REA Response: BEIS Committee Call for Evidence: 'Decarbonisation of the Power Sector'

The Association for Renewable Energy & Clean Technology (REA) is pleased to submit this response to the above consultation. 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, Nina Skorupska, would welcome the opportunity to provide oral evidence to this inquiry.

Summary

The British Energy Security Strategy was wholly inadequate and will not help deliver an energy system which is independent, secure, or stable. By locking the country into more expensive, longer to build, non-renewable power sources, the government failed to rise to the challenge facing the country. These concerns have only grown over recent weeks as the government has offered scant support for consumers in the face of rising bills.

The strategy should have helped people quickly transition away from fossil fuels and onto renewables, as well as reducing heat demand through better insulation. While the strategy needed to outline a long-term plan for an independent, secure, and flexible energy system, it should have also turbocharged support for renewable technologies which can meet the challenges of today. Ultimately, it did not succeed on either front, and the failure to invest in energy efficiency measures will condemn people to continued financial hardship for the foreseeable future.

The REA have set out a range of policy proposals below that must now be undertaken by the government. These include long-term measures such as the need to commit to strong, clear deployment targets for solar and onshore wind, but also measures that will make an immediate impact such as an expansion of the Energy Company Obligation Scheme. Between the Climate Change Committee report released this week which emphasised that current plans are not sufficient to meet Net Zero targets, and the current energy bill crisis facing consumers, it is clear that the BESS is insufficient, and the government must take immediate action.

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1. **Is the proposed future electricity mix, as announced in the Energy Security Strategy, the most efficient and cost-effective way to deliver power sector decarbonisation by 2035? Are there any further policy details and/or legislation required by the end of this Parliament to achieve these goals?**

Renewable, short-term measures

While the REA welcomed the government's ambitions regarding solar, hydrogen and offshore wind in the British Energy Security Strategy (BESS), we believe the strategy largely failed to go far enough in terms of delivering energy security or decarbonisation within the required time frames. The BESS failed to commit to strong immediate renewable deployment targets, even for solar and wind; while it ignored the important role that a wide range of other low carbon technologies, such as bioenergy or energy storage, will play in delivering energy security. Rather, the strategy focuses on more expensive, longer to build, non-renewable power sources, which present their own energy security concerns.

The BESS should have made stronger commitments towards the immediate deployment of renewables, recognising that they represent the most affordable and fastest to deploy forms of generation, able to deliver energy security in the near term. This involves the rapid deployment of a wide range of renewable energy and clean technology solutions.

The strategy should have aimed to replicate the lessons of the offshore wind sector, which has shown that, when adequately supported, renewable technologies can provide large amounts of electricity at an increasingly cheap cost. For example, In 2018, Offshore Wind cost £120/MWh while new installations forecast a cost of £58/MWh (5.8p/kWh) in 2022.[1]

Key policy required include:

- BEIS should introduce sixth monthly Contracts for Difference allocation rounds, with a clear rolling timetable and sufficient budget to see deployment of the levels of renewable capacity needed to meet Government targets of a fully decarbonise the power system by 2035.
- Prioritise the review of transmission and distribution grid capacity constraints to allow renewable projects to connect to the grid faster
- Department for Levelling Up should review planning permission processes to expedite and favour decisions on renewable developments.
- BEIS should immediately commit to strong, clear deployment targets on solar and wind, not just "ambitions to deploy".
- BEIS should introduce a Long Duration Energy Storage Cap and Floor Support Mechanism, along with support for hydrogen storage, to help deliver a flexible low carbon grid.

[1] Business Electricity Prices, < https://www.businesselectricityprices.org.uk/wind-turbine-facts/>

- The Government's upcoming Biomass Strategy must support existing biomass power infrastructure and enable the retrofitting of bioenergy carbon capture and storage (BECCS).
- Reform the Smart Export Guarantee (SEG) to provide fixed term contracts and therefore enable small scale projects to be built using debt finance.
- Provide a £200m increase in the Energy Company Obligation home energy efficiency scheme to help reduce energy demand and help thousands of households save around £600 a year on their energy bills.

Support for consumers

The government must provide better support to consumers during the transition. In order to mitigate the impact on cost-of-living, government should move most green support costs on to taxation, and off energy bills, as this would be a more progressive system.

