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Dear [REDACTED]

Ofgem Consultation on Long Duration Electricity Storage Project Assessment

Scottish Renewables (SR) is the voice of Scotland's renewable energy industry. Our vision is for Scotland to lead the world in renewable energy. We work to grow Scotland's renewable energy sector and sustain its position at the forefront of the global clean energy industry. We represent over 370 organisations that deliver investment, jobs, social benefit and reduce the carbon emissions which cause climate change.

SR also convenes and chairs the GB Pumped Storage Hydro Working Group, upon which all major developers of Pumped Storage Hydro (PSH) in Great Britain are represented. PSH Working Group members include Buccleuch, CCSQ, Dorothea Pumped Hydro, Drax Power, Foresight, Gilkes Energy, Glen Earrach Energy, ILI Group, SSE Renewables, Statera, Statkraft and the British Hydropower Association. Collectively, PSH Working Group members have over 9GW of PSH projects in development.

Long Duration Electricity Storage (LDES) will be essential for achieving an efficient, secure and resilient decarbonised electricity system. The decision by UK Government to introduce a cap and floor scheme to support enable the delivery of new LDES capacity was therefore warmly welcomed by the sector. We have been similarly encouraged to see Ofgem continuing to move at pace in its role as delivery body for the scheme.

PSH is an established technology which has unique characteristics that make it particularly well-suited for meeting the needs of a future electricity system dominated by variable renewables whilst also providing significant wider socio-economic benefits. Similarly, the high capital cost and extended build times of PSH projects also mean PSH faces unique barriers to securing investment that require cap and floor support to overcome. Scottish Renewables welcomes the opportunity to provide feedback on Ofgem's LDES project assessment consultation to help ensure the cap and floor brings forward these vital projects.

Background

In October 2024, the UK Government published its decision to enable investment in LDES by introducing a cap and floor regime run by Ofgem. The core purpose of the regime was to overcome investment barriers to LDES resulting from high capital costs and long build times.

Since December 2024, Ofgem has been developing the LDES cap and floor (C&F) regulatory regime. In April, Ofgem opened the first application window for LDES, asking developers able to deliver LDES projects by 2030 and 2033 to submit applications by June 9, 2025. Ofgem is in the process of deciding which projects meet the technical eligibility and deliverability requirements.

On May 28, 2025, Ofgem launched a consultation on proposals for evaluating and selecting LDES projects that have qualified for the first application window.

Key points from our response to the consultation are summarised below with detailed responses to questions attached as an annex.

Summary comments on Cap and Floor assessment proposals

1. The overall assessment and selection process

Ofgem's proposals seem to envisage a process where an economic assessment is first performed to rank individual projects, with this ranking then adjusted depending on results of strategic and financial assessments. Ofgem are also exploring if competition may be used to further determine project rankings.

We agree with the need to include economic, strategic and financial assessments in the evaluation and ranking of projects. We are concerned that insufficient weight may be given to strategic factors such as UK domestic energy security and economic growth. We suggest that a more explicit scoring approach be used to recognise the importance of such strategic factors.

It is also unclear how Ofgem intends to draw together the three assessments to award cap and floor agreements to projects in line with capacity targets. Ofgem must ensure as far as possible that the overall assessment process is simple, transparent, consistent and objective to preserve confidence in the scheme and mitigate the risk of legal challenge.

On competition, we suggest that asking projects to compete at this stage e.g. through bidding of financial parameters, would be difficult to achieve given the uncertainty associated with high value projects before final investment decisions, and indeed of the C&F regime itself. This may result in bids that are highly caveated or cannot be delivered – both of which would be undesirable. We note that Ofgem provides more details on competition in the subsequent C&F financial parameters consultation, and we will provide further views on this issue in our response to that consultation.

2. Economic Assessment

Ofgem propose that the NESO will evaluate the socioeconomic welfare of individual projects. Their evaluation will capture monetised and non-monetised values for customer/producer welfare and system impacts.

We agree this is an appropriate evaluation approach but are concerned that the proposed modelling approach may not capture all potential benefits e.g. benefits from re-optimisation (intraday trading), balancing actions, ancillary services (including congestion mitigation). We would disagree that these limitations may not materially affect project rankings – to the contrary, it will impact technologies differently according to their different operating characteristics. Additionally, we suggest potential network reinforcement savings should be included.

Furthermore, the modelling approach appears to focus on benefits arising from the 25-year period of the C&F regime. This does not recognise the additional benefits arising from PSH assets which have lifetimes expected to be more than 100 years.

