Consultation response

Capacity Market - Consultation on proposals to improve security of supply and align with net zero (Phase 2) and call for evidence on Ten-year Review

Response from Regen and the Electricity Storage Network

December 2023

1 About Regen and the Electricity Storage Network

Regen is an independent centre of energy expertise with a mission to accelerate the transition to a zero carbon energy system. We have 20 years' experience delivering expert advice and market insight on the systemic challenges of decarbonising power, heat and transport. Regen has over 150 members who support our mission including clean energy developers, businesses, local authorities, community energy groups, academic institutions, and research organisations across the energy sector.

Since 2018, Regen has managed the Electricity Storage Network (ESN), the industry group and voice for grid-scale electricity storage in GB. The ESN has 90 members who have a shared mission to promote the use of energy storage and flexibility to support the net zero transition. The ESN membership includes clean energy developers, owners, investors, optimisers, and academic institutions.

1.1 ESN member working groups (quarterly meetings)

Name	Description
Markets and Revenues Working Group	This working group looks at key market opportunities and new business models for storage, including future plans from the system operator and distribution system operators, existing and emerging markets and network charging reforms.
Sustainability, Safety and Supply Chain Working Group	This working group is a space to discuss many important aspects of the investment, development and operation of storage sites in the UK. The focus is on creating a sustainable industry that can aid the transition to net zero, with the core principle of adhering to environmental, social and corporate governance (ESG) criteria. Recently fire safety has been the focus area of the working group.
Innovation and Technology Working Group	This working group focuses on the role of new, emerging and enabling storage technologies. The group highlights the roles new technologies can provide to the electricity system, removing barriers to new technology development and to enable the ESN and its members to engage with research and innovation. Recently, long duration energy storage has been the focus of this working group.
Electricity Storage Network/National Grid ESO strategic meeting	The ESN/ESO strategic meeting is our regular meeting with the ESO to discuss how storage can best participate in markets. Topics include dispatch rates in the control room and the ESO's plan for their response and reserve market reforms.
Grid Connections Working Group	The Grid Connections Working Group discusses issues impacting access to the electricity grid, engaging closely with the network operators.
REMA Working Group	The Review of Electricity Market Arrangements (REMA) is a set of market reforms that could have significant impacts on electricity storage. In this new working group for 2023, we want to start preparing our messaging and thinking ahead of the second REMA consultation from DESNZ due in Autumn 2023.

2 Background and contacts

The Electricity Storage Network, managed by Regen, hosted a workshop with several members to garner feedback on this consultation on 21 November 2023. The points made in that workshop – as well as feedback from bilateral conversations with members and ongoing engagement with the Department for Energy Security and Net Zero (DESNZ) team – have fed into this response.

This response also builds on our responses to the January consultation on Capacity Market (CM) reform, and the Review of Electricity Market Arrangements (REMA) initial consultation.

2.1 Continuing engagement

We would like to offer our help and insight as the reform process continues following this consultation. As a centre of expertise and a collection of leading companies and organisations, both in the electricity storage sector and the wider energy sector, we are well positioned to help design the solutions and additional work that will follow on from this consultation.

Electricity Storage Network Lead – Olly Frankland

Olly is an expert in effective stakeholder engagement, working closely with our members, chairing and facilitating working groups, presenting on key issues and writing consultation responses.

T: 07465 201596

E: ofrankland@regen.co.uk

Markets Lead – Ellie Brundrett

Ellie led Regen's response to DESNZ's REMA consultation, bringing together subject matter experts from across Regen's knowledge areas and helping to run two member events on the subject. She continues to lead Regen's work on market reform.

T: 07939 835 059

E: ebrundrett@regen.co.uk

3 Part A: Consultation on proposals to improve security of supply and align with net zero

A significant part of our response to the January consultation focused on strongly opposing the Satisfactory Performance Days (SPD) reform proposals and, as such, we are pleased to see that these have not been brought forward.

However, the extended performance test (EPT) process remains a significant challenge for batteries and, despite the proposals explored in this consultation to support storage CMUs, there remains the need to address the more fundamental challenge of how to ensure reliable delivery of capacity across all technologies, rather than simply asking the question of how extended performance testing can be optimised for storage CMUs.

Broadly we would like to see a level playing field for all technologies that participate in the CM. The industry feels that the current approach towards batteries is overly onerous and unfair, particularly with regards to both the requirements associated with the enhanced performance test – which is not applied to other technologies – and the methodology for calculating the de-rating factors (see Section 4.2 in Part B for more detail).

We have heard from members that the high administrative burden, additional risks from new penalties, on top of the punitive de-rating factors and the associated methodology, may mean that asset owners simply stop bidding for new CM contracts in the future. This becomes particularly important at a time of capacity scarcity and very high clearing prices, and would clearly not be a good outcome for the industry as a whole.

Following engagement with DESNZ officials, we understand that wider CM reforms will be taken forward within the upcoming second REMA consultation and ongoing process, as well as a CM phase 3 consultation in 2024 and beyond. We intend to continue to engage in these upcoming policy changes.

We have explored some of these points in more detail in our response to Part A, where we have focused on the sections relating to storage CMUs and projects with long build times, and in Part B.

3.1 Response questions

3.1.1 Addressing challenges faced by batteries in the Capacity Market

Question 6: Do you agree with the proposals that we have put forward to help address barriers faced by storage CMUs in managing battery degradation?