2. Beyond current Government ambitions, how else can energy demand be reduced and how much of an impact will this make on reaching power supply targets? What action is required to ensure consumers engage with and are protected during the power sector transformation?

Flexibility and energy efficiency is required to meet future demand given electrification of heat and transport

The decarbonisation of the energy system will require high levels of electrification of transport and heat. The current models from the Climate Change Committee expect power demand to double, rather than decrease, in order to meet Net Zero targets. Meeting this demand will depend on high levels of energy efficiency and flexible smart energy systems.

Consumer engagement and delivery of smart appliances

Consumers, both domestic and commercial/industrial, will to be empowered to better manage their own energy usage. To encourage engagement, policy should support continued deployment of smart energy appliances, including smart meters, electric vehicle charge points, energy storage and heat pumps.

Enabling consumers to shift their demand through smart appliances

The government will need to deliver decentralised energy systems that grant consumers power to shape the system itself. This includes opportunities for greater demand and consumption data aggregation allowing for the development of more sophisticated smart tariffs for the benefit of consumers and flexibility on the grid. These tariffs should include

safeguards for more vulnerable consumers unable to change energy consumption patterns.

Key policy required:

- Immediately introduce a well-funded energy efficiency scheme for the UK, including a £200m increase in the Energy Company Obligation home energy efficiency scheme to help thousands of households save around £600 a year on their energy bills.
- HMT must expand the Energy Saving Materials list to include domestic energy storage, making it exempt from VAT and improving the financial case for consumers. This will help consumers benefit from flexibility services in the home, matching home renewable generation with their demand. Data shows that the UK currently lags behind similar global markets in deployment of home energy storage, despite higher levels of domestic solar and heat pumps.[2]
- BEIS should introduce a Cap and Floor mechanism to support grid-scale, long-duration energy storage to improve flexibility at the distribution and transmission level.
- Enable faster rollout of flexible Time of Use Tariffs to combine with smart appliances and consumer behaviour change (with safeguards for vulnerable consumers unable to change consumption patterns).
- Introduce zero interest loans for the purchase of smart appliances and domestic renewables and clean technology.

3. **What are the key challenges faced by each generation technology (e.g., nuclear (traditional, small and advanced modular, and fusion), offshore and onshore wind, solar, hydrogen, tidal, biomass, and gas combined heat and power) regarding both their deployment and scaling up within the current policy framework? What can be done to overcome these challenges? What generation capacity is required and what role will each technology play?**

See table below:

[2] IHS Market Global Residential Storage Index, Q2 2020

Role in decarbonisation	Barriers to deployment	Solutions
Solar		
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 - *How: Reform ENA Grid Queue management process* - Review planning procedures to streamline renewable energy planning applications. *Planning Policy Statements* - Confirm eligibility for future CfD auctions. *CfD Auction parameters for future auctions.*
Wind		
Both onshore and offshore wind provide some of the cheapest form of energy generation. Within a balanced net zero pathway, wind is expected to make the largest contribution of 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. - *Secretary of State decision within Energy Act 2013* Make decision on future CfDs for onshore wind projects.

		- *CfD Auction Parameters* 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. [3] Domestic storage is charged at 20% VAT, making it an unattractive prospect.	Introduce a Cap and Floor mechanism to encourage investment in long-duration storage. *- Via response to Call for Evidence on this area still outstanding / Energy Bill* Add energy storage to the Energy Saving Materials list, therefore exempting it from VAT. - *Treasury decision* 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]. - *Via the REMA process / Energy Bill*
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 a 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.	Electrolysers should be given access to cheaper renewable electricity. Decoupling wholesale gas and electricity price via the upcoming electricity market reforms will be instrumental to this. - *REMA reforms / Energy Bill* Lifting environmental levies and network charges from the retail price of electricity. - *Issue overdue Call for Evidence on these costs / Energy Bill* Develop a long duration energy storage support mechanism for all relevant

		technologies, including hydrogen. - *See above*
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 for projects as government must provide an indication that they will maintain 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. - *Publication of the Biomass Strategy Q3/Q4 2022* Government needs to expedite work on the development of appropriate BECCS business models to see the technology delivered across a range of sites. - *Possible inclusion in new Energy Bill following consultations*
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. - *REMA process*
Energy From Waste (EFW)		
EFW provides firm dispatchable power, complementing the	EFW requires support to enable the retro-fit of carbon capture technology, providing	Government is currently developing an Industrial Carbon Capture Contract

