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The Rt Hon Steve Reed OBE MP, Secretary of State for Environment, Food and Rural Affairs
&
The Rt Hon. Ed Miliband MP, Secretary of State for Energy Security and Net Zero
House of Commons
London SW1A 0AA

CC: Chief Scientific Advisors Professor Gideon Henderson (DEFRA) & Professor Paul Monks (DESNZ)

Dear Ministers,

Recommendations for supporting and accelerating biochar deployment in the UK

The UK has an ambitious and important goal to scale new Greenhouse Gas Removal (GGR) technologies, recognising their role in helping deliver the UK's net-zero target. One of the most developed technologies is biochar. Not only does biochar offer durable storage of carbon captured from the air, but it also offers wider environmental benefits including moisture and nutrient retention when applied to soils.

Currently, however, there are regulatory and policy gaps which hinder the growth of the biochar sector, as well as other land-based GGRs such as enhanced rock weathering. As academic experts and leaders in the UK's national GGR research programme, we are writing to highlight the three key gaps – waste regulation, carbon valuation and policy ownership - and to offer a way to resolve them, enabling biochar to contribute to the national net zero goal.

Biochar is a charcoal-like material produced by heating organic matter in a low-oxygen environment. The previous government's Net Zero Strategy committed to deploying 5 million tonnes of GGR technologies by 2030, on a path to 75-81 million tonnes per year by 2050.[1] Biochar is highlighted specifically in the Strategy as one such technology, alongside other engineered approaches: enhanced rock weathering, bioenergy with carbon capture and storage (BECCS) and direct air carbon capture and storage (DACCS).

UK biochar research and pre-commercial activity is picking up pace. The £31 million GGR Demonstrators Programme funded by UKRI includes a Biochar Demonstrator[2] alongside the CO_2RE research hub[3] and four other GGR demonstrators. The Demonstrator is showing that

[1] Powering Up Britain: Net Zero Growth Plan (2023)
[2] https://biochardemonstrator.ac.uk/
[3] https://co2re.org/

biochar can meet environmental standards for addition to soils, and that it can sequester carbon on climate-relevant timescales (100-1,000 years). The Demonstrator has deployed close to 200 tonnes of biochar and has established that it can be applied safely at a level of 10 tonnes per hectare, potentially enabling considerably more to be deployed than set by the current 1 tonne per hectare per year limit set by the Environment Agency's Low Risk Waste Position (LRWP) 61.[4]

Five DESNZ-funded projects,[5] led by Black Bull Biochar, Invica Industries, Lapwing Energy, Ricardo and Mersey Biochar represent a further investment of £19 million. Together they are currently deploying hundreds of tonnes of biochar with the aim of becoming commercial enterprises. Further, biochar features prominently in the Department for Transport's £30 million Live Labs 2 Programme to decarbonise roads, where it is being trialled in aggregates.

Commercial developments are already providing further momentum with, for example, A Healthier Earth [6] announcing plans to produce 9,000 tonnes of biochar per year. Globally, biochar generated revenues of $600 million in 2023[7] and provided the largest quantity of engineered GGR – over 200 times more than DACCS.[8]

In the UK, around 2 million tonnes of potential feedstock for biochar production is available per year, which would deliver 4 million tonnes of GGR, meeting over 5% of the GGR required by 2050 in the Net Zero Strategy. In the shorter term, annual production levels of 500,000 tonnes would meet 20% of the 2030 GGR target. As well as application on agricultural soils, woodlands, amenity land and peatlands all provide significant areas for deployment, while use in aggregates for roads and construction materials provide yet further potential.

Despite the potential and progress, there are some key issues preventing the scale-up of biochar in the UK.

Waste regulation. Biochar made from materials such as demolition wood can be hazardous, meaning that regulation is crucial. The Environment Agency's LRWP 61 defines certain untreated wood and agricultural plant wastes as permissible feedstocks for biochar production. However, for wastes which have undergone treatment, such as fibre from anaerobic digestion of food, the biochar produced carries a waste code and cannot be spread to land, even if it meets rigorous environmental specifications such as those set by the European Biochar Certificate (EBC)[9]. End-

[4] https://www.gov.uk/government/publications/low-risk-waste-positions-landspreading/storing-and-spreading-biochar-to-benefit-land-lrwp-61
[5] https://www.gov.uk/government/publications/direct-air-capture-and-other-greenhouse-gas-removal-technologies-competition/projects-selected-for-phase-2-of-the-direct-air-capture-and-greenhouse-gas-removal-programme
[6] https://pyreg.com/uks-largest-biochar-facility-to-remove-17000-tonnes-of-co2-annually/#:~:text=A%20Healthier%20Earth%2C%20a%20UK,removal%20projects%20in%20the%20UK.
[7] https://biochar-international.org/2023-global-biochar-market-report/
[8] https://www.stateofcdr.org
[9] https://www.european-biochar.org/en/home

of-Waste status can be obtained, but this is a time-consuming process for both producers and regulators. In contrast, the EBC list of permissible feedstocks does include residues from food processing [10].

Carbon valuation. Government is developing a Contract for Difference (CfD) business model for BECCS and DACCS,[11] and supports more conventional GGR practices such as tree planting and peatland restoration through policies such as the Environmental Land Management Scheme (ELMS).[12] Unlike these, biochar (and other new GGR approaches that do not require CCS, such as enhanced rock weathering) has no current or planned policy support to reflect its carbon value. While biochar is attracting some private income through voluntary carbon markets,[13] payments go to producers and do not pass on to farmers and deployers. The co-benefits of biochar in terms of soil moisture and nutrient retention, though valuable, are insufficient economic drivers on their own for scaling deployment in the UK. Further, farmers are uncertain as to the impact biochar may have on ELMS payments for improving soil organic carbon. A clear and sufficient regulatory incentive, whether standalone or within an existing policy (e.g. ELMS or CfDs), would enable biochar to scale and reflect its benefit to climate.

Policy ownership. No single team within Government has oversight of biochar. Aspects are dispersed across teams primarily in DESNZ and DEFRA, including net zero innovation, net zero strategy, biomass strategy, ELMS, soils, environmental waste, and others. For those outside Government (and sometimes those inside) it is unclear who to engage and who is responsible for driving forward the aims for biochar identified in the Net Zero Strategy.

Going forward, we propose the formation of a cross-Departmental task force to set a holistic policy framework for biochar that aligns with the voluntary markets and emerging policy in the rest of Europe. We recognise that many officials are already doing excellent work on relevant aspects and suggest that these issues could be resolved effectively if they are brought together in a time-bound manner with a clear mandate and championing by senior leadership.

Scientific evidence is available to inform the proposed task force. We stand ready to support you with expert advice, as well as extensive connections to our networks of research and industry knowledge as needed.

Yours sincerely,

Professor Colin Snape
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University of Nottingham

Dr Steve Smith,
Executive Director, CO_2RE
University of Oxford

[10] https://www.european-biochar.org/media/doc/2/positivlist_en_2022_1_v10_1.pdf
[11] https://www.gov.uk/government/publications/greenhouse-gas-removals-ggr-business-model
[12] https://www.gov.uk/government/publications/environmental-land-management-update-how-government-will-pay-for-land-based-environment-and-climate-goods-and-services
[13] See e.g. https://registry.puro.earth/carbon-sequestration/projects