Specifically:

a. The introduction of a definition of Permitted Augmentation under Rule 4.4.4.

b. Enabling the level of EPT requirement to be appropriately reduced when secondary trading occurs.

Broadly, we are supportive of both proposals put forward to help address barriers faced by storage CMUs, recognising that these changes will offer improvements to some storage CMUs by providing them with the ability to take action to manage degradation and have a better chance of meeting the performance requirements over the course of multi-year agreements. We thank the work of the officials in question to get these changes confirmed.

However, there are some concerns regarding the proposed definition of permitted augmentation, particularly the condition that storage CMUs cannot supplement a CMU's capacity with capacity from another CMU. In the past, several members have questioned why there was not a more efficient way to deliver agreements at an aggregate level across a portfolio. DESNZ should explore relaxing this condition, to better allow companies with several battery storage CMUs to manage degradation at portfolio level and ensure delivery of low carbon capacity. Relaxing this condition would also enable more efficient utilisation of the materials that are needed to build the batteries, and reduce pressures on an already stretched supply chain.

Furthermore, while there is the potential for a successful secondary trading market in the CM, the secondary trading market as it currently stands is illiquid and there is no guarantee of finding an asset to trade with. The success of proposal B in supporting storage CMUs to manage asset degradation is predicated upon a better functioning secondary trading market, which could also could improve security of supply (see Section 4.4 in Part B for more discussion regarding secondary trading).

On a more fundamental level, members have raised the concern that, while these proposals are helpful adjustments to the existing mechanism, there are more fundamental questions that need to be asked around the treatment of storage CMUs within the CM, whether this is fair or reasonable within the context of a technology neutral scheme, and whether more substantial reform is required. Permitted augmentation alone cannot be viewed as an enduring solution to solving the challenges faced by storage in participating in the CM.

We would like to see a level playing field for all technologies that participate in the CM. The industry feels that the current approach towards batteries is overly onerous and unfair, particularly with regards to both the requirements associated with the enhanced performance test – which is not applied to other technologies – and the current and future de-rating factors (see Section 4.2 in Part B for more detail).

We have heard from members that the high administrative burden, additional risks from new penalties, on top of the punitive de-rating factors and the associated methodology, may mean that asset owners simply stop bidding for new CM contracts in the future. This becomes particularly important at a time of capacity scarcity and very high clearing prices, and would clearly not be a good outcome for the industry as a whole.

Recommendation: Proceed with the proposals to:

A) introduce of a definition of Permitted Augmentation under Rule 4.4.4, and;
B) enable the level of EPT requirement to be appropriately reduced when secondary trading occurs – recognising that they are unlikely to significantly positively impact the participation of storage CMUs in the CM.

Recommendation: Review the requirements for an extended performance test, including whether an equivalent mechanism should be introduced for all technologies participating in the CM. If continued, reduce the frequency of extended performance tests in the CM for storage CMUs.

As a more lasting solution to support the participation of storage CMUs in the CM, we would advocate for the introduction of a mechanism that recognises degradation curves for storage, something that we have explored in more detail in our response to Q9.

Recommendation: Explore the development of a mechanism that could be applied across all technologies to allow storage CMUs to provide an expected capacity curve for the 15-year contract period that could be re-assessed at intervals (e.g. annually) to update with the actual level of degradation.

Question 7: Do you foresee any unintended consequences which could arise from the proposals set out in question 6?

For both proposals, an important consideration for DESNZ when approaching implementation is whether these should be retrospectively applied and the fairness of this should be carefully considered. We would appreciate some clarity on this in the next stage of this reform process.

When discussing this proposal at our member workshop, it was highlighted that, despite the termination risk present in the EPT process, different approaches have been taken by different CM participants, with some CM participants taking on contracts they knowingly cannot fulfil on the assumption that there would be some kind of rule change to support augmentation or secondary trading of obligations.

With this in mind, views were mixed as to whether these proposals should be applied retrospectively, given the risk of it benefitting some participants more than others. Some members raised that, while these proposals could be retrospectively applied, this is clearly not an ideal outcome for some and there may be a limit to the number of CMUs with contracts in place who can respond to this. The cost of augmentation is prohibitive for projects which have not been set up with augmentation in mind from project inception, and it might require additional planning permission which could be challenging if augmentation was not envisaged at the planning stage.

Additionally, as contract prices have varied considerably over time, there is a risk of participants gaming the system and retaining excess benefits through the use of secondary trading, which needs to be carefully managed.

Question 8: Do you believe that other supporting changes are required to accommodate the proposals set out in question 6, for example changes to testing arrangements?

See responses to Q6, particularly with regards to the need for a better functioning secondary trading market, and Q9.

Question 9: Noting the considerations outlined in section 6.1 of the consultation, do you have any further comments or concerns regarding the retention of the EPT framework for storage CMUs? Are there any further required changes which have not been identified or considered?

