

BECCS: Energizing Carbon Removals

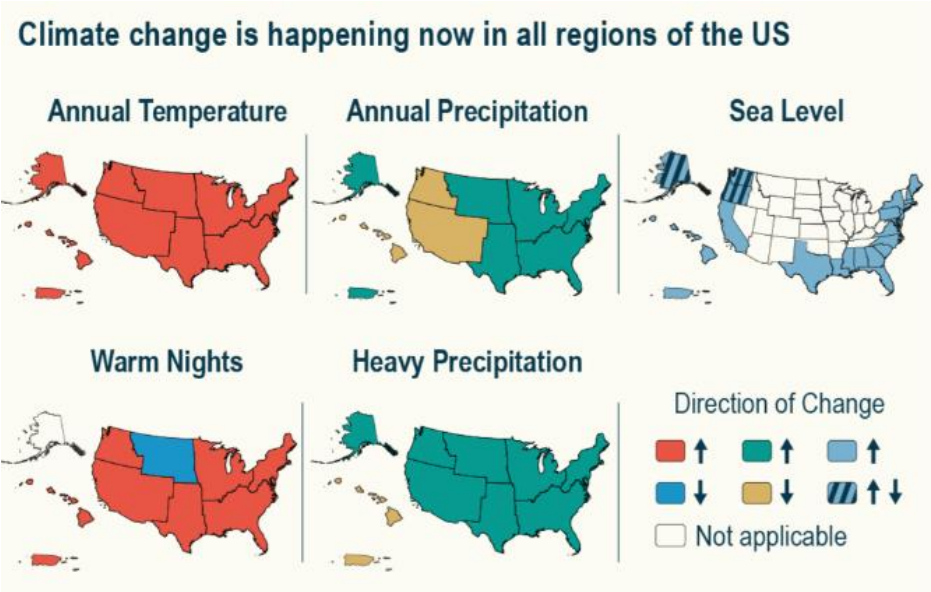
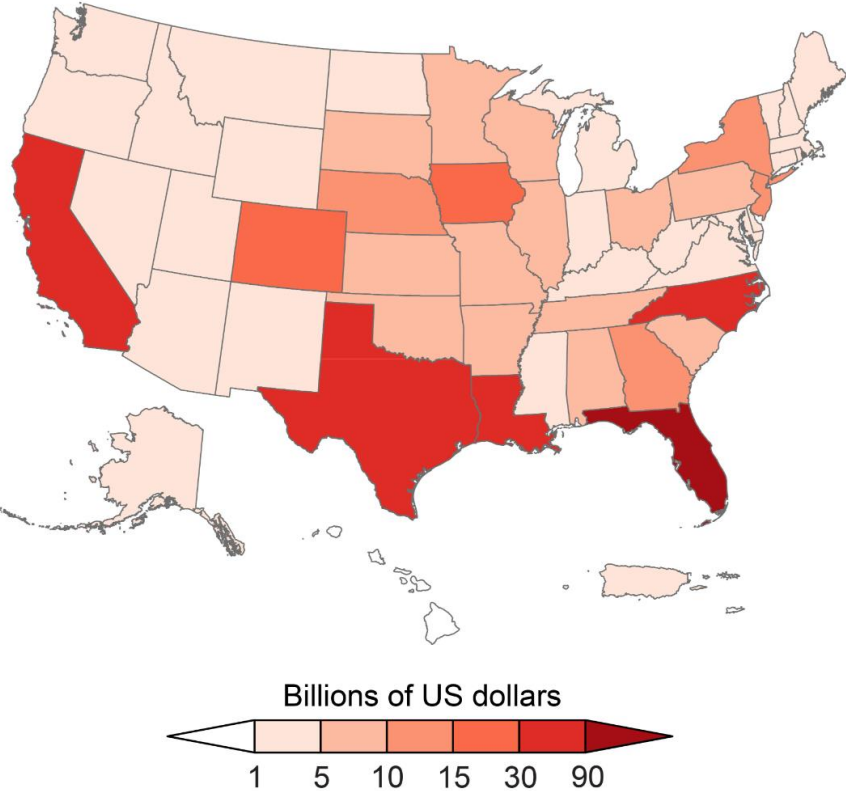
WBA Webinar

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International Affairs



Unprecedented impact of climate change in the U.S.

