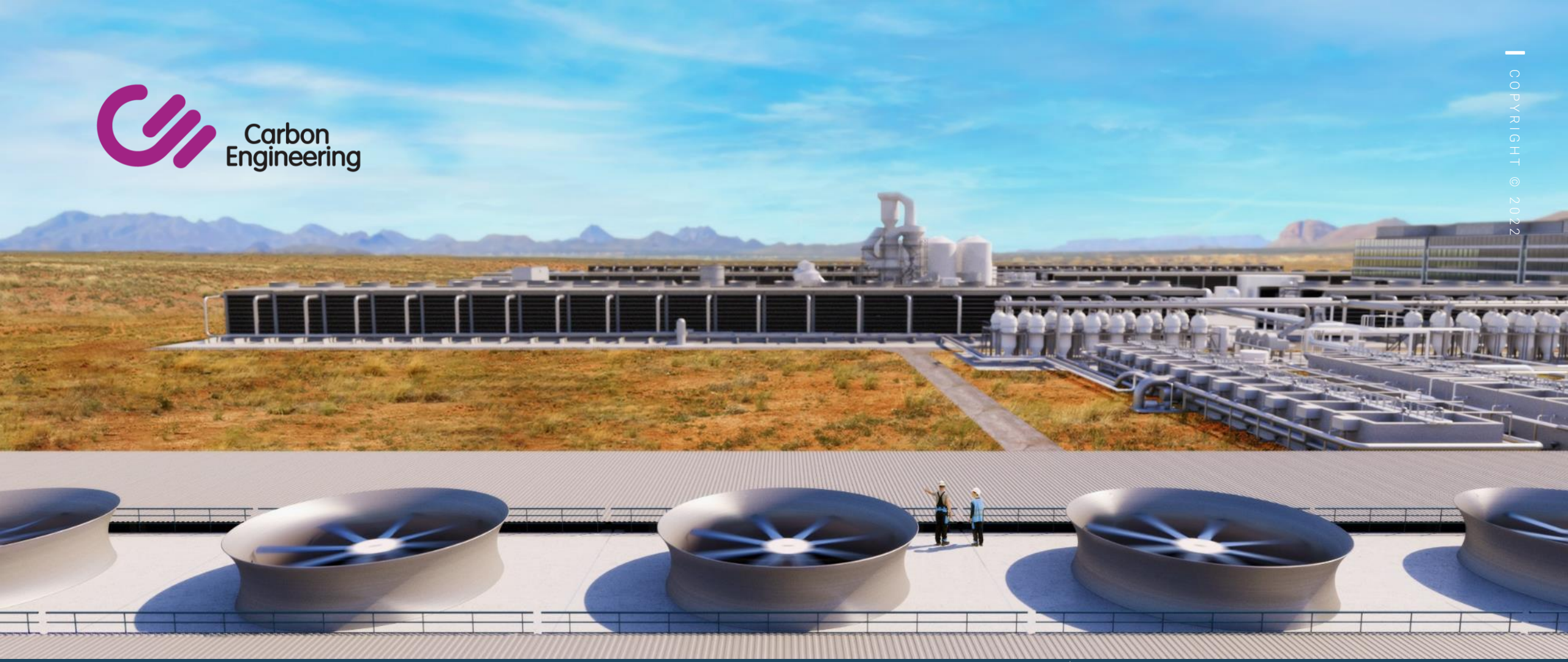


Role of Greenhouse Gas Removal - what are the solutions? Can Carbon offsetting work?

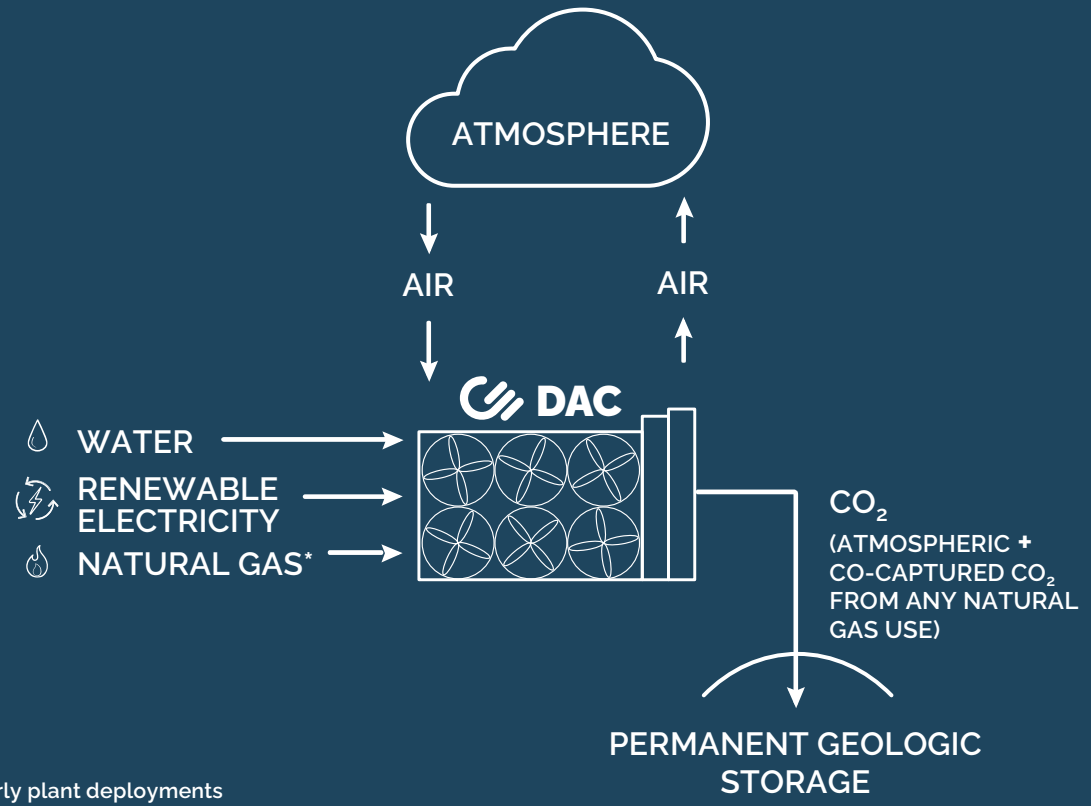
PRESENTED TO:
Farnborough Sustainable Skies summit