The extended performance test only applies to storage CMUs and has to be undertaken every three years, unfairly penalising and adding costs to these projects looking to enter the CM. While we recognise that the CM should be a technology-neutral mechanism, when comparing the expectations placed upon different technologies, it becomes apparent that the EPT process arguably does treat storage CMUs differently from other technologies, going against the technology neutrality principles of the mechanism. This was explained by one member during our workshop:

"On the legal risk and application to other technologies that compete in the in the CM, it's interesting to note [that] the de-rating factor for storage is reduced significantly. The 2023 T-1 de-rating factors for offshore wind and for [a] 1hr duration storage CMU are almost identical – 11.52% and 11.34% respectively. The EPT is also a test of the ability to get close to or very near to the connection capacity, and with a 100 MW 1hr storage CMU versus 100 MW offshore wind, the battery would be required to get to 95 MW for an hour, whereas the offshore wind would only be required to get to 11 MW."

This highlights the disparity between what is expected of storage CMUs in comparison to other technologies – as currently defined, the EPT requires storage providers to reach c.95% of their connection capacity, which is a requirement that other capacity providers do not have. Furthermore, no equivalent mechanism exists for testing the durability of other technologies participating in the CM – in the above analogy, offshore wind would not be expected to prove it could deliver capacity for an extended period of time, nor would it incur penalties for missing said capacity by a MW. Meanwhile, if a storage CMU were to fail an EPT marginally (e.g. by 3%) they could potentially receive an intend to terminate notice.

As such, ESN members have repeatedly raised a concern that the current rules on Extended Performance Testing need reviewing, as reflected both in our response to the January 2023 consultation, and in subsequent engagement with the DESNZ team. There is a need to address a wider challenge of how to ensure reliable delivery of capacity across all technologies, rather than simply asking the question of how EPT can be optimised for storage CMUs.

For example, one member highlighted that some older gas-fired generators might not be able to reliably deliver for more than 30 minutes, but currently no mechanism exists to test this technology's durability or penalise the CMU for non-delivery in the same way. Therefore, if the government considers assurance of durability to be a priority, then there should be an exploration of whether EPTs should be introduced for all technologies.

Recommendation: Review the requirements for an extended performance test, including whether an equivalent mechanism should be introduced for all technologies participating in the CM. If continued, reduce the frequency of extended performance tests in the CM for storage CMUs.

Degradation

The current process and systems in place to apply for CM contracts do not take into account the technology characteristics of the current dominant energy storage technology, Li-Ion batteries. This technology has a degradation rate that is well known and understood. Providers limit the number of cycles they do per day in order to maintain the health of the battery cells and to stay within their

warranty guidelines. In the T-4 auction, a 15-year contract is available and a battery storage project will degrade by a certain percentage rate over that time (depending on a variety of operational factors). This means that if they submit any bids using their full capacity they will not be able to meet that requirement over the 15-year contract.

The alternative to this is to submit less than the stated connection capacity at the pre-qualification stage informally, which is not an ideal process and could be improved – we have seen many CMUs bidding with a capacity that is lower than actual to include the assumed degradation over the length of the contract. This is counterproductive for developers and the bodies involved and limits the potential for this technology to contribute to capacity adequacy to the best of its ability.

It is also a compromise for asset owners who are limiting the commercial potential of their asset, with this reduction of revenue potential often then priced into the business case in the form of higher clearing prices, driving up prices for consumers. As Figure 1 highlights, in the last five T-4 auctions, the clearing price has consistently increased. While it is difficult to say whether this is a direct result of the treatment of storage CMUs, several of our members have pointed to a potential correlation between the de-rating of storage and rising prices. Furthermore, higher de-rating factors means more nominal capacity needs to be contracted, which can also drive up marginal price.

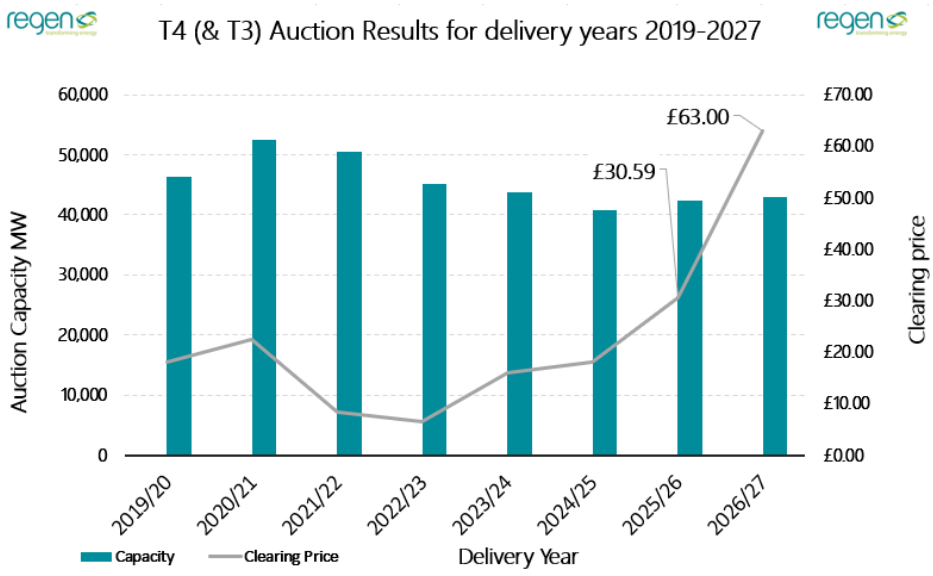

Figure 1: Capacity Market – Year 4 Auction Results for delivery years 2019/20 to 2026/27

However, some members have suggested that if the need for storage CMUs to self-derate was removed, and the true available capacity was recognised, then they might be able to bid into the auction at lower prices for the same asset, due to the ability to provide more capacity to the system with the same asset, reducing the cost to consumer.

