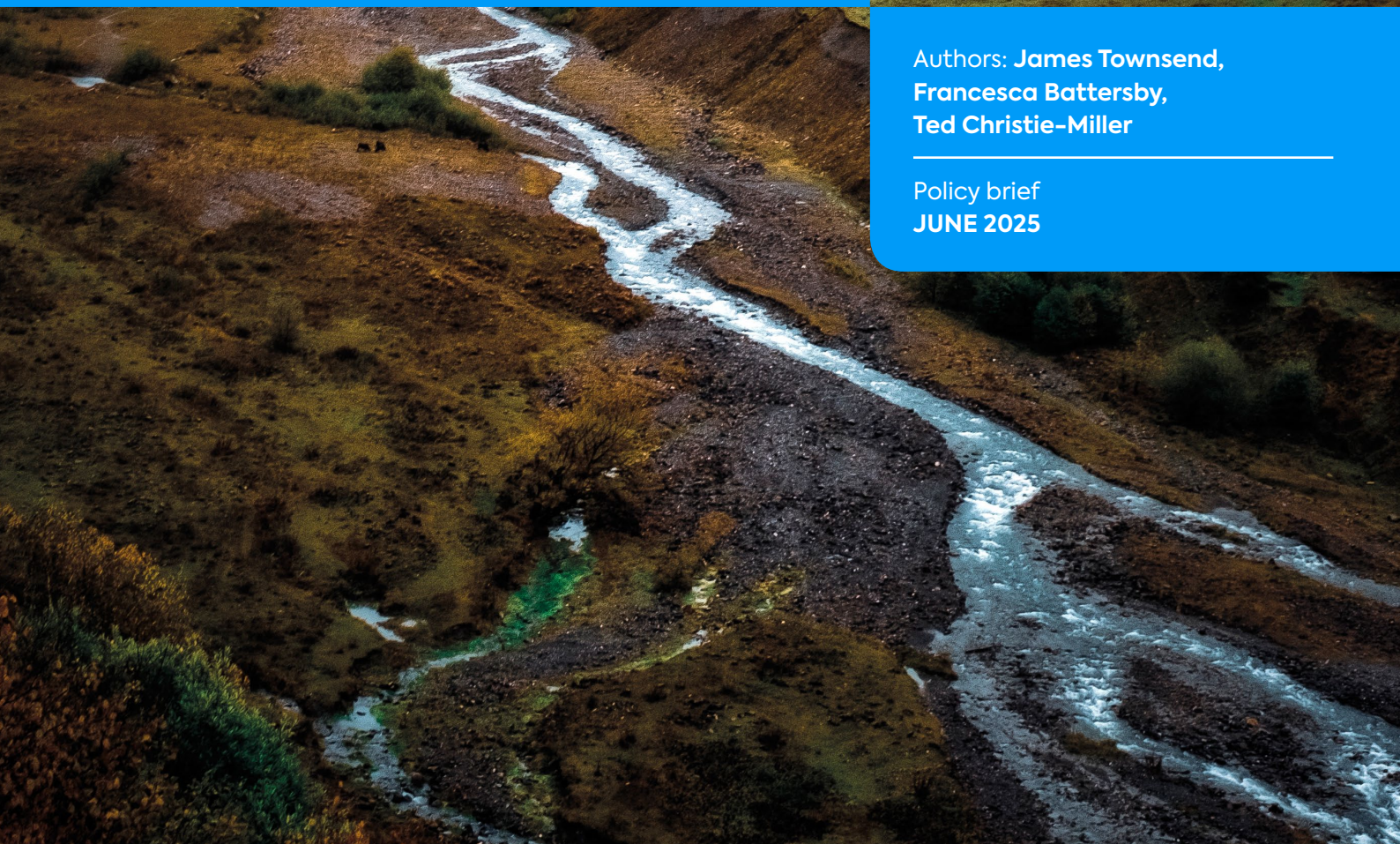
carbon gap

GROWTH THROUGH REMOVALS: MAKING GREENHOUSE GAS REMOVALS A VIBRANT PART OF THE UK ECONOMY

Authors: **James Townsend, Francesca Battersby, Ted Christie-Miller**

Policy brief
JUNE 2025



POLICY BRIEF

GROWTH THROUGH REMOVALS: MAKING GREENHOUSE GAS REMOVALS A VIBRANT PART OF THE UK ECONOMY

JUNE 2025

CONTENTS

Acknowledgements:
The authors would like to thank **Alex Luke**, **Dr Steve Smith**, **Joss Garman**, **Georgia Berry**, **Hermione Dace**, **Noah Deich**, and **Lukas May** for their thoughtful comments and suggestions for this paper.

FOREWORD

In towns like mine, the transition to net zero can't just be about targets on paper – it has to be about real jobs, investment in industry, and opportunities for the next generation.

Great Grimsby and Cleethorpes know what it means to power the country. From providing food security through our proud fishing legacy to our role today at the forefront of offshore wind, hydrogen and clean energy innovation. Here, we see how climate ambition can work hand-in-hand with economic opportunity.

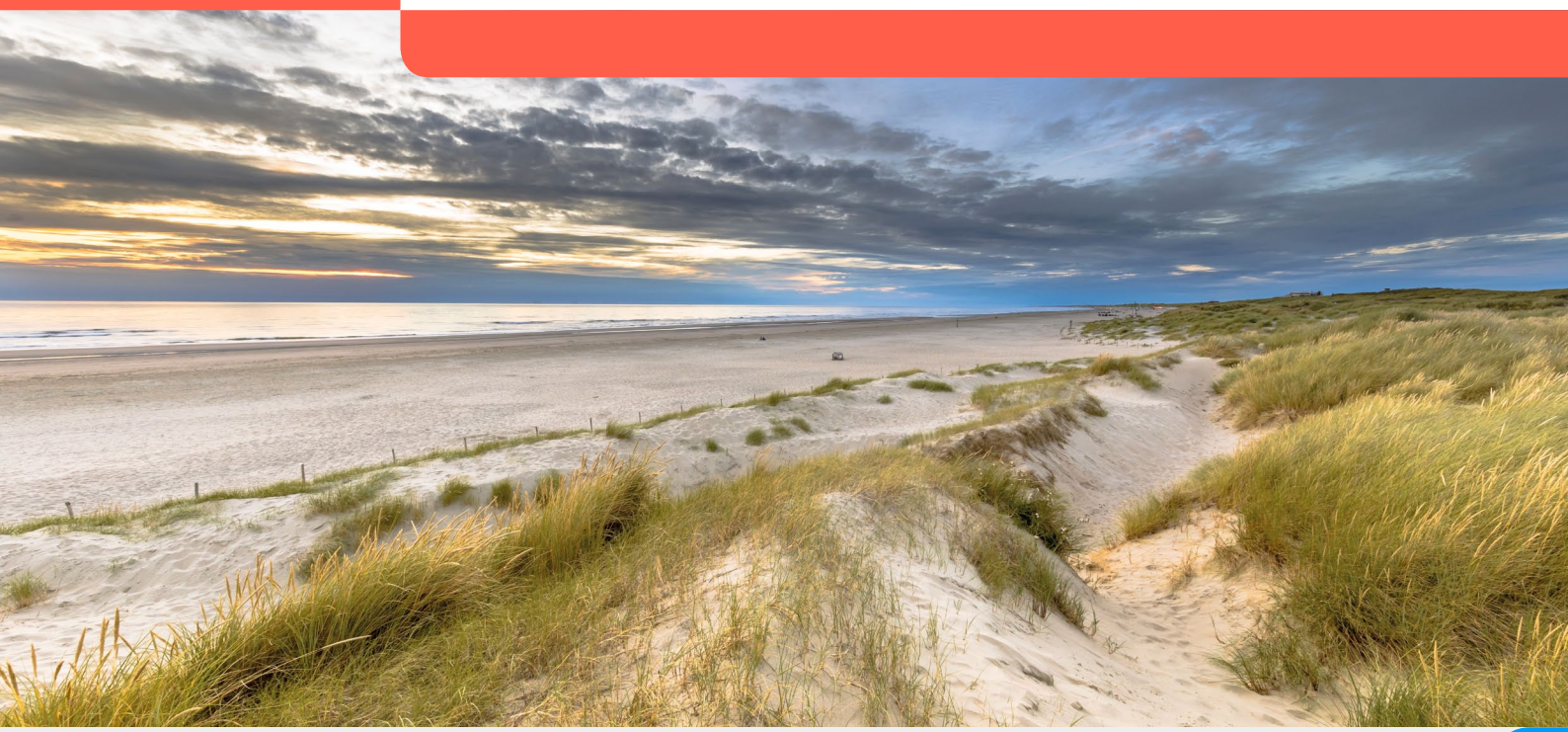
This paper sets out how the UK can lead in the emerging field of greenhouse gas removal (GGR), putting Britain at the forefront of a world-class industry. It shows that GGR isn't a distant ambition – it's a practical part of how we meet our climate commitments, maintain our industrial base, and create tens of thousands of high-skilled jobs, many in the very regions that have been hit hardest by economic change.

It also makes clear what happens if we delay. The US and Europe are already scaling up GGR, offering bold public support and shaping market rules. Without a clear plan, the UK risks becoming a follower – buying in the technologies we could have developed ourselves, and missing out on the growth, influence, and security that leadership brings.

Getting this right means investing in innovation, unlocking early demand through procurement, securing a long-term market through the Emissions Trading Scheme, and building the infrastructure – physical, financial, and regulatory – to scale. It means making GGR central to our wider industrial strategy and ensuring regions like the Humber are front and centre in that effort.

There is no silver bullet for net zero. But if we are serious about leading this transition in a way that delivers for people and places like ours, then GGR has to be part of the picture.

Melanie Onn MP, Labour MP for Great Grimsby and Cleethorpes and former Deputy Chief Executive of RenewableUK



EXECUTIVE SUMMARY

The UK stands at a crossroads. Greenhouse gas removal (GGR) is no longer a futuristic concept – in the world of overshoot that is approaching – it is a pillar of credible climate strategy and an industrial race already underway with other countries and regions such as Japan and the EU already leading the way. Every pathway to net zero relies not just on cutting emissions, but on removing carbon from the atmosphere at scale. Today, removals fall far short of what is needed.

The UK is well placed to lead. With world-class science, deep financial markets, and vast North Sea storage, Britain has the raw materials to build a world-leading GGR sector. Done right, this combination of factors can create a new generation of export industries, open up a trillion-dollar global market — and support up to 60,000 high-skilled jobs across the UK (and particularly in Scotland, the Midlands and the North) by 2050.