COMPANY:
Carbon Engineering Ltd.

DATE
April 1st 2022

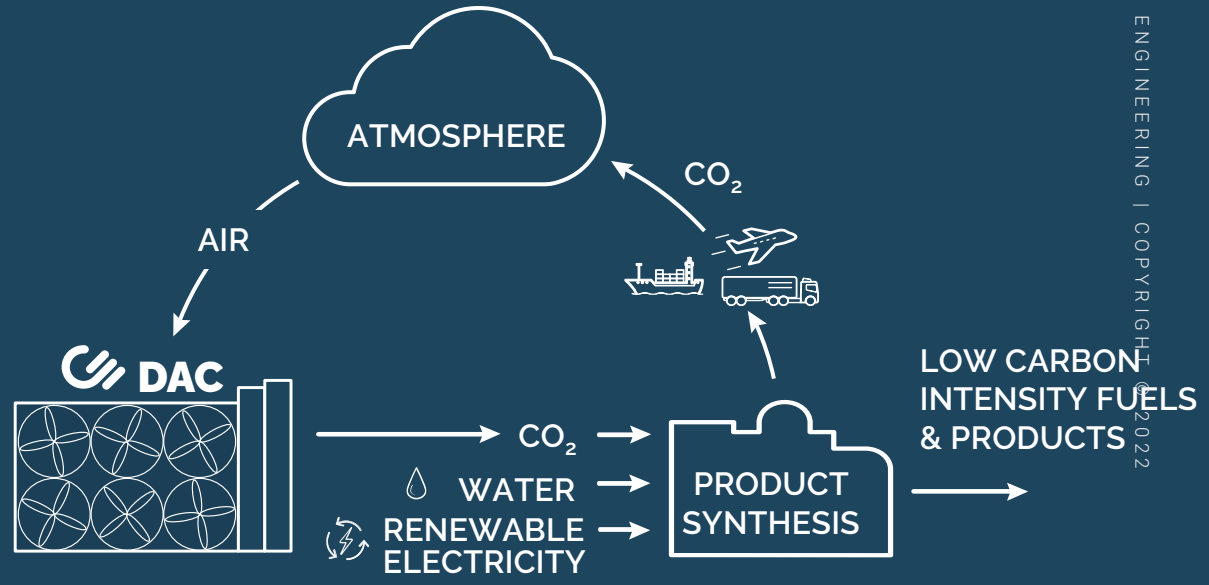
CE DAC enables complementary solutions for removal and reduction

