REA Response:
Public Accounts Committee Inquiry – Decarbonising the Power Sector

The Association for Renewable Energy & Clean Technology (REA) is pleased to submit this response to the above Select Committee Inquiry. The REA represents renewable electricity, heat and transport, as well as Electric Vehicle charging infrastructure, Energy Storage and circular economy companies. Members encompass a wide variety of organisations, including generators, project developers, fuel and power suppliers, investors, equipment producers and service providers. Members range in size from major multinationals to sole traders. There are around 550 corporate members of the REA, making it the largest renewable energy and clean technology trade association in the UK.

The Chief Executive of the REA, Dr Nina Skorupska CBE, would welcome the opportunity to provide oral evidence to this inquiry.

Summary

As has been identified by both the NAO, and most recently the Climate Change Committee (CCC), both the Government's Net Zero strategy and the British Energy Security Strategy are currently inadequate and will not deliver a secure, affordable, or decarbonised energy system in line with our net zero ambitions.

As emphasised by the NAO, while these strategies establish some good ambitions and targets, they severely lack the policies to address the key barriers to the deployment or deliver the cheapest forms of generation. Without these policies, the 'delivery plan', recommended by the NAO, cannot be realised.

Government must now address these barriers head-on, with dedicated policies that can be introduced urgently to deliver a decarbonised power system. In response to this inquiry, the REA highlights some of these barriers while suggesting key solutions that should be considered by the committee. These barriers are divided into the following four areas for action:

1. Reinforcing the UK power grid, so that new generation and storage can connect quickly.
2. Overhaul the planning and permitting systems, so that low carbon generation is appropriately prioritised and ensure applications are reviewed promptly.
3. Provide routes to market for strategically important innovative technologies, including long-duration energy storage, hydrogen production and bioenergy carbon capture and storage.
4. Ensure an attractive investment environment in the UK, for both building new and repowering existing low-carbon assets.

The CCC, within their "Delivering a Reliable Decarbonised Power System" [1] the report, also emphasises that a wide range of low-carbon technologies, including low-carbon flexible solutions, will be required to realise a decarbonised power system. Therefore, in section 5 of this response, the REA provide an overview of some of these technologies and the key barriers to their deployment.

[1] https://www.theccc.org.uk/publication/delivering-a-reliable-decarbonised-power-system/

1) **Reinforcing the UK power grid, so that new generation and storage can connect quickly.**

One of the largest barriers to the deployment of low-carbon generation and energy storage systems is the lack of available capacity on the UK power grid system, restricting the number of new connections for low-carbon generation. This applies both to the distribution and transmission grids, where a lack of historic investment means that the grid system remains designed around large-scale fossil-based generation stations, rather than helping the grid to transition to a system that supports lots of smaller decentralised and flexible generation units. This situation will only get tighter as demand is expected to double with the electrification of the UK's power and transport systems.

This has led to members reporting estimated connection dates of up to nearly 15 years. For example, a Southwest England geothermal development has been quoted a December 2036 energisation date, and a London energy storage project a 2037 connection date. This is the case around the country for projects of all sizes and scales. This creates a development market that is impossible to invest in and develop in. The notion that a generation site, which may only take 3-4 years to build out, won't be able to generate and export to the grid for over a decade, quickly undermines a project's business case.

The REA recognise that there are several workstreams underway across the Transmission Network Operator (National Grid ESO), The Electricity Networks Association (ENA) (representing Distribution network operators) and Ofgem to improve this situation. However, progress is slow and could be significantly sped up with both dedicated government funding and independent direction from a body such as the Future System Operator.

Below we outline key actions to address capacity constraints:

- Review the queue management protocols of both the TNO and DNO connection systems so that projects currently holding capacity agreements are actively being built out, while now defunct projects, still holding connection agreements, are removed from the queue.
- Prioritise energy storage and flexibility assets within the connections queue, these could help maximise the efficiency of our current grid systems, reducing the level of reinforcement required.
- Pass the Energy Security Bill as a matter of urgency so that the Future System Operator can be established and quickly become an independent director for how the TNO and DNOs should be developed.
- Prioritise funding and allow greater levels of investment amongst the TNOs and DNOs to reinforce the grid systems as quickly as possible.
- Ensure TNO and DNO system charging framework is fit for purposes and enables low carbon generation and storage to be built quickly.