The economic opportunity is clear. Carbon removal could revitalise industrial supply chains, drive investment into underpowered regions, and position Britain as a global hub for climate innovation. But the window is closing fast. Other countries are moving first, setting standards, scaling technologies and writing the rules. Without decisive action, Britain risks becoming a buyer, not a builder, of the next generation of climate solutions.

This paper sets out how the UK can seize the GGR opportunity. It argues for action across three pillars:

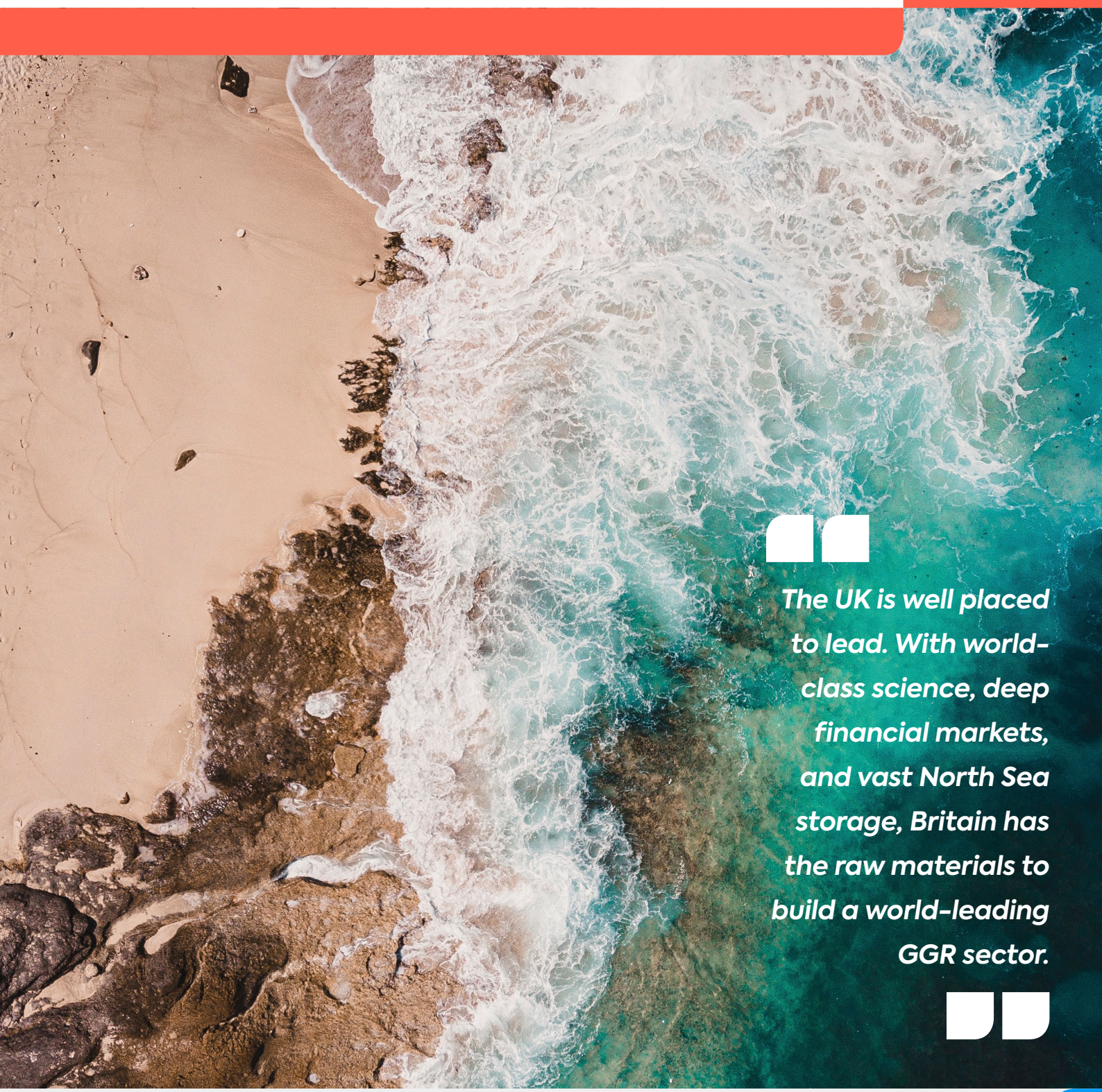
- **Drive corporate demand:** Use public procurement to catalyse early projects and maximise the impact and integrity of integrating GGR into the UK ETS to create long-term, reliable markets.
- **Lay the foundations for success:** Extend innovation funding, bridge the financing gap for early-stage technologies, establish world-leading certification standards, and extend support across a broader range of GGR methodologies.
- **Make GGR central to UK climate strategy:** Fund large-scale carbon capture, utilisation, and storage (CCUS) clusters, back the industrial infrastructure needed for removals, and put GGR at the heart of net zero delivery.

GGR is not a peripheral issue – it is a strategic necessity for Britain's economy, climate leadership, and energy security. There's no doubt that GGR requires substantial investment – £10bn annually according to the CCC. Smart policy design is therefore needed to crowd in private investment, limiting the share of costs borne by the Treasury or by consumers. Where public investment does occur, Britain can ensure that investments are aligned with its strategic goals.

Pillar	1. Drive corporate demand	2. Lay the foundations for success	3. Mainstream GGR within UK climate policy
Recommendation	1a. Kick-start demand by using public GGR procurement to encourage private purchases	2a. Create funding instruments for R&D and innovation, and scale-up	3a. Place GGR at the heart of the CCUS clusters programme
		2b. Maximise the impact of UK GGR methodologies	
	1b. Establish an effective compliance market through the UK ETS	2c. Develop business models for other near-commercial GGRs such as biochar and enhanced rock weathering	

Table A: *Recommendations for UK policy leadership on engineered GGR.*

The countries that move first will shape the industries, technologies, and markets of the future. Denmark, Sweden, Canada and (historically) the US, have moved swiftly to promote domestic investment and establish supportive policy regimes. Britain has the resources to lead - but it must match ambition with action. Building a world-class GGR sector is not just vital for meeting our climate targets. It is a chance to rebuild Britain's industrial strength for the net zero age - and to ensure that the jobs, investment and influence of the next energy transition are secured at home.



The UK is well placed to lead. With world-class science, deep financial markets, and vast North Sea storage, Britain has the raw materials to build a world-leading GGR sector.

INTRODUCTION

The UK has a chance to lead the next cleantech frontier: greenhouse gas removal (GGR). As countries compete to build the foundations of a net zero economy, GGR is emerging not only as a climate necessity but as a trillion-dollar global market – projected to **exceed $1 trillion** a year by 2050. With its scientific expertise, world-class universities, North Sea storage assets and strengths in engineering and finance, the UK is well placed to lead. But that window is closing fast.

A thriving GGR sector could anchor new domestic supply chains, attract international investment and create tens of thousands of high-quality, regionally distributed jobs. Done right, it can also reinforce the UK's position as a global climate leader and innovation hub. But without decisive action, the UK risks becoming simply a buyer of the next generation of climate solutions.

This paper sets out how the UK can seize the GGR opportunity, with a focus on 'engineered' removals – those that draw on innovative technology and processes to take carbon out of the air. It outlines a strategy to scale innovation, set clear market rules, organise public funding and unlock finance, and embed these removals at the heart of the UK's climate and economic planning. With the right policies in place over the next decade, GGR can become a cornerstone of Britain's green industrial revival.

What is greenhouse gas removal?

Greenhouse gas removal (GGR) or carbon dioxide removal (CDR) (used interchangeably here) involves capturing CO_2 from the atmosphere and durably storing it in geological, oceanic or land-based reservoirs. Though often conflated with carbon capture and storage (CCS), GGR explicitly excludes CCS from fossil power generation or industry, as well as carbon storage in short-lived products like fuels. Only activities that genuinely bring down atmospheric greenhouse gas levels qualify as GGR. In short, GGR is the "net" in net zero.[1] GGR takes multiple forms, broadly segmented into "conventional" and "novel" approaches.

- Conventional methods include afforestation, reforestation, soil carbon sequestration, and peatland restoration—practices that leverage natural carbon sinks. These methods account for nearly all current GGR activities, with about 2 $GtCO_2$ removed annually.[2]

- Novel or engineered GGR methods - such as biochar, bioenergy with carbon capture and storage (BECCS), direct air capture and storage (DACS) and enhanced rock weathering - remain in their infancy, removing only 0.0013 $GtCO_2$ per year but expanding rapidly.[3]

While cutting emissions prevents future damage, GGR is an additional tool that is essential for counteracting 'hard-to-abate' (those emissions that are difficult or impossible, either technically or economically, to mitigate based on current/expected technology) sources like agriculture, aviation and industrial processes – after they have already happened. More crucially, achieving net-negative emissions – a policy goal to which countries like Denmark, Germany, and Sweden have indicatively subscribed – depends on large-scale GGR deployment in the coming decades.

Ultimately, GGR is not an alternative to emissions reductions but a necessary complement. As the world grapples with the challenge of staying within safe climate limits, unlocking the full potential of GGR through diverse and scalable solutions will determine whether global net zero, and later net negativity, becomes a reality.

[1] As opposed to absolute zero, which would not involve any GGR.

