Drax Group

Unlocking net zero through coal-biomass-BECCS conversions

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Drax: Enabling a zero carbon, lower cost energy future

Who we are

Global, vertically integrated renewable power company utilizing Bioenergy with Carbon Capture and Storage (BECCS)

19,200 jobs supported by our operations and across our supply chain

Operator of Europe's largest decarbonization project; we've converted a 2.5GW power station from coal to sustainably sourced biomass

A leading producer of wood pellets from sustainably managed working forests; with operations in Western Canada and the U.S. South

The largest renewable power generator in the UK (12%), the equivalent of powering over 5 million homes and businesses

Carbon Dioxide Removal (CDR) pioneer

Our global footprint

Where we operate

Canada

- Drax offices – Vancouver, Prince George
- 2 ports
- 9 pellet mills

UK

- Drax offices – London, Glasgow, Yorkshire
- Pumped storage generation – Cruachan
- Sustainable biomass generation – Drax Power Station
- Hydro generation – Lanark, Galloway
- Biomass from waste – Daldowie
- B2B renewables supply and services

US

- Drax office – Monroe
- 2 ports
- 1 pellet mill development
- 7 pellet mills

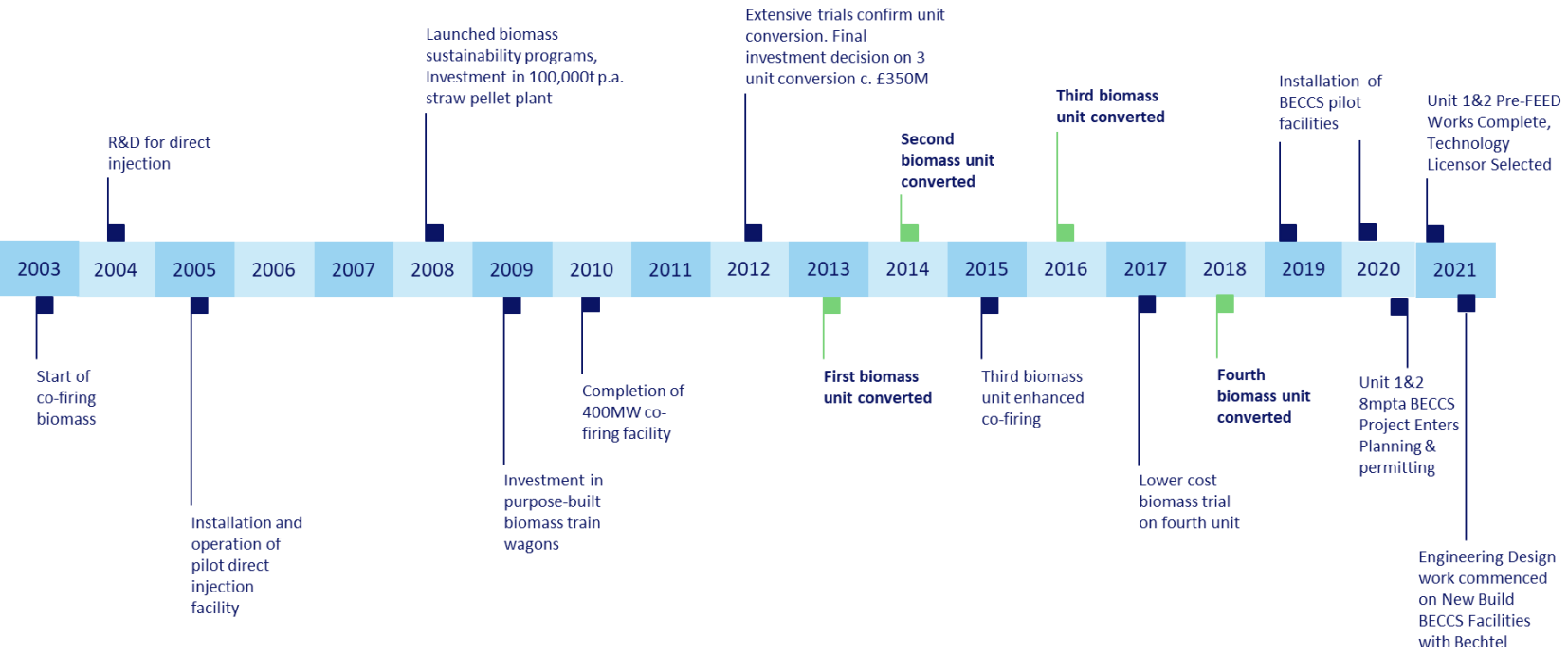
Japan

- Drax office – Tokyo

Biomass & BECCS Evolution at Drax

Drax's biomass journey began with co-firing in 2003, followed by investments in the power station and throughout the supply chain

