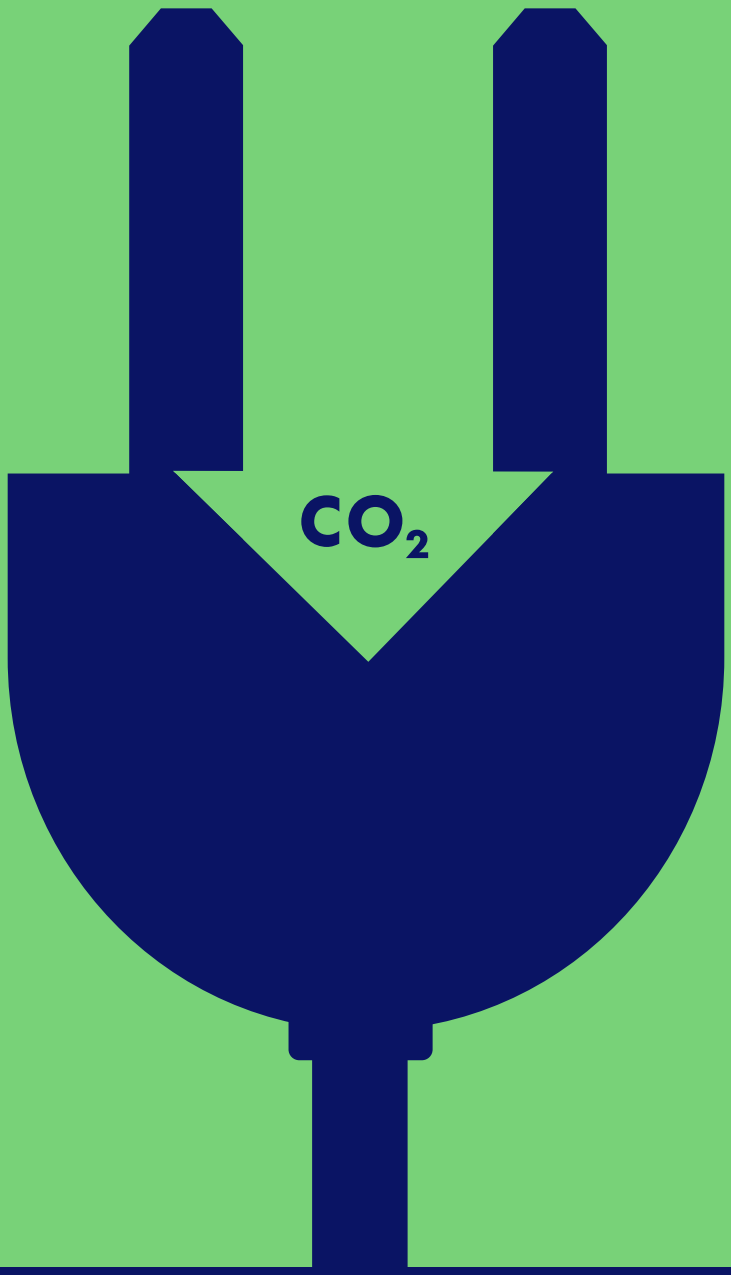
Setting the standard for carbon removals

A guide to understanding and using high-integrity carbon credits, including those associated with BECCS



drax | Carbon Removals

Foreword

The planet's temperature is increasing. With every incremental increase comes the increased risk of destabilizing a delicately balanced ecosystem.

In response, climate innovation is accelerating. The world needs to drive down emissions, and new solutions have come to the market that will deliver real, verifiable climate benefit. Carbon removals are a critical part of these solutions.

But with quick innovation comes the need for guidance. There's been appropriate concern about the quality and use of carbon credits; from greenwashing practices, to credits produced by unreliable or ambiguous projects.

Buyers need robust standards so they can be sure that they're choosing solutions that deliver the climate benefits claimed.

At Drax, we're working to create an abundance of high-integrity carbon credits, ramping up the benefits that carbon removals can bring on a global scale. Importantly, we're joining other carbon removal leaders in championing the need for reliable, robust standards.