The evaluation approach invites submissions from developers for non-monetised impacts, such as natural capital, skills and supply chain and economic growth. While Ofgem expects impacts of economic growth to differ between technologies, this is not addressed in the modelling. We suggest there will be significant differences in non-monetised impacts between projects. For example, [analysis](#) commissioned by Scottish Renewables shows that an economic benefit of £1.2 billion Gross Value Added per GW of new PSH capacity may be realised. This should be recognised in the economic or strategic assessment.

For the reasons above, we are concerned that the proposed economic assessment will not robustly represent the benefits that PSH can bring from their operating characteristics, asset lives and economic growth. We suggest that the proposed assessment process should be modified to take appropriate account of these factors.

3. Strategic Assessment

In this assessment, Ofgem proposes to assess project benefits from a diverse technological mix, options for future expansion/learning, provision of resilience and flexibility across multiple future scenarios. Projects that appear capable of securing investment on a merchant basis will receive lower scores.

We suggest that other strategic and policy issues should be addressed in this assessment category. As well as resilience, these should include factors such as economic benefits and ensuring domestic energy security. It is unclear how the proposed factors of technological diversity, option value and flexibility will be defined and assessed in a competitive assessment process.

The purpose of the C&F regime is to enable the financing of viable high capital value and long-build technologies such as PSH, that cannot otherwise be financed. Technologies capable of securing investment on a merchant basis should not be awarded a cap and floor.

4. Financial Assessment

Ofgem will use the Financial Assessment to check if the projects are financially viable. Ofgem proposes to use project-submitted financial information, then to validate this information against its own assumptions. Revenues will be evaluated over the 25-year C&F period. As for the economic assessment, Ofgem will not model re-optimisation or ancillary service revenues but will seek input from developers. Balancing revenues will be excluded.

We agree that the Financial Assessment should provide a valuable cross check of project viability. However, we are concerned that the assessment may not accurately represent the benefits arising from the operating characteristics and asset lifetimes of PSH plant. The omission of balancing market revenues will distort the assessment.

5. Market modelling

NESO's project assessment proposes to use a Marginal Additional (MA) approach where each LDES project is assessed against a counterfactual of the 2025 FES Holistic (highest renewable) Pathway.

This Pathway already includes a range of other storage and flexibility assets which will result in the marginal benefit of each new project being lower than if it was optimised with the existing storage/flexibility assets. Ofgem considers this simplified approach is appropriate, given that the aim is to rank projects in terms of the value they provide relative to one another.

We agree this is a pragmatic approach for ranking projects. However, this simplistic approach does not take account of locational benefits, or other benefits from individual operating characteristics (and access to a wider revenue stack), asset lifetimes, etc. These factors will need to be addressed proportionately elsewhere in the assessment.

Ofgem also highlights that the modelling approach does not capture the second-order impacts of new LDES projects on generation and network capacity and suggests that this does not have a material impact on the ranking of individual projects. We disagree with this conclusion. Some LDES technologies can deliver significant benefits through, for example, reduced network reinforcement or displacement of gas peakers and it is therefore important that this is captured in the modelling approach.

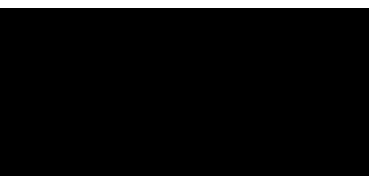
Conclusion

Overall, we welcome the approach that Ofgem has proposed to assess the comparative benefits of LDES projects. In conclusion, we have three main concerns:

- Firstly, that the three-stage assessment approach does not sufficiently value the benefits of economic growth and domestic energy security that technologies such as PSH can provide.
- Secondly, that the modelling approach does not incorporate revenues and value attributable to PSH assets by virtue of their operational characteristics and long asset lifetimes.
- Thirdly, the proposed evaluation and scoring approach needs greater clarity to ensure that the cost benefit assessment is demonstrably fair and robust. It will need to give confidence to investors, so they continue funding the development of major infrastructure projects.

Finally, we would once more highlight that the UK Government decided to introduce the LDES C&F regime first and foremost to overcome barriers to the financing of high capital value LDES projects with long build times. This should remain forefront of mind as Ofgem works to deliver a C&F regime which fully recognises the long-term benefits that prospective LDES projects can provide so as to successfully enable the delivery of high-value projects which without C&F support would not otherwise come to fruition.

Yours sincerely,




Head of Economics and Markets


Scottish Renewables

Annex – Responses to consultation questions

Responses to each of the consultation questions are provided below with reference to the respective consultation chapters.

Chapter 2: The overall assessment process

Multi-Criteria Assessment (MCA) framework

Q1. Do you have any views on our overall approach to the MCA, including specifically the proposal to assess the three main areas set out in 2.2?