[2] Smith, S et al. (2024). **The State of Carbon Dioxide Removal 2024 - 2nd Edition**

[3] Smith, S et al. (2024). ibid

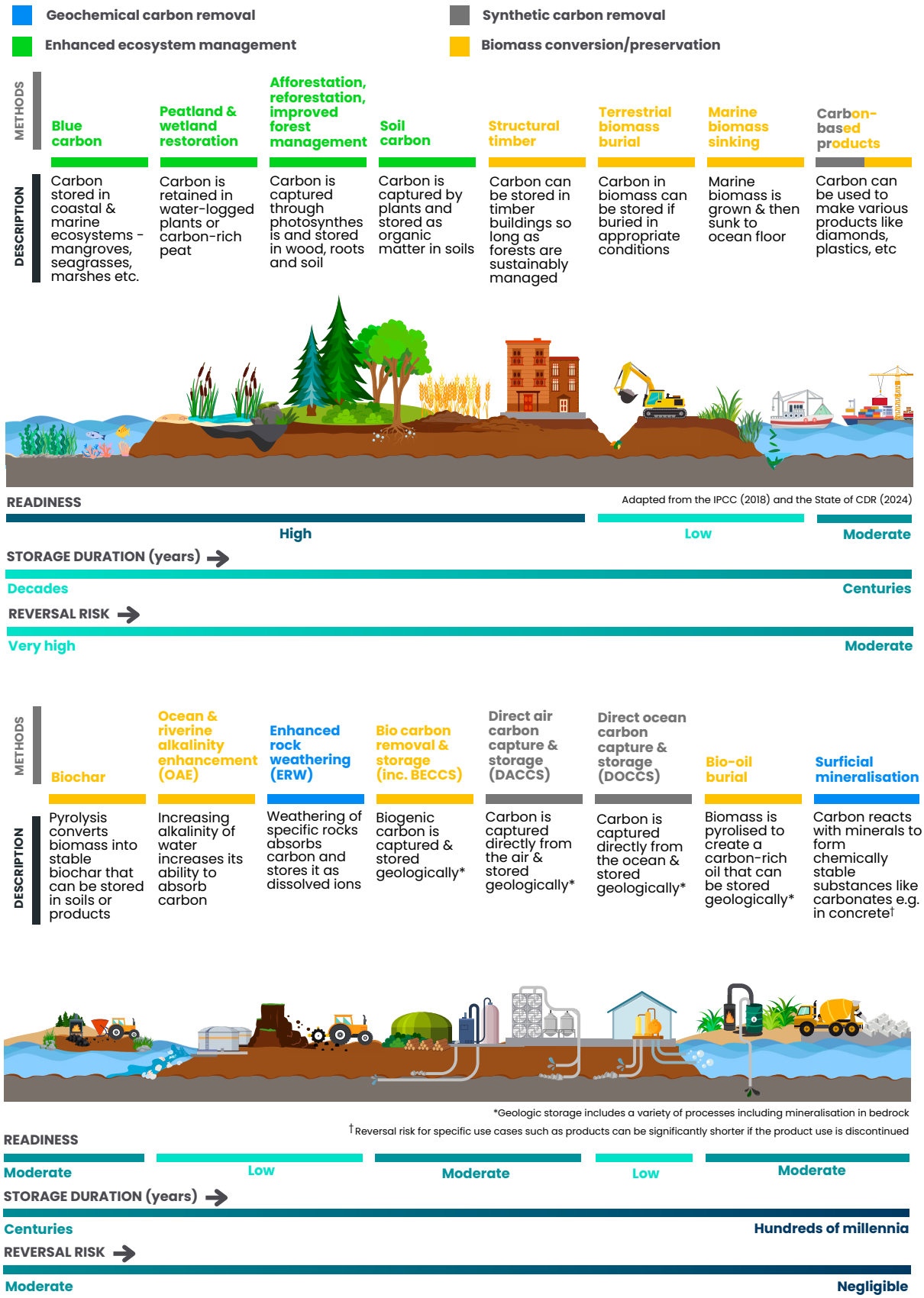


Figure 1: *An overview of carbon dioxide removal (CDR) methods.*

Large scale GGR is unavoidable, both globally and domestically.

Between today and 2050, a staggering cumulative total of 165 billion tonnes of carbon removal will be required, translating to an annual demand of up to 10 billion tonnes by mid-century. This monumental effort is indispensable if we are to curb the progression of climate change to within the confines of a 1.5-2°C increase, a target enshrined in the Paris Agreement. Indeed, the IPCC asserts that achieving gigatonne-scale GGR has become an inescapable necessity to meet our climate objectives.

This urgency is mirrored on a domestic scale. As articulated by the Climate Change Committee (CCC), GGR is slated to contribute significantly to the UK's net zero transition by 2050. Projections indicate that 35.8 Mt of engineered removals would be needed by 2050 to address residual emissions from sectors like aviation and heavy industry.[4] Varied methodologies such as biochar, direct air carbon capture and storage (DACCS), enhanced weathering, and bioenergy with carbon capture and storage (BECCS) are being considered for UK GGR (see Figure 1 for more detail on these methods). Notably, the CCC's Balanced Pathway indicates that GGR efforts will surpass the combined emissions abatement potential of hydrogen and carbon capture use and storage (CCUS).

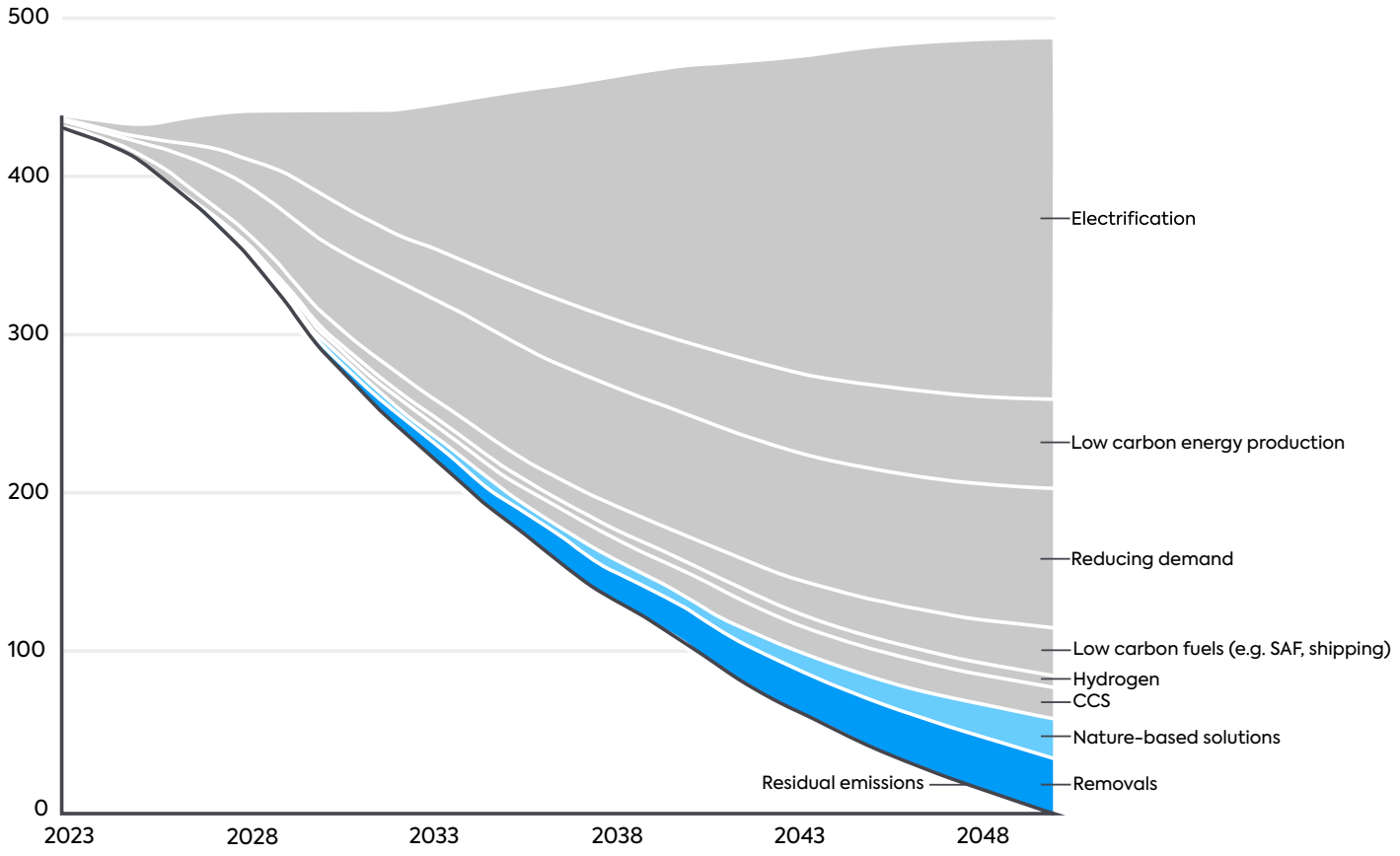


Figure 2: *Types of abatement in the UK's Climate Change Committee's Balanced Net Zero Pathway. Source: CCC's Seventh Carbon Budget*

[4] Climate Change Committee (2025). The Seventh Carbon Budget: Advice for the UK Government

There is a near-term political imperative to deal with this issue. Firstly, tackling climate change remains a key issue for voters. In the last election, climate change was one of the top three reasons that Labour and Lib Dem voters gave for their votes. On the other side of the spectrum, there is no polling evidence that people voted Reform because of the party's climate policies.[5] Secondly, the UK has already subscribed to delivering 5 Mt of engineered GGR by 2030. By the 2029 election, it will become clear whether the UK's targets are within reach or way off track.

Lastly, while the UK has met every carbon budget it has set to date, headroom for subsequent budgets is becoming tighter. The 'last mile' of the decarbonisation journey will be increasingly challenging, and while a focus on near-term wins like clean power is critical, investment in longer-term solutions is also vital to keep voters on side. A sustained focus on GGR is thus a necessary corollary of Labour's industrial and infrastructure policies. Policies including airport expansions and sustained conventional steelmaking each reinforce a trajectory in which GGR is needed at scale.

Scaling GGR requires a robust mix of technology innovation, supportive policy and investment. Research funding, technological demonstrations and private investment through voluntary carbon markets are expanding, but demand-side policies remain weak. Effective regulation, rigorous monitoring, and integration into compliance markets will be critical to accelerating deployment.

[5] Climate Outreach (2024). The new parliament's climate story

THE GGR OPPORTUNITY FOR THE UK

The GGR industry is a trillion-dollar opportunity. McKinsey estimates that the whole GGR industry (conventional and engineered) will be worth $1.2 trillion by 2050.[6] For context, if this were to happen it would be worth more than the global airlines industry.[7] If the UK can position itself as a global GGR leader – achieving our near-term climate targets in the process – there is a huge opportunity to drive growth. The GGR sector presents an opportunity for the UK to:

- **Harness technological innovation to drive export potential;**
- **Power a new wave of green jobs in the GGR sector;**
- **Demonstrate international leadership and meet climate targets.**

Each of these opportunities is outlined below.

Harness technological innovation to drive export potential

The UK has long been at the forefront of scientific discovery. With world-class universities and research institutions, it consistently ranks among the top three nations for research output, sitting behind only the United States and China.[8] This intellectual firepower is the foundation for positioning the UK as a global leader in GGR technology—a sector with the potential to become a major economic and industrial asset.

The UK's expertise in geochemistry, geophysics and geology provides a critical advantage in developing GGR solutions.[9] Enhanced rock weathering (ERW) and CCS-enabled methods like DACCS and BECCS — among the most promising GGR methods identified by the IPCC — rely on deep scientific knowledge in these fields.