Damages by State from Billion-Dollar Disasters (2018–2022)



Rapid and Unprecedented Changes

- 800k years

Present-day levels of greenhouse gases in the atmosphere are higher than at any time in at least the past 800,000 years, with most of the emissions occurring since 1970.
- 3,000 years

The rate of sea level rise in the 20th century was faster than in any other century in at least the last 3,000 years.
- 2,000 years

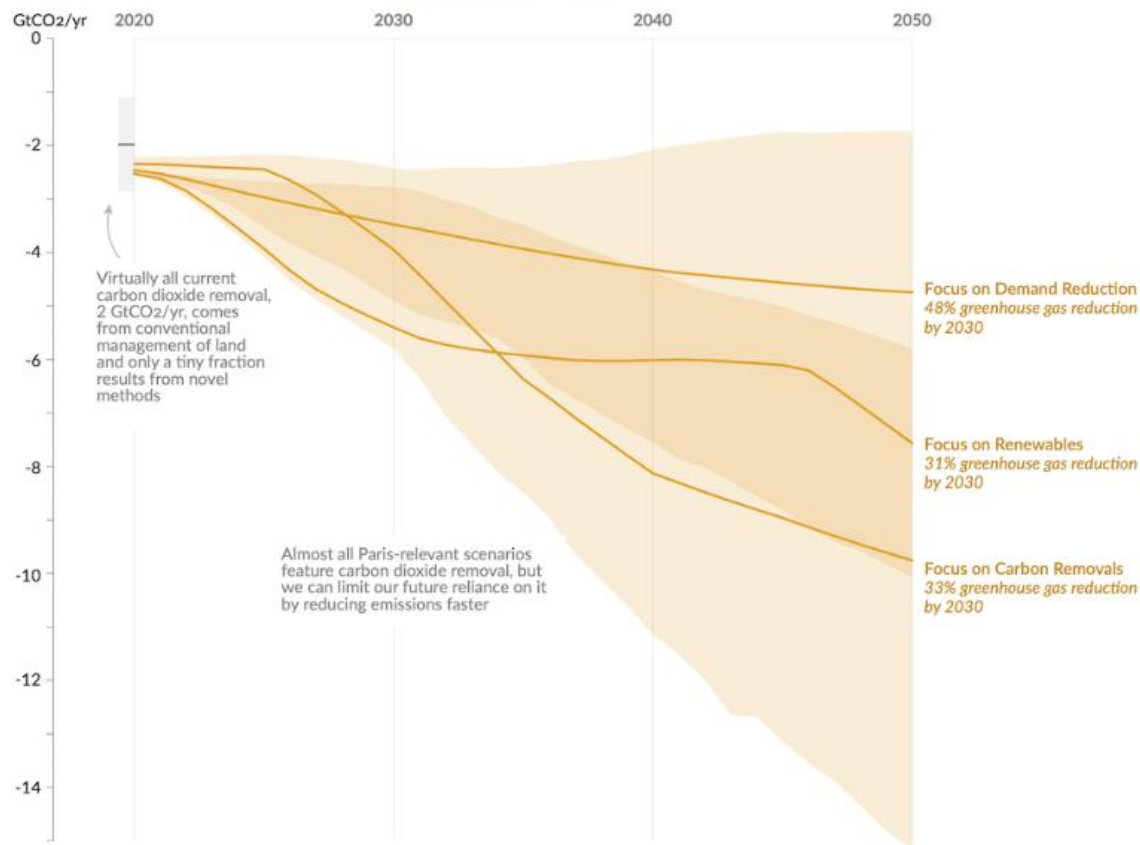
Global temperature has increased faster in the past 50 years than at any time in at least the past 2,000 years.
- 1,200 years

The current drought in the western US is now the most severe drought in at least 1,200 years and has persisted for decades.

Growing need for carbon removals...