2) **Overhaul the planning and permitting systems, so that low carbon generation is appropriately prioritised and ensure applications are reviewed on time.**

Getting through either the local authority or state planning permission processes also remains a major delaying factor to new developments. For the most part, this is primarily due to the under-resourcing of planning offices, where members report that planning applications can take more then a year to even be looked at, well before any decision is made.

Some of these delays could be addressed through dedicated reviews of the National Planning Policy Frameworks (NPPFs) and Nationally Significant Infrastructure Projects framework. Within these,

appropriate prioritising of the building of low carbon generation and flexibility assets could help speed up planning decisions. It is recognised that such prioritisation must still consider local views and environmental needs, as well as other priority land uses. The government has promised reviews to the NPPF to address these concerns for some time, but detailed reviews have not yet materialised.

Even Government commitments to reversing the effective ban on onshore wind, recently proposed in the Levelling Up Bill, fails to properly address the issue. The amended footnotes, proposed in the recent Levelling up a consultation, seem to continue to promote a default position against onshore wind development in England. This needs to be addressed, given both the government's stated ambitions for net zero and the decarbonisation of the power system by 2035. The planning system should be encouraging onshore wind development where sensible planning processes are considered and the needs of local communities are addressed.

The same delays are also arising around Environmental Permitting, where regulators across the UK seem unable to deal with the number of applications being made or meet sensible timescales for reviewing applications. Members also report that the application of existing permitting guidance can also be widely inconsistent depending on the permitting officer. As a brief illustration, one of our members is a composting operator with two sites operating using the same technology and operating procedures. One of these sites has been given six improvement conditions costing approx. £10K under their permitting application, and the other site in a different area with a different officer, has been given 29 improvement conditions, likely to cost in the region of £250K.

Below we outline key actions to address planning and permitting delays:

- Sufficient funding for relevant environmental regulatory organisations (Such as the EA and SEPA) and local authority planning offices is essential. This will help to meet decision timelines, increase their staff and improve their evidence base and understanding of different technologies.
- Government must urgently do a detailed review of the NPPF to ensure guidance is aligned with net zero ambitions and the rollout of low carbon generation.

3) Provide routes to market for strategically important innovative technologies, including long-duration energy storage, hydrogen production and bioenergy carbon capture and storage.

A full range of technologies will be required to deliver a fully decarbonised power system. There are several technologies of strategic importance, identified by industry, national grid and CCC that, while proven, need direct government support to be delivered at a commercial scale. These include:

Energy Storage, particularly long duration:

As the deployment of variable renewables increases, both low carbon base load generation (like biomass and energy from waste) and a flexible storage asset will need to be built. The government's numbers suggest that around 30GW of total low-carbon flexible capacity will be needed in 2030, and 60GW in 2050, to maintain energy security and cost-effectively integrate high levels of renewable generation technologies.[2]

[2] https://www.gov.uk/government/publications/transitioning-to-a-net-zero-energy-system-smart-systems-and-flexibility-plan-2021

The system will need a wide range of storage assets able to deliver flexibility at different timescales, from short to long durations. This is everything from a couple of hours discharging energy, to being able to store potential energy between seasons.

Short-duration storage is already being provided by lithium batteries, although this also needs to be deployed faster, especially within homes with low carbon onsite generation, such as solar panels. Batteries can help reduce household bills by enabling households to store energy produced during the day and use it when demand is highest at night.

Longer Duration Energy Storage technologies must now also be prioritised and provided a viable route to market. There is a range of different storage technologies that provide different storage timescales and services to the energy grid. This includes thermal storage, hydrogen (from electrolysis or bioenergy pathways), pumped storage, compressed air and liquid air storage, as well smart response. Delivery of these technologies will require both specific government support and the development of a flexible market.

To address barriers to the market for storage:

- Government should add energy storage to the Energy Savings Materials List. This will allow standalone storage units to be zero-rated for VAT, as is the case already for solar and low-carbon heating systems in people's homes. This will incentivise the installation of the home's energy storage systems.
- Government should introduce a Cap and Floor support mechanism that enables the delivery of long duration energy storage system. Such a scheme would help deliver predictable revenue for such projects, de-risking their deployment and providing time for the development of such business models.
- Prioritise the development of deep and transparent flexibility markets, that appropriately reward assets for services they provide to the grid.
- Reform the CfD, wholesale market and capacity markets to better incentivise co-location with storage.