Spending to date by UK Research and Innovation (UKRI) and the Department for Energy Security and Net Zero (DESNZ) has put the UK in a leading position on GGR. The UK exceeds the EU-27 average in research grants for GGR projects, and along with Norway and Switzerland account for 11% of all global funding support for GGR; these efforts put the UK among the highest per capita investment in GGR globally.[10] For projects moving out of research environments, support has been offered through the Net Zero Innovation Portfolio, which has channelled £70m to support projects in the TRL range 4-7.[11]

London and the San Francisco Bay Area lead the world in the number of climate tech startups, with London hosting over 300 such companies.[12] This rapid expansion signals that the UK has both the financial and intellectual firepower to take the lead in GGR innovation. This positioning is reflected in the fast-growing GGR sector in the UK, with companies such as Carbon Hill, OCO Technology, Premier Forest, Origen, UNDO, Mission Zero, Drax and The Carbon Removers becoming industry leaders over the last few years, alongside start-ups offering auxiliary services like Kita, Isometric, BeZero Carbon, Sylvera and beyond.

[6] McKinsey (2023). Carbon removals: How to scale a new gigaton industry

[7] Forecast 2024 revenues for global commercial airlines. IATA (2023). Industry Statistics Fact Sheet December 2023

[8] BEIS (2022). International comparison of the UK research base, 2022

[9] According to the 2025 QS World University Rankings by Subject: Geophysics, the University of Oxford is ranked 2nd globally, while the University of Cambridge holds the 6th position. In the field of Earth &Marine Sciences, QS places the University of Oxford at 3rd, the University of Cambridge at 4th, and Imperial College London at 17th. QS Top Universities (2025). QS World University Rankings by Subject 2025

[10] Smith, S et al. (2024). ibid

[11] DESNZ (2022). Projects developing innovative carbon removal tech benefit from over £54 million government funding

[12] dealroom.co & London & Partners (2022). World leading tech hubs: London and Bay Area

Despite the UK's strengths in research and innovation, there is a persistent challenge in converting scientific expertise into commercial success. Only 5-7% of UK businesses collaborate with universities, higher education institutions, or public research organisations.[13] The UK also lags behind other European nations in securing intellectual property. Between 2012 and 2016, Germany filed 246% more patents in environmentally related technologies than the UK, while France outperformed the UK by 54%.[14]

The Inflation Reduction Act and Bipartisan Infrastructure Law in the US – which in past years have drawn talent and technologies away from the UK with their substantial funding allocation towards GGR – provide a model for bold industry-building policy. By 2022, the US had committed as much as $17 billion towards natural and engineered GGR across the two instruments, not including billions in tax credits through the cornerstone 45Q policy.[15] There is already evidence of companies moving into US jurisdictions to reap the rewards of this legislation, with Origen and Drax planning to deploy in the US, for example. That being said, there is still significant uncertainty around the new administration's approach to these technologies.

While countries like the US might have greater resources to channel towards GGR, the UK can build on its excellence in technology innovation to compete in key niches. Yet doing so will require a sharper focus on commercialisation and creating internationally competitive technologies. With the right structures in place, the UK has the potential to be a dominant force in the global GGR economy.

Power a new wave of up to 60,000 green jobs in the GGR sector

The UK's GGR industry has the potential to deliver tens of thousands of high-quality, geographically-distributed jobs - both through domestic project development and the export of technologies and services. With the right policies in place, it can help drive the UK's industrial renewal and support a fair transition away from fossil fuels.

The North Sea remains one of the UK's greatest physical assets. Its vast carbon storage capacity – equal to 200 years of UK emissions at current rates – could underpin a new carbon management economy - sustaining industrial jobs and breathing new life into regional supply chains. Many of the skills developed in oil and gas - in storage, transport and engineering - are directly transferable to CO_2 transport and storage for the GGR and CCS value chain. The majority of engineered removals are likely to be located in the North, the Midlands and in Scotland, with up to 77% of CCUS and GGR capacity expected to be clustered in these regions.[16]

The opportunity is already quantifiable. According to analysis aligned with the CCC's 7th Carbon Budget (CB7), GGR deployment in the UK could support up to 60,000 jobs by 2050.[17] That's based on delivering 35.8 million tonnes of engineered removals by mid-century (thus excluding further job creation through non-engineered methods), including:

- BECCS: 24.8 $MtCO_2$ per year, supporting 33,000 to 45,000 jobs
- DACCS: 8 $MtCO_2$ per year, supporting 6,000 to 9,000 jobs
- Enhanced weathering and biochar: 3 $MtCO_2$ per year, supporting 4,000 to 5,000 jobs

[13] Hughes, A. (2015). Review of approaches to the commercialisation of university research and support for university industry collaboration in the UK

[14] Onward (2021). Green Shoots: How to drive innovation to meet net zero

[15] WRI (2022). Carbon Removal in the Bipartisan Infrastructure Law and Inflation Reduction Act

[16] Onward (2021). Greening the Giants

[17] Based on top-down analysis using Rhodium Group's job intensity figures. Note: Carbon Gap is in the process of preparing a bottom-up assessment of potential GGR-related job creation in the UK.

Crucially, these are high-quality jobs. The median salary for roles across the GGR sector - engineers, technicians, construction specialists - is £48,838, around 30% higher than the UK average. And in the regions where GGR is likely to be concentrated, that premium is even greater: up to 48% higher in the North East, 42% in Wales, and 40% in the Midlands. It is worth noting that these jobs will also be highly skilled and transferrable from other industrial sectors.

GGR isn't just about industrial clusters – many methods can also deliver real benefits for the rural economy. Biochar alone made up a significant share of GGR credit sales in 2023. If just one-fifth of the UK's 2030 removal target – around 1 $MtCO_2$ – were delivered through biochar, that could generate around £100 million in revenue for farmers and rural developers (assuming a conservative credit price of £100 per tonne). With improvements in MRV, other land-based methods like peatland restoration and soil carbon could follow suit.

Nurturing a domestic GGR sector will bring domestic economic benefits. The UK has made a start through its CCUS clusters programme - but it must now be expanded and aligned with the broader GGR agenda. The prize is not just climate credibility - it's tens of thousands of well-paid jobs in places that need them most.

Lead by example and re-assert global leadership

The UK was the first major economy to legislate net zero. That milestone mattered since within a year, over 70% of global GDP was covered by similar targets.[18] It showed that when the UK moves first, others follow.

But global leadership is not a trophy. It is a muscle that needs to be developed and maintained, and right now, we are losing ground.

Carbon removal is the next frontier. The IPCC states that between 5 and 10 billion tonnes of removals will be needed annually by 2050 to stay within 1.5-2°C.[19] Yet today, the global market delivers only a fraction of that.[20] No country has cracked the challenge at scale; that is the UK's opening.

Removals are a strategic asset. With high-quality removals priced at $100-400 per tonne depending on the technology, GGR is a future trillion-dollar market.[21] Countries that move first to build high-integrity supply, trusted standards and exportable technology will own the rails of a new climate economy.

The UK already has a track record of climate policy, with real soft power on the global stage. When the UK banned coal, others followed. When it launched the Powering Past Coal Alliance, membership grew to over 180 national and subnational governments, utilities, and businesses.[22] When it hosted COP26, it helped broker the final agreement on Article 6 after years of deadlock.[23]

[18] Energy & Climate Intelligence Unit (2025). Net Zero Tracker

[19] IPCC (2022). Climate Change 2022 Mitigation of Climate Change: Working Group III Contribution to the Sixth Assessment Report of the Intergovernmental Panel on Climate Change.

[20] Smith, S et al. (2024). ibid

[21] National Academies of Sciences, Engineering, and Medicine (2022). A Research Strategy for Ocean-based Carbon Dioxide Removal and Sequestration Washington, DC: The National Academies Press.

[22] Powering Past Coal Alliance (2025). Our Members

[23] UNFCCC (2021). COP26 Reaches Consensus on Key Actions to Address Climate Change

That influence came from credibility - from acting first, acting credibly, and acting consistently. We need to do the same now on removals.

The UK has the necessary building blocks: the British Geological Survey, world-leading satellite and MRV firms, a strong finance sector, top-tier universities, and a fast-growing ecosystem of carbon removal startups.[24]

It also has the imperative - DESNZ has a stated ambition for 5 million tonnes of engineered removals by 2030, and 23 million tonnes a year by 2035 to stay on track for net zero. We are not on course and every year we delay is a year in which others write the rules.

Global GGR leadership is industrial strategy and foreign policy in one. If we lead on removals, we create high-wage jobs, attract global buyers, shape international rules, and secure UK soft power in a decade in which climate credibility will define both diplomatic influence and economic opportunity.

[24] Royal Society & Royal Academy of Engineering (2018). Greenhouse gas removal

SOLUTIONS FOR UK GGR LEADERSHIP

The imperative of engineered GGR for the UK is unequivocal. Developing an engineered removals sector is necessary to meet our climate goals whilst delivering economic and political benefits. The UK has already positioned itself as a leader through critical initiatives like the GGR Business Model (a contract-for-difference-based revenue support mechanism that is currently under development), the CCUS clusters programme, licensing for CO_2 storage, plans to integrate GGRs into the UK ETS, development of GGR standards, and support for research and innovation in GGR projects through flagship UKRI and DESNZ programmes.

Yet we must plug critical gaps in the policy framework. While the UK has made a strong start, we now need to take a longer-term view. Smart policy design is needed to draw as much private capital into the sector as possible, limiting the share of costs borne by the Treasury or by consumers. We also need to address the remaining gaps in the innovation pipeline, set clear rules to ensure high-impact projects, and shore-up policy direction and political support to make GGRs work. Here we outline six key action areas to ignite a rapid expansion of this emerging sector, across three pillars: corporate demand, clear foundations for success, and centralising GGR within UK climate policy.

Pillar One: Drive corporate demand

Perhaps the key issue for scaling GGR currently is the need for demand at scale. According to advisor at BECCS developer Stockholm Exergi, Johan Börje, *"The question number one for permanent CDR is demand. That is also question number 2. And number 3."* [25]

Demand is critical to establishing the business case for investing in GGR projects and therefore to scaling up supply.

Corporates are seen as a critical source of demand for GGRs. In line with guidance frameworks like SBTi, many corporates are expected to have some residual emissions persisting after deep decarbonisation, which will need to be addressed via removals if net zero is to be achieved.