This document aims to help organizations understand the principles of a high-integrity carbon credit, and to give you the right information, so you can invest with confidence. It explains how certain carbon removal methods, including Bioenergy with Carbon Capture and Storage (BECCS), can and will deliver measurable climate benefits. Benefits that bring permanent, positive change.

The carbon market will be a valuable tool in the fight against climate change. And it needs investment to grow – but this will only happen if buyers have total confidence that those championing carbon removals are doing the right thing.

Drax is working tirelessly to deliver positive outcomes for the climate, based on the best available standards and the high quality our customers expect from us. We hope you join us on the journey.

Will Gardiner
CEO, Drax Group

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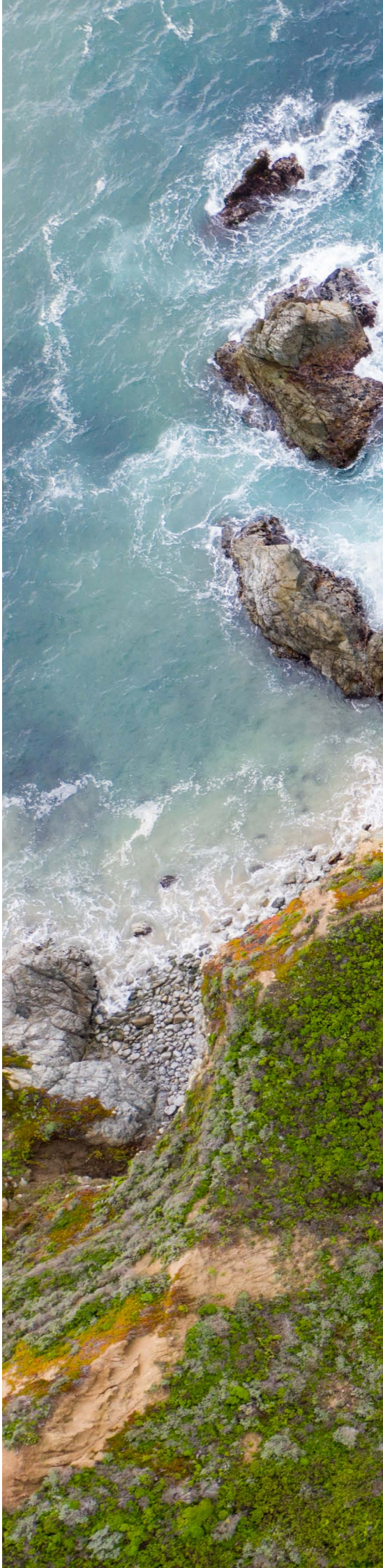


Chapter 1

The global need for CDRs

We need a rapid reduction of global emissions to mitigate the impact of climate change.

We're collectively emitting around 50 billion tonnes of carbon dioxide emissions (CO_2e) every year. In 2022, the greenhouse gas (GHG) emissions recorded were at their highest concentration levels in two million years. The world's annual emissions are a staggering 40% higher than they were in 1990.

It's clear that all of us – as organizations and individuals – need to do all we can to reduce emissions. But it's also clear that reduction, on its own, is not enough. We also need to make the most of technologies that can remove CO_2 from the atmosphere.

That's where carbon markets come in. Carbon markets give organizations access to high integrity carbon dioxide removals (CDRs) for purchase. These CDRs, alongside all additional efforts to reduce emissions, are the key to unlocking a brighter future for our planet.

> Reaching net zero GHG emissions primarily requires deep reductions in CO_2, methane, and other GHG emissions, and implies net-negative CO_2 emissions. Carbon dioxide removal (CDR) will be necessary to achieve net-negative CO2 emissions.

ipcc
INTERGOVERNMENTAL PANEL ON climate change

The Intergovernmental Panel on Climate Change

> Carbon dioxide removal is essential if the world is to achieve its universally agreed sustainable development goals.

UNECE

Executive Secretaries of the United Nations

> The science is clear… holding the global average temperature increase below 1.5°C will require removing increasing amounts of CO_2 from the atmosphere… Hard-to-abate greenhouse gas emissions will have to be balanced with removals in order to achieve net-zero CO_2 emissions in less than 30 years.

THE STATE OF Carbon Dioxide Removal

The State of Carbon Dioxide Removal Report, 2023

Chapter 2

How to build a high-integrity carbon portfolio

Climate science shows that both emissions reductions and removals are necessary to achieve net zero.