CARBON DIOXIDE REMOVAL



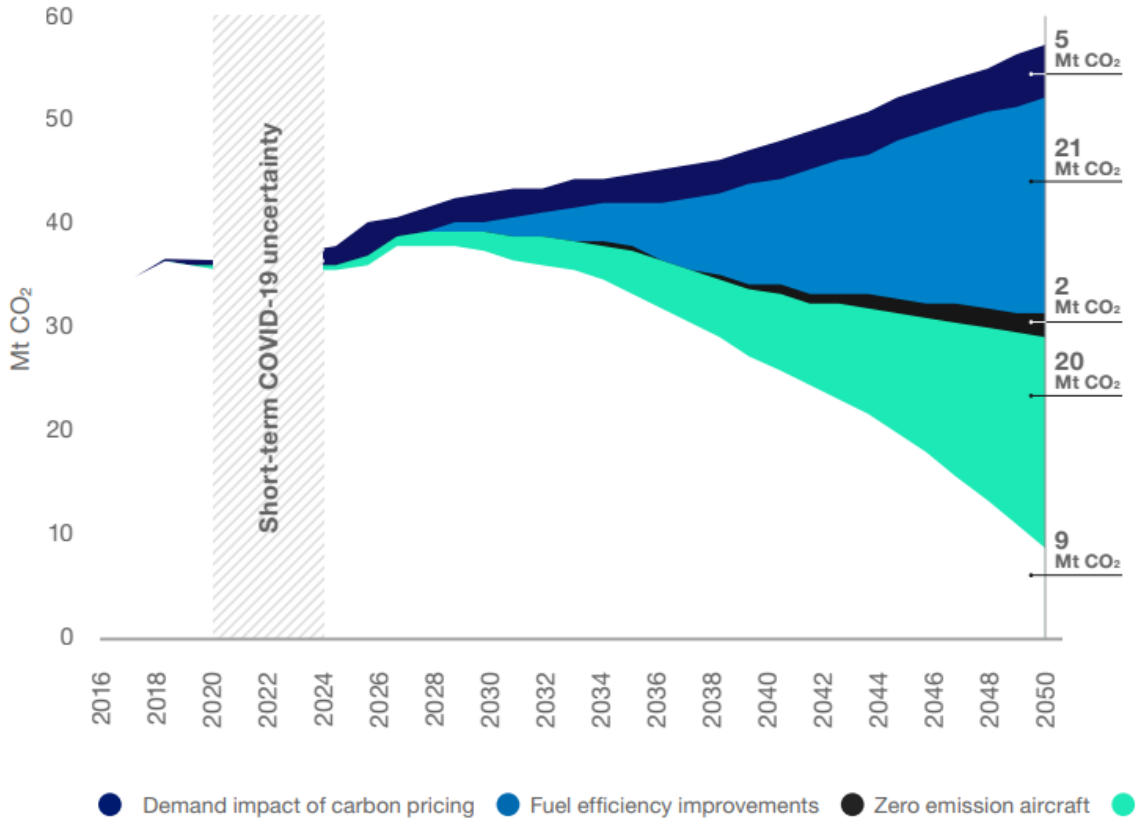
* In early plant deployments

LOW CARBON INTENSITY FUELS & PRODUCTS

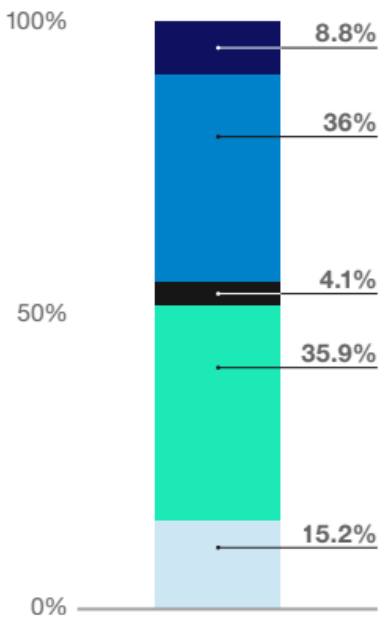


Example: The UK's Jet Zero pathways

Scenario 3: High ambition with a breakthrough on SAF



% abatement from each measure in 2050

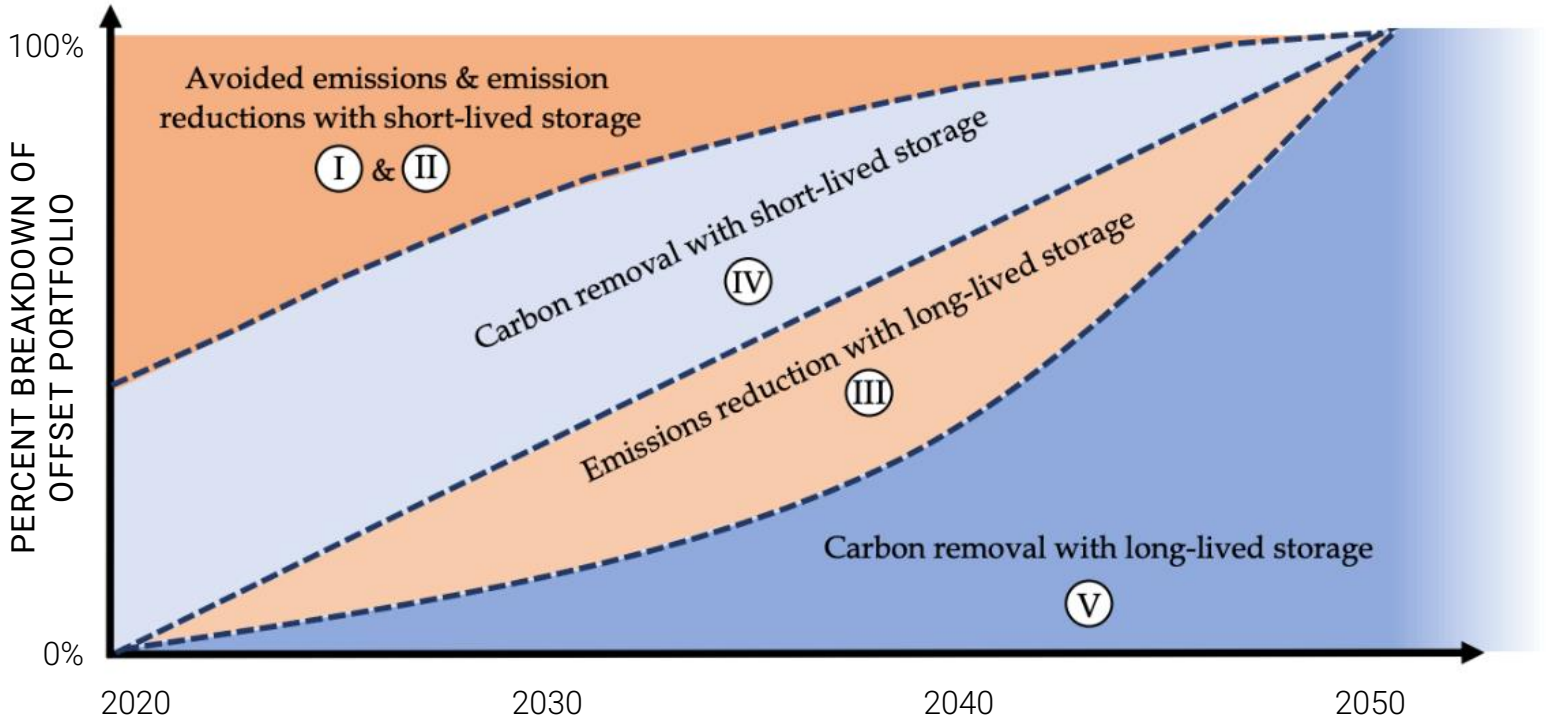


Demand impact of carbon pricing | Fuel efficiency improvements | Zero emission aircraft | SAF | Abatement outside aviation sector

The Oxford offsetting principles

GLOBAL DEBATE IS CONVERGING ON THE PATH TO NET ZERO

1. Cut emissions at source wherever possible
2. Residual emissions need to be offset through activities that store carbon permanently.



Source:

