Coalition for Negative Emissions

The Growth Potential of the UK Greenhouse Gas Removals Industry

Summary

We cannot reach Net Zero without a developed and broad GGR industry.

The UK can be a global leader in research, DACCS, BECCs, EfW and nature-based removals.

Working with Government to introduce supportive policies, the industry can become self-funding.

The GGR industry can rapidly deliver government objectives for growth, regional investment, Net Zero and decarbonised power.

Greenhouse Gas Removals (GGRs) – The 'Net' in 'Net Zero'

However successfully the UK decarbonises, industry and households will unavoidably continue to emit residual CO2; our heating and transport, steel, cement, and glass production and waste incineration; we unavoidably produce CO2, adding to climate change unless fully offset.

Intergovernmental Panel on Climate Change: *"Carbon removals can lower net CO_2 emissions in the near- term; counterbalance 'hard-to-abate' residual emissions (e.g., emissions from agriculture, aviation, shipping, industrial processes) mid-term; and achieve net negative GHG emissions in the long-term"*

Without a new, extensive and broad GGR industry, the UK cannot deliver Net Zero.

The size of the opportunity

The potential of the CDR market is huge:

- To keep within 2 degrees of global warming, we will need a GGR industry of 7-9 GtCO2/yr by 2050 or 22 GtCO2/yr (cumulative)[1]
- The **UKRI forecast** a £400 billion future global market in greenhouse gas removals[2]
- **McKinsey** forecast a gigaton scale global carbon removal industry worth up to $1.2 trillion by 2050[3]
- The **Climate Change Committee** forecast the need for over 60MTCO2pa of GGRs in the UK by 2050, including 35MT of engineered removals, with c. 50% being delivered by the mid 2030s[4]. Industry revenues could be £14.25 - £17.75bn per annum[5] from UK sales alone

The breadth of the opportunity for the UK

Within that global opportunity, the emerging UK GGR sector is broad[6], with opportunities in:

- **Research and implementation** of engineered and nature-based solutions, such as perennial biomass, biochar, rock weathering, woodland creation, peat restoration and soil sequestration
- **Direct Air Capture** with Carbon Capture and Storage (DACCS), benefitting from our decarbonised grid and access to CO2 storage

- **Bioenergy** with CCS (BECCS), increasing demand for domestically produced biomass, such as the 4.5Mtpa of waste wood, and capitalising on existing biomass power plants
- **Energy from waste** plants across the UK that emit over 10MT of biogenic CO2 pa[7]
- **Global finance** and CDR purchases, with verification and CDR registration capability
- Our developing **CCS storage** network, and the North Sea's ideal geology, where we have capacity to store over 78 gigatons of CO2, including European CDRs[8]; the UK has a crucial competitive advantage

With CCS infrastructure in place and supportive regulatory and legislative support across engineered and nature based GGRs, the UK can be a world leader of the GGR industry.

The path to zero subsidy

The demand for GGRs is increasing, with new compliance demand (with GGRs being allowed as ETS offsets) materially supplementing the voluntary market. Global demand for carbon credits is growing in both compliance and voluntary carbon markets, where it could reach annual demand of 5.9GtCO2 in 2050[9]. The range of projections from market experts Baringa include scenarios for GGR prices that exceed £200/ton by 2040 and £350/ton by 2050[10]. In parallel, the cost of CCS is expected to fall 15-30% by 2035[11]. The CCC 7th carbon budget uses a cost per ton for BECCS in the range of £325-349/ton (excluding energy co-product benefit) for the period 2030-2050. DACCS costs are forecast to reduce below £350/ton in the 2040s.[12]

While Government business model support for GGR projects is required at the outset because of the inherent uncertainty of price and demand volumes, those **forecasts suggest the majority of GGR projects could be self-funding over the CfD period; the sector could operate at zero subsidy in the 2040s.** Government can be a catalyst to investment and growth at no cost to the UK taxpayer.