Organizations must decarbonize by rapidly reducing emissions in their operational supply chains, while at the same time purchasing carbon removals to negate their residual emissions.

Best practice that's backed by science.

Companies seeking to decarbonize should seek guidance from industry best practices on how to utilize carbon credits. Currently, the Science Based Targets initiative (SBTi) and the Voluntary Carbon Markets Integrity Initiative (VCMI) lead this guidance.

The SBTi requires companies to set long term decarbonization targets to cut all possible emissions by 2050. For those emissions that can't be eliminated, SBTi encourages companies to counterbalance them through purchasing permanent carbon removals.

VCMI sets guidance for companies on how to use high-quality carbon credits on the path to net zero and clearly supports the early use of high integrity carbon removals.

> The importance of early investment in carbon removal projects should be reinforced. As highlighted by the IPCC AR5, these solutions are fundamental to achieving net-zero emissions and need to be scaled up. VCMI encourages companies to use carbon dioxide removals as part of their carbon credits portfolio and invest in future carbon removals.

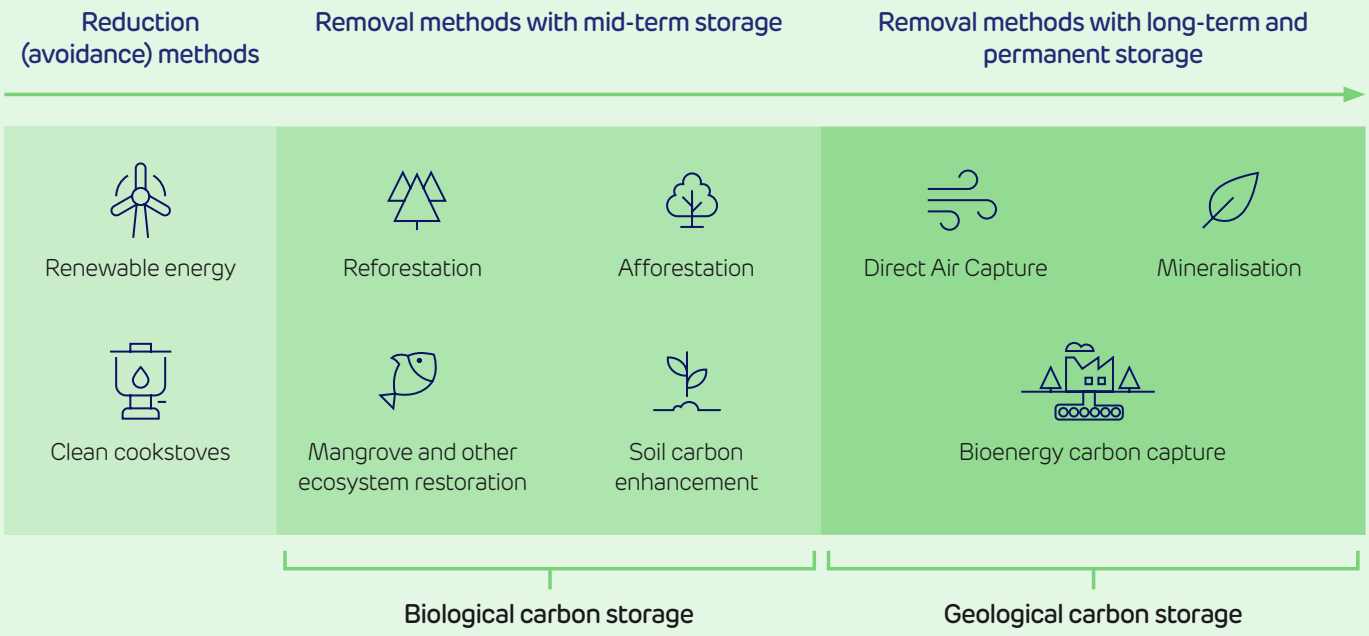
Voluntary Carbon Markets Integrity Initiative – Code of Practice

Where do credits come from?

Most credits on the market today are carbon reductions.