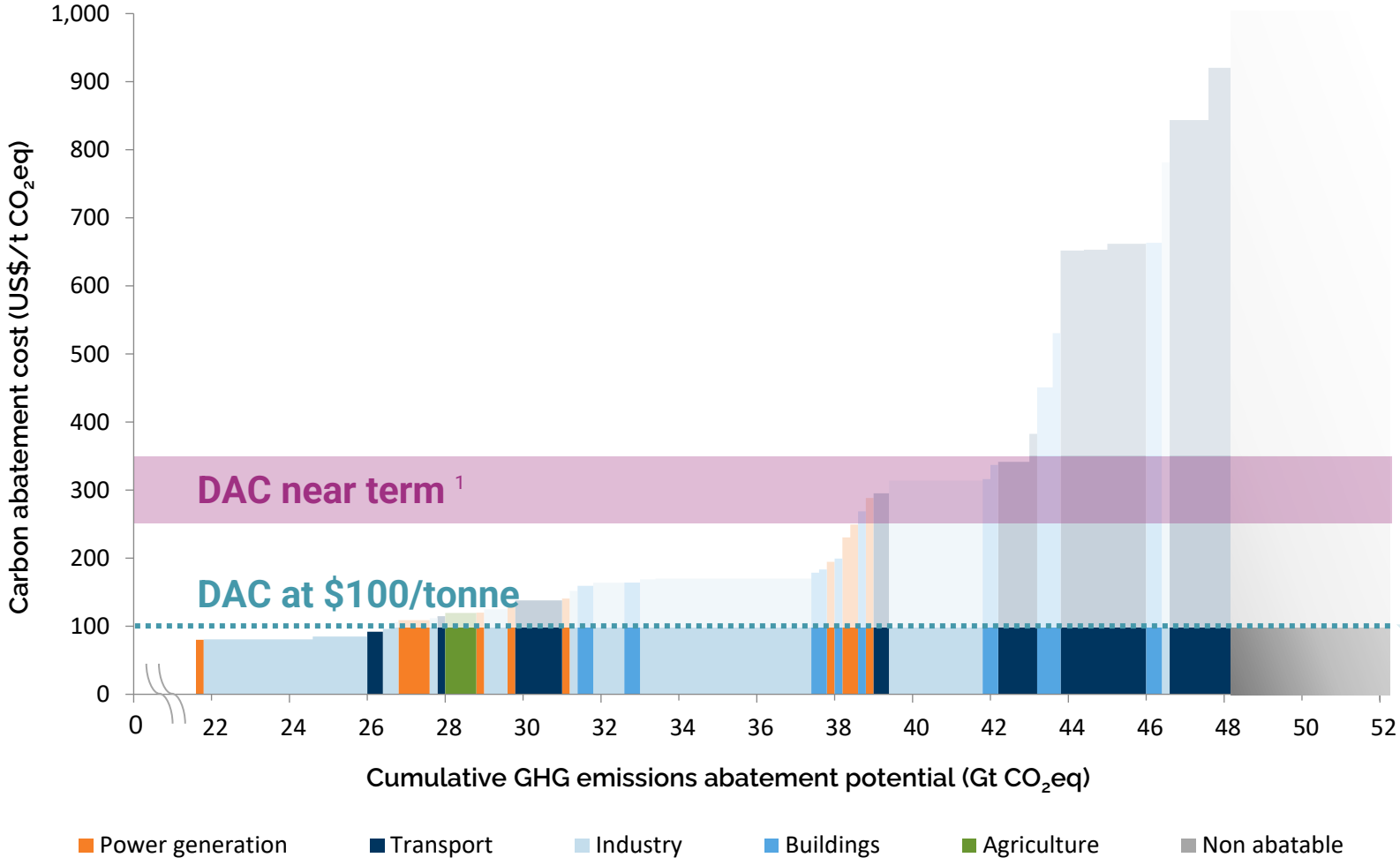
UNIVERSITY OF OXFORD

How DAC can support aviation decarbonization

Three principal pathways:	Where DAC can support:
1 **Sustainable Aviation Fuels (SAF):** Focus on long-haul flights (>1,500km)	**CRITICAL** **Pathway 1:** • DAC is 1 of 4 key enabling technologies • DAC-fuels have scalable feedstock and can be ultra low carbon intensity
2 **Electric & hydrogen powered aircraft:** More suited to shorter and medium-haul flight.	**SUPPORT** **Pathway 2:** • DAC-fuels can provide initial offtake demand for green hydrogen
3 **Carbon removal:** Through the direct removal of carbon from the atmosphere.	**CRITICAL** **Pathway 3:** • Even with significant introduction of SAF, any mix of alternative fuels will yield residual emissions • Support for DAC+S moves DAC technology down the cost-curve for future use in DAC-fuels too