Biomass evolution at Drax



Key Highlights

- Drax started co-firing with biomass in 2003 with the aim of reducing carbon emissions
- UK Government Renewable Obligation Certificates scheme provided Drax incentives to reduce coal, move to biomass and drive towards full conversion
- During 2003-12, Drax was co-firing at 10% and the first fully converted plant was launched in 2013 after extensive trials
- Drax trialled a number of different types of fuels (350+), before deciding on high quality wood pellets as the optimal fuel with the best chemistry for Drax plant, mills and boiler configuration
- During full conversion of the units (2.6GW), Drax has invested to build a sustainable pellets supply chain in Canada, the U.S. and via 3rd party suppliers
- Support through Contracts for Difference (CfD), and carbon price have been critical policy success factors
- Switching from coal to sustainable biomass has enabled Drax to reduce carbon emissions from generation by over 90%

Drax Group are on the journey of bioenergy evolution with BECCS and sustainable pellet cost reduction to enable a subsidy-free future post 2027 and become a carbon negative company

Supporting coal to biomass conversions

With the right policy mechanisms in place, coal to biomass conversions are cost-effective

Key benefits

- Upfront capital spend on conversions is significantly lower than capex required to build a new CCGT unit
- Biomass fuel cost compares favorably with the cost of gas
- Capital investment of over $1bn will support the economic transition of Japan
- Direct transferability of skills from existing coal asset to biomass means the safeguarding of existing skilled jobs
- Additional jobs and investment created through the biomass supply chain and associated materials handling capabilities
- Firm, renewable power offers immediate replacement of fossil GHG emissions
- Firm, renewable power offers the cheaper integration of intermittent wind and solar

