

## Written evidence from The Association for Renewable Energy and Clean Technology (REA)

### REA Response to the Environmental Audit Committee Inquiry: What role can negative emissions technologies (NETs) play in Net Zero Britain?

The Association for Renewable Energy & Clean Technology (REA) is pleased to submit this response to the above committee inquiry. The REA represents 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 over 500 corporate members of the REA, making it the largest renewable energy trade association in the UK.

Due to the timing of this inquiry taking place during a particularly busy period of Government energy policy consultation and in the run up to COP 26, we are sorry not able to answer all the questions posed in the Terms of Reference. However, we would welcome the opportunity to be able to expand on the answers provided here by giving oral evidence to the committee.

#### *1) What contribution could NETs (through DACCS, BECCS, and/or other NETs) make to achieving net zero by 2050?*

The REA recognise the need for a wide range of both engineering-based and nature-based negative emission technologies (NETs) to meet the UK's net-zero targets. Energy scenarios set out by the Climate Change Committee, National Grid ESO Future Energy Scenarios and the REA's Bioenergy Strategy (2019) all demonstrate the need for negative emissions for delivering the UK's net-zero emissions target.

Bioenergy with carbon capture and storage (BECCS) is seen as of critical strategic importance within the CCC sixth carbon budget, identifying the need for it to provide approximately 53 MtCO<sub>2</sub> by 2050 across a mix of biomass power, waste-to-energy, industrial heat, biohydrogen, biojet and other biofuel & biomethane facilities. However, the delivery of BECCS is dependent on the continued growth and development of existing energy sectors. As the committee may already be aware, the biomass power sector is pioneering demonstration projects in BECCS and will be ready to deploy at scale within the late 2020s. Anaerobic digestion and bioethanol plants are also already capturing carbon dioxide for use in the food and drinks industry, replacing imports. Further bioenergy industries are also considering how the retrofitting of CCS on existing infrastructure may be achieved, following the CCC's sixth carbon budget which suggest this will be needed within the 2030s. As such, policy design for the delivery of BECCS, and other NETs, must consider existing industries as their starting point, with the continued growth and transition of these sectors being crucial to the delivery of NETs at the scales required.

Similarly, we strongly support carbon sequestration through environmental land management methods including agriculture, forestry, agroforestry, energy crops, perennial energy crops and peatland restoration. The CCC identify an estimated 39 MtCO<sub>2</sub> of greenhouse gas savings that could come from these measures alone. As such, the delivery of nature-based solutions should be considered of equal importance alongside engineering-based solutions and will likely require separate policy approaches to see them delivered. We also stress the link between land use and bioenergy carbon capture and storage, with policies that promote NETs through bioenergy and environmental land management having co-benefits to the broader bioeconomy, supporting the delivery of each sector.

REA members are currently involved in the following NETs and are therefore the focus of our response:

- Bioenergy Carbon Capture and Storage (BECCS) – including on non-biomass power applications such as anaerobic digestion.

- Biochar
- Afforestation
- Habitat Restoration
- Soil Carbon Sequestration

The REA are also members of the Coalition for Negative Emissions and are supportive of other NETs, as identified within their submission to this inquiry, where powered by renewable energy sources.

***2) What are, and have been, the barriers to further development of NETs? How can such barriers be overcome?***

Primary barriers to deployment are currently commercial and lack of dedicated policy support for the foundational industries from where NETs are going to be delivered.

The development of a market price for negative emissions is seen as critical for building the commercial case for NETs. Carbon pricing in its current form does not reward negative emission and will need to be reformed if there is to be a tradeable carbon market in which GGRs can participate and realise meaningful revenue streams.

In many cases NETs are a potential additional commercial activity for existing sectors. In such cases, both the primary activity must continue to have a market if they are to build on existing supply chains and knowledge to deliver innovative NET technologies. The additional investment to deliver NETs in these sectors must therefore be regarded as part of stackable revenue streams. In the case of BECCS, this includes being appropriately rewarded for dispatchable renewable power, contributing to energy security and grid flexibility. In the case of nature-based solutions, largely resulting from land management sectors, the benefits of NETs need to be suitably rewarded as part of the broader agriculture payments.

As such, ensuring NETs are strategically considered as part of current wider policy proposals is crucial to avoiding barriers to deployment of the foundational technologies from which NETs are attained. In terms of current Government workstreams this means NETs being incorporated into such policy proposals as the reforms to the CfD, the Biomass Strategy, the Heat and Buildings strategy, the Hydrogen Strategy, the England Tree Strategy, reforms to the Renewable Transport Fuel Obligation and the Environmental Land Management Scheme, amongst others.

The deployment rate of NETs will also depend on the availability of infrastructure. As part of the Government strategic thinking on infrastructure priorities, there must be a focus on areas such as addressing capacity constraints on the gas network to allow for increased injection of green gasses or identifying carbon storage regions within the UK.

Regulatory barriers must also avoid being a factor. Early engagement with authorities like the Environment Agency will be crucial to ensure the development of a suitable regulatory environment that enables the deployment of NETs and appropriate accounting for negative emissions, while also ensuring mitigation of any environmental risks posed if NETs are done badly.

Finally, in the immediate term, commercialisation is likely to be the biggest barrier to NET deployment. Different NETs are at different technology readiness levels, with many not yet being commercially viable. Dedicated bespoke support, to different solutions will be required to see the establishment of these technologies and sectors, building developer and investor confidence. This should also include the development of CCS technologies that can be retrofitted on to existing bioenergy infrastructure, to enable the transition of these sectors. This can be done to move towards more market based, and technology-neutral, delivery solutions in the medium to longer term.