Given this attention on corporates as key buyers of credits (which include, but are not limited to, GGR), markets for carbon are often divided into two groups: 'voluntary' markets, where corporates buy carbon credits on a purely voluntary basis, and 'compliance' markets, where corporates are required to buy carbon credits under law. Emissions trading schemes (ETSs) are examples of compliance markets, where companies in scope must buy allowances commensurate to the volume of greenhouse gases they release to the atmosphere.

Pillar	1. Drive corporate demand	2. Lay the foundations for success	3. Mainstream GGR within UK climate policy
Recommendation	1a. Kick-start demand by using public GGR procurement to encourage private purchases	2a. Create funding instruments for R&D and innovation, and scale-up	3a. Place GGR at the heart of the CCUS clusters programme
	1b. Establish an effective compliance market through the UK ETS	2b. Maximise the impact of UK GGR methodologies	
		2c. Develop business models for other near-commercial GGRs such as biochar and enhanced rock weathering	

Table 1: *Recommendations for UK policy leadership on engineered GGR.*

[25] Johan Börje (2025). LinkedIn post

The voluntary carbon market (VCM) has grown quickly in recent years, from US$320m in 2019 to US$723m in 2023 (peaking at US$2.1bn in 2021) by value of traded credits.[26] Within the VCM, the market for carbon removals was placed at around US$66m in 2023. Forecasts for significant long-term growth in the GGR market persist. McKinsey indicates a value of US $0.3-1.2tn by 2050 in terms of market revenues, to deliver the amount of GGR required for net zero.[27]

The VCM constitutes a critical source of revenue for GGR projects. Yet, given the voluntary and unregulated nature of the VCM, it has been repeatedly set back by scandal and distrust, with corporate practices for using carbon credits often characterised as a race to the bottom. Avoiding these same quality issues when establishing a voluntary GGR market will be critical. The VCM also risks lacking reliability for GGR developers – the interests of buyers can change quickly, either as preferences for different project types shift, new evidence emerges (e.g. about the quality of certain project types), or as buyers withdraw involvement altogether. These persistent risks present a challenge for GGR developers in establishing a business case in the VCM.

At the same time, compliance markets are often seen as a 'north star' for GGR. Given that a compliance market establishes a legally enforceable obligation to buy GGR, it can provide a more reliable source of revenue for GGR projects. Compliance markets could bring in a wider range of buyers compared with the select group of firms that currently buy credits voluntarily. Such markets could also create standardisation and harmonisation, setting clear rules about what type of credits or projects are eligible, in terms of (for example) methods, permanence levels, MRV protocols, and certification systems.

Clearly, the UK must catalyse action on both fronts – the VCM and compliance markets. Doing so means mobilising high-integrity corporate action as a near-term imperative. On the other hand, the UK needs to establish an underpinning market infrastructure that will precipitate large-scale projects and associated financing over the long term – this is most likely to happen via the UK Emissions Trading Scheme (ETS). Without demand for GGR, it will not be able to scale at the rate required.

Kick-start demand by using public GGR procurement to encourage private purchases

Public procurement of GGR is already attracting significant attention as a catalytic way to support novel projects to scale-up. A programme for government to buy GGR credits at a modest scale could offer significant benefits for innovation by providing revenue certainty for a diverse selection of GGR methods to establish early projects and achieve associated learnings and cost reductions. Procurement could also be a powerful lever to kick-start demand, guide and de-risk early corporate purchases, and promote larger-scale purchasing by directly challenging corporate buyers to match public funding.

A UK public procurement programme for GGR could fill a critical funding gap while the government undertakes efforts to establish the long-term framework (through the ETS and GGR Business Model). Such a programme would kick-start demand through a small envelope of public money. Carbon Gap has proposed a similar scheme for the EU, which is now under consideration,[28] recommending that funding is split between families of methods to promote diversity.[29]

[26] Ecosystem Marketplace (2024). State of the Voluntary Carbon Market

[27] McKinsey (2023). ibid

[28] European Commission (2025). Workshop: Perspectives on a Purchasing Programme for CRCF Permanent Carbon Removal Credits

[29] Carbon Gap (2024). Introducing an EU Pilot Procurement Programme

In the US, the CDR Purchase Pilot Prize was established in 2023 and has brought forward 24 new projects with only US$35m of investment, including drawing some European projects to the US. A proposal for a UK GGR procurement programme is outlined in Box 1. These figures are small but catalytic for the GGR sector. Over time, purchasing schemes can be ramped up or can transition into hybrid instruments like contracts for difference that use public money to supplement private purchases. Public procurement allows governments to kick-start demand and set the foundation for wider private sector involvement.

Critically, procurement could also create a 'certifier effect', whereby the governments' transactions in the GGR market provide confidence and direction for the private sector. Most directly, GGR projects that have sold to the government could be seen as more reliable suppliers for voluntary market buyers. More indirectly, state GGR purchases could provide information to guide buyers of GGR more generally – highlighting the GGR methods, permanence levels, certification standards and other characteristics that are seen as most impactful, providing de facto best practice in the market.

Box 1: A proposal for GGR procurement in the UK

The UK has an opportunity to further its international leadership on GGR innovation by establishing a GGR procurement programme. Here we outline a proposed approach to GGR procurement by the UK government, building on proposals for an international advanced market commitment to CDR, developed with Stripe Climate Fellow and former US DOE Senior Advisor Noah Deich.

Scale and duration
We propose that the UK commit £50m over the next three years for GGR purchases, either in its own right or as a commitment to match private sector purchases. This scale would be small enough to fit within budgetary constraints, while still being large enough to provide a catalytic demand signal to the sector. It would also align with other international precedents - such as the DOE's US$35m Purchase Pilot Prize and Canada's CA$10m procurement scheme under its Greening Government programme.

Scope
The scheme should be focused on high-durability GGR methods given that they face the most significant scaling challenge between now and the point of net zero and therefore represent the most catalytic area of potential investment. All high-durability methods could conceivably be in scope, but if there are concerns around double-subsidy for methods already due to be eligible for support via the GGR Business Model (namely power BECCS and DACCS), purchases could focus specifically on other methods such as CO2 mineralisation (including Enhanced Rock Weathering), non-power biomass carbon removal, biochar and a host of marine GGR options like ocean alkalinity enhancement (OAE) and direct ocean carbon capture and storage (DOCCS).

Mechanism
Options for the specific mechanism used include incorporation in the UK's Greening Government procurement efforts (like in Canada) or directed by DESNZ as an innovation prize or other milestone-based award (as done in the US). The scheme could be structured to support innovative UK GGR projects (in the UK and/or using UK- based technology and/or finance) in ways that complement existing UK GGR strategies. In particular, the scheme could be designed in such a way as to directly motivate private purchases - as per the DOE's Purchase Pilot Prize, which prioritised awards to projects that could secure the most private voluntary credit offtake agreements.

A procurement scheme can be explicitly designed to encourage private sector participation. The US DOE's CDR Purchase Pilot Prize is instructive in this regard. Firstly, the scheme was designed to encourage participating GGR suppliers to secure private purchases alongside public ones, with suppliers who manage to secure a greater number of private purchases being given a higher ranking in the prize award process. But the US prize was also accompanied by a Voluntary Carbon Removal Purchasing Challenge, encouraging private companies to support the effort by making their own purchases and notifying the government. The Challenge led private firms (Meta and Google) to mobilise a further US$70m for GGR.[30,31]

Crucially, procurement efforts must extend beyond just the 'usual candidates' of DACCS and BECCS and into novel but promising methods like enhanced rock weathering (ERW) and biochar. This expansion will be critical for creating confidence and accelerating investment into these promising but so far less prioritised CDR methods.

All in all, public procurement of GGR based on a clear strategy for purchasing provides a way to guide buyers in the GGR market without setting hard and fast rules. This approach is in keeping with the government's approach to date, which includes the publication of principles for VCM best practice,[32] diverging from, for example, the firmer EU approach of setting a regulated standard for Green Claims.

Establish an effective compliance market through the UK ETS

The current reliance of the GGR market on voluntary purchases from corporates inhibits demand growth and stops more developed financial mechanisms such as project finance and insurance from being unlocked. To scale GGR in the medium and long term, compliance markets will need to take up the reins. The government has already made this a long-term intention, by announcing plans to integrate engineered GGRs into the UK ETS and publishing a detailed set of considerations for integration (see Box 2).

Despite the government's 2024 consultation on ETS integration containing a wealth of progressive thinking and policy design on the topic, improvements are needed if the stated ambition of integration is to be achieved. The proposal presented in summer 2024 is not likely to deliver the expected volumes of higher-durability carbon removal in the requisite timeframe without specific design changes. There is no clear incentive for buyers to purchase high-quality GGR over other types of units, and the likelihood of buyers doing so voluntarily is overestimated. Corporates as a whole face capacity gaps that prevent GGR engagement, while also being deterred by uncertainty about the impacts and costs of different GGRs. To address these issues, ETS integration should:

- **Establish a GGR sub-mandate or alternative mechanism to ensure demand.** Such a mechanism would clarify the role of GGR in the ETS and in the transition to net zero, ensuring that an increasing share of ETS emissions are covered by GGRs. Critically, it would also create predictable demand from the ETS, making GGR projects more bankable.

- **Set and communicate eligibility rules for GGR projects.** The ETS should offer a mechanism for GGR project developers to be sure at Final Investment Decision that they will be able to sell their units into the ETS. This mechanism, again, is critical to the bankability of GGR projects.

[30] US DOE (2024). U.S. Department of Energy Announces Intent to Launch Voluntary Carbon Dioxide Removal Purchasing Challenge

[31] Ranevska, S (2024). Meta Answers DOE's Carbon Removal Challenge With $35M Pledge. Carbon Herald

[32] DESNZ (2024). Principles for voluntary carbon and nature market integrity

- **Exclude low-durability woodland credits.** In line with the recommendations of leading scientists, low-durability offsets cannot effectively compensate for industrial emissions, and 'durable net zero' (where residual fossil emissions are balanced like-for-like with highly durable removals) should be pursued as the long-term target.[33,34] Only highly durable GGRs should be included in the ETS to ensure credibility and uphold climate benefits.

Getting the compliance market right will be critical for setting the long-term framework for GGR. The measures above, in concert with the strong proposals already outlined by government, would deliver a robust climate policy instrument that drives ongoing emissions reductions while establishing a much-needed demand signal for GGR. Indeed, announced plans to link the UK and EU emissions trading schemes may influence design choices – though it is hoped that the UK's GGR plans can be ringfenced, rather than nullified, within this new context, potentially even influencing the wider EU direction on ETS integration.