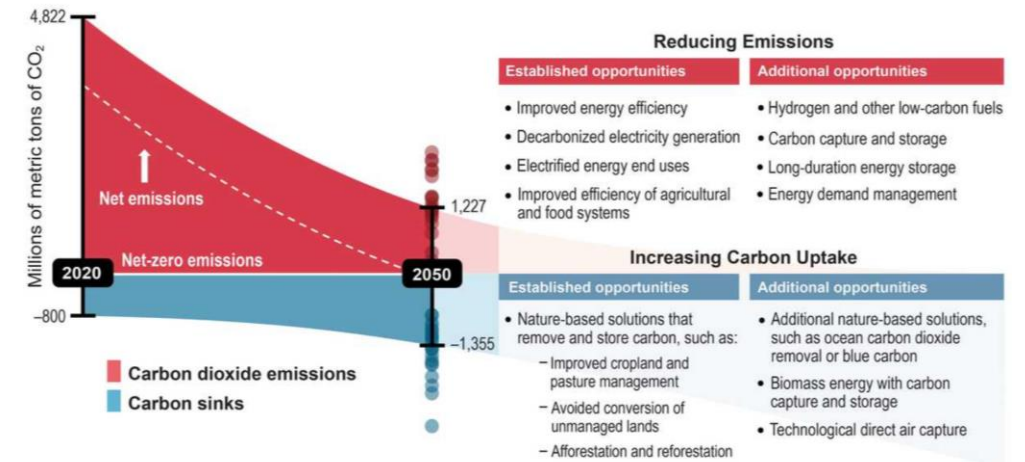
Globally

Carbon dioxide removal (GtCO₂/yr), in 2020 and in three Paris-relevant scenarios

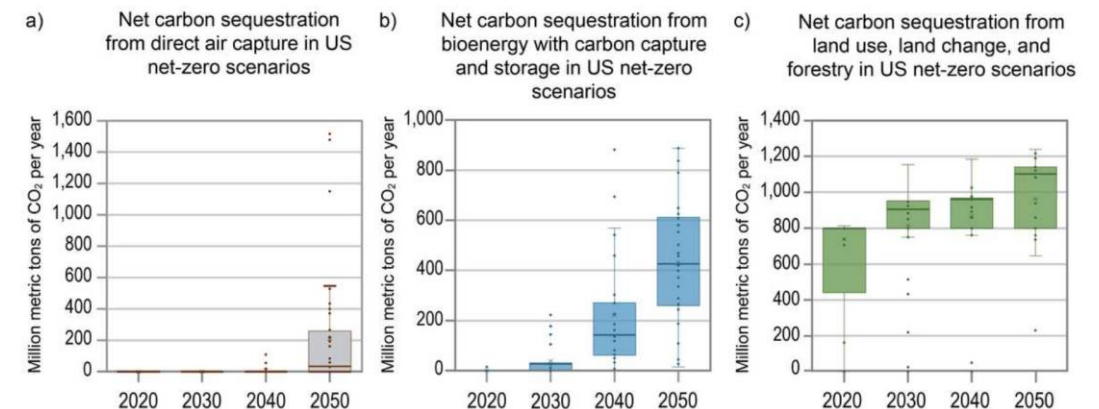


and in the U.S

Portfolio of Mitigation Options for Achieving Net Zero by 2050



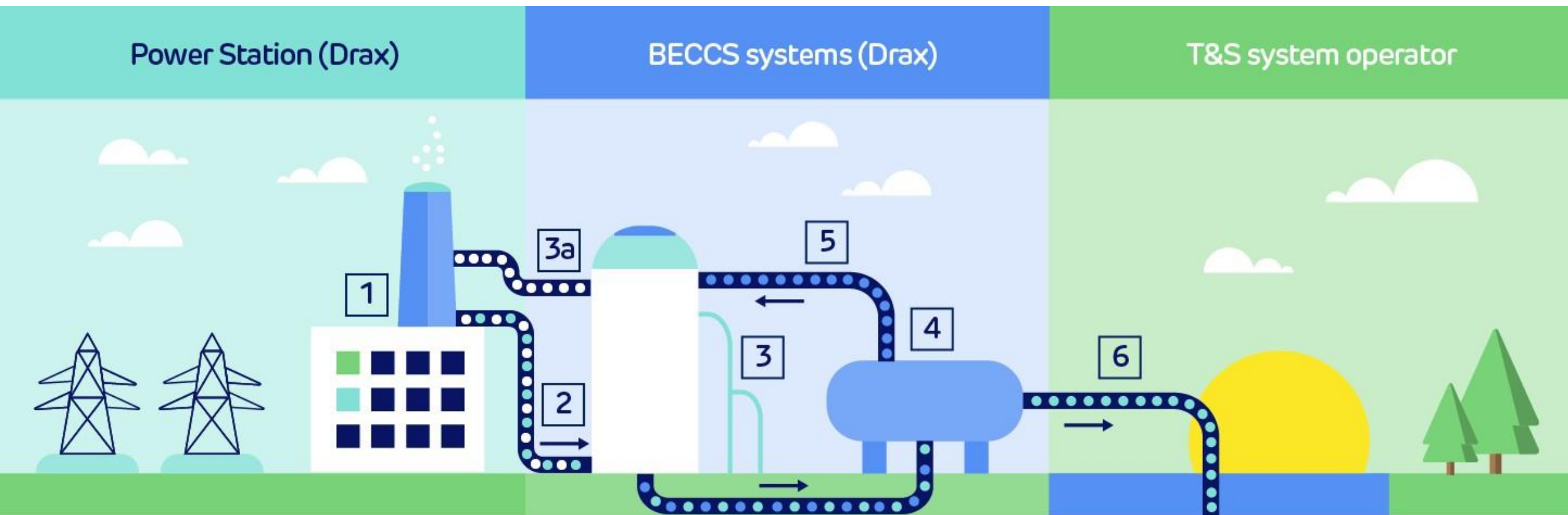
Scale and Type of Carbon Dioxide Removal in US Net-Zero Emissions Scenarios



Net-zero emissions scenarios project substantial carbon dioxide removal by 2050, although the type and quantities used in the scenarios vary considerably.

FIGURE 32.14. Annual carbon dioxide (CO₂) removals increase between 2020 and 2050 in scenarios that reach net zero by 2050, including nature-based sequestration on land (c), bioenergy with carbon capture and storage (b), and—after 2040—direct air capture (a). Median sequestration (thick horizontal lines) by land use, land-use change, and forestry increases less dramatically in scenarios. Plots show individual scenarios as points, the 25th–75th percentile ranges as rectangles, and the 10th–90th percentile ranges as thin vertical lines. The mean of each set of scenarios is represented by an X. Figure credit: University of California, Irvine.

Post-combustion capture on existing biomass generation units and solvent treatment of CO₂



KEY

- Flue gas
- CO₂
- Solvent

1. Flue gas containing CO₂ leaves the power production process
2. The flue gas is cooled and treated before entering an absorber tower
3. Inside the absorber tower, a chemical reaction takes place which extracts CO₂ from the flue gas. CO₂-depleted flue gas is released into the atmosphere (3a)
4. The solvent containing the CO₂ is heated in a re-boiler, which reverses the chemical reaction separating the CO₂ from the solvent
5. The solvent is then re-circulated back into the carbon capture system