While we are aware of concerns around the need for the CM to remain technology neutral, it should be possible to introduce a mechanism that both recognises degradation curves for storage CMUs and is applicable across all technologies. For example, all technologies could be expected to provide a capacity profile for the contract duration, which could be flat for some technologies and represent a

curve for others. There could also be flexibility to allow all technologies to update this and redeclare their capacity on a regular basis – annually, for example.

This would address the fact that storage CMUs are currently being treated differently when it comes to de-rating, accepting the uniqueness of storage CMUs in certain respects and allowing them to compete while still adhering to tech-neutrality.

We raised this in our response to the January consultation, with a recommendation that storage CMUs should have the ability to provide an expected capacity curve for the 15-year contract period that could be re-assessed at intervals (e.g. annually) to update with the actual level of degradation.

We believe that this recommendation should continue to be considered by the DESNZ team, as the ability of the CM to better recognise the degradation of technologies over time would allow for both a) improved visibility of future capacity adequacy, and therefore allow for more accurate auctions to procure additional capacity, and b) better cost reflectivity and, by extension, better value for consumers.

Recommendation: Explore the development of a mechanism that could be applied across all technologies to allow CMUs to provide an expected capacity curve for the 15-year contract period that could be re-assessed at intervals (e.g. annually) to update with the actual level of degradation.

Self-nomination of connection capacity

Finally, we would welcome clarity on plans to formalise the process for self-nomination of connection capacity. The government response to the January consultation stated that:

"The government welcomes the views shared on the option for applicants to self-nominate connection capacity, provided the value does not exceed TEC, MEC or Average Output. While feedback received was broadly supportive of the proposal, the government intends to explore this policy proposal further as part of phase 2, including undertaking further analysis and development in order to better understand interactions with wider arrangements."

However, this does not appear to have been included in this consultation. The introduction of an amendment to allow for self-nomination of connection capacity amendment would mean that CMUs are able to prequalify a reduced capacity for the duration of the contract. As discussed above, self-nomination as a practice has been undertaken informally by CMUs, and has been allowed by the Delivery Body, but formal clarification has not been provided.

Whilst we recognise that this does not provide the best solution to the issue of degradation – and longer term would continue to advocate for the ability for all CMUs to provide a capacity profile, as discussed above – it would allow participants with storage CMUs some comfort that they can enter the CM knowing that a multi-year contract will not be subject to termination and allowing batteries to contribute to security of supply throughout the entire term of a 15-year contract.

Recommendation: In the short term, provide clarification on the plans to formalise the process for self-nomination of connection capacity, as explored in the January consultation.

3.1.2 Projects with long build times

Question 11: Do you agree with the proposed introduction of Declared Long Stops, both 12- and 24-month options, to accommodate low carbon projects with long build times in the CM?

Yes.

However, as we discussed in our response to BEIS' call for evidence on long duration storage in 2021, while the CM is one of the few well-established markets to value flexible duration, it is unlikely to be sufficient on its own to incentivise large-scale, long-duration electricity storage (LLES). Therefore, while we agree with the proposed introduction of Declared Long Stops to support the development of projects with long build times, it is unlikely to have a meaningful impact on the development of such long duration storage projects without the additional development of targeted support mechanisms. We are looking forward to the upcoming cap and floor mechanism and consultation from DESNZ that will look to fill this void.

Furthermore, there remains a need for DESNZ to provide industry with some clarity on the strategy regarding long duration storage in the future, including a vision for how different mechanisms should interact, such as the CM alongside more targeted support mechanisms.

Recommendation: DESNZ should publish the planned consultation on a cap and floor mechanism for long duration as soon as practically possible. This should be followed by a vision for a government strategy regarding the future of long duration storage.

Question 12: Does the option to declare a (12-month) Long Stop Date provide developers with any benefits versus relying on the existing Long Stop Date process?

Question 13: Does a Declared Additional (24-month) Long Stop Date, Rule 6.7.7 (if applicable) and the existing 120 working days from a Notice of Intention to Terminate provide sufficient time for slippage, and if not, what would be an appropriate amount of time which would need to be considered?

Depending on the scale of the infrastructure and the development stage of the technology, long duration storage projects can take up to seven years to complete construction. This means for some projects with long build times, the introduction of a 24-month long stop date may still not be sufficient if they have very long build times or encounter significant, unexpected delays in construction.

The consultation also states:

"Utilising the existing long stop results in a reduction to a CMU's agreement length, delaying delivery until the following Delivery Year, resulting in a forfeit of 12 months of CM revenues. For example, if a CMU has secured a 15-year agreement in the relevant T-4 auction and then exercises the Long Stop date, they will receive 14 years of revenue. This incentivises CMUs to deliver for their contracted Delivery Year, only using the Long Stop when necessary, as utilising the mechanism results in lost revenues."

However, it is not clear whether this would also be the case for a 24-month long stop, i.e. utilising the long stop would result in a loss of 24 months of CM revenues, reducing a 15-year contract to 13. This could negatively impact the investment case for said projects, impacting project viability and

disincentivising them from participating in the market – many in industry have highlighted the importance of a full 15-year agreement from a financing perspective.