Bioenergy Carbon Capture and Storage

Bioenergy with carbon capture and storage (BECCS), which uses waste or biomass feedstocks, is unique in its ability to deliver both renewable energy and negative emissions. By capturing CO2 and permanently storing it, BECCS creates a ‘carbon conveyor belt’, tapping into the natural carbon cycle to remove carbon dioxide from the atmosphere permanently.

The world’s leading authorities on climate change are clear on the need for negative emissions. The UN IPCC said in its most recent report that carbon dioxide removal techniques (such as BECCS) are “unavoidable” if we are to achieve net zero emissions. In the UK’s Net Zero Strategy, BECCS provides the single largest source of negative emissions required to offset residual emissions in 2050. BECCS plays a similarly important role in the CCC’s Sixth Carbon Budget and National Grid’s Future Energy Scenarios.

As Chris Skidmore's independent review of Net Zero made clear, the policy must also consider the cost of "Not Zero". Attempting to deliver Net Zero without BECCS will not only be far more challenging but also significantly more expensive.

The government have been developing support-based business models for Power BECCS and has started the initial allocation processes through the Industrial Cluster Sequencing process. However, progress is slow, stopping investors from getting directly involved in the sector. Initial allocation

processes have been restricted to only the largest-scale BECCS projects, ignoring the wide range of medium to small-scale biomass power plants that could also install BECCS if given the route to market.

To address these barriers government should:

- Urgently announce the intended design for the Power BECCS Business Model.
- Urgently announce the results of Track-1 of the cluster sequencing process.
- Establish the timeline for the next cluster sequencing allocation rounds and ensure these are open to all sizes of BECCS projects, especially those below 100 MW which are currently excluded.
- Government must urgently publish their Biomass Strategy which has now been delayed, establishing how they wish to take the Biomass sector forward.

Hydrogen Production

Hydrogen is expected to have several roles within a decarbonised power sector, as well as within other areas of the overall energy system.

Within power production, hydrogen is particularly well suited to the delivery of flexibility both in terms of using generation from low carbon sources, when demand is low. to produce hydrogen via electrolysis and then storing that hydrogen to be used in electricity production, when demand is high. This provides options for long-duration storage, out to the interseasonal scale, being able to make the most of our renewable sources in the UK.

Hydrogen may also have a role in industrial Combined Heat and Power sites, where hydrogen is used to displace oil or natural gas-based heat production.

To date the government has produced both a Low Carbon Hydrogen Standard and a Hydrogen Business Model however, again, progress has been slow. The Hydrogen Business Model has, so far, only been focused on electrolysis production pathways. Bio-based alternative pathways must also be promoted within the business model.

To address these barriers government should:

- Finalise the Hydrogen Business Model as a matter of urgency.
- Ensure the Hydrogen Business Model also provides a route to the market for bio-based alternative pathways, not just electrolysis pathways.
- Electrolysers should be given access to cheaper renewable electricity. Decoupling wholesale gas and electricity price via the upcoming review of electricity market arrangements.
- Lifting environmental levies and network charges from the retail price of electricity.
- Fast-track the development of transport and storage infrastructure to ensure it is ready to play its role in the power sector.

4) Ensure an attractive investment environment in the UK, for both building new and repowering existing assets.

Over the last six months, the investment environment for renewables has weakened, with investors putting decisions on hold. There are several reasons for this, including the political uncertainty the country has experienced and an increasingly competitive international investment environment, especially given the attractiveness of the US Inflation Reduction Act and EU Clean Energy Package.

Recent Government interventions are also now actively disincentivising renewable and clean technology investment. The REA fully recognises the role the industry must play in helping to address the energy crisis down and recognise that the new Electricity Generators Levy is needed to help bring costs down for consumers. However, the levy is poorly designed and is currently exacerbating the issues seen in the UK investment market.

