REA Response:
Facilitating the deployment of large-scale and long-duration electricity storage: call for evidence

The Association for Renewable Energy & Clean Technology (REA) is pleased to submit this response to the above consultation. The REA represents a wide variety of organisations, including generators, project developers, fuel and power suppliers, investors, equipment producers and service providers. REA members range in size from major multinationals to sole traders. There are over 500 corporate members of the REA, making it the largest renewable energy trade association in the UK.

1. **Do you agree with our definition of LLES as storage technologies that can store and discharge for over 4 hours and have a power capacity of at least 100 MW? If not, what alternative definition would be more suitable? Please provide supporting evidence where possible.**

Four hours makes a reasonable delineation between short and longer duration energy storage and is what was used by the REA in our Longer Duration Energy Storage Report. [1]

However, the REA suggest caution in using a rigid definition in eligibility criteria, particularly when it comes to the introduction of a high 100 MW capacity threshold. This creates a barrier to technologies that may need to be proven at smaller scales, or shorter discharge times below 4 hours, before being scaled up once the commercial case is proven, and investor confidence is assured.

Given this, BEIS should also consider the threshold figure in relation to other existing market thresholds, this includes:

- Distribution and Transmission level thresholds. A 100MW figure effectively excludes distribution level storage, which may typically be around 50 MW but still provides significant balancing services.
- The 50 MW threshold has also historically been used as defining "Nationally Significant Infrastructure Project" in England and Wales
- The 1 MW threshold for accessing the Balancing Mechanism.

The REA recognise that this Call for Evidence is focused on 'Larger Scale' projects and appreciate that, as a result, categorisation via definitions of capacity thresholds maybe useful. However, the ability for longer duration to be delivered at a variety of scales, or the need for smaller scale commercial demonstrations, must not be forgotten. As such, the introduction of such definitions needs to be accompanied with equal focus on how smaller projects may still be delivered, preferably also through an income floor support scheme.

This definition could also be further refined to reflect the varied characteristics of longer duration projects. As such, the following should also be considered for categorisation within the definition, and may impact the type of support appropriate to each category:

- ***Categorising longer duration storage beyond just four hours*** – as recognised within the call for evidence, LLES could provide energy over hours, days, weeks and inter-seasonally. As such, there are sub-categories of LLES, including medium storage or very long duration storage. Such categories apply equally to the distribution grid as they do to the transmission grid. Future support mechanisms and eligibility criteria should recognise these differences, and the variety of commercial business cases they require, to enable a wide variety of technologies a route to market.
- ***Asynchronous and inertial storage*** - there are material differences between the services these different storage forms provide to the grid. For example, the delivery of inertia will require such projects to have concurrent contracts and deliver their storage benefits, , set against which such plants deliver a much broader range of services, most of them concurrently.
- ***Distribution vs transmission scale projects*** – definitions and eligibility criteria should recognise at what level power is being provided to grid and recognise that the associated business models do vary. Members suggest that definitions should align with the existing thresholds already in place – namely at the transmission (typically >100 MW) or distribution grid levels (<100 MW and usually under 50 MW); 50-100MW projects are assumed to be transmission but may be distribution subject to agreement with the relevant network operator(s).

We also highlight that it could be beneficial for the definition to consider the MWh capacity of a project. An MWh capacity reflects that storage projects both have an import capacity and export capacity, along with the length of time of discharge. As such, the MWh capacity figure provides a metric for considering the actual services provided by the storage project, rather than just reflecting the size of the project in terms of MWs.

Finally, while we appreciate this consultation relates to 'electricity storage', the REA believe that other technologies such as thermal storage should also be included in support for longer duration energy storage, as there is increased sector coupling and more parts of the energy system decarbonise, requiring even greater flexibility capacity across energy vectors. As such, Non-electric forms of storage should not be forgotten when setting out categories and definitions.

[1] REA (2021) Longer-Duration Energy Storage: The missing piece to a Net Zero, reliable and low-cost energy future, https://www.r-e-a.net/resources/rea-longer-duration-energy-storage-report/

2. Do you agree that the electricity system requires, and will benefit from, LLES delivering the services outlined above? Are there any other important services

that LLES can provide that are not covered here? Please provide supporting evidence where possible.