Ofgem proposes to assess both quantitative and qualitative impacts. These include socioeconomic welfare (SEW) of consumers, producers and LDES owners, as well as broader system impacts and strategic benefits. The key elements are:

- **Economic Assessment** - the SEW impact of each LDES project, including both monetised and non-monetised costs and benefits.
- **Strategic Assessment** - a qualitative assessment including technological diversity, system security, flexibility, community benefits and contribution to economic growth.
- **Financial Assessment** - review of project costs, revenues, and financial parameters to assess value for money for consumers and if projects are financially sustainable.

In October 2024, the UK Government published its decision to enable investment in LDES by introducing a cap and floor regime run by Ofgem. The primary purpose of the regime was to overcome investment barriers to LDES resulting from high capital costs and long build times. The Ofgem C&F assessment process should reflect this policy decision. These investment barriers are the ones that are being experienced by PSH projects and should be addressed through the C&F regime.

Ofgem's proposals seem to envisage a process where an economic assessment is first performed to rank individual projects, then this ranking is adjusted depending on the results of strategic and financial assessments. Ofgem are also exploring if competition may be used to further refine project rankings.

We note from the consultation that Ofgem proposes to set a LDES target (in MW and MWh) in consultation with NESO and DESNZ, in advance of C&F awards in Q2 2026. It is expected to align with the Clean Power 2030 Action Plan assumptions for 2030 and 2035 and the Spatial Energy Plan (SSEP). The C&F regime will be offered to eligible projects that fall within that range.

We agree with the need to include economic, strategic and financial assessments in the evaluation and ranking of projects. However, we are concerned that insufficient weight may be given to strategic factors such as UK domestic energy security and economic growth. We suggest that a more explicit scoring approach be used to recognise the importance of such strategic factors. Ofgem must also ensure as far as possible that the assessment process is simple, transparent, consistent and objective to mitigate the risk of legal challenge.

From the information provided in the consultation it is unclear how Ofgem intends to ensure a transparent and consistent assessment process. An assessment process which is fair and robust is essential to avoid undermining confidence in the scheme and to mitigate the risk of legal challenge. We encourage Ofgem to provide more detail on how the process will work in practice to ensure applications are assessed fairly, objectively and consistently.

On competition, we suggest that asking projects to compete at this stage e.g. through bidding of financial parameters, would be difficult to achieve given the uncertainty associated with high value projects before final investment decisions, and indeed of the C&F regime itself. This may result in bids that are highly caveated or cannot be delivered – both of which would be undesirable.

As stated above, the primary purpose of the C&F regime should be to enable the development of viable high capital, long build LDES projects that cannot otherwise raise finance. We have supported the proposal for the LDES C&F as a way of enabling a series of once in a generation investments in PSH projects. However, we are concerned that the proposed assessment approach may not achieve this purpose.

Q2. Do you have any views on our proposed in-the-round assessment that will rank projects based on NPV and then adjust with non-monetary impact will provide a robust result?

Ofgem propose that NESO will evaluate the SEW impact of individual projects, which will feed into Ofgem's overall assessment. Ofgem will make decisions on which projects will be awarded a C&F regime. The proposed assessment approach is as follows:

- Monetised impacts will be expressed as, the Present Value (PV) of the impact in £ terms. To ensure projects of different storage and output capacities can be compared, we will also normalise the PV of the impact by presenting it in £/MWh and £/MW terms.
- Non-monetised impacts will be scored based on whether they are likely to deliver a benefit, based on a like-for-like comparison of different projects. This will be informed by quantitative metrics derived from NESO's power market modelling, evidence submitted by projects and/or Ofgem judgement and analysis.
- All the monetised impacts will be aggregated to provide an overall Net Present Value (NPV) in £, £/MWh and £/MW terms.
- Ofgem do not intend to combine this aggregate NPV with the non-monetised impacts into an overall quantitative score. Adopting a mechanistic approach to quantifying and weighting individual non-monetised impacts poses obvious challenges. It also risks yielding sub-optimal outcomes in terms of selecting a balanced portfolio of LDES assets that collectively meet the aims of the LDES C&F scheme.

This is a logical approach, but we have concerns about the modelling rigour and whether appropriate assumptions will be used for the Economic Assessment – this may not allow a fair, consistent and accurate representation of costs and benefits between competing technologies and projects. For example, the lifetimes and associated benefits of PSH projects may exceed 100 years compared to shorter periods for other technologies.