To address this Government must:

- Reform to the Capital Allowances regime for renewable and clean technology deployment. This would incentivise investment in new renewable and clean technologies through a tax break, even as the EGL comes into force. Importantly it would also mirror the Investment incentive provided to the Oil and Gas sector within the Energy Profits Levy, which inexplicably has not been provided to the renewables sector.

- Shorten the period that the EGL will be in place. The government is currently intending for the levy to be in place until 2028. This is too long and will impact the market well beyond the period of the current energy crisis. To mitigate the impact of the EGL on future investment decisions the EGL should be legislated to end in 2026 at the latest.

In addition, Government must urgently address the fact that existing low-carbon assets will shortly be coming to the end of their existing support contracts. Renewable power generation built out under the Renewable Obligation will start to come to the end of their contracts in 2027. The RO supports over 26,500 accredited assets, that account for over 35 GW of total capacity.[3] If the UK is to meet its net zero ambitions, it must ensure these generating assets are maintained, with options provided for them to repower these sites. This does not mean providing them with new subsidies but providing routes to market that de-risk the next stage of investment. There are several options for achieving this:

- Create a Repowering, or Voluntary, CfD whereby assets can contract at a guaranteed price for their generation for 10 to 15 years. This price could be below today's wholesale price but will provide longer-term certainty for new investments.
- Ensure relevant assets that have the innovation potential are supported in doing so. For bioenergy sites, this could mean access to bioenergy carbon capture and storage or hydrogen business models. For wind or solar sites, this could be enabling them to invest in co-located storage technologies.
- Introduce low capex multi-year contracts into the capacity market to enable such sites to participate. This would both secure the existing capacity and reward them for continuing to generate.

[3] https://www.ofgem.gov.uk/publications/renewables-obligation-ro-annual-report-2020-21

5) Overview of specific Low Carbon Generation Technologies and Current Barriers to Deployment

Role in decarbonisation	Barriers to deployment	Solutions
Solar PV		
Low-cost predictable renewable generation. Within a balanced net zero pathway, the CCC suggest that solar generation will need to increase from 10 TWh in 2019 to 60 TWh by 2035. [1]	- Securing an affordable grid connection in good time, due to grid capacity constraints. In some cases, getting a new connection can take many years. - Delays in receiving planning permission.	DNOs and National Grid ESO to prioritise grid reinforcement work and better manage application queues, removing applicants with connections that aren't being used. Review planning procedures to streamline renewable energy planning applications.
Wind		
Both onshore and offshore wind provides some of the cheapest forms of energy generation. Within a balanced net zero pathway, the wind is expected to make the largest contribution to renewable generation. [1]	Limited route to market as CfD auctions only take place annually and no timetable for future auctions. For onshore wind, like solar, both delays in getting grid connections and planning permission remain the largest barrier to deployment.	Move to six-monthly auctions for CfDs, with a clear timetable for future auctions allowing developers to plan. Remove planning barriers to new onshore wind developments. As with solar, review grid connection and planning permission processes.
Energy Storage		
Net Zero and energy security cannot be achieved cost-effectively without increases in storage capacity. Research from the Carbon Trust and Imperial College London suggest that a	Developers struggle to secure investment because revenues are too volatile or uncertain. This is particularly true for large and longer-duration projects that require large capital investment or novel technologies.	Introduce a cap and floor mechanism to encourage investment in long-duration storage. Add energy storage to the Energy Saving Materials list, therefore exempting it from VAT.