We strongly agree that the electricity grid will benefit from the services identified. We however note that 'stability services' is a broad term and wish to highlight some of these services further, as they are not well explored in the call for evidence. These include:

- **Benefits to Short Circuit level (SCL) -** Storage can contribute to SCL during the occurrence of a fault, vital to maintaining system voltage and enabling faster system recovery. As well as helping to replace the levels of SCL lost as fossil-fuelled synchronous generation is fully phased out.
- **Voltage frequency regulation –** Storage provides the ability to respond in seconds, rather than minutes to maintain voltage, providing greater value to the grid.
- **Phase Lock Loops –** Energy storage can support voltage and frequency control through PLL methods.
- **Reactive power and load –** Energy storage provides a quick responsive source to immediate reactive power and load.
- **Black Start –** Allowing the restarting of a generation station without the support of an external power station in the event of an outage or blackout situation. The technical requirement for doing so requires energy storage duration that goes well beyond 4 hours. However, it is noted that it is currently difficult for some longer-duration energy storage technologies to access as there is a lack of clarity over energy storage's role in the mechanism (for example, it is considered the primary plant or the main plant, with each having different requirements).
- **Voltage Angle Stability -** The active and reactive power support from storage systems can stabilise the electricity system's angle and voltage profiles.

The benefits outlined in the Call for Evidence can all be provided on an individual basis by a range of technologies. LLES technologies are fairly unique in that they can provide all of these services outlined in a combination and in a low-carbon manner. This means that rather than deploying multiple technologies to provide a range of services, LLES can be deployed to provide this range, often for a lower cost. This ability itself must be appropriately rewarded by the market or within contracts, with each delivered service being appropriately compensated for in order to deliver commercial-scale projects.

3. Do you think that there will be a need for a range of different LLES technologies, alongside other technologies that may be able to deliver system benefits, such as hydrogen production and generation, and carbon capture, use and storage?

The REA strongly support ambitions to see a wide range of different LLES technologies brought to market. Therefore, it is appropriate that these technologies' range of benefits should be recognised and well rewarded in any future support mechanism. As part of this, system efficiencies of each storage technology should also be identified and appropriately rewarded within support schemes so that the right market signals are given with the most efficient systems being delivered.

The REA also supports carbon capture and storage on bioenergy sites, as delivering negative emissions is seen as critical for achieving net-zero. We also support green hydrogen production and blue hydrogen production, where the carbon is fully captured and accounted for. However, we note that both these technologies have separate government work streams dedicated to their delivery. As such, there should not be a specific carve-out of support for them under energy storage support mechanisms meant to bring a wide range of LLES to market.

4. Please provide details of specific LLES projects that could begin development in the next 5 years. These details should include technology type (including intended use of fuel generated through sector coupling), MW and MWh, the business model or route to market, efficiency and expected development, capital, operational costs and expected lifetime of projects.

BEIS should be aware of a significant number of potential projects that are in the pipeline, and we would encourage them to consider the information that has been received through the running of the Longer Duration Energy Storage Net Zero Innovation Programme, highlighting the number and wide range of projects that could be brought to market.

However, the REA stress that unless there is the introduction of a support mechanism to provide an appropriate route to market, then no LLES projects currently in the pipeline will be delivered.

5. Do you agree that the issues outlined are barriers to the deployment of LLES? Please comment on any issues that are particularly significant in your view.

The REA agrees with the barriers identified in the call for evidence and describes several additional barriers within the answer to Question 6.

However, we also stress that the most significant barrier to deployment is the current lack of revenue certainty for the development of projects. Through either development of support mechanisms or regulatory changes, the enablement of long term and predictable revenue certainty will enable projects to become bankable and allow private investment into the market. In turn, this will allow a market to address the other identified barriers thanks to having revenue certainty. This includes providing finance for high upfront capital costs; creating a business model that takes account of long lead times; establishing a successful track record for commercialised projects and providing further evidence to determine the right changes to market signals.

It is the REA's view that the introduction of an income floor price would provide the revenue certainty required to invest in LLES technologies.

6. Are there any other barriers impacting the deployment of LLES?

Below we highlight further market barriers not identified within the call for evidence. Many of these barriers are also explored in the REA's Longer Duration Energy Storage Report, available here: https://www.r-e-a.net/resources/rea-longer-duration-energy-storage-report/

Wholesale Market Barriers

Revenues from net-energy sales through arbitrage payments do not provide bankable and adequate investment signals, resulting in the already identified lack of revenue certainty, which remains the primary market barrier that needs addressing to enable deployment. This in turn will allow space for further development of power purchase agreements between market participants (suppliers or renewable energy generators) and flexibility providers to better recognise the balancing and ancillary services provided by energy storage projects.