Recommendation: Carefully explore whether the proposals as laid out in the consultation will have the intended effect of supporting growth in the long duration storage sector, or whether further amendments may be required, such as the inclusion of a 36-month long stop or a revision of the rules regarding loss of revenues when utilising a long stop.

Question 14: Do you foresee any unintended consequences which could arise from the introduction of the declared long stop dates?

See answer to Q13.

Question 15: Do you agree with the proposed eligibility criteria for CMU's seeking to utilise the Declared Additional (24-month) Long Stop?

Question 16: Do you agree with the proposed operational conditions for a Declared Additional (24-month) Long Stop?

Question 17: Do you have views on the relationship between a CMU utilising the Declared Additional (24-month) Long-Stop and its role as Price Maker versus Price Taker in the CM auction(s)?

The status of a CMU as a Price Maker or Price Taker should not be impacted by the use of the 24-month long stop, particularly if, as outlined in our response to Q13, this is associated with a reduction in contract length. Projects which will be eligible for this proposal will likely have a high investment costs, and fewer years of a multi-year agreement to recover said costs, meaning they may require an auction clearing price higher than the Price Taker threshold bid of £25/kW.

Given that this status of Price Taker means that these projects would be unable to exit the auction if the price clears above this price, it is far more likely to lead to non-participation in the CM, which would be counterproductive to the aims of the proposed amendment.

Recommendation: Ensure that the use of a 24-month long stop does not impact the status of a CMU as a Price Maker or Price Taker.

Question 18: Are there any further required changes for the implementation of a Declared Additional (24 month) Long-Stop which have not been identified?

4 Part B: Ten-year Review Call for Evidence

The CM has been a critical element of the current electricity market arrangements since its introduction in 2013. Its key purpose is to ensure that there is sufficient capacity adequacy by providing a subsidy to existing capacity that would otherwise exit the market, and to encourage investment in new capacity. Over the next decade it will be especially important to incentivise investment in energy storage and dispatchable low carbon generation, which will be essential in a very high renewable energy system.

REMA

Having engaged extensively with both REMA and the current CM review process, it is clear that significant changes are required to align the CM with the UK's net zero goals and stimulate the required investment to achieve these goals. We understand that REMA will be taking forward many of the reforms proposed to the CM and we are very much supportive of that process. We ask that the second REMA consultation be shared with industry as soon as possible, as the current policy uncertainty is impacting decisions on participation in future auction rounds.

In our initial response to the REMA consultation, we were supportive of the introduction of multipliers into the CM, although from engagement with the REMA team over the course of this year it appears that the introduction of minima via a single auction might be a more successful reform option for valuing low carbon and flexible technologies. This differs from the suggestion 2 from the Technopolis report which suggested a split auction.

We will continue to engage with this reform discussion as part of the REMA process, and would advocate for a strengthening of mechanisms to incentivise unabated fossil fuel assets with CM contracts to decarbonise, alongside measures to support the further participation of low carbon, flexible assets such as battery storage within the CM.

Finally, it is also important to recognise that the continued uncertainty around reform, such as the ongoing REMA process, impacts our ability to answer to questions laid out in Part B of this consultation, as it is challenging to speak to future requirements without having clarity on the current possible pathways of CM reform. As far as possible, the following sections explore the most significant issues raised by our members with regards to the CM, and possible solutions.

Recommendation: Progress with the REMA process to provide clarity on possible CM reforms as soon as possible, including further exploration of the potential introduction of minima, multipliers or separate auctions to allow the CM to better value low carbon technologies.

4.1 Realising the potential of low carbon flexibility

This section relates to questions 13, 14, 21 and 22.

Electricity storage, and the set of technologies this represents, is a significant and growing presence in the energy system. There is now an estimated 3.4 GW, or 4.3 GWh, of grid-scale battery storage in the GB market, a figure that has increased by over 1 GW so far in 2023. These assets, alongside the existing 2 GW of pumped hydro on the system, are crucial for the delivery of low carbon flexibility and for

meeting the UK's 2035 target for a decarbonised power system. They provide a wide range of services to the ESO and help reduce balancing costs, reducing bills for consumers.

We have a world-leading grid scale electricity storage industry in GB with billions of pounds worth of projects installed already and tens of billions in the pipeline (e.g. 122 GW of standalone battery storage with contracted capacity[1]). This is considerably more when considering sites co-located with renewable energy (approx. 180 GW). Our innovative market frameworks, particularly the frequency response services, have stimulated this significant interest. However, we risk losing our position as one of the leading grid scale markets in the world if we fail to work collaboratively to maintain the successful and competitive market frameworks.

If we want to maintain this level of deployment in short duration batteries and help build additional longer duration assets, we need to put the right market mechanisms in place. The CM has been a crucial part of the revenue stack for developers of storage and recently we have seen record levels of batteries in particular receive contracts in auction rounds. However, our members are concerned that batteries will not be bidding in future auction rounds with even lower de-rating factors.

De-rating factors

Batteries continue to be one of the highest providers of new build capacity bidding into the CM auctions. However, the de-rating factors for batteries in both the T-1 and T-4 auctions are down by roughly a third this year compared to last year. This drop has followed previous significant drops in the years before. We feel that the current de-rating factor methodology, last updated in 2017, is no longer fit for purpse. If the status quo is maintained and the de-rating factors go down further in subsequent auction rounds, battery storage developers will simply not bid in the auction rounds due to lack of revenue versus the costs/penalties/risks. This issue was highlighted in the Technopolis report:

"A prominent concern over misalignment between the Capacity Market and Net Zero was de-rating factors for low carbon technologies."

