

Written evidence submitted by RenewableUK (ECO0040)

About RenewableUK

RenewableUK is the leading renewable energy trade association in the UK. Our members are building our future energy system, powered by clean energy, including offshore and onshore wind, tidal stream, green hydrogen, energy storage and future systems management. We bring them together to deliver that future faster; a future which is better for industry, billpayers, and the environment. We support over 450 member companies to ensure increasing amounts of renewable electricity are deployed across the UK and to access export markets all over the world. Our members are business leaders, technology innovators, and expert thinkers from right across industry.

Overview

RenewableUK welcomes the opportunity to respond to this call for evidence on the economics of the energy sector. We set out below the key criteria for reforming electricity markets in a way that enables us to decarbonise the power system in a cost-effective way whilst maintaining security of supply.

We note that we are currently responding to the Government's second consultation on the Review of Electricity Market Arrangements (REMA). Designing a market system fit for the future whilst maintaining investor confidence will require careful balancing of policy options, investment and operational signals. By implementing the recommendations outlined below and in our REMA response, the Government can:

- **Address some of the main challenges arising from the current set of market arrangements**, including price cannibalisation and excessive constraints on the network, through measures that build on current arrangements.
- **Ensure that the transition to new market arrangements minimises any increases in the cost of capital of necessary new infrastructure**, which would make the transition more expensive, limit our ability to continue attracting private investment into the UK and wipe out the whole-system cost savings that could be delivered through the implementation of certain options.

Please see our full responses to the consultation questions below.

Consultation Questions:

1. *What should be the underlying principles of the UK energy market?*

We recommend that the key underlying principles the Government should adhere to when reforming the UK energy market are a **rapid transition to a renewables-based energy system** which is **secure and lower-cost**.

Rapid transition to a renewables-based energy system

The UK has ambitious net zero targets and therefore needs an energy market that accelerates the development of this future energy system.

The UK still needs to build 35GW of new offshore wind to meet our 2030 target. Additionally, at least 134GW of wind and solar will need to be built to 2035, as well as up to 55GW of storage and demand-side response and between 30-50GW of long duration flexibility, to enable power sector decarbonisation.¹

In order to build and run this future, decarbonised energy system, the energy market must foster investor confidence and alleviate constraints on the power system.

Investor confidence

Investor confidence in the UK's energy market is critical to ensure there is the capital to build the necessary renewable energy projects. The next decade to 2035 is essential for attracting private investment at pace to meet our targets and ensure that private finance does the heavy lifting in terms of building the future energy system.

With increased international competition for mobile capital, it is essential that REMA reforms give precedence to sending the right investment signals over locational or operational signals. Indeed, the effectiveness of

¹ Energy Pulse, [FES 2023 scenario framework and assumptions - V1 for publication.xlsx \(live.com\)](#)

locational or operational signals will be limited if the UK does not manage to attract the investment required to build capacity in the first place.

Reforms that evolve the current Contracts for Difference framework, that guarantee a route to market for long duration flexibility or that create different revenue streams for key technologies should be prioritised as they can drive private investment into the UK. We discuss these issues in more detail below.

Alleviating constraints

The current transmission grid was built to service large coal and gas power stations. Now, with the majority of the UK's power coming from power sources mostly around the coast, our transmission grid does not currently deliver the capacity needed, with constraints meaning that there is 550GW worth of renewable energy capacity waiting to connect. This issue can be addressed through rapid scale up of grid infrastructure and connections reform, which the Government is seeking to do through its [Connections Action Plan](#) and [Transmission Acceleration Action Plan](#).

Some of the reforms in REMA are also intended to alleviate constraints in the network – e.g. by optimising locational decisions through zonal pricing. Government should aim to achieve broad alignment between the range of reforms and constraints markets, to maintain some optionality on how constraints are mitigated (e.g. by incentivising investment in low carbon flexibility) instead of relying on a silver bullet option such as zonal pricing which, as will be explained below in more detail, may not deliver good outcomes for constraints management. The adoption of measures such as Contracts for Difference reform (also examined in more detail below) would also help manage constraints, as it will disincentivise generation at times of system overload.

Secure and lower-cost energy system

It is essential that the Government seeks to design the energy market to establish lower cost for consumers, but ensures energy security as well.

This principle is closely linked to the first principle, as renewable energy is the cheapest form of electricity for consumers. Government must ensure that new market arrangements minimise any increases in the cost of capital, as increasing the cost of capital will increase costs associated with the energy transition, with costs flowing down to bill-payers.