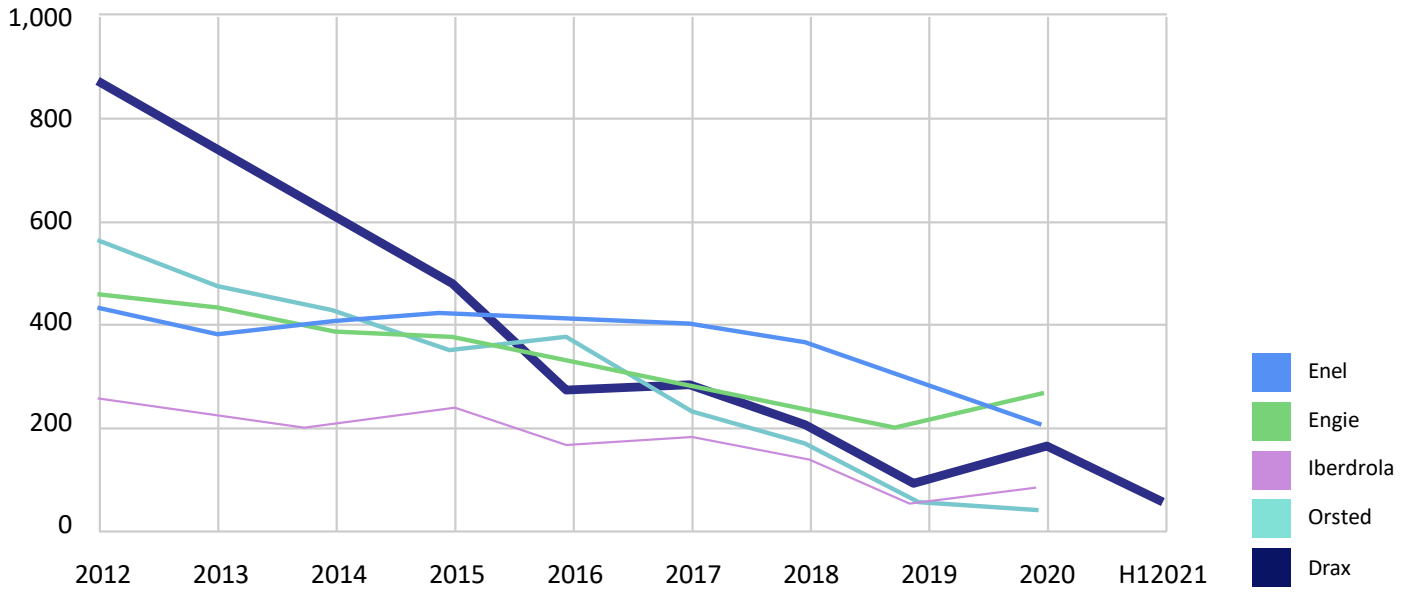
Policy considerations

- At scale biomass conversions require long term policy support to enable upfront capital expenditure
- Mechanisms such as the CfD and the RO in the UK have enabled biomass conversions at scale
- As a result, the UK has decarbonized faster and more cost effectively than any other developed nation
- In the EU, the inclusion of biomass in capacity mechanisms is supporting energy security as coal is phased out

Emission reductions through coal to biomass conversions

Drax unrivalled expertise and proven track record

Industry leading CO2 intensity reduction (tCO_2 e/GWh)



#1 Europe's leading utility in carbon reduction

Recognized as a Climate leader in Europe

Over 90% carbon reduced using our technology

World leading engineering project delivery

The world's leading sustainable biomass generation and supply business

BIOMASS VALUE CHAIN

DRAX BIOMASS (US & Canada)

DRAX POWER

Forest, Harvesting & Transport	**Drax Pellet Production**	Transport to ports	Port storage and handling	Ocean Freight	Port storage and handling	Rail	Drax Power Generation	**BECCS**
Fibre and residue purchase contracts with accredited 3rd parties	**Drax produces 5 MT p.a** from 16 production facilities in Canada and the U.S.	Rail wagons leased via logistics contract	**Drax developed Baton Rouge Transit** • 2mt/annum handling capacity • Northernmost deep water port	Shipping secured via contracts of affreightment	**Drax developed & invested in storage & handling at 4 ports***	**Drax invested +£50m in developing & owning rail wagons**	**Drax Selby 2.6GW biomass capacity (4 x 660MW units)**	**Ambition to capture 12 Mt of carbon from BECCS by 2030**

Third Party Pellet Suppliers:

- Strong long term supply chain relationships with regular meeting and plant audits
- 99% Sustainability Biomass Program (SBP) compliant supply and monitoring system for non-SBP certified supply

Drax assets (owned/ managed)

Contracted services

What is sustainable biomass?

Sustainable Biomass is organic matter (e.g. plant materials, forest or agricultural residues) that generators can use to produce renewable electricity and heat ("bioenergy").

It is drawn from Sustainable Forest Management activities and secondary residues, such as sawdust.

Secondary Residues

Saw mill chips
Produced by a sawmill, often used in pulp industry

Sawdust
Low value, often used on-site in kilns or biomass boilers

Harvesting Residues

Pulpwood
Low value roundwood, can be random size and shape

Other residues
Has no value and is a waste product if no market. In British Columbia, laws exist to burn this residue on site if there is no other use

Drax's Canadian feedstock

Sustainable biomass feedstock sourced in British Columbia comes from:

- ~80% secondary residues
- 20% harvesting residues

Biomass can only be deemed sustainable if it meets strict criteria as set out in national and international legislation and regulation.

