

Call for input response

# Reformed National Pricing Locational Charges and Regulatory Siting Levers

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## Electricity Storage Network

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The **Electricity Storage Network (ESN)** is the industry group and voice for grid-scale electricity storage in GB. The ESN has 100 members who have a 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. This includes representation from publicly listed specialist funds focusing on storage and independent developers that have raised several billion pounds to invest in this new technology.

This response is based on input from ESN members involved in developing grid-scale electricity storage projects in GB, as well as feedback received via our Markets and Revenues working group.

## About Regen

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Regen manages the ESN. Regen provides independent, evidence-led insight and advice supporting our mission to transform the UK's energy system for a net zero future. We focus on analysing the systemic challenges of decarbonising power, heat and transport. We know that a transformation of this scale will require engaging the whole of society in a just transition.

Regen is also a membership organisation, managing the Regen members' network and the Electricity Storage Network (ESN). We have over 200 members who share our mission, including clean energy developers, businesses, local authorities, community energy groups, academic institutions, and research organisations.

# Continuing engagement

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## Summary

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ESN welcomes the opportunity to respond to Ofgem’s call for input on locational charges and regulatory siting levers. The current framework was developed for a very different electricity system and must now evolve to support the scale and pace of investment in grid-scale storage required for Clean Power 2030 and the Strategic Spatial Energy Plan (SSEP). To enable that outcome, we recommend the following:

- **A holistic review of storage policy and the investment environment is needed** that brings together network charging (TNUoS reform), Transmission Constraint Licence Conditions changes/clarification, Balancing and Settlement Code P462, Strategic Spatial Energy Plan pathways and assumptions on storage, plans to shift to locational procurement of response and reserve services, and dispatch issues regarding repetitive re-trading. The objective should be enabling storage to work for the system and the consumer while maintaining storage investment and deployment. The current approach to Reformed National Pricing and other policy areas is often siloed and fragmented, risking unintended consequences that undermine the sector. DESNZ has started a project looking at barriers to deployment of BESS and we welcome wider industry engagement on this critical topic.

**Recommendation:** DESNZ, working alongside NESO and Ofgem, needs to ensure a holistic review of storage policy and investment environment is completed with ongoing engagement with the industry.

- From our engagement with members, there is a majority view that storage should not be treated as generation. Discussions around options for reform have been suggested by different industry stakeholders via code modifications (e.g. CMP393 and CMP405) and strategically reviewed by the TNUoS storage subgroup managed by NESO. The sector is frustrated by the progress so far and is keen to work on solutions with NESO, Ofgem and other stakeholders. In particular, we would like to understand how previous work on storage specific reforms will be integrated into the work of the new Locational Charges Design Group (LCDG).

**Recommendation:** Storage should not be treated as generation in a new TNUoS framework, and the industry would like to see an integrated solution developed, informed by previous work.

- There are strong views in our membership regarding TNUoS reform, depending on the location of the storage assets that are operational and being developed. This means that the provision of transitional arrangements should be treated as an urgent priority ahead of any significant changes to the current framework to help maintain investor confidence at a critical time for deployment.

**Recommendation:** Ofgem should develop transitional arrangements that provide a time-limited phased implementation, potentially combined with targeted protections.

## Reform options

Ofgem’s call for input sets out five options under consideration for reforming the locational and strategic signals within TNUoS. Overall, we consider Options A, B or D to provide the strongest potential basis for reform. However, we recognise that, at this stage, the call for input is necessarily framed at a relatively high level. As a result, the options presented currently lack detail and could encompass a wide range of possible interpretations. It is therefore difficult to assess how these options would operate in practice, including their potential implications for market participants and system outcomes. As such, it is not yet possible to take a definitive view on any single option until further clarification and detail are available.

**Recommendation:** At this stage, ESN does not take a definitive position on a preferred option. However, based on the information currently available, ESN members see the strongest potential in Options A, B and D. More details on the options need to be provided by Ofgem to industry before a definitive position can be taken.

## Responses to questions

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### The case for change for regulatory siting levers

Q1. Do you agree with our assessment criteria for locational charging options?

No answer provided.

### Potential options for interzonal locational charges

Q2. Do you have a preference for any of the five options? If so, why?

All the options presented currently lack sufficient detail to assess their potential implications for market participants and overall system outcomes. In light of this, it is not yet possible to

reach a definitive view on any single option. We would therefore welcome further clarification and more detailed development of the proposals to enable a more informed assessment.