Another key aspect of this principle is flexibility services, and ensuring that the energy market places value on flexibility.

Placing value on flexibility

Flexible solutions, including storage technologies, demand response and co-location with renewables, are essential to ensuring energy security in the UK's future energy mix. This future energy system will depend on variable renewable energy generation, meaning there will be times when renewable energy sources significantly over or undersupply generation as compared to demand.

Deploying flexible technologies is vital to optimising renewables and reducing curtailment across the system. Storage technologies, for example, can capture excess renewable energy in small, medium or large volumes and release it later to meet any shortfalls in demand. Long duration storage includes established technologies such as pump hydro and lithium-ion batteries as well as a range of innovative technologies such as flow batteries, liquid air storage and compressed air storage, which are close to commercial deployment.

Reforms should shape a market that clearly rewards the value of flexible solutions and provides clear routes to market for technologies such as long duration energy storage and incentivises co-location of complementary technologies such as renewables with flexibility. Capacity Market reforms should encourage greater participation from flexible, low carbon technologies first (batteries, hydrogen to power, interconnectors, storage, demand-side response), with unabated gas only used as a last resort. Contracts for Difference reform options like deemed generation would also be beneficial for overall system flexibility.

Additionally, scaling up flexibility will also lead to cost savings, for example, deploying up to 20GW of long duration energy storage by 2050 could lead to system costs savings of up to £24bn.²

2. Can Government deliver radical reform in the UK energy market?

Radical reform of the UK's energy market is neither necessary nor desirable. Radical and insufficiently consulted long-term change to market arrangements risk negatively impacting investor confidence which, as discussed above, is necessary to fund UK's energy transition and achieve net zero targets.

Instead, Government should focus on evolutionary improvements of existing mechanisms to mitigate emerging issues and ensure coherence across policy and regulations, in addition to other measures including, critically, accelerating transmission buildout and connections reform.

We discuss these evolutionary approaches in more detail in response to the question below.

3. Is the Review of Electricity Market Arrangements likely to deliver the necessary changes to the energy sector?

No, REMA alone will not deliver the necessary changes to the energy sector.

Firstly, while REMA is important to deliver the necessary changes to the energy sector, it is essential that new grid infrastructure is built to allow new renewable energy projects to be connected to the grid, and alleviate grid constraints, hastening the decarbonisation of the electricity system. It is therefore critical that the Government continues to collaborate with industry to implement the [Transmission Acceleration Action Plan](#), halving the time to build new transmission infrastructure from 14 years to 7 years, and the [Connections Action Plan](#) to more effectively manage the transmission queue.

Secondly, some of the more radical elements in the Government's second round of consultation for REMA would not deliver on the benefits outlined in question 4 as currently drafted because they would increase the cost of capital and could cause an investment hiatus that would jeopardise energy security.

We recommend that the following should be incorporated into the final design of REMA:

1. Remove radical changes including zonal pricing

As outlined in question 2, we reiterate that REMA should be evolutionary, not revolutionary or radical. To this end, we welcome the Government's removal of locational marginal pricing and green power pools as options in the latest round of REMA consultation.

However, zonal pricing remains an option. We strongly recommend that zonal pricing is also removed from REMA as it will dampen investment and investor confidence for the following reasons:

- Renewable assets will base their location decision on several factors: natural resources, ability to obtain planning consent and in the case of offshore technologies, the seabed leasing rounds. Generally, where these three criteria intersect are at the extremities of the network and therefore away from demand centres. For renewable generators such as offshore wind these factors mean they are unable to respond to locational signals and typically located at the extremities of the network. The introduction of sharper locational signals via zonal pricing will not change the fact that offshore wind is located offshore and there is no evidence on the willingness of large demand centres to relocate to zones to avail of cheaper power.
- Studies estimate that a move to a zonal pricing regime could increase the cost of capital by 0.3 to 0.9 percentage points for all technologies, wiping out any system cost benefits, adding to consumer bills and creating additional costs related to the need to grandfather arrangements on existing contracts.³
- Furthermore, it is unclear how zonal pricing will support the growth of emerging technologies. Again, technologies such as wave, tidal and floating wind will locate where resources are most plentiful which

² [Scenario Deployment Analysis for Long-Duration Electricity Storage \(publishing.service.gov.uk\)](#)

³ [The implementation of locational pricing brings benefits to the GB energy system but benefits could be offset by associated risks | LCP Delta.](#)

is at the extremities of the country. Under zonal pricing these technologies would be located in zones already dominated by more established renewable technologies and therefore exposed to very low prices set by these technologies. Under these market conditions emerging technologies would be effectively priced out of the market as it will take time to reach a suitable price point alongside established renewable technologies over the next several years. Technologies such as wave, tidal and floating wind have a strong role to play alongside fixed bottom offshore wind in developing a balance system and it is important that future markets arrangements account for this fact.