[1]eFuels and power-to-liquids are commonly used interchangeable terms for synthetic fuels produced from clean hydrogen and CO_2. When the source of CO_2 is atmospheric, these fuels have the potential to be near carbon neutral.

DAC+S provides an economic solution for distributed and hard to abate emissions



5-10 Gt/yr

Emissions with abatement cost >$300/tonne

>10 Gt/yr

Emissions with abatement cost >$100/tonne

$Trillions/yr

Potential cost advantage over alternative solutions to achieve Net Zero

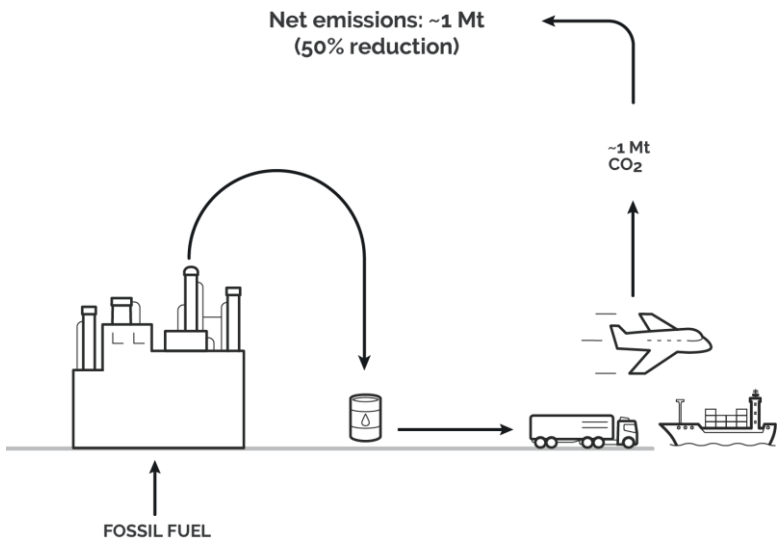
<$100/tonne

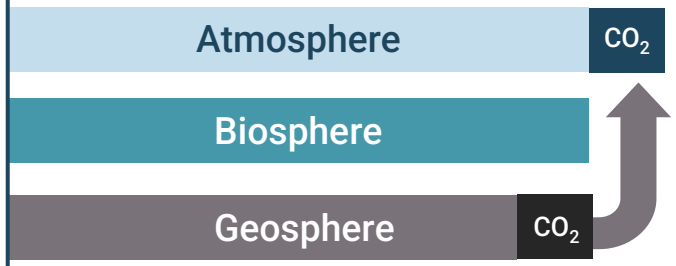
US DOE 'Carbon Negative Shot' stated long-term program goal

Sources:
Carbon abatement costs based on currently available solutions; data from Goldman Sachs, Carbonomics, November 2021
1. DAC cost range shown based on current cost estimate for liquid sorbent DAC from McKinsey, June 2021, How negative emissions can help organizations meet their climate goals

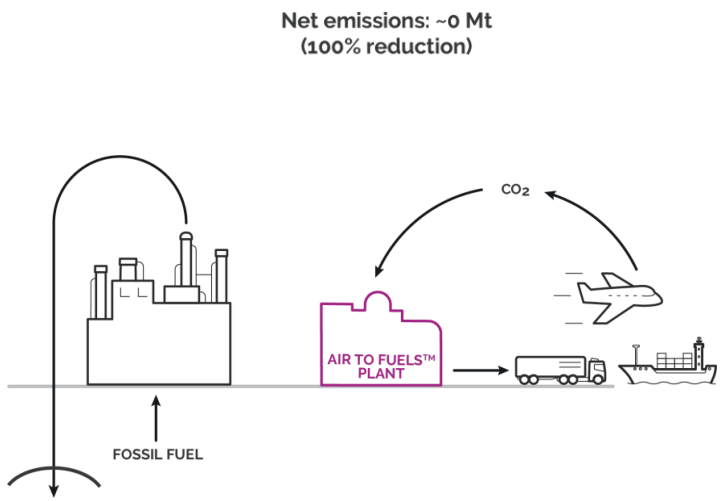
Why make SAF from atmospheric carbon?