[33] Axelsson, K. et al. (2024). Oxford Principles for Net Zero Aligned Carbon Offsetting (revised 2024) Oxford: Smith School of Enterprise and the Environment, University of Oxford.

[34] Fankhauser, S. et al. (2021). The meaning of net zero and how to get it right. Nature Climate Change, 12, 15–21.

Box 2: The UK's proposal to integrate greenhouse gas removals into the UK Emissions Trading Scheme

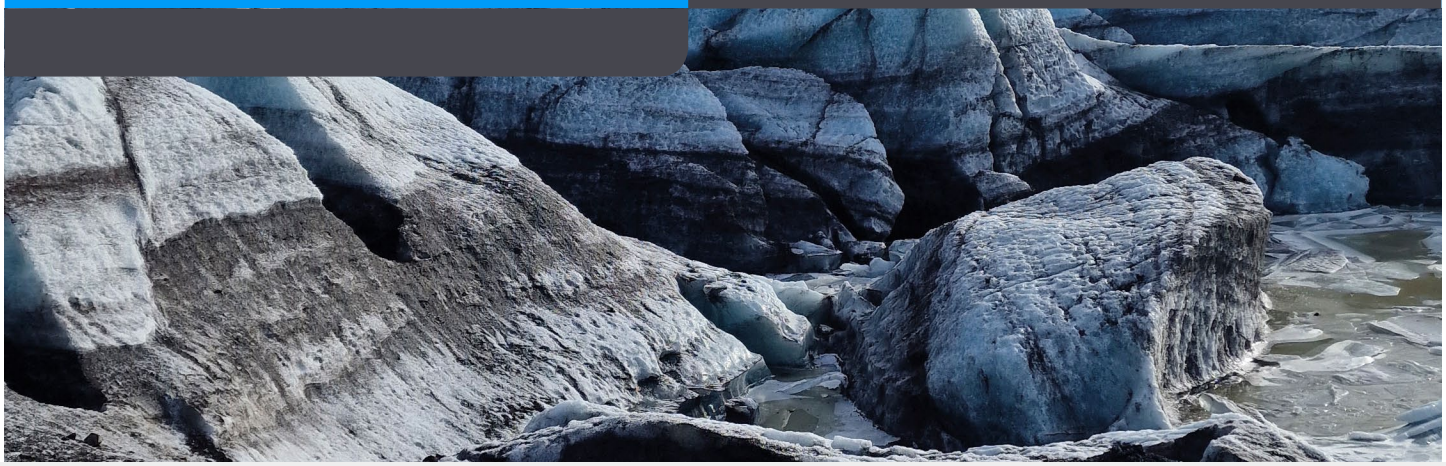
In 2023, the UK government confirmed its view that the UK Emissions Trading Scheme (ETS) is an 'appropriate long-term market for GGRs'. In summer 2024, the ETS Authority consulted on key elements of the proposed integration of GGRs into the UK ETS. The consultation document comprised a series of 'minded to' positions of the UK ETS Authority as well as open questions about GGR integration. These are outlined below.

MINDED TO

- **Cap design:** The Authority intends to 'maintain the gross cap' on allowances in the UK ETS initially. Any GGRs entering the market would lead to the removal of an equal number of conventional allowances (UKAs) – meaning that real emissions under the ETS would remain unchanged.
- **Ex-post allowances:** The Authority believes that GGR operators should be issued with allowances in the UK ETS after the removal has taken place and been verified (ex-post).
- **Restriction to UK-based GGRs:** For initial integration, the Authority proposes that only UK-based GGRs will be eligible for participation in the UK ETS.
- **Pathway to integration:** The Authority plans to include a 'supply control mechanism' during early integration, limiting the amount of GGRs that can enter the ETS.
- **Timing of integration:** The earliest possible date for integration would be 2028.

OPEN POSITIONS

- **Cap design:** In the later phases of integration, a maintained cap may no longer be relevant, as eventually there will be no UKAs to substitute with GGRs. The Authority reserves the option to eventually establish a new cap that would continue to issue GGR allowances in order to sustain GGR demand under the ETS.
- **Woodland GGR credits:** The Authority sought views on whether new ex-post woodland units generated in line with UK Woodland Carbon Code standards should be considered for inclusion in the UK ETS.
- **Permanence:** The Authority sought views on a three-pronged permanence framework involving a minimum storage period, liability rules for operators, and fungibility measures that modulate the value of different GGR allowances to reflect their permanence.
- **Differentiation:** The Authority explored the possible differentiation of UKAs and GGR-backed allowances – offering them the same compliance value but potentially including information to differentiate between allowance types.



Box 3: Domestic or international removals for UK climate targets?

A live topic in GGR policymaking is the role of international GGR units in countries' climate plans, given the potential of Article 6 of the Paris Agreement to facilitate the trading of removals (and other types of credits) between nations.

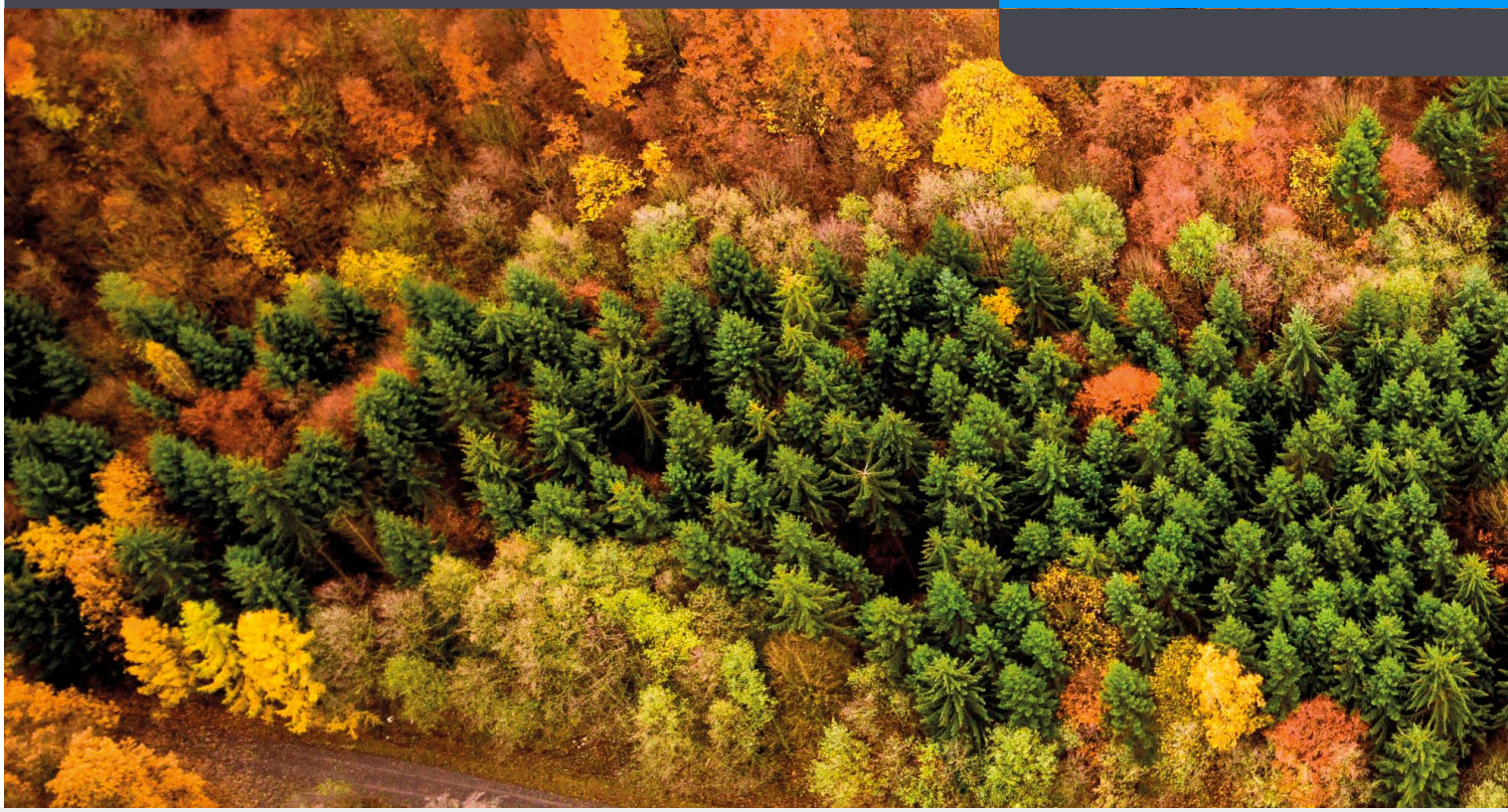
The UK currently does not intend to use international credits. The Seventh Carbon Budget outlines a fully domestic approach to achieving UK emissions goals for the 2038–2042 period, and the latest Nationally Determined Contribution states that "the UK does not currently intend to use cooperative approaches" under Article 6 but that it "reserves the right" to do so. The ETS Authority (see Box 2) proposes only allowing UK-based GGRs in the ETS. Any shift to the current, domestically focused position would open up significant questions for policymakers.

The ability to rely on domestic removals will depend on two things, namely on the UK:

- Deploying domestic GGR at the rates and scales needed to fulfil plans,
- Maintaining ambition on emissions reductions to ensure further GGRs are not required.

Questions persist around the reliability of GGRs delivered abroad as well as the risk of negative impacts on host countries and perverse incentives for buyer countries. Yet for some countries, domestic GGR supply could be constrained by factors like resource availability (land, biomass, CO_2 storage) and energy costs (particularly for the UK), prompting them to consider international trading.

