ALL NEMO COMMITTEE

European Network of Transmission System Operators for Electricity

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NEMO AND TSO ANSWER TO THE COMMENTS RECEIVED DURING THE PUBLIC CONSULTATION OF THE CO-OPTIMISATION R0 REPORT

28 November 2025

DISCLAIMER

This document is submitted by all Nominated Electricity Market Operators (NEMOs) and Transmission System Operators (TSOs) to ACER for information purposes only accompanying the Co-optimisation R1 Report.

Introduction

This document lists NEMOs' and TSOs' assessment of the comments provided to the R0 Report during 19 May 2025 – 30 June 2025 public consultation.

On 23 September 2024, ACER issued its decision No 11-2024 on amendments to the price coupling algorithm and the continuous trading matching algorithm, including the common sets of requirements (the "Algorithm Methodology"). Subsequently, Article 4.15 of the amended Algorithm Methodology requires NEMOs, in cooperation with TSOs to carry out R&D to enable the implementation of co-optimisation in the SDAC algorithm within defined areas, starting in 2024 and finalising in November 2026.

On 3 April 2024, NEMOs and TSOs submitted a draft of the first of the required reports, referred to as "R0-Report" to ACER, covering concepts of Bidding Products, Bid Design and Pricing.

As required by Article 4.16(a) of the Algorithm Methodology, NEMOs, in cooperation with TSOs, launched a public consultation on the R0 report, including its annexes, as well as ACER's assessment of the draft report.

Balancing capacity is presently procured by TSOs largely on a national basis, to ensure the availability of balancing energy in real time. Co-optimisation implies that balancing capacity is procured together with energy in SDAC and subject to cross-zonal exchange to maximise the sum of economic surplus in both markets. In theory, this is a more efficient way to use scarce resources for energy, balancing capacity and cross-zonal exchange capacity. However, the implementation of co-optimisation involves significant changes that will affect all market participants.

The objective of the public consultation was to collect the stakeholders' views on Co-optimisation, namely bid design, bidding products and pricing. After the public consultation, NEMOs and TSOs assessed the comments received from the stakeholders, prepared an updated version of the report (R1) submitted to ACER in at the end of November 2025.

This document is not legally binding. It only aims at clarifying the assessment of the comments received from stakeholders during the formal public consultation of the R0 Report. This document is not supplementing the R1 Report, nor can it be used as a substitute to them.

MCSC NEMOs and TSOs acknowledge and thank stakeholders for the effort that they have invested in providing feedback for the consultation on the Co-optimisation R0 Report; this feedback is a major contribution to bringing improvements and transparency to the process.

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Responses to public consultation comments

1. Section 3.1.2 of the report identifies several issues with "explicit bidding" and, on this background, clearly concludes in favour of "implicit bidding". Do you have comments on these issues, the conclusion to further develop implicit bidding or on possible advantages of co-optimisation with explicit bidding compared to implicit bidding with a possibility of an explicit 'premium'? For further detailed information, please refer to sections 2.2 - 2.4 of Appendix A: N-Side Report.

No.	Stakeholder	Organisation	Comment/Proposal	NEMOs & TSOs response
1.	Abdolhamid Farzambehboudi	ASB group of companies (independent Analyst)	Yes. The preference for implicit bidding over explicit bidding is understandable, considering the complexity and inefficiency associated with explicit coordination in real-time markets. The report correctly highlights the non-scalability and incompatibility of explicit bidding under current SDAC algorithmic assumptions. However, the practical implementation of implicit bidding is deeply conditional on trust in algorithm transparency, the reliability of price signals, and the ability to capture technical constraints that certain market actors face — particularly strategic storage operators, pumped hydro, or multi-timeframe aggregators. Sections 2.2–2.4 of the report highlight that product design and bid formatting are still in a conceptual phase. Many non-convex costs and intertemporal constraints remain difficult to fully model — and are only simplistically addressed in small-scale use cases. In this context, full reliance on implicit bidding may lead to flattening of operational nuance. Two Key Concerns: 1. Operational Control: Flexibility providers operating across multiple markets (e.g., intraday + balancing) often need to reflect internal optimization — something explicit bidding supports better. In its absence, these participants might be forced to "take it or leave it" on	We intend to tackle the open points highlighted here in the up-coming R&D phases. (a) It should be noted that although the implicit bidding introduces challenges for MPs to "replicate" the algorithmic implementation, all the algorithmic implementations, including market clearing and price definition, will be supported by relevant TCMs updates at the AM/AMM level and at the Products' Methodologies. (b) Existing bidding capabilities and new bidding structures as combined bidding and storage orders are expected to provide the relevant modeling capabilities. (c) Indeed, simplified examples, non-inclusive of non-convexities were provided in the R0 Report as at this phase we needed to conceptually illustrate the concept of implicit bidding with easier examples. We intend to provide more

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			suboptimal terms. 2. Tacit Bilateral Practices Can't Be Modelled: In reality, some market failures (like generator tripping or unplanned deficits) are often resolved through informal bilateral understanding: • "You're short 40MW at 13:00? I can cover that if you help me with my evening ramp." • In Persian idiom: «آیا می‌خواهی مشکل کمبودت را با مشکل من طاق بزنی؟» ("Want to swap your production shortfall with my surplus later?") These practical "deals under pressure" are vital to system stability but can't be captured in the current scope of implicit-only formats. Recommendation: Until the R&D process matures to handle non-convexities and bid-linked product logic effectively, hybrid bidding frameworks should be considered. These would allow critical resources to: • Submit explicit fallback constraints; • Signal conditional availability; • Participate with semi-structured transparency without undermining the centralised logic.	complicated bidding structures and analysis in the R2 Report where the majority of the bidding structures and capabilities will be deployed in the Algorithm.
2.	Thorbjørn Grønbæk	Epsilon Quantitative ApS	No further comments, I fully agree with the optimization to use implicit bidding. The major headache appears to be the capacity price calculation for cross-border FTR, but that is not a market we participate in.	
3.	Maiken Thomsen	Ørsted	Orsted acknowledges some of the concerns raised in the paper regarding explicit bidding. Errors related to DA price forecasts may result in suboptimal outcomes and leading to negative profits for market participants. In this context implicit bidding as represented in the R0 report may provide benefits for markets participants. However, these benefits may only exist theoretically.	We'll take the input into consideration. The assumption of the implicit bidding is correct. We will continue to evaluate how to best provide the MPs to express their constrains with a bid design.

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			There are two important elements we would like to address: First, implicit bidding should only be understood as the absence of explicit accounting of the opportunity cost of related SDAC bids. This means that market participants should still be able to freely choose all remaining aspects of their bidding, e.g. how they participate in the different balancing capacity markets and the remaining cost elements related to their bid. Second, the RO report state that market participants do not need to rely on forecasting the SDAC price in their bidding as this is accounted for through the optimisation. However, given that non-linear relationship in the cost structure between DA markets and balancing markets this assumption is not necessarily correct. Balancing capacity bids will be dependent on the energy price and the likelihood of being activated with the corresponding energy bids. This is to our knowledge not reflected in the co-optimisation model. The expected revenue will be different for each market participant, which implies that it is not possible to model a common cost structure in the algorithm. It is thus crucial that the TSOs and NEMOs evaluate and address the weaknesses of this assumption. Furthermore, given the expected complexity there is a high probability that market participants may still need to rely heavily on price forecasts when making their bids. As a direct consequence, even with implicit bidding, the outcome may still depend on anticipating the most economical dispatch, and any deviation from it would thus rely on the quality of price forecasts for all co-optimised products. We therefore strongly encourage, that NEMOs and TSOs before discarding explicit bidding option, thoroughly evaluate how energy and capacity products are modelled and how the bidding design gives market participants the possibility to reflect their constraints in their bids.	(a) Efforts will be made to design bidding formats to properly reflect cost and other modelling considerations. (b) Implicit bidding does not make irrelevant the price forecasting for SDAC. MPs will still need to forecast SDAC Energy and BC Prices, cf. the new Annex I in the R1 report. We agree with the last statement that energy and BC products/bidding modelling is a paramount importance for the understanding of price formation (and therefore usage in price forecasting). We want to highlight that the balancing capacity and SDAC energy are being optimised during the Euphemia optimisation process. The activation of the Balancing Energy will be done by the relevant TSO on-need basis; not as part of the SDAC optimisation.
4.	Kjerstin Dahl Viggen	Hydro Energy	We agree on the conclusion.	No comment.

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5.	Lucie Horová	CEZ Group	We partly agree, at a theoretical level. On the other hand, not all possible combinations to create a representative bid for a standard energy source are affected in the study or practical examples. Respecting the complex variability of the energy source, the complexity of the bid will be significantly bigger than indicated in the study. As a participant in the wholesale electricity market, we consider studies on the benefits of co-optimization to be significantly overestimated. For now, we do not see any benefits of co-optimization. Therefore, we take co-optimization to be a threat to an efficient and flexible market. At the moment, we offer electricity contracts and balancing reserves. In co-optimization, we essentially offer the entire portfolio, i.e., source options. However, when a source is out, the obligation arising from co-optimization is difficult to transfer elsewhere. At the same time, after co-optimization on a day-ahead basis, the asset operator remains responsible for the position and its commitments until the end of the delivery. There is no central dispatch in the EU as in other relevant markets, so any inspiration from other markets needs to be adapted.	The benefit of the co-optimisation is still to be validated at the later stage of the R&D work. At this point we aim to complete the core assumptions to build a prototype to see how well the co-optimized market behaves.
6.	Dione Hernández Galvis	RWE Supply & Trading GmbH	We acknowledge the challenges associated with explicit bidding as described in the report and fully agree that the ability to bid an explicit premium is essential for capturing the value of the intraday market. However, we do not share the conclusion that cooptimisation with implicit bidding constitutes an optimal market design (see our general comments under Question 20, as well as Questions 25–27).	The pros and cons of co-optimisation will be addressed in the further R&D
7.	Thomas Kallevik	Statkraft Energi AS	Statkraft considers implicit bidding an acceptable solution as long as a premium is included as proposed. However, we do not agree with ENTSO-E/NEMOs that this premium cannot account for opportunity cost. The reason is that the setup proposed in the report does not incorporate the individual market participant's assessment of the	We do not presently intend any limitations on how to set the premium. Separate premia per product and MTU can be freely set by the MPs. Negative premia will be allowed unless testing

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			likelihood of being activated and the expected balancing price. Such assessments will vary between market participants and therefore cannot be standardised in the algorithm. This expectation will also change with the SDAC price, meaning that market participants may have different premiums across the entire range of SDAC price. Another factor motivating differentiated premiums is that taxation is not accounted for in the algorithm. There are differences in tax burdens between capacity and spot markets, and tax systems also vary across countries. The tax rate may also be a function of the SDAC price, which further supports the need for varying premiums across the spot price range. To capture the effects mentioned above, it must also be possible to have a negative premium. Statkraft believes that market participants should be free to determine what to include in the premium and be able to set different premiums for the different products, as well as allow the premium to vary with the whole SDAC price outcomes. Market participants will have economic incentives to set the most accurate premium possible.	reveals unintended consequences. The SDAC optimisation process does not deal with taxation. Tax rate is not part of the algorithmic input.
8.	Klaus Salletmaier	SWM	We support the possibility of an explicit premium.	
9.	Liselotte van Balen	Eneco	First and foremost, Eneco would like to support the conclusion that implicit bidding would probably work better compared to explicit bidding. However, Eneco would like to point out that the issues raised in the report are minor (and probably should not even be classified as issues). Specifically, the two forecast errors, which are 'normal' for market players. They should be able to adapt fast to new situations. Furthermore, these forecast errors could be relatively small compared to other uncertainties when active in energy trading and capacity markets.	See previous comments, especially responses 1, 2 and 3
10.	Krassimir Stantchev	BDEW	We fully agree that there are issues with explicit bidding (cmp. our previous consultation responses). However, we strongly disagree with the conclusion to prefer implicit bidding instead. Actually (cmp. position	We believe the proposed bid structure offers ample opportunities for market

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			paper) our concerns towards combined bids are much stronger. While explicit bidding poses challenges for market participants and the clearing algorithm, at least the bidding format and the corresponding market outcome are comprehensible.	participants to prepare their bids according to their needs. It should also be noted that, although recognizing possible issues of reduced transparency, the choice for implicit over explicit bidding is tied to potential welfare degradation effects from the latter approach. Safeguarding economic surplus is a more important concern than intuitive prices.
11.	Astrid Buhr Broge	Green Power Denmark	We acknowledge some of the concerns raised in the paper regarding explicit bidding. Errors related to DA price forecasts may result in suboptimal outcomes and lead to negative profits for market participants. In this context implicit bidding as represented in the R0 report may provide benefits for markets participants. However, these benefits may only exist theoretically. There are two important elements we would like to address: First, implicit bidding should only be understood as the absence of explicit accounting of the opportunity cost of related SDAC bids. This means that market participants should still be able to freely choose all remaining aspects of their bidding, e.g. how they participate in the different balancing capacity markets and the remaining cost elements related to their bid. Second, the RO report states that market participants do not need to rely on forecasting the SDAC price in their bidding as this is accounted for through optimisation. However, given the non-linear relationship in the cost structure between DA markets and balancing markets this assumption is not necessarily correct. The optimisation choice of either participating in balancing capacity markets or day ahead depends on the expected energy price (DA) versus the price for capacity plus the	We believe the proposed bidding structure, combined with the premium, which can be freely chosen for each product and MTU, should provide significant flexibility to the market participants. We would like to clarify that implicit bidding refers solely to the consideration of opportunity costs, and that the decision to bid into balancing capacity lies with the market participant. If market participants believe certain aspects are not taken sufficiently into account, we welcome specific proposals on improvements. See also response #3

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			likelihood and price of being activated with the corresponding BA energy bids. This is to our knowledge not reflected in the co-optimisation model. The expected revenue will be different for each market participant, which implies that it is not possible to model a common cost structure in the algorithm. It is thus crucial that the TSOs and NEMOs evaluate and address the weaknesses of this assumption. Furthermore, given the expected complexity there is a high probability that market participants may still need to rely heavily on price forecasts when making their bids. As a direct consequence, even with implicit bidding, the outcome may still depend on anticipating the most economical dispatch, and any deviation from it would thus rely on the quality of price forecasts for all co-optimised products. We therefore strongly encourage that NEMOs and TSOs before choosing definitively between explicit and implicit bidding, thoroughly evaluate how energy and capacity products are modeled and how the bidding design gives market participants the possibility to reflect their constraints in their bids, and what impact on price formation and market dynamics are to be expected.	
12.	Magnus Landstad	Lyse Produksjon AS	As long as it is possible to account for all costs related to delivering capacity vs. energy, implicit should work. For implicit to work, it is important that the rules for linked and combined bids are designed such that one can account for this.	
13.	Magnus Thorstensson	Swedenergy	We strongly encourage, that NEMOs and TSOs before choosing definitively between explicit and implicit bidding, thoroughly evaluate how energy and capacity products are modeled and how the bidding design gives market participants the possibility to reflect their constraints in their bids, and what impact on price formation and market dynamics are to be expected.	Examples in R0 and R1 provide information on the evaluation (especially on the benefits and suitability of implicit bidding with premium). NEMOs and TSOs consider that next R&D phase will only focus on implicit bidding. At the same time, efforts will be made to design bid formats that are as flexible as possible

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				and suitable to describe costs as precisely as possible.
14.	Olivier Van den Kerckhove	ENGIE	While the inclusion of opportunity costs from the day-ahead market in balancing capacity bids through implicit bidding is theoretically elegant, its practical implementation remains extremely challenging, if not impossible in the current EU context. Translating physical constraints into actual market bids is far from straightforward, as it demands numerous assumptions and simplifications to align with real bid characteristics. These assumptions often vary by technology, country, and even specific assets. The correct (or even approximative) reflection of physical constraints into bid prices goes far beyond the example cited on page 20, or even the table 2 on page 51 of the N-side Report. Linking these constraints to potential opportunity costs in the day-ahead market through links poses a further complexity on this. In addition to these challenges, accurately reflecting both fixed and variable costs for each product through premia (see next question) adds another layer of complexity. These cost structures are essential for realistic bidding but are difficult to generalize across diverse assets and market conditions. Currently, market participants manage this complexity through successive rounds of optimization. Developing a standardized methodology that accommodates all needs across the EU will be extremely challenging, if not unfeasible. Even if such a methodology were found, the resulting bids would likely be overly complex (while still not fully able to represent the broad range and methodologies that market parties use to represent their assets), potentially hindering the ability to find optimal solutions within acceptable computational timeframes. Some specific challenges observed within internal portfolios include: - Product interdependencies:	We acknowledge these comments and agree that it is not proven that co-optimisation will improve market efficiency. A European-wide optimisation will never be able to optimise individual assets at the same level of detail as the individual market parties as SDAC optimises the entire day-ahead market, not the individual assets The question is then if the loss of efficiency at this level is compensated by the increase of efficiency by better cross-market-party co-ordination. This is extremely difficult to analyze. However, for the time existing regulation requires us to continue towards implementation of co-optimisation.

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			o Ramping limits that depend on the operating set point o Minimum production thresholds o Mutual exclusivity between certain products - Time-based dependencies: o Some assets exhibit varying ramping capabilities depending on their runtime, which affects their FRR (Frequency Restoration Reserve) potential o Opportunity costs: The cost associated with one Market Time Unit (MTU) may depend on the clearing outcome of another MTU, particularly in the case of LER (Limited Energy Resources) In summary, while inclusion of opportunity costs from the day-ahead market through implicit bidding offers conceptual appeal and would be the main way in which co-optimisation could improve market efficiency, its practical implementation is hindered by significant complexity, making a unified EU-wide approach both highly challenging and computationally impractical.	
15.	Ola Hamada	Vattenfall Energy Trading	From a market participant perspective, we would also prefer implicit bidding.	NEMOs and TSOs consider that next R&D phase will only focus on implicit bidding. At the same time, efforts will be made to design bid formats that are as flexible as possible and suitable to describe costs as precisely as possible.
16.	Pierre Peureux	EDF	EDF acknowledges the theoretical benefit of co-optimisation as a mean to be less sensitive to forecast quality of either MPs or TSOs in the definition of energy and reserve values. EDF is also convinced that the allocation of cross-zonal capacity for the exchange of balancing capacity or sharing of reserves defined through a market-based process has a beneficial intrinsic value. EDF believes that, even with implicit bidding, the process of bid construction by market participants will still rely on price forecasts. Indeed, given the foreseen high complexity of bidding and the extremely high number of links needed between the different offers, market	Examples in R0 and R1 provide information on the evaluation (especially on the benefits and suitability of implicit bidding with premium). NEMOs and TSOs consider that next R&D phase will only focus on implicit bidding. At the same time, efforts will be made to design bid formats that are as flexible as possible

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			participants could need to rely on forecasts to identify silent constraints (aka constraints that are not expected to be active given expected market conditions) to select a subset of all possible options to be submitted. For example, an exclusive link between upward and downward activation may not be needed if the market is expected to clear above the marginal cost of the asset. Another case may be if an asset is highly constrained (for example, only one start-up per day), it could be offered via carefully selected blocks to reflect the constraint across market time units. Implicit bidding results would then continue to rely on this anticipation of the most economical dispatch and the close variations to it will rely on the quality of price forecasts for all co-optimized products. The report does not give any detail on the calculation of the opportunity costs for the different bidding designs mentioned. It is thus difficult to give a definitive and informed answer to this question. For example, the report mentions the opportunity cost between energy and aFRR or energy and mFRR products. But it does not mention the opportunity cost between aFRR and mFRR or between aFRR and FCR. As FCR is not included in the considered co-optimisation market, the opportunity costs of providing either FCR or aFRR for small storage units for example will not be taken into account. Furthermore, EDF is concerned that resolving the balancing and energy markets jointly will increase the probability of having volumes from the market that are in fact unfeasible in view of technical constraints and that require re-optimisation of the portfolio after the market has been resolved, and this more often and on a larger scale than what is already the case in the sequential logic. Indeed, in the sequential paradigm, the energy order book is proposed by incorporating an anticipation of the balancing volume retained – or even the volume established by the markets – which improves the representation of technical constraints. In case co-optimisation doesn't allow a close representation of technical constraints, it is likely to lead to the addition of premiums associated	and suitable to describe costs as precisely as possible. We acknowledge these comments and agree that it is not proven (and maybe cannot be proven) that co-optimisation will improve market efficiency. A European-wide optimisation will never be able to optimise individual assets at the same level of detail as the individual market parties as SDAC optimises the entire day-ahead market, not the individual assets. The question is then if the loss of efficiency at this level is compensated by the increase of efficiency by better cross-market-party co-ordination. This is extremely difficult to analyze. However, for the time existing regulation requires us to continue towards implementation of co-optimisation, We acknowledge the fact that for any case of portfolio optimisation the feasibility of results depends on the scheduling tools capacity to properly reflect technical constraints. However, excluding the case of unit-based bidding where all modelling is relevant to each specific asset, portfolio optimisation and feasibility of scheduling, even currently,

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			with this re-optimisation and technical constraints to the proposed price. This could lead to a sub-optimal solution in relation to the technical and economic reality of the portfolio on the one hand, but also in relation to what is achievable today in the logic of sequential markets. In fact, EDF stresses the need to conduct a broad impact study of the benefits of co-optimisation before implementing this solution. Finally, EDF has concerns regarding the possibility to maintain a portfolio-based bidding in the day-ahead market, which has repeatedly proven its efficiency and its value to the European market up to this day. EDF wonders whether some possible designs would force to participate on a per-asset basis. Unit-based bidding makes the bidding process less efficient compared to the portfolio-based bidding that is widespread across Europe. This is especially the case for complex portfolios with multiple technologies, technologies that can act complementary like storage and renewables or technologies that are temporally optimized like pumped hydro storage assets. Portfolio bidding allows for blending specific abilities of these assets to result in more efficient bids. Moreover, before ruling out the explicit bidding option, the representation of energy and capacities offered via products and bidding design must be carefully assessed to ensure that market participants will be able to reflect all their constraints and remain in control of the pricing of their bids.	is a responsibility of the market participants. The scope of R2 for NEMOs and TSOs is to provide the tools for efficient bidding minimizing any intrinsic possibility of infeasibilities. We consider that all R&D efforts for co-optimisation will be directed at providing the appropriate tools for the MPs to participate either under a portfolio-based bidding strategy or with a unit-based bidding strategy depending on the preferred option. To this extent, we aim to make the co-optimisation design compatible with current market options, and we do not intent to narrow these options. We recognize the inherent complexity of portfolio bidding and strive to provide the right tools to enable it.
17.	Coline Gailleul	Energy Traders Europe	Introduction We welcome the additional research provided on co-optimisation. We reiterate the following points, previously stated in our position paper with Eurelectric. 1 (see link below) The potential implications of the implementation of a co-optimisation process include several practical challenges identified by market participants, e.g. algorithmic and bidding complexities or co-optimisation compatibility with flow-based. We emphasise the need to consider the overall welfare impacts of co-optimisation on the functioning of the market.	We emphasize that the proposed premium, which market participants can use to cover their needs and to which there are no requirements, in essence offers the opportunity to specify any costs other than the opportunity costs already taken into account by the algorithm. We also refer to our answer under #14.

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			Key messages • Challenges remaining to be addressed include algorithmic and bidding complexities or the compatibility with the flow-based. • If the theoretical benefits of co-optimisation cannot be realized considering real-world constraints and the benefits are outweighed by negative practical consequences, any further implementation steps should be stopped. • The R&D on co-optimisation should consider a broader perspective, notably overall welfare impacts, assessing the potential benefits under realistic market assumptions and highlighting the costs involved with the collateral impacts on balancing capacity and wholesale markets. • Furthermore, clear boundaries on the design choices available to R&D should be made to preserve existing market structures. For example, having self-dispatch and portfolio bidding in European energy markets rather than central dispatch and unit bidding. • Another trade-off to be aware of is the more co-optimised and sophisticated the market is, the less adaptable that structure is to future changes impacting all the energy sector. Question 8: We fully agree that there are issues with explicit bidding. However, we strongly disagree with the conclusion preferring implicit bidding instead. Our concerns towards combined bids are much stronger. 2 (see link below) Also addressed in Question 16, we highlight that the complexity of the implicit bid will be significantly bigger than indicated in the study. While explicit bidding poses challenges for market participants and the clearing algorithm, at least the bidding format and the corresponding market outcome are comprehensible. 1 https://cms.energytraderseurope.org/storage/uploads/media/energytrader	We do not understand the comment that "at least the bidding format [of explicit bidding] and the corresponding market outcome are comprehensible". The bidding formats are very similar, and the market outcome of explicit bidding could be difficult to grasp. We welcome Energy Traders Europe to further explain their concerns and propose possible solutions during the further R&D. Regarding the remark on transparency of market outcome, also refer to our answer to response #10. Regarding central vs decentral: We consider that all R&D efforts for co-optimisation will be directed at providing the appropriate tools for the MPs to participate either under a portfolio-based bidding strategy or with a unit-based bidding strategy depending on the preferred option. To this extent, we aim to make the co-optimisation design compatible with current market options, and we do not intent to narrow these options. We recognize the inherent complexity of portfolio bidding and strive to provide the right tools to enable it.

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			seurope-eurelectric-cooptimisation-position-paper.pdf 2 https://cms.energytraderseurope.org/storage/uploads/media/energytraderseurope-eurelectric-cooptimisation-position-paper.pdf	NEMOs and TSOs acknowledge the need for further welfare assessment beyond initial estimation from ACER's study. However, this is currently excluded from R2 scope, consistently with AM.
18.	Dr. Bernhard Walter	EnBW Energie Baden-Württemberg AG	We fully agree that there are issues with explicit bidding as outlined in previous consultation responses. To account for the interdependence between (multiple) balancing capacity and energy products, bid structure (inter-product and inter-temporal links) and bid preparation would become much more complex than in today's sequential markets. While explicit bidding poses challenges for market participants and the clearing algorithm, at least the bidding format and the corresponding market outcome are comprehensible. Still, market based cross-zonal capacity allocation allows for sequential optimisation, which in our view is essential to reflect the real value of the respective products. At the same time, we strongly disagree with the conclusion to prefer and further develop implicit bidding instead. In fact, we have even stronger concerns about combined bids, as they lead to unclear price formation and a tendency towards unit-based bidding and central dispatch (more details in following answers).	We acknowledge these comments and agree that it is not proven (and maybe cannot be proven) that co-optimisation will improve market efficiency, A European-wide optimisation will never be able to optimise individual assets at the same level of detail as the individual market parties as SDAC optimises the entire day-ahead market, not the individual assets The question is then if the loss of efficiency at this level is compensated by the increase of efficiency by better cross-market-party co-ordination. This is extremely difficult to analyze. However, for the time existing regulation requires us to continue towards implementation of co-optimisation,
19.	Ulrik Gregers Jørgensen	Fjernvarme Fyn	As a district heating operator with both electricity consumption and heat-bound production, We support the report's conclusion in favor of implicit bidding. This approach shifts complexity to the optimization algorithm, while the premium mechanism allows us to reflect real, non-optimized costs, such as reduced flexibility, alternative heat production costs, and lost intraday opportunities.	

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20.	Max Schneider	Eurelectric	Eurelectric acknowledges some of the concerns associated with explicit bidding but cannot share at this stage the proposal to discard this option and focus only on implicit bidding. Errors related to day-ahead price forecasts may reduce overall welfare and result in suboptimal or even negative profits for market participants. By comparison, implicit bidding as presented in the report may provide greater benefits and offers superior properties. Eurelectric underlines, however, that implicit bidding may also require forecasts, leading at least to moderate this perceived theoretical superiority. One should also note that prices specific to balancing capacity, and notably representing its technical constraints, are necessary to address price signals for long-term investments into flexible assets. In this regard, Eurelectric would like to address two important elements: First, we understand that implicit bidding as defined in the N-Side report only refers to the absence of explicit accounting of the opportunity cost of related SDAC bids. Eurelectric rejects any interpretation of implicit bidding that would lead to unit-based bidding. Market participants should thus remain able to freely choose all remaining aspects of their bidding, including the choice of participation in the different balancing capacity markets and the reflection of the rest of their costs. Second, the R0 report states that market participants do not need to rely on forecasting the SDAC price in their bidding because this is accounted for through the optimisation. However, this assumption is not necessarily correct, since the cost structure between the balancing capacity markets and the day-ahead market is non-linear. Balancing capacity bids will be dependent on the energy price (SDAC), technical capabilities of assets, the energy price for balancing activation (BA), and the likelihood of being activated with the corresponding energy bids (SDAC and BA). As far as we can see, this is not reflected in the co-optimisation model, and the expected revenue will be different for each market participant, which means a common cost structure cannot be modelled in the algorithm. It is important that TSOs and NEMOs evaluate and address the weaknesses of this assumption.	Regarding the complexity of market participants' assets, it is they who have the required knowledge that is needed to determine the bid formats, and we welcome specific suggestions to improve our proposals. We further point that the premium can be freely chosen by the market participants and may vary between bids and MTUs, providing similar freedom as explicit bidding. We also refer to our answers under #14, #16 and #17. NEMOs and TSOs intend to develop bid formats that provide sufficient flexibility. Relevant to price forecasting it should be noted that implicit bidding does not make irrelevant the price forecasting for SDAC. MPs will still need to forecast SDAC Energy and BC Prices, cf. the new Annex I in the R1 report. Calculation of opportunity costs and balancing capacity prices under implicit bidding is already provided with specific examples and bidding structures in R0 and R1 reports. Should further cases needed to be illustrated for calculation of opportunity costs (for highly constrained assets/portfolios with interdependencies

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			Additionally, given the expected complexity of the bidding process, market participants may still need to rely on price forecasts for day-ahead and intraday markets when constructing their bids. As a result, even with implicit bidding, the outcome may still depend on anticipating the most economical dispatch, and any deviation from it would thus rely on the quality of price forecasts for all co-optimised products. Finally, we underline that the implicit approach requires the ability to compute the opportunity costs for highly constrained assets/portfolios with interdependencies between dispatch decisions. Thus, before choosing definitively between explicit and implicit bidding, it is crucial to thoroughly evaluate how energy and capacity products are modeled and how the bidding design allows market participants to reflect their constraints in their bids, and what impact on price formation and market dynamics are to be expected. Specifically, Eurelectric would welcome a clarification as to how implicit bidding can maintain clear and understandable price signals.	between dispatch decisions) MPs are welcomed to illustrate these cases for being considered in the R&D and the R2 report. Referring on need of clear and understandable price signals (i.e. the price formation under co-optimisation) see our answers #1.
21.	Anonymous	Anonymous	Implicit bidding could be more straight forward way to handle markets but how market participants could include at least major parameters from their assets to the bid is unclear - Start-up costs and other non-linear parameters could be difficult to model into the bid with only one premium At certain times powerplant could be offered to balancing market without opportunity cost from DayAhead energy markets. How clearing mechanism would know that in implicit bidding method? In explicit approach forecasting errors result degraded social welfare but the same principle/inefficiency occurs in wider view. For example, “What to be produced tomorrow when forecasted price is there for next week?”.	We believe startup costs are properly handled by both linked bids and combined bids as shown in our examples. We do not understand “without opportunity costs from the DA market”. If the price in the DA market is zero, then the opportunity cost would indeed be zero. Another possibility could be to offer a negative premium. Forecast errors may always exist. But deciding on BC prices based on estimations/forecasts of the energy prices/opportunity costs and having the algorithm decide directly for the BC prices as opportunity costs is really a plus

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			- This challenge is regarding the assets with limited energy storage (e.g. hydro storage or batteries) - The same case is with FCR since the R0 report does not include these to the cooptimization at this point.	for the implicit bidding in terms of price forecast errors for BC. We will come back to limited energy storage as soon as that option is available in SDAC. Although NEMOs and TSOs see the conceptual parallel with FCR, this is currently out of scope.

2. With implicit bidding, opportunity costs of balancing capacity that occur in SDAC will be automatically taken into account in the optimisation and at least recovered by each market participant. However, there may be other costs related to offering balancing capacity that are not captured within the SDAC optimisation. Section 3.1.3 of the report suggests the possibility of a premium for balancing capacity to be able to cover such costs. Do you agree with the need to have a premium for balancing capacity? If no, please explain why you disagree.

No.	Stakeholder	Organisation	Comment/Proposal	NEMOs & TSOs response
22.	Abdolhamid Farzambehboudi	ASB group of companies (independent Analyst)	Yes, a premium is necessary — particularly during the transition to a mature co-optimised design. Section 3.1.3 and the R&D phases outlined in Sections 2.2–2.4 confirm that while opportunity costs are handled by the co-optimised SDAC algorithm, a wide range of "fundamental" costs remain external to this process. These include startup costs, wear and tear, minimum load inefficiencies, and lost revenue in other timeframes — all of which can critically affect participation in balancing markets. Given that: • Current bid formats are still under development,	We support these comments and the concerns about the danger of "double charging". The best measure against this is well-functioning competition, that XZ exchange can contribute to. Also lowering barriers for participation in the balancing capacity market is essential. Because the premium is essential and competition may be weak initially, regulatory control may be required.

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			• Cost structures of new and distributed assets (e.g. batteries, demand response) are not fully understood, and • Explicit modeling of many cost types is deliberately postponed to later R&D phases, a dedicated premium is justified. It serves as a safeguard that enables accurate participation and prevents the exit of key flexibility providers during early implementation stages. Caution: • Clear guidelines must distinguish which cost types can be recovered through this premium (e.g., fundamental vs. endogenous). • Without this, there's a risk that premiums might be used to double-charge for opportunity costs, leading to inefficiencies or even gaming. • In competitive markets, such behavior may self-correct, but design clarity is still essential.	
23.	Thorbjørn Grønbæk	Epsilon Quantitative ApS	I do not a priori agree with a premium for the balancing capacity as due to time concerns and risk management, getting accepted to be a balancing service provider for a delivery day can significantly reduce risk. It seems mostly that power plants / physical energy providers wish get paid this way. As long as the market is competitive, this is fine, but from experience, local constraints tends to take precedence in any case, leading to less competition than anticipated and overall more cost onto the consumer.	These arguments are valid, but we believe the premium is a necessity, which is also supported by most respondents. See also answer on #22.
24.	Maiken Thomsen	Ørsted	Yes, strongly agree. It is important the market participants can reflect costs related to providing balancing capacity. Costs could vary between market participants depending on asset portfolio, bidding setups, technical elements, etc. For this reason, it is important to have the ability to reflect market participants true cost in a co-optimisation setup.	No comment.