Overall, the use of quantified and non-quantified assessments appears appropriate. Given the above concerns about the robustness of monetised Economic Assessment of projects, we suggest that greater emphasis is placed on the Strategic Assessment to reflect policy goals and project viability. In particular, we suggest the wider economic and domestic energy security benefits of PSH projects are fully considered.

Role of competition in assessing some financial parameters

Q3. Do you have any views on using competitive bids - based on project-specific parameters - to inform the financial assumptions and C&F levels in each project's assessment? How might this approach work on a technology neutral basis?

Ofgem propose that projects may be expected to bid their preferred rate of return to inform the cap level, but also the proposed regime length and the residual value of the project at the end of that regime. Ofgem suggest that this added flexibility allows developers to tailor their bids to the specific characteristics of their projects.

The ability of projects to bid a preferred rate of return is highly dependent on the individual project's assumptions which will be derived well ahead of contractual commitments and final investment decisions. Asking for bids on the cap or floor may lead to low bids that subsequently cannot be delivered or are highly conditional. An administrative cap with suitable incentives for optimisation above and below the cap appears more appropriate.

Requiring competitive bidding before final contractual commitments can be made is likely to benefit technologies where there are fewer delivery uncertainties than, for example, large scale PSH projects.

Our comments on competition are provided before we have been able to review the recently published (and related) Ofgem consultation upon Cap and Floor Financial Parameters and may be revised.

Deliverability and project maturity

As part of the Project Assessment, Ofgem proposes to reassess deliverability and overall project viability before making any C&F award decisions. Any material changes to the deliverability assessment made at the eligibility stage will be taken into account. Ofgem will not award a C&F regime to projects that are deemed undeliverable or not viable.

This appears an appropriate approach. However, all large infrastructure projects may face unforeseen delays that are outside their reasonable control, including supply chain delays. For example, the regime that Ofgem has established for the delivery of the ASTI transmission works has sought to establish a pragmatic approach to ensure delivery.

While changes to deliverability should be assessed such that non-viable projects are not pursued, a balance needs to be struck to enable viable projects to proceed if they face delays that are out with their reasonable control.

PSH is a mature technology with strong global evidence showing that projects can be delivered and operated over many decades. We suggest that this track record is considered when assessing deliverability.

Economic and financial analysis produced by applicants

Q4. Do you agree that some revenue streams - such as from re-optimisation or ancillary services - cannot be fully captured in the Economic Assessment? How could NESO or Ofgem better account for or validate these in the assessment process?

To support the assessment process, Ofgem proposes that projects provide their own assessment of monetised impacts, where available, and provide supporting evidence of the non-monetised impacts.

Ofgem proposes projects should forecast the revenues they expect to generate from the operation of their LDES asset, including:

- (a) Wholesale market trading revenues from initial arbitrage positions and re-optimisation.
- (b) Participation in the Balancing Mechanism.
- (c) Participation in the Capacity Market.
- (d) Where relevant, provision of Ancillary Services.

We suggest that the NESO should be able to model re-optimisation and ancillary service revenues, However, if this is not possible, or the information is insufficiently robust, projects should be able to provide supporting evidence to clarify both monetised and non-monetised elements of the assessments. It will be important for Ofgem and NESO to clarify how this information will be used in the assessment process and ensure that evidence is assessed consistently across projects.

Additionally, not all projects are the same, some will realise benefits from location, others from providing ancillary services, economic benefits, etc. It will therefore be important that these individual aspects are reflected in monetised and non-monetised assessments.

Chapter 3: Economic assessment

Q5. Are we considering the right impacts for the Economic Assessment, and have we correctly characterised both monetised and non-monetised impacts?

The NESO will evaluate the socioeconomic welfare of individual projects, capturing monetised and non-monetised values for customer/producer welfare and system impacts as listed below.

- **Consumer welfare**
 - o *Wholesale market costs (Monetised – NESO)*
 - o *Constraint management costs (Monetised – NESO)*
 - o *Renewable support scheme costs (Monetised – NESO)*
 - o *Interconnector and LDES C&F scheme costs (Qualitative – Ofgem)*
 - o *Capacity market impacts (Qualitative – Ofgem)*
 - o *Non-assessed impacts - Real-time flexibility benefits*
- **Producer excl. LDES project welfare**
 - o *Wholesale market net revenue (Monetised – NESO)*
 - o *Renewable Energy Sources (RES) support scheme revenues (Monetised – NESO)*
 - o *Interconnector/LDES C&F scheme revenues (Qualitative assessment – Ofgem/Project)*
- **LDES project welfare**
 - o *LDES wholesale market gross margin (Monetised – NESO)*
 - o *Project capex and opex, financing costs (Monetised – Ofgem/Project)*
- **System impacts**
 - o *Security of supply (cost of EENS) (Monetised – NESO)*
 - o *Ancillary Services (system operability) (Qualitative – NESO/Ofgem/Project)*
 - o *Avoided renewable curtailment (Quantified – NESO)*
- **Non assessed impacts - Network reinforcement costs**
- **Wider economic and social impacts**
 - o *Reduction in greenhouse gas emissions (Monetised – NESO)*
 - o *Natural capital, Landscape, Local Community (Qualitative - Ofgem/Project)*
 - o *Skills and supply chain (Qualitative - Ofgem/Project)*
- **Impacts on economic growth through other mechanisms**