The projects behind carbon credits span engineered-technologies, nature-based projects, and hybrid solutions. All can have real climate benefits, but it's only Carbon Dioxide Removals (CDRs) that remove existing CO_2 from the atmosphere.

There's no silver bullet – we need all these solutions. That's why we recommend that organizations build a diverse portfolio, made up of carbon credits from different projects, different storage types, and so on.



Biological carbon storage	Geological carbon storage
Stored in soil, vegetation or aquatic environments	Stored underground or in rocks
Some risk of reversal (CO_2 being re-released)	Stored permanently
Stored for decades to centuries	Stored permanently

Source: IPCC CDR fact sheet

The unifying factor in any portfolio should be high integrity.

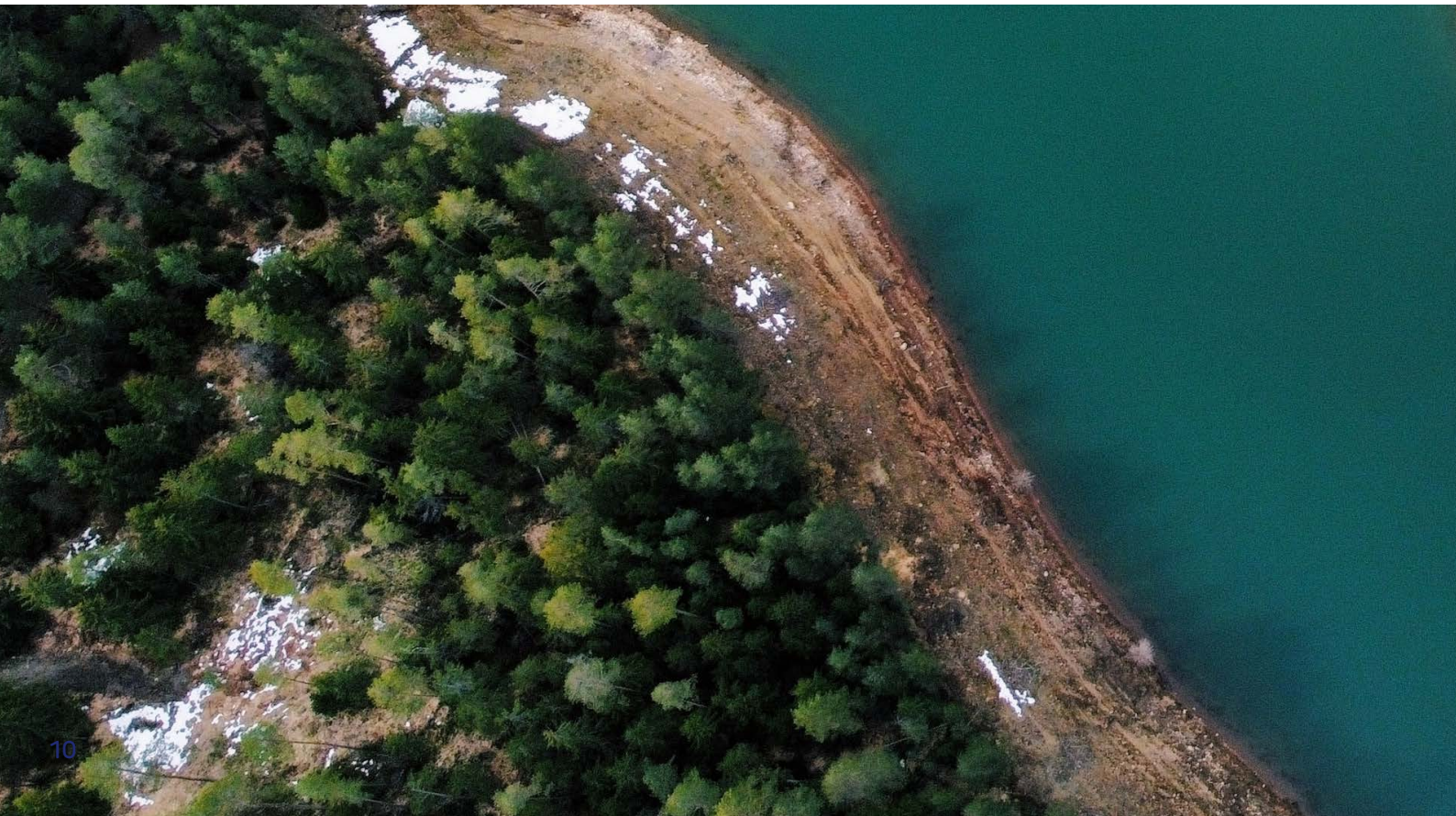
Above all, the VCMI encourages companies investing in carbon credits to "prioritise projects based on the quality of the climate mitigation and co-benefit impacts they may deliver."