No.	Stakeholder	Organisation	Comment/Proposal	NEMOs & TSOs response
25.	Kjerstin Dahl Viggen	Hydro Energy	The participants take a risk with balancing capacity commitment, and can potentially get penalties if obligation not met. Agree that premium is needed to attract capacity volumes.	No comment.
26.	Raphael Spiekermann	illwerke vkw	If "implicit bidding" is persued, we consider an explicit premium to be essential due to the reasons stated in the report.	No comment.
27.	Lucie Horová	CEZ Group	Yes, we agree. The premium can help to allow market participants to reflect all costs other than the opportunity cost.	No comment.
28.	Dione Hernández Galvis	RWE Supply & Trading GmbH	Yes. We would like to point out that in the current market design, balancing capacity and energy bidding are not necessarily carried out by the same counterparty. It must therefore continue to be possible to submit bids separately for energy and the different balancing capacity products. If bids are submitted by different counterparties, coordination is not permitted under competition law, which reduces the theoretical social welfare benefits of co-optimization.	If there is no physical link between energy and balancing capacity bids, there is no reason to give a common bid for these products. It will be fully possible also in the envisaged co-optimisation setup to provide bids for either energy or balancing capacity separately.
29.	Thomas Kallevik	Statkraft Energi AS	Yes, that is important. Another factor not accounted for is that the market participants must price in the risk of an outage. This assessment will be different for each market participant. Please also see our answer in question 8. It should also be an option to opt out of the different markets when bidding.	Premium will be set freely by market participant – including pricing the risk of an outage.
30.	Klaus Salletmaier	SWM	We agree with the need to have a premium.	No comment.
31.	Liselotte van Balen	Eneco	Eneco thinks it is vital for the optimal functioning of the markets to allow negative premium as well. We therefore argue that is necessary to have a bidding framework which enables participants to reflect constraints in their bids.	The proposed bid design will allow for a wide range of constraints, but will never be able to fully cover all possible constraints in the physical world. The premium is one way to represent constraints through a cost addition. Negative premiums will be allowed unless testing reveals unintended consequences.

No.	Stakeholder	Organisation	Comment/Proposal	NEMOs & TSOs response
32.	Krassimir Stantchev	BDEW	We definitely agree with the need for a separate premium for each individual balancing capacity product. Also dedicated bids for energy, aFRR-pos, aFRR-neg, mFRR-pos, mFRR-neg need to be possible, cmp. page 3 ("energy-only or balancing capacity-only").	It will be fully possible to provide dedicated single-product bids.
33.	Astrid Buhr Broge	Green Power Denmark	Yes. The premium shall allow market participants to reflect all costs other than the opportunity cost. This can be for example (without being limited to) additional costs related to the provision of balancing capacity compared to energy (on top of the opportunity cost), or technical costs or loss of intraday opportunity that could not be reflected in the bidding structure. Moreover, depending on the technical characteristics of the plant/asset (e.g. storage capacity) different strategies may be chosen regarding balancing energy price and the likelihood of activation. Nevertheless, if these technical constraints must be reflected in the premium due to a decline in the diversity of the bidding language, this may lead to a sub-optimal solution given the technical and economic reality of the system but also in relation to the solution offered by the current sequential market. We therefore insist on the necessity to develop a bidding framework that enables market participants to reflect their constraints in their bids. Costs vary between market participants depending on asset portfolio, bidding setups, technical elements, etc. For this reason, it is important to have the ability to reflect market participants true cost in a co-optimisation setup.	We fully agree that a bidding framework that allows to represent costs well is a condition for a true welfare maximisation. At the same time, it will not be possible to include every detail of all assets. The co-optimisation is thus a trade-off between on the one hand the benefit of better co-ordination between all assets, and on the other hand some reduction in the "perfect optimisation" of each single asset, which can in principle be better handled by the asset owner. During the continued R&D, we are grateful for specific suggestions from market participants on how to improve the design of linked and combined bids. See also #3 and #20.
34.	Magnus Landstad	Lyse Produksjon AS	It is very important to have a premium.	No comment.
35.	Magnus Thorstensson	Swedenergy	Yes	No comment.

No.	Stakeholder	Organisation	Comment/Proposal	NEMOs & TSOs response
36.	Olivier Van den Kerckhove	ENGIE	Yes, but we disagree with the usage of the term 'premium' as this seems to imply an addition above the normal price, while it actually reflect other (opportunity) cost elements.	We agree they may (but do not need to) be opportunity costs, but these opportunity costs are not treated in the SDAC optimisation, and using this term would be confusing.
37.	Ola Hamada	Vattenfall Energy Trading	Yes, offering balancing capacity often comes at a cost that we expect to be compensated for, with the understanding that this premium comes on top of the price of the energy bid.	
38.	Pierre Peureux	EDF	If the implicit bidding option is proved to be satisfactory, then EDF agrees that including a premium for balancing capacity would be necessary to include all the costs. The addition of a premium would indeed enable market participants to include unaccounted opportunity costs, other specific or fixed costs, as well as try to reflect some specific constraints. However, market participants would determine their premium depending on the specificities of their portfolio and possibly depending on their ability to re-optimise it. As a consequence, the construction of the premium would differ significantly from a market participant to another. This could lower transparency and trust in the price formation and, even if the premium is able to perfectly capture the cost of the technical constraint it reflects, it could still give rise to further market surveillance which would burden market participants. Moreover, the premium will be all the more complex as the implicit bidding option cannot take into account all the costs or constraints induced by the different kind of assets. If the bid design is not rich enough it could lead to a premium which is a kind of an all-in. As a consequence, EDF strongly advocates for developing a bid design allowing market participants to propose as many offers as possible which will lead to a premium with a manageable level of complexity.	It is certainly intended to have a bid design that can represent costs well, but as indicated in #33, this is a trade-off. Specific suggestions on bid formats are welcome during the continued R&D. Relevant to possible transparency considerations in price formation due to different and diverse premiums it should be noted that regulatory oversight is considered a cornerstone of regulated markets.
39.	Coline Gailleul	Energy Traders Europe	We agree with the need for a separate premium for each individual balancing capacity product. Also dedicated bids for energy need to be possible: afrr-pos, afrr-neg,	It will be fully possible to provide dedicated single-product bids.

No.	Stakeholder	Organisation	Comment/Proposal	NEMOs & TSOs response
			mfrr-pos, mfrr-neg, cmp. Page 3 ("energy-only or balancing capacity-only").	
40.	Dr. Bernhard Walter	EnBW Energie Baden-Württemberg AG	We strongly agree with the need to have a separate premium for each individual balancing capacity product. It is important to mention that also dedicated bids for scheduled energy, aFRR-pos, aFRR-neg, mFRR-pos and mFRR-neg need to be possible as also outlined on page 3 of the report ("energy-only or balancing capacity-only").	It will be fully possible to provide dedicated single-product bids.
41.	Ulrik Gregers Jørgensen	Fjernvarme Fyn	We agree that a premium is essential for implicit bidding to be useful in our case. As a district heating company, offering capacity for balancing may reduce our ability to produce heat. The premium must therefore reflect the cost of supplying heat by alternative means.	The premium will be set by the market participant and may vary freely between MTUs and products.
42.	Max Schneider	Eurelectric	Yes, strongly agree. The premium allows market participants to reflect all costs other than the opportunity cost. This can be for example (without being limited to) additional costs related to the provision of balancing capacity compared to energy (on top of the opportunity cost), or technical costs or loss of intraday opportunity that could not be reflected in the bidding structure. Moreover, depending on the technical characteristics of the plant/asset (e.g., storage capacity) different strategies may be chosen regarding balancing energy price and the likelihood of activation. In addition, one should note that an insufficient bidding language would poorly reflect on welfare. Specifically, in case some technical constraints cannot be reflected via bids, they would have to be reflected in the premium. This may lead to a sub-optimal solution given the technical and economic reality of the system but also in relation to the solution offered by the current sequential market. Eurelectric thus insists on the necessity to develop a bidding framework that enables market participants to reflect their constraints in their bids.	We fully agree that a bidding framework that allows to represent costs well is a condition for a true welfare maximisation. At the same time, it will not be possible to include every detail of all assets. The co-optimisation is thus a trade-off between on the one hand the benefit of better co-ordination between all assets, and on the other hand some reduction in the "perfect optimisation" of each single asset, which can in principle be better handled by the asset owner. During the continued R&D, we are grateful for specific suggestions from market participants on how to improve the design of linked and combined bids. See also #3 and #20.
43.	Anonymous	Anonymous	Yes, the possibility to include non-convex costs in implicit bidding is relevant	No comment.

3. The R0 report mentions some specific costs that can be reflected by means of a premium. Which costs would you consider relevant to be reflected by such a premium?

No.	Stakeholder	Organisation	Comment/Proposal	NEMOs & TSOs response
44.	Abdolhamid Farzambehboudi	ASB group of companies (independent Analyst)	A premium for balancing capacity should cover fundamental costs that cannot be internalized in the current SDAC optimization process. Based on the R0 report and Sections 2.2–2.4, these costs include: • Fuel and ramping costs (cost per MW and time) — due to efficiency drops when operating at non-optimal loads. • Maintenance and wear & tear costs (cost per time) — particularly for flexible or aging assets. • Start-up costs (cost per event) — including thermal losses during synchronization and mechanical strain. • Degradation costs — relevant for batteries and demand response aggregators. • Opportunity costs in other markets — e.g., intraday or reserve markets where providers may have otherwise earned more. • Facilitation costs — such as IT, telemetry, compliance, and bid aggregation, which are especially high for new entrants or aggregated DERs. Given the report's own acknowledgement that many of these cost structures are not yet deeply modeled or fully understood (especially for non-traditional assets), this premium should act as a temporary but essential mechanism. It allows resource providers to remain viable while the R&D process continues to improve bid formats and cost capture. Note: Care must be taken to exclude "endogenous" opportunity costs already calculated during SDAC optimization — as rightly warned in Section 3.1.3 — to avoid duplication and inefficiency.	Depending on the final bidding formats, some of these costs could be covered within those formats, e.g. startup costs and decreasing marginal costs.

No.	Stakeholder	Organisation	Comment/Proposal	NEMOs & TSOs response
45.	Thorbjørn Grønbæk	Epsilon Quantitative ApS	I should think that market participants are capable of submitting bids/offers that properly reflect their costs / opportunity cost. Everyone operates under a level of uncertainty in these markets and hence properly accounting for this uncertainty seems like the responsibility of the market participants themselves. My primary concern is tail-risk phenomenae where proper risk management and price modelling may be unfeasible. For these cases, certain premium could be considered as a measure to manage these scenarios.	These suggestions that will be considered in the further R&D.
46.	Kjerstin Dahl Viggen	Hydro Energy	Potential cost of imbalances, and of unfavorable setpoints when commitments. Also, need a premium if market players have to run higher volumes than the obligation to be able to be activated on obligation.	Unfavorable setpoints and "high volumes that the obligation" could be handled through linked bids.
47.	Raphael Spiekermann	illwerke vkw	The costs mentioned in the report are certainly significant, especially the expected lost intraday revenue. We expect additional cost factors, but we cannot specify them at this time.	No comment.
48.	Lucie Horová	CEZ Group	Based on our experience we suggest these costs: intraday market opportunity costs, balancing bids activation probability, generation forecast quality (insecurity), the incurred costs of the non-ability to construct enough sophisticated bids (related to the asset or market position) not even mentioned.	These suggestions that will be considered in the further R&D.
49.	Dione Hernández Galvis	RWE Supply & Trading GmbH	Relevant costs that should be reflected by such a premium include, in particular: - Opportunity cost of lost intraday flexibility (the "intraday value") when capacity is reserved for balancing instead of being available for intraday trading, - Risk-related costs, such as penalties (e.g. non-delivery penalties), forecast uncertainty, and the cost of potential outages,	These suggestions that will be considered in the further R&D.

No.	Stakeholder	Organisation	Comment/Proposal	NEMOs & TSOs response
			- Wear and tear due to volatile operating patterns or suboptimal operating points, especially relevant for thermal assets and pumped storage.	
50.	Thomas Kallevik	Statkraft Energi AS	See the mentioned answer in question 8, but in general such cost would be start-stop costs, premium to reflect expected activation and tax cost.	Startup costs would be handled in the bidding format, either in linked or in combined bids.
51.	Klaus Salletmaier	SWM	We consider the loss of Market-Opportunities and short term extra-costs for operating the assets.	These suggestions that will be considered in the further R&D.
52.	Liselotte van Balen	Eneco	One key example are the degradation costs associated with delivering aFRR with a wind farm.	These suggestions that will be considered in the further R&D.
53.	Krassimir Stantchev	BDEW	Non-exhaustive list of relevant costs that should be reflected by such a premium. • Opportunity cost of lost intraday flexibility (the "intraday value") when capacity is reserved for balancing instead of being available for intraday trading, • Risk-related costs, such as penalties (e.g. non-delivery penalties), forecast uncertain-ty, and the cost of potential outages, • Wear and tear due to volatile operating patterns or suboptimal operating points, especially relevant for thermal assets and batteries.	These suggestions that will be considered in the further R&D.
54.	Astrid Buhr Broge	Green Power Denmark	The premium should not be limited to costs related to electricity but should also include heating, for example costs related to alternative production sources for the heating supply. This is particularly relevant in an energy system with district heating and CHPs.	These suggestions that will be considered in the further R&D. At the same time, SDAC will clearly not be able to address costs related to the heating market, and it will remain up to the market party to provide these. See also the added example in Annex I of R1.
55.	Magnus Landstad	Lyse Produksjon AS	There are costs related to the efficiensy curve at different loads, difference in taxes, difference in risks regarding fees for not delivered capacity, wear and tear as a consequence of running away from most efficient part when delivering aFRR of mFRR Down. Also opportunity costs to the FCR-market and the Intradaymarket.	These suggestions that will be considered in the further R&D.

No.	Stakeholder	Organisation	Comment/Proposal	NEMOs & TSOs response
56.	Magnus Thorstensson	Swedenergy	See answer to Q11.	No comment.
57.	Olivier Van den Kerckhove	ENGIE	Market participants should keep the freedom to integrate any (negative) costs they deem relevant. We would therefore want to highlight that any list of potential costs to be integrated in premiums should not be considered exhaustive. • Activation cost [€] • Fix aFRR up Cost [€] • Variable aFRR up Cost [€/MWaFRRh] • Fix aFRR down Cost [€] • Variable aFRR down Cost [€/MWaFRRh] • Fix mFRR up Cost [€] • Variable mFRR up Cost [€/MWmFRRh] • Fix mFRR down Cost [€] • Variable mFRR down Cost [€/MWmFRRh] In addition opportunity costs and risk premia related to other markets and penalties could also be integrated.	These suggestions that will be considered in the further R&D.
58.	Ola Hamada	Vattenfall Energy Trading	1- cost of reservation of capacity, i.e. expected losses on intraday. 2- cost of water: i.e. opportunity cost of having to run power at a different time.	We believe the "cost of water" would be reflected in the activation bid.
59.	Pierre Peureux	EDF	The report mentions loss of profit in the intraday market, but other costs would need to be accounted for. A non-exhaustive list would be: anticipated profit on the balancing energy markets, lowered efficiency of the power output when providing balancing services or depending on the power output (for example higher efficiency when close to max power output), loss of profit in the upcoming days (due to stability constraints), network charges, etc. Furthermore, EDF is concerned about the scope of a premium logic to represent fundamental costs – and therefore technical constraints. Degrading the diversity of bidding offers and the representativeness of operating constraints through the offers currently available, with the argument that these constraints can be translated into costs in the premium, risks leading to a sub-optimal solution.	We believe the anticipated profit in the BE markets would be covered in those markets, although they might indeed be a source for a negative premium. The efficiency issue would be covered by a set of linked bids. We agree with the last paragraph that it is not possible to catch all relevant constraints into the premium and invite the respondent to provide alternative suggestions. However, there will be a trade-off here, cf. 14.

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60.	Coline Gailleul	Energy Traders Europe	There are highly specific portfolios and market situations to be considered. We include below a non-exhaustive list of cost elements that echo the diversity of portfolios and market situations in practice. A non-exhaustive list of elements not mentioned we identified: Intraday market opportunity costs, balancing bids activation probability and balancing power 2nd step pricing, generation forecast quality (insecurity), and the incurred costs of the non-ability to construct enough sophisticated bids (related to the asset or market position).	These suggestions that will be considered in the further R&D.
61.	Dr. Bernhard Walter	EnBW Energie Baden-Württemberg AG	In our view it is impossible to provide an exhaustive list of costs that need to be considered. Still, it is obvious that aspects such as opportunity costs for the loss of intraday flexibility, risk-related costs, additional costs due to suboptimal operating, etc need to be considered.	These suggestions that will be considered in the further R&D. We agree that an exhaustive list is indeed not possible to provide, but there should be enough flexibility in the bid formats to describe a broad range of cost components.
62.	Ulrik Gregers Jørgensen	Fjernvarme Fyn	Besides the specific cost mentioned in the report, we see replacement costs for heat production as a relevant premium.	These suggestions that will be considered in the further R&D. At the same time, SDAC will clearly not be able to address costs related to the heating market, and it will remain up to the market party to provide these. See also the added example in Annex I of R1.
63.	Anonymous	Anonymous	The R0 report already lists some of the cost. We see that listing should not be too limiting. It might be highly asset and asset type related what cost should be considered as fundamental costs.	These suggestions that will be considered in the further R&D. We agree that an exhaustive list is indeed not possible to provide, but there should be enough flexibility in the bid formats to

No.	Stakeholder	Organisation	Comment/Proposal	NEMOs & TSOs response
				describe a broad range of cost components.

4. Do you have any additional suggestions for this premium (e.g. potential restrictions, maximum, etc.)?

No.	Stakeholder	Organisation	Comment/Proposal	NEMOs & TSOs response
64.	Abdolhamid Farzambehboudi	ASB group of companies (independent Analyst)	Yes. To preserve the premium's intended role — bridging the gap between fundamental costs and co-optimised clearing — it's essential to prevent misuse and ensure market efficiency. I recommend the following: 1. Restrict Premiums to Fundamental Costs Only As the report and Section 3.1.3 emphasize, premiums should not cover endogenous opportunity costs (already internalised by the algorithm). This must be clearly enforced through: • Guidelines on eligible cost categories; • Pre-declared cost components in bid documentation. 2. Introduce a Soft Cap with Justification Threshold Rather than a hard ceiling (which may penalize valid high-cost providers), a soft cap can be used — e.g., participants exceeding a standard level must submit justified cost data or risk non-selection. This promotes discipline without excluding genuine flexibility. 3. Reflect Asset Type and System Value Premium structures should distinguish between: • Legacy assets with high startup and maintenance costs; • Modern flexible assets (e.g., BESS, VPPs) with different degradation economics. This could be achieved via default premium bands by asset class,	These suggestions which will be further discussed with ACER, ENTSO-E, NEMO Committee and stakeholders.

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			adjustable over time with R&D validation. 4. Require Transparency & Ex-Post Monitoring Premium bids should be: • Auditable post-clearing; • Subject to aggregated reporting by TSOs and NEMOs; • Reviewed periodically for distortionary impact or inefficiencies. 5. Treat Premiums as Transitional Until R&D Matures As clearly outlined in Sections 2.2–2.4, much of the required cost modeling and bid logic is still under development. The premium should therefore: • Be treated as a temporary mechanism, • Be gradually phased out or absorbed into smarter bid structures once R&D results support it. Final Remark: Without these safeguards, there is a risk that the premium — while justified in principle — could be used to mask inefficiencies, create barriers to entry, or distort economic surplus. I urge ENTSO-E, ACER, and stakeholders to treat this tool with precision, transparency, and a clear phase-out logic.	
65.	Maiken Thomsen	Ørsted	To ensure that market participants are truly able to recover their true cost it is essential that there is NO PREDEFINED list of cost that are accepted as part of the premium. As already stated, costs associated with providing balancing capacity may be different from one market participant to another, making it highly unlikely that a predefined list will capture all costs that a given market participant can encounter.	We agree that it may be difficult to predefine all costs, but without a certain control with relevant cost elements, distortions may occur, cf. the previous response. It could be possible to create a relevant list based on input from market participants.

No.	Stakeholder	Organisation	Comment/Proposal	NEMOs & TSOs response
66.	Kjerstin Dahl Viggen	Hydro Energy	It can be a very high premium needed if marginal cost differs significantly from Day Ahead price, and all volumes offered can not be part of capacity(and activation) bids.	The possibilities to use linked bids to represent cost structures and constraints should be carefully studied and used where possible for a better representation than a premium
67.	Raphael Spiekermann	illwerke vkw	We reject restrictions on the premium, as it's in the provider's interest to offer values that reflect their costs optimally. Therefore, we see no reason to restrict them.	These suggestions which will be further discussed with ACER, ENTSO-E, NEMO Committee and stakeholders.
68.	Lucie Horová	CEZ Group	From the perspective of preserving market only principles, no price or volume restrictions should be imposed.	These suggestions which will be further discussed with ACER, ENTSO-E, NEMO Committee and stakeholders.
69.	Dione Hernández Galvis	RWE Supply & Trading GmbH	It should be possible to enter the premium with both signs (positive and negative). Otherwise, it must not contain any restrictions.	These suggestions which will be further discussed with ACER, ENTSO-E, NEMO Committee and stakeholders. Negative premiums will be allowed unless testing reveals unintended consequences.
70.	Thomas Kallevik	Statkraft Energi AS	As mentioned, it should be possible to have a negative premium. It should also be possible to have a different premium for the different products and also have a premium that is different for the outcome of the SDAC price.	We foresee not one fixed premium, which should satisfy the first part of the response. Negative premiums, see response #69. We understand that the last suggestion implies a premium that depends on the market price, which we believe is not possible to model. The market party would need to base this component of a premium on price forecasts.
71.	Klaus Salletmaier	SWM	Only technical restrictions should be considered.	We believe that is too limited, see several other responses

No.	Stakeholder	Organisation	Comment/Proposal	NEMOs & TSOs response
72.	Liselotte van Balen	Eneco	As abovementioned, Eneco thinks it is vital that negative premiums should be allowed.	These suggestions which will be further discussed with ACER, ENTSO-E, NEMO Committee and stakeholders. Negative premiums will be allowed unless testing reveals unintended consequences.
73.	Krassimir Stantchev	BDEW	No restrictions or cap should be applied to the premium, apart from the respective technical limits for energy and balancing capacity. The premium should also be allowed to become negative, to facilitate all possible bidding considerations.	These suggestions which will be further discussed with ACER, ENTSO-E, NEMO Committee and stakeholders. Negative premiums will be allowed unless testing reveals unintended consequences.
74.	Astrid Buhr Broge	Green Power Denmark	To ensure that market participants are truly able to recover their true cost it is essential that there is no predefined list of cost that are accepted as part of the premium. As already stated, costs associated with providing balancing capacity may be different from one market participant to another, making it highly unlikely that a predefined list will capture all costs that a given market participant can encounter. Also, new technologies may emerge and there should be some flexibility for these to reflect their cost structure. Key is that bidding is in line with REMIT and other relevant legislation, and as such no additional limitations should be needed. To avoid disclosing market participants' fixed costs and operational constraints, premiums should be embedded within the proposed price rather than reported as separate cost components.	We refer to responses #64 and #65. Regarding the last sentence, we point out that there will not be "proposed price" for balancing capacity, only for energy. The purpose of the premium is to cover costs other than opportunity costs in SDAC. All bids will be confidential in the same way as present SDAC bids. Specific provisions on market transparency and surveillance may also arise depending on the selected market design for co-optimisation.
75.	Magnus Landstad	Lyse Produksjon AS	There should be no restrictions on the premium, the market player must be able to give their bids to their fully commercial decisions. The premium should be in Euro / MW / hour.	These suggestions which will be further discussed with ACER, ENTSO-E, NEMO Committee and stakeholders. Negative premiums will be allowed unless testing reveals unintended consequences.

No.	Stakeholder	Organisation	Comment/Proposal	NEMOs & TSOs response
76.	Magnus Thorstensson	Swedenergy	To ensure that market participants are truly able to recover their true cost it is essential that there is no predefined list of cost that are accepted as part of the premium. To avoid disclosing market participants' fixed costs and operational constraints, premiums should be embedded within the proposed price rather than reported as separate cost components.	We agree that it may be difficult to predefine all costs, but without a certain control with relevant cost elements, distortions may occur, cf. the previous response. It could be possible to create a relevant list based on input from market participants. We refer to responses #64 and #65 and we also point out that there will not be "proposed price" for balancing capacity, only for energy. The purpose of the premium is to cover costs other than opportunity costs in SDAC. All bids will be confidential in the same way as present SDAC bids. Specific provisions on market transparency and surveillance may also arise depending on the selected market design for co-optimisation.
77.	Olivier Van den Kerckhove	ENGIE	As mentioned in the answer to the previous question, market participants should remain free to define their own bidding strategies and therefore there should not be any explicit restrictions on the premium formulation, including the ability to define a negative premium.	These suggestions which will be further discussed with ACER, ENTSO-E, NEMO Committee and stakeholders. Negative premiums will be allowed unless testing reveals unintended consequences.
78.	Ola Hamada	Vattenfall Energy Trading	Premium could also be negative. It can happen that we cannot offer certain capacities on the energy market, and would rather offer them on the capacity market with a more competitive price.	These suggestions which will be further discussed with ACER, ENTSO-E, NEMO Committee and stakeholders. Negative premiums will be allowed unless testing reveals unintended

No.	Stakeholder	Organisation	Comment/Proposal	NEMOs & TSOs response
				consequences. It will be possible to give capacity only bids.
79.	Pierre Peureux	EDF	EDF understands that this question is asked to shed light on the R&D process but underlines that there shouldn't be a predefined list of items considered as acceptable for an inclusion within the premium. Each market participant should be free to include the costs it considers relevant to be recovered. Moreover, premiums should be part of the proposed price. Indeed, if it is not the case, fixed costs and constraints of market participants will be made available to all.	We refer to response #64 and #74.
80.	Coline Gailleul	Energy Traders Europe	No restrictions or caps should be applied to the premium, apart from the respective technical limits for energy and balancing capacity. We caution against any limitations on price, volume and links. The premium should also be allowed to become negative, to facilitate all possible bidding considerations.	These suggestions which will be further discussed with ACER, ENTSO-E, NEMO Committee and stakeholders. Negative premiums will be allowed unless testing reveals unintended consequences.
81.	Dr. Bernhard Walter	EnBW Energie Baden-Württemberg AG	We strongly suggest that there are no restrictions or caps being applied to the premium (apart from the respective technical limits for scheduled energy and balancing capacity). Furthermore, the premium should also be allowed to become negative to facilitate all possible bidding considerations.	These suggestions which will be further discussed with ACER, ENTSO-E, NEMO Committee and stakeholders. Negative premiums will be allowed unless testing reveals unintended consequences.
82.	Ulrik Gregers Jørgensen	Fjernvarme Fyn	As long as premiums are calculated in compliance with REMIT and competition rules, we see no need for hard caps or standardization. A flexible, market-based approach is preferable.	These suggestions which will be further discussed with ACER, ENTSO-E, NEMO Committee and stakeholders.
83.	Max Schneider	Eurelectric	Market parties should be free to define the premium in function of their bidding strategy and portfolio. Eurelectric emphasizes that there should be no predefined list of acceptable cost components for inclusion in the premium and that negative premiums should also be possible.	These suggestions which will be further discussed with ACER, ENTSO-E, NEMO Committee and stakeholders. Negative premiums will be allowed unless testing reveals unintended consequences.

No.	Stakeholder	Organisation	Comment/Proposal	NEMOs & TSOs response
84.	Anonymous	Anonymous	Not at this point	No comment.

5. Section 3.2.2 of the report proposes both "linked bids" and "combined bids" to be used in a potential future co-optimised SDAC market. For more detailed information on linked and combined bids, please refer to sections 3.1 and 3.2 of Appendix A: N-Side Report. Do you see the need to enable both types of bids, combined and linked?

No.	Stakeholder	Organisation	Comment/Proposal	NEMOs & TSOs response
85.	Abdolhamid Farzambehboudi	ASB group of companies (independent Analyst)	Yes, enabling both linked and combined bids is necessary — but their design and governance must reflect the complexity they introduce. Why both are needed: 1. Asset Flexibility Varies Greatly • Linked bids are crucial for expressing interdependencies between energy and balancing services, especially for portfolio-based or multi-use assets (e.g., units that must choose between offering energy or upward reserve). • Combined bids allow direct representation of physical constraints for assets capable of simultaneously providing multiple services (e.g., a battery providing both energy and aFRR up/down in one bid). 2. Different Use Cases Require Different Tools • Linked bids are suitable for dynamic participation decisions or fallback logic (parent-child, exclusivity). • Combined bids are more suitable for unit-based commitments (e.g., thermal plants or storage assets with known degradation patterns). Design Caveats: • Binary Complexity Risk: Section 3.2.2 warns that excessive use of linked bids creates binary complexity, which can overwhelm the algorithm. Therefore: • Encourage combined bids for standard assets with known profiles; • Reserve linked bids for portfolio or intertemporal dependencies that	Thank you very much for your feedback and for pointing out your concerns. We as NEMOs and TSOs agree with your conclusions and the concerns and will consider this feedback within the R&D.

No.	Stakeholder	Organisation	Comment/Proposal	NEMOs & TSOs response
			can't be simplified. • Not Mutually Exclusive: Combined and linked bids should coexist, with clear use-case definitions and limitations to avoid overlap or misuse. • Clarity for Market Participants: The system must offer transparent documentation and examples, especially for new entrants, so they don't default to simpler bidding options that don't reflect their cost structure. Final Note: In theory, co-optimisation should deliver higher economic surplus. But this depends entirely on whether actual physical constraints and commercial trade-offs can be accurately reflected. Enabling both linked and combined bids — with proper controls — is essential to achieving this goal.	
86.	Thorbjørn Grønbæk	Epsilon Quantitative ApS	I am uncertain whether some of these bids, especially the combined bid, would allow large portfolios to effectively perform insider trading in a manner that cannot be effectively tracked by ACER. This would effectively allow them to match supply/demand volumes across time and have limited, if any, price risk, as the portfolio would be balanced and internal accounting would allow the displacement of the volumes towards the more favourable allocation of trading participants (and not necessarily the consumer). Ultimately this lack of competition would incur higher prices for the consumer. Without proper walls between asset types in large portfolios, this would be extremely hard to track for ACER.	At this point we cannot rule out that a fundamental change in market design can result in such inefficiencies. We are aiming to investigate this in the upcoming R&D phases together with possible effects of exercising market power.
87.	Maiken Thomsen	Ørsted	Orsted strongly opposes to any reduction in the current diversity of energy products or bidding flexibility in the SDAC, as this could expose market participant to risks and result in reduced efficiency and welfare in the SDAC. Furthermore, if the purpose of reducing the current possibility is to accommodate the complexity of implementing co-	NEMOs and TSOs fully support these comments. We would like to emphasize that the report does not in any way propose to reduce the flexibility of existing products. We also agree that if

No.	Stakeholder	Organisation	Comment/Proposal	NEMOs & TSOs response
			optimisation in the Euphemia, we believe this is a clear example of why co-optimisation may only be superior theoretically. Given the complexity of the market it is important that the bidding structure enables cost representation at each time step and for every feasible generation schedule of each power plant unit. Capturing the interdependencies between balancing capacity and wholesale energy products also requires effective bid linkage. We thus welcome the linked bids and combined bids as outlined in the R0 report, as a way to capture the diversity in assets, costs and technical constraints. As highlighted in the R0 report, linked bids are particularly effective for representing advanced trading strategies within portfolio-based bidding, whereas combined bids are better suited to reflect the specific characteristics of individual assets. Lastly, we would like to raise our concern that reducing the current flexibility of bidding in the current market to manage the complexity of co-optimisation could have severe consequences. For this reason, we strongly emphasize that any solution to manage this complexity must not compromise the core principles of the European market design, which is fundamentally grounded in decentralised dispatch and portfolio-based bidding, as underlined in the report. The algorithmic performance should therefore not be dependent on a minimum level of particular products – like combined bids – being used.	bid designs are not able to represent fundamental costs accurately enough, the theoretical increase in economic surplus will not be achieved. The impact on the computational complexity will be investigated in the next R&D phase (R2). NEMOs and TSOs agree that flexibility should not be compromised to accommodate co-optimisation.
88.	Raphael Spiekermann	illwerke vkw	We need both.	No comment.
89.	Lucie Horová	CEZ Group	Yes, we consider both types of bids needed.	No comment.
90.	Dione Hernández Galvis	RWE Supply & Trading GmbH	Yes, in theory, both linked and combined bids could be useful and serve different purposes. However, from our perspective, the structure of combined bids—as currently proposed—may be too simplistic to	NEMOs and TSOs perspective is aligned with this comment. While combined bids offer a good alternative for some market

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			adequately represent the complexity of a portfolio such as RWE's. In particular, capturing interdependencies across diverse assets, flexible constraints, and cost structures may require the more granular flexibility provided by linked bids. Therefore, while combined bids may offer computational advantages, they might not be sufficient on their own for large and heterogeneous portfolios.	participants, linked bids are necessary to capture specific interdependencies within diverse portfolios.
91.	Thomas Kallevik	Statkraft Energi AS	Yes, it would be necessary to enable both types to represent the cost efficiently. It is worth mentioning that it will be highly complex.	No comment.
92.	Klaus Salletmaier	SWM	At the moment combined bids seem to be the most relevant.	No comment.
93.	Liselotte van Balen	Eneco	Eneco is of the opinion that any reduction of the diversity of productions should be avoided, particularly if these changes aim to facilitate the algorithmic complexity of co-optimisation. Therefore, we are in favour of enabling both types of bids.	NEMOs and TSOs fully support this comment. We would like to emphasize that the report does not in any way propose to reduce the flexibility of existing products. We also agree that if bid designs are not able to represent fundamental costs accurately enough, the theoretical increase in economic surplus will not be achieved. The impact on the computational complexity will be investigated in the next R&D phase (R2). NEMOs and TSOs agree that flexibility should not be compromised to accommodate co-optimisation.
94.	Krassimir Stantchev	BDEW	Linked bids are definitely required, there is no need for combined bids.	NEMOs and TSOs believe that while combined bids offer a good alternative for some market participants linked bids are necessary to capture specific interdependencies within diverse portfolios.

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95.	Astrid Buhr Broge	Green Power Denmark	We strongly oppose to any reduction in the current diversity of energy products or bidding flexibility in the SDAC, as this could expose market participant to risks and result in reduced efficiency and welfare in the SDAC. A new co-optimised market should be backwards compatible, meaning it must be possible to participate in the market without having to change bidding processes and tools at all market participants. Furthermore, if the purpose of reducing the current possibility is to accommodate the complexity of implementing co-optimisation in the Euphemia, we believe this is a clear example of why co-optimisation may only be superior theoretically. Given the complexity of the market, it is important that the bidding structure enables cost representation at each time step and for every feasible generation schedule of each power plant unit. Capturing the interdependencies between balancing capacity and wholesale energy products also requires effective bid linkage. We thus welcome the linked bids and combined bids as outlined in the R0 report (provided that they do not lead to an increase in paradoxically rejected bids and a sub-optimal solution), as a way to capture the diversity in assets, costs and technical constraints. As highlighted in the R0 report, linked bids are particularly effective for representing advanced trading strategies within portfolio-based bidding, whereas combined bids are better suited to reflect the specific characteristics of individual assets. Lastly, we would like to raise our concern that reducing the current flexibility of bidding in the current market to manage the complexity of co-optimisation could have serve consequences. For this reason, we strongly emphasize that any solution to manage this complexity must not compromise the core principles of the European market design, which is fundamentally grounded in decentralised dispatch and portfolio-based bidding, as underlined in the report. The algorithmic performance should	NEMOs and TSOs fully support this comment. We would like to emphasize that the report does not in any way propose to reduce the flexibility of existing products. We also agree that if bid designs are not able to represent fundamental costs accurately enough, the theoretical increase in economic surplus will not be achieved. The impact on the computational complexity will be investigated in the next R&D phase (R2). NEMOs and TSOs agree that flexibility should not be compromised to accommodate co-optimisation.

