

THE UK NEEDS A BALANCED PORTFOLIO OF GREENHOUSE GAS REMOVAL METHODS



A range of methods for removing greenhouse gases are available – each with its own profile of risks and benefits. GGR will transform the landscape, interact with a number of other policy objectives, and have implications for local communities and regions. These will need to be carefully navigated.

DIRECT AIR CARBON CAPTURE AND STORAGE (DACCS)



Potential =
1-25 MtCO₂/year

Scaling DACCS will require major infrastructure that may transform local landscapes.

Delivering 25 MtCO₂/yr of DACCS will:

- » Cover 50km² of land – about the area of Loch Ness,
- » Have a substantial energy demand, requiring dedicated offshore wind capacity greater than is currently installed in the UK.

BIOENERGY WITH CARBON CAPTURE AND STORAGE (BECCS)



Potential =
51-83 MtCO₂/year

The BECCS supply chain will depend on large-scale domestic and international biomass production.

Scaling BECCS in the UK alone will require 15-28 average-sized power stations (or 3-5 Drax-sized ones).

Nonetheless, these could generate 13-21 GW of electricity (compared with current UK gas generation of 32GW).

AFFORESTATION

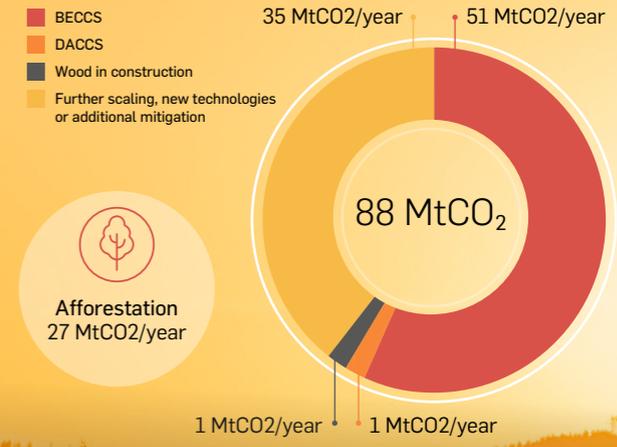


Up to
27 MtCO₂/year

Large-scale afforestation for GGR will see tree cover increase from 13% to 19% across the UK. For some areas this could mean a doubling of tree cover, with an area the size of Northern Ireland being planted.

Woodland can bring many additional benefits, including improved biodiversity, soil quality and flood management, as well as bringing health, well-being, and recreational value to local communities. These benefits will need to be carefully assessed and aligned with the perspectives and needs of the local communities and stakeholders.

Cost, technological readiness and overall removal potential often shape discussions about the optimal GGR technology mix. In reality, deployment will be shaped by a range of factors. Social, cultural and regulatory interactions will influence what is acceptable. Meanwhile, carbon benefits will need to integrate with other environmental objectives. Social factors will also shape which activities need GGR to decarbonise. How these interactions are navigated will be as important as the issues themselves.



Infrastructure

DACCS and BECCS will rely on infrastructure for transporting and storing CO₂. New infrastructure will impact local communities, and will require both regulatory and wider public approval. How will this be sought?



Liability

Forest carbon is vulnerable to fire, disease and drought over the lifetime of a tree and beyond.

For BECCS and DACCS, geologically-stored carbon must be monitored to ensure permanence.

Who will be liable for stored carbon?



Land Use

BECCS, Afforestation and DACCS all require land, to plant trees, grow bioenergy feedstock or build infrastructure. Where will the land come from? How will land use changes impact landscapes and local livelihoods? Challenges to local landscape, culture and heritage are likely to be contested.



New economic opportunities

The low-carbon transition will transform national and local economies. The new GGR sector will bring opportunities for local business and employment. Realising these opportunities will stem from how the local community is engaged.



Negotiating policy priorities

GGR options will interact with a range of policy areas, such as agriculture, flood management, biodiversity and wellbeing. How will these economic and non-financial values be balanced?