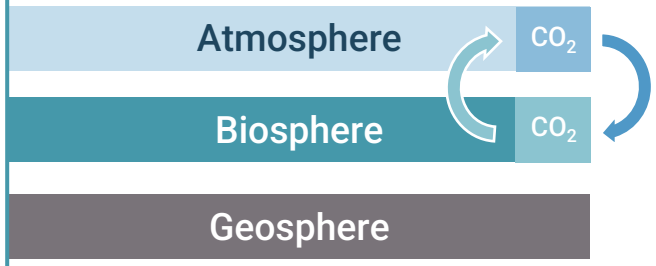
RECYCLED, REDUCTION PATHWAY





RENEWABLE, NET ZERO ALIGNED



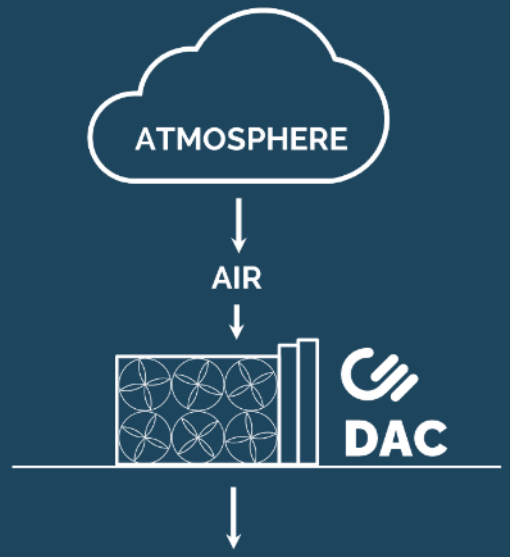


ATMOSPHERIC CARBON PROVIDES A PATHWAY FOR NET-ZERO ALIGNED SAF

Carbon Engineering

Pioneering large scale Direct Air Capture (DAC)

Can address any CO_2 emission, from any place and point in time



FOUNDING

12+ years development; 6 years pilot plant operations

MILESTONES

2015 DAC pilot plant built

2017 AIR TO FUELS™ pilot plant built

2021 Innovation and R&D centre built

2021 FEED underway for 1st commercial DAC plant

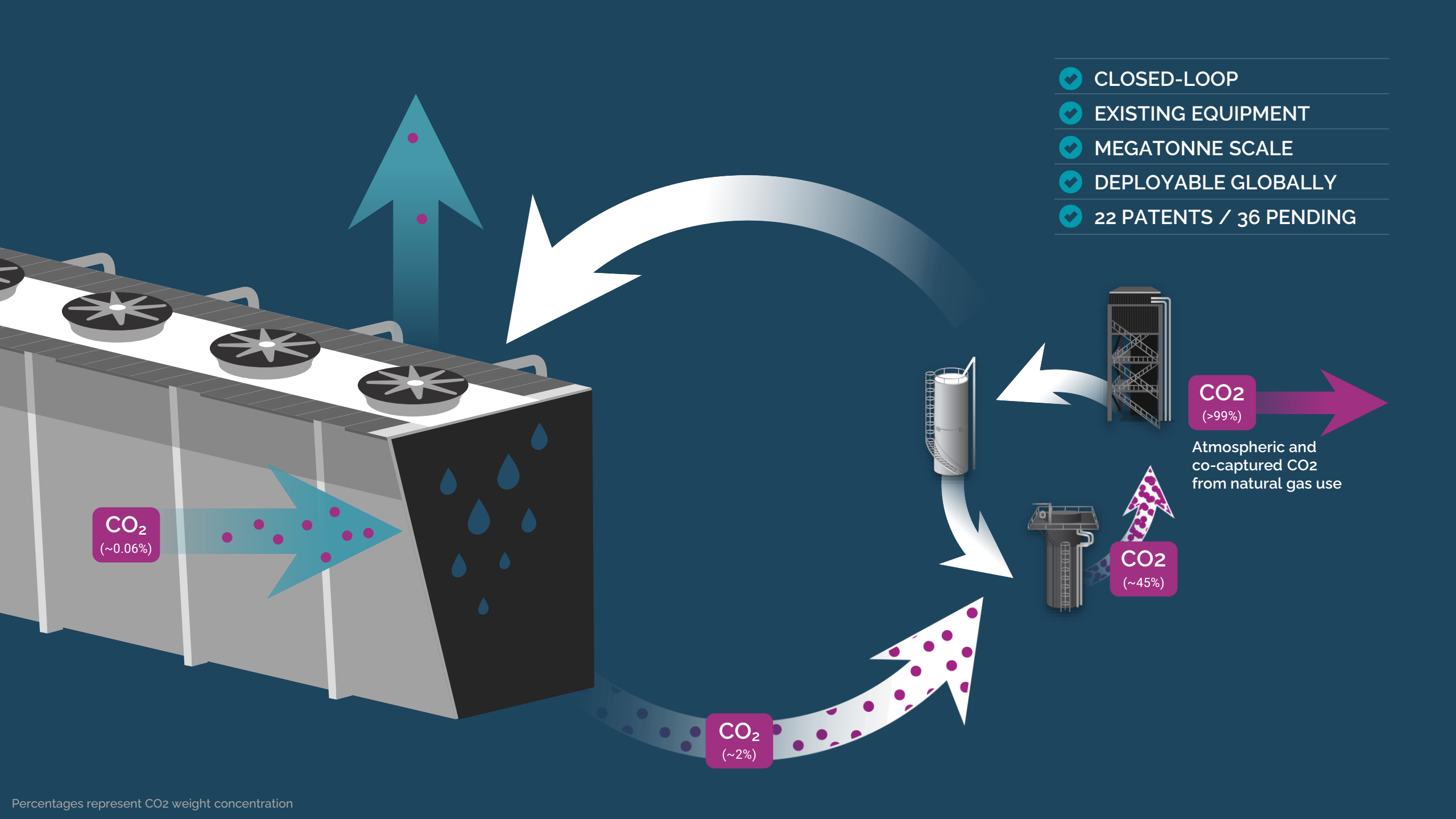
2024 1st commercial DAC plant expected operational