>>



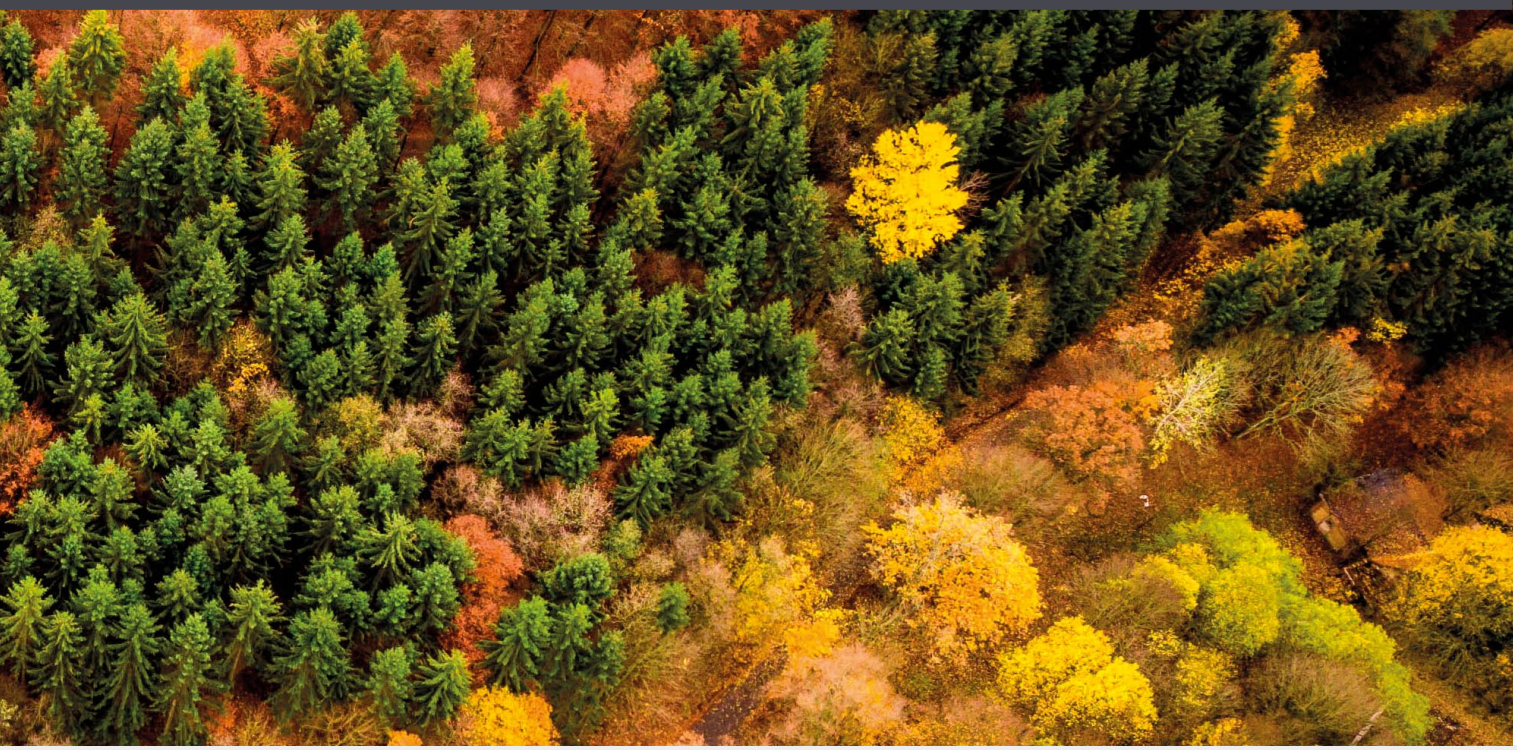
Proposals for international GGRs range from full fungibility with emissions reductions (an outcome that must be strictly avoided to ensure sustained mitigation ambition), to fungibility between domestic and international removals, to more restricted approaches. The latter category includes proposals to limit the volume of international units allowed or to place restrictions on the ownership of such units.

Such a mechanism could emulate the approach taken by Japan. Under Japan's GX-ETS, obligated Japanese companies can use international carbon removal credits for up to 5% of their emissions if they invest at least 20% in the project or act as a key technology provider. Projects must meet high standards for additionality, permanence and MRV in alignment with frameworks like CORSIA and the ICVCM's Core Carbon Principles. Equivalence is ensured through strict verification, early-stage involvement requirements and alignment with recognised global benchmarks.

A similar rule for the UK could incentivise British companies to co-invest in high-quality carbon removal projects abroad — particularly in underdeveloped regions with strong potential for scale — while maintaining strategic control and credibility. By expanding the pool of eligible GGRs (e.g. through the J-Credit approach outlined above) the UK could achieve greater liquidity and diversification in the carbon market, integrate development goals into climate policies, and support global climate action.

The emphasis on international and domestic deployment will depend on factors such as cost and resource availability. Nonetheless, it is clear that a focus on international deployment would trade off against the economic and employment benefits at home. We note that linkage of the UK ETS to other trading systems like the EU ETS may deliver many of these goals indirectly.

While further work is needed to assess feasibility, governance, and geopolitical implications, the interplay between the allowability of international credits and the pace of domestic delivery will remain a live issue over the coming years.



Pillar Two: Lay the foundations

To retain UK talent and capture talent from overseas, it is imperative to cultivate a supportive environment for GGR research and innovation domestically. The UK to date has outperformed peers on GGR grants, but most funding is slated to end in 2025 and 2026 (namely the 'GGR-D' GGR demonstrators programme (including the CO_2RE research hub) and the 'DAC and GGR Innovation Programme'). Yet the UK possesses unique strengths such as world-leading universities, robust innovation hubs and closer public-private collaboration, all of which can be leveraged to drive advancements in GGR technologies. We recommend three key avenues for driving UK GGR innovation and ensuring that the sector has the foundational underpinnings that it needs to thrive:

Create funding instruments for R&D, innovation, and scale-up

UK GGR projects are stuck in the 'valley of death' - the chasm between promising research and commercial deployment. Without targeted funding and financing to bridge this gap, breakthrough technologies risk stalling before they ever reach market. Private capital alone won't close it; early-stage GGRs carry high technical and revenue risk, and few investors are willing to take that bet.

2025 represents a cliff edge. The UK's flagship R&D programmes - GGR-D, the CO_2RE Hub, and the GGR Innovation Programme - are set to end with no clear successor. These initiatives helped build early momentum, but left significant gaps: methods like DACCS, ocean-based GGR and hybrid systems were arguably underrepresented. Future funding must fill those gaps - not just to develop specific GGR methods, but to advance MRV approaches, enable field deployment, assess long-term social and environmental impacts, and create tools that support decision-making about where and when to deploy GGR within wider climate change mitigation strategies.

To address this gap, government should launch a GGR Innovation Catalyst Fund modelled on successful UKRI initiatives like the Faraday Battery Challenge. A dedicated £100 million over three years would support underfunded methods and cross-cutting technologies, from ocean alkalinity to scalable MRV systems.

At the demonstration stage, the Future Economy Loan Scheme – already operated by Innovate UK – should be expanded and ringfenced for GGR. Loans of up to £2 million – offered on patient, low-interest terms – could be targeted at companies transitioning out of the lab but not yet bankable by commercial lenders. Ringfencing at least £50 million for GGR over the next five years would provide the capital needed to prove new approaches and build investor confidence.

Further along the pipeline, the National Wealth Fund (NWF) must make GGR an explicit priority. Backed by government and geared toward clean growth, the NWF is ideally placed to support early deployment of GGR infrastructure through patient debt or equity finance. A dedicated allocation – e.g. £200 million over five years – could help innovative GGR projects scale and support strategic goals like regional regeneration and green jobs. Together, government alongside UKRI, Innovate UK, and the NWF, could form a coordinated funding ecosystem – to support GGR from the lab to industrial scale. Global evidence shows that targeted public funding crowds in private investment when deployed strategically. The UK's challenge is not a lack of potential, it's the risk of losing momentum at this critical moment.

Maximise the impact of UK GGR methodologies

Defining quality in the context of GGR is critical. Without standards, buyers and regulators do not have visibility of the true impact of a GGR project; they cannot be assured that real removals have happened at all. Standards are needed to clearly define features like the appropriate inputs, conditions for deployment, how impact should be measured and calculated, and how risks should be managed – in short, 'what counts' as GGR. Alongside standards for project quality, certification frameworks – such as the EU CRCF (the Carbon Removal and Carbon Farming Regulation) – provide a process for carbon credits to be generated, transferred, and tracked, to ensure buyers do not abuse them or make misleading claims.

Given the challenges faced by the carbon market in the past, there is a critical need to build trust by setting a high bar for GGRs. The UK is taking an important step towards doing so, through its work with BSI to develop specifications for DACCS and BECCS. This process will start with the preparation of minimum quality thresholds (MQTs) for each GGR method, expected in 2025, followed by the development of full and detailed specifications by mid-2027.

However, the process adopted by government faces some potential issues. The primary aim of the methodologies is to serve as an eligibility requirement under the GGR Business Model. Publication of the MQTs in 2025 will allow any complying BECCS and DACCS projects to demonstrate eligibility for subsidy support. This emphasis on the near-term MQTs leaves uncertainty around the purpose, level of detail, and expected timeline for the full specifications.

The approach also provides little certainty on what might be coming down the line for the broader portfolio of GGR methods beyond DACCS and BECCS (a portfolio that the CCC increasingly tells us that we need at scale). While high-level, the MQTs remain method-specific; they do not set cross-cutting requirements on common issues like permanence, additionality, and sustainability that can provide useful direction for wider methods that might be certified at a later point (contrary to the approach adopted by the EU's CRCF, which involved a common framework applicable to many GGR methods, followed by a series of delegated acts setting out method-specific criteria).

In addition, technology-specific rules remain only part of the quality puzzle for GGR projects. There remains a gap for an overarching process that regulates the certification of GGR units against those rules, and the subsequent issuance of credits to buyers. A full certification process, mirroring that developed by the EU, would both uphold integrity in the GGR market and promote clarity for suppliers and buyers. Moreover, the process should include clear rules for registries, which play a vital role in tracking issued carbon credits, holding information about transactions and credit ownership, and whether or not credits have been retired. Crucially, the BSI process should also outline the relative roles of the MQTs and full specifications and set out a process for review and updating of those specifications.

The government should:

- As part of the BSI process:
  - Ensure the timely delivery of full GGR specifications for BECCS and DACCS;
  - Outline a process for how specifications will be updated as science and best practice evolves, including how reviews will be triggered, the expected frequency, and how DESNZ will navigate budget and capacity constraints that could limit the frequency of reviews;
  - As soon as possible, provide clarity on the next tranche of GGR methods for which BSI will develop specifications.
- Outside the BSI process, establish oversight of private actors involved in GGR standard-setting, namely registries and ratings agencies:
  - Registries must mandate the disclosure of certain information that is essential to establishing a policeable GGR market. See Box 4 for more detail.
  - Meanwhile, ratings agencies must ensure transparency, methodological rigour, and the avoidance of conflicts of interest. Ratings are increasingly influential in determining credit price and buyer confidence, yet their methodologies are largely self-governed. As a starting point, government could establish a voluntary code of conduct for ratings agencies, with a path to regulation if market maturity justifies it. Such a code could include minimum disclosure requirements, third-party review, and alignment with UK GGR standards where applicable.