### **3) How should the UK Government support the further development of NETs?**

#### ***Understand the Initial Development costs***

To start, it is important to understand the main costs associated with engineering-based NETs, which need to be addressed to make a project investable. These include:

1. Feedstock conversion into an energy/CO<sub>2</sub> mixture (E.g. Biomass being converted to electricity)
2. The capture of CO<sub>2</sub> - the cost of this can vary significantly depending on the technology. For example, relatively low for bioethanol/ AD.
3. Compression/liquefaction of CO<sub>2</sub> – the cost of which is the same for all technologies.
4. Transport of CO<sub>2</sub> – the cost of which depends on the method of transportation, being injected into a grid vs being tinkered, plus dependent on location and distances involved.
5. Sequestration of CO<sub>2</sub> – cost again depending on method and location

Any future framework must consider these costs and how any support mechanism helps cover them:

- Cost 1, is likely covered by an existing support mechanism such as the Contracts for Difference Scheme or Renewable Transport Fuel Obligation. However, consideration does need to be given to the development and retrofitting of CCS technology on existing infrastructure, given support mechanisms all focus on delivering brand new projects.
- Cost 2, is where GGR support needs to focus to provide a revenue stream for negative emission production.
- Cost 3-4 are associated costs around transport and storage that are relevant to GGRs and therefore should also be considered within the design of any support mechanism.

#### ***Create Optimal Market Conditions in the immediate term***

In the immediate term we are supportive of technology-specific mechanisms being designed for different NETs technologies, recognising different readiness levels or the status of the sectors in which they are being implemented. Bespoke grants will likely be required to drive appropriate levels of research, development, and deployment as appropriate to the specific sector to get to a level of commercialisation that enables more market-based approaches to operate.

Much of the regulatory or infrastructure requirements for carbon transport and storage will also need to be developed in parallel. As part of the Government strategic thinking on NETs, there must be a focus on areas such as addressing capacity constraints on the gas network to allow for increased injection of green gasses or identifying carbon storage regions within the UK. On the regulatory side, thought should also be given to the development of suitable accounting methodologies for negative emissions of different sectors so that the establishment of a market-based mechanism can be successfully developed.

In addition, the government must recognise the importance of maintaining the foundational industries for different NETs. It is the established sectors, such as the bioenergy sector, that have developed the knowledge, supply chains and skills necessary to see these GGR innovations delivered. This is equally true for building on existing investor confidence, private funders will not be encouraged to invest in new technologies if their existing investments in UK industries are undermined. If Government lets these foundational industries contract, rather than enabling them to transition through dedicated support for retrofitting, then delivering the innovation and commercialisation required will become harder. As such, NET priorities must start to be built into existing government workstreams, with the potential for technologies deploying today being able to contribute to negative emissions in the future.

***Create an appropriate support Mechanism for engineering based and nature based NETs deployment***

The REA believe a Contracts for difference (CfD) based mechanism for BECCS, to reward renewable power production, combined with a separate carbon payment for negative emissions is a useful combination for delivering biomass power projects with CCS. Such a payment also has the advantage of being adaptable to other foundational technologies, operating in conjunction with other support mechanisms that deliver different renewable energy supplies such as the RTFO, RHI or future mechanism aimed at hydrogen production. Equally, existing infrastructure, such as AD sites which already capture CO<sub>2</sub>, could utilise the carbon payments to enable further investment in carbon capture and storage.

Lessons can be learned from the existing CfD mechanism especially in considering the success of the CfD in driving down costs within the offshore wind sector.

Over time, assuming the UK ETS matures successfully, the carbon payment will likely be able to transition to a straight market-based price that ensures ongoing revenue for negative emission production. As part of this development we would also like to direct Committee's attention to the REA Report "*Going Negative: Policy Proposals for UK Bioenergy with Carbon Capture and Storage*". Produced in 2019, this report examines how UK carbon price could be used to support BECCS, in conjunction with existing policies like the CfD. The report can be read here: <https://www.r-e-a.net/resources/going-negative-policy-proposals-for-uk-bioenergy-with-carbon-capture-and-storage-beccs/>

In the agriculture and forestry sectors, consideration should be given to how direct payments such as those being developed within the Environmental Land Management Scheme could also be used to deliver nature-based NETs by rewarding carbon-fixing in soils, tree growth and habitat restoration.

Regulatory approaches may also be effective for delivering nature-based solutions. For example, bans on use of domestic-source and imported peat within soil improvers and, where adequate technical performance of alternatives has been proven, in growing media would drive down demand and contribute to peat habitat restoration. Regulatory measures that ensure quality or drive down poor agricultural practices will help in promoting GGR nature-based solutions.

***How might the Government's role Change in the Longer term?***

The role of the Government will change as NETs become more commercially established. Once achieved it is appropriate that the Government facilitate a move to more market-based solutions, that drives competition between technologies and drives down costs. This is likely to be achieved through the maturing of a cross-sector carbon price, potentially through the UK ETS, which rewards negative emissions. However, given the range of technologies that will be required and the need to get them all to successful commercialisation, such a technology-neutral policy role should be considered a medium to long-term policy objective.

It is also worth noting, that at some point government's role will also change from facilitating the innovation and commercialisation of NETs to ensuring their ongoing deployment and retrofitting of the technologies. This change may require the Government to review initial approaches and make appropriate changes, likely within the 2030s.

Aside from any policy changes, the Government must still maintain regulatory clarity and consistent direction of travel to maintain investor confidence and enable long-term planning for projects.

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