Meeting Government targets

Building a GGR industry will deliver a number of additional key Government targets:

- EfW with CCS can **deliver over 10GWhe of baseload power and BECCS could have 4GW of capacity by 2030**; a significant contribution to the decarbonisation of our grid[13]. The investment required and jobs created will be across the UK
- Increasing need for sustainable feedstock will **support farming income** across the UK and increase security of supply
- Nature-based projects are regionally dispersed and **support wider biodiversity objectives**
- The potential for self-funding projects within a decade **supports Government's growth agenda with minimal calls on the Exchequer**
- Captured biogenic and air-sourced CO2 can also **underpin production of SAF**

Affordable policy support

While the GGR business case and UK opportunities are compelling, the nascent industry does require strong public-private collaboration and policy support, which could include:

- **A UK-EU integrated, involatile carbon price** through the Emissions Trading Scheme
- **Integration of GGRs into the ETS** with 100% offset potential
- **Consideration of a Mandatory GGR purchases** for corporates as a % of ETS to offset forecast residual emissions
- Encouraging the **aviation sector to promote voluntary purchases** of aviation CDR offsets
- Continued **support of leading UK R&D** and demonstrator projects
- **Consistent GGR standards** across voluntary and compliance markets
- Compliance market **support for high integrity, permanent nature based GGRs**
- Finalisation of the GGR, BECCS, DACCS and EfW ICC **business models**
- **Government business model support for early projects** to create supply across GGR sectors, mitigate price and demand risks and enable cost reductions through experience

Many of these initiatives are underway, but **the sooner policies are introduced, the faster the industry will grow and secure and increase the UK's competitive advantage.**

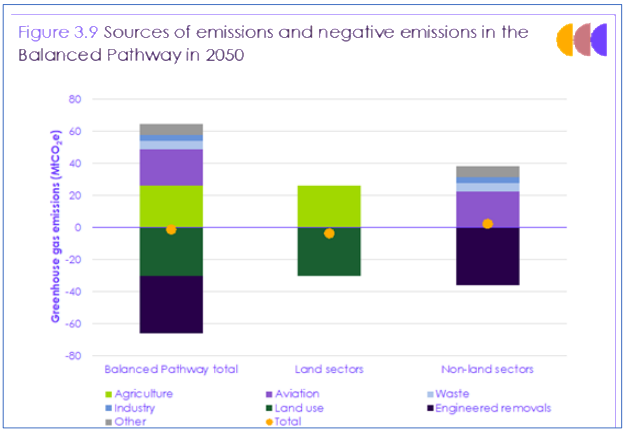
While limited subsidy support is needed now to kick start the GGR industry, any underlying grant may be fully repaid over the life of the contracts, while in the interim anchoring a broad industry in the UK and ensuring GGRs' economic potential is realised.

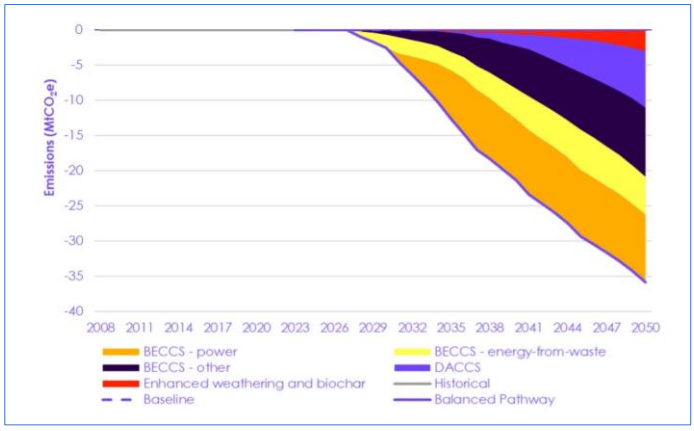
There is a compelling business case for promoting the GGR industry now to secure UK competitive advantage and kick-start a large, self-funding industry