We are aware that there are plans for a wider review and consultation on the de-rating methodology, and a commitment was made for the ESO to consult on this in Autumn 2023. However, we are yet to see this published.

Recommendation: ESO to publish a review of the de-rating factors methodology and approach to battery storage and other technologies as soon as practically possible.

Adverse impacts on co-located projects

There is more that could be done to encourage the participation of co-located sites in the CM. We define co-location here as when energy storage is sited with generation (normally solar PV) and/or demand, and there is a shared grid connection. This is also known as a hybrid site, or a multi-unit site.

[1] Regen/Electricity Storage Network, 2023. Pipeline of GB electricity storage https://regengis.maps.arcgis.com/apps/dashboards/9c29e3a1dc42497db27308ee87e099ba

While we understand there has been some negotiations to allow co-located sites to pre-qualify and win contracts in the CM, the process of engaging the EMR delivery body for each site is inefficient. This needs reform to help improve integration of this type of site in to the CM. There were also discussions in the past regarding the creation of a hybrid CMUs category in the CM open letter from BEIS in 2020[2]. As the number of co-located sites grows at the distribution and transmission network scale, this is something that we would like to see explored in more detail. We believe now is the right time to re-open the discussion regarding a new generating technology class. We understand a Phase 3 consultation from DESNZ will look at co-location in more detail.

Recommendation: Provide an optimised process for co-located battery storage sites to participate in CM via a new generating technology class and consultation process.

Extended performance testing and degradation

We would also highlight the following recommendations from Part A that would apply to this section.

Recommendation: Explore the development of a mechanism that could be applied across all technologies to allow CMUs to provide an expected capacity curve for the 15-year contract period that could be re-assessed at intervals (e.g. annually) to update with the actual level of degradation.

Recommendation: Review the requirements for an extended performance test, including whether an equivalent mechanism should be introduced for all technologies participating in the CM. If continued, reduce the frequency of extended performance tests in the CM for storage CMUs.

Recommendation: In the short term, provide clarification on the plans to formalise the process for self-nomination of connection capacity, as explored in the January consultation.

4.2 Prioritising the decarbonisation of the CM

This section relates to questions 1, 4, 13, 14, 20 and 22.

At this stage in the UK's net zero transition, dispatchable generation should be in the form of low carbon solutions such as battery storage, gas with carbon capture and storage (CCUS) and hydrogen fuelled power generation and storage. However, the CM arrangements, and the current carbon intensity limits within the CM, have not prevented unabated gas turbines and reciprocating engines from dominating the market.

This is highlighted when comparing the volume of (currently unabated) gas-fired generation awarded contracts in the most recent CM auction versus low carbon technologies, as seen in Figure 2. This includes two new CCGT plants at Eggborough (total 1552 MW) which were awarded 15-year CM contracts worth a massive £98m per annum. This new capacity that will be able to compete in the

[2] BEIS, 2020 https://www.gov.uk/government/consultations/capacity-market-new-technologies-2020/open-letter-on-new-technologies-in-the-capacity-market#fn:2

wholesale and balancing market, with no equivalent CfD clawback if energy prices and revenues are high and no imperative to switch to a low carbon alternative within their contract term.

Continuing to support new build and refurbished fossil fuel plants, including CCGT and gas reciprocating engines, in the CM risks locking GB into an expensive high carbon future and is fundamentally incompatible with the government's own decarbonisation commitments. In this regard, the current CM mechanism has prioritised security of supply to the detriment of the third objective, to *complement the decarbonisation agenda*.

Recommendation: Adjust the wording of the third objective – "*avoid unintended consequences: to minimise design risks and complement the decarbonisation agenda*" to more explicitly prioritise decarbonisation of the CM.

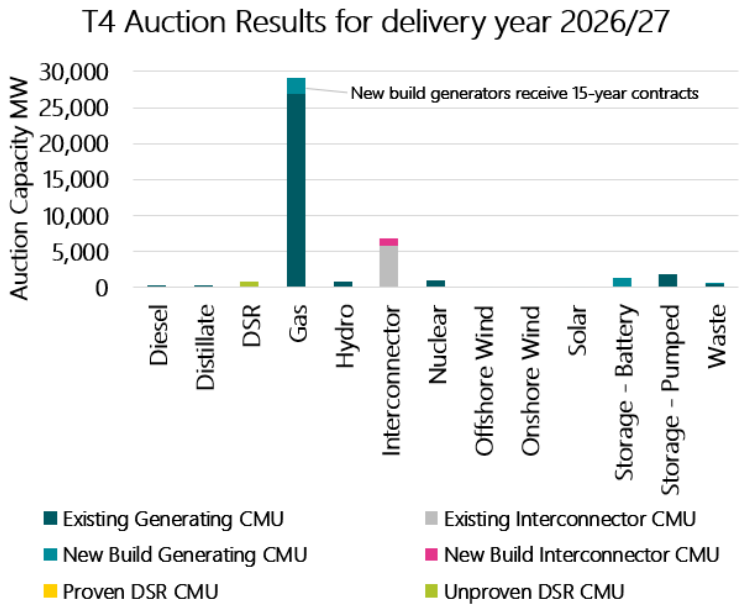

Figure 2: Capacity Market – T4 Auction Results for delivery year 2026/27

It was promising that in the January consultation DESNZ recognised that the CM as it is currently designed is inconsistent with net zero, and stated an aim to align the current rules on emissions limits with net zero targets, something which was highlighted in the Technopolis report. However, in our response we highlighted our concern that the proposed changes to emissions limits did not go far enough in preparing the CM for a net zero future, or in properly valuing the emissions avoided by participation of low carbon assets in the CM.

