REA Response to the Energy Security and Net Zero Select Committee: 'Keeping the power on: our future energy technology mix'

The Association for Renewable Energy & Clean Technologies (REA) is pleased to submit this response. The REA represents industry stakeholders from across the sector and includes dedicated member forums focused on solar, energy storage, green gas & hydrogen, biomass power, and energy from waste (including advanced conversion technologies). Our members include generators, project developers, heat suppliers, investors, equipment producers and service providers. Members range in size from major multinationals to sole traders. There are over 500 corporate members of the REA, making it the largest renewable energy trade association in the UK.

Renewables and clean technologies provide some of the cheapest forms of energy while providing a secure domestic energy supply. The REA's representation of companies across the renewable and clean technology sector gives us a unique vantage point to examine how the energy mix of the UK needs to change shortly and what technologies could deliver a national capability to keep the power on while delivering against net-zero targets.

Given the range of organisations the REA represents and our expertise, Dr Nina Skorupska CBE (REA Chief Executive) or an REA policy expert would be happy to provide oral evidence to the committee during the inquiry.

1. Is the energy sector open enough to new-generation technology?

The REA has previously welcomed the Government's target of having a completely decarbonised power system by 2035, as laid out in the 2022 Energy Security Strategy and 2023 Powering Up Britain plan. In addition, we commend the establishment of the government-industry Solar Taskforce to produce a roadmap to developing 70GW capacity of solar by 2035, and for the publication of the long-awaited Biomass Strategy that confirms an ongoing critical role for bioenergy in meeting net zero.

However, overall, there remains a substantial need for firm policies to deliver these stated ambitions. The Government still needs to provide clearer routes to market for both new generation technologies, as well as ensure the UK maintains the existing low carbon generation capacity, if the UK is to successfully deliver a secure, affordable, and low carbon energy system. Below we highlight several key policy gaps that need to be addressed to deliver the level of low carbon generation required:

- ***A rolling timetable for future CfD rounds, with dedicated budgets for both established and less established technologies.*** It is positive that the government has committed to annual CfD auctions, however, there remains no firm timetable or committed budget for these auctions, making it difficult for developers to plan. A rolling schedule of allocation rounds would help this. In addition, while the Government recently announced that the budget for Allocation Round 5 (AR5) of the CfD scheme has been increased by £22 million,

only £2 million of this increase will be allocated to emerging technologies. The CfD scheme has been a success in attracting investment for renewable deployment, driving down costs and enhancing energy security. To replicate the lessons of the CfD scheme, which has shown that, when adequately supported, new renewable technologies can provide large amounts of electricity at an increasingly cheap cost, the less established technology pot requires a greater allocation of funding.

- ***Government must now deliver a support mechanism for the deployment of Long Duration Energy Storage.*** Government strategies recognise the critical importance of long-duration energy storage needed to maintain energy security and cost-effectively integrate high levels of low-carbon generation. The government has committed to delivering such a mechanism by 2024 but has yet to confirm its intentions or consult on the scheme design. [1] Industry is very concerned by this delay.

- ***Grid Capacity constraints and planning delays must be urgently addressed:*** More urgent than funding is addressing the real market barriers and ensuring a wholesale market that properly values low carbon generation. Chief amongst these barriers is getting to grips with our power grid infrastructure and planning systems. The REA continues to regularly hear of planning applications that take more than 12 months to be looked at and grid connection dates that are more than 10 years away. Such delays are simply untenable with a 2035 net zero power system target. We encourage the committee to review the REA's response to their 'Flexible Grid for the Future' inquiry' for further information on this.

- ***Routes to Market for Bioenergy Carbon Capture and Storage must be finalised as soon as possible:*** The REA also welcomes the Government's recent commitment to carbon capture and storage, and the ongoing workstreams to develop relevant business models, but there is an urgent need to go further in the next few months. Ministers must provide workable routes to market for "negative emissions" made possible by combining bioenergy with carbon capture and storage (BECCS). This proven technology removes carbon dioxide from the atmosphere while also delivering low-carbon electricity. Government should act now to make it possible to deliver BECCS at all scales.

- **The government should introduce Capital Allowances for Low Carbon Generation investment to address the impact of the Electricity Generator Levy.** The government has pushed ahead with the introduction of the Electricity Generator Levy, a windfall tax on 'excess profits' from low carbon generation. The renewables industry supports and recognises the need to contribute to addressing the energy crisis, however, the government

have consistently ignored calls for the introduction an investment allowances as part of the levy so that new investments are not disincentivised. Such an investment allowance exists within the equivalent Energy Profits Levy, that applies to the oil and gas sector. The committee should call on the government to address this disparity by introducing capital allowances for low carbon generation investments within the Autumn Statement.