ESN members consider Options A, B and D to provide the most credible basis for reform. These options, to varying degrees, build on existing frameworks or introduce changes that could deliver clear signals without undermining investor confidence. By contrast, Options C and E would introduce significant new complexity, uncertainty and risk and represent a departure from the established principles underpinning TNUoS. They are considered less predictable and more difficult to implement, with a higher likelihood of deterring investment or increasing cost of capital.

### Option A

Option A proposes retaining the current investment cost-related charging framework while implementing targeted reforms to improve alignment with the SSEP. This includes aligning TNUoS zones with SSEP geographies, improving the treatment of network utilisation and basing charges on the future planned network rather than the existing network alone.

Option A represents a pragmatic evolution of the current charging framework and, on balance, could be viewed as a practical and proportionate route forward. Retaining an investment cost-related approach while introducing targeted reforms to improve alignment with the Strategic Spatial Energy Plan (SSEP) could strengthen locational signals without introducing excessive complexity or undermining investability.

Measures such as aligning TNUoS zones with SSEP geographies, improving the treatment of network utilisation and basing charges on the future planned network rather than the existing network alone could improve the effectiveness of the framework. Aligning charging signals with the future network, rather than simply reflecting current constraints, appears sensible in the context of strategic planning.

While ESN members highlighted significant shortcomings in the design and implementation of the current approach, building on this framework, rather than introducing a wholly new approach, could help to reduce financing risk and maintain investor confidence, minimise disruption and potentially be implemented more quickly than more fundamental reform options. However, this approach also has limitations and risks, as retaining the current framework may not address underlying issues of volatility and predictability. As with all of the options, more detail is needed.

### Option B

Option B would retain the principle of long-run marginal cost charging but introduce stronger utilisation-based signals linked to the planned future network. Under this approach, charges would reflect the extent to which new connections contribute to overloading planned network infrastructure or accelerate reinforcement requirements.

Option B appears to provide a coherent long-term direction and could be seen as a logical evolution of Option A. A framework based on efficient utilisation of planned network capacity is compatible with strategic energy planning and could provide clearer investment signals as the system evolves. More explicit alignment between charging signals and the future strategic network could help support cost-effective delivery of the SSEP and reduce inefficient network development over time.

There is also merit in the principle that projects locating materially outside the strategic plan could face stronger locational signals unless and until the SSEP itself changes. If designed well, this approach could move charging arrangements closer to accurately reflecting the long-run costs imposed on the network.

However, this option requires significantly further development before it could be definitively supported. Much of its effectiveness would depend on detailed design choices, including how Network Utilisation Impact Charges (NUIC) are calculated, how frequently charges are updated and which modelling assumptions underpin the methodology. There is a significant risk that frequent updates or poorly calibrated assumptions could create unpredictable and volatile charges, undermining investor confidence and reducing the stability needed for long-term investment decisions.

There are also important design challenges relating to cliff-edge effects and first-mover disadvantage. Projects could face materially different charging outcomes based on relatively small changes in location or timing, creating risks of distorted investment behaviour unless these issues are explicitly addressed within the design framework. The extent of charge volatility may also depend on whether Long-Run Marginal Cost (LRMC) or Long-Run Incremental Cost (LRIC) methodologies are used.

Overall, Option B could provide stronger alignment between charging signals and the future planned network and may represent one of the closest approaches to genuinely cost-reflective charging. However, this comes with increased complexity and implementation risk, meaning careful design and robust governance would be essential.

## **Option C**

We are significantly more cautious regarding Option C. Option C proposes extending TNUoS beyond network investment costs to include wider system costs, including long-run structural constraint costs. In effect, this would introduce a form of long-term locational value signal within TNUoS based on the future operational impacts of siting decisions.

While there may be conceptual merit in considering wider system impacts and long-run network utilisation, we are concerned this option risks becoming a mechanism for recovering constraint costs through TNUoS charges. In our view, this would represent a fundamental shift in the purpose of the charging regime and could introduce substantial complexity. In particular, there is a clear risk of conflating operational constraint costs – more appropriately managed

through BSUoS and balancing markets – with long-run locational investment signals. This would blur established distinctions within the framework and could lead to inefficient outcomes.

Another key challenge is the practical implementation of such an approach. Developing a robust and non-arbitrary methodology to translate constraint impacts into forward-looking network charges would be extremely difficult. This risks reintroducing the same uncertainty concerns that led to the rejection of more granular zonal approaches. While averaging constraint impacts over longer periods could mitigate volatility, doing so would tend to dilute locational signals to the point that outcomes increasingly resemble those under Option B – raising questions about whether the added complexity of Option C can be justified.