We agree this is an appropriate evaluation approach but are concerned that the modelling approach proposed may not capture all potential benefits e.g. benefits from re-optimisation (intraday trading), balancing actions, ancillary services (including congestion mitigation). The monetised calculation should include revenues that individual PSH projects may receive from congestion management, and the benefits realised through avoided renewable curtailment.

We disagree with Ofgem's claim that these limitations may not materially affect project rankings – to the contrary, it will impact technologies differently according to their operating characteristics.

Furthermore, the modelling approach appears to focus on benefits arising from the 25-year period of the C&F regime. This does not recognise the additional benefits arising from PSH assets which have lifetimes expected to be more than 100 years.

Ofgem does not intend to capture the impact of individual projects on network reinforcement costs within the Economic Assessment. Instead, any impact on the network will be implicitly captured in the assessment of constraint management costs.

The failure to capture the benefits of LDES upon transmission investment appears to be a significant omission. While it may be difficult to assess the wider system benefits of LDES due to the potential

complexity of assessment, significant value to customers may be lost. For example, large scale LDES development in Scotland may reduce the need for high-cost network infrastructure investments. If the assessment ignores such benefits, then inefficient decisions may result.

Q6. Are there important system-level benefits from LDES that are not well captured in the Economic Assessment but could significantly impact outcomes? If so, what are they, and can they be consistently assessed across projects?

The evaluation approach invites submissions from developers for non-monetised impacts such as natural capital, skills, supply chain and economic growth. While Ofgem expects impacts of economic growth to differ between technologies, it is not proposed to incorporate top-down modelling of these factors in the economic methodology.

Ofgem does not propose to assess the direct impact of each project in terms of jobs supported or created, in a mechanistic manner. Ofgem says it is not convinced that such impacts could be calculated and compared between different projects following a robust and consistent methodology. However, Ofgem has stated that they will consider any evidence submitted will consider introducing additional metrics if appropriate.

We consider that there will be significant differences in non-monetised impacts between projects. For example, the [report](#), 'The Economic Impact of Pumped Storage Hydro', which Scottish Renewables commissioned from BiGGAR Economics indicates that six PSH projects under development could deliver £5.8 billion in Gross Value Added (GVA) and create nearly 15,000 jobs by 2035, assuming a further 4.9GW of PSH capacity was added. Economic benefits should be fully recognised in the economic or strategic assessment.

The BiGGAR Economics report assumed that the combined investment in these projects was expected to be around £6-8 billion. Due to the high civil works component of construction, the report showed that 72% of this investment would be spent in the UK economy.

During the development and construction phase, the projects are expected to contribute £4.2-5.8 billion GVA and 67,900-92,800 years of employment in the UK (peaking at 10,700-14,800 jobs). This includes £677-926 million GVA and 10,600-14,500 years of employment in the local areas where the projects are based (peaking at 1,290-1,780 jobs).

These projects will also support employment in operations and maintenance for decades after their construction. Annually, they are expected to support: £68 million GVA and 1,230 jobs in the UK, including £13 million GVA and 190 jobs in the local areas.

For the reasons above, we are concerned that the proposed economic assessment will not robustly represent the benefits that PSH can bring from their operating characteristics, asset lives and impact on the economy. We suggest that the overall assessment process should be designed to take appropriate account of these factors.

Chapter 4: Strategic Assessment

Q7. Do you have any views on the relevance, appropriateness and completeness of the impacts proposed in the Strategic Assessment?

Ofgem has proposed the following strategic issues should be considered:

- **Technological diversity** - Ofgem may attribute additional strategic value to individual projects based on their contribution to enhancing technological diversity.
- **Option value** – this may include plant expansion, novel technologies or project interdependencies. Where such option value is significant, Ofgem will invite projects to provide quantified evidence of this, following relevant appraisal guidance and ensuring that their analysis is proportionate to the option value in question.
- **System Security and resilience** - Under this criterion, Ofgem proposes to assess whether individual LDES projects are likely to deliver superior performance during system stress events relative to other projects.
- **Flexibility** – this is designed to identify projects that demonstrate robust performance across diverse future scenarios.
- **Need for cap and floor support** - Ofgem propose to take a view on whether an LDES project genuinely requires C&F support to proceed, or whether it could potentially be developed on a purely merchant basis without regulatory intervention.