No.	Stakeholder	Organisation	Comment/Proposal	NEMOs & TSOs response
			therefore not be dependent on a minimum level of products – like combined bids – being used. However, with increased bid complexity we are afraid the issues with e.g. paradoxically rejected bids will only increase. Currently the Nordic mFRR AOF is challenged and TSOs ask market participants to reduce the complexity of their bids, as the function ends up skipping complex bids. Before implementing co-optimisation the performance of Euphemia must be sufficient to optimise economic welfare even with the big increase in complexity that co-optimisation inevitably will bring.	
96.	Magnus Landstad	Lyse Produksjon AS	Yes.	No comment.
97.	Magnus Thorstensson	Swedenergy	We strongly oppose to any reduction in the current diversity of energy products or bidding flexibility in the SDAC, as this could expose market participant to risks and result in reduced efficiency and welfare in the SDAC. Furthermore, if the purpose of reducing the current possibility is to accommodate the complexity of implementing co-optimisation in the Euphemia, we believe this is a clear example of why co-optimisation may only be superior theoretically.	NEMOs and TSOs fully support this comment. We would like to emphasize that the report does not in any way propose to reduce the flexibility of existing products. We also agree that if bid designs are not able to represent fundamental costs accurately enough, the theoretical increase in economic surplus will not be achieved. The impact on the computational complexity will be investigated in the next R&D phase (R2). NEMOs and TSOs agree that flexibility should not be compromised to accommodate co-optimisation.
98.	Olivier Van den Kerckhove	ENGIE	The availability of both type of bids would be highly beneficial to replicate the actual constraints of assets, an asset class or portfolio. Regarding the combined bids, it's important to highlight that there are different costs per product (aFRR/mFRR) for same direction (different ramping, opportunity cost, …)	We would like to emphasize that the report does not in any way propose to reduce the flexibility of existing products. We also agree that if bid designs are not able to represent fundamental costs accurately enough, the

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			Additionally, and as already mentioned in our answer to question 8, a larger diversity of bid characteristics is necessary to represents portfolio in a co-optimisation context that would use implicit bidding in a similar way we currently offer it on sequential market. Any simplification of the bidding structure would come at the cost of decreased efficiency, which could eclipse the expected gain from the introduction of co-optimisation.	theoretical increase in economic surplus will not be achieved. NEMOs and TSOs believe that while combined bids offer a good alternative for some market participants, linked bids are necessary to capture specific interdependencies within diverse portfolios. Additionally, we would also like to encourage to propose specific examples of "a larger diversity of bid characteristics". Specifically, regarding different costs per product NEMOs and TSOs would like to highlight that different "Premiums" for each balancing capacity products can be submitted. This is now also highlighted in the relevant examples in the R1 report and the N-Side report.
99.	Ola Hamada	Vattenfall Energy Trading	With the current proposal, linked bids look more useful. However a few added adjustments to combined bids can make them more usable.	No comment.
100.	Pierre Peureux	EDF	To take into account all costs and technical constraints, it is imperative to have an extremely rich market structure that can propose a cost for each time step and for each possible production program of each power plant unit. A very significant number of links between each production program and each unit must be possible. To fully reflect interdependencies between balancing capacity products and wholesale energy products, it is necessary to link them. Two approaches are described in the R0 report: linked bids and combined bids. Having a great variety of assets, EDF would consider using all the mentioned links and mainly exclusive, parent-child, exclusive with max power links as well as all the proposed options for standard combined	We appreciate your comprehensive response. As indicated throughout this document, co-optimisation will always be a trade-off and SDAC will need to be able to address key constraints that market participants need to consider. Addressing everything is not considered feasible. Regarding your specific suggestions, we believe that where combined bids cannot reflect all constraints, linked bids, with

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			product. In particular, the use of linking of combined bids may be necessary in order to reflect technical constraints (setpoints, minimum/maximum duration time at a given output etc.). Nevertheless, EDF wonders to what extend such bids could be suitable to represent multiple setpoints for a specific asset as well as time constraints. Therefore we propose to evaluate the introduction of fixed 5-dimensional bids which we detail in question 13. Moreover, EDF shares the concern of NEMOs and TSOs regarding the combination of bid linking and combined bids . Indeed, if they seem to offer a broad range of possibility to describe fundamental costs it is of the utmost importance that they ensure the capability to fully represent them to avoid sub-optimal outcomes, something that is conceivable with the development of premiums. Furthermore, if the proposed bids could be appropriate from a theoretical standpoint, the feasibility of their implementation remains to be demonstrated. Similarly, the quality of the solution and its optimality raises concerns and could be lower than what it is available with today's process. This complexity could lead to a solution where the diversity of bids is reduced to ensure the computational feasibility. EDF recalls its strong opposition to any reduction in the variety of the energy products and bidding flexibility offered for the SDAC in order to accommodate the algorithmic complexity of co-optimisation, as it would only reinforce the risks for market participants and consequently result in welfare destruction. At last, it should be a prerequisite that the result of the co-optimisation be at least an equivalent solution compared to the one obtained through the sequential model. Illustration of the potential use of the mentioned links Let's take the example of a hydroelectric plant, composed of one turbine: - 100% energy output without aFRR provision, but with or without downward mFRR provision	the proposed additions, offer enough flexibility to address your concerns, e.g. "*the 200/200 aFRR up or down*". With regard to bids for storage units NEMOs and TSOs would like to emphasize that this is an important topic. Storage orders for SDAC are currently under development. From the perspective of NEMOs and TSOs this should be completed first. Subsequently, the extension of storage orders for co-optimisation will be investigated.

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			- 80% energy output with both upward and downward aFRR provision - 0% energy output with upward mFRR provision All these options could be offered by using a combination of the mentioned links, conditioned to the fact that the links can be used between different products and multiple links combined at the same time. In this case, group of exclusive bids with maximum power equals to the maximum power output of the turbines, composed of - Energy bid = maximum power output - Upward aFRR bid = 20% max. power output, with a parent-child link to the energy bid - Downward aFRR bid = 20% max. power output, with a parent-child link to the energy bid; if the aFRR must be provided in both directions then a loop link could be used between the two aFRR bids - Upward mFRR bid = maximum power output - Downward mFRR bid = maximum power output, with a parent-child link to the energy bid This example raises the question of what “exclusive links with maximum power” means: how is the power of the downward balancing capacity accounted for? The combined bid is a promising option, although it would need in our opinion more variables to correctly reflect the constraints and possible behaviour of a thermal asset: - possibility to tag bids as indivisible or have a minimum procured power, including for balancing capacity bids - minimum running time and minimum duration between two running periods - maximum total balancing capacity procured to better reflect asymmetrical provision of aFRR. If a unit can provide either 200 MW of upward aFRR, or 200 MW of downward aFRR or 100 MW of upward	

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			and downward aFRR at the same time, this cannot be reflected with the bid design provided in paragraph 3.2.2. Adding a maximum procured balancing capacity, could solve this issue Activation cost: 15 € Variable price: 60 €/MWh Min. Power: 50 MW Max.Power: 250 MW Max. Up BC: 200 MW Up BC price: 5 €/MW/h Max. Down BC: 200 MW Down BC price: 5 €/MW/h Max. total BC: 200 MW To adapt this bid design to storage or some hydro units, it would also be useful to add other variables representing energy thresholds. These proposals are only for indicative purposes as EDF did not pursue a detailed assessment of the possible bidding strategies in a co-optimisation market context.	
101.	Coline Gailleul	Energy Traders Europe	On the one hand, we see the need for linked bids. On the other, we are more sceptical about the need for combined bids. From our position paper, we reiterate our serious concerns on the bidding structure. 3 (see link below) Should combined bids be pursued and in addressing portfolio bidding, it would be interesting to have links between combined bids and linked bids. 3 https://cms.energytraderseurope.org/storage/uploads/media/energytraderseurope-eurelectric-cooptimisation-position-paper.pdf	NEMOs and TSOs believe that while combined bids offer a good alternative for some market participants, linked bids are necessary to capture specific interdependencies within diverse portfolios. That is why both options should be available as stated in the R1 report. The choice between linked and combined bids should be up to the discretion of each market participant.
102.	Dr. Bernhard Walter	EnBW Energie Baden-	While we do see a strong need to enable linked bids, we do not support the need for combined bids.	NEMOs and TSOs believe that while combined bids offer a good alternative

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		Württemberg AG		for some market participants linked bids are necessary to capture specific interdependencies within diverse portfolios.
103.	Ulrik Gregers Jørgensen	Fjernvarme Fyn	As a district heating operator with both electricity consumption and heat-bound production, we use hourly orders (called step bids in the N-SIDE report), which the report tells can co-optimize with capacity market bids using "combined bids" by adding extra information on cost and capacity for capacity bids. Therefore, combined bids are of high interest to us. We support enabling both linked and combined bids, including the ability to link combined bids, to reflect portfolio interactions. However, the increased complexity may incentivize some participants to simplify their bids, leading to suboptimal dispatch.	Thank you for your feedback.
104.	Max Schneider	Eurelectric	Eurelectric reiterates its strong opposition to any reduction in the diversity of energy products or bidding flexibility within the SDAC, as this could expose market participant to risks and result in reduced efficiency and welfare in the SDAC. Furthermore, if the purpose of such restrictions is to accommodate the algorithmic complexity of co-optimisation in Euphemia, we believe this would be a clear example of why co-optimisation may only be superior in theory. To accurately reflect all relevant costs and technical constraints, a highly granular market structure is essential—one that enables cost representation at each time step and for every feasible generation schedule of each power plant unit. Capturing the interdependencies between balancing capacity and wholesale energy products also requires effective bid linkage. In this context, Eurelectric welcomes the two approaches outlined in the R0 report—linked bids and combined bids— as valuable options to capture the diversity of assets and the variety of associated costs and constraints. As highlighted in the R0 report, linked bids are particularly effective for representing advanced trading strategies within portfolio-	NEMOs and TSOs fully support this comment. We would like to emphasize that the report does not in any way propose to reduce the flexibility of existing products. We also agree that if bid designs are not able to represent fundamental costs accurately enough, the theoretical increase in economic surplus will not be achieved. The impact on the computational complexity will be investigated in the next R&D phase (R2). NEMOs and TSOs agree that flexibility should not be compromised to accommodate co-optimisation.

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			based bidding, whereas combined bids are better suited to reflect the specific characteristics of individual assets. That said, Eurelectric remains concerned about the algorithmic complexity these bidding formats may introduce. Eurelectric strongly emphasizes that any solution to manage this complexity must not compromise the core principles of the European market design, which is fundamentally grounded in decentralised dispatch and portfolio-based bidding – as underlined in the report. The algorithmic performance should therefore not be dependent on a restriction of the bidding diversity to a limited number of specific products, such as combined bids.	
105.	Anonymous	Anonymous	Both at this point	No comment.

6. Do you agree with the proposals referred to in Question 12 and/or do you have further suggestions for the design of linked bids and combined bids, for example, what kind of linking should be possible or what kind of combined bids should be provided?

No.	Stakeholder	Organisation	Comment/Proposal	NEMOs & TSOs response
106.	Abdolhamid Farzambehboudi	ASB group of companies (independent Analyst)	Yes, I support the proposed use of both linked and combined bids as outlined in Section 3.2.2. These mechanisms are essential to accurately represent the technical and economic realities of different asset types. However, the actual design and calibration of these bids — particularly link types like exclusivity, parent-child, or looped logic — should be developed cautiously and iteratively. I propose the following further Suggestions: 1. Real-world pilot testing is essential before finalizing complex link structures, especially to assess binary complexity risks and algorithmic scalability. 2. Default templates for common asset types (e.g., thermal, battery,	The suggestions will be taken into account in the further R&D work.

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			hybrid) should be published and updated regularly — to guide new market entrants and minimize bidding errors. 3. Limit the nesting depth of linked bids unless operationally justified — to avoid overwhelming the solver with unnecessary logical dependencies. 4. Combined bids should be prioritized for unit-based or well-characterized assets, while linked bids remain optional for portfolio strategies or flexible fallback conditions. 5. Stakeholder feedback loops should remain active during early implementation, to catch unintended market barriers or overly rigid bidding rules.	
107.	Maiken Thomsen	Ørsted	It is important to also allow for market participants to continue use block bids, as is gives market participants the ability to truly represent the hourly cost of assets with a high start up cost. Furthermore, it seems like the concern related to block bids and co-optimisation is related to complexity in Euphemia. We thus emphasize again that any solution to manage this complexity must not compromise the current flexibility in the market.	NEMOs and TSOs would like to emphasize that it is currently not foreseen that existing order types (e.g., block bids) are discontinued in a co-optimised market setup. To avoid further misunderstandings this statement is now also included explicitly in the R1 report. If other bid designs prove more efficient they may be offered as complementary options. The impact on the computational complexity will be investigated in the next R&D phase (R2). NEMOs and TSOs agree that flexibility should not be compromised to accommodate co-optimisation.

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108.	Raphael Spiekermann	illwerke vkw	We consider all proposed variants of linked bids and combined bids to be important, especially the two variants not yet included in the SDAC: Exclusive links with maximum power and Loop link. It would also be of great importance to consider the number of bids that could be linked in a linked or combined bid, e.g., how many parent-child generations, how many products, etc. For our portfolio, a large number of each – typically in the three-digit range – would be necessary for optimal bidding. We cannot rule out the possibility that other linking variants would be effective, but we cannot specify them at this time.	NEMOs and TSOs acknowledge the need for a high number of bids to reflect portfolio interdependencies.
109.	Lucie Horová	CEZ Group	Already in the current system there is insufficient number of parent-child bids as well as exclusive ones. The complex and detailed study that would enhance all aspects of interdependencies and relations within a market participant having a large and complex portfolio has not been made yet. Thus, there is no prerequisite the proposed bids can ever be enough and efficient. The examples described in the Figure 16 and 17 of the N-SIDE study are of very low complexity. In the proposed design there is not a complex solution for a market participant, which have the need to optimize with all the production parameters outcomes from the Stakeholder survey as mentioned in APPENDIX B.	NEMOs and TSOs agree that the examples shown in the report are relatively simple. These are just meant to showcase the basic functionalities of the proposed bid design. The proposed approach itself allows for much more complex structures. NEMOs and TSOs recognize the need for a high number of bids.

No.	Stakeholder	Organisation	Comment/Proposal	NEMOs & TSOs response
110.	Dione Hernández Galvis	RWE Supply & Trading GmbH	We generally support the proposals on linked and combined bids but believe further development is needed—particularly to make combined bids more applicable for complex asset portfolios. Combined bids: To become practically useful, combined bids must be capable of capturing more complex asset characteristics and operational constraints. In particular, we suggest enabling the following features (Note: the list is indicative, not exhaustive): - Definition of reserve bands, especially relevant for units offering multiple balancing products. - Removal of the implicit 1:1 linkage between balancing and wholesale capacities, which does not reflect reality for some assets—especially storage units, where flexibility and state-of-charge constraints play a key role. - Inclusion of maximum runtime per day, important for units with limited operational hours or efficiency constraints. - Consideration of costs related to mode changes ("Lastwechselkosten") or ramping inefficiencies. - … Linked bids (Note: the list is indicative, not exhaustive): - We also see a need to further refine linked bid functionalities. As with combined bids, the assumption of a strict 1:1 relationship between balancing and wholesale capacities is too limiting, particularly for storage. More advanced linking options would allow for accurate representation of portfolio-level interdependencies and asset-specific behaviours. - ...	NEMOs and TSOs appreciate the specific proposal made and acknowledge the fact that combined bids need a large range of features to become practically useful. The given examples indeed suggest that we have assumed 1:1 linkage between balancing capacity and energy but we believe that the proposed linked bids also allow to represent more advanced dependencies. With regard to storages NEMOs und TSOs would like to clarify that specific orders for SDAC are currently under development. These bid types should be completed first. Subsequently, the extension of storage orders for co-optimisation will be investigated taking into account the aspects mentioned in your response.
111.	Thomas Kallevik	Statkraft Energi AS	It is important that block bids are allowed. In the future optimisation of smaller, decentralized assets, a price dependent block bidding with complex parameters such as minimum acceptance ratios or linked categories such as parent and child relation will become increasingly necessary. In today's Euphemia implementation, especially with regards	NEMOs and TSOs would like to emphasize that it is currently not foreseen that existing order types (e.g., block bids) are discontinued in a co-optimised market setup. To avoid further misunderstandings this statement is now

No.	Stakeholder	Organisation	Comment/Proposal	NEMOs & TSOs response
			to 15 min MTU implementation, this brings the optimisation to its limits. Co-optimisation will not make this easier.	also included explicitly in the R1 report. NEMOs and TSOs acknowledge that computational complexity will become a challenge. The specific impact will be investigated in the next R&D phase (R2).
112.	Liselotte van Balen	Eneco	Eneco notes that the report primarily focusses on unit bidding, which in our opinion is an outdated way of looking at bidding strategies. In order to make a future proof system, we are of the opinion that portfolio bidding has to be facilitated. This means that in follow-up studies, the effect of portfolio bidding should be included in the considered examples.	Although the examples in the report represent single assets NEMOs and TSOs believe that the proposed bid design options provide flexibility and tools for portfolios. With the proposed design market participants will retain responsibility for scheduling their assets based on the accepted bids. The next phase of R&D will mostly focus on assessing feasibility and performance to test the impact on computational complexity. Thus, the focus will be less on the representativeness of actual portfolios.
113.	Krassimir Stantchev	BDEW	Intertemporal and specific inter-product (em, aFRRpos, aFRRneg, mFRRpos, mFRRneg) links are required. Parent-child and exclusive groups including bids for all MTUs and products. Linked bids are definitely required. However, there is no need for combined bids. For linked bids: We also see a need to further refine linked bid functionalities. As with combined bids, the assumption of a strict 1:1 relationship between balancing and wholesale capacities is too limiting, particularly for storage. More advanced linking options would allow for accurate	NEMOs and TSOs believe that while combined bids offer a good alternative for some market participants linked bids are necessary to capture specific interdependencies (among others intertemporal and across products) within diverse portfolios. That is why both options (linked and combined bids) should be available as stated in the R1 report. The choice between linked and combined bids should be up to the discretion of each market participant.

No.	Stakeholder	Organisation	Comment/Proposal	NEMOs & TSOs response
			representation of portfolio-level interdependencies and asset-specific behaviours.	NEMOs and TSOs acknowledge that the given examples indeed suggest that 1:1 linkage between balancing capacity and energy have been assumed. However, we believe that the proposed linked bids also allow to represent more advanced dependencies.
114.	Astrid Buhr Broge	Green Power Denmark	It is important to also allow for market participants to continue use block bids, as is gives market participants the ability to truly represent the hourly cost of assets with a high startup cost. Furthermore, it seems like the concern related to block bids and co-optimisation is related to complexity in Euphemia. We thus emphasize again that any solution to manage this complexity must not compromise the current flexibility in the market.	NEMOs and TSOs would like to emphasize that it is currently not foreseen that existing order types (e.g., block bids) are discontinued in a co-optimised market setup. To avoid further misunderstandings this statement is now also included explicitly in the R1 report. NEMOs and TSOs acknowledge that computational complexity will become a challenge. The specific impact will be investigated in the next R&D phase (R2).
115.	Magnus Landstad	Lyse Produksjon AS	It is important that all market products can be linked. Specially it is important to be able to link an "up"-bid with a "down"-bid. In the Nordic market today, one can only link up with another up bid (and down with another down bid) in aFRR and mFRR CM.	NEMOs and TSOs would like to clarify that, at this time, there are no limitations on how bids can be linked across MTUs and products foreseen. This has now also been explicitly added to the R1 report.
116.	Magnus Thorstensson	Swedenergy	It is important to also allow for market participants to continue use block bids, as is gives market participants the ability to truly represent the hourly cost of assets with a high start up cost. Furthermore, it seems like the concern related to block bids and co-optimisation is related to complexity in Euphemia. We thus emphasize again that any solution to manage this complexity must not compromise the current flexibility in the market.	NEMOs and TSOs would like to emphasize that it is currently not foreseen that existing order types (e.g., block bids) are discontinued in a co-optimised market setup. To avoid further misunderstandings this statement is now also included explicitly in the R1 report. NEMOs and TSOs acknowledge that

No.	Stakeholder	Organisation	Comment/Proposal	NEMOs & TSOs response
				computational complexity will become a challenge. The specific impact will be investigated in the next R&D phase (R2).
117.	Olivier Van den Kerckhove	ENGIE	Combined bids will have to be much more extensive than the example cited in the report on page 20. In addition to the features in table 2, page 51 of the N-side report, the following characteristics should be included: • Activation cost [€] • Variable price [€/MWh] • Min Power (no BC) [MW] • Max Power (no BC) [MW] • Min Power (aFRR) [MW] • Max Power (aFRR) [MW] • Min Power (mFRR) [MW] • Max Power (mFRR) [MW] • Max Up aFRR [MW] • (Min Up aFRR [MW]) • Max Down aFRR [MW] • (Min down aFRR [MW] • Max Up mFRR [MW] • (Min Up mFRR[MW]) • Max Down mFRR [MW] • (Min Down mFRR [MW]) • Fix aFRR up Cost [€] • Variable aFRR up Cost [€/MWaFRRh] • Fix aFRR down Cost [€] • Variable aFRR down Cost [€/MWaFRRh] • Fix mFRR up Cost [€] • Variable mFRR up Cost [€/MWmFRRh] • Fix mFRR down Cost [€] • Variable mFRR down Cost [€/MWmFRRh]	NEMOs and TSOs appreciate the specific proposals made and acknowledge the fact that combined bids need a large range of features to become practically useful. While we cannot guarantee that all of the proposed characteristics will be available, most of them seem to already be considered. With regard to minimum balancing capacity volumes as well as fixed costs for balancing capacity NEMOs and TSOs believe that these can be considered as global values and not product specific. However, NEMOs and TSOs may consider alternative proposals in the next R&D phases.

No.	Stakeholder	Organisation	Comment/Proposal	NEMOs & TSOs response
118.	Ola Hamada	Vattenfall Energy Trading	With the current structure, we would probably bid in with loop bid/exclusive/family combination. We either run the pump/turbine in the respective MTUs for energy, and BC in the opposite direction, or we don't run them – and offer BC in the same direction as power instead.	No comment.
119.	Pierre Peureux	EDF	See the answer to the previous question regarding the benefits of allowing the use of several links at the same time and between different products. It is EDF's understanding that the variable costs of energy in a combined bid could be represented by a function of the energy cleared. Similarly, it might be appropriate to propose that the costs associated with capacity reservation and the volumes of reserves offered in aFRR and mFRR also be functions of the energy cleared. Moreover, it would be beneficial if the combined bid design includes a minimal and a maximal volume of energy constraints for each product across the block bid across all technologies and not only for batteries as fuel/water management is an important aspect of the portfolio management. Furthermore, it is unclear how a combined bid would differentiate and link aFRR and mFRR (up and down) products, as the examples given in the document do not describe this. It is also uncertain how the opportunity cost between balancing markets would be calculated. Finally, it is unclear how the link between the FCR reservation – treated separately – and the aFRR reservation would be established. To accurately represent the constraints of one asset or a group of assets, the combined bids would need a lot of variables to allow the optimisation process to compute all the possible combinations. This could lead to a burdensome maintenance to follow market participants evolution demands and would not necessarily be robust to the emergence of new types of assets. Rather than to dive into a detailed but necessary description, another option would be to let the market participants offer exclusive 5-dimensions dispatch-like bids. These dispatch bids would represent the	NEMOs and TSOs appreciate the suggestions to enrich the proposed bidding products. The designs of the more advanced combined bids are not yet final, and the feedback will be considered. Currently, NEMOs and TSOs consider the extension of existing bid types to be the highest priority for the upcoming R&D phases, while new bid types (e.g. Combined Thermal Bid) will be considered at a subsequent stage. With regard to storage NEMOs und TSOs would like to clarify that a specific order type for SDAC is currently under development. This order type should be completed first. Subsequently, the extension of storage orders for co-optimisation will be investigated. Regarding computational impact NEMOs and TSOs agree that flexibility should not be sacrificed to allow for computational ease. Algorithmic performance and feasibility of the proposed design will be further assessed in R2.

No.	Stakeholder	Organisation	Comment/Proposal	NEMOs & TSOs response
			available volumes for a given configuration of the asset [energy output, aFRR +, aFRR -, mFRR +, mFRR -] and different configurations could be offered as exclusive bids. This would allow the market participant to integrate its technical constraints into the bid and reduce the usage of a premium. Moreover, because the linking of energy and balancing market would be fixed inside each bid, the cost of opportunity wouldn't be calculated twice (only once by the market participants but the clearing anticipation will be calculated in any case as mentioned in the appendix of the report as well as in this response). Therefore, the complexity of computing a feasible configuration stays the responsibility of market participants, but linking all products in a dispatch-like bid could still allow to embark many links within one bid. EDF would like to draw attention on the computational impact of the implementation of a complete co-optimisation (e.g. with the ability to reflect all costs) on the Euphemia algorithm which already seems at its limits. EDF is strongly opposed to any reduction in the variety of the energy products and bidding flexibility offered for the SDAC in order to accommodate the algorithmic complexity of co-optimisation as it would only reinforce the risks for market participants and consequently result in destruction of welfare. At last, it should be a prerequisite that the result of the co-optimisation be at least an equivalent solution compared to the one obtained through the sequential model.	
120.	Coline Gailleul	Energy Traders Europe	Here are the types of links to consider: • Intertemporal and specific inter-product (energy market, aFRRpos, aFRRneg, mFRRpos, mFRRneg) links; • Parent-child and exclusive groups including bids for all MTUs and products. In the current system, there is already an insufficient number of parent-child bids, as well as exclusive. A complex and detailed study that would enhance all aspects of interdependencies and relations within a market participant having a large and complex portfolio was not made. Thus,	NEMOs and TSOs agree that the examples shown in the report are relatively simple. These are just meant to showcase the basic functionalities of the proposed bid design. The proposed approach itself allows for much more complex structures. NEMOs and TSOs recognize the need for a high number of bids.

No.	Stakeholder	Organisation	Comment/Proposal	NEMOs & TSOs response
			there is no prerequisite that the proposed bids can ever be enough and efficient. The examples described in Figures 16 and 17 of the N-SIDE study are of low complexity. In the proposed logic, there is no complex solution for a market participant needing to optimize with all the production parameters outcomes from the Stakeholder survey as mentioned in APPENDIX B.	
121.	Dr. Bernhard Walter	EnBW Energie Baden-Württemberg AG	We do agree with the proposal. Overall, there should be no product limitations, i.e. including bids for all MTUs and products, spread, exclusive inter-MTU and inter-product links. Further we strongly suggest that intertemporal and specific inter-product (scheduled energy, aFRRpos, aFRRneg, mFRRpos, mFRRneg) links are required. Also, all of the existing SDAC products need to be maintained.	NEMOs and TSOs would like to clarify that, at this time, there are no limitations foreseen on how bids can be linked across MTUs and products. This has now also been explicitly added to the R1 report.
122.	Ulrik Gregers Jørgensen	Fjernvarme Fyn	We support the proposed bid structures and suggest: - Combined bids should support minimum up/down time and ramp rates - Linking of combined bids should allow for portfolio optimization, not only unit-level logic	No comment.
123.	Max Schneider	Eurelectric	As far as Eurelectric understands, while providing further flexibility, combined bids illustrated in section 3.2.2 of the report do not allow to express “block” constraints. Bids offered under these conditions would need to be fully divisible between the min and max for both day-ahead power and balancing capacity without the possibility of a temporal link. This wouldn’t allow to reflect all the limitations of a given asset. We therefore believe that: i.the use of linked combined bids seems specifically appropriate to represent either the technical constraints of an asset that cannot be translated into costs or the strategies of market participants; and ii.combined block bids seem like a more promising option than simple combined bids, though further descriptions of the concept would be needed.	NEMOs and TSOs would like to emphasize that it is currently not foreseen that existing order types (e.g., block bids) are discontinued in a co-optimised market setup. To avoid further misunderstandings this statement is now also included explicitly in the R1 report. More specifically block bids as well as their combined block bids counterpart will be considered in the next R&D phases.
124.	Anonymous	Anonymous	Total volume of accepted bids for group of energy bids could be relevant for hydro storage and batteries	Thank you for your comment, we appreciate the suggestions.

No.	Stakeholder	Organisation	Comment/Proposal	NEMOs & TSOs response
			In general, linked bids could enable exact bids that could be set so it covers well current status of power plant - However, it requires complex linked offer tree. Where and how to build and visualize this? Combined bids are kind of a beginning of fully modelling physical asset in to bid - Still parameters could cover more attributes from an asset (for example) • efficiency curve of steam/hydro turbine • FCR capability if FCR could be part of market • Price dependency of energy cost (not stable variable cost for some assets) • Cumulative daily energy limit • Minimum production level for energy and capacity bid as they could be different	The designs of the more advanced combined bids are not yet final, and the feedback will be considered. Currently, NEMOs and TSOs consider the extension of existing bid types to be the highest priority for the upcoming R&D phases, while new bid types (e.g. Combined Thermal Bid) will be considered at a subsequent stage. With regard to storage NEMOs und TSOs would like to clarify that a specific order type for SDAC is currently under development. This order type should be completed first. Subsequently, the extension of storage orders for co-optimisation will be investigated. Although we recognize some conceptual parallels between FCR and FRR, FCR is currently considered out of scope of this R&D.

7. Are there special characteristics in your portfolio or your country that are not adequately addressed in the proposed bid structures? What are your suggestions for additional features that may be needed?

No.	Stakeholder	Organisation	Comment/Proposal	NEMOs & TSOs response
125.	Abdolhamid Farzambehboudi	ASB group of companies	Yes — based on current bid structure proposals and the examples given in Appendix B, several portfolio characteristics still require more explicit representation, particularly for countries or participants dealing	NEMOs and TSOs recognize that there are some specific aspects that are not considered with the proposed bid design.

No.	Stakeholder	Organisation	Comment/Proposal	NEMOs & TSOs response
		(independent Analyst)	with resource diversity, legacy plant dynamics, or storage-constrained flexibility. Key gaps and suggestions: 1. Ramp Constraints with Multi-product Offers While some ramp constraints are modeled in simplified form (Section C.3), many assets face multi-directional constraints — for example: • A hydro plant may ramp down energy to ramp up aFRR or mFRR simultaneously. • Combined-cycle gas turbines (CCGTs) have non-linear constraints depending on forecasted pricing. Suggestion: Allow submission of multi-axis ramp envelopes across linked or combined products to better reflect feasible operational paths. 2. Battery Constraints and SoC-Dependent Costing Battery flexibility is not fully modeled unless: • State of Charge (SoC) is a parameter; • Degradation or cycle-cost sensitivity is reflected in pricing (currently ignored in standard combined bids). Suggestion: Allow conditional bid logic based on SoC boundaries and introduce a “depth of use cost curve” as a bid input for advanced battery portfolios. 3. Reservoir-linked Hydro Interactions Appendix B notes dependencies between plant head and energy volume, or between multiple plants in the same river. These are vital in many national portfolios (e.g., in Balkan, Alpine, or Anatolian systems). Suggestion: Enable multi-bid relational links (beyond just parent-child) — for example: • Reservoir-linked scheduling logic (like “if bid X in plant A is accepted,	However, as indicated throughout this document, co-optimisation will always be a trade-off and SDAC will need to be able to address key constraints that market participants need to consider. With regard to storage NEMOs und TSOs would like to clarify that a specific order type for SDAC is currently under development. This order type should be completed first. Subsequently, the extension of storage orders for co-optimisation will be investigated.

