ramping rate restriction).

FEBEG feedback

These measures hence need to be based on clear, transparent and non-discriminatory rules. According to

Elia response

1) Elia agrees that it's crucial to make sure that sufficient flexibility can be found on the markets when the decision of preventive curtailment is taken. On the other hand,

FEBEG the following considerations should be taken into account when elaborating such rules:

- 1) Elia should confirm that preventive actions will only be required only on DAH and not in ID.
- 2) Elia should provide transparent rules that ensure that there's no discrimination between BRPs regarding the frequency of curtailment/ramping rate limitation (e.g. more preventive curtailment for party A compared to party B because of 'bad' position in geographical zone).
- 3) Ramping rate limitations should be remunerated. If not, Elia should also foresee a cap to allow offshore wind parks to take into account the production loss in their business plans.
- 4) It's not acceptable that BRP's would not be compensated for preventive curtailments or ramping limitations resulting from forecast errors made by Elia, even if the cap is low compared to the annual production hours.
- 5) The cap for preventive curtailment should also include the hours during which the wind parks voluntarily decide to reduce production (including a security margin which will take into account on the starting time of curtailment) in order not to jeopardize the incentive for parks to voluntarily decrease production.
- 6) Elia should also clarify how it will compensate any preventive curtailment above the foreseen cap.

forecast and evaluation of available reserves are getting more precise closer to real-time. The exact timing for the decision will have to be determined when establishing the procedure, in function of the state of the market. This is further developed in the updated report.

2) The operational procedures will be defined in detail in a later stage. They will include transparent rules for triggering preventive curtailment / ramping rate restriction. The high-level principles are the following:

- For preventive curtailment, the volume curtailed will depend on the forecasted production loss of each individual wind park (only the new ones, existing parks are not concerned by the measure), taking into account its power curve. Its geographical position could influence the production loss, which is not discriminatory but simply reflecting the actual contribution of the park to the system risk.
- Ramping rate restrictions will be applied in the same way to all new parks in function of the system state.

3) Elia understands the need for the parks to have as much certainty as possible. It's for that reason that a cap on preventive curtailment has been spontaneously proposed. The same approach is not proposed for ramping rate limitation because:

- The use will not only depend on meteorological conditions but also on system state.
- The financial impact of ramping rate limitations are expected to be low or even positive for the BRP.

Elia however commits to regularly evaluate the measures and to adapt them if necessary. This is further described in the updated report.

4) Elia emphasizes the very high complexity that a financial compensation would imply, while the financial impact is expected to be limited, which justifies a pragmatic approach. In addition, the cap is based on the yearly average amount of storms, which incentivizes Elia to accurately predict storms in order not to apply preventive curtailment when it's not strictly needed.

5) The approach proposed by Febeg 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.

6) Remuneration beyond the cap, should it be needed, will be further evaluated during the detailed design.

BOP Feedback

The underlying problem in relation to ramping rates is twofold; firstly certain assets (amongst others offshore wind) can ramp-up their production relatively fast, and secondly, the currently available reserves are not always able to ramp-down at the same rate. Therefore, in BOP's opinion, Elia should explore solutions on both sides of this problem.

In order to ensure that the solution is the most cost-effective one from a societal perspective, it is important that the direct and indirect costs of ramping rate limitations, when applied, are remunerated by Elia. These costs are predominantly production losses for the wind parks, but also balancing costs for the BRP. A cost-reflective remuneration will ensure that Elia only imposes ramping rate limitations when they are required and more cost-effective than procuring more flexible reserves.

BOP agrees with Elia's proposal to only impose ramping rate limitations when required (i.e. on an ad hoc basis), rather than permanently. Provided that ramping rate limitations will be remunerated, BOP wishes to further discuss this proposal with Elia, in order to further analyse the details of such limitations:

- When will they be applied?
- Can we define pre-set triggers?
- Should there be a cap on how often they can be applied?
- To which technologies should they be applied?
- Should they be applied locally, or country-wide?
- Etc.

Elia response

Elia understands BOP's concern. As remunerating ramping restriction would socialize costs caused by a risk specifically created by offshore wind parks, Elia has designed the measure in such a way to limit the financial impact for the BRPs and parks as much as reasonably possible. This is further developed in the updated report.

7.10. Coverage of imbalances by BRPs

7.10.1. Multiple BRPs on one access point

FEBELIEC feedback

On multiple BRPs per access point, Febeliec strongly supports this proposal, as it could provide a solution to not only the discussion at hand but could also allow more dynamics for large industrial consumers, who could also assign multiple BRPs on their access points, thus also creating more opportunity for competition between BRPs, which could only benefit consumers. It would also avoid that one or a few BRPs would be the only option for large asset owners.

Elia response

The analysis on "multiple BRPs on one access point" will be developed in a dedicated study in 2021.

BOP feedback

Multiple BRPs on one access point seems a valid option, especially if the new wind parks will be larger than the existing wind parks. BOP looks forward to Elia's more detailed plan & process in this regard.

NEXT KRAFTWERKE feedback

Ten tweede, vraagt Next Kraftwerke om verheldering van de voorgestelde maatregel met betrekking tot meerdere BRPs op 1 aansluitingspunt. Wat is de setup die Elia hier voor ogen heeft? Komen er verschillende allocatiepunten achter het access point, elk met een eigen meterinfrastructuur? Of wordt het access point en de onbalans volgens een vastgestelde rekenregel pro rata over de deelnemende BRP's op het access point verdeeld (bijvoorbeeld 4 deelnemende BRPs, die elk 25% van het achterliggende park voorspellen en traden, en 25% van de onbalanskosten nemen)?

7.10.2. Ability of BRPs to manage their position

BOP feedback

On the ability of BRPs to manage their position: Demanding higher expectations from BRPs with offshore wind parks might further decrease the number of offshore BRPs in the market, which could undermine the efforts to increase the amount of BRPs with offshore wind in their portfolio by allowing multiple BRPs on one access point.

Elia response

The measure on ability of BRPs to manage their position is limited to BRPs with a high amount of offshore wind in their portfolio. Hence, it is not expected to limit the amount of BRPs on the market.

Elia refers to its previous answers regarding the coverage of imbalances by the BRPs.

FEBELIEC feedback

Febeliec can only completely support this, and refers to its comments on the too conservative nature of the analysis. The BRPs are responsible for 100% of their imbalances, with Elia only covering residual imbalances. Moreover, even though the imbalances for offshore wind might partially be unplanned, this does not mean that they are unpredictable and in any case BRPs should be able to maintain balance in their portfolio.