We suggest that further explanation is needed for each of these assessment areas and how they will be valued and scored. If projects are being asked to address these factors in their submissions, then it will be important to clearly define how these will be assessed and how Ofgem will ensure the assessment is fair and objective.

For example, taking technological diversity – such diversification may be seeking to address technological risks arising from construction, supply chain, operation, decommissioning, and geopolitical risks. These risks could be addressed by individual projects as part of their bid submission.

It is unclear how the proposed factors of technological diversity, option value, and flexibility will be defined and assessed in a competitive assessment process. If high levels of resilience are required, this could be addressed through LDES design requirements.

The strategic assessment should also consider the value of total energy capacity in MWh and duration of LDES projects. Projects, such as PSH, capable of extended periods of operation in excess of the eight-hour minimum threshold can add additional system value.

The core purpose of the C&F regime is to support the financing of high capital value projects with long build times that cannot otherwise be financed. We agree that projects capable of securing investment on a merchant basis should not be awarded a cap and floor.

Q8. Are there other impacts that we should be considering in the Strategic Assessment?

We suggest that other important strategic and policy issues should be addressed in this assessment category. As well as resilience, these should include factors such as economic growth from green jobs and investment and ensuring domestic energy security.

In this regard, PSH developments can deliver 'home-grown' storage using existing water resources instead of being reliant on international supply chains and the environmental risks from recycling. As

well as economic benefits to the country from PSH construction, the growth of a PSH development expertise in the UK offers significant export potential as other countries similarly look to exploit the benefits of PSH in the energy transition.

To repeat our example of economic growth benefits, the BiGGAR Economics [report](#), 'The Economic Impact of Pumped Storage Hydro', indicates that six PSH projects under development could deliver £5.8 billion in Gross Value Added (GVA) and create nearly 15,000 jobs by 2035, assuming a further 4.9GW of PSH capacity was added.

Furthermore, we suggest that the strategic assessment category could also consider technology deliverability. PSH is a proven technology that has been successfully delivered and operated for decades in the UK and worldwide. The degree to which projects have extended duration and extended MWh storage capacity above the minimum requirements for eligibility for the C&F should also be considered to be a strategic factor.

Chapter 5: Financial Assessment

Financial assessment approach

Q9. Do you have specific suggestions for how the Financial Assessment output should be considered alongside the Economic Assessment?

Ofgem propose to develop high-level Financial Assessments for each LDES project. The assessment involves three key activities:

- a) First, Ofgem will establish C&F levels using project-submitted cost estimates and key financial metrics.
- b) Second, Ofgem will independently estimate gross margin revenues, primarily using outputs from NESO's market modelling. They will validate these revenue projections against assumptions provided by projects.
- c) Finally, Ofgem will assess the calculated gross margin revenues against the established C&F levels to calculate expected C&F payments and financial impact on consumers.

The Financial Assessment will evaluate revenues over the full C&F regime duration, obtaining and validating company forecasts for wholesale market, capacity market and ancillary service revenues.

The assessment period is proposed to typically be 25 years, though this timeframe may depend on project characteristics and project submissions. As the market modelling will only cover a 25-year period, Ofgem proposes to extrapolate revenue projections for any additional years in line with the approach used by NESO to extrapolate beyond the PLEXOS simulation horizon.

Ofgem proposes to use the Financial Assessment as a practical cross-check on the Economic and Strategic Assessments. The Financial Assessment would be used to assess whether the projects proposed by developers appear to be financially viable.

We welcome that Ofgem proposes to use project-submitted financial information, then to validate against their own assumptions. As for the Economic Assessment, Ofgem will not model re-optimisation or ancillary service revenues but will seek input from developers. Balancing revenues will be excluded.

We agree that the Financial Assessment should provide a valuable cross check of project viability. However, we are concerned that the assessment as currently proposed may not accurately represent the revenues and benefits arising from the operating characteristics and 100+ year asset lifetimes of PSH plant.

We consider that the economic assessment should be the primary element of determining individual project value. The financial assessment should only be a cross-check that projects have demonstrated their financial viability. In this context, we would request that Ofgem fully considers the supporting evidence and maturity of information provided by developers. For example, we are concerned that PSH projects with fully developed cost assessments, may suffer in comparison with projects with less mature and more ambitious cost forecasts. Ofgem should ensure that evidence is gathered and assessed consistently across projects.