We are also concerned that Option C could expose projects to highly volatile and uncertain costs. Developers are not well placed to manage risks arising from network delays, delivery uncertainty or inaccuracies in the SSEP or CSNP, yet this approach could transfer those risks onto them. Developers building in accordance with strategic plans should not face materially higher charges due to delayed network investment or short-term operational constraints that persist longer than expected, and there is a significant risk of misalignment where Option C signals assume timely network delivery, but in practice network build is delayed.

This risk is compounded by current limitations in modelling. Accurately forecasting long-term constraint costs would require a step change in the capability, granularity and transparency of system modelling. At present, constraint forecasts can differ significantly from outturn, and any approach relying on these forecasts would risk embedding inaccuracies into enduring charges. Without major improvements in modelling capability, the credibility of the resulting signals would be questionable.

We are also concerned that modelling future constraint costs using current network build plans may systematically overstate long-term structural constraints. Previous approaches to constraint modelling have often reflected relatively short planning horizons, implicitly assuming network limitations persist indefinitely because future reinforcement beyond the modelled horizon is not included. This risks embedding distorted investment signals into enduring network charges.

Constraint costs should primarily be treated as a shorter-term operational issue, particularly during transitional periods when network infrastructure is being delivered, rather than as a permanent component of locational network charging.

## **Option D**

Option D proposes introducing metrics linked to the evolution of the energy system relative to the SSEP. For example, charges could vary according to whether a region is over- or under-developing compared to the strategic plan, dynamically reinforcing delivery of the SSEP over time.

Option D may warrant further consideration as a supplementary mechanism to fine-tune locational signals relative to the delivery of the SSEP and may offer some benefits. In particular, the relative simplicity of metric-based charges could provide clear, stable and predictable signals for investors compared to modelling-heavy approaches. If well designed, such metrics could embed a degree of alignment with the SSEP and support early-stage siting decisions by reducing uncertainty.

However, there are also concerns with this approach. Fundamentally, Option D represents a departure from the principle of cost-reflectivity that has traditionally underpinned TNUoS. Charges derived from high-level system metrics risk lacking a clear causal link to the underlying costs of the network.

Significantly more detail is required on how such metrics would operate in practice, how they would be translated into charges, and how they would interact with existing methodologies. At present, the lack of methodological clarity creates a risk that resulting charges could be perceived as arbitrary. This in turn could weaken investor confidence and reduce the effectiveness of the signals being sent.

There are also potential fairness concerns. A simple metric-based approach may not adequately reflect differences between technologies, operational characteristics, or system contributions, creating risks of inequitable treatment across asset classes – including for storage relative to other technologies. Poorly designed metrics could lead to distorted investment signals or unintended consequences across different locations and technologies.

ESN members also noted that Option D may not be sufficiently strong on its own to fully align investment with strategic planning objectives. If the link between the metric and the actual system needs is weak, there is a risk that the approach will fail to drive meaningful behavioural change. Significantly more detail on the approach is therefore needed, but this Option should not be ruled out at this stage.

## **Option E**

Option E proposes a more fundamental redesign based on auctioning zonal connection capacity aligned with the SSEP, with projects competing for access rights and potentially setting locational charges through the auction process itself.

While Option E raises interesting questions around strategic coordination and scarcity pricing, it represents a far more fundamental redesign of the current framework. Auction-based approaches would require careful consideration alongside connections reform, CfDs, the Capacity Market and wider electricity market reform.

Given the scale and nature of the change proposed, this option is likely to be perceived as high risk by clean energy investors and would be inherently challenging to design and implement. It would introduce significant uncertainty around access, costs, and revenue expectations, all of

which are critical to investment decisions. There is also a material risk of unintended consequences, particularly if the auction design does not align with other policy mechanisms or creates barriers to participation.

As such, extensive further development to assess feasibility, liquidity impacts and interactions with wider market arrangements, detailed design work, and sustained stakeholder engagement would be essential before this option could be considered viable.

Practical concerns also arise around how auctions would function across zones with varying levels of interest. In low-liquidity areas, there are risks of market power and unrepresentative clearing prices. In more competitive zones, a “winner’s curse” dynamic could lead to overbidding, project attrition and inefficient allocation of capacity. While auctions could support price discovery where markets are sufficiently liquid, it remains unclear what underlying value signals prices would reflect in relation to long-term system needs.