Notes

1. State of CDR 2nd Edition, Table 8.2.
2. https://www.ukri.org/news/uk-invests-over-30m-in-large-scale-greenhouse-gas-removal/,
3. Source: McKinsey, 'Carbon Removals: How to scale a new gigaton industry', https://www.mckinsey.com/capabilities/sustainability/our-insights/carbon-removals-how-to-scale-a-new-gigaton-industry
4. Source: The CCC's 7th Carbon Budget https://www.theccc.org.uk/publication/the-seventh-carbon-budget/

The Climate Change Committee's Balanced Pathway for negative emissions and detailed engineered removals





5. Domestic value of the market of 35MTCO2pa of engineered removals at a price of £300-400/ton plus 25MTCO2pa of land use removals at a price of [£150/ton – NFU].
6. The Coalition for Negative Emissions paper Being Positive About Negative Emissions gives an overview of the breadth of the GGR industry and the need for companies to implement clear Net Zero strategies, including offsets for residual emissions
7. The potential of the EfW sector to deliver carbon removals is reviewed in the Oxford Institute for Energy Studies: Carbon capture in energy from waste: A low-hanging fruit and ERM: EfW with CCS: A Key pillar for Net Zero in the UK. The potential for the sector to deliver robust carbon removals is reviewed by CDR registry Isometric in Potential for EfWs as a carbon removal pathway
8. UK Government: CCUS: A vision to establish a competitive market
9. 2025 Carbon Market Buyer's Guide, South Pole. https://www.southpole.com/publications/2025-carbon-market-buyers-guide
10. Proprietary Baringa CDR price forecasts, shared with signatories of this letter and HMG for the purposes of evidencing the GGR business case. Under scenarios in Baringa's global energy transition model, willingness to pay for CDRs is driven by the marginal cost of carbon abatement across the economy. The model assumes a level of ambition to decarbonise, through market or policy drivers. Please note the following disclaimer from Baringa to allow us to include their price forecast; "*the Baringa CDR Price Forecast: (a) is proprietary to Baringa Partners LLP ("**Baringa**") and should not be re-used for commercial purposes without Baringa's prior written consent; (b) shall not form part of any contract nor constitute an offer capable of acceptance; (c) excludes all conditions and warranties whether express or implied by statute, law or otherwise, to the fullest extent permitted by law; and (d) places no responsibility or liability on Baringa or its group companies for any inaccuracy, incompleteness or error herein. Any reliance upon the Baringa CDR Price Forecast shall be at the user's own risk and responsibility. If any of these terms are invalid or unenforceable for any reason, the remaining terms shall remain in full force and effect. Nothing in this statement shall limit or exclude Baringa's liability for death or personal injury caused by its negligence, fraud or any other liability which cannot be limited or excluded by law. Copyright © Baringa Partners LLP 2025. All rights reserved.*"
11. Driving Cost Reductions and VFM on CCUS - Carbon Capture and Storage Association
12. Committee on Climate Change, *7th Carbon Budget,* ref 7.12.2

13. Energy from waste power export to the grid exceeded 10 GWhe in 2024; 3.6% of UK power generation: Tolvik UK EfW statistics 2024 - UK Energy from Waste Statistics. This figure will increase as new EfWs come on stream this decade, but has not been reduced to reflect the parasitic load of EfW facilities.
BECCS numbers from NESO Clean Power 2030:

Fuel / technology type (GW)		2023	2030 Further Flex and Renewables	2030 New Dispatch
Variable	Offshore Wind	14.7	50.6	43.1
	Onshore Wind	13.7	27.3	27.3
	Solar	15.1	47.4	47.4
Firm	Nuclear	6.1	3.5	4.1
Dispatchable	Biomass/BECCS	4.3	4.0	3.8
	Gas CCS/Hydrogen	0	0.3	2.7
	Unabated gas	37.4	35.0	35.0
Flexibility	LDES	2.8	7.9	4.6
	Batteries	4.7	27.4	22.6
	Interconnectors	8.4	12.5	12.5
	Demand-side flexibility (excl. storage heaters)	2.5	11.7	10.4
Annual demand (TWh)		**258**	**287**	**287**

Table 2: Capacity by technology in the clean power pathways (GW)