Box 4: Transparency in the GGR market through consistent registry disclosures

To underpin any UK GGR market, government must establish robust rules for registries. As BSI moves forward with its methodologies for BECCS and DACCS, the role for registries that will list these certified units remains unclear. Requiring consistent and transparent information about GGR projects ensures removal units can be tracked as they are bought and sold, and suppliers and buyers can be held to account, for example, if removals are reversed.

In the EU certification framework, a single EU registry is established to centralise information on the GGR market. The UK could follow this approach, but could also allow for multiple privately run registries, as long as common (and sufficiently robust) standards are upheld.

The following requirements must be in place for GGR registries to operate effectively:

- Registries should mandate disclosure of essential information regarding the GGRs used – for example, the status of certified units (issued/retired/expired), the ownership of the units and the expected duration of carbon storage.
- Registries should also contain information related to liability for GGR reversals and be used to ensure that buyers who retire GGR units remain responsible for ensuring accurate accounting and redress if reversals occur.[35]

[35] This means taking appropriate measures if carbon is released, by purchasing a replacement unit where necessary to uphold any claim or making appropriate disclosures or updates to GHG inventories to reflect changes that have taken place.

Develop business models for near-commercial GGRs such as biochar and enhanced rock weathering

The UK's carbon removal ambitions will not be met through CCS-based GGR alone. A broader portfolio of high-integrity solutions must be brought into the policy mainstream. Among the most promising are biochar and enhanced rock weathering. These methods offer durable carbon storage with significant co-benefits. But without credible, long-term business models, they will remain stuck in pilot mode.

According to the Climate Change Committee's (CCC) Seventh Carbon Budget, biochar and enhanced rock weathering are projected to contribute a combined total of approximately 3 million tonnes of carbon removal per year by 2050, representing about 8% of the UK's total expected volume of GGR. The science is sound, trials are underway, and demand from corporate buyers is growing - but the economics remain marginal.

Currently, very few projects are being built. There are fewer than 15 biochar plants operating at commercial scale in the UK, and enhanced rock weathering developers report major difficulties securing investment. The reason is simple: there is no predictable revenue stream. Developers face volatile voluntary carbon credit prices, limited buyer visibility, and no policy-backed guarantee that high-quality removals will be purchased at a viable price.

The government should address this gap by designing tailored business models that provide revenue certainty. This could include:

- Contracts-for-difference that pay developers the difference between an agreed strike price and the market price of carbon credits.
- Price floors underwritten by government or public finance institutions to crowd in private capital.

These approaches are not new. They have already driven deployment of offshore wind, hydrogen production, and industrial carbon capture. Applying them to this next tier of GGR methods would send a powerful signal to investors that the UK intends to lead in the next generation of climate technologies.

Tailored business models are the missing link. Without them, near-commercial GGR solutions will remain under-deployed. With them, the UK could unlock millions of tonnes of durable removals, attract private investment, and build a globally competitive carbon removal sector.

Pillar Three: Mainstream GGR in UK climate policy

Despite early momentum in UK policy, today GGR remains a fringe issue with fragile political status and inadequate resources behind it. The UK must build a broader coalition of support and signal political intent while outlining a clear vision for the future. We recommend the following action to drive this long-term vision and ensure GGR delivers on its goals:

Place GGR at the heart of the CCUS clusters programme

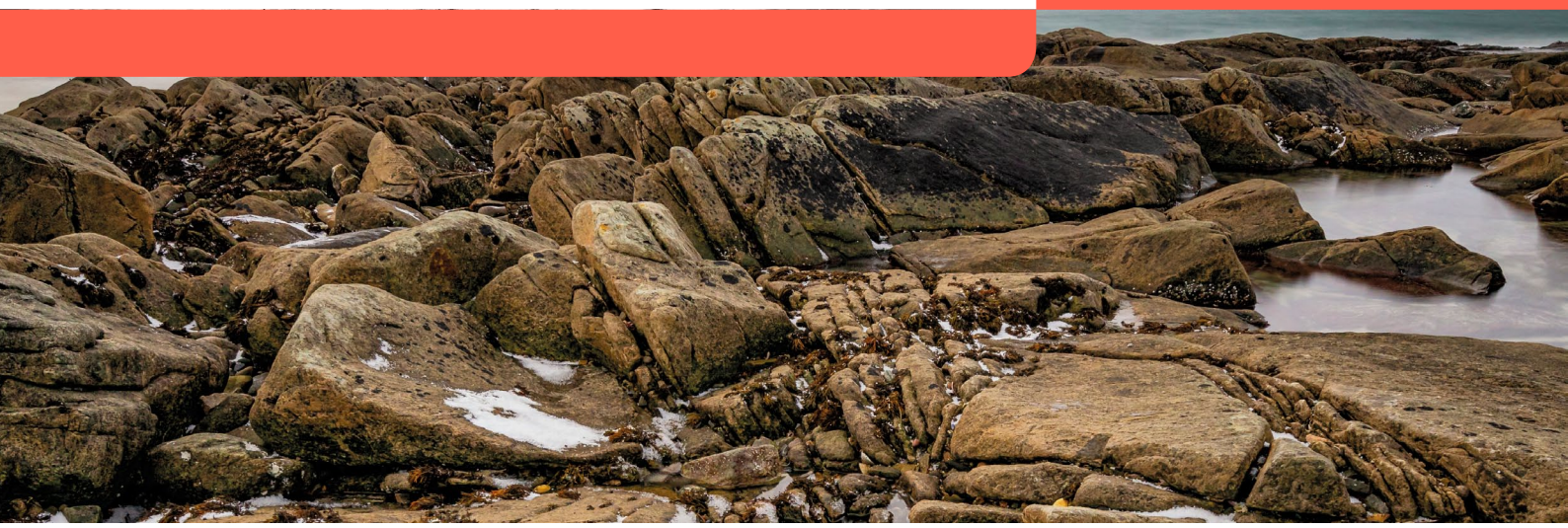
Chancellor Rachel Reeves announced on 11th June 2025 that Track-2 of the UK's Carbon Capture, Usage and Storage (CCUS) programme – comprising of the Acorn cluster in Scotland and the Viking cluster in the Humber – will move ahead and receive funding as planned (although, at the time of writing, specific funding amounts are yet to be confirmed). CCUS and GGR (specifically CCS-enabled methods such as DACCS and BECCS) have commonalities in terms of their technology and supply chain components as well as the financial and regulatory instruments used to support them. Demonstrating CCUS at scale in the UK will thus directly and indirectly facilitate GGR.

The CCUS clusters programme – the UK's flagship policy for CCUS – is crucial for enabling many GGR projects due to their dependence on a transport and storage supply chain. Yet no dedicated GGR projects have yet been funded.[36] Thus, the clusters programme has not yet fulfilled a core aim. The National Audit Office found that changes to the cluster sequencing programme have rendered it "unclear how DESNZ will meet the 2030 target for engineered Greenhouse Gas Removals".

The Labour government took a bold step by agreeing funding for CCUS projects within its first 100 days, allowing two projects in Teesside to move swiftly to final investment decision.[37] This move was subject to some scrutiny, including accusations of unnecessarily prolonging fossil fuel infrastructure and of taking unreasonable risk on "unproven" technology.
Yet in the face of this criticism, establishing the infrastructure for capturing, transporting, and storing CO_2 from appropriate sources has an unquestionable role in the UK's future according to independent CCC analysis. Though costly today, proving CCUS at scale will enable a more competitive sector in the future, paid for by polluters rather than the taxpayer. It will promote trust amongst both investors and the public. And through strong governance, risks like CO_2 leakage and mitigation deterrence should be manageable.

Demonstrating carbon capture and CO_2 storage will have strong direct and indirect impacts on the investability and scalability of GGR. And while some projects under the clusters programme may involve capture from legacy industries, it should not be overlooked that GGRs are expected to represent the lion's share of UK CO_2 capture activity by 2040.[38] By expanding the clusters programme across the country, such as through a Scottish cluster, the UK can truly champion a role for GGR and CCS in delivering distributional benefits in the economy. The clusters will be critical to creating a new carbon management economy in the North Sea.

Delivering large-scale CCUS in the UK is a complex and lengthy endeavour and vulnerable to political challenge. The CCUS clusters programme must maintain its current momentum, with more projects (for example, those under 'Track-1 Expansion') being approved and progressing to Final Investment Decision, and GGR must become an increasingly integral part of the programme if it is to have any chance of reaching the scale that the UK requires.



[36] Some energy-from-waste projects are in Track-1, which may engage in GGR activities as part of a wider revenue stack.

[37] DESNZ (2024). Contracts signed for UK's first carbon capture projects in Teesside

[38] Climate Change Committee (2020). The Sixth Carbon Budget: The UK's path to Net Zero

CONCLUSION

Engineered greenhouse gas removal is no longer a fringe idea; it's a foundational pillar of credible net zero strategy and a defining industrial opportunity of the next decade. Every credible pathway to net zero depends on these removals. The only question is whether the UK will lead in building, funding, and exporting them, or watch as others do.

We have the ingredients: world-class science, financial firepower, and vast North Sea storage. But we're at risk of letting first-mover advantage slip away. Other countries are already setting standards, writing cheques, and building pipelines. If the UK doesn't act now, it won't just fall behind, it will lose the chance to shape a market that could be worth over $1 trillion by mid-century.

This imperative isn't just about domestic delivery. It's about leadership in a global system. By scaling high-integrity GGR at home and exporting excellence abroad, the UK can shore up its net zero pathway, maximise social and economic dividends, and become a credible climate leader.

Done right, engineered GGR can be a growth engine for the UK economy, a bridge to global carbon markets, and a cornerstone of net zero delivery. The opportunity is ours to take; the risk is in waiting.

ABOUT US

Carbon Gap is an independent, Brussels and UK-based non-profit **organisation** supporting Europe's unique opportunity to lead the responsible deployment of carbon dioxide removal (CDR) to fight climate change through independent and science-led advice.

www.linkedin.com/company/carbongap
www.x.com/carbongap
contact@carbongap.org
www.carbongap.org

Carbon Gap is a registered charity (charity number 1200562) and a private company limited by guarantee (company number 13557860), registered in England and Wales. Registered office address: 71-75 Shelton Street, Covent Garden, London, WC2H 9JQ, UK.
EU Transparency Register: 159208346089-06