

National Climate Strategies Bet on Forests and Soils to Reach Net-Zero Targets



PRESENTER:
Harry Smith
@harry_b_smith

Harry Smith¹, Dr Nem Vaughan¹, Dr Johanna Forster²

¹School of Environmental Sciences at the University of East Anglia, Tyndall Centre for Climate Change Research
²School of International Development at the University of East Anglia, Tyndall Centre for Climate Change Research

The problem is:

The deployment of Carbon Dioxide Removal (CDR), a range of methods that remove CO₂ from the atmosphere, is essential to reach national (or global) net-zero, yet **little is known about CDR in national net-zero planning**.

CDR is used to balance out so called 'residual' (or 'hard-to-abate') emissions towards the tail end of decarbonisation, so tend to be absent within short-term pledges commonly analysed.

We wanted to understand:

- How does CDR fit into national long-term targets?
- What methods were countries planning on using?
- To what extent relative to residual emissions?
- What challenges do countries see ahead?

CDR is more explicitly detailed in long-term national climate strategies (see Box 1). We analysed 41 strategies, all those published in English before the 1st January 2022, to find out the above.

We found:

- Long-term targets are often unclear in scope, leaving open the extent of CDR required to reach national net-zero.
- Strategies that quantify residual emissions and CDR (19/41 strategies), tend to **use forests or nature-based CDR to compensate for residual emissions** (Fig. 1).
- Beyond quantification, **enhancing the carbon stored in forests and soils are the most advocated methods** (40/41).
- Engineered-CDR, like direct air capture, is **less advocated, more speculative**, and dominated by Global North countries.
- The majority of strategies fail to quantify residual emissions (22/41).
- Strategies that quantify both residual emissions and CDR identify **national constraints** (e.g., wildfire risks for forests and geology for CO₂ storage) and highlight the need for **international collaboration** (e.g., via bilateral partnerships or international markets [Article 6]).

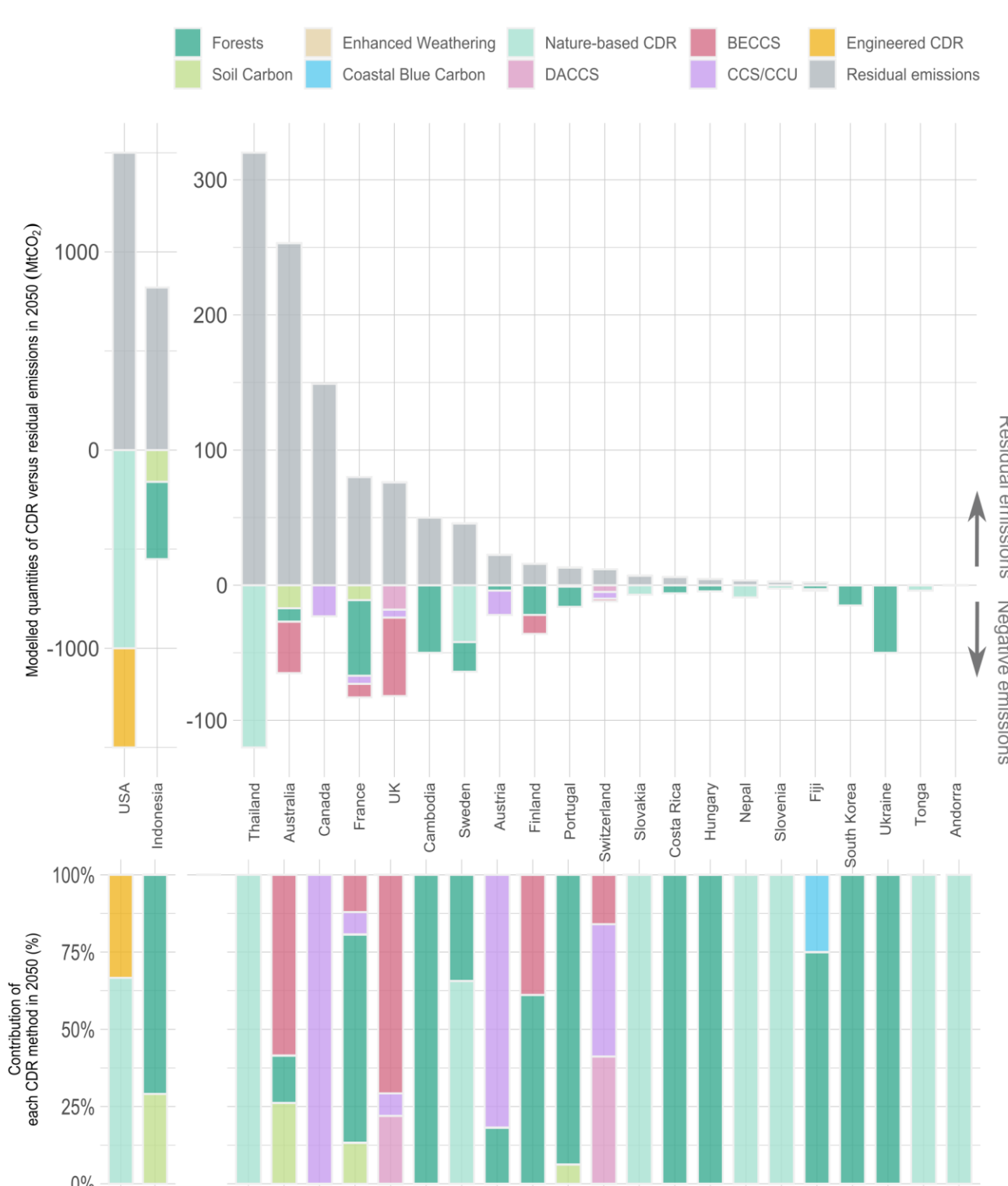
This means:

The **reliance on forests and soils may be risky**, these methods are often prone to reversal, saturate, and are hard to measure, characteristics acknowledged within our sample of strategies.

Nature-based CDR carries lots of co-benefits, e.g. for biodiversity, but engineered-CDR can provide continual negative emissions for the long-term.

Treating national net-zero as a state to be attained, not just momentarily achieved, and as a premise to net-negative targets, refocuses on **the necessity of emission reductions and national engagement with engineered-CDR**.

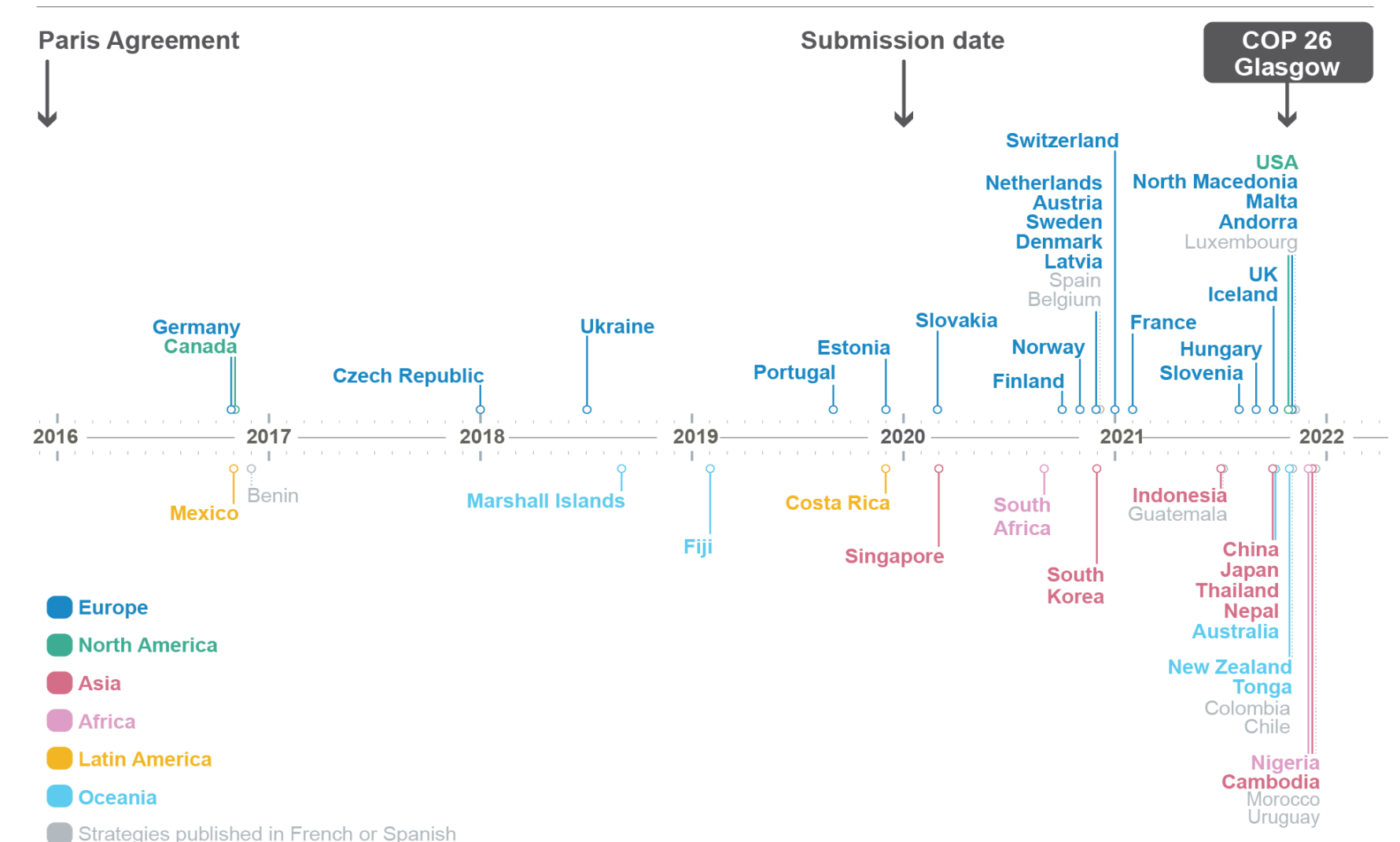
Fig 1. Residual emissions and CDR within our sample of long-term national climate strategies



Box 1: Long-Term National Climate Strategies?

The Paris Agreement supports two reporting exercises, nationally determined contributions (NDCs) and long-term low emission development strategies (LT-LEDS). **NDCs are compulsory and short-term (up to 2030), whilst LT-LEDS are up to 2050 or beyond, but optional.** Both are submitted to the UNFCCC (Fig.2). CDR tends to feature more readily and in more detail in LT-LEDS.

Fig 2. Timeline of long-term national climate strategies (or LT-LEDS)



The way forward:

Long-term national climate strategies provide for a means of comparing national approaches to CDR currently absent from other policy processes. The UNFCCC should therefore consider making them **a formal requirement, instead of optional**.

The CDR required is determined by how net-zero is defined, **long-term targets should be communicated against a shared definition of national net-zero**, specifying the gas and sectoral coverage, treatment of international aviation/shipping, and the use of international offsets/removals.

Long-term national climate strategies should be accompanied by detailed modelled pathways specifying residual emissions and CDR methods, alongside national feasibility assessments, and **efforts to 'near-term' CDR, such as separate targets within NDCs**.



Take a picture to download the pre-print, full article coming soon

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Article: 'Betting on Forests and Soils to Reach Net-Zero'
PhD Project: Promising Words, Evaluating Actions, Greenhouse Gas Removal in National Net-Zero Plans