No.	Stakeholder	Organisation	Comment/Proposal	NEMOs & TSOs response
			limit bid Y in downstream plant B"). 4. CHP and Heat-Coupled Constraints Combined heat and power (CHP) units may produce electricity conditionally on local heat demand. This introduces non-price bid constraints not handled in the current format. Suggestion: Accept auxiliary conditional flags — e.g., "accept if district heating constraint met" — or offer seasonal bid categories to ease modelling complexity. Final Note: Many of these constraints were acknowledged by stakeholders in Appendix B, but are still treated as "too complex to model now." However, not modelling them introduces inefficiency or exclusion for key participants. A modular approach to bidding (e.g., enabling constraints as add-ons) would allow: • Gradual adoption, • Improved modelling flexibility, and • A more inclusive and realistic co-optimised market.	
126.	Thorbjørn Grønbæk	Epsilon Quantitative ApS	We have a single assetless unit trading portfolio in Ireland, so we are fine with whatever :)	No comment.
127.	Maiken Thomsen	Ørsted	It is important to consider the impacts from co-optimisation on other markets. In Denmark a large amount of heat is produced from CHP units which also serve the electricity markets. As Euphemia only optimizes electricity markets and take heating markets for granted inefficiencies may arises as units serving both markets could end up being dispatched suboptimal. We question if moving towards a more centralized dispatch through co-optimization in fact will lead to increased social welfare, or if	NEMOs and TSOs agree with these concerns as is now also reflected in the R1 report. However, as indicated throughout this document, co-optimisation will always be a trade-off and SDAC will need to be able to address key constraints that market participants

No.	Stakeholder	Organisation	Comment/Proposal	NEMOs & TSOs response
			the market inefficiencies from increased complexity and the loss of optimal portfolio optimization will result in reduced social welfare.	need to consider. We do understand that neglecting the heating market results in inefficiencies but NEMOs and TSOs would like to highlight that this is clearly out of scope of the current co-optimisation setup given by EB regulation and SDAC Algorithm methodology.
128.	Raphael Spiekermann	illwerke vkw	We can't answer this question ad hoc. Defining the optimal bid structures for a co-optimized auction for our portfolio would require an internal project.	No comment.
129.	Lucie Horová	CEZ Group	As mentioned in the APPENDIX B High level stakeholder survey. All the parameters are described there. We also fully support the concern, that it is highly complicated to set all the parameters of the portfolio and construct completely conditionally complex bid. For this reason, it should be possible to bid not a production portfolio, but specific products that the portfolio will cover.	From NEMOs and TSOs perspective bidding specific products that are covered by portfolios is possible with the proposed design.
130.	Dione Hernández Galvis	RWE Supply & Trading GmbH	Storage assets in our portfolio present specific challenges that are not yet adequately addressed in the proposed bid structures—particularly with regard to the flexibility in linking energy and balancing capacities, and the need to model constraints such as state-of-charge and non-linear opportunity costs. Beyond that, we refer to the suggestions already outlined above regarding bid design enhancements (e.g. reserve bands, runtime limits, harmonised product durations, etc.). In addition, we note that soft operational factors, such as the risk of delayed asset start-up, may also need to be considered when evaluating feasibility and robustness of bids. While such factors may not be directly reflected in cost parameters, they influence bidding behaviour and asset availability.	NEMOs and TSOs appreciate these suggestions. With regard to storage NEMOs und TSOs would like to clarify that a specific order type for SDAC is currently under development. This order type should be completed first. Subsequently, the extension of storage orders for co-optimisation will be investigated. We recognize and agree that markets should be uniform and not support country-specific characteristics. NEMOs and TSOs aimed at collecting a

No.	Stakeholder	Organisation	Comment/Proposal	NEMOs & TSOs response
			We would like to emphasize that we do not support an approach where asset- or country-specific characteristics are hardcoded into the bid structure. The product design should be uniform across all markets, ensuring a level playing field and simplicity in market clearing.	comprehensive overview of constraints and costs to consider.
131.	Thomas Kallevik	Statkraft Energi AS	In the Nordic hydro system there are many complex water courses with many dependencies. Marginal cost will also change quickly with changing inflows which will require flexibility during operations (described in later questions). We believe they are accounted for if both linked bids and combined bids are allowed as well as block bids. [Part of the response was removed at the request of the market participant due to confidentiality]	Thank you for including this example and elaborating on the resulting challenges. NEMOs and TSOs agree with these concerns but would also like to highlight that co-optimisation will always be a trade-off and SDAC will need to be able to address key constraints that market participants need to consider. Addressing everything is not considered feasible.
132.	Klaus Salletmaier	SWM	§51 EEG rule must be considered in the german market	As this is a very specific rule from current regulation NEMOs and TSOs unfortunately won't consider this directly in the bid design.
133.	Liselotte van Balen	Eneco	We see for example in the Netherlands that there is a large discrapency between mFRR and aFRR volumes. It is currently unclear in the bid formats how this discrapency should be included in the bids submitted by market participants.	NEMOs and TSOs recognize that the examples might not be clear enough on this but separate volume constraints on aFRR and mFRR are considered in the proposed design.
134.	Krassimir Stantchev	BDEW	We would like to emphasize that we disagree with and do not support an approach where asset- or country-specific characteristics are hardcoded into the bid structure. The product design should be uniform across all markets, ensuring a level playing field and simplicity in market clearing. Storage assets in a portfolio present specific challenges that are not yet adequately ad-dressed in the proposed bid structures—particularly with regard to the flexibility in linking energy and balancing capacities, and	We recognize and agree that markets should be uniform and not support country-specific characteristics. NEMOs and TSOs aimed at collecting a comprehensive overview of constraints and costs to consider. With regard to storage NEMOs und TSOs would like to clarify that a specific

No.	Stakeholder	Organisation	Comment/Proposal	NEMOs & TSOs response
			the need to model constraints such as state-of-charge and non-linear opportunity costs.	order type for SDAC is currently under development. This order type should be completed first. Subsequently, the extension of storage orders for co-optimisation will be investigated.
135.	Astrid Buhr Broge	Green Power Denmark	It is important to consider the impacts from co-optimisation on other markets. In Denmark a large amount of heat is produced from CHP units which also serve the electricity markets. These units therefore already take part in a co-optimization where heat and power can be produced from the CHP or heat can be produced from other sources such as heat pumps or heat storage, as Euphemia only optimizes electricity markets and takes heating markets for granted, inefficiencies may arise as units serving both markets could end up being dispatched suboptimal. We question whether moving towards a more centralized dispatch through co-optimization in fact will lead to increased social welfare, or if the market inefficiencies from increased complexity and the loss of optimal portfolio optimization will result in reduced social welfare. Summer in particular will become more complex, as this period includes many hours with both negative and positive electricity prices. This increases the need for accurately representing the costs of individual units in the portfolio submission, while also ensuring that heat demand is met – regardless of the market clearing outcome The trend of system integration between e.g. power and heat is forecasted to increase in Denmark increasing this complexity. There is also a European trend of system integration into new markets like hydrogen and synthetic fuels, which could in time increase the complexity even more. It is important to understand the impact of co-optimisation in the context of the integrated energy system of the future.	We do understand and share that neglecting the heating market results in inefficiencies but NEMOs and TSOs would like to highlight that this is clearly out of scope of the current co-optimisation setup given by EB regulation and SDAC Algorithm methodology.

No.	Stakeholder	Organisation	Comment/Proposal	NEMOs & TSOs response
136.	Magnus Thorstensson	Swedenergy	Hydropower, see answer to Q27. As Euphemia only optimizes electricity markets and takes heating markets for granted, inefficiencies may arise as units serving both markets could end up being dispatched suboptimal.	We do understand and share that neglecting the heating market results in inefficiencies but NEMOs and TSOs would like to highlight that this is clearly out of scope of the current co-optimisation setup given by EB regulation and SDAC Algorithm methodology.
137.	Olivier Van den Kerckhove	ENGIE	ENGIE operates a highly diversified and extensive portfolio, and is active in both the energy markets and the balancing capacity markets. To correctly reflect the limitations and abilities of this portfolio, the bidding framework and products should be sufficiently broad (range of products) and deep (number of bids). Whether the proposed bid structure sufficiently addresses the needs is dependent on both the extent of the allowed linking of bids, as well as the complexity of the combined bids. As highlighted in our answer to question 27, it becomes more urgent to initiate simulations to get practical feedback on the practical way that bidding in a co-optimized context can take place, and whether the bidding complexity can be algorithmically accommodated.	NEMOs and TSOs acknowledge the need for a high number of linked bids to reflect portfolio interdependencies as well as the need for a large range of features for combined bids to become practically useful. The specific impact on computational complexity will be investigated in the next R&D phase (R2) in which simulations will play a major role.
138.	Ola Hamada	Vattenfall Energy Trading	The following would be the most usable for the hydro storage use-case: 1- Adding a min BC capacity (in both directions) 2- Ensuring that the sum of the capacities in the combination always falls with min/max power. For example, if we offer energy min: 50 MW, max: 100 MW, we would only offer aFRR down = 100-50 = 50 MW. But, if we only get 70 MW on the energy market, we should not get more than 70-50 MW = 20 MW of aFRR down. 3- The ability to set the bid over single or multiple MTUs 4- The ability to have exclusives, loops and linked bids of combined bids. We could also achieve the same flexibility with using linked bids, but we foresee that the combined bids would be a much more compact formulation, as opposed to having a linked exclusive/ family/ loops all rolled into one.	We believe that most of the features are already covered by the proposed bid design. With regard to *"min BC capacity"* NEMOs and TSOs believe that these can be considered as global values and not product specific. However, NEMOs and TSOs may consider the suggestions for the further R&D work.

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139.	Pierre Peureux	EDF	Combined block bids and combined scalable complex bids are essential, and they should be available within co-optimisation. Nevertheless, at this stage there is no evidence from an algorithmic point of view that such products are compatible with linked bids and combined bids.	Extending existing order types (e.g. block bids) to include their combined bid counterpart has a high priority for the simulations in the next R&D phase.
140.	Coline Gailleul	Energy Traders Europe	We disagree with the approach to formulating asset- or country-specific attributes into the bid design. We share the concern that it is highly complicated to set all the parameters of the portfolio and construct a complete conditionally complex bid.	We recognize and agree that markets should be uniform and not support country-specific characteristics. NEMOs and TSOs aimed at collecting a comprehensive overview of constraints and costs to consider for the co-optimised bid design.
141.	Dr. Bernhard Walter	EnBW Energie Baden-Württemberg AG	We disagree with the approach to formulate asset- or country-specific attributes into the bid design. Bids should be product-specific to facilitate competition and to retrieve adequate price signals from the clearing process.	We recognize and agree that markets should be uniform and not support country-specific characteristics. NEMOs and TSOs aimed at collecting a comprehensive overview of constraints and costs to consider for the co-optimised bid design.
142.	Ulrik Gregers Jørgensen	Fjernvarme Fyn	As a district heating operator with both electricity consumption and heat-bound production, we have a complex district-heating production portfolio with a large storage option. As mentioned in the N-SIDE report ”3.2.4 Combined bids for storage” including storage is currently in an early stage. We think it would be challenging in any case to communicate all our complexity regarding production, consumption and storage to the market clearing algorithm.	We do understand and share that neglecting the heating market results in inefficiencies but NEMOs and TSOs would like to highlight that this is clearly out of scope of the current co-optimisation setup given by EB regulation and SDAC Algorithm methodology. With regard to storage NEMOs und TSOs would like to clarify that a specific order type for SDAC is currently under development. This order type should be

No.	Stakeholder	Organisation	Comment/Proposal	NEMOs & TSOs response
				completed first. Subsequently, the extension of storage orders for co-optimisation will be investigated.
143.	Max Schneider	Eurelectric	This question does not concern directly an association such as Eurelectric, but we would like to underline as a minimum that co-optimisation should also take into consideration system integration of electricity and heat markets. Should co-optimisation only optimize electricity markets, taking heating markets for granted, inefficiencies may arise, as units serving both markets could end up being subject to suboptimal dispatch. We question whether such a move would increase social welfare or rather lead to market inefficiencies.	We do understand and share that neglecting the heating market results in inefficiencies but NEMOs and TSOs would like to highlight that this is clearly out of scope of the current co-optimisation setup given by EB regulation and SDAC Algorithm methodology.
144.	Anonymous	Anonymous	It is important to highlight that aFRR and mFRR capacities might not be equal for an asset - It is required to deviate aFRRcap and mFRRcap offers in linked and combined bids addition to energy bids	NEMOs and TSOs recognize that the examples might not be clear enough on this but separate volume constraints on aFRR and mFRR are considered in the proposed design.

8. Specifically, to what extent do the proposed bid designs address portfolio bidding?

No.	Stakeholder	Organisation	Comment/Proposal	NEMOs & TSOs response
145.	Abdolhamid Farzambehboudi	ASB group of companies (independent Analyst)	The proposed bid designs — especially the linked bids — partially address portfolio bidding needs, but important limitations remain. Strengths: • Linked bids offer a flexible tool to represent exclusivity and conditional acceptance across a set of units or products, which aligns well with portfolio logic (e.g., “if unit A accepted, reject unit B”). • Combined bids allow grouping energy and balancing offers for a single asset, which is valuable for hybrid portfolios or aggregated assets.	We appreciate these specific suggestions that we took into account for the finalization of the R1 report. However, NEMOs and TSOs cannot promise that all functionalities and suggestions will be included. We will consider the feedback going with the R&D.

No.	Stakeholder	Organisation	Comment/Proposal	NEMOs & TSOs response
			Gaps and Limitations: 1. No native portfolio-layer abstraction: The proposals do not yet provide a formal construct for portfolio-level bidding objects — e.g., grouping bids into a "virtual portfolio" that reflects global constraints like: • maximum aggregated capacity, • internal optimization rules, or • joint ramp rates. 2. Bid logic is still bid-centric, not portfolio-structured: Market participants must simulate portfolio behavior via multiple linked bids, which increases bid volume and computational complexity — especially for portfolios with more than 5–10 units. 3. Lack of portfolio constraint flags: Real portfolios often have soft constraints (e.g., joint emissions cap, internal grid bottlenecks) that cannot be modeled via existing bid formats. Recommendation: To better support real-world portfolio strategies, the bid model could evolve to: • Allow a "portfolio bid container" concept that groups individual bids and assigns shared constraints. • Include optional portfolio attributes like total bid cap, conditional efficiency rules, or renewable quota flags. • Ensure backward compatibility by treating this as an extension, not a replacement, to linked bids. In short, the foundation is there — but more work is needed to make the system truly portfolio-aware and reduce the workaround burden on participants managing diverse or high-volume portfolios	

No.	Stakeholder	Organisation	Comment/Proposal	NEMOs & TSOs response
146.	Thorbjørn Grønbæk	Epsilon Quantitative ApS	See comments in question 12.	
147.	Maiken Thomsen	Ørsted	Theoretically, the proposed bid structure may allow to reflect the different capabilities and limitations of a given portfolio. The feasibility remains doubtful when considering the high combination, notably in terms of bid linking. This doubt stands both on market participants' side (will market participants be able to build all those combinations to reflect those capabilities and limitations) and on the algorithm side (should MPs manage this complexity, will the algorithm be able to handle an adequate number of bids and links).	NEMOs and TSOs acknowledge the need for a high number of linked bids to reflect portfolio interdependencies. The specific impact on computational complexity will be investigated in the next R&D phase (R2) in which simulations will play a major role. NEMOs and TSOs will also try to consider portfolio bidding in the upcoming R&D phases but the focus for simulations in R2 lies on algorithmic performance and feasibility of the proposed design.
148.	Raphael Spiekermann	illwerke vkw	Provided a high (three-digit) number of connected bids is possible in the various linking variants, the proposed design largely enables a detailed representation of a complex portfolio. Otherwise, such a portfolio cannot operate at optimal costs, to the disadvantage of global welfare.	NEMOs and TSOs acknowledge the need for a high number of linked bids to reflect portfolio interdependencies that is pointed out by several market participants.
149.	Lucie Horová	CEZ Group	We would like to specifically highlight the 3.2.3 part of the study, where thermal bids are mentioned. Transferring the optimization of any type of unit to the complex system of pan European implicit system is hardly to imagine for any of the operator. Moreover, it is mentioned in the study, that relying solely on the products available on the day-ahead market not fully meet the future needs of market participants. Market participants must therefore always be able to offer their portfolio at their own choice and not be hampered	NEMOs and TSOs believe that while combined bids offer a good alternative for some market participants, linked bids are necessary to capture specific interdependencies (among others intertemporal and across products) within diverse portfolios. That is why both options (linked and combined bids) should be available as stated in the R1 report.

No.	Stakeholder	Organisation	Comment/Proposal	NEMOs & TSOs response
			by the structure of limited options in the bids themselves (portfolio bidding).	
150.	Dione Hernández Galvis	RWE Supply & Trading GmbH	We note that there is currently a lack of clarity on how portfolio bidding is to be addressed in the proposed bid structures, and this should be further specified—particularly to ensure that portfolios with diverse asset types and constraints can still be adequately represented.	NEMOs and TSOs believe that especially linked bids allow for a high degree of flexibility to also allow representation of portfolios. We welcome any specific proposals on constraints and costs with regard to portfolios.
151.	Thomas Kallevik	Statkraft Energi AS	There is a need to opt out of different assets. This is necessary to maintain flexibility in planning across our portfolio, ensuring both a technically and economically optimal solution. Without this flexibility, the results may be so restrictive that it becomes impossible to deliver.	NEMOs and TSOs believe that especially linked bids allow for a high degree of flexibility to also allow representation of portfolios. Specific suggestions and explanations on this "opt out" need are very welcome.
152.	Liselotte van Balen	Eneco	Eneco concludes that this topic is not considered sufficiently and needs to be investigated further by the project group.	NEMOs and TSOs believe that especially linked bids allow for a high degree of flexibility to also allow representation of portfolios. We welcome any specific suggestions on constraints and costs with regard to portfolios.
153.	Krassimir Stantchev	BDEW	With combined bids for particular asset types, unit-based bidding is not explicitly required, but portfolio flexibility is reduced.	NEMOs and TSOs would like to highlight that both linked and combined bids have advantages and disadvantages. Therefore, it is recommended in R1 to consider both options in a co-optimised setup. The choice between linked and combined bids should be at the discretion of each market participant.

No.	Stakeholder	Organisation	Comment/Proposal	NEMOs & TSOs response
154.	Astrid Buhr Broge	Green Power Denmark	Theoretically, the proposed bid structure may allow to reflect the different capabilities and limitations of a given portfolio. The feasibility remains doubtful when considering the high combination, notably in terms of bid linking. This doubt stands both on market participants' side (will market participants be able to build all those combinations to reflect those capabilities and limitations) and on the algorithm side (should MPs manage this complexity; will the algorithm be able to handle an adequate number of bids and links). There is a lack of in-depth research on whether the bidding structures can be applied in practice to multi-energy systems (e.g., district heating or Power-to-X), where participation is required in multiple markets independently of one another. We encourage this to be included as part of the continued R&D efforts	NEMOs and TSOs acknowledge the need for a high number of linked bids to reflect portfolio interdependencies. The specific impact on computational complexity will be investigated in the next R&D phase (R2) in which simulations will play a major role. NEMOs and TSOs will also try to consider portfolio bidding in the upcoming R&D phases but the focus for simulations in R2 lies on algorithmic performance and feasibility of the proposed design. While we share the concern on multi-energy systems NEMOs and TSOs would like to clarify that this is out scope for the co-optimised setup given by EB regulation and SDAC algorithm methodology.
155.	Magnus Landstad	Lyse Produksjon AS	It seems that the design is well designed for portfolio bidding. It is of great socioeconomic value that the market is solved on a portifolio level, and not at unit level.	Thank you for the feedback.
156.	Olivier Van den Kerckhove	ENGIE	Links between combined bids and linked bids should be possible to correctly reflect some portfolio effects.	NEMOs and TSOs recognize the need for linking of combined bids that multiple respondents mention. At this stage, it appears that exclusive links (on acceptance ratio and on maximum power) are the most reasonable option that NEMOs and TSOs plan to investigate further in the next R&D phases.

No.	Stakeholder	Organisation	Comment/Proposal	NEMOs & TSOs response
157.	Ola Hamada	Vattenfall Energy Trading	Provided the added flexibility, we would be able to bid a our capacities with ease. With the current suggestion, we would have to create extremely complex bids in order to bid our capacities effectively.	NEMOs and TSOs acknowledge the need for a high number of linked bids to reflect portfolio interdependencies. The specific impact on computational complexity will be investigated in the next R&D phase (R2) in which simulations will play a major role.
158.	Pierre Peureux	EDF	As expressed before, it is of the utmost importance that both linked and combined bids (as well as linked combined bids) remain available with complex bids within the co-optimisation framework, especially combined block bids and combined scalable complex bids. Indeed, as mentioned in the R0 report, linked bids can be used to model advanced trading strategies under portfolio bidding, whereas combined bids do not allow that, as they are tailored for specific assets. Moreover, EDF understands that the proposed combined block bids are an extension of the actual block bids with, in addition, dimensions related to balancing capacity. If this is the case, this kind of bids could be a valuable solution to reflect certain technical constraints. Furthermore, EDF would like to insist again on the algorithmic complexity induced by the proposed bid designs and would like to remind that it is opposed to address such complexity through a central dispatch. As reminded in the report, the European market design is predominantly based on decentralized dispatch and portfolio bidding. Moreover, once again EDF is opposed to any suboptimality of the solution to accommodate the algorithmic complexity.	R1 now sets out clear priorities for the next R&D phase with regard to bid design. For the simulations in the next R&D phase, NEMOs and TSOs consider the implementation of the proposed linking options as well as the extension of existing order types (e.g. block bids), to include their combined bid counterpart, to be of the highest priority.
159.	Coline Gailleul	Energy Traders Europe	With combined bids for particular asset types, unit-based bidding is not explicitly required, but portfolio flexibility is more complex and reduced (also see answer to question 21). More specifically in chapter 3.2.3 and thermal bids, transferring the optimization of any type of unit to the complex European implicit system is hard to imagine for any of the operators.	NEMOs and TSOs would like to highlight that both linked and combined bids have advantages and disadvantages. Therefore, it is recommended in R1 to consider both options in a co-optimised setup.

No.	Stakeholder	Organisation	Comment/Proposal	NEMOs & TSOs response
			Lastly, we question the study's mention of solely relying on the products currently available on the day-ahead market, which does not fully meet the future needs of market participants.	The choice between linked and combined bids should be at the discretion of each market participant.
160.	Dr. Bernhard Walter	EnBW Energie Baden-Württemberg AG	Even though it is stated in the R0 report that with combined bids for particular asset types, unit-based bidding is not explicitly required, the portfolio flexibility would still be strongly reduced.	NEMOs and TSOs would like to highlight that both linked and combined bids have advantages and disadvantages. Therefore, it is recommended in R1 to consider both options in a co-optimised setup. The choice between linked and combined bids should be at the discretion of each market participant.
161.	Ulrik Gregers Jørgensen	Fjernvarme Fyn	We propose the possibility for portfolio bids on balancing capacity as a combined bid with step-bids and linked bids.	NEMOs and TSOs believe that this is possible with the proposed design.
162.	Max Schneider	Eurelectric	Theoretically, the proposed bid structure may allow to reflect the different capabilities and limitations of a given portfolio. The feasibility remains doubtful when considering the high combination, notably in terms of bid linking. This doubt stands both on market participants' side (will market participants be able to build all combinations to reflect those capabilities and limitations) and on the algorithm side (should MPs manage this complexity, will the algorithm be able to handle an adequate number of bids and links). Eurelectric notes that, even though it is stated that combined bids do not imply unit-based bidding, more specific bid structures seem to bear a tendency towards unit-based bidding. Eurelectric would like to remind that portfolio bidding has repeatedly proven its efficiency and its value to the European market. The inability to maintain portfolio bidding would lead to inefficiencies and must be avoided.	NEMOs and TSOs acknowledge the need for a high number of linked bids to reflect portfolio interdependencies. The specific impact on computational complexity will be investigated in the next R&D phase (R2) in which simulations will play a major role. NEMOs and TSOs would like to emphasize that combined bids do not imply unit-based bidding. The choice between linked and combined bids should be at the discretion of the market participant.
163.	Anonymous	Anonymous	No comments on that since energy curve orders should be available as well	Thank you for the feedback

9. If you consider that portfolio bidding is not sufficiently supported, what kind of additions or improvements would you suggest?

No.	Stakeholder	Organisation	Comment/Proposal	NEMOs & TSOs response
164.	Abdolhamid Farzambehboudi	ASB group of companies (independent Analyst)	Yes, as outlined in Q15, current designs only partially support portfolio bidding through linked bids. The main gap lies in the lack of an explicit portfolio-layer structure. To address this, I recommend the following: Suggested Improvements: 1. Portfolio Bidding Containers Introduce a high-level bid object (e.g., Portfolio Bid Block) that can: • Encompass multiple asset-level bids; • Define aggregated capacity limits; • Apply shared constraints (e.g., max ramping rate, emission budgets, SoC balancing). 2. Aggregated Marginal Cost Curves Allow submission of pre-aggregated cost-volume functions from portfolios — especially for demand response aggregators or hybrid setups (e.g., PV + battery + EV fleet). 3. Internal Optimization Logic Permit optional black-box portfolio logic (e.g., "optimize among my own assets, but here is my max export curve"). 4. Validation-Friendly Design Develop tools that allow TSOs/NEMOs to validate and decompose portfolio bids transparently — this protects algorithm performance and fairness.	We appreciate these specific suggestions that we took into account for the finalization of the R1 report. However, NEMOs and TSOs cannot promise that all functionalities and suggestions will be included. We will consider the feedback as we move forward with the R&D.
165.	Thorbjørn Grønbæk	Epsilon Quantitative ApS	See comments in question 12.	
166.	Maiken Thomsen	Ørsted	Allowing for the continue use of block bids in addition to linked and combined bids will ensure that portfolio bidding is sufficiently supported.	NEMOs and TSOs would like to emphasize that it is currently not foreseen that existing order types (e.g., block bids) are discontinued in a co-optimised market setup. To avoid further misunderstandings this statement is now also included explicitly in the R1 report.

No.	Stakeholder	Organisation	Comment/Proposal	NEMOs & TSOs response
167.	Raphael Spiekermann	illwerke vkw	See answer to question 15.	
168.	Lucie Horová	CEZ Group	Regarding the possible improvements, we suggest including the changing cost structure related to load. The variable cost is not static value through all the load range though. The proposed functions for portfolio bidding do not take into account the complexity in case of a variety of generation sources. The portfolio management is a complex issue and we do not see a chance to get all the optionality into the co-optimized parameters for efficient bidding into the market. It is also does not take into consideration the relationship between the time units from the following perspective: the up or down balancing power is dependent on the power in each period and, this is important, of its changes between periods. In case of the fluctuation between two levels of base points in different periods, there might not have be enough place (power) for balancing bids activation. This functionality is completely missing.	NEMOs and TSOs acknowledge that the proposed bid design has certain limitations. With regard to changing cost structures, it is important to highlight that existing bid types already allow for a stepwise curve with a marginal cost per output level. In addition, with the combined bid counterpart of scalable complex orders load gradients are considered as well in the R1 report. An additional example on the use of block bids has been added to the N-Side report as well.
169.	Dione Hernández Galvis	RWE Supply & Trading GmbH	We do not have any concrete suggestions at this point. However, it should be noted that it cannot be assumed that a single asset is able to provide both energy and balancing capacity in the most-efficient way. Therefore, from a portfolio perspective, it is necessary that the provider can combine assets and model the respective products, and not the individual assets.	No comment.
170.	Thomas Kallevik	Statkraft Energi AS	See question 15	
171.	Liselotte van Balen	Eneco	As abovementioned, we believe that the focus of the project group on asset bidding is outdated. We, therefore, encourage the project group to explore some simple portfolio configurations to have a more future proof vision. For example: - Renewables + storage - Renewables + thermal	NEMOs and TSOs agree that considering these asset types is of high importance. With regard to Renewables, NEMOs and TSOs believe that no additional requirements emerge. With regard to storage, NEMOs und TSOs would like to clarify that a specific order type for

No.	Stakeholder	Organisation	Comment/Proposal	NEMOs & TSOs response
				SDAC is currently under development. This order type should be completed first. Subsequently, the extension of storage orders for co-optimisation will be investigated.
172.	Krassimir Stantchev	BDEW	Bids should be product-specific, not specific to certain asset types. Only this way it is up to the market participant to combine all of the assets in his portfolio to match the required products. This is particularly relevant for continuously optimizing the portfolio until deliv-ery. With asset type specific bids, the possibility to reassign assets to deliver certain prod-ucts is severely limited, obviously resulting in a loss of efficiency. For this reason, combined bids should be abandoned.	NEMOs and TSOs believe that while combined bids offer a good alternative for some market participants, linked bids are necessary to capture specific interdependencies (among others intertemporal and across products) within diverse portfolios. Therefore, both options (linked and combined bids) should be available as stated in the R1 report. The choice between linked and combined bids should remain at the discretion of each market participant.
173.	Astrid Buhr Broge	Green Power Denmark	Allowing for the continues use of block bids in addition to linked and combined bids will support portfolio bidding. It is unclear what a bidding structure would look like when covering a specific heat demand through a combination of electric boilers, heat pumps, and combined heat and power (CHP) plants in the auction, supplemented by heat deliveries from non-electricity market-based units (such as excess heat, external suppliers, and boilers).	NEMOs and TSOs would like to emphasize that it is currently not foreseen that existing order types (e.g., block bids) are discontinued in a co-optimised market setup. To avoid further misunderstandings this statement is now also included explicitly in the R1 report. As indicated throughout this document, co-optimisation will always be a trade-off and SDAC will need to be able to address key constraints that market participants need to consider. Addressing everything is not considered feasible.

No.	Stakeholder	Organisation	Comment/Proposal	NEMOs & TSOs response
174.	Magnus Thorstensson	Swedenergy	Allowing for the continued use of block bids in addition to linked and combined bids will ensure that portfolio bidding is sufficiently supported.	NEMOs and TSOs would like to emphasize that it is currently not foreseen that existing order types (e.g., block bids) are discontinued in a co-optimised market setup. To avoid further misunderstandings this statement is now also included explicitly in the R1 report.
175.	Olivier Van den Kerckhove	ENGIE	See answer to previous question.	
176.	Ola Hamada	Vattenfall Energy Trading	Outlined in question 14.	
177.	Coline Gailleul	Energy Traders Europe	Bid design should be product-specific , and not to certain asset types. The market participant decides to combine all assets in his portfolio to match the required products. This is particularly relevant for continuously optimizing the portfolio until delivery . With asset type-specific bids, the possibility of reassigning assets to deliver certain products is severely limited, resulting in a loss of efficiency (also see answer to question 21). For this reason, combined bids should be viewed very critically. We also highlight some missing elements. One is the lack of attention to the changing cost structure related to load. The variable cost is not a static value throughout the entire load range. To imagine a complex portfolio function is misguided. Portfolio management is complex, and we do not see a chance to get all the optionality into the co-optimised parameters for efficient bidding into the market. Secondly, the study forgets the relationship between time units from the following perspective: the up or down balancing power is dependent on the power in each period and, importantly, on its changes between periods. In the case of the ramp between two levels of base points in	NEMOs and TSOs believe that while combined bids offer a good alternative for some market participants, linked bids are necessary to capture specific interdependencies (among others intertemporal and across products) within diverse portfolios. Therefore, both options (linked and combined bids) should be available as stated in the R1 report. The choice between linked and combined bids should remain at the discretion of each market participant. With regard to changing cost structures, it is important to highlight that existing bid types already allow for a stepwise curve with a marginal cost per output level. In addition, with the combined bid counterpart of scalable complex orders load gradients are considered as well in

No.	Stakeholder	Organisation	Comment/Proposal	NEMOs & TSOs response
			different periods, there might not be enough space (power) for balancing bid activation. This functionality is completely missing.	the R1 report. An additional example on the use of block bids has been added to the N-Side report as well.
178.	Dr. Bernhard Walter	EnBW Energie Baden-Württemberg AG	In general, we strongly advocate maintaining portfolio bidding without limitations. In our view it should be product-specific, not specific to a certain asset type. Only this way it is up to the market participant to combine all the assets in his portfolio to match the required products. This is particularly relevant when continuously optimising the portfolio until delivery. With asset type specific bids, the possibility to reassign assets to deliver certain products is severely limited, obviously resulting in a loss of efficiency and social welfare. This can only be neglected by market participants with very large portfolios. Therefore, we strongly disagree considering the introduction of combined bids.	NEMOs and TSOs believe that while combined bids offer a good alternative for some market participants, linked bids are necessary to capture specific interdependencies (among others intertemporal and across products) within diverse portfolios. Therefore, both options (linked and combined bids) should be available as stated in the R1 report. The choice between linked and combined bids should remain at the discretion of each market participant.
179.	Ulrik Gregers Jørgensen	Fjernvarme Fyn	We recommend that future R&D phases cover: - How complex portfolios can be modelled effectively in combined and linked bids - How multi-energy systems (e.g. heat constraints and heating storage) can be represented in co-optimized clearing - Ensuring accurate cost expression without overloading bid formats	As indicated throughout this document, co-optimisation will always be a trade-off and SDAC will need to be able to address key constraints that market participants need to consider. Addressing everything is not considered feasible. The next phase of R&D will mostly focus on assessing feasibility and performance to test the impact of the proposed design on computational complexity. Thus, the focus will be less on the representativeness of actual portfolios

No.	Stakeholder	Organisation	Comment/Proposal	NEMOs & TSOs response
180.	Max Schneider	Eurelectric	Eurelectric underlines that bid types offered should allow to closely reflect all types of portfolios on the market. Eurelectric has stressed several times in the past that the diversity of bids accessible to market participants should not be subject to any market regression. The level of diversity of this bid offer should be maintained within a co-optimized market. Any divergence from this objective would lead to a loss of efficiency and welfare. In this spirit, linked bids, combined bids, linked combined bids, and combined block bids seem necessary to achieve the objective to reflect all portfolios on the market. Eurelectric is however concerned by the increased bidding complexity, which may not be manageable. Market participants could then need to resort to simplified bidding structures that would not reflect the full potential of their portfolios' capabilities, resulting in higher system costs. In particular, such bidding complexity could lead to an artificial split of offers between spot and balancing capacity markets. This would have detrimental market impacts, e.g., reduce market liquidity, and would lead to inefficiencies at a significant social cost which could outweigh any theoretical benefits of co-optimisation.	NEMOs and TSOs share the raised concerns on the complexity of bidding in a co-optimised setup as is now also reflected in the R1 report.
181.	Anonymous	Anonymous	No comments on this question since portfolio structure could be built already in the market participant side to some extent	Thank you for the feedback.

10. Specifically, if you operate storage facilities, do the proposed combined and/or linked bids cover your needs?

No.	Stakeholder	Organisation	Comment/Proposal	NEMOs & TSOs response
182.	Abdolhamid Farzambehboudi	ASB group of companies (independent Analyst)	Partially, but with notable limitations. Combined and linked bids are a step in the right direction for storage participation, but they fall short of covering the operational complexity and cost structure unique to storage technologies. Key Storage-Specific Gaps:	We appreciate the suggestions. A storage bid is presently under development for energy bids. As soon as this is in place, we will consider the necessary adaptations to make it suitable

No.	Stakeholder	Organisation	Comment/Proposal	NEMOs & TSOs response
			1. State of Charge (SoC) Dynamics Not Represented Neither combined nor linked bids currently allow for: • SoC-dependent availability or cost variation, • Charging/discharging cycle constraints, • SoC carryover across market intervals. 2. Degradation Costs Are Ignored Battery wear is not uniform — deep or fast cycles have a real financial cost not currently capturable in standard bid formats. 3. Inter-temporal Constraints Lacking Many storage assets require multi-hour optimization, but bid formats do not yet support: • Temporal linking across sequential time blocks, • Round-trip efficiency considerations. Suggested Enhancements: • Allow SoC-indexed bid parameters, enabling availability or price adjustment by internal state. • Permit bid-linked constraints like "If [discharge in hour N], then [charge must occur in hour N+X]". • Introduce a "storage module" within bid templates, with fields for degradation curves, charge limits, and efficiency.	for co-optimisation, to the extent possible.
183.	Raphael Spiekermann	illwerke vkw	Yes, if the two new proposed variants (Exclusive links with maximum power and Loop link) are part of it.	Currently, NEMOs and TSOs consider the new linking options together with the extension of existing bid types to be the highest priority for the upcoming R&D phases, while new bid types (e.g. Combined Thermal Bid) will be considered at a subsequent stage.
184.	Lucie Horová	CEZ Group	What is not described in all the material are the interdependencies of different time intervals and group of time intervals between each other. All the examples presented are related only to one virtual time period. What is not solved: time between charge and load, resting time,	We agree there are serious challenges related to complex river systems, although this is also the case today. TSOs

No.	Stakeholder	Organisation	Comment/Proposal	NEMOs & TSOs response
			preparation time, minimum discharge time, complex situation of multi-optimization of run on the sequential hydro power stations (you can hardly create a flexible complex interlinked bid for a interlinked group of generators connected by a river with specific hydrological conditions).	and NEMOs intend to develop bid formats that provide sufficient flexibility. We fully agree that a bidding framework that allows to represent costs well is a condition for a true welfare maximisation. At the same time, it will not be possible to include every detail of all assets. The co-optimisation is thus a trade-off between on the one hand the benefit of better co-ordination between all assets, and on the other hand some reduction in the perfect optimisation of each single asset, which can in principle be better handled by the asset owner. During the continued R&D, we are grateful for specific suggestions from market participants on how to improve the design of linked and combined bids. A storage bid is presently under development for energy bids. As soon as this is in place, we will consider the necessary adaptations to make it suitable for co-optimization, to the extent possible.
185.	Dione Hernández Galvis	RWE Supply & Trading GmbH	No	A storage bid is presently under development for energy bids. As soon as this is in place, we will consider the necessary adaptations to make it suitable for co-optimization, to the extent possible.