Balancing and Ancillary Services Barriers

Much of the value of energy storage comes from its capacity, balancing, ancillary, stability and other services, benefits of which are not currently well recognised within market contracts or grid payments. This includes:

- Short contract durations of a day, week or month for balancing and ancillary services do not enable bankable business cases for projects with an operational lifetime of several decades, significantly as investments in such large scale infrastructure projects depreciate over many years (15 – 25 years). Therefore, long term stable contracts are required.
- Separate procurement of different services makes it challenging to stack contracts or revenue streams effectively. This procurement process also fails to recognise that some separately procured services cannot be provided independently by longer duration energy storage plants, such as inertia. If a plant wins a contract for one service but not for another that can't be separated, the plant will not be fully renumerated for the services it provides. As a result, services become significantly under-priced, with some being provided for free, depreciating it's value to system stability and diluting market signals.
- Ancillary services markets are relatively shallow and illiquid. In addition, they are often location-specific (e.g. reactive power) and come with specific technical requirements set by National Grid ESO. This means investors cannot estimate with confidence how their value will evolve over long horizons.
- It is difficult to create a revenue stack that goes to more than one body. For example, suppose you were to get benefits from the grid. In that case, you could

not simultaneously get a revenue stack that involves contracts with the system operator, despite the mutual benefits realised.
- Within the Black Start / Distributed ReStart project, there is a lack of clarity over whether energy storage's role in the mechanism (for example, if it's considered the primary plant or the main plant, with each having different requirements) making it difficult for plants to benefit from this mechanism.

The introduction of an income floor will help to de-risk some of these barriers by ensuring a predictable revenue stream, allowing ancillary service markets to develop that properly value each service.

Network Constraints

Network constraints limit the amount of power that can be transferred from where it is generated to where it is consumed. This legacy grid infrastructure means that the benefits of longer-duration energy storage are maximised when it is developed close to where the energy will be used. Overall, highly flexible plants simplify the whole management of the grid, reducing the need for expensive network reinforcement. However, the current market provides limited price signals to reflect this, and LLES projects cannot monetise the savings to the grid. As already described in relation to wholesale market barriers, short contract durations also mean that these flexibility benefits are not delivered to the grid.

Existing Support Mechanism Barriers

Existing support mechanisms are also distorting price signals, with the price of electricity generation only making up a proportion of the total electricity costs, as levies also contribute significantly. While these levies are needed to secure new renewable generation through the RO, capacity market or CfD, the mechanism themselves have not been adapted to reward the development of LLES projects:

- The Contracts for Difference Model incentivises generators to produce as much electricity as possible. As such, it does not incentivise or reward flexibility, by providing value for operating at specific times, responding to market conditions or system requirements.
- The Capacity Market currently has no way of acknowledging the benefits that LLES delivers to the system, in areas such as network constraint management, frequency and voltage regulation, system stability, and restoration (Black Start). These are procured separately by National Grid ESO, in a fragmented manner and for shorter timescales, involving income uncertainty. In addition, the capacity market does not currently facilitate projects with longer lead times than four-years, which some LLES technologies would be well in excess of, such as pumped hydro storage.

Regulatory Barriers

Barriers also exist in the regulatory environment for the deployment of LLES:

- The current regulatory definition of storage distorts the market by favouring generation and interconnection over energy storage, meaning that the regulations do not directly encourage LLES development.
- The regulatory system is emissions blind and does not prioritise systems that abate carbon emissions. High carbon generation methods are not suitably penalised to encourage the transition to a totally decarbonise energy grid by 2050.
- The offshore regulatory regime prevents offshore generation from benefitting from onshore investment, as a result, renewable offshore generation projects are not encouraged to invest in onshore storage solutions.

7.What types of capital are available for LLES and from what types of investors?

Questions 7 and 8 are answered together.

8. Do the financing challenges LLES projects face primarily concern raising debt, or also equity?

The financing challenges are indeed more acute with raising debt, but even the cost of equity is very high and only available from venture capital investors. As described in previous questions, the lack of revenue certainty is currently low and the difficulty in stacking multiple revenue streams makes it difficult when trying to raise debt financing.

