



# A layman's guide to carbon capture and storage



*In this layman's guide, Phil Kent, CEO at Gravis, explains carbon capture and storage.*

*He also examines investment opportunities in carbon capture and storage infrastructure, showcasing real-world case studies and underscoring its potential to deliver both environmental impact and financial returns.*

## What is carbon capture and storage?

Carbon capture and storage (CCS) is a critical technology for mitigating climate change. It captures carbon dioxide (CO<sub>2</sub>) emissions before they enter the atmosphere, and stores them securely. It is an essential process for decarbonising industries where emissions are hard to abate.

The UK has positioned itself as a leader in CCS, with the technology playing an important role in the UK's plan to decarbonise the economy and reach Net Zero. Plans are in place for the sequestration of 20–30 million tonnes of CO<sub>2</sub> annually by 2030, leveraging the UK's engineering expertise and extensive oil and gas experience, to place it at the forefront of global CCS deployment.

## What are carbon capture and storage clusters?

Industrial activity contributes approximately 25% of the UK's greenhouse gas emissions\*, with 66% of these industrial emissions concentrated in seven energy intensive industrial clusters\*. By focusing CCS efforts on these clusters, emission reductions can be achieved efficiently and at scale.

CCS clusters integrate carbon capture technologies into existing industrial sites,

enabling the collection, transportation, and permanent storage of CO<sub>2</sub> in geological formations such as the depleted North Sea oil and gas fields. Key projects include the East Coast Cluster (Teesside) and HyNet North West, which are both "Track1" initiatives expected to begin operations in 2028. Additional projects, including the Acorn Project in Scotland and the Viking Cluster in Humber, are designated as "Track 2", with delivery expected from 2030.

Beyond emissions reduction, CCS clusters drive economic benefits by preserving industrial jobs, attracting green investment, and enhancing the UK's energy security. The integration of CCS also supports hydrogen production, another crucial element in the clean energy transition in the UK.

## How much government support is there for carbon capture and storage?

The UK government has pledged up to £21.7 billion to CCS initiatives, highlighting its commitment to the technology to support its decarbonisation ambitions. Various financing mechanisms have been introduced to attract investment, including:

- **Contracts for Difference (CfD):** The government is using business models – similar to the successful CfD scheme that supported offshore wind – to provide long-term revenue certainty for carbon capture, utilisation and storage projects, attracting private finance.



- Capital Grants: Initial capital grant funding has been made available to support projects.
- Research & Development: Up to £100 million of funding has been made available for research and development of direct air capture (DAC) technology and other removal technologies.
- Transport and Storage Business Model: A specific model has been put in place to encourage investment in the infrastructure necessary to transport and store CO<sub>2</sub>.

### Investment case studies for carbon capture and storage

#### 1. Anaerobic Digestion and CO<sub>2</sub> Capture

Gravis has a long track record of investing in anaerobic digestion in the UK, supporting the development of plants which generate renewable energy from organic waste. While biogas and biomethane are cleaner alternatives to fossil fuels, CO<sub>2</sub> is a byproduct of the process.

Gravis is implementing CO<sub>2</sub> capture technology at its sites to liquefy and sell CO<sub>2</sub> for industrial applications, including food and beverage production, until large-scale storage projects come online. This initiative reduces emissions and generates additional revenue streams from Renewable Gas Guarantees of Origin (RGGOs) and carbon removal credits (CDRs).



#### 2. Evero Energy: Waste-Wood Biomass with Carbon Capture and Storage (BECCS)

Evero Energy processes 375,000 tonnes of locally sourced waste wood each year, converting it into renewable energy generating enough power for 125,000 homes annually. The wood is typically from demolition, and cannot be recycled due to inclusions of glue or metal, so has little other use and would otherwise go to landfill.

Gravis has supported Evero since 2013, funding the original construction of the Evermore and Widnes projects, and supporting additional improvement works. One of Evero's power plants, located near the HyNet Cluster, has developed a proposal for the implementation of CCS by 2029. The scheme would capture over 200,000 tonnes of CO<sub>2</sub> per year, significantly reducing emissions and extending the operational lifespan of the project.

### The investment opportunity in carbon capture and storage

The global push for decarbonisation cannot be achieved without large-scale CCS adoption. McKinsey estimates that by 2050, the CO<sub>2</sub> removal market will be valued between \$300 billion and \$1.2 trillion.\*\*

For investors, CCS represents a compelling opportunity to finance a broad range of infrastructure to support carbon capture, including CO<sub>2</sub> clusters, onshore compression facilities, and offshore pipeline and subsea injection and monitoring facilities – all within a UK regime that is deploying a number of supportive new subsidy regimes and financing structures. The UK's leadership in CCS also provides the potential for exportable expertise and technological innovation.

Despite challenges such as high costs, regulatory complexities, and infrastructure development, the combination of government backing and private capital is driving CCS adoption. With strategic investments, CCS clusters will play a pivotal role in reducing industrial emissions and supporting a sustainable energy transition on a global scale.

*\*Source:*

*<https://zerocarbonhubs.co.uk/industrial-clusters.html>*

*\*\*Source: Carbon removals: How to scale a new gigaton industry | McKinsey 2 ggr-power-beccs-business-models-december-2023.pdf (publishing.service.gov.uk)*



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