No.	Stakeholder	Organisation	Comment/Proposal	NEMOs & TSOs response
				During the continued R&D, we are grateful for specific suggestions from market participants on how to improve the design of linked and combined bids.
186.	Thomas Kallevik	Statkraft Energi AS	[Response was removed at the request of the market participant due to confidentiality]	
187.	Liselotte van Balen	Eneco	The report explicitly concludes that the design for storage bids is under development, so we await those results.	No comment.
188.	Krassimir Stantchev	BDEW	No.	A storage bid is presently under development for energy bids. As soon as this is in place, we will consider the necessary adaptations to make it suitable for co-optimization, to the extent possible. During the continued R&D, we are grateful for specific suggestions from market participants on how to improve the design of linked and combined bids.
189.	Magnus Landstad	Lyse Produksjon AS	Yes.	No comment.
190.	Olivier Van den Kerckhove	ENGIE	For storage facilities, links between different time units are crucial, both in terms of pricing (charge / discharge cycle) and volumes.	NEMOs and TSOs appreciate this feedback on necessary functionalities for storages bids. We would like to highlight that linking across products and time units is already foreseen with the proposed bid design in R1. To avoid further confusion this is now also explicitly mentioned in the R1 report. In general, we intend to develop bid formats that provide sufficient flexibility. With regard to storage a bid is presently under

No.	Stakeholder	Organisation	Comment/Proposal	NEMOs & TSOs response
				development for energy bids. As soon as this is in place, we will consider your feedback for the necessary adaptations to make it suitable for co-optimization, to the extent possible.
191.	Ola Hamada	Vattenfall Energy Trading	No. Proposed improvements in 14.	No comment.
192.	Pierre Peureux	EDF	See a first proposal of evolution of combined bids given in the answer to question 12.	No comment.
193.	Coline Gailleul	Energy Traders Europe	We raise a list of non-exhaustive absent points. What is not described in the material are the interdependencies of different time intervals and groups of time intervals between each other. All the examples presented are related only to one virtual time duration. What remains unresolved: time between charge and load, resting time, preparation time, minimum discharge time, complex situation of multi-optimization of run on the river generation units cascade (one can hardly create a flexible complex interlinked bid for an interlinked group of generators connected by a river with specific hydrological conditions).	We agree there are serious challenges related to complex river systems, although this is also the case today. TSOs and NEMOs intend to develop bid formats that provide sufficient flexibility. We fully agree that a bidding framework that allows to represent costs well is a condition for a true welfare maximisation. At the same time, it will not be possible to include every detail of all assets. The co-optimisation is thus a trade-off between on the one hand the benefit of better co-ordination between all assets, and on the other hand some reduction in the perfect optimisation of each single asset, which can in principle be better handled by the asset owner. During the continued R&D, we are grateful for further specific suggestions from market participants on how to

No.	Stakeholder	Organisation	Comment/Proposal	NEMOs & TSOs response
				improve the design of linked and combined bids. A storage bid is presently under development for energy bids. As soon as this is in place, we will consider the necessary adaptations to make it suitable for co-optimisation, to the extent possible.
194.	Dr. Bernhard Walter	EnBW Energie Baden-Württemberg AG	Neither the complex bidding with linked explicit bids nor the increased uncertainty related to implicit bids can adequately compensate for the loss in bidding flexibility compared to sequential bidding.	NEMOs and TSOs share some of these concerns as is now also reflected in the R1 report.

11. In your opinion, what additional benefits could result from the ability to also include linking of combined bids? For additional information, please refer to section 6.3 of Appendix A: N-Side Report.

No.	Stakeholder	Organisation	Comment/Proposal	NEMOs & TSOs response
195.	Abdolhamid Farzambehboudi	ASB group of companies (independent Analyst)	Linking of combined bids unlocks a vital layer of operational realism for market participants managing hybrid assets, aggregated portfolios, or cross-product optimization strategies. Key Benefits: 1. Efficient Inter-product Trade-offs Linking allows resources (especially hybrid units like PV + battery or CHP + thermal) to express: • “Either provide energy or balancing capacity, but not both.” • “Prefer FRR unless energy price exceeds X.” Without linking, such internal trade-offs are hidden, risking inefficient market clearing. 2. Improved Asset Protection and Scheduling	NEMOs and TSOs appreciate this extensive feedback on linking of combined bids that multiple respondents mention. At this stage, it appears that exclusive links (on acceptance ratio and on maximum power) are the most reasonable option that NEMOs and TSOs plan to investigate further in the next R&D phases.

No.	Stakeholder	Organisation	Comment/Proposal	NEMOs & TSOs response
			Some units may have physical or contractual constraints — e.g., a battery cannot commit to both a 4-hour discharge energy bid and simultaneous aFRR availability. Linking allows this to be made explicit. 3. More Precise Risk Management Linking combined bids reduces the risk of partial or conflicting activations. This is critical for assets with non-reversible commitments, such as thermal generators or storage facing cycle degradation. 4. Support for Conditional Portfolio Strategies Linking enables advanced conditional logic — for example: • "Accept my aFRR combined bid only if my energy bid clears in hour N." This reflects real-world strategies while reducing manual post-market corrections. Final Thought: Linking combined bids adds nuance without excessive complexity — it's a modular improvement that preserves algorithm scalability while increasing market realism, efficiency, and fairness.	
196.	Maiken Thomsen	Ørsted	Given the different requirements to balancing bids and day ahead bid (bid size, minimum/maximum price, activation time and so forth) it is important to have the possibility of using linking of combined bids. This is especially the case for CHP plants were the cost of delivering balancing reserves cannot be represented by a linear curve. Today exclusive bids are used to represent the cost of delivering many different products (and combination of products) and deliver the most efficient bids to the market. To ensure a true presentation of cost in a co-optimised market it is important that market participants can deliver all the needed information to represent all the different outcomes (modes), and thus a true representation of cost.	NEMOs and TSOs appreciate the feedback on linking of combined bids that multiple respondents mention. At this stage, it appears that exclusive links (on acceptance ratio and on maximum power) are the most reasonable option that NEMOs and TSOs plan to investigate further in the next R&D phases. NEMOs and TSOs are open to research additional options for linking of combined in case of specific proposals.

No.	Stakeholder	Organisation	Comment/Proposal	NEMOs & TSOs response
197.	Raphael Spiekermann	illwerke vkw	Yes. For example, storage could be optimally marketed through linking in the energy market, while simultaneously offering capacity as an alternative.	Thank you for this feedback.
198.	Lucie Horová	CEZ Group	Linking a combined bids is next step to the complexity of the problem. But the provided example in 6.3 is still not sufficiently covering the needs of a market participant. We also have doubts the Figure 31 and Figure 32 describe the same situation. It works for block A' and A'' but seems not to be the same for A and A''. What is also missing is the implementation of this example into an exclusive bid as the market participant would like to have the option to start the generation at the most convenient period within the day.	NEMOs and TSOs share the concerns about the complexity of bidding in a co-optimised setup as is now also reflected in the R1 report. As indicated throughout this document, co-optimisation bid design will always be a trade-off between complexity and the level of expressiveness of costs and constraints.
199.	Dione Hernández Galvis	RWE Supply & Trading GmbH	It is difficult to assess at this stage. The ability to link combined bids might offer some simplification or added flexibility in representing certain portfolio configurations, but we are currently not in a position to clearly evaluate the benefits. Further clarification, practical examples, or testing would be needed to determine whether such functionality adds meaningful value.	No comment.
200.	Thomas Kallevik	Statkraft Energi AS	It is probably necessary to accurately reflect the cost structure for hydro. However, the current setup is already very complex, posing a significant risk of erroneous bids despite the implementation of several mitigating measures.	NEMOs and TSOs agree with the concern on the complexity.
201.	Krassimir Stantchev	BDEW	It is difficult to assess at this stage. The ability to link combined bids might offer some simplification or added flexibility in representing certain portfolio configurations, but we are currently not in a position to clearly evaluate the benefits	No comment.
202.	Astrid Buhr Broge	Green Power Denmark	Given the different requirements to balancing bids and day ahead bid (bid size, minimum/maximum price, activation time and so forth) it is important to have the possibility of using linking of combined bids. This is especially the case for CHP plants where the cost of delivering balancing reserves cannot be represented by a linear curve. Today exclusive bids are used to represent the cost of delivering many different	NEMOs and TSOs appreciate the feedback on linking of combined bids that multiple respondents mention. At this stage, it appears that exclusive links (on acceptance ratio and on maximum power) are the most reasonable option

No.	Stakeholder	Organisation	Comment/Proposal	NEMOs & TSOs response
			products (and combination of products) and deliver the most efficient bids to the market. To ensure a true presentation of cost in a co-optimised market it is important that market participants can deliver all the needed information to represent all the different outcomes (models), and thus a true representation of cost.	that NEMOs and TSOs plan to investigate further in the next R&D phases. NEMOs and TSOs are open to research additional options for linking of combined in case of specific proposals.
203.	Magnus Landstad	Lyse Produksjon AS	Linking of combined bids is very relevant. See answer 19.	No comment.
204.	Magnus Thorstensson	Swedenergy	Given the different requirements to balancing bids and day ahead bids, it is important to have the possibility of using linking of combined bids.	No comment.
205.	Olivier Van den Kerckhove	ENGIE	See answer to question 15.	No comment.
206.	Ola Hamada	Vattenfall Energy Trading	If we have to choose between linked and combined bids, we would almost exclusively use linked bids, since loop and exclusive structures are the prevailing bids we need for bidding energy. Adding on top of this, adding BC to the bids would result in extremely complex and nested bids. But allowing us to bid with combined bids within a linked/loop/exclusive bid would tremendously simplify the bids we give. They would be with the same order of complexity as our current bids.	NEMOs and TSOs appreciate the feedback on linking of combined bids that multiple respondents mention. At this stage, it appears that exclusive links (on acceptance ratio and on maximum power) are the most reasonable option that NEMOs and TSOs plan to investigate further in the next R&D phases. Further linking of combined bids options may also be considered.
207.	Pierre Peureux	EDF	Links of combined bids lead to the capability to offer exclusive combined bids baskets which can be useful on the one hand to formulate different bidding strategies as the report illustrates but also on the other hand as a way to represent some technical constrains. Moreover, since the cooptimisation should take into account most of technical constraints of assets or portfolios, such links are crucial. Nevertheless, such possibility could lead to huge algorithmic complexity and EDF wonders to what extent it could be solved by the algorithm.	Thank you for the feedback. NEMOs and TSOs agree with these challenges about algorithmic complexity which will be addressed in the upcoming R&D phase.
208.	Coline Gailleul	Energy Traders Europe	Linking combined bids adds another layer of complexity to an already complex problem. The example provided in 6.3 does not sufficiently cover the needs of a market participant. We also have doubts about	NEMOs and TSOs share the concerns about the complexity of bidding in a co-optimised setup as is now also reflected

No.	Stakeholder	Organisation	Comment/Proposal	NEMOs & TSOs response
			whether Figure 31 and Figure 32 describe the same situation. It works for blocks A' and A'' but seems not to be the same for A and A''. What is also missing is the implementation of this example into an exclusive bid as a market participant would like to have the option to start the generation at the most convenient period within the day.	in the R1 report. As indicated throughout this document, co-optimisation bid design will always be a trade-off between complexity and the level of expressiveness of costs and constraints.
209.	Dr. Bernhard Walter	EnBW Energie Baden-Württemberg AG	As we do not support combined bids, we do not see any additional benefits.	No comment.
210.	Ulrik Gregers Jørgensen	Fjernvarme Fyn	With portfolio bidding the combination of linked and combined bidding can ensure the optimal dispatch of several plants considering each plant's min/max loads and other market requirements (e.g. heat dispatch).	No comment.
211.	Max Schneider	Eurelectric	As stated in our reply to question 13, combined bids would need to be fully divisible between the min and max for both day-ahead power and balancing capacity without the possibility of a temporal link. This wouldn't allow to reflect all the limitations of a given asset. Therefore, we believe that i.the association of combined bids and linked bids seems necessary; and ii.combined block bids seem like a more promising option than simple combined bids, though further descriptions of the concept would be needed.	R1 now sets out clear priorities for the next R&D phase with regard to bid design. For the simulations in the next R&D phase, NEMOs and TSOs consider the implementation of the proposed linking options, as well as the extension of all existing order types (e.g. block bids), to include their combined bid counterpart, to be of the highest priority.
212.	Anonymous	Anonymous	Certain bids could be simpler by using linked combined bids than only using linked bids	No comment.

12. If you own or operate any of the following asset types, please identify which type of bid format (combined bid, linked bid, linking of combined bids, all of them) would address your technical and economic constraints in the best possible way and why: Biomass; Demand response; Solar; Battery storage; Pumped hydro; Thermal generators; Wind; Other (please specify). If none of the proposed bid formats are suitable for your asset types, please explain which needs are not properly addressed and why.

Disclaimer: NEMOs and TSOs are aware that portfolio bidding is the current practice in most European countries. This question could still help discover additional requirements.

No.	Stakeholder	Organisation	Comment/Proposal	NEMOs & TSOs response
213.	Abdolhamid Farzambehboudi	ASB group of companies (independent Analyst)	Battery Storage Best Fit: Linking of Combined Bids Battery operation involves both energy and reserve markets, with cycle life and SoC optimization across hours. Linking combined bids is essential to prevent conflicting activations and to express conditional offers based on internal state or degradation cost. Pumped Hydro Best Fit: Combined + Linked Bids Pumped hydro units are long-duration storage assets with clear charging/discharging windows. They often support balancing capacity and energy arbitrage. Linked bids help reflect constraints like reservoir limits or upstream water flow, while combined bids tie energy and reserve roles together. Thermal Generators Best Fit: Combined Bids Thermal plants (especially mid-size and baseload) need to represent startup costs, ramp limits, and dual commitments to energy and balancing. Combined bids handle those trade-offs efficiently. Linked bids may be helpful when coordinating between multiple units within the same site. Solar and Wind (VRE) Best Fit: Linked Bids Due to variability and forecast uncertainty, VRE assets benefit from linking bids across time intervals or to backup dispatchable assets. While not traditional candidates for balancing capacity, aggregated VRE	We appreciate these specific suggestions.

No.	Stakeholder	Organisation	Comment/Proposal	NEMOs & TSOs response
			portfolios may begin offering limited balancing under linked bid logic. Biomass / CHP Best Fit: Combined + Linked Bids CHP units have co-generation constraints (heat + power). Combined bids capture dual-product obligations, while linking bids support coordinated fallback or peak support across portfolio units. Demand Response Best Fit: Linked Bids DR aggregators rely on portfolio activation logic, often with consumer consent or delay constraints. Linked bids allow DR providers to coordinate across asset pools and reflect temporal substitution logic. Other – Hybrid Aggregates (e.g. PV + Battery + EV fleet) Best Fit: Linking of Combined Bids These systems need high flexibility, conditional activation paths, and adaptive prioritization. Linking of combined bids allows intelligent scheduling without risking overcommitment.	
214.	Maiken Thomsen	Ørsted	For CHP plants it is important to have the possibility of using combined bid, linking of combined bids, and block bids to truly represent the technical constraints and cost of assets, along with the non-linear relationship between different products (aFRR, mFRR).	We will look at the specific needs of CHP in the further R&D.
215.	Kjerstin Dahl Viggen	Hydro Energy	For our current needs, linked bids is sufficient.	No comment.
216.	Raphael Spiekermann	illwerke vkw	We would use all of them for a portfolio that includes demand, solar, wind, storages (all kinds).	No comment.
217.	Dione Hernández Galvis	RWE Supply & Trading GmbH	In our view, it would be helpful if the consultants proposed at least one illustrative use case per asset class. This would allow stakeholders to better assess whether the proposed bid formats sufficiently address the	We appreciate the suggestions. A storage bid is presently under development for energy bids. As soon as

No.	Stakeholder	Organisation	Comment/Proposal	NEMOs & TSOs response
			technical and economic characteristics of different technologies. We would like to emphasise that storage—particularly standalone and co-located storage—is currently not adequately covered by the proposed bid formats. Key aspects missing for storage include: - The economic value of storage is driven by spread, not by absolute price levels—this cannot be captured by static price-quantity bids. - Limited storage capacity creates temporary dependencies between time periods (e.g. state-of-charge), which are not addressed in the current bid formats. - A specific case of such temporal dependency is the ability to provide balancing capacity, which depends on previous and future wholesale operations—this intertemporal logic is crucial but not currently reflected.	this is in place, we will consider the necessary adaptations to make it suitable for co-optimization, to the extent possible. We also appreciate the suggestion to have illustrative examples for each asset class, but we will unfortunately not be able to include these in R1. Specificities of various asset classes will be studied in the further R&D.
218.	Thomas Kallevik	Statkraft Energi AS	[Response was removed at the request of the market participant due to confidentiality]	
219.	Krassimir Stantchev	BDEW	To replicate all of the considerations involved in sequential bidding, a vast set of linking options is required - regardless of the asset type. We do not support individual combined bids for each asset type.	NEMOs and TSOs acknowledge the need for a high number of high number of linked bids. We fully agree that a good bidding framework is a condition for a true welfare maximisation. At the same time, it will not be possible to include every detail of all assets. The co-optimisation is thus a trade-off between on the one hand the benefit of better co-ordination between all assets, and on the other hand some reduction in the perfect

No.	Stakeholder	Organisation	Comment/Proposal	NEMOs & TSOs response
				optimisation of each single asset, which can in principle be better handled by the asset owner. During the continued R&D, we are grateful for specific suggestions from market participants on how to improve the design of linked and combined bids.
220.	Astrid Buhr Broge	Green Power Denmark	Green Power Denmark does not own or operate any assets, but our members do. For CHP plants it is important to have the possibility of using combined bid, linking of combined bids, and block bids to truly represent the technical constraints and cost of assets, along with the non-linear relationship between different products (aFRR, mFRR). We take note of the comment on page 15 that "The Nordic experiences show design challenges". The current non-exhaustive list of price elements/ constraints for thermal units is already 16 items long. It is important in the long run to strike a balance between simplicity and transparency decreasing the barriers for market participation on one side and a complex theoretical optimisation on the other."	We acknowledge the trade-off between simplicity and optimality that we also have commented in response 219.
221.	Magnus Landstad	Lyse Produksjon AS	All types are relevant. Since we have full flexibilty of delivering all products at almost any time, it is important that the bids can reflect the different costs for different combinations. Linking is always relevant since delivering aFRR or mFRR CM down will need also energy delivery. Combined bids are important since there is a difference in the unit cost of delivering a small amount vs. a large amount.	We appreciate this response and will consider it in the further R&D.
222.	Magnus Thorstensson	Swedenergy	The heavy reliance of hydro power requires the possibility to use all bid formats. But this is also a prerequisite for an efficient system based on decentralised dispatch and portfolio bidding.	No comment.

No.	Stakeholder	Organisation	Comment/Proposal	NEMOs & TSOs response
223.	Olivier Van den Kerckhove	ENGIE	For several types of assets, links between combined bids – in addition to links between combined and linked bids – would be necessary to reflect different configurations or running regimes of one asset.	No comment.
224.	Ola Hamada	Vattenfall Energy Trading	For pumped hydro, we need combined bids, within an exclusive, linked or loop bid.	We appreciate the suggestions. A storage bid is presently under development for energy bids. As soon as this is in place, we will consider the necessary adaptations to make it suitable for co-optimization, to the extent possible.
225.	Pierre Peureux	EDF	See answer to question 7 for the different asset types EDF operates and answer to question 12 for the different bid formats needed to properly represent them. Nevertheless, if EDF acknowledges the capability of linked of combined bids to represent different kind of offers, it has doubts about the capability of links of combined bids to represent with the same level of granularity the constraints of hydro assets due to the high number of assets in only one portfolio.	NEMOs and TSOs appreciate the feedback and share concerns about the complexity. We intend to develop bid formats that provide sufficient flexibility.
226.	Dr. Bernhard Walter	EnBW Energie Baden-Württemberg AG	As stated in the previous responses, we disagree with the approach of an asset-specific bid design.	Thank you for your feedback. During the continued R&D, we are grateful for specific suggestions from market participants on how to improve the design of linked and combined bids.
227.	Dr. Bernhard Walter	EnBW Energie Baden-Württemberg AG	As stated in the previous responses, we disagree with the approach of an asset-specific bid design.	Thank you for your feedback. During the continued R&D, we are grateful for specific suggestions from market participants on how to improve the design of linked and combined bids.
228.	Ulrik Gregers Jørgensen	Fjernvarme Fyn	As a district heating operator with both electricity consumption and heat-bound production, our current portfolio consists of several CHP plants, electric boilers, heat pumps as well as several units only producing heat. Initially we prefer combined bids together with optional linking.	We appreciate this response and will consider it in the further R&D.

No.	Stakeholder	Organisation	Comment/Proposal	NEMOs & TSOs response
			However, we request further analysis into bid-structure of complex multi energy market portfolios.	
229.	Anonymous	Anonymous	Hydro storage and run of river: - At this point combined bids or combined linked bids	No comment.

13. What kind of challenges do you foresee for your own company related to the proposed new bid designs (linked and combined bids)?

No.	Stakeholder	Organisation	Comment/Proposal	
230.	Abdolhamid Farzambehboudi	ASB group of companies (independent Analyst)	The proposed bid designs are a welcome evolution, but several practical challenges will arise in implementation, particularly for operators managing complex or multi-asset portfolios: Key Anticipated Challenges: 1. Increased Operational Complexity • Translating internal asset constraints into multiple linked or combined bids requires advanced bid management tools. • Smaller operators or aggregators may struggle to build and validate compliant bid sets without significant IT investment. 2. Algorithm Transparency & Predictability • Participants may face difficulty predicting outcomes of co-optimised clearing due to opaque internal logic, especially when linking and combining are simultaneously applied. • Lack of "what-if" tools will limit trust in bid outcomes. 3. Testing & Simulation Gaps • Without robust testing environments or shadow clearing, market actors cannot fully validate how new bid designs interact, particularly under network congestion or price volatility. 4. Bid Volume & Data Overload • For portfolio-based operations, the need to represent bids over multiple	NEMOs and TSOs appreciate these valuable suggestions, especially regarding testing environments, training and support for small parties. We will consider these suggestions in further work towards practical implementation.

No.	Stakeholder	Organisation	Comment/Proposal	
			hours and scenarios will lead to exponential bid volume growth, stressing both internal systems and TSO/NEMO platforms. 5. Training & Market Readiness • Internal teams require training not only in new bid formats but also in co-optimised clearing logic, bid rejection root causes, and risk modeling under hybrid bidding conditions. Final Note: While these challenges are real, they are not insurmountable — provided that: • Adequate tooling and sandbox access is provided early; • Regulatory guardrails for fairness and transparency evolve alongside; • Smaller participants receive targeted support or standard bid templates to ease entry.	
231.	Maiken Thomsen	Ørsted	The exclusion of block bids will have negative implications for market participants that own assets with high startup costs, that could potentially affect the economic viability of firm capacity in Europe.	NEMOs and TSOs would like to emphasize that it is currently not foreseen that existing order types (e.g., block bids) are discontinued in a co-optimised market setup. To avoid further misunderstandings this statement is now also included explicitly in the R1 report.
232.	Kjerstin Dahl Viggen	Hydro Energy	Added complexity.	No comment.
233.	Raphael Spiekermann	illwerke vkw	This would involve enormous implementation effort with no guarantee of achieving the targeted optimal bidding for our portfolio, resulting in a direct negative impact on global welfare. The desired gain of global welfare could actually result in a loss of global welfare due to suboptimal bids from all market participants due to the enormous complexity. The complex bidding processes are subject to a high risk of failure and instability. It will be difficult to design and implement an appropriate, reliable backup process for emergencies. The same, of course, applies to	NEMOs and TSOs share these concerns and are committed to keeping focus on these issues during the further R&D.

No.	Stakeholder	Organisation	Comment/Proposal	
			the co-optimized auction, which has the potential to cause significant economic damage.	
234.	Lucie Horová	CEZ Group	None of operators will ever be able to create a complex portfolio optimized bid under the described condition. All the operators will be facing a burden of creation a complex bidding mathematical tool. To achieve such a complexity is hard and costly. Such costs are not included in the Co-optimization effects at all.	NEMOs and TSOs recognize the efforts and costs related to a potential implementation.
235.	Dione Hernández Galvis	RWE Supply & Trading GmbH	The proposed bid design seems very complex to us. At this stage, it is not yet clear to us whether we will be able to map all the necessary commercial constraints of our portfolio. If this is not possible, we will have to bid parts "explicitly", which runs counter to the desired result. We also cannot yet foresee what impact a mixture of coordinated, combined energy and balancing capacity bids on the one hand and uncoordinated separate energy and balancing capacity bids on the other will have on the clearing price and therefore on our result. As a result, we may not be able to maintain our services to third parties where we only offer either Energy or Balancing Capacity.	NEMOs and TSOs appreciate the feedback and like point out that these concerns are shared. Specifically, the impact on prices will be investigated in the next R&D phase as part of the simulations.
236.	Thomas Kallevik	Statkraft Energi AS	Extremely complex with risk of errors. Almost irrelevant implementation, as the future asset mix on the Continent will be far different than today; less central thermal units, more decentral flexible units. Capacity payments in day-ahead will be less relevant, but an open market for small scale flexibility will be increasingly important to foster the growth of renewables.	We appreciate these suggestions and point out that suggested bid formats aim at being general and cover all types of assets, not only thermal units.
237.	Klaus Salletmaier	SWM	IT and operational efforts to set up the new process	NEMOs and TSOs recognize the efforts and costs related to a potential implementation.
238.	Liselotte van Balen	Eneco	The key challenge relates to the complexity of converting the existing portfolio bidding process into the new bid formats.	Thank you for the feedback.

No.	Stakeholder	Organisation	Comment/Proposal	
239.	Krassimir Stantchev	BDEW	The proposed bid designs lead to an increased bidding complexitiy which may not be manageable. Market participants could then need to resort to simplified bidding structures that would not reflect the full potential of their portfolio´s capabilities, resulting in higher sys-tem costs. In particular, such bidding complexity could lead to an artificial split of offers between spot and balancing capacity markets. This would have detrimental market impacts, e.g. reduce market liquidity, and would lead to inefficiencies at a significant social cost which could outweigh any theoretical benefits of co-optimisation.	NEMOs and TSOs recognize these concerns as is now also reflected in the R1 report.
240.	Astrid Buhr Broge	Green Power Denmark	Green Power Denmark's reply on behalf of members: The exclusion of block bids will have negative implications for market participants that own assets with high startup costs. This could potentially affect the economic viability of firm capacity in Europe	NEMOs and TSOs would like to emphasize that it is currently not foreseen that existing order types (e.g., block bids) are discontinued in a co-optimised market setup. To avoid further misunderstandings this statement is now also included explicitly in the R1 report.
241.	Magnus Landstad	Lyse Produksjon AS	We dont see any big challenges on our side. There are a lot of different bid types suggested, so it is important that the market clearing stays transparent, and that the real costs of energy and capacity is reflected in the market prices.	Thank you for the feedback. The envisaged simulations will among others investigate the impact on prices and their transparency.
242.	Magnus Thorstensson	Swedenergy	See answer Q19 above.	
243.	Olivier Van den Kerckhove	ENGIE	The correct reflection of asset limitations and abilities through bidding format, both in terms of parameters/characteristics within combined bids, as well as potential limitations on linked bids (or linking of linked/combined bids). Overly simplifying asset representation will reduce the efficiency of the market outcome. It may lead to market participants focusing their limited bidding ability on expected market	Thank you for your feedback. At this point we would like to refer to previous comments on the bid design.

No.	Stakeholder	Organisation	Comment/Proposal	
			outcome, reintroducing market forecasting imprecisions that co-optimisation aims to reduce or even eliminate.	
244.	Ola Hamada	Vattenfall Energy Trading	1- technically creating and displaying the bids for the planners to verify 2- ensuring that the result from the exchange would be sufficiently feasible 3- Pricing the bids and premiums. I reckon a little bit of guess work would have to be done at the start 4- Trusting how the new algo would work, getting the kind of results we expect 5- Ensuring that our entire capacity is available for all possible markets	At this point we would like to refer to previous comments on the bid design.
245.	Pierre Peureux	EDF	EDF identifies several kinds of challenges related to the proposed bid designs. The list below is not exhaustive: • Algorithmic challenges in replicating the model • Difficulty in analyzing market results • The necessity to update the management of our portfolio and the bidding process • …	At this point we would like to refer to previous comments on the bid design.
246.	Coline Gailleul	Energy Traders Europe	The proposed bid designs lead to an increased bidding complexity which may not be manageable. Market participants could then need to resort to simplified bidding structures which would not reflect the full potential of their portfolio capabilities, resulting in higher system costs. In particular, such bidding complexity could lead to an artificial split of offers between spot and balancing capacity markets. This would have detrimental market impacts, e.g. reduced market liquidity, and would lead to inefficiencies at a significant social cost which could outweigh any theoretical benefits of co-optimisation. The operators and market participants will also face costs and challenges when creating a complex bidding mathematical tool for a complex portfolio-optimized bid under the described conditions. Such costs are not included in the co-optimisation effects.	NEMOs and TSOs recognize these concerns as is now also reflected in the R1 report. We understand that a potential implementation could result in significant efforts and costs.

No.	Stakeholder	Organisation	Comment/Proposal	
247.	Dr. Bernhard Walter	EnBW Energie Baden-Württemberg AG	In general, we are concerned about the proposed new bid design and do not support it. The proposed bid designs lead to an increased bidding complexity which may not be manageable. Market participants could then need to resort to simplified bidding structures that would not reflect the full potential of their portfolio's capabilities, resulting in higher system costs. Such bidding complexity could lead to an artificial split of offers between spot and balancing capacity markets. This would have detrimental market impacts, e.g. reduce market liquidity, and would lead to inefficiencies at a significant social cost which in our view would outweigh any theoretical benefits of co-optimisation.	NEMOs and TSOs recognize these concerns as is now also reflected in the R1 report.
248.	Ulrik Gregers Jørgensen	Fjernvarme Fyn	In the optimization a portfolio of multi energy markets and different assets such as electric boilers, heat pumps, CHP-plants, a heat storage and the obligation to fulfilled a certain heating demand, the complexity of either linked or combined bids is quite high. We foresee a difficult developmental task to adapt to a more complex bid structure and recommend further study into the compatibility of the proposed bidding structures. We'd also like to see how new technologies are covered as a part of the following R&D phases. If the bidding process becomes too complex, the transparency and efficiency of the market is at risk. Theres also a risk that the proposed bidding scheme does not support the correct cost representation of our cost. We recommend: - Backward compatibility with current bid formats. - Further research into new technologies and multi-energy portfolio bid representation.	NEMOs and TSOs appreciate the recommendations for further R&D. At this point we would like to refer to previous comments on the bid design and the topic of multi energy systems
249.	Anonymous	Anonymous	Complex setup of bids, where and how to build and visualize them - How to make sure that bids are timely and correct?	NEMOs and TSOs share the concern on the complexity of the bid design as is now also reflected in the R1 report

14. The report (Chapter 3) considers non-convexities as a major challenge for co-optimisation, caused by the technical characteristics/constraints of production assets (primarily thermal generators and their startup costs, minimum generation levels, minimum up/down times and other modelling options). What other sources of non-convexities do you see that have not been considered (e.g. in hydro fleets)?

No.	Stakeholder	Organisation	Comment/Proposal	NEMOs & TSOs response
250.	Abdolhamid Farzambehboudi	ASB group of companies (independent Analyst)	Yes, I agree — non-convexities are not just a major challenge, they're the messy roommate in the co-optimisation apartment. You can't kick them out, but you also can't pretend they're not eating up all your efficiency. Non-convex cost structures — such as startup costs, minimum run levels, and intertemporal constraints — can't be flattened into clean, linear bids without losing essential economic signals. Ignoring them would lead to distorted outcomes or infeasible schedules. Including them, however, demands significant computational power and smart bid design (which the linked/combined proposals begin to address). So yes — they're a challenge. But like many challenges in life, they're easier to manage when you're the one holding the reins. And in this case, افسار ما دست شماست — let's hope the horse doesn't run off a cliff.	No specific comment.
251.	Maiken Thomsen	Ørsted	The non-convexities between local heating markets and the internal electricity market. This is especially an issue for CHP which serve both local heating market, DA, ID and ancillary service markets.	We appreciate this response that, together with several others, suggests more specific focus on CHP. NEMos and TSOs would like to clarify that SDAC will clearly not be able to address costs related to the heating market, and it will remain up to the market party to provide these.

No.	Stakeholder	Organisation	Comment/Proposal	NEMOs & TSOs response
252.	Raphael Spiekermann	illwerke vkw	We see the non-convexities, but cannot name any others at the moment.	No comment.
253.	Lucie Horová	CEZ Group	any cascade for connected generation units, system of connected dams, hydro pump storages, accumulation + combustion gas turbines, more sophisticated complexes of power generation-heat supply-balancing services provision systems	These are indeed complex relations between assets that are hard to represent in the central market coupling. They will still need to be handled at the market participant level, as today. We agree that this becomes more complicated with co-optimisation, and refer to the trade-off we have commented e.g. in 33
254.	Dione Hernández Galvis	RWE Supply & Trading GmbH	Additional sources of non-convexities that should be considered include: • Start-up costs and minimum generation levels across various technologies, not just thermal, • Non-linear efficiencies, particularly relevant for storage and hydro, • Minimum up/down times for flexible but constrained assets, • Hydro topologies, including pumped storage operations, where water routing, reservoir levels, and interdependencies between turbines and pumps introduce complex, non-convex constraints.	We appreciate these suggestions and acknowledge specifically the challenges for hydro strings. We also refer to response 33.
255.	Thomas Kallevik	Statkraft Energi AS	Start / stop costs. Some issues with balancing services across needle combination which only gives certain production levels on the plant, 5-10 MW, 25-50 MW and 75-100 MW as an example. Legal production area for hydro plant, some production levels might be unwanted due to technical restrictions such as vibrations. The latter examples results in disconnected production areas.	These are indeed complex relations between assets that are hard to represent in the central market coupling. They will still need to be handled at the market participant level, as today. We agree that this becomes more complicated with co-optimisation, and refer to the trade-off we have commented e.g. in #33
256.	Krassimir Stantchev	BDEW	Even though it is stated that combined bids do not imply unit-based bidding, with more specific bid structures there is an obvious tendency towards unit-based bidding. This would restrict the efficiency gains that	We consider that all R&D efforts for co-optimisation will be directed at providing the appropriate tools for the MPs to participate either under a portfolio based

No.	Stakeholder	Organisation	Comment/Proposal	NEMOs & TSOs response
			market participants can generate by portfolio bidding and self-dispatch up to delivery.	bidding strategy or with a unit-based bidding strategy depending on the preferred option. To this extent, we aim to make the co-optimisation design compatible with current market options, and we do not intent to narrow these options. We recognize the inherent complexity of portfolio bidding and strive to provide the right tools to enable it.
257.	Astrid Buhr Broge	Green Power Denmark	The non-convexities between local heating markets and the internal electricity market. This is especially an issue for CHP with serve both local heating market, DA, ID and ancillary service markets. Same could be the case for PtX producers depending on the commercial setup and the development of the hydrogen market.	We appreciate this response that, together with several others, suggests more specific focus on CHP. NEMos and TSOs would like to clarify that SDAC will clearly not be able to address costs related to the heating market, and it will remain up to the market party to provide these.
258.	Magnus Landstad	Lyse Produksjon AS	Hydro fleets have many of the same non-comvexities: Start up costs, ramping, constraints in the reservoirs levels and downstream rivers. Non-convex-efficiency curves and illegal areas of load for some stations.	We appreciate these suggestions and acknowledge specifically the challenges for hydro strings. We also refer to response #33.
259.	Ola Hamada	Vattenfall Energy Trading	Downtime needed between running pumps/turbines.	No specific comment.
260.	Pierre Peureux	EDF	EDF shares the mentioned concerns regarding non-convexities caused by technical constraints of production assets and agrees with the summary of constraints (non-exhaustive) listed in the end of the R0 report that need to be taken into account. EDF sees at least two major source of non-convexities that doesn't seem to be addressed: operating	Regarding hydro we refer to response #254. Regarding the general danger of the reduction of global welfare, NEMOs and TSOs agree, and this needs full attention in the upcoming R&D phases.