Specifically, there is a risk that the implementation of a flat reduction in 2034 may effectively create a cliff-edge for decarbonisation, rather than a managed reduction in the carbon intensity of the CM function. If a flat limit is to be implemented, this should be adjusted annually in order to strengthen to limits sooner and better value low carbon assets, rather than having a steep reduction so late in the day that, if the emissions limit is not achieved, it risks achieving the 2035 net zero power target.

Furthermore, we are concerned that continuing to allow fossil fuel generators to meet a yearly emissions limit, even after the intensity emission limit is tightened after 2034, risks creating a situation

where unabated gas assets continue to participate in the CM. This is because, even if an unabated asset does not meet the intensity emission limit, it could still generate for a percentage of time annually in order to meet the yearly limit. By continuing to provide contracts under this principle, the financial incentive of participation might be greater than any penalties incurred for breaching the yearly emission limit, incentivising them to maximise their output in order to maximise revenues regardless of any emissions limit.

In our response to the January consultation we advocated for the removal of an annual emissions limit from 2034, to provide a stronger signal to fossil assets that they are required to decarbonise in order to participate in the CM. We provided several further recommendations to support the decarbonisation of the CM, as outlined below:

Limiting contracts

Recommendation: Re-explore the possibility of limiting long-term contracts to low carbon assets, as part of more fundamental reforms to the CM.

Recommendation: Longer term, begin the process of moving unabated fossil fuel assets out of the CM and into a Strategic Reserve, including the option to bring into public ownership.

Flat emissions limits

Recommendation: Replace the flat reduction in the emissions limit from 2034 with an annual downwards adjustment.

Recommendation: Remove the annual emissions limit from 2034 to provide a stronger signal to fossil assets that they are required to decarbonise in order to participate in the CM.

Valuing carbon

Regen and the ESN have been raising the issue of accounting for carbon in operational signals for several years (e.g. see our position paper published in 2020). It is an area we have engaged closely with National Grid ESO on though the ESN's Markets and Revenues Working Group. Broadly, we are asking for better valuation of carbon in electricity markets, including clear carbon reporting on all markets and services. In our REMA response we asked for policy changes to deliver on these areas. We welcome the data being provided by the ESO from the Balancing Mechanism and new methodology for carbon reporting of DSO services. However, we would welcome further ESO actions to monitor the carbon intensity of the services and markets they deliver. We have been working with the ESO on how the new Future System Operator could work more effectively in driving net zero delivery. Better monitoring and reporting of the carbon intensity of different markets, such as the CM, would highlight the extent to which the current structure render it incompatible with decarbonisation targets, strengthening the case for reform.

Recommendation: Give the FSO/ESO the mandate to monitor carbon intensity and prioritise low carbon assets in market services, such as the CM.

4.3 Security of supply

This section relates to questions 1, 6, 8 and 22.

In our initial REMA response we highlighted the need to move from a capacity neutral position (all MW are the same) to better align the CM with the delivery of an overall net zero system architecture and a set of system attributes and capabilities required for resilience and operability – such as duration, responsiveness, reliability, flexibility, power quality, stability, recovery, diversity of supply and low carbon. As we have highlighted in our response so far, it is clear that assets that are low carbon, provide sustained response, two-way response and have fast ramp rates are under-rewarded by the CM for the value they provide at present.

While capacity adequacy is important, a focus only on capacity is a reflection of traditional energy security thinking, based on maintaining a certain capacity margin in order to meet a predicted winter peak evening demand. That thinking is in turn based on the logic that, provided there was some capacity headroom against the winter peak, other aspects of energy system resilience could be managed by the System Operator. The definition of a CM system stress event – four hour duration with sufficient pre-warning for the system operator to issue a CM Notice at least four hours in advance to mobilise large generation capacity – reflects this thinking.

Maintaining an adequate peak demand capacity margin will still be important, and is still a useful benchmark to gauge security of supply. However, in the future, energy system stress events will be more varied and more dynamic, and will require different system attributes to deal with them. For example:

- With far more variable renewable generation on the system, we might expect to see greater volatility in supply caused by weather changes. This might be reflected to higher 'ramp rates' as generation rates change rapidly over relatively short periods.
- With a higher dependence on interconnectors the GB energy system may be subject to EU market fluctuations, as well as the possibility that interconnectors may come offline with little notice.
- Summer stress events may become more common – as already seen in 2022 – during periods of unexpectedly low renewable generation while other dispatchable assets are offline.
- We might expect to experience longer duration stress events, lasting days, caused by low wind generation combined with some other system constraint.
- We might also experience very short and unexpected stress events caused by, for example, sudden changes in demand responding to wholesale price changes.
- Low or falling demand may produce its own operability issues, including frequency fluctuations and loss of reactive power.