Including credits from high-integrity projects like Bioenergy with Carbon Capture and Storage (BECCS) will ensure that your portfolio is robust and anchored in permanent, quantifiable CDRs.

Why buy carbon removals now?

The Oxford Principles for Net Zero Aligned Carbon Offsetting recommends that organizations seeking to offset residual emissions should turn to CDRs that offer permanent CO_2 storage.

The Coalition for Negative Emissions believes that, in parallel with reducing emissions, buying permanent CDRs now (rather than deferring the purchase) will allow the CDR market to grow to the scale needed to achieve net zero.



“

Deferring a focus on negative emissions [carbon removals] until emissions reductions are achieved (which may be never at the current rate!) will prevent the development of the negative emissions market; both its ability to grow to the scale required and to drive down costs through investment and focus.”

”

‘Being Positive About Negative Emissions: Incorporating Carbon Removals into Net Zero Strategies’ report by the **Coalition for Negative Emissions**

Investing in credits accelerates decarbonization

A recent survey of large businesses showed that, on average, companies buying carbon credits are simultaneously cutting their Scope 1 and 2 emissions faster than those that don’t. Rather than slowing decarbonization, the evidence shows that investment in carbon credits coincides with an almost 2x increase in the rate of emissions reductions.

‘Carbon Credits: Permission to Pollute, or Pivotal for Progress?’, Sylvera

Chapter 3

Introducing BECCS

Bioenergy with Carbon Capture and Storage (BECCS) is a hybrid climate solution. It depends on both natural processes (CO_2 being absorbed from the atmosphere via photosynthesis) and engineered technology (separation and injection of CO_2 into geological storage).

BECCS has the potential to deliver large quantities of carbon removals, and is the most scalable carbon removal technology available.

Our ambition at Drax is to develop two new-build BECCS facilities in the US, starting in the south, and with multiple additional sites under evaluation. We've also developed an option for BECCS in the UK, based on our bioenergy power plant in Yorkshire, North England. In total, these BECCS plants could deliver 14 million tonnes (14MT) of carbon removals per year by 2030.

Bioenergy with Carbon Capture and Storage (BECCS)

Generates 24/7 baseload renewable electricity

Removes CO_2 from the atmosphere via photosynthesis

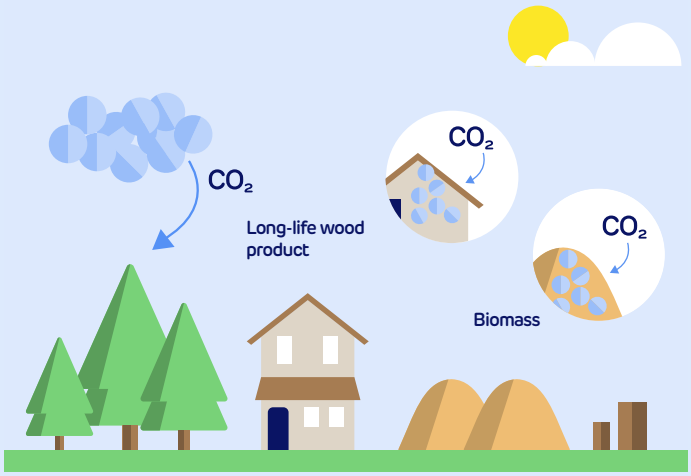
Stores CO_2 permanently and safely underground

All the illustrative mitigation pathways assessed in the IPCC's latest report use significant volumes of carbon removals, including BECCS, as a key tool for mitigating climate change.

The IPCC believes that globally up to 9.5 billion tonnes of CDRs via BECCS will be required per year by 2050.