Balancing Mechanism revenues

Q10. Do you agree with our proposal to assume that LDES projects will remain revenue neutral following balancing market actions?

Ofgem consider that, assuming perfect foresight of future trading opportunities, storage operators would be kept revenue neutral from any redispatch actions in the balancing market. In practice, storage operators do not have perfect foresight therefore they may lose out or gain from being re-dispatched.

For the purpose of the Financial Assessment, Ofgem propose to assume that overall LDES assets remain revenue neutral following balancing market actions and therefore balancing market revenues are not included in the Financial Assessment.

We disagree with this position as the omission of balancing market revenues will distort the assessment. We suggest that these figures are also submitted by developers and validated by Ofgem/NESO.

Not all projects are the same, some will realise benefits from location, others from providing ancillary services, etc. It will be important that the individual characteristics of projects are reflected and valued in the assessments. Greater clarity is therefore needed on how variation in characteristics across projects will be reflected in the assessments.

Modelling financial parameters

Ofgem is consulting separately on the C&F regime financial parameters. For the Financial Assessment, Ofgem will estimate C&F levels based on the outcome of that consultation and on project submissions on costs and financial parameters.

Ofgem expect projects to provide cost estimates for initial investment costs, fixed and variable operating and maintenance (O&M) costs, and replacement and decommissioning costs where appropriate. During Q3 2025 Ofgem plans to publish a cost template and submission guidance for eligible LDES projects. Ofgem will assess the reasonableness of these project costs.

Financial parameters - Ofgem proposes that the main financial parameters to determine cap and floor levels are:

- **Regime duration** - a standard period of 25 years is proposed as the default C&F regime duration. If projects propose alternative durations, these may be evaluated through the Financial Assessment.
- **Residual value** - a residual value of zero is proposed at the end of the C&F regime period. If projects propose alternative residual value assumptions, these may be evaluated through the Financial Assessment.
- **Floor rate of return** - this may be an administratively set rate of return, or it may be project-specific, competitively derived rate of return.
- **Cap rate of return** – this may be set administratively or derived through a competitive process.
- **Interest During Construction (IDC)** - this may be set administratively or derived as a project-specific, competitively determined rate of return.

Ofgem have proposed that all projects should have a residual value of zero at the end of the 25-year C&F period. As mentioned earlier in our response, PSH projects are expected to have asset lives of more than 100 years. This value and benefit will need to be appropriately reflected in project financial parameters in due course.

Competition to set financial parameters

Ofgem plans to use competition to help set certain regime parameters. The Financial Assessment will support this process by ensuring that competitive mechanisms continue to serve consumers' interests.

We suggest that asking projects to compete at this early stage by bidding of financial parameters, would be difficult to achieve given the uncertainty associated with high value projects before final investment decisions, and indeed of the C&F regime itself. This may result in bids that are highly caveated or cannot be delivered – both of which would be undesirable.

Chapter 6: Market modelling

Marginal additional approach and counterfactual definition

Q11. Do you have any views on the proposed Marginal Additional method and whether it provides a robust basis for assessment?

Monetised and non-monetised impacts in the Economic Assessment, and some of the revenues in the Financial Assessment will be derived from NESO's market modelling.

NESO proposes to use a Marginal Additional (MA) approach where each LDES is assessed against a counterfactual of the 2025 FES Holistic (highest renewable) Pathway. This Pathway already includes a range of other storage and flexibility assets which will result in the marginal benefit of each new project being lower than if it was optimised with the existing storage/flexibility assets. Ofgem considers this simplified approach is appropriate, given that the aim is to rank projects in terms of the value they provide relative to one another.

Ofgem notes that this represents a relatively pessimistic scenario from the perspective of the assessed project, as it assumes the system already has a range of storage and flexibility assets and so, the marginal benefit of the LDES project being assessed will be lower.

Within NESO's market modelling, the counterfactual and factual are proposed as follows:

- a) From a model based on the Holistic Transition Future Energy Scenarios 2025 (FES) pathway, remove LDES projects that have not yet reached a Final Investment Decision (non-FID projects) to establish a baseline capacity.
- b) Build back in a notional LDES plant to each of the modelled zones (37 transmission zones), such that total system capacity is marginally lower than the amount removed. The aim is to develop a single static counterfactual against which all projects are assessed. This counterfactual replaces the removed capacity in a neutral way, avoiding geographic or technological bias.
- c) The factual scenario is created by adding the LDES project being assessed to the counterfactual. The difference in system performance between these two scenarios represents the marginal benefit of the project in terms of socio-economic welfare and system impacts.