Unless the required regulatory reforms are made and appropriate support mechanisms are brought in, this situation will not change, and we will fail to raise investor confidence to enter the market to support LLES projects. Once the barrier of revenue certainty is well addressed, we are confident that both debt and equity financing will be available.

Government should consider what could be done to enable debt funding to take on the risks of early LLES projects. Some form of government back investment or special instrument could play a significant role in reducing the cost of capital. This role could well be taken on by the UK Infrastructure Bank, but we are yet to see exactly what this bank will be focusing on and financing. It will be worth BEIS monitoring the impact the Bill Gates Foundation will have in the United States market, where their venture capital fund is effectively playing this role, taking on early risk to enable further private investors to enter the market.

9. To what extent will the reforms outlined support the investability of LLES? Please comment on any specific reforms that, in your view, hold potential to support the investability of LLES significantly

All the identified reforms will be beneficial, but none will provide a route to market strong enough by themselves to deliver LLES projects and make them financeable, as they do not ultimately resolve the market-wide issue of revenue certainty.

The reforms remain specific, continuing the 'salmi slicing' the revenue opportunities for LLES projects. For example, differing requirements around the need for inertia mean it is impossible for potential project to benefit from both early competition trails and Stability Pathfinders.

Similarly, the Stability Pathfinder reforms are themselves useful but will largely benefit existing assets or new projects with short lead times and may not be fully effective in getting a wider market for LLES deployment delivered.

Equally, the proposed reforms to the capacity market to better align the mechanism to net zero, currently being consulted on, are welcome. However, the capacity market is a small component of the potential revenue stack required for a bankable project, meaning that reforms to address wholesale market revenues and ancillary services are still needed.

As such introduction of a dedicated support mechanism for LLES is required in addition to the reforms identified within the call for evidence.

10. Do you have any views on further reforms that could take place in current markets to improve the investability of LLES?

LLES technologies will often stack multiple revenue streams in order to build an investment case. Reforms that increase the clarity over revenue stacking will help to improve the investability of LLES. In particular, it is important that these technologies are fully rewarded for all the benefits they provide to the system, for example, arbitrage, inertia, short circuit level etc.

11. Are you aware of any proposed market changes (and/or system changes) that could make it difficult to finance LLES within current markets?

Concerns have been raised around reforms to try and deliver distributed restarts. The Technical Report from National Grid ESO suggest that distributed resources cannot work. The difficulty being that no technology is currently able to energise neighbouring grids, especially at the next voltage level up. As such, this reform currently seems unlikely to deliver tangible benefits for LLES deployment.

12. Considering your answers to 9, 10, 11, do you think further intervention is needed to de-risk investment in LLES?

Yes.

While the REA welcome the reforms identified within the call for evidence, we maintain that they do not successfully address the fundamental and market-wide need for revenue certainty. The reforms are useful, but they will likely only benefit small areas of the potential market, due a to a salami sliced approach to addressing specific LLES benefits or barriers. The delivery of a mechanism that could provide revenue certainty to all potential LLES technologies and a variety of business models, is required to successful de-risk investment and grow investor confidence to allow further private finance into the market.

Q13. Do you think it is necessary to try to accelerate the deployment of LLES, even if stronger signals for longer duration storage may not develop until the late 2020s/2030s?

Yes.

It is essential that the UK accelerate LLES deployment today to be ready with an established industry that can take full advantage of expected stronger market signals in the late 2020s/ 2030s.

The lead times involved in many LLES projects means that now is exactly the right time to be driving deployment, ensuring that supply chains, expertise and investor confidence are established now, rather than starting from a standing start later and delaying our ability to decarbonise the grid. Given we will have to do this, it will ultimately be cheaper to establish the sector now, rather than having to rush deployment later in the 2030s.

At the same time, further delay now could see potential revenue stocks diluted or cannibalised by the growth of the shorter duration energy storage market, meaning the energy system would lose out from being able to make the most of having a complete range of storage projects and duration times. These markets need to develop together if we are going to realise the range of benefits to the electricity grid.

Finally, pressing ahead now also helps to continue to build British expertise and industrial base in the LLES sector, ensuring we can keep up with other leading countries, including the US, China and Japan. This in turn will provide export and growth opportunities for the UK, as stronger market signals are seen across the world. Delays to doing this now, will mean the UK will need to buy in these expertise and technologies into the UK in the 2030s, rather than be the ones exporting knowledge and technologies to take full advantage of this innovation.