INTELLECTUAL PROPERTY

22 issued patents & 36 applications in 15 patent families in key jurisdictions

WORLD CLASS PARTNERSHIPS

OXY · Worley · 1POINTFIVE · shopify · UNITED · HURON CLEAN ENERGY · BHP · Chevron · STOREGGA



Percentages represent CO2 weight concentration

Large scale deployment underway

PILOT PLANT:
BUILT 2015

6 years of data providing high confidence in DAC performance

INNOVATION CENTRE:
BUILT 2021

R&D / advanced development platform for ongoing technology development and testing

US DAC-1:
CONSTRUCTION EXPECTED 2022

Up to 1 million tonnes CO_2/y with 185,000+ hours of engineering complete

UK & NORWAY DAC:
ENGINEERING UNDERWAY

Expected to capture 500,000 – 1 million tonnes CO_2/y each

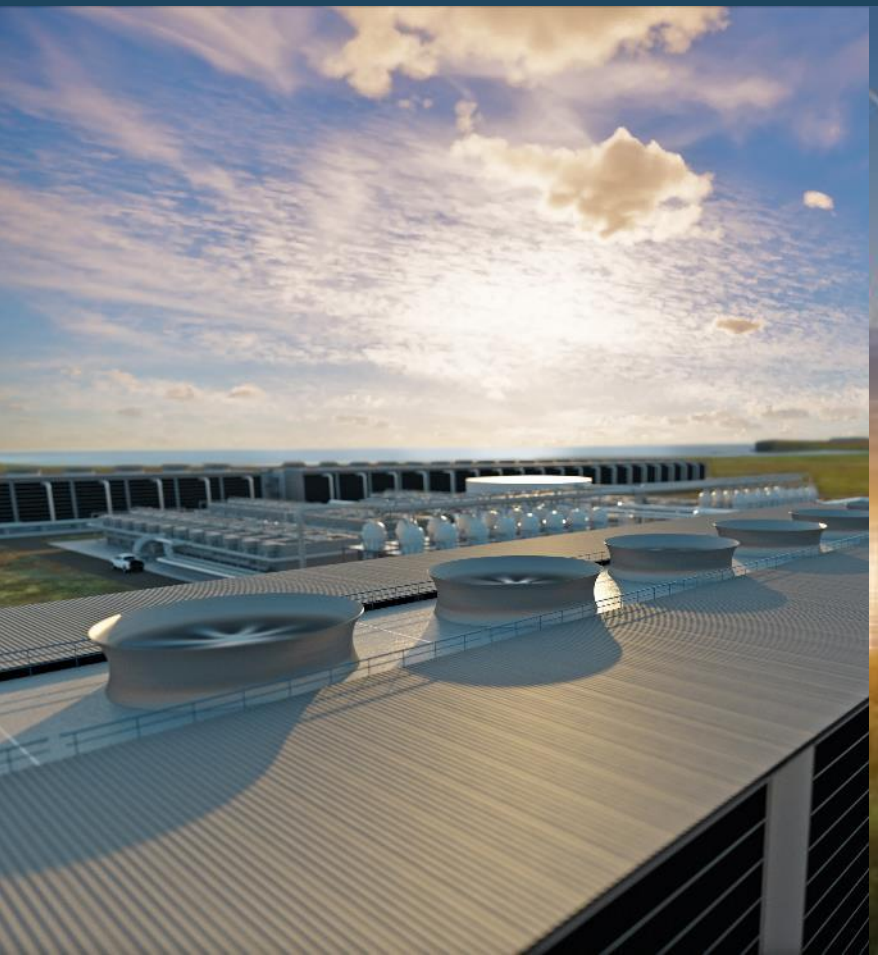
AIR TO FUELS™ PLANT
ENGINEERING UNDERWAY