- One of the justifications for moving to zonal pricing relates to expectations that the grid expansion we need to see will not materialise sufficiently quickly. Given that the REMA package is meant to lay the foundations for our future energy system, and that the arrangements should be enduring, we think that trying to solve issues related to grid build out through a market reform package is not appropriate. Doing so could send the wrong signals to investors and transmission operators who are ramping up for greater levels of grid investment, and it could also skew the final reform package towards a solution that creates a much higher risk profile for renewables infrastructure (see above). Furthermore, it is not necessarily a faster solution - for example, in Australia, zonal pricing was debated for over five years before it was eventually thrown out.⁴
- It is also worth noting that in the Nordic countries, where zonal pricing has been implemented to deal with grid congestion, the problem has not gone away. In fact, price differentials between zones have been increasing year on year, pointing to a worsening congestion problem.

The Government must instead ensure that there is an appropriate sequencing of the different types of signals is reflected in the final reforms package, with investment signals being paramount over the next decade, with operational signals becoming more important once the majority of the capacity has been built.

We would also caution against disaggregating elements of the future energy system and optimising the outcomes in one part but not the others – all reforms should be looked at holistically. For example, reforms that could in theory optimise system operability need to be tested in a whole-system scenario to ensure they don't create significant unintended consequences in other parts of the system.

2. Reflecting the value of flexibility

As mentioned above, reforms should shape a market that clearly rewards the value of flexible solutions. This should be achieved in several ways:

Clear routes to market for long duration energy storage

We recommend that the Government provide **clear routes to market for long duration energy storage** (LDES) technologies through a cap and floor mechanism, which the Government has recently consulted on. RenewableUK responded to this consultation, and our key recommendations were:

- **Exclusion criteria** - this scheme should be technology agnostic to the widest extent possible. The cap and floor scheme should not be excluding technologies that can demonstrate they can meet the LDES Stream 1 eligibility requirements (such as Li-ion batteries). Li-ion projects (both large scale in terms of capacity and duration) are being deployed in other markets but are not commercially feasible in the UK at the moment because they face similar challenges to other longer duration electricity storage technologies. Li-ion storage could improve rapidly and provide a much more competitive offering for 6-8 hour durations and could therefore support some of the LDES policy objectives.
- **Scheme capacity** - while we recognise that there are several variables at play which makes setting an overarching target of LDES capacity more challenging, we believe it is important for the Government to send a clear signal to investors which will help the industry to understand what it needs to build towards. We urge the Government to set an ambition, potentially with a range, or a minimum capacity that can be adjusted in response to updated analysis, building on LCP Delta's modelling on the capacity required by 2030 and 2035 across both Stream 1 and Stream 2. We would not be supportive of an approach where the maximum system need for LDES is solely procured via a cap and floor mechanism. We also strongly urge DESNZ to develop an updated flexibility and storage strategy, including an update to the 2021 Smart Systems and Flexibility Plan. It is important that the LDES

⁴ [Locational marginal pricing is finally dead. Time to get smart about grid congestion | RenewEconomy](#)

scheme aligns with the broader trends and strategic policy framework for flexibility, including changes to demand side flexibility.

- **Detailed design** - much will depend on both the pace of the delivery of the LDES cap and floor scheme and the detailed design to ensure it is investable. Therefore, we suggest an industry working group is established to support the development of the detailed design of the mechanism for the rest of the year. This should include consideration of: the assessment criteria framework, ways to streamline the interconnector cap and floor assessment process for LDES scheme and some more detailed elements of the cap and floor design.
- **Clarity on application window opening** - after the policy detail is finalised this year, DESNZ should look to open the application for both Stream 1 and Stream 2 technologies in 2025. This would ensure that projects are up and running and able to realise benefits to the system well before the 2035 targets. We believe that opening the application window for Stream 1 technologies in Q1 2025 and Stream 2 later on in 2025 is a viable target DESNZ should be building towards.