No.	Stakeholder	Organisation	Comment/Proposal	NEMOs & TSOs response
			points constraints for thermal power plants which prevents the technical feasibility of all possible combinations of balancing and energy products a s well as cascading constraints within a valley for hydro fleets. Those constraints are exacerbated by the co-optimisation paradigm and will lead to premium and suboptimalities. Moreover, EDF stresses out the need to allow actors to represent their assets or portfolio through block bids. Moreover, and as expressed before, it is of the utmost importance to accurately represent the constraints of one asset or a group of assets through an important diversity of the biding products, something that is partially made possible in the current sequential market. However, the implementation of co-optimisation leads to higher level of algorithmic complexity, and EDF is worried that the implementation of such evolutions in the algorithm would results in the decrease of the diversity of bidding products and therefore would decreases the global welfare compared to a sequential market.	At the same time, it is necessary to acknowledge that these effects are difficult to analyze theoretically while at the same time such technical constraints are already existing.
261.	Coline Gailleul	Energy Traders Europe	We identify any cascade for connected generation units, systems of connected dams, pump storage, accumulation and combustion gas turbines, and more sophisticated complexes of power generation-heat supply-balancing services provision systems. Although it is stated that combined bids do not imply unit-based bidding (asset-specific bidding), with more specific bid structures there is an obvious tendency towards unit-based bidding. This would restrict the efficiency gains that market participants can generate by portfolio bidding and self-dispatch up to delivery.	These are indeed complex relations between assets that are hard to represent in the central market coupling. They will still need to be handled at the market participant level, as today. We agree that this becomes more complicated with co-optimisation, and refer to the trade-off we have commented e.g. in 33 We consider that all R&D efforts for co-optimisation will be directed at providing the appropriate tools for the MPs to participate either under a portfolio based bidding strategy or with a unit-based bidding strategy depending on the preferred option. To this extent, we aim to make the co-optimisation design

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				compatible with current market options, and we do not intent to narrow these options. We recognize the inherent complexity of portfolio bidding and strive to provide the right tools to enable it.
262.	Dr. Bernhard Walter	EnBW Energie Baden-Württemberg AG	Even though it is stated that combined bids do not imply unit-based bidding, we do have very strong concerns that with more specific bid structures there is an obvious tendency towards unit-based bidding. This would clearly restrict the efficiency gains that market participants can generate by portfolio bidding and self-dispatch up to delivery.	We consider that all R&D efforts for co-optimisation will be directed at providing the appropriate tools for the MPs to participate either under a portfolio based bidding strategy or with a unit-based bidding strategy depending on the preferred option. To this extent, we aim to make the co-optimisation design compatible with current market options, and we do not intent to narrow these options. We recognize the inherent complexity of portfolio bidding and strive to provide the right tools to enable it.
263.	Ulrik Gregers Jørgensen	Fjernvarme Fyn	We highlight heat production constraints, such as minimum thermal output, as non-convex factors not directly linked to electricity markets, but highly relevant for co-optimization. Similarly, participation in other markets can lead to non-convex solutions, such as local heating market or participation in the FCR market.	We refer to our other answers to this question's responses.
264.	Anonymous	Anonymous	For example (additional to the list of Appendix B) • efficiency curve of steam/hydro turbine • FCR capability if FCR could be part of market • Price dependency of energy cost (not stable variable cost for some assets)	We believe that several of these points can be handled with linked bids, but acknowledge the required development efforts by market participants, see also #237.

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			• Cumulative daily energy limit • - Minimum production level for energy and capacity bid as they could be different	

15. Do you have comments on the proposed pricing approach with a preference for a solution where Paradoxically Accepted Bids (No PAB) are removed from the solution? For more detailed information on the No PAB design, please refer to section 5.4.1 of Appendix A: N-Side Report.

No.	Stakeholder	Organisation	Comment/Proposal	NEMOs & TSOs response
265.	Abdolhamid Farzambehboudi	ASB group of companies (independent Analyst)	The proposal to adopt a pricing approach with No PABs (Paradoxically Accepted Bids) is conceptually sound and welcome — provided the market-clearing engine can handle the stress without needing a therapist. Removing PABs increases transparency and aligns accepted bids with participants' true preferences, reducing the need for post-market patch-ups. It's like promising, "If your bid clears, you actually make money" — a refreshing upgrade from the current paradox where one might win and still lose. That said, avoiding PABs often comes at the cost of welfare suboptimality or added algorithmic complexity. The goal should be to ensure that efficiency is not sacrificed just to keep the results more palatable. Market participants understand risk — what they need is clarity. In short: removing PABs is great — as long as it doesn't turn the market into a paradox of its own. If we're cutting paradoxes, let's not create a new one in the algorithm. Or as we say:	NEMOs and TSOS note broad support for a No-PAB approach, particularly acknowledging the increased transparency, coherence, flexibility and alignment with current SDAC practices that this design brings. At the same time, we recognize the concerns raised about potential algorithmic limitations as also mentioned in R0. We understand that excluding PABs could restrict product diversity or limit the number of offers available, should technical constraints arise. In response, we agree that ongoing qualitative and quantitative analysis will be essential, and that it is prudent to revisit the exclusion of PABs if significant trade-offs are observed.

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			آمدیم ابرو درست کنیم، زدیم چشم رو کور کردیم We came to fix the eyebrow — and ended up blinding the eye. آمدیم ثواب کنیم، کباب شدیم We meant to do a good deed — and got ourselves burned instead.	
266.	Maiken Thomsen	Ørsted	In terms of market transparency, Orsted supports the current market design choice of not including paradoxically accepted bids. However, it is important to stress that in case trade-offs need to be done because of limitations in algorithmic performance – like limiting the type or amount of products made available to market participants – this choice to exclude PABs may need to be revisited.	NEMOs and TSOs acknowledge the support for the current market design choice of not allowing paradoxically accepted bids (PABs). Furthermore, it is noted and agreed that further R&D may reveal the need to revisit this choice if algorithmic limitations lead to restricted product diversity or a reduced number of offers available to market participants. NEMOs and TSOs are committed to making clear such trade-offs in the upcoming phases of R&D to ensure that any significant trade-offs are thoroughly evaluated and addressed.
267.	Dione Hernández Galvis	RWE Supply & Trading GmbH	We agree with the proposed removal of Paradoxically Accepted Bids. The "No PAB" design ensures clear and uniform pricing, which enhances market coherence, transparency, and trust. It aligns with existing SDAC practice and supports consistent price signals across markets.	NEMOs and TSOs acknowledge the support for the current market design choice of not allowing paradoxically accepted bids (PABs). Furthermore, it is noted and agreed that further R&D may reveal the need to revisit this choice if algorithmic limitations lead to restricted product diversity or a reduced number of offers available to market participants. NEMOs and TSOs are committed to making clear such trade-offs in the

No.	Stakeholder	Organisation	Comment/Proposal	NEMOs & TSOs response
				upcoming phases of R&D to ensure that any significant trade-offs are thoroughly evaluated and addressed.
268.	Krassimir Stantchev	BDEW	We agree with the proposed removal of Paradoxically Accepted Bids. The "No PAB" design ensures clear and uniform pricing, which enhances market coherence, transparency, and trust. It aligns with existing SDAC practice and supports consistent price signals across markets.	NEMOs and TSOs acknowledge the support for the current market design choice of not allowing paradoxically accepted bids (PABs). Furthermore, it is noted and agreed that further R&D may reveal the need to revisit this choice if algorithmic limitations lead to restricted product diversity or a reduced number of offers available to market participants. NEMOs and TSOs are committed to making clear such trade-offs in the upcoming phases of R&D to ensure that any significant trade-offs are thoroughly evaluated and addressed.
269.	Astrid Buhr Broge	Green Power Denmark	In terms of market transparency, we support the current market design choice of not including Paradoxically accepted bids. However, it is important to stress that in case trade-offs need to be done because of limitations in algorithmic performance – like limiting the type or number of products made available to market participants – this choice to exclude PABs may need to be revisited. We therefore agree with NEMOs and TSO's that further qualitative and quantitative analysis is necessary to decide on that question.	NEMOs and TSOs recognize the need to revisit this choice if algorithmic limitations lead to restricted product diversity or a reduced number of offers available to market participants. NEMOs and TSOs are committed to ongoing qualitative and quantitative analysis to ensure that any significant trade-offs are thoroughly evaluated and addressed.
270.	Magnus Landstad	Lyse Produksjon AS	We concider it most correct to choose the Option 1, Non Uniform Pricing with Side Payment. With Option 0, bids can be rejected allt though they are "in the money" on the cleared market price. This means the market price is set some higher than if the rejected bids were	NEMOs and TSOs understand the arguments for preferring Option 1, Non-Uniform Pricing with Side Payment, as it ensures market prices reflect the actual

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			included. With opt. 1, we will get a market price that reflects the prices of the volumes available. The bid that in Opt. 0 would have been rejected, should than be compensated with the difference between bid price and market price. This will give the lowest and most transparent market prices for the different market products. We have in the Nordic seen many non intuitive market prices in aFRR and mFRR CM, caused by accepted block bids that set an extreme price spike in a single hour to make the block bid in the money, causing many of the ordinary bids to be rejected. This is not good for the functioning of the markets, it might cause strategic bidding, it gives wrong signals to the market players, ant the price does not reflect the real cost of delivering capacity in those hours. All though the mathematical solution might be correct, it is not good for keeping a well functioning market. It is important that the marked clearing is transparent and published to the market participants.	prices of available volumes and compensates rejected bids, leading to more transparent and competitive market prices. However, given the associated complexity of a solution like Option 1 and that such issues are aggravated by low liquidity markets (which are not relevant for all areas and will be less relevant under co-optimisation), NEMOs and TSOs remain committed to Option 0 (No-PAB) as the default option for further assessment in upcoming R&D phases.
271.	Magnus Thorstensson	Swedenergy	We agree with NEMOs and TSO's that further qualitative and quantitative analysis is necessary to decide on that question.	No specific comment.
272.	Olivier Van den Kerckhove	ENGIE	We agree with the current proposal to remove Paradoxically Accepted Bids. However, this has algorithmic performance consequences. If in future development it becomes clear that trade-offs need to be done because of limitations in algorithmic performance – like limiting the type or amount of products made available to market participants – the choice to exclude PABs may need to be revisited.	NEMOs and TSOs acknowledge the potential algorithmic performance consequences and agree that if future developments reveal significant trade-offs, such as limiting the type or amount of products available to market participants, the exclusion of PABs may need to be revisited. NEMOs and TSOs are committed to ongoing qualitative and quantitative analysis to ensure that any significant trade-offs are thoroughly evaluated and addressed.

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273.	Ola Hamada	Vattenfall Energy Trading	For the German market, I expect that we would have enough liquidity.	NEMOs and TSOs note the input that the German market will be less likely to suffer the consequences of low liquidity related issues which may present obstacles for the transparency of prices in the No-PAB solution.
274.	Pierre Peureux	EDF	The evaluation of the impact on the liquidity and the ability for all TSOs to cover their balancing capacity needs is insufficient at the moment to give a definitive answer. EDF agrees with the issue raised at the beginning of paragraph 3.3.3 regarding the No PAB rule (aka the main issue with the No PAB design is liquidity). EDF understands the ground behind the choice for the no-PAB solution but underlines it comes with drawbacks. For example, if a market participant has a limited portfolio, or a portfolio leading to an incentive of at-all-cost bidding strategy, it will adapt its strategy to ensure having a revenue every day and for every asset, even if it means using fewer complex bids to avoid PRBs. This can lead to infeasibilities and future costs to balance the portfolio after the day-ahead market, which will be reflected in the offered bids. Moreover, the other solution explained in the R0 report is the use of Non-Uniform Pricing. EDF understands the benefit of this proposal but remains doubtful regarding the side-payments of this design which could come from regulatory pocket and grid tariffs for example. In this regard, EDF shares NEMOs and TSOs' point of views that further qualitative and quantitative analyses is necessary to validate if and how non-uniform pricing should be considered for future implementation. In particular, EDF considers that impacts on liquidity and on algorithmic complexity should be measured before definitively adopting one of those pricing options. Those impacts could indeed need to be weighed against other design options (such as the product and bid diversity).	NEMOs and TSOs acknowledge that the evaluation of the impact on liquidity and the ability for all TSOs to cover their balancing capacity needs is currently insufficient to provide a definitive answer on the feasibility of co-optimisation. We understand EDF's concerns regarding the No PAB rule and the potential drawbacks, such as the impact on market participants with limited portfolios and the risk of strategic bidding. NEMOs and TSOs also recognize the need for further qualitative and quantitative analyses to validate the feasibility of a pricing solution given identified trade-off. However, NEMOs and TSOs maintain that No-PAB is the preferred default option but remain committed to investigate its potential impacts and trade-offs with liquidity and algorithmic complexity. NEMOs and TSOs are committed to ongoing evaluation to ensure that any significant trade-offs are thoroughly assessed and addressed.

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275.	Coline Gailleul	Energy Traders Europe	We agree with the proposed removal of Paradoxically Accepted Bids. The "No PAB" design ensures clear and uniform pricing, which enhances market coherence, transparency, and trust. It aligns with existing SDAC practices and supports consistent price signals across markets. However, if this design proves ineffective, it should be possible to revise it together with market participants, taking into account consequences on price formation and on Euphemia (notably stress on the algorithm).	NEMOs and TSOs acknowledge the support for the current market design choice of not allowing paradoxically accepted bids (PABs). Furthermore, it is noted and agreed that further R&D may reveal the need to revisit this choice if algorithmic limitations lead to restricted product diversity or a reduced number of offers available to market participants. NEMOs and TSOs are committed to making clear such trade-offs in the upcoming phases of R&D to ensure that any significant trade-offs are thoroughly evaluated and addressed.
276.	Dr. Bernhard Walter	EnBW Energie Baden-Württemberg AG	We do not have any further comments.	No specific comment.
277.	Ulrik Gregers Jørgensen	Fjernvarme Fyn	We initially support the No PAB approach due to its simplicity and transparency. Continuous monitoring of market impact is necessary.	NEMOs and TSOs acknowledge the support for the current market design choice of not allowing paradoxically accepted bids (PABs). Furthermore, it is noted and agreed that further R&D may reveal the need to revisit this choice if algorithmic limitations lead to restricted product diversity or a reduced number of offers available to market participants. NEMOs and TSOs are committed to making clear such trade-offs in the upcoming phases of R&D to ensure that

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				any significant trade-offs are thoroughly evaluated and addressed.
278.	Max Schneider	Eurelectric	For reasons of market transparency and ease of market outcome understanding, Eurelectric supports the current design choice to not include Paradoxically Accepted Bids. However, Eurelectric also understands that this choice affects algorithmic performance. It is important to stress that in case trade-offs need to be done because of limitations in algorithmic performance – like limiting the type or amount of products made available to market participants – this choice to exclude PABs may need to be revisited. Besides, the assessment of the impact on market liquidity and the capacity of all TSOs to meet their balancing needs is not yet comprehensive enough to draw a definitive conclusion. Eurelectric thus shares NEMOs and TSOs' point of view that further qualitative and quantitative analysis is necessary to decide on that question.	NEMOs and TSOs acknowledge Eurelectric's concerns regarding the impact on algorithmic performance and the potential need to revisit this choice if significant trade-offs arise. We also agree that further qualitative and quantitative analysis is necessary to comprehensively assess the impact on market liquidity and the capacity of all TSOs to meet their balancing needs. Please also refer to response #266
279.	Anonymous	Anonymous	Co-optimized SDAC would be just one step on continuous markets	No specific comment.

16. What are your reflections on other alternative pricing options outlined in the report and its annexes?

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280.	Abdolhamid Farzambehboudi	ASB group of companies (independent Analyst)	The alternative pricing options outlined in the report — including marginal pricing with non-convexities, pay-as-bid, and uplift/convex hull approaches — each offer a unique balancing act between efficiency, fairness, and computational feasibility. Marginal pricing is theoretically elegant and promotes welfare maximization, but struggles under real-world non-convex constraints. It's like telling a pianist to play with broken keys — beautiful in theory, but incomplete in practice. Pay-as-bid seems appealing for predictability but distorts bidding	NEMOs and TSOs appreciate this overview that confirms our view that pricing with non-convexities is not a "law of nature" but a trade-off between conflicting requirements.

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			incentives and may encourage strategic behavior, especially in tight or asymmetric markets. It might reward those who guess the auctioneer's mind, not those who offer true value. Convex hull pricing is the economic gold standard — but also the computational nightmare. While it could recover fixed costs more fairly and resolve PABs with fewer tradeoffs, the scale and data requirements could overwhelm current systems unless significant algorithmic innovation occurs. If we oversimplify, we risk unfairness or lost efficiency. If we overcomplicate, we risk opacity or system breakdown. So instead of chasing the perfect price, perhaps the goal is a pricing method that works well enough, transparently enough, and fast enough — and isn't undone by an edge case at 2am. As we say: هر گلی خاری دارد Every rose has its thorn. اگر هنر ترکیب رنگ‌ها را بلد نیستیم، در خصوص زیبایی گل‌ها صحبت نکنیم If we don't understand the art of color harmony, perhaps we shouldn't rush to judge the beauty of the flowers.	
281.	Thorbjørn Grønbæk	Epsilon Quantitative ApS	While they all appear desirable, it is unclear to me whether introducing additional complexity into an already fairly complex energy market, will allow the consumers to understand their electricity bill. Ultimately, I think all of the above suggestion option decrease the ability of the consumer to understand their electricity bill. Whether this is achievable or not, is a great question, but given the recent gas crisis in 2022 and subsequent public uproar on electricity prices, I feel that there is great political value (not just economical) in choosing the simplest solution and allowing a somewhat imperfect, but transparent & understandable, market to operate.	NEMOs and TSOs understand the concerns about the complexity of the energy market and the importance of maintaining transparency and simplicity for participants. We acknowledge the potential risks associated with co-optimization frameworks, including increased computational complexity and reduced flexibility, and agree that these factors must be carefully evaluated. It is crucial to preserve the ability of free and

No.	Stakeholder	Organisation	Comment/Proposal	NEMOs & TSOs response
				flexible markets to adapt to changing conditions while ensuring grid stability and security of supply. This includes further qualitative and quantitative analysis to comprehensively assess the impact on market liquidity and the capacity of all TSOs to meet their balancing needs as well as to investigate its potential impacts and trade-offs with liquidity and algorithmic complexity. NEMOs and TSOs are committed to ongoing evaluation to ensure that any significant trade-offs are thoroughly assessed and addressed.
282.	Lucie Horová	CEZ Group	The report and all co-optimization proceedings do not touch the back up procedures at all. We have seen couple of problems in the current set up, where at least once coupling did not happen and market participants faced a big financial loss. In this case it is a big risk for grid stability and security of supply. In general, increasing the level of one-step multidimensional market optimization—such as that proposed by co-optimization frameworks—tends to elevate both the computational complexity and the systemic impact on market participants. This, in turn, introduces greater rigidity and reduces flexibility within the day-ahead planning and trading systems. Such a structure may prove less adaptable in responding to emerging challenges within the European electricity and balancing capacity reservation markets. We strongly recommend that these potential risks be carefully considered in the evaluation of co-optimization strategies. Given the increasing and foreseeable need for dynamic and responsive market	NEMOs and TSOs acknowledge the concerns regarding the lack of backup procedures in the current co-optimization R&D deliverable and the potential risks to grid stability and security of supply. We clarify that back-up and fallback procedures for both day-ahead energy and balancing capacity will be covered in the R3 deliverable. NEMOs and TSOs further recognize the challenges posed by increased computational complexity of the algorithm. NEMOs and TSOs are committed to ongoing evaluation to ensure that any significant trade-offs are

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			mechanisms, it is essential to preserve the ability of free and flexible markets to evolve in step with changing conditions.	thoroughly assessed and addressed in the upcoming phases of R&D. Regarding reduced flexibility within day-ahead planning and trading systems, NEMOs and TSOs take note that market participants highlight risks of greater rigidity and reduced flexibility for market participants depending on the requirements for market participants if co-optimisation is implemented. NEMOs and TSOs however would also like to point out that the proposed bid design seeks to create at least the same amount of flexibility in bidding as is seen today.
283.	Thomas Kallevik	Statkraft Energi AS	Not looked into the details. If side payments are introduced, it is important to have measures in place to still secure efficient pricing of the individual bids and also to ensure the transparency in the market. It remains important that market players have the means to understand the price formation based on fundamental data of the market. We believe with nodal pricing and different optimisation methods, this might vanish.	NEMOs and TSOs acknowledge that there are many unknowns and potential complications related to nodal pricing. NEMOs and TSOs however, would like to stress that there are no current plans on introducing nodal pricing.
284.	Thomas Kallevik	Statkraft Energi AS	Not looked into the details. If side payments are introduced, it is important to have measures in place to still secure efficient pricing of the individual bids and also to ensure the transparency in the market. It remains important that market players have the means to understand the price formation based on fundamental data of the market. We believe with nodal pricing and different optimisation methods, this might vanish.	
285.	Liselotte van Balen	Eneco	We would like to point out that the consultation period is too short to form an opinion on this.	NEMOs and TSOs acknowledge that the contents of R0 are indeed technical and complex – therefore the public

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				consultation period was also extended to last 6 weeks. Given the long stretch of work on co-optimisation R&D, NEMOs and TSOs are of course open to receiving feedback from market participants at any time.
286.	Krassimir Stantchev	BDEW	The ambiguity that is introduced in price formation by jointly clearing energy and balancing capacity is even increased with more sophisticated pricing options.	NEMOs and TSOs acknowledge that this is a significant concern for market participants. It is clear that while the removal of Paradoxically Accepted Bids (PABs) is widely supported for enhancing market coherence and transparency, and is the preferred option of NEMOs and TSOs, there are valid concerns about the potential complexities and algorithmic limitations that could arise, necessitating the need to look closer into options of Non-uniform pricing. Hence NEMOs and TSOs appreciate the comment on ambiguity of such options and will further assess and communicate any further trade-offs that may be observed during simulations.
287.	Astrid Buhr Broge	Green Power Denmark	We generally oppose alternative pricing schemes like Non-Uniform Pricing due to the lack of market and price transparency.	NEMOs and TSOs acknowledge that this is a significant concern for market participants. It is clear that while the removal of Paradoxically Accepted Bids (PABs) is

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				widely supported for enhancing market coherence and transparency, and is the preferred option of NEMOs and TSOs, there are valid concerns about the potential complexities and algorithmic limitations that could arise, necessitating the need to look closer into options of Non-uniform pricing. Hence NEMOs and TSOs appreciate the comment on ambiguity of such options and will further assess and communicate any further trade-offs that may be observed during simulations.
288.	Magnus Landstad	Lyse Produksjon AS	See question 22.	
289.	Magnus Thorstensson	Swedenergy	We oppose alternative pricing schemes as this do not create the correct market signals and also undermines transparency.	NEMOs and TSOs acknowledge that this is a significant concern for market participants. It is clear that while the removal of Paradoxically Accepted Bids (PABs) is widely supported for enhancing market coherence and transparency, and is the preferred option of NEMOs and TSOs, there are valid concerns about the potential complexities and algorithmic limitations that could arise, necessitating the need to look closer into options of Non-uniform pricing. Hence NEMOs and TSOs appreciate the comment on ambiguity of such options and will

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				further assess and communicate any further trade-offs that may be observed during simulations.
290.	Ola Hamada	Vattenfall Energy Trading	I dislike the lack of transparency when it comes to one -time payouts.	NEMOs and TSOs recognize the lack of intuitiveness as one drawback of non-uniform pricing, which however must be weighed against potential problems with the No-PAB solution, to be investigated.
291.	Pierre Peureux	EDF	EDF regrets that the evaluation of a solution based on the "market-based" methodology was not considered given that the "market-based" solution offers a more feasible alternative. The implementation of co-optimisation may lead to strong inefficiencies linked to the possibility to fully reflect technical capabilities and constructive limitations of assets for the simultaneous matching of energy and reserve bids. As expressed before, implementing co-optimisation will lead to use far more significantly complex orders to reflect both interdependencies between assets (as of today) and energy-balancing capacity interdependencies, with huge computational impact.	NEMOs and TSOs recognize this concern but point out that the focus of this R&D is limited to co-optimisation as prescribed. As such, an assessment of market based remains out of scope, although NEMOs and TSOs think that options for exchanging BC should be compared to each other on fair terms before any decisions on implementations are made
292.	Coline Gailleul	Energy Traders Europe	The ambiguity introduced in price formation by jointly clearing energy and balancing capacity is increased with more sophisticated pricing options. Additionally, the report and all co-optimisation proceedings do not appertain to the backup procedures in case of decoupling. In the current setup, we observed a few problems where one partial decoupling resulted in significant losses for market participants. We see a considerable risk for grid stability and security under co-optimisation where TSOs will not have any balancing reserves.	NEMOs and TSOs acknowledge these concerns and point out that these issues will be subject to the next R&D phases.

No.	Stakeholder	Organisation	Comment/Proposal	NEMOs & TSOs response
293.	Dr. Bernhard Walter	EnBW Energie Baden-Württemberg AG	The ambiguity that is introduced into the price formation by jointly clearing scheduled energy and balancing capacity bids is even further increased with more sophisticated pricing options.	NEMOs and TSOs acknowledge that this is a significant concern for market participants. It is clear that while the removal of Paradoxically Accepted Bids (PABs) is widely supported for enhancing market coherence and transparency, and is the preferred option of NEMOs and TSOs, there are valid concerns about the potential complexities and algorithmic limitations that could arise, necessitating the need to look closer into options of Non-uniform pricing. Hence NEMOs and TSOs appreciate the comment on ambiguity of such options and will further assess and communicate any further trade-offs that may be observed during simulations.
294.	Max Schneider	Eurelectric	As explained in the answer to the previous question, Eurelectric has in the past opposed alternative pricing schemes for SDAC like Non-Uniform Pricing because of market transparency and ease of market outcome understanding.	It is clear that while the removal of Paradoxically Accepted Bids (PABs) is widely supported for enhancing market coherence and transparency, and is the preferred option of NEMOs and TSOs, there are valid concerns about the potential complexities and algorithmic limitations that could arise, necessitating the need to look closer into options of Non-uniform pricing. Hence NEMOs and TSOs appreciate the comment on ambiguity of such options.

No.	Stakeholder	Organisation	Comment/Proposal	NEMOs & TSOs response
				Please refer to response #286
295.	Anonymous	Anonymous	NUP might result suboptimal results especially in low liquidity area with large bid sizes	NEMOs and TSOs recognize the lack of intuitiveness as one drawback of non-uniform pricing, which however must be weighed against potential problems with the No-PAB solution, to be investigated.

17. What is your view on the substitutability rule for aFRR and mFRR, or do you have suggestions to modify or improve it? For more information on the substitutability rule, please also refer to section 6.1 of Appendix A: N-Side Report.

No.	Stakeholder	Organisation	Comment/Proposal	NEMOs & TSOs response
296.	Abdolhamid Farzambehboudi	ASB group of companies (independent Analyst)	The substitutability rule between aFRR (automatic Frequency Restoration Reserves) and mFRR (manual Frequency Restoration Reserves) is a promising concept in theory — it aims to increase procurement flexibility and resource efficiency. However, in practice, substitutability is not always seamless, especially across different national systems or asset types. Key considerations: • Technical readiness: Not all mFRR providers have ramping or response capabilities equivalent to aFRR, which could impact grid stability if substitution is overused without proper thresholds or testing. • Market confidence: If substitution is applied too broadly or dynamically, participants may hedge against it by reducing offered volume or inflating prices — which defeats the purpose. • Operational layering: Substitutability should reflect the operational "layers" of reserve usage. aFRR is more continuous and fast-responding; mFRR is more discrete and scheduled. A one-size-fits-all substitution rule risks blurring roles in a way that affects optimization quality and	NEMOs and TSOs appreciate these considerations. Regarding the first concern, we point out that there will be no change as seen from the providers of aFRR or mFRR, as only the demand from the TSO will change. We recognize the risk of price inflation, however this also creates a risk for the bidder. Finally, as stated in the report, TSOs will have the possibility to limit the level of substitution by requiring a minimum level of mFRR supply.

No.	Stakeholder	Organisation	Comment/Proposal	NEMOs & TSOs response
			dispatch trust. Instead of static rules, a contextual substitutability approach — informed by real-time system state, scarcity signals, and asset class — may deliver better outcomes. And to wrap it with a cultural saying: چوب دو سر طلا نیست؛ یکی باید بسوزد، یکی باید روشن کند. A stick can't shine on both ends — one end must burn to light the other. Substitution, too, needs trade-offs. Let's just make sure it doesn't burn out both ends.	
297.	Maiken Thomsen	Ørsted	Given the different requirements between the two products we do not believe it makes sense to substitute one for the other, even though aFRR could substitute mFRR. However, there are local constraints that are important to be aware of. E.g. in some countries mFRR are used more than aFRR do the types of assets available within the specific country. Furthermore, mFRR offers greater flexibility in terms of is ability to be used for system constraints, its manual activation allows for anticipatory use in case of expected imbalances and its looser technical requirements may enable larger and more varied offers.	NEMOs and TSOs appreciate the response, but clarify that the level of substitution will be at discretion of the TSO, which is the primary party to define the allowable level of substitution.
298.	Dione Hernández Galvis	RWE Supply & Trading GmbH	We consider the proposed substitutability rule between aFRR and mFRR acceptable. At this stage, we have no objections and no further suggestions for modification.	NEMOs and TSOs appreciate the supportive comments on this topic
299.	Thomas Kallevik	Statkraft Energi AS	If different premiums for the different products is allowed, this rule will function. If not, the premium might not reflect the actual cost for both products which also makes the substitution not beneficial for the market participant.	NEMOs and TSOs presently do not foresee such constraints to the premium level.
300.	Liselotte van Balen	Eneco	As abovementioned, we see in some markets, for example the Netherlands, there is a large discrepancy between the required aFRR and mFRR volume. We are uncertain how this is going to be addressed in the	NEMOs and TSOs appreciate the response, but clarify that the level of substitution will be at discretion of the

No.	Stakeholder	Organisation	Comment/Proposal	NEMOs & TSOs response
			bid structure. If we are moving ahead, this should be addressed in a follow-up study.	TSO, which is the primary party to define the allowable level of substitution.
301.	Krassimir Stantchev	BDEW	We consider the proposed substitutability rule between aFRR and mFRR acceptable. If a fraction of aFRR bids is transformed into mFRR because there is limited liquidity and the price is higher, the mFRR price should also be applied to mFRR-substitutable aFRR bids that are accepted as aFRR bids.	NEMOs and TSOs appreciate the comment. Such pricing implications will be addressed in further R&D.
302.	Astrid Buhr Broge	Green Power Denmark	Given the different requirements between the two products, we do not believe it makes sense to substitute one for the other, even though aFRR could substitute mFRR. However, there are local constraints that are important to be aware of. E.g. in some countries mFRR are used more than aFRR due to the types of assets available within the specific country. Furthermore, mFRR offers greater flexibility in terms of is ability to be used for system constraints, its activation time allows for anticipatory use in case of expected imbalances and its looser technical requirements may enable larger and more varied offers. Further, it should be up to the market participant to define whether their bid can be part of a substitution or not.	Please refer to response #297 and #301. NEMOs and TSOs believe that market participants should not be concerned with how their bids are utilized, provided they receive the correct payment.
303.	Magnus Landstad	Lyse Produksjon AS	This must be investigated. There could be difference in how large volumes are qualified for the different products, difference in risk premium between aFRR and mFRR e.g., that can explain why mFRR some times is priced hihger than aFRR. But to simplify the algoritms and market complexity, it is a good idea to look at ways to clear mFRR and aFRR in combination and in a simplified way.	NEMOs and TSOs appreciate the response, but clarify that the level of substitution will be at discretion of the TSO, which is the primary party to define the allowable level of substitution.
304.	Magnus Thorstensson	Swedenergy	Given the different requirements between the two products we do not believe it makes sense to substitute one for the other,	NEMOs and TSOs appreciate the response, but clarify that the level of substitution will be at discretion of the TSO, which is the primary party to define the allowable level of substitution.
305.	Olivier Van den Kerckhove	ENGIE	We believe that the question of substitutability between aFRR and mFRR is primarily a matter for the TSOs, given their operational	NEMOs and TSOs appreciate the supportive comments on this topic

No.	Stakeholder	Organisation	Comment/Proposal	NEMOs & TSOs response
			responsibility and system-wide perspective. Price sensitive demand for balancing capacity should not be expressed at the detriment of system security. That said, from our point of view and on the condition that market participants remain responsible to define the volumes and prices bid in each market, the proposed substitutability rule appears acceptable. To our knowledge, this rule is already applied in the Netherlands where it has already been implemented and seems to support efficient market functioning without compromising system reliability.	
306.	Ola Hamada	Vattenfall Energy Trading	I find it quite reasonable. In a market like the German one, however, I don't see how helpful it would be, since mFRR is significantly cheaper than aFRR.	Please refer to response #297. NEMOs and TSOs further point out that, although that is the case today, it is not possible to foresee with any certainty how market prices for various products will develop in the rapidly changing environment.
307.	Pierre Peureux	EDF	From the point of view of a frequency restoration after an incident, aFRR and mFRR are probably substitutable. However, mFRR capacities can be used by TSOs with other purposes or dynamics: - aFRR activation for system constraints purposes is forbidden whereas the mFRR energy standard product allows it - mFRR activation is, by definition, manual and so can also be demanded in anticipation of a foreseen imbalance Moreover, since the dynamic specifications of mFRR are lower, it also enables to offer more volumes, sometimes with a different configuration than aFRR (for instance, the start-up of a hydroelectric turbine to provide upward mFRR energy with associated fixed costs besides an opportunity cost). Furthermore, EDF would like to highlight that the substitutability rule for aFRR and mFRR is not only a pricing issue. Indeed, some assets are today designed for aFRR and not for mFRR. As a consequence, such substitutability would impact the functioning of those assets for which the monitoring and control systems will have to be modified as well as the relevant control processes which lead to additional cost for market	Please refer to response #297. From the asset side, there will be no difference: aFRR will remain aFRR and mFRR will remain mFRR, they just might be used for different purposes.