Planned for B.C. Canada with expected capacity up to 100 million L/y

Artist renderings shown

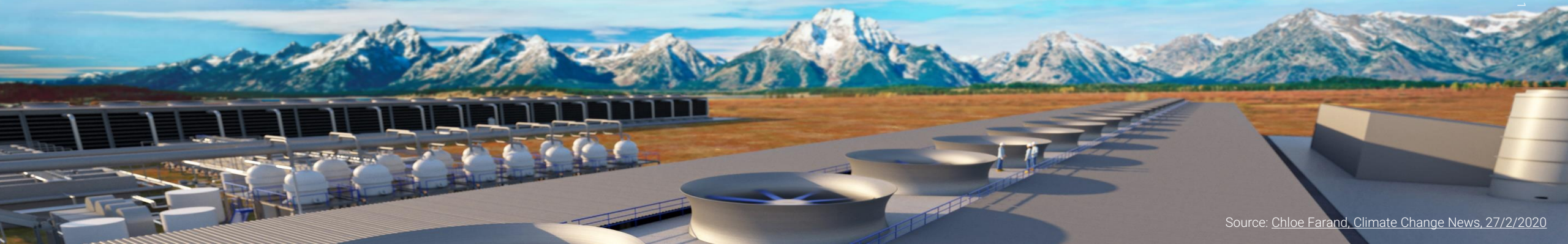
AIR TO FUELS™ solution converts clean hydrogen into drop-in transport fuels

Atmospheric CO_2 + **Clean Hydrogen** → **Drop-in compatible, low carbon intensity fuel**



Call to action

- For residual emissions, transition from “offsets” to permanent removals in line with the Oxford net zero principles
- DAC+S is not “out of sector” but a strategic tool in aviation decarbonisation
- Measure decarbonisation potential rather than volume. Base potential on a full lifecycle analysis



Source: Chloe Farand, Climate Change News, 27/2/2020

MORE INFORMATION CAN BE FOUND AT:

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Carbon Engineering Ltd.

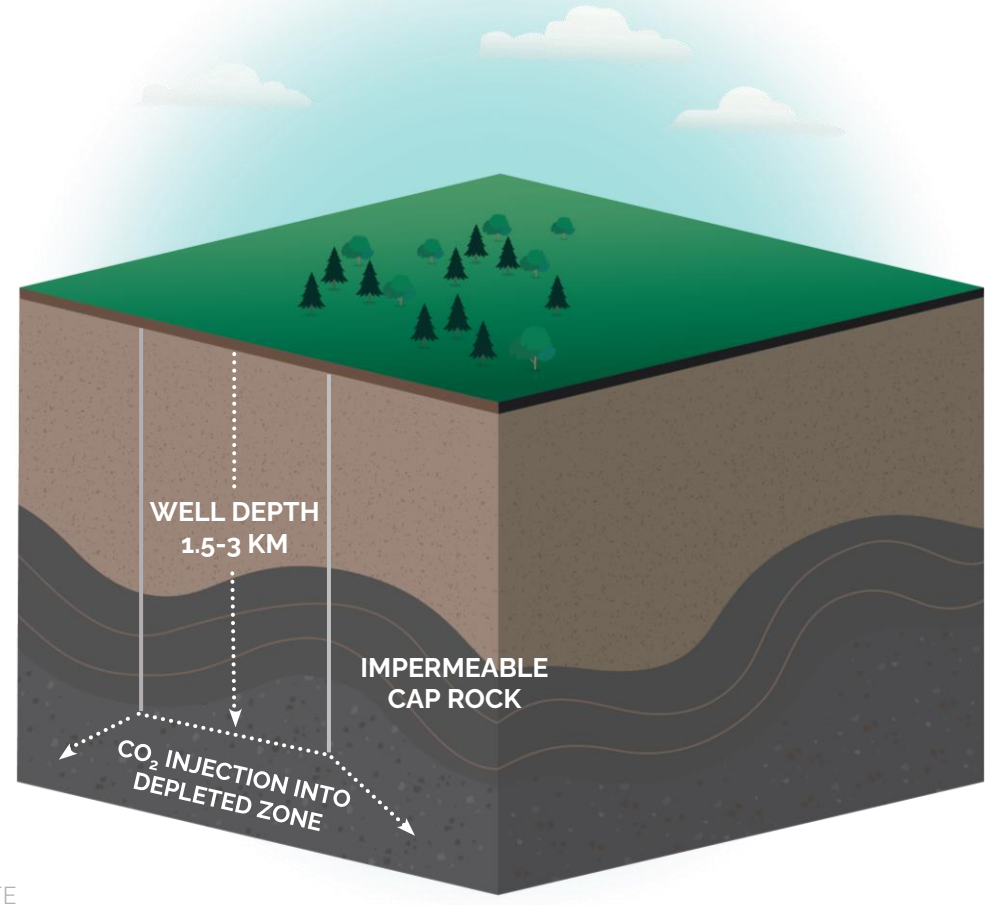
@CarbonEngineer

CarbonEngineering

Safe, measurable, permanent

- Captured CO_2 is injected underground through a secure and highly engineered infrastructure to the porous injection reservoir
- At the top of a reservoir formation, an impermeable rock layer (i.e., cap rock) traps the compressed CO_2
- The CO_2 cannot permeate this rock layer to return to the surface

How Geologic Sequestration of CO2 Works



Source: GLOBAL CSS INSTITUTE

Source: [1]A Bergman & A Rinberg (2021) "The Case for Carbon Dioxide Removal: From Science to Justice" https://cdrprimer.org/, edited by J Wilcox, B Kolosz, J Freeman

STORING CARBON SAFELY AND SECURELY UNDERGROUND 1000+ YEARS[1]