- ***The government must also ensure that existing low-carbon generation sites are not lost at the end of their current contract arrangements:*** It is also worth reiterating the importance of maintaining existing generation assets through repowering to ensure that the Government does not no go backwards in its ambitions. Existing assets that have been supported by the Renewable Obligation to date will start to come to the end of their existing contractual arrangements in 2027. This includes a range of generation assets such as solar, wind and bioenergy (including landfill gas) sites. The government must confirm the intention to ensure that such sites continue to generate or risk losing much-needed existing low-carbon capacity. The REA was encouraged by the Government's consultation on repowering assets through the CfD scheme and would like to highlight that the Government should respond to this consultation as soon as it is feasible.

2. Does the Government sufficiently support the development of innovative energy infrastructure?

The Government does currently have work streams for developing business models for innovative energy infrastructure, including for hydrogen production (which is likely to be used for storage and generation on the power system) and Power Bioenergy Carbon Capture and Storage (Power BECCS). These business models must be finalised as a matter of urgency so that final financial commitments can be made. The current slow progress in these developments is seeing investment diverted abroad as financiers are attracted by support mechanisms like the US Inflation Reduction Act. The REA would like to reiterate the importance of parliament passing the current Energy Bill, which has been much delayed and includes the provision of powers for the Secretary of State to establish the business models and see these innovative technologies delivered.

3. Is the Government's plan for energy security sufficiently long-term?

The Government's plan for energy security ambitions appears sufficiently long-term, but as previously stated in question 1, there needs to be more clarity on the policy steps that the Government plans to take to see these ambitions delivered.

These ambitions are also undermined by confusing messages coming from a government that could undermine energy security ambitions. Firstly, addressing the impact of the Electricity Generator Levy by introducing Investment Allowances (as described above), would ensure an attractive investor market. Secondly, the

government's intention to issue new oil and gas exploration licences for the North Sea has brought into question the Government's commitment to net zero and damaged investor confidence. Such a move ensures continued exposure to volatile international fossil fuel markets, making the industry question whether the Government's strategy is a sensible pathway to energy security and lower costs.

4. What current technologies could usefully be deployed at scale to deliver better energy security in the UK?

There will not be any one renewable and clean technology that can deliver a decentralised and decarbonised energy system by itself. Instead, the UK will need a wide mix of renewable and low-carbon technologies to deliver energy security, creating a power system that maximises variable renewable generation from solar and wind, while also delivering the benefits of firm power from technologies like biomass and geothermal, plus storage technologies.

Please see the list of technologies below, with accompanying barriers to deployment and potential solutions, that could be usefully deployed to deliver better energy security:

Role in decarbonisation	Barriers to deployment	Solutions
Solar		
Low-cost predictable renewable generation. The Government's ambition is to achieve 70GW of solar capacity by 2035.	Securing an affordable grid connection in good time, due to grid capacity constraints. In some cases, developers have received connection dates of over ten years. Significant delays in receiving planning permission. Lack of Government-backed grants and loans for residential rooftop solar. Ensuring that the workforce is adequately resourced and skilled to respond to the increased demand for solar.	The ENA and National Grid ESO's connection reform plans to be carried out to better manage application queues, removing applicants with connections that aren't being used, and further prioritisation of grid reinforcement work Review Energy National Policy Statement (NPS) procedures to streamline renewable energy planning decisions. Publish a timetable for future Allocation Rounds of the Contract for Difference scheme.
Wind		
Both onshore and offshore wind provide some of the cheapest forms of energy generation. Within a balanced net zero pathway, wind is expected to make the largest contribution to renewable generation. The government has a target of 50 GW of Offshore wind by 2030.	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 barriers to deployment. Planning rules mean that onshore wind is *de facto* banned in England.	Publish a clear timetable for future auctions allowing developers to plan. 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 suggests that a fully flexible energy system could cut the cost of reaching net zero by up to £16.7bn a year. [2]	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. New projects are often short-duration storage as this is incentivised by the Wholesale and Capacity markets. Standalone installations of domestic storage devices are charged at 20% VAT, despite other energy-saving materials being zero-rated.	Introduce a Cap and Floor support mechanism to encourage investment in long-duration storage. Add energy storage to the Energy Saving Materials list, therefore exempting it from VAT. Reform the CfD, Wholesale and Capacity Markets to better incentivise co-location with storage.
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 a flexibility market that appropriately rewards long-duration energy storage. Bio-hydrogen production pathways are not currently being awarded under the Low Carbon Hydrogen Business Model, despite being eligible.	Electrolysers should be given access to cheaper renewable electricity. Ensuring the use of excess generation is incentivised through the Review of Electricity Market Arrangements (REMA) Lifting environmental levies and network charges from the retail price of electricity. Ensure biohydrogen pathways are supported in the Low Carbon Hydrogen Business Model.
Biomass		
Biomass power, operating in line with strict sustainability governance, is the second	The majority of current biomass power assets were deployed under the Renewables Obligation. These	The government needs to expedite work on the development of appropriate BECCS