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			participants which could exceed the benefits of this rule and require time to be implemented.	
308.	Coline Gailleul	Energy Traders Europe	We agree with the proposal for substitutability between aFRR and mFRR products if this is explicitly included in the bid ("mFRR-substitutable"). If a fraction of aFRR bids is transformed into mFRR because there is limited liquidity and the price is higher, the mFRR price should also be applied to mFRR-substitutable aFRR bids that are accepted as aFRR bids. Additionally, it should be possible to declare an aFRR bid as aFRR-only.	NEMOs and TSOs appreciate the response but clarify that the level of substitution will be at discretion of the TSO, which is the primary party to define the allowable level of substitution. NEMOs and TSOs believe that market participants should not be concerned with how their bids are utilized, provided they receive the correct payment. Please also refer to response #297 and #301.
309.	Dr. Bernhard Walter	EnBW Energie Baden-Württemberg AG	In our view while aFRR-only bids need to be possible, mFRR-substitutable aFRR bids should be explicitly declared. If a fraction of aFRR bids is transformed into mFRR because there is limited liquidity and the price is higher, the mFRR price should also be applied to mFRR-substitutable aFRR bids that are accepted as aFRR bids.	NEMOs and TSOs appreciate the response but clarify that the level of substitution will be at discretion of the TSO, which is the primary party to define the allowable level of substitution. NEMOs and TSOs believe that market participants should not be concerned with how their bids are utilized, provided they receive the correct payment. Please also refer to response #297 and #301.
310.	Ulrik Gregers Jørgensen	Fjernvarme Fyn	We support the substitutability rule, as it enables more efficient allocation of available reserves across aFRR and mFRR. However, battery storage and limited energy reservoir (LER) assets may require special consideration, due to their duration limitations and the different activation profiles of the reserve markets. These constraints may affect their ability to reliably deliver both aFRR and mFRR services under the substitutability logic.	Please refer to responses #297 and #302. NEMOs and TSOs acknowledge the special requirements for storage bids and will address these in the upcoming R&D phases, when a final storage bid format has been defined.

No.	Stakeholder	Organisation	Comment/Proposal	NEMOs & TSOs response
			A proposed solution is to make it optional for the market participants whether their bids are suitable for substitution or not.	
311.	Max Schneider	Eurelectric	From a frequency restoration standpoint, aFRR and mFRR can serve similar roles. Generally, aFRR is considered higher-value as it can respond more quickly to activation signals. However, mFRR offers flexibility: • It can be used for system constraints, unlike aFRR. • Its manual activation allows for anticipatory use in case of expected imbalances. • Its looser technical requirements may enable larger and more varied offers. Eurelectric underlines that aFRR-only bids need to be possible, and bids that offer aFRR and mFRR for the same capacity should be explicitly declared and priced. Delivery of either aFRR or mFRR is not solely a pricing matter. The provision of aFRR and mFRR are different and technical constraints may mean that some assets can provide aFRR and not mFRR. With regard to the substitution of mFRR demand of TSOs by aFRR capacity in case the aFRR capacity is lower priced or if this substitution results in an overall lower cost, Eurelectric considers that this is mainly a TSO matter given their operational responsibility and system-wide perspective. The criteria used by TSOs to choose either aFRR or mFRR bids need to be discussed with MPs and disclosed by TSOs in advance. However, price-sensitive demand for balancing capacity should not be expressed at the detriment of system security.	NEMOs and TSOs appreciate the response but clarify that the level of substitution will be at discretion of the TSO, which is the primary party to define the allowable level of substitution.
312.	Anonymous	Anonymous	It is important to highlight that aFRR and mFRR capacities might not be equal for an asset - It is required to deviate aFRRcap and mFRRcap offers in linked and combined bids addition to energy bids	Please refer to responses #297 and #302

18. Are there any issues regarding bidding products, bid design and pricing that have not or not sufficiently been addressed in the report? If yes, please explain.

No.	Stakeholder	Organisation	Comment/Proposal	NEMOs & TSOs response
313.	Abdolhamid Farzambehboudi	ASB group of companies (independent Analyst)	The report covers an impressive range of critical issues in bidding products, bid design, and pricing — particularly within the context of co-optimisation and market evolution. However, a few areas would benefit from further elaboration or structured follow-up: 1. Treatment of Bilateral Flexibility Arrangements: In a more interconnected and diversified energy system, bilateral contracts — especially those between DSOs or behind-the-meter aggregators — remain significant. Their integration or parallel treatment in a co-optimised SDAC context has not been explored deeply enough. 2. Risk Handling for Non-Standard Assets: Emerging resources like hybrid systems, demand-side resources with stochastic behaviour, and small aggregated batteries still face high exposure to uncertainty in implicit frameworks. The report could benefit from explicit suggestions on risk buffers or safeguards to keep these actors engaged without penalizing flexibility. 3. Cross-border Settlement Complexities: Pricing and settlement implications for cross-border combined/linked bids deserve further illustration, especially considering asynchronous reserve obligations and national regulatory nuances. 4. Feedback Loops and Learning Mechanisms: Finally, while the methodology is forward-looking, the governance of market updates, algorithm fine-tuning, and participant feedback integration needs more emphasis — especially in early implementation phases. In short, the foundations are strong — but as with any modular system, the value lies in the interfaces, not just the components. Or, as we say: “نقشه خوب است، اما تا راه نرویم نمی‌فهمیم کجایش کج است.”	1. We do not believe such arrangements need explicit concern in a co-optimisation setting. 2. In general, emerging resources like storage and demand response need more focus and we intend to address this in the upcoming R&D. 3. XB settlement needs indeed to be handled, but can be postponed to closer to implementation. 4. Governance is part of R&D phase 3.

No.	Stakeholder	Organisation	Comment/Proposal	NEMOs & TSOs response
			"The map may look good — but only by walking the path do we see where it bends."	
314.	Esko Heinonen	Elisa Oyj	How bidding products fit when combining multiple assets? In day-ahead e.g. a curve order can be made to reflect costs of each asset on relatively fine level of details. On the other hand, the reserve capacity market minimum bid size is typically 1MW, so how multiple assets can be combined into a single bid? This doesn't really work if an aggregator needs to "identify" what kind of assets it is bidding	NEMOs and TSOs acknowledge that treatment of aggregated assets needs further analysis in the next R&D phases.
315.	Thorbjørn Grønbæk	Epsilon Quantitative ApS	Referring to my answer in question 12, my primary concern is the ability of the regulator to properly track and identify market manipulation when these new bid product (combined/linked) would be introduced. Are portfolio rules properly aligned such that they prohibit internal book-keeping in large portfolios between supply and demand assets? This is more a question for ACER and given their experience they would likely be able to answer this properly.	NEMOs and TSOs share these concerns and will further discuss them with ACER. At this point we cannot rule out that a fundamental change in market design can result in such inefficiencies. We are aiming to investigate this in the upcoming R&D phases together with possible effects of exercising market power.
316.	Maiken Thomsen	Ørsted	In co-optimization the allocation of CZC will be performed according to an integrated welfare calculation as part of the Euphemia target function. The market-based methodology is doing a similar calculation when determining the value of CZC. While the CZC available for balancing capacity in the market-based methodology is restricted to 10%, it is not limited for co-optimization. With the price-insensitive demand and generally steeper offer curves, it is possible that this will result in a preference for balancing capacity when allocating CZC. Such a potential bias needs to be evaluated and properly communicated, as a risk of increased SDAC spreads and reduced levels of price convergence are of high general interest to various stakeholders.	NEMOs and TSOs agree that price effects are important and confirm that market impacts will be analysed in the upcoming simulations.
317.	Raphael Spiekermann	illwerke vkw	The MTU of the aFRR and mFRR was not addressed. However, this is crucial for the product design requirements and bidding options.	NEMOs and TSOs have clarified in the R1 report that a common MTU and

No.	Stakeholder	Organisation	Comment/Proposal	NEMOs & TSOs response
			Will capacity pricing be pay as cleared? Ramp products could play a role in the future and should therefore be considered.	clearing mechanism will apply to both energy and balancing products. Ramp products may be further considered. At the same time, market participants will still be able to do a significant degree of self-dispatch, that will give them flexibility.
318.	Lucie Horová	CEZ Group	There is no complex example of bidding proceedings for market participant with complex portfolio in the study or anywhere else. All relevant documents are written in highly theoretical level. The implications to the real operation are not simply foreseen. There is a overestimation of potential positive effects of the co-optimization and its impacts on the wholesale electricity market.	NEMOs and TSOs recognize the efforts and costs related to a potential implementation.
319.	Dione Hernández Galvis	RWE Supply & Trading GmbH	We see great uncertainties as to whether the proposed design meets the needs of all market partners and thus ultimately leads to the desired social welfare effects in practice. Further analysis can reduce the uncertainties, but will likely not completely eliminate them. Due to the complexity of the design, everyone must be aware that this will require a long implementation period and that short-term corrections in the event of undesirable results will hardly be possible. A changeover therefore also involves a major risk. The worst case scenario would be a mixture of different artificial bidding behavior by different market participants with clearing prices that are no longer comprehensible. This would mean that electricity trading would lose its raison d'être, which is to set price signals for investments. On the other hand, it is foreseeable that there will be shifts in CZC allocation between energy and balancing capacity due to the different liquidity and volatility in the European intraday markets. This will be accompanied by an increase in price spreads in the energy spot markets with an impact on futures markets and cross-zonal hedging. We	NEMOs and TSOs share these concerns and plan to address them in the further R&D and simulations. TSOs in particular point out that price signals are at least as important for efficient dispatch as for investment signals.

No.	Stakeholder	Organisation	Comment/Proposal	NEMOs & TSOs response
			recommend investigating the effects at an early stage, making them transparent and asking for political acceptance.	
320.	Thomas Kallevik	Statkraft Energi AS	As mentioned, the complexity that is foreseen is huge which will come with a cost also for the market and the market participants. We think this complexity is not well enough commented on and resolved in the current report.	NEMOs and TSOs acknowledge this comment and several others pointing at the risks and costs related to high complexity. The R1 report now includes a particular section on this issue.
321.	Liselotte van Balen	Eneco	The report currently focuses too much on thermal assets. The delivery of aFRR/mFRR with renewables and storage is insufficiently addressed.	NEMOs and TSOs stress that this will receive more attention in the further R&D and simulations.
322.	Krassimir Stantchev	BDEW	In co-optimization the allocation of CZC will be performed according to an integrated welfare calculation as part of the Euphemia target function. The market-based methodology is doing a similar calculation when determining the value of CZC. While the CZC available for balancing capacity in the market-based methodology is restricted to 10%, it is not limited for co-optimization. With the price-insensitive demand and generally steeper offer curves, it is possible that this will result in a preference for balancing capacity when allocating CZC. Such a potential bias needs to be evaluated and properly communicated, as a risk of increased SDAC spreads and reduced levels of price convergence are of high general interest to various stakeholders.	NEMOs and TSOs agree that price effects are important and confirm that market impacts will be analysed in the upcoming simulations.
323.	Przemysław Kacprzak	PSE	R0 report explicitly excluded FCR from the list of co-optimised products. In PSE's opinion there should be an option to include FCR in co-optimised process. There are no explicit legal requirements for inclusion of FCR in co-optimised process. However there are general requirement on effectivness in EB GL and CACM. The ACER welfare study indicated significant potential welfare benefit when switching from sequential to co-optimised process. In case some TSOs decide to implement co-optimised process, they should have possibity to include FCR in the list of co-optimised products if this is	NEMOs and TSOs acknowledge the concerns regarding FCR. Although we recognize some conceptual parallels between FCR and FRR, FCR is currently considered out of scope of this R&D.

No.	Stakeholder	Organisation	Comment/Proposal	NEMOs & TSOs response
			preferrable according to their their assesment. In addition, PSE has noted that that in R0 the proposed combined bids don't consider requirements arising from obligation to provide FCR, it could be a problem for market participant if FCR is not co-optimised.	
324.	Astrid Buhr Broge	Green Power Denmark	In co-optimization the allocation of CZC will be performed according to an integrated welfare calculation as part of the Euphemia target function. The market-based methodology is doing a similar calculation when determining the value of CZC. While the CZC available for balancing capacity in the market-based methodology is restricted to 10%, it is not limited when introducing co-optimisation. With the price-insensitive demand and generally steeper offer curves, it is possible that this will result in a preference for balancing capacity when allocating CZC. Such a potential bias needs to be evaluated and properly communicated, as a risk of increased SDAC spreads and reduced levels of price convergence are of high general interest to various stakeholders.	NEMOs and TSOs agree that price effects are important and confirm that market impacts will be analysed in the upcoming simulations.
325.	Magnus Thorstensson	Swedenergy	See answer to Q27.	No comment.
326.	Olivier Van den Kerckhove	ENGIE	In co-optimization the allocation of cross-zonal capacity will be performed according to an integrated welfare calculation as part of the Euphemia target function. The cross-zonal capacity available for balancing capacity is not limited when using the co-optimization methodology. With the price-insensitive demand and generally steeper offer curves, it is possible that this will result in a skew towards using cross-zonal capacity for balancing capacity. Such a potential bias needs to be evaluated carefully as a risk of increased spreads in the day-ahead market and reduced levels of price convergence runs counter to the idea of market coupling.	Please refer to response #316. NEMOs and TSOs also point out that, in a co-optimised setting, prices have two dimensions (energy and capacity) and that reduced price convergence for energy does not necessarily "run counter to the idea of market coupling" if there is increased price convergence for capacity.
327.	Ola Hamada	Vattenfall Energy Trading	The examples for the bidding products were a little too simplistic. Please refer to the answer for question 14 for how it would realistically be useful. Pricing is a little unclear in how it would handle non-convexities.	We agree that the examples are simple. Their idea is to illustrate the concepts in an understandable way, which would be very challenging with realistic example.

No.	Stakeholder	Organisation	Comment/Proposal	NEMOs & TSOs response
				Pricing in the context of non-convexities is comprehensively described in the N-SIDE Annex.
328.	Pierre Peureux	EDF	As explained before, it is crucial that co optimization takes into account all costs and technical constraints for all assets, which requires to have an extremely rich market structure that can propose a cost for each time step and for each possible production program of each power plant unit. This requirement could be fulfilled with linked bids, combined bids, combined block bids, combined scalable complex bids and will probably require additional bid linking features such as mutually exclusive baskets of bids which could resemble to the (exclusive) linking of combined bids proposed in the report. We also believe that 5-dimensional exclusive and fixed volume bids would increase the ability of the biding products to represent MP constraints and strategic choices. Nevertheless, such possibility could lead to huge algorithmic complexity and EDF wonders to what extend it could be solved by the algorithm while keeping the existing products. Furthermore, market participants would be exposed to challenges expressed in answer to question 20.	These are valid concerns that we have responded to in multiple responses. Referring also to response 33, we point out that the market coupling algorithm never will be able to represent all constraints of any character, and that this will remain the responsibility of the market parties, as it is today.
329.	Coline Gailleul	Energy Traders Europe	We underline two elements. In co-optimization, the allocation of Cross Zonal Capacity (CZC) will be performed according to an integrated welfare calculation as part of the Euphemia target function. The market-based methodology does a similar calculation when determining the value of CZC. While the CZC available for balancing capacity in the market-based methodology is restricted to 10%, it is not limited to co-optimization. With the price-insensitive demand and generally steeper offer curves, it will possibly result in a preference for balancing capacity when allocating CZC. Such a potential bias needs to be evaluated and properly communicated, as the risk of increased SDAC spreads and reduced levels of price convergence are of high general interest to various stakeholders.	NEMOs and TSOs agree that price effects are important and confirm that market impacts will be analysed in the upcoming simulations. Representation of portfolios remains a challenging topic to be further analysed in the upcoming R&D.

No.	Stakeholder	Organisation	Comment/Proposal	NEMOs & TSOs response
			We pay attention to the assumptions and parameters used in the study. There was no example of bidding proceedings for market participants with complex portfolios. With the study focused on theory, the implications and application to real operations are lacking.	
330.	Dr. Bernhard Walter	EnBW Energie Baden-Württemberg AG	In co-optimisation the allocation of CZC will be performed according to an integrated welfare calculation as part of the Euphemia target function. The market-based methodology is performing a similar calculation when determining the value of CZC. While the CZC available for balancing capacity in the market-based methodology is restricted to 10%, it is not limited for co-optimisation at all. With the price-insensitive demand and generally steeper offer curves, it is possible that this will result in a preference for balancing capacity when allocating CZC. Such a potential bias needs to be evaluated and properly communicated to all involved stakeholders (market parties, policy makers, regulatory authorities), as a risk of increased SDAC spreads and reduced levels of price convergence are of high general interest to various stakeholders.	Please refer to response #316.
331.	Ulrik Gregers Jørgensen	Fjernvarme Fyn	We find that the report does not sufficiently explain: - Fallback procedures if co-optimisation fails or markets must decouple - Why FCR is excluded, despite strong interdependencies with SDAC and reserve capacity - We strongly recommend backward compatibility of existing bid formats to ensure a smooth transition and full participation at go-live.	Fallback procedures will be addressed in phase 3 of the R&D. Backward compatibility will mostly or entirely be ensured. We further refer to response #323
332.	Max Schneider	Eurelectric	In co-optimisation, the allocation of cross-zonal capacity (CZC) will be performed according to an integrated welfare calculation as part of the Euphemia target function. The market-based methodology is doing a similar calculation when determining the value of CZC. While the CZC available for balancing capacity in the market-based methodology is restricted to 10%, it is not limited for co-optimisation. With the price-insensitive demand and generally steeper offer curves, it is possible that this will result in a preference for balancing capacity when allocating CZC. Such a potential bias needs to be evaluated and properly	Please refer to response #316. NEMOs and TSOs believe the that likelihood of activation is a component in the market participants analysis of costs and benefits, and as such an element in their price setting. We do therefore not see it as an issue directly influencing the market coupling algorithm.

No.	Stakeholder	Organisation	Comment/Proposal	NEMOs & TSOs response
			communicated, as a risk of increased SDAC spreads and reduced levels of price convergence are of high general interest to various stakeholders. In the case of aFRR and mFRR, the R0 report does not sufficiently clarify how co-optimisation will incorporate different components of balancing capacity prices and other factors such as the likelihood of activation. It should be noted that the likelihood of activation changes over time and is influenced by different factors (e.g. renewable infeed, weather forecasts, …).	
333.	Anonymous	Anonymous	Even with implicit bidding the opportunity costs for FCR market and following days needs to be taken in to account for certain assets - As well as potential opportunity cost from IDC Maybe TSOs could utilize IDC and mFRR-Energy market as one entity and combine these two markets in the future - Some energy could be activated also from IDC quarter market if it adds total welfare	Regarding FCR, please refer to response #323. Note that opportunity costs can be included through the suggested premium. Although utilization of the ID market is an interesting idea, it falls outside of the present scope of the R&D.

19. For potential providers of balancing capacity: what conditions must be satisfied for you in a co-optimised market to bid at least as much balancing capacity as today and potentially more? Please be as specific as possible.

No.	Stakeholder	Organisation	Comment/Proposal	NEMOs & TSOs response
334.	Abdolhamid Farzambehboudi	ASB group of companies (independent Analyst)	To bid at least the same — and potentially more — balancing capacity in a co-optimised SDAC market, several key conditions would need to be satisfied: 1. Transparent and Predictable Pricing Signals Providers must have a clear understanding of how balancing capacity is valued within the market-clearing algorithm. This includes the logic behind premium calculations, treatment of opportunity costs, and	5. Pricing will be further analysed in the upcoming R&D. While rules and logic will be openly available information, the outcomes may not always be intuitive. 6. As we have commented several places, it will not be possible to

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			settlement rules for accepted and non-accepted bids. 2. Recognition of Asset-Specific Constraints and Costs For assets like pumped hydro, batteries, and thermal units with start-up costs, minimum run times, or wear-and-tear factors, it's essential that these are adequately reflected through premium mechanisms or cost-recovery designs. Non-convexity must not be penalized through over-simplified pricing. 3. Portfolio and Temporal Bidding Flexibility Operators managing multiple units or technologies (e.g., a mix of solar, storage, and demand response) need to represent interdependencies through combined/linked bids and portfolio structures. Without this, bidding becomes riskier and economically inefficient. 4. Adequate Forecasting Tools and System Data Access Since implicit bidding limits control over dispatch, the market must provide high-quality forecasting, transparency on congestion and reserves, and guidance on expected imbalance prices — ideally via a centralized forecasting interface or platform API. 5. Fair and Timely Settlement / Compensation Guarantees Providers will require settlement schemes that guarantee timely compensation for capacity that was reserved but not activated, especially when such reservation led to lost opportunities in intraday or other ancillary service markets. 6. Scalable IT Infrastructure and Bid Submission Interfaces To handle the increased bid complexity of co-optimised structures, market participants must be supported by efficient, secure, and user-friendly digital infrastructure, including APIs for automated portfolio bidding. 7. Regulatory Stability and Legal Safeguards Long-term commitment from TSOs and NEMOs to maintain a stable market environment with defined dispute resolution, auditability of clearing processes, and cross-border coordination frameworks. In short: capacity providers need visibility, flexibility, fairness, and	represent all relevant constraints. It will be up to the market participants to represent their assets as precisely as possible within the limitations of the bid formats, which then should reflect constraints in the final prices. 7. See 2. 8. While TSOs will do their utmost to predict and publish grid conditions, other forecasting will primarily be the responsibility of the market participants. 9. It is a clear assumption that settlement will be fair and timely, as today. 10. Submission of bids and necessary IT is the responsibility of the market participants. 11. While we acknowledge that regulatory stability is important, it is also necessary to be able to adapt quickly in case of the introduction of a major market change like co-optimisation.

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			security — or they'll hedge with caution or exit. As we say: "کسی به مهمانی می‌آید که دعوت‌نامه‌اش معلوم باشد، نه فقط صدای طبل از دور." "The guest only comes if the invitation is clear — not just the distant sound of a drum."	
335.	Maiken Thomsen	Ørsted	There need to be the same bidding flexibility as exists today. Any significant reduction in the type and amount of bids that a market participant can submit will reduce market participants ability to make a correct reflection of the full technical abilities of an asset or portfolio of assets. In addition, the ability to reflect the relationship between local heating markets and the internal electricity market to reflect optimal dispatch of CHP plants. These two elements remain key challenges of a realistic implementation of the co-optimisation model, as the combined complexity of four different balancing capacity markets, SDAC market and local heating markets may significantly exceed the algorithm's capacity, which we already today see is reaching its limitations.	There are no plans to reduce the flexibility of today's bid formats related to co-optimisation. As addressed in other responses, CHP is a particular challenge to be looked upon in the further research. At the same time, it is clear that SDAC can never be directly involved in the optimisation of local heating markets, but should be able to address relevant constraints through flexible bid formats.
336.	Kjerstin Dahl Viggen	Hydro Energy	Activation market can restrict the volumes today. Smaller minimum volumes in activation market can increase capacity volumes offered.	While TSOs will handle volumes down to 1 MW, even smaller volumes need to be handled through aggregation.
337.	Lucie Horová	CEZ Group	We strongly recommend to keep the system as it is and do not move towards co-optimization.	No specific comment.
338.	Dione Hernández Galvis	RWE Supply & Trading GmbH	The fundamental challenge is that not all products can be exercised simultaneously and independently of each other. This is especially true for storage. It is therefore unlikely that a bidder would refrain from reducing quantities in a combined auction as a precautionary measure. The need to provide back-up-reserve, internally or externally, is also easier to implement in a step-by-step approach in combination with re-optimization between the auctions. In addition, it must be possible to combine different asset classes in a portfolio into one reserve bid.	It is up to the market participants to construct their bids in any way they see fit for their assets. NEMOs and TSOs, together with the service provider, will strive to provide versatile bid formats that are the best trade-off between flexibility, complexity and the capabilities of the market clearing algorithm.

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339.	Thomas Kallevik	Statkraft Energi AS	It is crucial to have a market design where the actual cost and actual flexibility is reflected. Instead of optimising the day-ahead stage of ancillary market offerings, it is more important to open the market to more capacity and smaller units, i.e. easing the entry barriers. In the future, we expect that interactions between short term intraday markets and short-term ancillary markets will be more relevant than the day-ahead optimisation.	NEMOs and TSOs acknowledge that a stronger focus on the ID market (and less on SDAC), could reduce the relevance of cooptimisation as currently conceived. It is important that this aspect stays in focus and is considered before each step in the further developments.
340.	Klaus Salletmaier	SWM	- possibility to cover all costs (especially for market-opportunities) - reliable, transparent and high performant plattform and bidding process	No specific comment.
341.	Liselotte van Balen	Eneco	We would like to highlight again that the essence of bid formats should reflect as much as possible the cost structure of a portfolio (not individual assets). As abovementioned, bid examples for renewables (e.g. aFRR up) and storage assets are missing from the report. It would greatly help market participates in this is explored in the next report.	NEMOs and TSOs agree that bid formats should be able to represent costs as accurately as possible. Storage will explicitly be included in further work ahead.
342.	Krassimir Stantchev	BDEW	Offering the same volume balancing capacity as currently is highly unlikely. In sequential bidding BSPs can re-optimize their bids after each auction outcome and offer all of the remaining capacity to subsequent balancing capacity and day-ahead markets. Not all combinations of balancing capacity and energy assignments are operationally feasible, particularly for operators of storage assets. However, BSPs still bear full responsibility for any balancing capacity assignment of the algorithm. To account for the uncertainty involved in receiving an arbitrary auction result for energy and balancing capacity, a more moderate bidding behaviour is necessary. This will result in a reduction of liquidity. One approach to offer similar volumes of balancing capacity (neglecting re-optimization of aFRR/mFRR), would be to restrict the bid to balancing capacity only. This is obviously linked to an efficiency loss at the day-ahead stage, as energy bids will only be submitted intraday in case of no acceptance for balancing capacity	NEMOs and TSOs acknowledge these concerns. At the same time we point out that the flexibility of a portfolio still can be used in a co-optimisation environment. It will also be possible to bid capacity in the balancing energy market. And although the auction outcome may appear “arbitrary” now, we assume market participants will quickly learn which factors influence acceptance. As referred in several other responses, storage will be further addressed in the upcoming R&D phases.

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			A key condition for storage assets is that they are properly reflected in the co-optimised market design. This includes: • Accurate modelling of intertemporal constraints (e.g. state of charge, charg-ing/discharging limits), • Recognition of spread-based value rather than absolute price levels, • Clear representation of opportunity costs across timeframes, including interactions with wholesale markets, Practical and manageable bid formats that reflect these characteristics.	
343.	Astrid Buhr Broge	Green Power Denmark	There need to be the same bidding flexibility as exists today. Any significant reduction in the type and number of bids that a market participant can submit will reduce market participants ability to make a correct reflection of the full technical abilities of an asset or portfolio of assets. In addition, the ability to reflect the relationship between local heating markets and the internal electricity market to reflect optimal dispatch of CHP plants. These two elements remain key challenges of a realistic implementation of the co-optimisation model, as the combined complexity of four different balancing capacity markets, SDAC market and local heating markets may significantly exceed the algorithm's capacity, which we already today see is reaching its limitations.	There are no plans to reduce the flexibility of today's bid formats related to co-optimisation. As addressed in other responses, CHP is a particular challenge to be looked upon in the further research. At the same time, it is clear that SDAC can never be directly involved in the optimisation of local heating markets, but should be able to address relevant constraints through flexible bid formats.
344.	Magnus Landstad	Lyse Produksjon AS	Simple solutions for submitting bids. Transparency on required volumes, accepted volumes, price clearing, overview that all obligations are registred in TSO-system at all times. Good technical solutions for retrieving data with a minimum of time lag from the TSOs and exchanges.	These are sound suggestions that need to be soundly taken into account when implementation is approaching.
345.	Magnus Thorstensson	Swedenergy	There need to be the same bidding flexibility as exists today. Any significant reduction in the type and amount of bids that a market participant can submit will reduce market participants ability to make a correct reflection of the full technical abilities of an asset or portfolio of assets.	Please refer to response #335

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346.	Olivier Van den Kerckhove	ENGIE	Today market participants re-optimize their portfolio after the market outcome of each separate market (balancing capacity for aFRR and mFRR). This allows the use of in-house tools and asset representation methodologies that are generally well-suited to the portfolio that market participants manage. The translation of this complexity into a pan-European, generic bidding format will undoubtedly result in numerous simplifications and approximations. However, this will be required as the interactions between the different markets, that is today managed and optimized by the market participants, will have to be expressed towards and solved by the central optimization algorithm. The concern on the implementation of co-optimisation therefore is at least three-fold: - Simplifications and approximations will no longer fully represent asset/portfolio ability reducing market efficiency; - Bidding limitations (in terms of amount of bids and thus bid complexity) will force market participants to reduce asset representation towards the central algorithm, forcing either reduced asset/portfolio ability reflection, or forcing market parties to focus their bidding strategy on expected market outcome, (re)introducing forecasting imprecisions; - The complexity of submitted bids – even in reduced form resulting in market degradations mentioned in previous two points – will put an exponential increase on the strains of the central algorithm, which is already today at its limits. This can result in less-than-optimal market outcome by the algorithm, or increased operational risks. We therefore consider that focusing the discussion on achieving the same amount of balancing capacity as in todays sequential markets – while a relevant question – omits important other considerations when assessing the efficiency of co-optimisation compared to todays market design.	NEMOs and TSOs share many of these concerns, but we will also point out that co-optimisation will not rule out any other portfolio optimisation by market participants, on the contrary. Co-optimisation will lead to a better co-ordination across market participants, but this comes at the cost of a reduction in the degrees of freedom of each market participant, cf. response 33. This does not mean that the central algorithm takes over all optimisation today done by market participants, rather that the latter will have to be adapted.
347.	Ola Hamada	Vattenfall Energy Trading	1- Profitability: it must be worthwhile to bid into the balancing market instead of outright energy. 2- transparency: understanding what factors come into play when the	It will be possible to bid BC only in the proposed structure. The required complexity has been addressed in several

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			price is being set 3- Flexibility: especially for the hydro storages, the ability to bid in our entire capacity in both directions (pumps and turbines), we would rely heavily on complex bid types.	other responses and remains a major issue. Transparency of price formation will also remain challenging.
348.	Pierre Peureux	EDF	As explained above, some bids will still rely on the forecast of the marginal price of all five products. Today, the transparency requirements regarding balancing capacity are insufficient. The Balancing Regulation only requires TSOs to publish the details of the procured balancing capacity and not all balancing capacity bids as for the energy product. This prevents market participants from adequately assessing the market depth and therefore it is detrimental to the quality of the price forecasts. In a co-optimised day-ahead market, EDF expects improved transparency regarding balancing capacity bids.	NEMOs and TSOs will assess the concern at later stage. As the comment indicates, the underlaying issue is regulation, not the design of the SDAC market.
349.	Coline Gailleul	Energy Traders Europe	Liquidity of balancing capacity bids offered will likely be reduced in a co-optimised market due to the increased uncertainty. One can assume that market participants will respond to an increased uncertainty by overly complex bidding or arbitrary clearing rules by resorting to simplified bidding structures that would not reflect the full length of their portfolio's capabilities. The potential reduced liquidity in balancing capacity and SDAC markets would have considerable negative welfare implications. In sequential bidding, Balancing Service Providers (BSPs) can re-optimize their bids after each auction outcome and offer all of the remaining capacity to subsequent balancing capacity and day-ahead markets. Not all combinations of balancing capacity and energy assignments are operationally feasible, particularly for operators of storage assets. However, BSPs still bear full responsibility for any balancing capacity assignment of the algorithm. To account for the uncertainty involved in receiving an arbitrary auction result for energy and balancing capacity, a more moderate bidding behaviour is necessary. Due to market	NEMOs and TSOs acknowledge these concerns. At the same time we would like to point out that the flexibility of a portfolio still can be used in a co-optimisation environment. It will also be possible to bid capacity in the balancing energy market. And although the auction outcome may appear "arbitrary" now, we assume market participants will quickly learn which factors influence acceptance. As referred in several other responses, storage will be better addressed in the upcoming R&D phases.

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			participants' response, this would result in a decrease of liquidity, with considerable negative welfare implications. We detail below one approach for market participants to deal with the increased uncertainty introduced with co-optimization. To offer similar volumes of balancing capacity (neglecting re-optimization of aFRR vs. mFRR), one approach would be to restrict the bid to balancing capacity only. This is linked to an efficiency loss at the day-ahead stage, as energy bids will only be submitted intraday in case of no acceptance for balancing capacity.	
350.	Dr. Bernhard Walter	EnBW Energie Baden-Württemberg AG	In our view, it is highly unlikely that the same balancing capacity volume as currently will be offered. In sequential bidding, BSPs can re-optimise their bids after each auction outcome and offer all of the remaining capacity to subsequent balancing capacity and day-ahead markets. Not all combinations of balancing capacity and energy assignments are operationally feasible, particularly for operators of storage assets. However, BSPs still bear full responsibility for any balancing capacity assignment of the algorithm. To account for the uncertainty involved in receiving an arbitrary auction result for energy and balancing capacity, a more moderate bidding behaviour is necessary. This will result in a liquidity reduction. One approach to offer similar volumes of balancing capacity (neglecting re-optimisation of aFRR/mFRR), would be to restrict the bid to balancing capacity only. This is obviously linked to an efficiency loss at the day-ahead stage, as energy bids will only be submitted intraday in case of no acceptance for balancing capacity.	We refer to response #342
351.	Ulrik Gregers Jørgensen	Fjernvarme Fyn	To maintain or increase our current balancing capacity offerings, we require: - Capacity bids that are conditional on day-ahead energy acceptance - Bid structures that reflect heat and electricity (load) dependencies	Capacity and energy bids are optimized simultaneously in a co-optimised setting that will reflect the conditions define by the bidder.

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				Heat-electricity load dependence is an issue that will be given further consideration in the upcoming R&D
352.	Max Schneider	Eurelectric	A full equivalence of bidding ability/freedom compared to today's sequential bidding should be maintained. Any significant reduction in the type and amount of bids that market participants can submit will reduce their ability to correctly reflect the full technical abilities of an asset or portfolio of assets. This remains, in the view of Eurelectric, one of the key challenges of a realistic implementation of the co-optimisation model, as the combined complexity of four different balancing capacity markets and the SDAC market may significantly exceed the algorithm's capacity, which we see already reaching its limitations in today's market context.	There is no intention to reduce the type and amount of bids. Algorithmic complexity will be subject to further R&D.
353.	Anonymous	Anonymous	Bidding structure should not limit offering - If fundamental-cost-style costs are hard or even impossible to include to a bid it is difficult to make best available offers and sometimes this could result to partly offered capacity On the other hand, bidding structure should not be too complex in order to be timely and accurately in the market Clear vision for future markets - Assets require some investments to be part of mFRR and aFRR capacity and energy markets. If market rules or possibilities are very unclear, investments to flexible assets could be hard to reason	We acknowledge these concerns that need to be taken into account in the further R&D.