Q14. Are other reforms needed to markets to ensure long-duration storage assets are providing the maximum value to the system? If yes, please provide detail of what reforms could be needed.

Any reforms should ensure that the signals being provided to the market incentivise the correct behaviour. Since LLES technologies are a broad range of technologies with differing operational characteristics and the ability to provide a different range of services, this should be recognised within a mechanism to support their deployment. The REA's view is that an income floor mechanism can provide this recognition by incentivising operators to react to market signals according to the operational characteristics of their project.

Members have also highlighted further possible reforms, which would work in addition to a revenue stabilisation mechanism, which we believe are worth consideration and wider industry consultation on:

1) Curtailment mechanism to support RES and LLES operator - RES developers are likely to calibrate their Final Physical Notifications (FPN) in electricity markets to account for forecast errors. However, the available energy in real-time might be greater than that forecasted. This additional energy could be injected into the system. However, because that energy was not declared in the FPN of that unit there is currently no mechanism to make it visible and there is no responsibility on NG to minimise curtailment. A curtailment exchange platform could support innovative LLES applications that could benefit RES developers by supporting the optimisation of both, output volume and capture price, and it would also increase the storage capacity factor enhancing the economics of LLES assets. Revenue from such a mechanism would unlikely be bankable in itself, but could provide a useful upside benefit in addition to a revenue stabilisation mechanism.

2) A New Network Entry Capacity allocation and charging methodology that reflects the value of an asset to the system - Recognising that new storage can free up capacity on the network. A methodology could be developed to assess the optimum utilisation of network entry capacity in a way that allows for optimum allocation to projects delivering the greatest value. The REA stress that further exploration and consultation of the appropriate methodology would be needed to see how it affects market signals and diversity of project delivery.

Q15. Which intervention, in your view, has the most potential to be appropriate for addressing barriers to help bring forward investment in LLES, including novel storage technologies? Are there any other mechanisms which might be appropriate to consider? Please provide evidence to support your response where possible.

The REA considered the positives and negatives of four proposed mechanisms within our Longer Duration Energy Storage Report published earlier this year. Chapter 4, page 15 to 19 provides anlysis of an income floor, regulated asset base, capacity market and Contracts for Difference approach. The Full report can be read here: https://www.r-e-a.net/resources/rea-longer-duration-energy-storage-report/

The REA believe an Income floor model has the most potential to see a varied LLES market delivered, while also protecting consumers.

Overall, the REA favour the development of the income floor model. This would de-risk revenue streams by introducing a minimum amount LLES plant operators can earn, allowing for top-up payments where operators are unable to earn enough due to market barriers. As such, all revenue streams (i.e. energy market arbitrage, capacity market and ancillary services) would be taken into account by determining whether returns (gross margin) are below the Floor. The contract would be for an annual income floor value in £/MW terms, conditional upon the availability of flexibility resources, including MWhs of storage, MVArs of reactive power, and a frequency response/inertia capability.

This model is the most compatible with the operational profile of energy storage, focused on the delivery of flexibility and ancillary services, with dispatch decisions still driven by price signal (e.g. wholesale market, balancing market and ancillary services), while also incentivising energy storage providers to maximise the commercial value of plant operations.

Furthermore, construction risks would sit with the developer, removing the exposure of consumers. Although, it is recognised that this could make it more difficult for emerging technologies to attract investor support.

The income floor could also, in time, be awarded following competitive tender processes in order to both ensure value for money and allow a variety of LLES technologies to be able to access support, while prices are driven down. However, in the first few instances, due to the scale and lead times of LLES projects, it is envisaged that an administrative contract allocation process would likely be needed to get the market going.

It is, however, recognised that, as described in the call for evidence, Government is likely to want to see the inclusion of a 'cap' as part of the income floor mechanism, to control costs and protect consumers. However, the REA raise concern that a rigid cap would mean that any plant approaching the cap would have no further incentive to optimise for the electricity system, limiting balancing and ancillary revenues, and therefore the electricity system would not benefit from what the deployment of LLES is supposed to achieve. Moreover, the consumer does not benefit either because the lack of further optimisation greatly limits, or even eliminates, the possible pay-back available to consumers as operators avoid any actions over the cap.