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. Most recently, the Government have confirmed an ongoing role for Bioenergy, especially when combined with carbon capture and storage, within the Biomass Strategy.	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.	business models to see the technology delivered across a range of sites. This includes urgently finalising the Power BECCS business model. A bridging mechanism is required to ensure generation is maintained between 2027 and when BECCS business models become available. This could be done through a repowering CfD.
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.	The 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. Proposals for a Repowering CfD would be effective in this case.
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. 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	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 carbon capture clusters. .

	aviation fuels, hydrogen and green chemicals that are essential to decarbonising hard-to-treat sectors.	
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. [3]	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 of renewable and dispatchable power generation from these plants.	The government must plan to maintain the existing generation capacity. Fixed term 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).
Geothermal		
There is significant potential in areas such as Cornwall, Devon and Cumbria to utilise geothermal heat for power production. This is estimated to be 222 GWe (GW electricity) at depths of up to 6.5km depth and 2,280 MWe (MW electricity) at 4.5km depth. This could provide a significant amount of baseload capacity for a decarbonised power grid. [4]	There is currently no accessible route to market for realising Geothermal projects in the UK despite the potential it has for decarbonising both the power and heat sectors.	Ringfencing a budget for Geothermal Power production with the next CfD Allocation Rounds would ensure the delivery of the first few geothermal power projects in the UK. A separate Geothermal Development Incentive should be explored to support both heat and power decarbonisation.

5. Are there technologies that have not been able to develop their potential and should be abandoned?

The REA does not intend to answer this question.

6. What energy generation mix will get us to net zero the quickest in the most affordable way?

The UK must use the full range of available renewable and clean technologies to take us to net zero. A decentralised energy system will require both variable renewable generation like wind and solar, along with baseload generation coming from biomass,

and geothermal technologies. In addition, energy storage, especially Long Duration Storage Technologies must be deployed to help balance the grid. The Government should continue to support the Contracts for Difference scheme to provide a stable long-term deployment route for technologies and, in turn, reduce prices by securing economies of scale.

Through this scheme, the market can determine which technologies are deployed. There is a case for supporting emerging technologies, such as geothermal and BECCS, due to their wider UK supply chain and industrial strategy benefits. The full range of bioenergy technologies should not be overlooked as these technologies can be cost-effective compared to many alternatives. For example, BECCS could be developed at existing sites delivering both negative emissions and electricity production.

7. Are the energy solutions universal across the UK or are there regional and local approaches to fuel and energy?

There is no 'one size fits all' national approach and deployment can, and should, differ regionally. Both the Climate Change Committee and the National Grid ESO's Future Energy Scenarios have made clear that different energy mixes will be required in different regions, including storage along with generation. These analyses match the conclusion of the latest version of our annual statistical report, REview22. [3]

Our report indicates that much of the renewable and clean technology industry is weighted towards London and the Southeast, which reflects a trend across the economy. However, our modelling shows that consistent and proactive support from the Government – for example, more use of Supply Chain Plans – could see future jobs and investment distributed more equally across every region and nation of the UK.[3]

For example, Scotland and Wales have great potential for onshore wind while Humberside's historical industrial infrastructure can benefit the development of BECCS and hydrogen. Geothermal is another technology that is variable by region. Although it cannot be deployed nationwide, it can be very effective in heat networks and has a range of uses.

Infrastructure also has an impact on the viability of certain technologies within a region. There are current disparities around grid availability and capacity, which will limit options. Local planning bodies will need to be able to consider what is best for their area, which includes making the most of local biomass, or other natural resources, if available.

This regional variability is another reason for continuing to support a neutral market-wide route to market through the CfD mechanism. Increasing the frequency of bidding opportunities will drive deployment across all regions rather than focussing on one or two technologies and therefore benefitting particular regions.

References

[1] DES NZ (2022) Facilitating the deployment of large-scale and long-duration electricity storage: call for evidence, https://www.gov.uk/government/consultations/facilitating-the-deployment-of-large-scale-and-long-duration-electricity-storage-call-for-evidence

[2] Carbon Trust (2021) Groundbreaking 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-and-insights/news/groundbreaking-analysis-reveals-a-fully-flexible-energy-system-could-cut-the-cost-of-reaching-net-zero-by-up-to-ps167bn-a-year-in-2050

[3] REA (2022) REview22, https://www.r-e-a.net/wp-content/uploads/2022/11/REview_9.11.22_FINAL1.pdf

[4] REA and Arup (2022) Government urged to help deliver a 'world leading' deep geothermal sector to secure the UK's 'green recovery' https://www.r-e-a.net/government-urged-to-help-deliver-a-world-leading-deep-geothermal-sector-to-secure-the-uks-green-recovery/