While Option E may offer longer-term benefits, the practical risks, complexity and implications for investor confidence are substantial.

**Recommendation:** At this stage, ESN does not take a definitive position on a preferred option. However, based on the information currently available, ESN members see the strongest potential in Options A, B and D. More details on the options need to be provided by Ofgem to industry before a definitive position can be taken.

**Q3. For each of the options presented, what do you see as the key costs, benefits, and system-wide implications given the case for change set out in Chapter 2?**

No answer provided.

**Q4. How does each option perform against the assessment criteria set out in Chapter 2?**

No answer provided.

**Q5. Are there options not considered here which we should be exploring? If so, please provide detail.**

No answer provided.

### **Option A: Targeted changes to the current charging regime**

**Q6. What are your views on the possible changes outlined in Option A? What other alterations could be made to the current methodology to support the SSEP and deliver benefits?**

Please include views on:

- How far a modified transport model could be well aligned with the SSEP.
- To what extent a modified transport model should be used to reflect spare capacity and whether it could do so effectively.

No answer provided.

### **Option B: Network utilisation impact charge**

Q7. What long-run costs should NUIC reflect, particularly in the context of the growing share of network investment made anticipatorily through the CSNP rather than responding directly to the connection of new assets?

No answer provided.

Q8. Should the costs of network build determined by strategic planning be recovered on the same bases as the network build required by assets locating outside of the SSEP (and therefore requiring network beyond the SSEP's optimisation)?

No answer provided.

Q9. If an LRIC-type methodology were developed for transmission network charging, how could the concepts of (a) time-to-reinforcement and (b) baseline demand projections be adapted in the context of strategic planning and anticipatory network reinforcement?

No answer provided.

Q10. Could any other LRMC approaches be used to send a locational signal to support the SSEP or deliver wider system benefits? Please clearly indicate any relevant methodologies, including those applied in other international contexts.

No answer provided.

### **Option C: System and constraints impact charge**

Q11. What additional measures might be required to deliver effective locational signals using the approach in Option C?

Q12. Are there any alternative approaches integrating SSEP outcomes to send a signal reflecting assets' wider system impact, including constraints?

No answer provided.

### **Option D: Metric-based charge**

Q13. To what extent could a metric-based charge act as a complementary 'top up' signal alongside a broader charging methodology, rather than operating as a standalone approach? What challenges would this present?

No answer provided.

Q14. What other metric-based approaches might be a suitable basis for setting charges?

No answer provided.

### **Option E: Plan-based auction pricing**

Q15. What interactions do you foresee between plan-based auctions for generation, government support mechanism auctions and the connections regime? What potential implementation risks and mitigations should be considered?

No answer provided.

Q16. What design features could help ensure that auctions remain workable across zones with very different levels of project interest?

No answer provided.

Q17. Could alternative mechanisms achieve similar outcomes with fewer risks or dependencies?

No answer provided.

### **Provisional design considerations for locational charges for demand and storage**

Q19. What should be considered when designing a network charge for storage?

Please include views on:

- Whether or not the TNUoS fees paid by storage should have a locational element, guiding where assets are encouraged to site, in a strategically planned system.
- Whether storage should continue to face the same charge as some forms of generation, or whether a more tailored approach should be considered.
- If a more tailored approach to storage charging were considered, whether or not differences in storage asset class and characteristics should be reflected. If differences should be reflected, please indicate which, with rationale.
- The extent to which the charging options (A-E) described above might be appropriate and provide useful locational signals to storage.
- Whether network charges for storage should reflect the extent and characteristics of network constraints.
- Any possible roles for any types of flexible connections for storage assets.

Electricity storage is distinct from generation and should not be assumed to impact the network in the same way. Locational signals designed to optimise generation or demand deployment

will not necessarily result in efficient storage siting. Storage assets respond to different economic and operational drivers and may require tailored signals to ensure their deployment aligns with system value. Charging arrangements should recognise this and provide signals that incentivise storage both to operate in a manner that delivers benefits to the system, and to locate and behave in ways that support local network needs and minimise system costs.

There is a strong case for storage charges to more closely reflect the costs imposed on, and value delivered to, the system. Storage has a fundamentally different network impact from conventional generation because of its bi-directional nature. Storage can absorb excess generation, reduce curtailment, support balancing and help manage constraints. Current TNUoS arrangements do not adequately reflect these characteristics and continue to classify storage broadly alongside conventional generation technologies. This risks undervaluing the flexibility services storage provides through both import and export behaviour.