However, it would be possible to design a 'soft-cap' mechanism, whereby the operator is required to pay back a proportion of the profits made above the cap. For example, if an operator was required to pay back a third of their profits above the cap, they would still be reasonably incentivised to optimise their plant to benefit the electricity system, while also raising the contribution that would be paid back to the consumer and the grid, ensuring LLES benefits continue to be realised.

Regulatory Asset Base (RAB) Model would also help de-risk investment but could lead to market distortions

It is recognised that the RAB model could also be compatible with the operational profile of storage, while providing fully regulated returns, delivering high levels of certainty to investors. However, given that payments would be made from consumers to developers during the construction phase, the consumer could be subject to construction risks (e.g. cost overruns) depending on the arrangements set out by the regulator. Such a regulatory regime may need to be project-specific adding complexity to any competitive award process.

In addition, the RAB would need careful design to ensure it actually incentivises efficient operation. This would not be impossible, but adds complexity and may lead to market distortions, which is why it is not the favoured option of the REA.

Reforms to the Capacity Market would complement introduction to an Income floor model

It is also stressed that considered reforms to the capacity market should also be done in conjunction with introducing an Income Floor. The capacity market would form an important revenue stream to be considered by the income floor. So, while unlikely to prove a strong enough incentive by itself to see the LLES market developed, reforms to the capacity market to incentivise flexibility and deployment of low carbon generation will be an important bit of revenue generation to reward ancillary and balancing services for inclusion in LLES business models. Capacity Market reforms, therefore, complement the introduction of an income floor, rather than being seen as an alternative support mechanism.

Q16. Please provide suggestions for how the most effective intervention, in your view, could be structured to ensure value for money and affordability.

An income floor would provide the best value for money

As described in answer to Q15, An income floor (no cap) would provide the greatest incentive for system optimisation, and therefore benefit the grid and consumer the most, despite the lack of direct repayments. This would also provide a purer market mechanism and provide value for money.

To ensure affordability, the income floor, where administratively awarded, should be carefully set to de-risk investment but not subsidise returns. This should give sufficient confidence to make the CAPEX available, while also ensuring that the market delivers the return through plant optimisation benefiting from balancing and ancillary services.

An income floor and 'soft-cap' could maximise pay-back to the consumer and ensure LLES are optimised to benefit the grid.

As described in answer to Q15, it is recognised that Government is likely to want to see the inclusion of a 'cap' as part of the income floor mechanism to control costs and protect consumers. However, the REA raise concern that a rigid cap would mean that any plant approaching the cap would have no further incentive to optimise the electricity system, limiting balancing and ancillary revenues, and limiting the possibility of possible pay-back to the consumer, as operators avoid any actions over the cap.

However, it would be possible to design a 'soft-cap' mechanism, whereby the operator is required to pay back a proportion of the profits made above the cap. For example, if an operator was required to pay back a third of their profits above the cap, they would still be reasonably incentivised to optimise their plant to benefit the electricity system, while also raising the contribution that would be paid back to the consumer and the grid, ensuring LLES benefits continue to be realised.

Eligibility Criteria can be set to ensure the most beneficial LLES projects are supported

Eligibility criteria could include:

- Only New build / expansion projects should qualify for support. Existing assets should not be eligible because the purpose of the regime would be to bring forward investment in assets that otherwise would not come forward.
- A Capex threshold (around £0.5 million per MW as a starting point) could be required, which aligns with the capital intensity of projects supported by the interconnector and OFTO regimes
- A positive business case and cost benefit anlysis (CBA) should be provided, which would be assessed as part of the allocation process. A scoring mechanism to consider location (to help address network constraints) and ability of the asset to provide ancillary services (i.e. inertia, frequency response, reserve, reactive power, system restoration) with the view to reduce whole system costs for consumers could be adopted. National Grid ESO could also develop a methodology that values Congestion Management in a locational context, and the considers the role of ancillary services, as the contribution to system stability and restoration from energy storage are highly locational. Currently assessments only capture the contribution to constraint management in a limited way, neglecting a significant portion of the value storage creates.
- If projects combine other public funding (e.g. from Innovate UK, or special contracts to incentivise certain technologies), then consideration of these can be included in the business case and CBA assessment
- Projects should be net zero emission 2050 compatible (or at the very least be able to provide plans for 2050 net zero emissions readiness) in order to ensure only projects that help with the transition to net zero are supported and we avoid supporting assets that may become stranded within a few years.