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.	a pathway to negative emissions. Currently a lack of focus on 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.	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. - *Via CCUS contracts policy* Six monthly CfD auctions will support the development of supply chains and deployment. - *See above*
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 early 2030s many assets will run out of subsidies for the renewable electricity they generate, such as Renewables Obligation 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.	Government must plan ahead and think whether these projects may need support beyond the current subsidy regime to continue to operate and help decarbonise our power system. - REMA process / Energy Bill 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). - REMA process / Energy Bill. Changes to the GGSS secondary regulations.

[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.>

4. **What are the challenges for the current grid infrastructure in delivering the proposed energy mix by 2035 and how can these be overcome in a cost-effective manner? What role does digitisation of the grid infrastructure play and developing a smart electricity network? Are current regulators enabling this transition and flexibility within the system? What role will storage play? Please consider this question from generation source to in the home.**

Grid connections

While a range of supportive measures have improved investment in renewable technologies, grid capacity constraints and the time required to get a grid connection on the distribution grid remains a primary barrier to deployment.

In part this is caused by some companies holding grid connection offers and not being able to build them, possibly with intentions to sell rights onward to another developer. But principally this is due to delays to connection due to capacity constraints and the approach of not reinforcing networks ahead of need.

Members also report issues with DNOs being slow to conduct reinforcement work before approving connections, creating substantial and crippling delays for projects. Some report delays as long as 8 -10 years.[3] This can cause issues for other parts of development including planning permission, funding and supply chain procurement. Costs to connect to the grid are also high and can be prohibitive to market entrants. We think there could be scope for managing the grid in new ways using flexible technologies such as energy storage, to minimise the need for new wires to be built – the networks have recognised this as well.

Supporting flexibility

The UK needs to develop a standardised flexibility market with varying contract lengths to attract investment in flexibility services. DNOs should support this process by standardising the flexibility products offered across the UK.

This process should be complemented by the introduction of a specific asset definition for energy storage, in a similar manner to that undertaken for interconnectors. The government committed to introduce primary legislation to "define storage as a distinct

[3] FT (2022) Renewables projects face 10-year wait to connect to electricity grid, https://www.ft.com/content/7c674f56-9028-48a3-8cbf-c1c8b10868ba

subset of generation" in the Smart Systems and Flexibility Plan 2021 and should now take steps to define it as a unique asset class.[4]

Key policy required:

- Ofgem should introduce a system for the removal of applicants sitting on grid connections with little intention of use, while giving greater flexibility to those with unforeseen delays.
- Grid connection costs need to be kept under close review by a strategic authority, like Ofgem, to ensure further cost barriers are avoided.
- DNO application queues should be assessed in a strategic, rather than chronological order to facilitate deployment of flexible services. At present, there are energy storage projects which could optimise limited DNO capacities and see more generation capacity connected, but they can be delayed by an inefficient queue management system.
- Standardised flexibility products should be developed across all DNOs.
- Introduce a separate asset definition for energy storage.

5. What key milestones and indicators are needed to scrutinise and measure progress in delivering the UK's power sector targets? Should new reporting requirements be required and what role should Ofgem, or the proposed new energy systems regulator, play?

Future System Operator

The Future System Operator (FSO), now being established, should ensure that power sector targets are met. The REA believes that there is potential conflict of interest between the immediate needs of the energy grid and long-term targets to decarbonise, and the FSO should therefore be positioned to provide longer-term strategic targets to NGESO and Ofgem.

Ofgem and decarbonisation

At present, Ofgem and Code Administrators do not have a clear decarbonisation objective as a key performance indicator. The regulator is not yet required to consider environmental concerns to the same extent as the protection of consumers and grid modifications are not reviewed in the context of decarbonisation. Ofgem and Code

[4] BEIS, Smart Systems and Flexibility Plan (2021), < https://www.gov.uk/government/publications/transitioning-to-a-net-zero-energy-system-smart-systems-and-flexibility-plan-2021>.

Bodies decisions can undermine transition to a net zero and decentralised energy system.