Even within traditional supply interruptions the ability to respond very quickly at the outset of a stress event may have additional value to the energy system and lessen the impact of 'bull-whip' effects. As seen in the area of frequency management, a fast response will likely often require less intervention. A good example of the need to have a rapid response capability were the lightning strikes of 9th August

2019 which knocked out two generators, producing a sudden frequency variation, which in turn had a knock-on impact on other generation assets.

Building resilience in the CM to cope with the different stress events of the future will require the mechanism to value and bring forward different types of assets and capabilities: assets that can respond very quickly and flexibly to 'hold the line', assets that can then provide extended capacity over several hours and assets that can provide resilience over even longer durations such as long duration storage. Assets in this context could mean generation assets but could equally mean demand flexibility solutions and storage solutions that are able to provide both supply and demand.

This reinforces the importance of the REMA process to bring forward a reformed CM that can better value and stimulate the growth of flexible, low carbon assets on the system.

Recommendation: Recognise that future stress events may become more dynamic than the traditional 4-hour window, and prioritise valuing flexibility within the CM as part of the REMA reforms.

The role of interconnectors

As highlighted above, we would appreciate some clarity on the role of interconnectors in the CM, and whether they may negatively impact security of supply. During an actual stress event to what extent is the risk present that a) interconnectors could be flowing the wrong way, b) the 'turning of the dial' to EU/France could be prioritised due to economics, or c) an interconnector unexpectedly exporting or going down could be the trigger for the system stress event in the first place?

Furthermore, to what extent is it appropriate or cost effective to be providing interconnectors with CM payments, if the risk of them triggering or exacerbating system stress events is significant? The 2021 Call for Evidence sought views on the future of cross-border participation in the CM and the role of interconnectors within this. However, despite the summary of responses committing to "*developing more detailed proposals on specific areas of potential Capacity Market design change*", there appears to have been little progress on providing a public consultation to review the role of interconnectors within the CM.

Recommendation: Provide an update on the review process for interconnectors and cross-border participation within the CM since the 2021 Call for Evidence and, if possible, release a public consultation on this.

4.4 Secondary trading

This section relates to questions 18 and 19.

We are supportive of the growth of a secondary trading market for CM contracts, as we do not feel it that in its current form it is fit for purpose. The need for substantial reform in this market was raised by participants at the end of 2018 and more recently in the Technopolis report. This remains a priority for our members and we look forward to DESNZ undertaking a holistic review of secondary trading as announced in the most recent CMAG report.

There is the potential for a successful secondary trading market that could benefit providers, if some of the conditions were changed. For example, the battery storage sector has for some time been experiencing significant supply chain issues, which is causing delays to the construction of some new-build units. A better functioning secondary trading market could allow those providers to pass on their contract to a site which does not have a CM contract in place but would like one, allowing for no loss in security of supply as that capacity obligation is being fulfilled by a third party.

We support the development of a secondary trading marketplace presented in the Technopolis report alongside the consultation. The current market is highly dysfunctional and this would remove a significant administrative burden for providers while helping to reduce the risk of penalties or terminations.

Recommendation: Work with providers to develop a more liquid secondary trading market that could better protect security of supply and support the development of new assets across a number of technology classes. This could include a new secondary trading marketplace developed with industry input.

In addition, as part of the upcoming review of secondary trading we would like the maximum aggregation cap of 50 MW cap for a portfolio within the SPD process to be reviewed, as this limits the ability of providers to use this to full advantage. This would help with unintended outages, as currently if anything goes wrong there is immediate risk of a termination, which members did not feel was efficient or good value for consumers. Raising the cap would allow for flexibility across assets for providers, increasing security of supply.

Recommendation: Consider increasing the cap on portfolios for SPDs to increase security of supply and flexibility for providers with multiple assets to deliver the expected capacity.

4.5 Issues with portal holding back long-term policy development

This section relates to question 21.

During the members workshop that took place to inform our response to the January consultation, several members raised concerns that the lack of flexibility within the portal, and the wider processes associated with qualification, are holding back longer term policy development in the CM and restricting the potential growth in this market, to the detriment of security of supply. For example, the need to submit paperwork for each CMU as part of the pre-qualification process represents a significant burden for those participants with a portfolio of assets. It is a time-consuming process and the highly manual nature of it increases the risk of error. As one member explained:

"[You can] can easily make a mistake… if you're copying over cover letter cover letter – miss over one CMU ID and they reject your whole application, [with] no flexibility. It's pretty harsh given how much paperwork there is and that they don't give any advice prior to the pre-qual process. It doesn't feel necessary to go through the admin of an account for each CMU – you should have it all on one account."

In this way, participants with a portfolio of assets should be able to link these CMUs to a single account, to save time and reduce the risk of error. This feeds into wider issues with the portal that were raised

by members, such as the inflexibility with regards to allocating additional capacity or duration to a site. The inability to align different CMUs on the same site, and the additional complexity of the metering associated with such a task, led members to feel that the relatively archaic legacy portal, and the delays in transitioning fully to the new portal, are restricting the ability of participants to develop their sites, with a knock-on impact for security of supply.

Recommendation: Review the effectiveness of the portal and whether it is impacting progress in the CM. Work to streamline processes to allow participants to engage more efficiently.

Regen
Bradninch Court, Castle Street, Exeter, EX4 3PL
01392 494399