

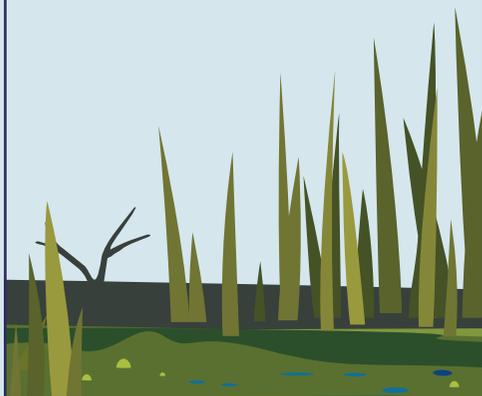


Greenhouse Gases Removal Demonstrator (GGR-D) projects

Peatland restoration

Peatlands are carbon-rich wetlands that occupy 12% of UK land area (a much higher percentage compared to the world in total, which is just 3%)

- UK peatlands store 3 billion tonnes of carbon, the same as all the forest in the UK, France and Germany put together.
- Peatland plants capture the greenhouse gas carbon dioxide (CO₂) through the process of photosynthesis. The acidic and waterlogged habitat means that when plants die, they do not decompose under the wet conditions and so lock in carbon.
- Human disturbance (eg, drainage for agriculture, forestry, grazing and peat extraction) means peatlands are rapidly losing this carbon to the atmosphere becoming a net source of greenhouse gases, as opposed to a net sink.
- By re-establishing, optimising and enhancing conditions that lead to peat formation, healthy peatlands will be restored and CO₂ will remain trapped and not released.



Enhanced rock weathering

Silicate rocks, such as basalt, absorb carbon dioxide (CO₂) as part of the natural chemical reactions that continuously erodes away rocks in our landscape over millions of years

- As part of a process called 'enhanced rock weathering', silicate rocks are crushed and the dust is spread over farmland.
- Because these crushed rocks have a much greater reactive surface area they can absorb more CO₂ than as solid rock.
- The crushed rock may also improve crop health and increase yields by re-supplying soils with depleted minerals.

Biochar

Biochar is a carbon-rich charcoal like substance made of organic material from agriculture and forestry

- Biochar is created at high temperature in the absence of oxygen in a process called pyrolysis and generates energy and other useful by products.
- Biochar is then spread on farmland, potentially storing carbon in the soil for an extended period.
- Soil fertility and water retention may also be improved, increasing crop yields re-supplying soils with depleted mineral.



Afforestation

Afforestation, the establishment of a forest or stand of trees (forestation) in an area where there was no previous tree cover, utilises this process as an approach for CO₂ removal

- Trees are vital for our planet, absorbing carbon dioxide (CO₂) and producing oxygen (O₂).
- Woodlands store carbon in standing trees, in forest soils and in timber products.
- Co-benefits of afforestation include habitat creation, improving water quality, reducing flood risk, cleaning the air, and providing recreation.
- However, tree planting could be counter-productive and increase greenhouse gas emissions if the location, types of trees and ongoing management of the woodland are not carefully considered. One example of this would be planting trees on peatland.



Bioenergy crops

Bioenergy crops including Miscanthus grasses and coppice willow are grown, capturing carbon dioxide (CO₂) as part of photosynthesis

- Once harvested, the biomass is burnt to generate energy which is largely carbon neutral.
- If the CO₂ produced is not released but instead stored underground, a technology called bioenergy with carbon capture and storage (BECCS), the process is carbon negative.
- As these bioenergy crops are perennial, they remain in the ground for 20+ years, providing a renewable source of biomass and simultaneously sequestering carbon into the soil via long-lived root systems.