We agree this is a pragmatic approach for ranking projects. However, the removal of technological and geographic benefits in the model means that these will need to be reflected elsewhere in the assessment. As discussed earlier in our response, it is important that the modelling of additional project benefits reflects their individual operating characteristics (and access to a wider revenue stack) and asset lifetimes.

Ofgem notes that adding LDES capacity to the system may also impact the required levels of renewable generation, dispatchable peaking generation or network infrastructure. The proposed modelling approach does not explicitly capture these dynamic effects.

Ofgem suggests these limitations do not materially affect the relative ranking of individual projects, and a consistent application of their methodology ensures that the comparative assessment remains robust for decision-making purposes, even if absolute benefit values may be subject to some uncertainty.

While it may be difficult to assess the wider system benefits of LDES due to the potential complexity of assessing the wider system benefits, significant value to customers may be lost. For example, LDES development in Scotland may reduce the need for multi-billion-pound network infrastructure or

interconnectors to be constructed and enhance wind generation output. If the modelling ignores such benefits, then inefficient decisions may result.

Ofgem also highlights that the modelling approach does not capture the second-order impacts of new LDES projects on generation and network capacity and suggests that this does not have a material impact on the ranking of individual projects. We would disagree and instead would suggest that some LDES technologies can deliver significant benefits through, for example, reduced requirement for network reinforcement or displacement of gas peakers.

In summary, Ofgem notes that there are two main limitations of its modelling approach:

- The counterfactual scenario will not necessarily represent an optimised portfolio of assets which would be built in the absence of LDES assets.
- The modelling approach does not directly measure second-order impacts on generation and network capacity.

Ofgem do not consider this to be a material limitation when it comes to ranking individual projects in NPV terms.

We would agree that the proposed simplistic modelling approach will allow projects to be ranked against each other. However, the analysis does not take account of locational or technological differences or other individual limitations or benefits. These will need to be considered elsewhere in the assessment.

Counterfactual and sensitivities

Q12. Do you have any views on the counterfactual to use for this assessment and sensitivities that we could use?

Counterfactual - Ofgem's view is that using a FES pathway to define the counterfactual is a pragmatic and transparent approach that allows them to robustly assess many LDES applications within the time constraints of the Project Assessment process.

The NESO proposes to use the FES 2025 Holistic Transition (HT) scenario as the counterfactual. This has not yet been published, so the following comments reflect the 2024 FES HT scenario.

The 2024 Holistic Transition scenario is the NESO's highest renewable pathway with unabated gas dropping to zero shortly after 2036. Supply side flexibility is high, delivered through electricity storage and interconnectors. By 2035, this scenario assumes 48 GW and 172 GWh of total storage capacity (excluding vehicle to grid capacity).

The FES 2024 also makes assumptions about consumer flexibility – it is assumed that consumer flexibility reaches 29 GW by 2035, increasing from 7 GW in 2023. This increase predominately arises from growth in vehicle to grid and smart charging flexibility. This increase appears highly uncertain, potentially further depressing marginal benefits from additional LDES and distorting the analysis. It is unclear what impact such uncertainties have upon the LDES volume and benefit calculations.

Additionally, the FES 2024 makes assumptions about the capacity of batteries that are connected. Given the subsequent introduction of the C&F regime, this proposed battery capacity could be replaced by cheaper LDES, thereby leading to a change in the respective technology scenarios.

Sensitivities - Ofgem intends to model a single base case with additional sensitivity runs. The sensitivities will be used to understand which projects deliver the highest socio-economic value differ

materially depending on the underlying assumptions around pricing, demand level and generation mix, weather patterns and zonal pricing arrangements. The proposed sensitivities are:

- a) Base Run: Central Future Energy Pathway
- b) Additional Future Energy Pathway
- c) Zonal
- d) Weather Year 2010
- e) Weather Year 1985
- f) High Gas Prices (optional) – higher gas prices are likely to increase the value of LDES
- g) High Demand Side Response (optional) – increased demand side response may reduce the need for LDES

Ofgem will also assess the impact of the LDES project costing more than planned (i.e. at the upper end of the cost range provided by projects), to see if it would still deliver sufficient benefits to justify going ahead with it. They propose that projects demonstrating robust performance across multiple scenarios would receive favourable scoring within the Strategic Assessment.

These appear to be a logical set of sensitivities to assess the impact of extreme events. We would suggest that a low demand side response scenario is also modelled as described above.

In addition, given the growing reliance on interconnectors to provide low carbon flexibility, we would suggest modelling a low interconnector capacity scenario. This might be based on the major French nuclear outages in 2022, for example.

END