20. Please provide any other general comments to R0 report on Co-optimisation

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354.	Abdolhamid Farzambehboudi	ASB group of companies (independent Analyst)	The R0 report represents a significant step toward designing a future-proof co-optimised SDAC market, and it admirably consolidates complex economic, technical, and operational insights into a structured framework. Several foundational decisions — such as favoring implicit bidding and supporting combined/linked bids — reflect a thoughtful and scalable vision. However, a few general comments and suggestions for future iterations: 1. From Blueprint to Trial Space Many of the report's assumptions still rest in conceptual clarity rather than practical proof. Before full implementation, a robust sandboxing environment or regional pilot test — with transparent feedback loops — would help refine the proposals. This is especially critical in cross-border substitution and linked bid settlement dynamics. 2. Value of Real-Time Feedback and Governance The success of co-optimisation will depend not only on the design but also on its ongoing governance. A formal mechanism for integrating market participant feedback, system performance audits, and periodic calibration of algorithms should be integrated early — not retrofitted later. 3. Ensuring Inclusivity Across Asset Classes Emerging actors like demand response aggregators, hybrid systems, and small-scale batteries risk being structurally underrepresented in the early phases. Specific pathways for onboarding, simplified participation rules, and modular bid formats should be developed in parallel. 4. Language and Accessibility While the technical depth is necessary, parts of the report could benefit from clearer visualization, use-case walkthroughs, and simplified annex summaries, especially to engage stakeholders who may not have in-house market modelling teams. 5. Cultural and Strategic Readiness Beyond the algorithms and products, co-optimisation touches the strategic core of how national TSOs and market participants collaborate.	1. It would indeed be advisable to introduce co-optimisation gradually with only a few participants initially. In contrast to other large changes like 15-minute, there is no need to include the whole market from day 1. 2. Governance is included in phase 3 of the R&D. 3. We agree on the importance of including all market parties. Our hope is that more parties will already be active in the market if and when implementation of co-optimisation starts. 4. There is indeed a trade-off between necessary complexity and readability. 5. Agreed

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			A strong emphasis should be placed on building trust, standardization of interpretation, and shared learning environments. As a closing reflection: “آمدیم صواب کنیم — کباب شدیم.” “We came to earn virtue — and ended up burned.” Let’s ensure co-optimisation doesn’t become a well-intentioned redesign that overcooks key players. With thoughtful iteration and inclusive learning, the system can truly become more efficient, fair, and forward-looking. “…داستان من ممکنه تمام شده باشه، ولی این قصه همچنان ادامه داره” “My chapter may be complete in this section, but the story goes on…	
355.	Esko Heinonen	Elisa Oyj	BSP role and aggregating from multiple BRPs: Is it forced to bid always to day-ahead or can it participate to reserves only? If forced to day-ahead, becomes messy with different BRPs and impossible bid with combined capacity to all markets (aggregation from multiple BRPs allowed in reserves but not in day-ahead) Looks like the option where BSP offers capacity from multiple BRPs is not taken into account at all – is it possible to combine multiple BRPs at all in this model? Is this fighting against the regulation about independent aggregator role?	These are good suggestions to look closer at the issue. This will take place during the later phase of the project, after R2 report is published. In any case it will be possible to bid balancing capacity only in SDAC.
356.	Maiken Thomsen	Ørsted	Given the above considerations, we fully support the statement by NEMOs and TSOs: “NEMOs and TSOs remain highly skeptical on the technical and market function feasibility of co-optimisation - especially with regard to the appropriate consideration of multiple constraints on the side of balancing service providers in all kinds of bidding regimes” (Executive Summary). Co-optimisation may theoretically be superior and provide benefits in	NEMOs and TSOs share these concerns as also illustrated by our cited statement. While theoretical models like ACER’s welfare study suggest potential welfare gains, practical challenges remain. Quantitively addressing the concerns raised in this public consultation,

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			terms of increased social welfare. However, we still believe there are several complexities that have not be accurately analyzed, most likely due to the natural limitations of theoretical models. These complexities include: i) how to ensure optimal dispatch of CHP plants, which serves both the internal electricity markets along with local heating markets, ii) How to truly represent market participants' cost in a co-optimisation setup. iii) The limitations of Euphemia. The algorithm is already today stretched thin, and with additional elements being included in the coming years, we highly question its ability to handle to complexity of co-optimisation without having to compromise. Taking these complexities into account we do not believe that the RO report illustrates that moving to co-optimisation will increase social welfare. Orsted is therefore very critical of the feasibility of co-optimisation.	especially the trade-off between reduced market participant optimisation versus better global coordination, is however extremely complex (please refer to response #14). As such, there cannot be certainty that co-optimisation will increase economic surplus of the electricity markets. Further reflection on additional concerns is now provided in Section 2.5 of the R1 report.
357.	Raphael Spiekermann	illwerke vkw	Will capacity pricing be pay as cleared? Are block products intended for capacity products (depending on the intended capacity MTU)? In such a complex system, there is a high risk of algorithm failure or infeasibility. Therefore, a secure fallback must exist that does not disadvantage any market participant. There is a risk that individual fallback events could negate the expected gain of global welfare or even cause significant economic damage.	Capacity pricing will be pay as cleared, assuming the No-PAB option appears workable. Otherwise Non-Uniform Pricing with side payments may become relevant. As highlighted in previous responses, NEMOs and TSOs would like to emphasize that it is currently not foreseen that existing order types (e.g., block bids) are discontinued in a co-optimised market setup. To avoid further misunderstandings this statement is now also included explicitly in the R1 report. Lastly, fallback procedures will be studied in phase 3 of the R&D.

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358.	Lucie Horová	CEZ Group	We would like to highlight the risk of loosing liquidity on the day-ahead market as the insufficient complexity of bids or complex difficulty of creating the correct bids will cause the exodus of market participants to the SIDC markets in power and significant reduction of balancing volume bids into the market. What is also not covered in the report is the case where starting costs are covered by multi days operation. It only confirms that the dependency on explicit price forecasting measures cannot ever by completely avoided. We also doubt that such a complex optimization task can be calculated in a reasonable time with reasonable security of getting the result. As mentioned before, the costs incurred by the market participants (changes of optimization processes, software implementation for creating the "new bids", etc.) are not incorporated in the estimated valuation of co-optimization at all. We also do not agree with the statement from the 5.5 study, that there have not been identified any fundamental obstacles at his stage as the study is of insufficient complexity and only on a theoretical level. In the same part is also mentioned that several risk and challenges are not solved.	We register these concerns.
359.	Dione Hernández Galvis	RWE Supply & Trading GmbH	Even though the report has provided initial ideas for a future market design, we remain skeptical as to whether the theoretical social welfare effects can be achieved in practice. Overall, the design appears to be too complex and its implementation involves too many risks for energy trading as a whole. The primary objective must remain that energy trading provides a comprehensible and trustworthy price signal for future investments in assets. It is not yet clear whether this will be the case under the proposed design. We also do not believe that these concerns can be completely dispelled in the coming years. The behavior of different market participants with their different preconditions and	NEMOs and TSOs share these concerns. While theoretical models like ACER's welfare study suggest potential welfare gains, practical challenges remain. Quantitively addressing the concerns raised in this public consultation, especially the trade-off between reduced market participant optimisation versus better global coordination, is however

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			boundary conditions in the national markets cannot be predicted and therefore cannot be modeled. The key question for us is whether all asset types can be mapped with sufficient accuracy and whether portfolio effects can be leveraged. In any case, the gap regarding the mapping of storage must therefore be closed. In principle, however, we still have a clear preference for portfolio bidding and decentralized dispatch in a future market design.	extremely complex (please refer to response #14). As such, there cannot be certainty that co-optimisation will increase economic surplus of the electricity markets. Further reflection on additional concerns is now provided in Section 2.5 of the R1 report.
360.	Thomas Kallevik	Statkraft Energi AS	Statkraft supports the ambition to enhance the efficiency of market coupling by reducing the current inefficiencies between the capacity and energy markets. However, we believe that the inefficiencies observed today will not be resolved through co-optimisation as currently assumed. In other words, whether through co-optimisation or sequential clearing, a degree of inefficiency between the capacity and energy markets will persist, as outlined in our responses in the pricing section. We are therefore of the opinion that the added complexity introduced by co-optimisation—both in terms of bidding formats and algorithmic design—presents a significant downside without delivering a corresponding increase in efficiency. Moreover, we find that this trade-off has not been sufficiently discussed or reflected upon in the report. Statkraft maintains that a market-based model with sequential clearing remains the preferred approach. At the same time, we see clear potential for improving the efficiency of the current model by: • Establishing common capacity markets where feasible, • Further developing TSOs' market forecasts to better assess the value of capacity, and • Increasing the permissible cross-zonal capacity reservation limits. Where balancing capacity markets are in place, Statkraft supports the introduction and use of a continuous capacity market. This would help	We appreciate these thoughtful comments and constructive proposals for alternative solutions. NEMOs and TSOs share the concerns in this response and will continue to make sure that such solutions remain on the table.

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			resolve the remaining inefficiencies between the energy and capacity markets. As the share of non-flexible renewable generation continues to grow, short-term markets will become increasingly important. The primary objective of energy markets must be to ensure accurate dispatch—not necessarily to align precisely with forecasts, as the co-optimisation model implies. We believe the model and measures outlined above will enable more efficient dispatch with lower complexity and reduced costs for both society and market participants, compared to co-optimisation. Statkraft does not see evidence that co-optimisation leads to more accurate dispatch or a more efficient use of cross-zonal capacity. In any case, adjustments to positions in both the energy and capacity markets after co-optimisation will be necessary to achieve this goal. Finally, we note that the long-term development of European market coupling is not trending toward co-optimisation. Instead, the increasing importance of energy markets and the evolving relationship between energy-only and capacity markets warrant a broader and more strategic discussion about the future market design. Statkraft also believes that, the economic welfare assessed by ACER is very optimistic. While not being able to prove this data driven, we believe certain assessments into the analysis performed are not right for the time of operating a co-optimised day-ahead and ancillary market setup in a couple of years from now. The reasons are namely: - Computations were taken based on previous years market data. Already today it becomes clear that the future energy mix will be much more dominated by renewable energy sources and decentralized flex, rather than procuring balancing capacity by huge thermal units. - Additionally, the market efficiency aspect is neglected. We believe that asset operators are very good in optimising their asset base in a multi-	

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			market approach across all parts of the value chain, from day-ahead to intraday stage.	
361.	Liselotte van Balen	Eneco	First and foremost, Eneco would to raise two questions: - What is the problem in the current SDAC set-up and; - What are efficient solutions to address these issues? We see that the questionnaire is already extremely detailed and seems to skip the more fundemental questions which we just raised. We believe it is necessary to first have the fundemental discussion before turning to designing a detailed system. The primary objective of the DA spotmarket has to be efficient trading. Any change to its structure has to bring sufficient benefits to offset additional complexity. We are currently not convinced that the additional complexity will bring sufficient benefits to justify the investigated change. Less optimal functioning of the DA market will result in a lower welfare. We would also like to raise some generic (yet crucial concerns) - The complexity of calculations executed by Euphemia will increase significantly. The implementation of co-optimisation menas that it will be more difficult to understand price formation in the DA spot market. For future investments we need to be able to forecast DA spot market revenues. Therefore, sufficient transparency with regards to data publication is needed to facilitate this. - The proposed change (procuring balancing capacity in the DA auction) will result in less cross-border capacity being available for ID trading. This means that market participants will likely face higher costs for trading away their forecast errors either in ID or imbalance. This will result in welfare destruction, which is not taken into consideration in the current proposal. - Lastly, when contracting balancing capacity, the price of energy bids is not taken into account. When cheap capacity has high imbalance welfare is not optimised. The report currently does not take this into consideration either.	We share the concerns about the complexity and we refer to responses #33 and #356. Regarding the last two points, we believe there is a misunderstanding. Indeed reservation of CZC for BC will somewhat reduce the CZC for energy, but this will only happen if the increase in economic surplus through this reservation is higher than the decrease caused by reduced energy trade. This is in fact one of the main arguments for co-optimisation. This refers also to the last point: the price of energy is taken into account in this process.

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362.	Krassimir Stantchev	BDEW	Even though the report has provided initial ideas for a future market design, we remain skeptical as to whether the theoretical social welfare effects can be achieved in practice. Overall, the design appears to be too complex and its implementation involves too many risks for energy trading as a whole. The primary objective must remain that energy trading provides a comprehensible and trustworthy price signal for future investments in assets. It is not yet clear whether this will be the case under the proposed design. We also do not believe that these concerns can be completely dispelled in the coming years. The behavior of different market participants with their different preconditions and boundary conditions in the national markets cannot be predicted and therefore cannot be modeled. The key question for us is whether all asset types can be mapped with sufficient accuracy and whether portfolio effects can be leveraged. In any case, the gap regarding the mapping of storage must therefore be closed. In principle, however, we still have a clear prefer-ence for portfolio bidding and decentralized dispatch in a future market design. We therefore fully support the statement by NEMOs and TSOs: “NEMOs and TSOs remain highly sceptical on the technical and market function feasibility of cooptimisation - espe-cially with regard to the appropriate consideration of multiple constraints on the side of balancing service providers in all kind of bidding regimes” (Executive Summary). The impact of the modification of price formation on the energy system is not adequately considered. Without explicit bid prices for each product, market clearing and transparent price formation, as it is, will change and instead of providing straightforward price signals, SDAC and balancing capacity results may be more complex to anticipate and understand. This affects both long-term investments into flexible assets and forward markets settling on the SDAC price.	NEMOs and TSOs share these concerns and refer to response #356. At the same time, we would still argue for implicit bidding without explicit pricing of balancing capacity products (apart from the premium). We very much agree with the difficulties in representing bids in a trustworthy way, as there is no empirical data. While balancing capacity bids indeed are binding once accepted, in most member states, market participants would still have freedom in how to provide these within their portfolio, thus keeping significant degrees of freedom.

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			When assessing the benefits of different co-optimization implementation variants, changes in bidding behaviour need to be considered. Simulations with historical or synthetical data can provide insights into computational aspects of the algorithm but will not provide a valid quantitative assessment of the potential benefits. Shortcomings of studies like the one conducted on behalf of ACER have been highlighted in previous consultation responses. In the evaluation report (https://www.acer.europa.eu/sites/default/files/2024-09/ACER_Decision_11-2024_Annex_V.pdf, Nr. 12) ACER even acknowledged the increased complexity in bids due to intertemporal dependencies for storage units, that, however, were not considered in the study at all (the reasoning that no public data would be available on hydro assets is not clear to us). Feedback of market participants must be adequately taken into account for a proper qualitative assessment of the potential benefits and down-sides of co-optimization. In the initial statement on page 1 it is emphasized that other markets where co-optimisation is applied are fundamentally different. Central dispatch and unit-based bidding is applied and all subsequent timeframes are included. Energy trading and dispatch optimization in EU energy markets is not a one-shot exercise formulated into a day-ahead bid but is continuously performed up to delivery. An accepted balancing capacity bid is an obligation that cannot be reversed like an accepted energy bid that just forms a trade position. Unlike in a central dispatch setting, market participants are bearing full responsibility for delivering the assigned balancing capacity and therefore need to have control over the offered and accepted capacity. It is not clear which SPBC is envisaged in the study. Although balancing markets will transition to 15-minute granularity, the 4h block for balancing capacity should be additionally maintained.	
363.	Astrid Buhr Broge	Green Power Denmark	Given the above considerations, we fully support the statement by NEMOs and TSOs: “NEMOs and TSOs remain highly skeptical on the	NEMOs and TSOs appreciate these comments and share several of the

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			technical and market function feasibility of co-optimisation - especially with regard to the appropriate consideration of multiple constraints on the side of balancing service providers in all kinds of bidding regimes" (Executive Summary). Co-optimisation may theoretically be superior and provide benefits in terms of increased social welfare. However, we still believe there are several complexities that have not been accurately analyzed, most likely due to the natural limitations of theoretical models. These complexities include: i) how to ensure optimal dispatch of CHP plants, which serves both the internal electricity markets along with local heating markets, ii) How to truly represent market participants' cost in a co-optimisation setup. iii) The limitations of Euphemia. The algorithm is already under pressure today, and with additional elements being included in the coming years, we highly question its ability to handle to complexity of co-optimisation without having to compromise. iiii) The optimization of energy storage units like BESS under co-optimisation v) How a fall-back solution would look like - Is it local clearing within the price area with co-optimization, or should the markets in that case be decoupled and operated as five individual auctions? And if so, how should the bids be decoupled to make that possible. As mentioned in the report, no empirical foundation exists for running simulations, which makes assumptions applied in the R&D work critical to the results. Consequently, it is not possible to predict the outcome until real participation from all market participants begin. In this context, the experience from Denmark shows that there can be a significant gap between the theoretical model and expectations for a market change, and the actual outcome (e.g., the new imbalance prices and mFRR EAM). In this case, the consequences are even greater than expected, which is why a fallback solution is also of interest.	concerns, as addressed in response #356. This comment also rightly points out that it is not possible to address all issues in simulations, as market participants' reactions cannot be modelled trustworthy. This may lead to unexpected and potentially detrimental effects once implementation is done.

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			Taking these complexities into account, we do not believe that the RO report illustrates that moving to co-optimisation will increase social welfare. We are therefore critical of the feasibility of co-optimisation.	
364.	Magnus Landstad	Lyse Produksjon AS	We will strongly advice a plan for large scale testing with high volumes and relevant bid types from the market participants (MP), to get experience on how co-optimisation will clear the markets. To give incentives for this, one should establish some mechanism that compensates those MPs who participate. It seems very important to have testing with high and relevant volumes. The optimisation of cross zonal capacities between the markets is very important to reach the potential of socioeconomic benefit. It is not clear to us how this will work together with Flow based market clearing in DayAhead. As pointed out earlier, it is very important that the market design come out with market prices that actually show the true costs and values of delivering energy and capacity. Both to give relevant investment signals, and also for the MP with long term flexibility (e.g. hydro storage) to be able to price in the value of delivering in the different markets at different times ahead. We will again high light the need for transparency and sound and healthy market prices. A socioeconomic optimisation which gives non-intuitive market clearing and many rejected bids is not healthy.	We appreciate the suggestions for testing together with market participants that will somehow be compensated. This can be a way to address the concerns about realistic bids (cf. response #362). Consequences on prices will be first addressed in the upcoming simulations.
365.	Magnus Thorstensson	Swedenergy	Our comments above are very limited as we lack a thorough analysis of co-optimisation. Even though co-optimisation is claimed to be the theoretically most efficient solution, a primary question is for whom is it the most efficient method? A spontaneous suspicion is for the TSOs rather than society. A larger share of RES increases the need for real-time flexibility,	We share the concerns about the complexities related to hydro power. Regarding the reservation of CZC, we refer to response #361.

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			however, is it automatically so that this increases the need for ancillary services given the obligations of the BRPs to be in balance? Also, should the balancing by the TSOs be solved cross-border? Of course, cost-efficiency increases with bigger markets, but we find it contradictory to the focus on MACE in the FFR-markets. Also, it is apparent that with larger shares of RES, the quality of forecasts increases the closer to the operational stage, which is also the motive for moving IDGCT closer to real-time. However, co-optimisation means that the capacity allocation will be done based on information from at the best 14-38 hours before real-time, which also is contradictory. The Nordic power system relies heavily on a complex and flexible hydropower system with substantial storage capabilities. This flexibility is only valuable if operators can accurately forecast market prices across all relevant timeframes—from day-ahead to weeks and even months ahead. We strongly question that co-optimisation can ensure optimal dispatch from conventional HPP in general and HPP situated in cascading river in particular. The system's complexity requires long-term visibility and high forecast accuracy to ensure optimal use of stored water. Furthermore, there is also an intricate legal and operational framework surrounding hydropower assets dictating how water flows must be managed. In addition, most major rivers involve multiple owners, each with their own operational constraints and obligations. This fragmented ownership structure, combined with strict regulatory requirements, makes coordinated planning and optimization even more challenging. Without this, the risk of suboptimal dispatch increases, potentially leading to unnecessary spillage or missed opportunities for balancing and ancillary services. From a Nordic perspective, we also conclude that the analysis of the implementation of flowbased capacity calculation and the automated	

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			mFRR EAM respectively, did solely focus on the day ahead market and ignoring the consequences for other markets or society as a whole. Furthermore, we can deduce that the EU-regulation on electricity is implicitly based on the notion of one bidding zone per country based on the experiences from the implementations mentioned. Hence, this calls for a thorough analysis of the method. Given the hitherto unsolved discussion on the 70%-rule, we find no information on the volume of the allocated capacity. With co-optimisation, is the 30% reliability margin still valid? We understand that co-optimisation may be a technically efficient solution in models like central dispatch, but we fail to see this under the current market framework. Marginal pricing is usually a good method for efficient resource allocation, but this is only valid if the goods are "identical", but from a market point of view, DA-CZC is not equal to BC-CZC. In the absence of profitable large scale storage solutions, it is vital to allocate as much capacity as possible to the market to facilitate cost-efficient balancing by the market participants in all time frames, not the least the ID-market. As with the market-based allocation method, the volume of capacity reservations should at least be limited to 10 percent.	
366.	Olivier Van den Kerckhove	ENGIE	While the report prepares the way for the next phase, it remains to a large degree a very theoretical exercise that has plagued the co-optimisation discussions in the past. We consider it high time that the discussion moves away from theory and concrete simulations are performed to assess the actual feasibility of co-optimisation in the European market context. In that regard, we share to a large degree – and for reasons mentioned through our answer to the consultation – the skepticism of NEMOs and TSOs on the ability to achieve a workable co-optimisation methodology can actually deliver added value compared to todays markets. In that sense, the scalability of any solution should be stress-tested to ensure market robustness.	We clarify that preparations for simulations have started and actual simulations are planned for Q1 2026.

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367.	Ola Hamada	Vattenfall Energy Trading	The idea of co-optimization is quite a big jump for the day-ahead market. If implemented properly, it would be a huge leap forward, though we would need ample time to adjust our bidding strategies, models and general approach. I question, however, how this fits with the general direction the TSOs are taking, in Europe and worldwide. The trend seems to be more real-time, more flexibility, more granular, while this seems to be trying to prefect the "snapshot" auctions. I also agree with the sentiment that this would be an incredibly difficult question to answer for flex storage. It seems that the intention of this is to remove the strategizing from the market participants, and put this optimization efforts in the balancing algorithm. This is not the case for hydro storage though. We would still need to assert some assumptions based on forecasts and bid based on that strategy. Even if all the recommendations from this survey were implemented, we still cannot have trivial bids.	We acknowledge that a stronger focus on the ID market (and less on SDAC), could reduce the relevance of co-optimisation as currently conceived. It is important that this aspect stays in focus and is considered before each step in the further developments.
368.	Pierre Peureux	EDF	The description of the flow netting in the context of co-optimisation provided in paragraph 3.3.2 raises questions to possible impacts beyond the SDAC. If the energy flow is not always intuitive regarding the energy price differential, then it may have impact on the anticipation of the interconnection capacities' value (so on long-term auctions), as well as on forward energy markets for the upcoming months or years. From a general standpoint, EDF would like to highlight that the assessment of co-optimisation requires a holistic approach: the principles as discussed in this consultation (bid design, bid products, pricing) and the feasibility of their implementation. If EDF acknowledges that the definition of the principles and the implementation are two different stages in the process, it is crucial that no simplification of the design intervenes later to accommodate implementation difficulties. Indeed, co optimisation is only conceivable if i) market participants keep their	These are valid concerns about flow-netting, that will be addressed in the upcoming R&D phases. We appreciate the detailed expression of the concerns in this response. However, we want highlight that the future market approaches are defined in regulatory decisions; not by SDAC.

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			capability to offer all their assets at the same conditions as today and ii) implementation does not lead to suboptimalty compared to the present situation. At this point of the R&D work, EDF strongly share the skepticism of NEMOs and TSOs regarding the technical feasibility of the current proposed methodology as well as its capacity to obtain a similar quality of the solution. Indeed, too many element points to significant computational challenges, some of which may not be solvable. Furthermore, EDF would also like clarification on the coexistence of sequential and co-optimised approaches in the future market. Indeed, it is EDF's understanding that co-optimisation (or a market-based approach) must be made possible between two or more TSOs that request to do so. However, it would appear that the current co-optimisation framework is now considered to be the target model for the future European electricity market (according to ACER's presentation during the Florence Forum). In this regard, EDF reiterates the value of comparing a market-based solution at the European level with the co-optimised solution and regrets that a parallel R&D process has not been initiated. A market-based process appears to present fewer algorithmic challenges than co-optimisation while capturing a significant part of its increased economic efficiency and allowing for a bidding language as diverse as the one currently in use. The assessment of co-optimisation should also be thorough because of the many possible impacts identified already at this early stage. Furthermore, the failure of one of the parts of the solution can in fact impact and endanger the whole co-optimisation process. Indeed, EDF is worried that co-optimisation already seems to be considered as the target while it remains so far an appealing theoretical concept still requiring further and deeper investigation and confrontation to "real life" constraints (of assets) and market participants processes, especially at times when the algorithm is already challenged by other evolution. The	

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			best can be the enemy of the good with a divergence between markets and physics and a higher complexity.	
369.	Coline Gailleul	Energy Traders Europe	We fully support the statement by NEMOs and TSOs: "NEMOs and TSOs remain highly sceptical on the technical and market function feasibility of co-optimisation - especially concerning the appropriate consideration of multiple constraints on the side of balancing service providers in all kind of bidding regimes" (Executive Summary). The impact of modifying the price formation on the energy system is not adequately considered. Without explicit bid prices for each product, market clearing and transparent price formation - as it is - will change, and instead of providing straightforward price signals, SDAC and balancing capacity results may be more complex to anticipate and understand. This affects both long-term investments in flexible assets and forward markets settling on the SDAC price. When assessing the benefits of different co-optimization implementation variants, changes in bidding behaviour need to be considered. Simulations with historical or synthetical data can provide insights into the computational aspects of the algorithm but will not provide a valid quantitative assessment of the potential benefits. ACER acknowledged in its evaluation report 4 (see link below) the increased complexity in bids due to intertemporal dependencies for storage units. However, that was not considered in the study at all. Feedback from market participants must be adequately considered with a proper qualitative assessment of the potential benefits and drawbacks of co-optimization. We also doubt that such a complex optimization task can be calculated in a reasonable time with acceptable security for the results. As mentioned before, the costs incurred by market participants (changes of optimization processes, implementation for creating the "new bids", etc)	Please refer to responses #356, #362 and our other comments on the responses to this question.

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			are not incorporated in the valuation of co-optimization. In the initial statement on page 1, it is emphasized that other markets where co-optimisation is applied are fundamentally different. Central dispatch and unit-based bidding are used, and all subsequent timeframes are included. Energy trading and dispatch optimization in EU energy markets is not a single exercise formulated into a day-ahead bid but is continuously performed up to delivery. An accepted balancing capacity bid is an obligation that cannot be reversed like an accepted energy bid that forms a trade position. Unlike in a central dispatch setting, market participants bear full responsibility for delivering the assigned balancing capacity and therefore need to have control over the offered and accepted capacity. It is unclear which Standard Product Balancing Capacity is envisaged in the study. Currently, the 4h block for balancing capacity is well established in several markets. Reducing the product length will result in additional costs for balancing capacity provision due to frequent changes in unit allocation. We also disagree with the statement from the 5.5 chapter in the N-Side Co-optimisation stud y that there have not been any fundamental showstoppers identified at this stage as the study is of insufficient complexity and only on a theoretical level. In the same part, it is also mentioned that several risks and challenges are not solved. Additionally, there is a risk of losing liquidity in the day-ahead market as the complexity of the bids will cause an exodus of market participants to the SIDC markets, significantly reducing the balancing volume of bids in the market. An additional element not covered in the report is the case where starting costs are covered by multi-day operations. It only confirms that the	

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			dependency on explicit price forecasting measures cannot ever be completely avoided. https://www.acer.europa.eu/sites/default/files/2024-09/ACER_Decision_11-2024_Annex_V.pdf, Nr. 12	
370.	Dr. Bernhard Walter	EnBW Energie Baden-Württemberg AG	We fully support the following statement by NEMOs and TSOs in the Executive Summary: "NEMOs and TSOs remain highly sceptical on the technical and market function feasibility of cooptimisation - especially with regard to the appropriate consideration of multiple constraints on the side of balancing service providers in all kinds of bidding regimes". The impact of the modification of price formation on the energy system is not adequately considered. Without explicit bid prices for each product, the current market clearing and transparent price formation will change and instead of providing straightforward price signals, SDAC and balancing capacity results may be more complex to anticipate and understand. This will affect both the long-term investments into flexible assets as well as the forward markets settling on the SDAC price. When assessing the benefits of different co-optimisation implementation variants, changes in bidding behaviour need to be considered. Simulations with historical or synthetical data can provide insights into computational aspects of the algorithm but will not provide a valid quantitative assessment of the potential benefits. Shortcomings of studies like the one conducted on behalf of ACER have been highlighted in previous consultation responses. In the evaluation report (https://www.acer.europa.eu/sites/default/files/2024-09/ACER_Decision_11-2024_Annex_V.pdf, Nr. 12) ACER themselves even acknowledged the increased complexity in bids due to intertemporal dependencies for storage units. This, however, was not considered in the study at all (we cannot follow the apparent reasoning that no public data on hydro assets would be available). Feedback from market participants must be adequately considered for a proper qualitative assessment of the potential benefits and disadvantages of co-optimisation. In the initial statement on page 1, it is emphasised that other markets	Please refer to responses #356 and #362.

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			where co-optimisation is applied are fundamentally different. There, central dispatch and unit-based bidding is applied, and all subsequent timeframes are included. However, energy trading and dispatch optimisation in EU energy markets is not a one-shot exercise formulated into a day-ahead bid but is continuously performed up to delivery. An accepted balancing capacity bid is an obligation that cannot be reversed like an accepted energy bid that just forms a trade position. Unlike in a central dispatch setting, market participants are bearing full responsibility for delivering the assigned balancing capacity and therefore need to have control over the offered and accepted capacity. It is not clear which SPBC is envisaged in the study. Currently the 4h block for balancing capacity is well established in several markets. Reducing the product length will result in additional costs for balancing capacity provision due to frequent changes in unit allocation.	
371.	Ulrik Gregers Jørgensen	Fjernvarme Fyn	We support the theoretical goal of co-optimising energy and balancing capacity to improve market efficiency. However, for operators with heat-bound electricity production and consumption, it is essential that the final market design allows for accurate representation of technical constraints and multi-energy system interactions, including heat demand, thermal storage, and unit inflexibilities. The report correctly notes that no empirical data is available to validate the proposed co-optimization approach. This creates a substantial implementation risk, as key modelling assumptions may prove inaccurate and only become apparent at go-live. We recommend full transparency on these assumptions, stakeholder involvement in their validation, and robust sensitivity analyses to test outcomes under realistic scenarios. We also question the exclusion of FCR from the co-optimization scope. Since FCR delivery relies on the same resources as energy and other reserves, this separation could distort participation or pricing. We recommend that interactions between FCR and other markets be analysed and clarified in the next phase. In summary, co-optimisation has a clear potential, but success depends	Please refer to responses #343, #356, #362 and our other comments on the responses to this question.

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			on a design that reflects operational realities, supports all technologies, and manages implementation risks through careful, evidence-based development	
372.	Max Schneider	Eurelectric	Given the above considerations, we fully support the statement by NEMOs and TSOs: "NEMOs and TSOs remain highly skeptical on the technical and market function feasibility of co-optimisation - especially with regard to the appropriate consideration of multiple constraints on the side of balancing service providers in all kind of bidding regimes" (Executive Summary). The following considerations are central to the further pursuit of co-optimisation R&D: • Technical feasibility: although this is not the subject of this report, it would be judicious to establish a co-optimisation product design with regard to its technical feasibility. If the analysis finds that the product design needs to be downgraded in the face of future algorithmic challenges, it would have to be rejected. Co-optimisation should thus only be implemented if market participants are assured that they can maintain the flexibility and diversity of offers they currently have and if it is proven that co-optimisation leads to an improvement in economic surplus. However, these two conditions do not currently appear to be guaranteed, given the complexity of the methodology and the foreseeable algorithmic difficulties. • Transparent price formation: the impact of the modification of price formation on the energy system needs to be considered. A transparent process of price formation is needed to provide straightforward price signals for SDAC and balancing capacity to ensure long-term investments into flexible assets. When assessing the benefits of different co-optimisation implementation variants, changes in bidding behaviour need to be considered. Simulations with historical or synthetical data can provide insights into computational aspects of the algorithm but will not provide a valid quantitative assessment of the potential	NEMOs and TSOs clarify that there are no plans to reduce the present flexibility of the bid formats. We agree that price transparency is important. However, in an optimisation that includes several products, prices will be less intuitive in some cases. NEMOs and TSOs believe that, over time, average prices will be transparent and largely understandable, even if a single MTU price may look obscure at first. As pointed out in previous responses, storage assets will be addressed in the next phases of the R&D. Lastly, although a balancing bid indeed leads to an obligation, that is also the case in today's markets. As we have pointed out in other responses, market participants still have the flexibility of their portfolio to satisfy the commitment.

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			benefits. Shortcomings of studies like the one conducted on behalf of ACER have been highlighted in previous consultation responses. • Stakeholder input: in the evaluation report of its public consultation on the amendment of the algorithm methodology and on the expected benefits of co-optimisation (ACER, September 2024, Link, p.18), ACER acknowledged an increased complexity in bids due to intertemporal dependencies for storage units. Such dependencies were, however, not at all considered in the study because of a stated lack of public data on hydro assets, a statement which we do not understand. Feedback from market participants must be adequately considered for a proper qualitative assessment of the potential benefits and downsides of co-optimization. • Specificity of markets with decentralized dispatch: The executive summary of the MCSC R0 report emphasises that other markets where co-optimisation is applied "have a very different fundamental structure, and do not serve as relevant examples." For example, in some parts of the US, central dispatch and unit-based bidding are applied, and all subsequent timeframes are included. Energy trading and dispatch optimisation in EU energy markets is not a one-shot exercise formulated into a day-ahead bid but is continuously performed up to delivery. An accepted balancing capacity bid is an obligation that cannot be reversed like an accepted energy bid that just forms a trade position. Unlike in a central dispatch setting, market participants are bearing full responsibility for delivering the assigned balancing capacity and therefore need to have control over the offered and accepted capacity. Standard product duration: it is not clear which Standard Products for Balancing Capacity are envisaged in the study. Eurelectric underlines that the product may need to strike a balance between granularity and constraints over unit allocation.	

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373.	Anonymous	Anonymous	In general, it is nicely composed report and appendix	NEMOs and TSOs appreciate the feedback.