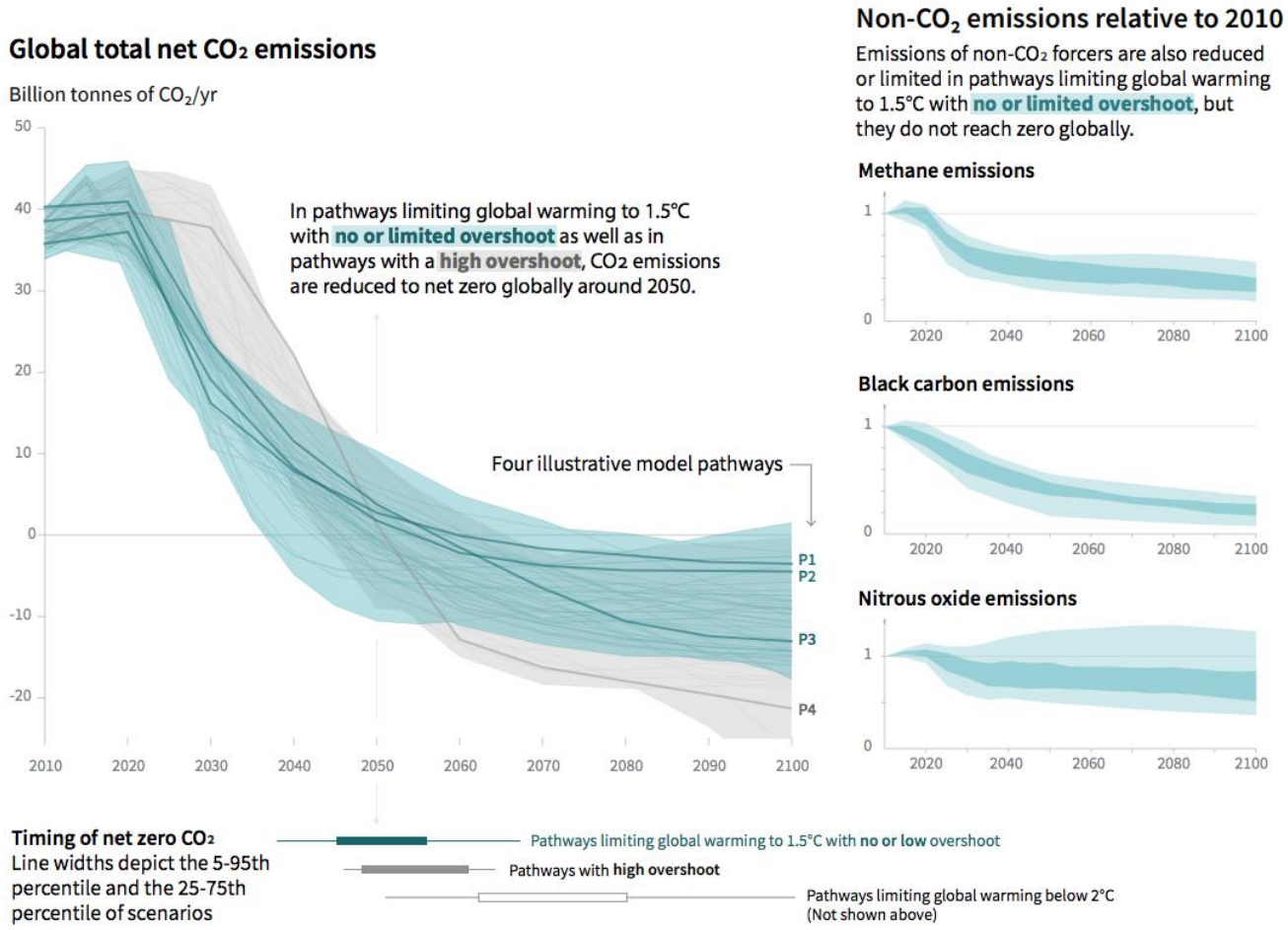
In addition, at Drax, we believe the right biomass is that which leads to climate, nature and people-positive outcomes.

Woody biomass from Canada provides bulk industrial-grade fuel pellets for clean biomass energy to customers in Japan.