Incentivise co-location of complementary technologies

REMA reforms must also be **designed to incentivise co-location of complementary technologies**. For example, a wind farm and a battery could be co-located and work together to make efficient use of network capacity assets and available land, providing a fundamental value to the system and consumers. Achieving a flexible system and unlocking greater operability from co-located and hybrid renewables will require a coordinated effort and a holistic strategy cutting across markets, grid, planning and technical (metering) challenges that need to be overcome. We outline all our recommendations for encouraging co-location in a report which will be released at the end of April 2024.

Capacity Market reforms

Finally, **Capacity Market reforms should first encourage greater participation from flexible, low carbon technologies**, such as batteries, hydrogen to power, interconnectors, storage, demand-side response, with unabated gas only used as a last resort. As part of REMA, we recommend the Government continue to progress the Optimised Capacity Market option (multiple clearing prices), while at minimum a low carbon characteristic should be included from the start. Optimised Capacity Market (with low carbon minima) will ensure a smooth transition that maintains investor confidence in the Capacity Market to deliver high liquidity and participation from flexible low carbon assets such as storage, demand-side technologies and brings forward new renewables. If properly calibrated (both in terms of targets and parameters) an Optimised Capacity Market (with minima) will likely encourage greater participation from low carbon flexible sources including forms of distributed flexibility. Most importantly, DESNZ should set out a clearer objective and vision on how different technologies such as hydrogen to power, long duration storage and so on will be working to support a net zero system. An overall strategy needs to be communicated to the industry to provide confidence on the approach, therefore we recommend that DESNZ develops an updated flexibility and storage strategy, including an update to the 2021 Smart Systems and Flexibility Plan.

3. Contracts for Difference reform

Industry recognises the need to decouple Contracts for Difference (CfD) payments from output to manage operational inefficiencies and reduce curtailment costs.

Deemed generation

One option to achieve this is through '**deemed generation**' as described in the Government's second REMA consultation.⁵ The deemed generation framework means the generator is paid on potential output, rather than actual output, and so would receive its CfD payment regardless, reducing the need for curtailment payments.

Deemed generation also delivers whole-system benefits, as generators are incentivised to behave more flexibly and to participate more in other markets such as the balancing and ancillary services, knowing that CfD payments would not be impacted by this.

⁵ 'Deeming is the process of determining the maximum amount of generation an asset could in theory produce at any point in time reflecting 'live' conditions (e.g. weather). To accurately determine this, the government would need to establish a deeming methodology. Subsidy difference payments could then be determined by this deemed output, meaning their actual generation and activity in the market would be separate from subsidy payments. Aside from replacing metered output with deemed output, this model would retain most of the existing CfD design, including the auction process.' [Review of Electricity Market Arrangements: second consultation \(publishing.service.gov.uk\)](https://publishing.service.gov.uk)

The methodology for deeming generation will need to be developed in close consultation with industry, however the complexity of the scheme and any uncertainty it introduces would be offset by the fact that reform builds on existing arrangements and the CfD regime which is familiar to investors.

Hybrid metering

The introduction of hybrid metering through the Government's recent Allocation Round 7 consultation is positive, and it will go a long way to help assets be more responsive to system needs. More work needs to be carried out by government and industry to remove barriers to offshore co-location as the current provisions on hybrid metering do not address co-location barriers specific to offshore wind such as the Offshore Transmission Owners regime.

4. Ensure REMA aligns with other policies

Greater reassurance will need to be provided on how the REMA work interfaces with other reforms being developed at the moment, most notably the Strategic Spatial Energy Plan (SSEP). Industry recognises that some of the elements of REMA have interdependencies with other reforms progressed through different teams in DESNZ, Ofgem or National Grid ESO. However, it is currently unclear how inputs from different working groups and policy teams are coordinated at a strategic level. Investors and asset managers have also pointed that the perception of REMA being looked at in isolation from other reforms is impacting perceptions of the attractiveness of the UK market.

A prime example here is the upcoming SSEP, which is due to be commissioned this month. The development of such a centralised plan would bring into question the effectiveness of a locational signal sent through a zonal market, as location choices will be dictated by the SSEP. We recommend that REMA options which contradict existing reforms and work packages are discounted.

4. What are the major benefits that the UK should be seeking to deliver from energy market reform?

The overall benefits that the Government should be seeking to deliver from the energy market reform are:

- a reduction on reliance on fossil fuels,
- bringing down costs to consumers and
- maintaining security of supply.