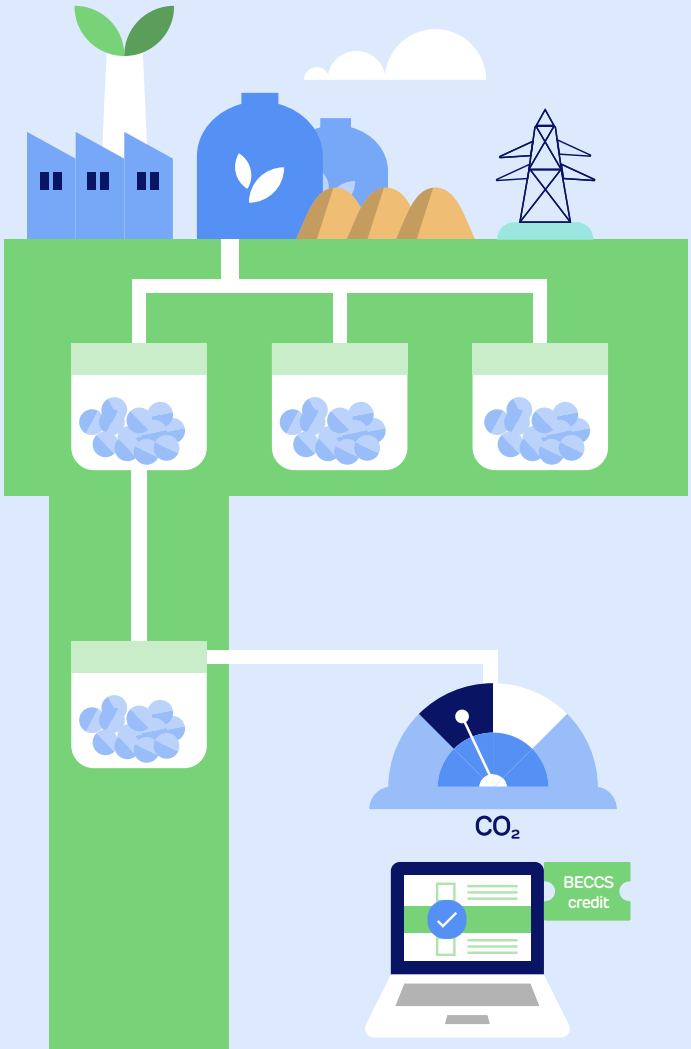
Chapter 4

How BECCS credits are made



Harnessing natural photosynthesis

Sustainably-managed forests absorb CO_2 from the atmosphere via photosynthesis. Biomass is harvested from these forests, following strict principles. These ensure the protection of forest regeneration, soil quality, biodiversity, stable or increasing carbon stocks, among other criteria for well-managed sustainable forestry.



Generating renewable electricity and capturing CO_2 permanently

Sustainable biomass is used to generate bioenergy, to produce dispatchable, 100% renewable power.

Producing power this way releases CO_2 from the sustainable biomass. At Drax, we capture the CO_2 and transport it in pipelines to reach the location of permanent storage underground. It's safely injected into geological storage formations and stored for thousands of years.

Counting and accrediting every tonne

Every tonne of CO_2 that gets stored will be accurately measured. From this figure, we'll deduct any carbon emissions associated with the BECCS value chain. This gets independently verified, to ensure all CDRs are net negative removals.

When verified, independent registries issue and manage the CDR credits, which we pass on to organizations looking to achieve their net zero goals.

Chapter 5

Raising the bar for carbon removal standards

How do you define integrity in a new market?

Carbon markets have recently been under increased scrutiny. Although this has mostly been driven by concerns regarding the environmental outcomes of traditional projects, it provides a welcome renewed emphasis on the quality of credits. This integrity is important to nurture a trustworthy carbon market.

Since it's critical that buyers can identify high-integrity CDRs, there must be robust standards to verify that the removals are delivering the climate benefits claimed.

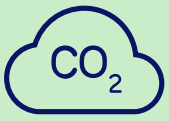
Carbon market leaders are working quickly to bring these standards to the market

Driving standards on the supply side are the **Core Carbon Principles (CCPs)**, outlined by the Integrity Council for the Voluntary Carbon Market (IC-VCM).