Initially issue income floors through administrative process with a clear plan to move to competitive allocation

To initially establish the market and quickly see viable LLES projects delivered, as well as appropriately consider the different technology costs, it would be best for income floor contracts to be administered through a bi-lateral administrative process at the start.

This allows for the different technology markets to develop and for reasonable administrative strike prices to be reached.

However, once the first few commercial projects are established, with lessons learned about costs, it could be appropriate to move to a more competitive allocation process to introduce market signals that start to drive cost down for viable established technologies. Government should propose a clear process for moving to competitive allocation so that the market is already made aware of the intention and signals to drive down costs are given from the start, even if weaker during an administrative allocation process.

Q17. Do you think that hydrogen storage that will provide flexibility could face the same financing barriers in relation to LLES as described above? Please provide evidence where possible.

Question 17 and 18 are answered together

Q18. Do you agree that it is not yet appropriate for a Cap & Floor mechanism to be considered for hydrogen storage? If so, what other approaches might be appropriate to consider?

Many of the barriers to be able to ensure revenue certainty for storage benefits will be the same for hydrogen as for other LLES technologies. However, hydrogen specific barriers should be addressed through the Government's Hydrogen Strategy and other specific hydrogen workstreams, including work on business models. To avoid conflicting market signals for hydrogen, LLES support mechanism should not have a specific carve-out for hydrogen-related storage, but it should be supported as a LLES if seen as viable when compared to the efficiencies of other LLES technologies. Ultimately, the LLES should be as technology-neutral as possible and support all available technologies.

Q19. What are the key risks in intervening to support LLES, and what risks might arise from a Cap & Floor specifically?

The REA recognise the risks highlighted within the call for evidence.

Firstly, that interventions may support some technologies more than others, these may not end up being what is most needed or restricting innovation. However, this can be addressed through an administrative allocation process and ensuring the eligibility criteria is fit for purpose. It might well be appropriate for BEIS to keep eligibility criteria under review, as is done for each new allocation round of the CfD, to refine what is being supported and brought forward. If this is done in a transparent manner, with plenty of notice, this would seem a sensible way of mitigating this risk.

Secondly that the LLES support may deliver projects that just continue to operate in short duration mode despite the support. Addressing this risk involves ensuring that LLES contracts do focus on system flexibility and ancillary service needs, beyond just rewarding technology utilisation. If contracts ensure appropriate rewards and demand for long-duration benefits then projects will be disincentivised from just operating in the short duration market.

20. How might a Cap & Floor mechanism distort the market for short-duration flexibility and nascent technologies? Please provide evidence where possible.

As has been previously demonstrated to BEIS in meetings, following the publication of the REA's Longer duration Energy Storage Report, the point of the income floor is to address existing distortions within the market.

Without an income floor, plant developers must actively over amortize each individual service, to address the risk of not managing to contract for each service in their revenue stream. The income floor effectively de-risks the stack, allowing for each service to be properly amortized and a predictable revenue level to be secured. As such, the floor is helping to remove a distortion, caused by needing multiple contracts, from the market.

Conversely, and as described in answer to Q15 and 16, the cap could potentially introduce a distortion, as plants are only incentivised to optimise their operations up to the cap, restricting both the level of benefits provided to the grid and the possibility of pay-backs to consumers. This could be addressed with a soft-cap, whereby something like a 1/3 of profits above the cap is paid back, but that sites continue to receive revenue for optimising their plants to provide balancing and ancillary services to the grid.

We would also note that LLES and short duration technologies tend to operate in different markets with short duration storage providing immediate short-term responses to changes in system frequency with LLES providing longer-term consistent benefits for multiple hours at scale.

21. How could any intervention, such as a Cap & Floor mechanism, be designed and implemented to enable the benefits to outweigh the risks?

We refer our answer to question 16, namely that risks can be mitigated by:

- Using suitable eligibility criteria to ensure the most beneficial LLES projects are supported
- Initially issue income floors through administrative process with a clear plan to move to competitive auctions
- Use a soft cap to both incentivise plant optimisation and enable higher possible pay-backs to consumers.
- The implementation phases of the LLES intervention mechanism should be developed with industry and relevant stakeholders such as Ofgem, NG ESO, and the UK Investment Bank.

- The design should include the creation of an adequate assessment framework. These could include criteria such as innovation, contribution to decarbonisation and the UK economy.
- Finally, it would be advisable to get the UK Investment Bank Involved from day one to provide feedback of conditions they expect with regards to the floor.

August 2021