It is also important to recognise that different storage technologies provide distinct system functions and face different deployment constraints. Short-duration storage and Long Duration Energy Storage (LDES) differ materially in their operational characteristics, siting requirements, revenue models and contribution to system resilience. A “one-size-fits-all” approach to charging risks failing to capture these differences. While reform should avoid unnecessary complexity or creating perverse incentives, a degree of technology-specific treatment may be justified to ensure storage assets are appropriately valued for the system and cost benefits they provide.

Discussions around options for reform have been suggested by different industry stakeholders via code modifications (e.g. CMP393 and CMP405) and strategically reviewed by the TNUoS storage subgroup managed by NESO. The industry has concerns about the methodology currently used by NESO, developed by Afry for the TNUoS Storage Subgroup, to assess the impact of energy storage on the network, which focuses solely on the day-ahead market. In practice, storage assets optimise revenues dynamically across day-ahead, intraday, balancing and ancillary service markets and behave in different ways depending on their location relative to constraints.

The sector is frustrated by the progress so far and is keen to work on solutions with NESO, Ofgem and other stakeholders. In particular, the industry would like to understand how previous work on storage-specific reforms will be integrated into the work of the new Locational Charges Design Group (LCDG).

**Recommendation:** Storage should not be treated as generation in a new TNUoS framework, and the industry would like to see an integrated solution developed, informed by previous work.

## **Technical Design Choices**

Q28. How can locational charging best reflect technology-specific differences?

See answer to question 19.

## **Treatment of legacy and transitional assets**

Q33. Under what circumstances do you see a need for introducing LAT arrangements? Do you agree with our rationale for the potential introduction of such arrangements?

Transitional arrangements should be treated as an urgent priority. Given the scale and complexity of the proposed reforms, implementation will inevitably take time. It is crucial that the process does not inadvertently deter investment or increase the cost of capital for projects approaching Final Investment Decision (FID) in the near term. Projects progressing toward FID in the coming months and years require greater clarity and assurance over future charging arrangements to avoid pricing in additional risk.

Ofgem should work closely with the government to develop and communicate more immediate transitional measures or guarantees. These should provide sufficient certainty to investors during the interim period, ensuring continuity of investment while longer-term reforms are developed and implemented.

Q34. Can you provide details and/or information on how investment decisions have been made to date and what factors or assumptions regarding TNUoS charging were taken into account?

Q35. Do you agree with these principles for LAT arrangements? Are there any which we are missing?

Q36. Do you believe determining the scope of LAT arrangements solely based on a FID cut-off date is appropriate, or should we narrow their scope based on route to market or other differentiators?

Q37. What would be the best way, in your view, for the Authority to collect and assess evidence of FID for the purposes of determining eligibility for LAT arrangements? Would it be more

appropriate to use Milestones 7 and/or 8 of the connections process as the method of determining eligibility?

Q38. What would be the best way, in your view, for the Authority to collect and assess evidence of FID for the purposes of determining eligibility for LAT arrangements? Would it be more appropriate to use Milestones 7 and/or 8 of the connections process as the method of determining eligibility?

Q39. Which design – parallel running, phased implementation or a fixed charging regime – could best achieve a balance of the aims for LAT arrangements?

Several ESN members expressed preference for a phased implementation approach, which may provide the best overall balance against the objectives, although there is also a credible case for fixed arrangements for some existing assets.

A phased approach could balance the need for more accurate and cost-reflective locational signals over time with the need to maintain investor confidence and avoid undue disruption for projects developed under the current framework. As assets reach major reinvestment or life extension decisions, they could increasingly transition towards updated charging signals aligned with future system needs.

However, there is also a case for fixed arrangements for legacy and transitional assets that were financed under long-term assumptions based on the current regime. Sudden or significant changes to charging arrangements risk undermining investor confidence and making it harder for projects to reach Final Investment Decision (FID). Fixed arrangements may therefore be appropriate if reforms would otherwise create large and unexpected changes in cost exposure.

On balance, a time-limited phased implementation, potentially combined with targeted protections for some existing assets, may offer the most proportionate route forward. This should be supported by clear governance and measures to limit excessive year-on-year charge movements during the transition period.

**Recommendation:** Ofgem should develop transitional arrangements that provide a time-limited phased implementation, potentially combined with targeted protections.

Q40 If fixing of charges for legacy generators was deemed appropriate, which of the approaches described could achieve a balance of aims for the LAT arrangements? Are there other approaches we should consider for fixing?

See answer to Q39.