The IC-VCM is the market's response to the demand for high-integrity carbon credits. It provides guidance on quality through its CCPs and Assessment Framework. Together, these documents outline how high quality credits should be made and governed, covering requirements such as additionality, quantification and permanence. The IC-VCM will play a governance and compliance role to ensure quality and scale in the VCM.

Governance

1. Effective governance
2. Tracking
3. Transparency
4. Robust independent third-party validation and verification



Emissions impact

5. Additionality
6. Permanence
7. Robust quantification of emissions reductions and removals
8. No double counting

Sustainable development

9. Sustainable development benefits and safeguards
10. Contributions to net zero transition

How is the market working together to apply standards?

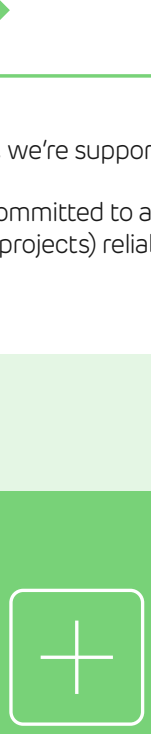
Core functions	Key players within these groups (non-exhaustive)	Their role in a nutshell
Overarching bodies	THE INTEGRITY COUNCIL FOR THE VOLUNTARY CARBON MARKET	Define key criteria for programs to adhere to in order to address quality and integrity concerns.
	VCMI Voluntary Carbon Markets Integrity Initiative	Sets guidance for companies on how to use high-quality carbon credits on the path to net zero and clearly supports the early use of high integrity carbon removals.
	ICROA International Carbon Reduction & Offsetting Accreditation	Certify and endorse carbon credit programs.
	TASKFORCE ON SCALING VOLUNTARY CARBON MARKETS	Aim to scale the VCM by bringing together all aspects of the value chain.
	SCIENCE BASED TARGETS	Helps companies set science-based targets for their decarbonization goals.
Standards setters	VERRA, Gold Standard, puro.earth, American Carbon Registry, CLIMATE ACTION RESERVE, ART Architecture for REDD+ Transactions	Registries that create methodologies for the quantification, reporting and verification of credits from crediting projects.
Validation and Verification bodies (VVBs)	AENOR	Independently audit credits against methodologies to ensure protocols are being followed correctly.

Chapter 6

Our high-integrity carbon removal pillars

At Drax, we're supporting the development of high-integrity standards for carbon removals.

We're committed to aligning with the IC-VCM's Core Carbon Principles, ensuring that our Carbon Removals (from our BECCS projects) reliably and verifiably meet five key pillars of high integrity:



Additionality	Permanence	Robust quantification	Sustainable development
Our BECCS projects are developed due to the incentive created by carbon credit revenues.	The CO_2 we capture will be in storage for tens of thousands of years, with a very low risk of reversal.	Our removals will be robustly quantified, based on conservative approaches and sound scientific methods.	Drax BECCS will create positive outcomes for climate, nature and people.

Well-governed

Our credits will adhere to stringent governance principles: reliable tracking, transparent reporting, and independent validation and verification.

About Drax

Tackling climate change while advancing sustainability is at the heart of our purpose: to enable a zero carbon, lower cost energy future.

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

14m tonnes

CO_2 removed every year by 2030 with our international BECCS plants

250MW

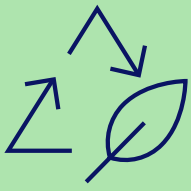
power generated by each plant – enough to power ~200,000 homes

40+ years

experience in power generation, bioenergy pioneering and decarbonization partnerships

We have a history of putting sustainability first, and our strategy ties our commercial success to delivering climate positive, nature positive and people positive outcomes.

Transforming Europe's largest coal-fired generator into its largest decarbonization project



99% reduction in generation Scope 1 & 2 CO_2 intensity since 2012

On track to be a carbon negative company by 2030

Capture the opportunity

If everyone commits now, we can build a better future for generations to come.

High integrity carbon credits are critical to achieving international climate targets. Carbon Removals from Drax gives organizations the opportunity to realize their goals while investing in a real climate solution.

It's time to take action.

If your organization wants to understand more about using carbon removals to achieve your climate goals, visit

draxcarbonremovals.com

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