6. The now pure stream of CO₂ is transported via pipeline for permanent storage underground, under the ocean or sea

Global leader in carbon removals

Tackling climate change while advancing sustainability is at the heart of our purpose.

Using bioenergy with carbon capture and storage – BECCS - we're creating opportunities for businesses to advance their environmental goals while delivering positive global change.

14Mt

of CO₂ removed every year with our BECCS plants



Key focus areas for Drax in developing Global BECCS:



Policy

Mechanisms to incentivize investment – tax breaks, support with capex, remuneration for carbon removal projects



Biomass

Ambition to phase down coal and need to decarbonize. Favorable perceptions of biomass benefits



Storage

Suitable geological formations for permanent storage of CO2



Delivery

Further refine the technical preparation and business case to deliver BECCS

North America

- First site in pre-FEED in U.S. South – targeting FID by 2026 and operation by 2030.
- Other sites under evaluation for second project.
- Targeting 6Mt of carbon removals.
- Pipeline of potential future new build or retrofit developments being originated across U.S.
- Enabling a just energy transition through BECCS

UK

- 8Mt of carbon removals at Drax Power Station

Global

- Currently screening development leads in Europe
- Potential for both new build and retrofit BECCS projects

Strategic partnerships to unlock the BECCS opportunity together



- Scalable baseload, 24/7 reliable renewable power
- Remove carbon from the atmosphere and achieve your net zero targets faster
- Potential large scale supplier of biogenic CO₂
- New fit for purpose supply chains
- Boost local economies
- Create thousands of jobs in new clean energy technology