Growing need for carbon removals

To prevent harmful climate change, reducing emissions won't be enough

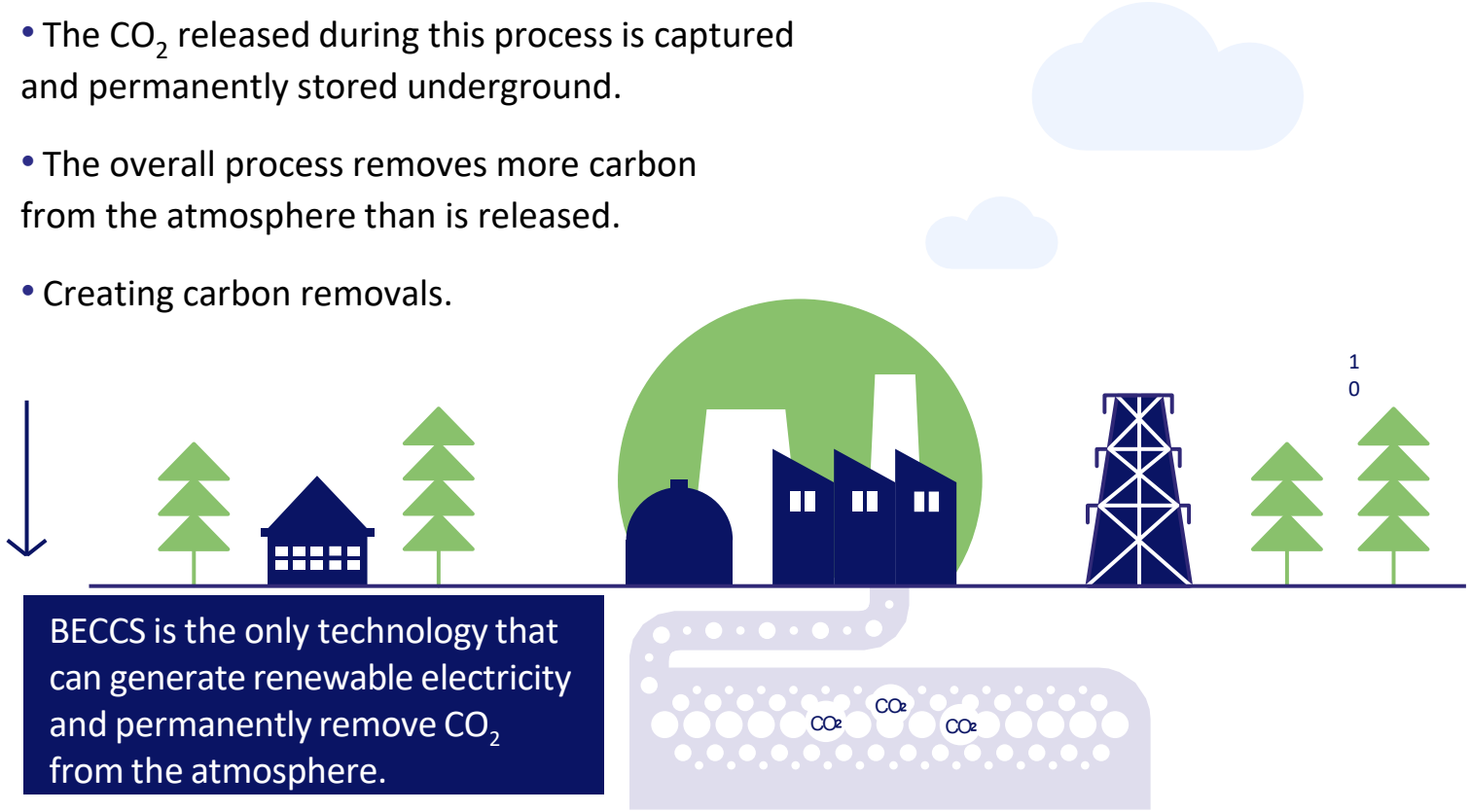
- To reach net zero we need to reduce emissions across each sector of the global economy.
- But by 2050, a significant volume of emissions will still be emitted by hard-to-decarbonise sectors such as aviation, agriculture and heavy industry.
- To tackle climate change and reach net zero, we need to remove carbon dioxide from the atmosphere in order to compensate for any residual emissions.



BECCS: Global problem – the right solution

What is bioenergy carbon capture with storage? (BECCS)

- Biomass, which absorbs CO_2 from the atmosphere as it grows, is used to generate renewable electricity.
- The CO_2 released during this process is captured and permanently stored underground.
- The overall process removes more carbon from the atmosphere than is released.
- Creating carbon removals.



BECCS is the only technology that can generate renewable electricity and permanently remove CO_2 from the atmosphere.

Affordable, rapid decarbonization of power supply and operations in one solution

The only technology that delivers 24/7 baseload renewable power and removes carbon from the atmosphere simultaneously

The most scalable and affordable carbon dioxide removal technology

BECCS at Drax Power Station

World's first carbon removal power station – 8MtCO2/a by 2030

- **Most advanced CCUS** project in the UK:
  - Pre-FEED work completed, FEED / EPC contractor announced
  - Technology / solvent provider selected
  - Two successful CO2 capture pilots
  - DCO planning process well advanced
- **First unit operational from 2027**, second by 2030
- Around **4mtpa negative emissions** from each unit
- **10,300 jobs created** by Drax BECCS and c.50,000 by CCUS in the region

The next opportunity: ongoing global technical work

Key focus areas for Drax in developing coal to biomass conversions and 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 coal to biomass conversions and BECCS

Objectives:

- To establish an **integrated concept design** for coal to biomass conversions and BECCS.
- To assess the **viability of strategic locations** for conversions and new build BECCS plants
- Identify optimal sites

Scope:

- **Technology assessment** – technology options and assessment of viability covering boiler, turbine and CCS islands
- **Innovation** – in technology and plant integration to optimise efficiency
- **Strategy** - market assessments of key geographies
- **Cost estimates** - CapEx & OpEx
- **Project planning** – development journey incl. planning and environmental

thank you

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