fully flexible energy system could cut the cost of reaching net zero by up to £16.7bn a year. [2]	New projects are often short-duration storage as this is incentivised by the Wholesale and Capacity markets. [3] Domestic storage is charged at 20% VAT, making it an unattractive prospect.	Reform the CfD, Wholesale and Capacity Markets to better incentivise co-location with storage. See REA long-duration energy storage report for more information [3].
Hydrogen		
Renewable hydrogen will play a critical role in balancing a renewables-based electricity system, along with other energy storage solutions, by transforming renewable electricity into hydrogen when renewable electricity is abundant and cheap, storing it and dispatching it at the time it is needed. This includes providing long-duration seasonal storage. It can also be used for daily storage, as a backup and provide buffering functions and grid balancing.	High running costs of electrolysers Lack of route to market for bio-based alternative hydrogen production pathways. Lack of a flexibility market that appropriately rewards long-duration energy storage.	Electrolysers should be given access to cheaper renewable electricity. Decoupling wholesale gas and electricity price via the upcoming electricity market reforms. Lifting environmental levies and network charges from the retail price of electricity. Develop a long-duration energy storage support mechanism for all relevant technologies, including hydrogen.
Biomass		
Biomass power, operating in line with strict sustainability governance, is the second largest producer of low-carbon power in the UK. Biomass also provides firm, dispatchable power which complements the further deployment of variable renewable generation like solar and wind.	The majority of current biomass power assets were deployed under the Renewables Obligation. These contracts start to come to an end in 2027. At present, there is a lack of certainty on the future of projects as the government must indicate that they will maintain the current generation infrastructure. By 2030 most biomass sites will also be looking to install bioenergy carbon, capture and storage technology (BECCS), critical for the delivery of negative emissions.	Government must use the development of the Biomass Strategy, to be published later in 2022 to provide confidence to the sector that existing sites will continue to be needed. The government needs to expedite work on the development of appropriate BECCS business models to see the technology delivered across a range of sites.

Landfill Gas (LFG)		
The industry currently supplies 3 TWh of baseload electricity per year and reduces methane emissions by more than 17 million t/CO2-e per year, over 4% of the UK's total net emissions. While this will inevitably decline as landfills close, significant quantities of electricity and methane abatement can continue to be generated from the remaining gas on landfill sites up until, and beyond, 2035.	LFG power stations require investment to continue to operate. They also face higher future regulatory costs. Under present policies, most generating sites lose support in 2027 and continued generation will not be viable without it.	Government must confirm in the near term that the existing policies that support production will continue across the full period or that steps will be taken to develop suitable replacements. Develop routes to market for repowering these sites, this could be through the CfD or Capacity Market.
Energy From Waste (EfW)		
EfW provides firm dispatchable power, complementing the deployment of variable renewables, while also providing a waste treatment sanitation service. It also provides a pathway to negative emissions, when combined with carbon capture and storage.	EfW requires support to enable the retrofit of carbon capture technology, providing a pathway to negative emissions. Currently a lack of focus on the delivery of advanced conversion technologies, such as gasification and pyrolysis. These enable even more efficient power production and a route to the delivery of renewable products such as aviation fuels, hydrogen and green chemicals that are essential to decarbonising hard-to-treat sectors.	The government is currently developing an Industrial Carbon Capture Contract that will help EfW sites. This will quickly need to be broadened out to support a wide range of EfW projects outside of industrial clusters. Six monthly CfD auctions will support the development of supply chains and deployment.
Anaerobic Digestion		
According to the REA's ReVIEW 2021, power generation through anaerobic digestion (AD) has continued to see steady growth, with a rise of 4% between 2018 and 2019. The publication reported that growth rates were relatively consistent for the last three years, and it was expected that annual generation would surpass 3,000 GWh in 2020.	From the early 2030s, many assets will run out of subsidies for the renewable electricity they generate, such as Renewables Obligations and Feed-in Tariffs. There is a risk that once this happens some or most of these plants will cease to operate and be decommissioned, and this could potentially result in a drop in renewable and dispatchable power generation from these plants.	Government must plan and think about whether these projects may need support beyond the current subsidy regime to continue to operate and help decarbonise our power system. Fixed-term Smart Export Guarantee (SEG) contracts for new power-led projects, and new support for renewable

		heat projects/an increase in caps on new plants in the Green Gas Support Scheme (GGSS). -

[1] CCC (2020) Sixth Carbon Budget

[2] Carbon Trust (2021) “Ground-breaking analysis reveals a fully flexible energy system could cut the cost of reaching net zero by up to £16.7bn a year in 2050” <https://www.carbontrust.com/news-andevents/news/groundbreaking-analysis-reveals-a-fully-flexible-energy-system-could-cut-the>

[3] REA (2021) Longer Duration Energy Storage Report < https://www.r-e-a.net/resources/rea-longer-duration-energy-storage-report/#:~:text=REA%20Longer%2DDuration%20Energy%20Storage%20Report%20%2D%20REA&text=REA%20has%20published%20a%20report,energy%20storage%20in%20the%20UK.>

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