These benefits can be realised through an energy market which:

- Delivers a step change in the rate of deployment of low carbon technologies and reduce our dependence on fossil fuelled generation.
- Provides the right signals for flexibility across the system.
- Facilitates consumers to take greater control of their electricity use by rewarding them through improved price signals, whilst ensuring fair outcomes.
- Optimises assets operating at local, regional, and national levels.
- Ensures that the security of the system can be always maintained.

5. What are the chief barriers to reform of the energy market and is the Government serious about addressing those?

The Government's market reform is working towards a net zero power system, and therefore assumes a future system with vast quantities of renewable energy and flexibility projects. This assumption is fundamentally flawed unless these projects are built. Therefore, the barriers to deployment and in effect barriers to energy market reform.

The key barriers to deployment are:

- **Grid** - as mentioned before, the lack of necessary grid infrastructure will impede the transition to a decarbonised energy system and benefits of any reform to the energy market. The Government has committed to tackling this issue through its *Transmission Acceleration Plan* and must ensure that it is seen through in collaboration with industry.
- **Investor confidence** is at risk, not just because of the potential REMA changes mentioned above such as zonal pricing, but also due to concerns over legacy arrangements for existing generation such as potential breaching of grandfathering principles.

- **CfD rounds not maximising procurement**- The Government should seek to set CfD round parameters to maximise procurement in renewable energy projects. Following Allocation Round 5 in 2023, where the parameters were set so that no offshore wind was procured, Government has listened to industry and adjusted the Administrative Strike Prices for the next Allocation Round (AR6), however it must increase the budget to ensure that the AR6 maximises investment in renewable energy projects.
- **Visibility of future procurement** - the Government's CfD rounds also do not provide indicative volumes that the Government aims to procure, but rather relies on the market to determine the volume procured. This is despite needing to procure around 5GW of offshore wind per year to meet the current Government's 2030 target. Visibility of pipelines would not only provide confidence to investors, but will support infrastructure and supply chain investment and skills development, for example current targets have allowed the UK to assess its port facilities and determine that they require upgrades to service the demand up to 2030. Visibility of pipelines also ensure renewable energy is better integrated into the energy system, allowing planning for grid infrastructure. The Government should provide more visibility for industry by outlining future indicative budgets and capacity targets for allocation rounds up to 2030.
- **Co-location** - There are several policy barriers which need to be addressed if the Government seeks to unlock the full flexibility potential from co-locating projects. These barriers and the recommended action to be taken by Government are outlined in our new report which will be released at the end of this month. First and foremost, a consistent definition of co-location and hybridisation needs to be applied as we develop policies across network planning, network codes, system operability and market arrangements. It is helpful to have a clear definition of what a hybrid installation is so that that from high level regulation to lower level, covering permitting and connection to the grid is adapted. We outline all our recommendations for encouraging co-location of onshore technologies in a report which will be released at the end of April 2024.

6. Is it possible to ensure that consumers are insulated from market failures in the energy sector?

The CfD scheme has been successful at protecting consumers from significant increases in electricity prices, as seen during the energy crisis in 2022 due to Russia's war on Ukraine. Even prior to the gas crisis, renewables had already saved consumers over £6.1 billion on their bills (equivalent to £221 per household) in 2021 by displacing gas.⁶ Renewables helped the UK avoid the need to buy nearly £12.5 billion of gas in 2022.⁷ Maintaining the CfD and reforming it will ensure that consumers continue are protected from fossil fuels price volatility.

The evolutionary reforms outlined above will help mitigate operations distortions we may see in the energy market. However, building grid transmission infrastructure is also necessary to reduce curtailment costs and to ensure that any market distortion impacts are avoided as much as possible.

Furthermore, both consumer protection and net zero are now part of Ofgem's remit, so Ofgem is able to drive better alignment between the two objectives and ensure we take early action to prevent market failures that then get added to consumer bills. For example, now that Ofgem is able to support anticipatory investment in grid infrastructure, curtailment costs will be reduced, which will have positive impacts on bills.

April 2024

⁶ [Renewed Importance: How Renewables Cut Energy Bills \(ukonward.com\)](https://www.ukonward.com/news/renewed-importance-how-renewables-cut-energy-bills)

⁷ [Analysis: Why UK energy bills are soaring to record highs – and how to cut them - Carbon Brief](https://www.carbonbrief.org/analysis-why-uk-energy-bills-are-soaring-to-record-highs-and-how-to-cut-them)