Key policy required:

- Decarbonisation should be added into Ofgem and Code Administrators Key Objectives and Terms of Reference.
- The Grid Code Review currently underway to reform the system, should be sped up of possible and should fund smaller user representatives on industry panels to ensure more voices for decarbonisation.
- The FSO's roles should be expanded to include a range of measures that would disincentivise carbon-intensive projects and incentivise affordable renewable technologies. For example, through a contract length mechanism that links the length of a contract to the carbon intensity of its generation within the capacity market.

6. **Does the UK have the right skills, industrial and labour capacity, and materials required to effectively deliver on the proposed energy security strategy by 2035, and if not, how can the supply chain be scaled up?**

Skills gap

The UK currently has major skills shortages in renewables and clean tech, this is of particular concern in the energy efficiency market given the number of homes that require installation of energy efficiency measures. The opportunity to transition fossil fuel workers to renewables and clean tech should be used. The North Sea Transition Deal is a good example of this from Government.

Key policy required:

- Government should invest in existing industries and ensure there is no loss of skills, supply chains or investment, particularly in the bioenergy sector.
- Work with industry and educational bodies to develop a skills strategy to work towards the retrofit of energy efficiency materials across all UK homes. We want to see all homes in EPC Band C or above in the next few years as a stretch target.

7. **How should Government work with industry to ensure proposed projects are ready when needed and on-budget? Are there domestic or international examples of time- and cost-effective delivery of large-scale power generation schemes?**

Deployment targets

The British Energy Security Strategy outlined 'ambitions to deploy' solar, wind, and energy storage. Government should urgently commit to strong deployment targets in relation to these technologies and more renewables such as marine and bioenergy technologies.

Contracts for Difference (CfD)

The route to market for some generation is dependent on the CfD, where gaps between auctions are too large. We call for six monthly CfD auctions.

Transmission and distribution grid upgrades

Targets should be introduced for UK wide transmission and distribution grid upgrades. In order to meet Net Zero targets, the UK should have a decentralised system with established flexibility markets by 2030.

Key policy required:

- BEIS should introduce at least one 'Emergency CfD Auction' in the next 6 months and move to regular six-monthly CfD auctions on a rolling three-year time horizon, together with adequate budget for this.
- BEIS should immediately commit to strong deployment targets for all renewables, including marine, bioenergy, solar, wind, and energy storage.

8. Does the Government's strategy incentivise investment that enables decarbonisation of the power sector by 2035? Do current financing mechanisms allow for the required investment? What are the risks for taxpayers and/or consumers? Are there national security and investment considerations we should understand?

Investment in under-financed technologies

Some strategically important Technologies are not yet commercially viable through private investment alone, such as BECCS and Marine energy. The UK Infrastructure Bank must be used to support emerging technologies along with the development of government backed business models.

Contracts for Difference (CfD)

The route to market for some generation is dependent on the CfD, where gaps between auctions are too large.

Flexibility services

Energy storage and other flexibility services that will be crucial to a decarbonised energy system often lack a viable route to market. This can be amended through a support mechanism for long duration energy storage and through a regular, centralised, and transparent market for flexibility services.
This will enable a route to market for energy storage and other flexibility services we know will be crucial in the future energy system.

Biomass power

The government should offer certainty to existing Biomass Power Infrastructure after 2027 when projects start to come off the Renewables Obligation (RO). Government should maintain existing infrastructure and expedite support for them to invest in BECCS in order to ensure energy security and the delivery of critical negative emissions.

Similar commitments are needed for Anaerobic Digestion, landfill gas and ay other project in the RO scheme,

Key policy needed:

- The Infrastructure Bank Bill should be amended to include a specific clause to support the development of emerging technologies. The Bank should be used to support earlier stage sectors and technologies that often struggle to initially secure private finance.
- BEIS should introduce at least one 'Emergency CfD Auction' in the next 6 months and move to regular, six-monthly CfD auctions on a rolling three-year time horizon, together with an adequate budget for this.
- As part of REMA, BEIS should introduce a regular, centralised and transparent market for flexibility services (e.g., voltage control), with longer term contracts.
- BEIS should introduce a Long Duration Energy Storage Cap and Floor Mechanism and provide additional support for hydrogen storage.
- BEIS must provide support to the Biomass Power and other sectors with a view to ease the transition off the Renewable Obligation from 2027.