

# Can we deploy enough BECCS to achieve climate targets?

Carbon dioxide removal technologies may play a key role in meeting climate targets, but deploying Bioenergy with Carbon Capture and Storage (BECCS) at the rates suggested by some models will be challenging.

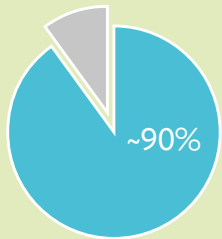
## What is BECCS?

Bioenergy with Carbon Capture and Storage (BECCS) is a process that has the potential to remove carbon from the atmosphere, resulting in 'negative emissions'.

## Why do we need BECCS?

The vast majority of IPCC scenarios that limit global warming to 2°C or under rely on the large scale use of BECCS.

## Out of 203 IPCC scenarios meeting the 2°C target:<sup>1</sup>



require the use of a significant amount of BECCS

## How BECCS works

- 1 BECCS involves planting forests and bioenergy crops (which absorb CO<sub>2</sub> as they grow), and using forestry and agricultural residues (waste),
- 2 burning them to produce electricity and capturing and storing the subsequent carbon emissions,
- 3 resulting in a net removal of carbon dioxide from the atmosphere, also described as 'negative emissions'.



1. Assuming at least a 50% probability of meeting 2°C  
2. The amount of sequestered carbon dioxide assumed to be delivered by the whole BECCS system

3. The AVOID 2 simulations assume that the efficiency of carbon capture and storage is 100% and that annual bioenergy crops are used

4. Alongside the crops necessary to feed a growing global population

## Uncertainties around BECCS use

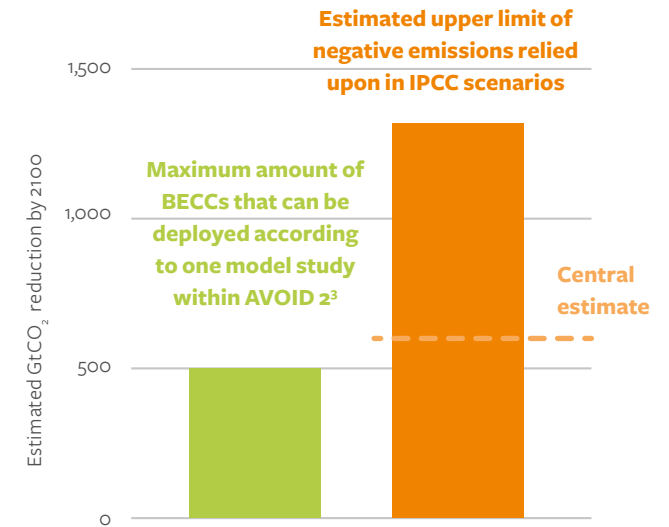
Deploying BECCS on the ambitious scale suggested relies on a number of assumptions, many of which could have significant implications, but are not fully understood.

## How experts rated nine assumptions about BECCS deployment in past studies

	Assumption	Influence on results	Expert confidence
<b>Bioenergy</b> 	Available land	High	Low
	Future yields	High	Low
	Proportion of energy supplied by biomass	High	Low
<b>CCS</b> 	Storage capacity	Medium	Medium
	Technology uptake	Medium	High
	Capture rate	High	High
<b>General</b> 	Policy framework	High	Low
	Social acceptability	High	Low
	Negative emissions <sup>2</sup>	High	Low

## For example...

AVOID 2 research suggests that land-use constraints will limit how much BECCS we can deploy.



This AVOID 2 study assumes that the equivalent of ~20% of land currently devoted to agriculture will be used to grow bioenergy crops by 2100.



Bioenergy crops will have other effects on climate that may influence the effectiveness of BECCS. For example, bioenergy crops reflect a different amount of sunlight to the bare soil or forest that they may replace.