



SCCS

Annual Conference 2023

The Carbon Landscape:  
Methods & Metrics of CO<sub>2</sub> Storage

# Large-scale bioenergy with CCS (BECCS)

Gareth Johnson, Drax

#SCCSconference



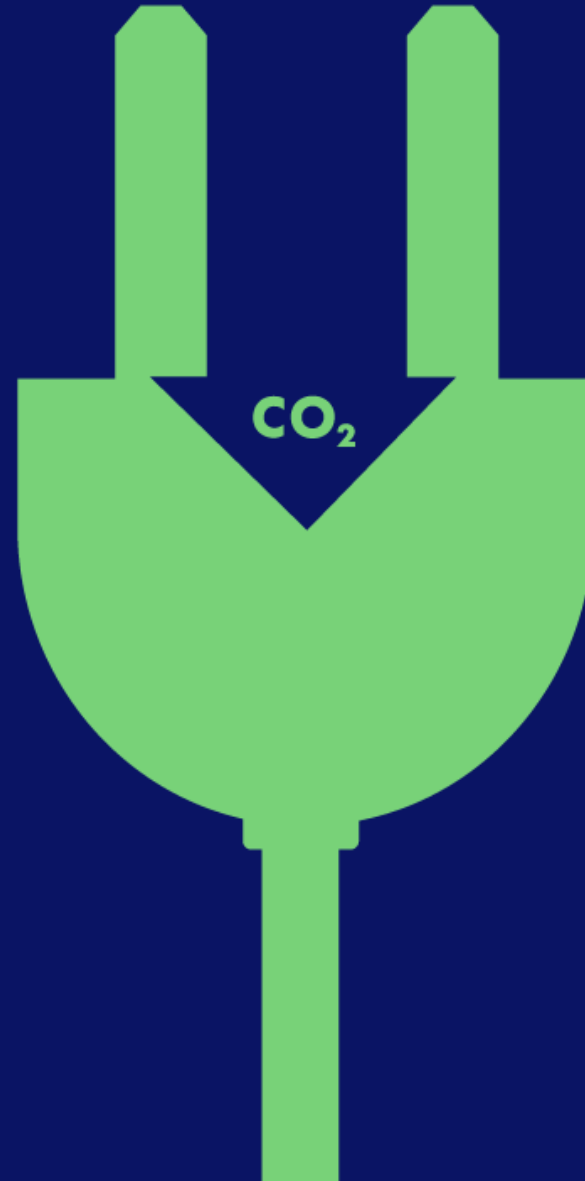
drax

# Large-scale BECCS

**Gareth Johnson**

Head of CCS Sustainability

SCCS Annual Conference 5<sup>th</sup> December 2023



## Who we are



Global, vertically integrated renewable power company



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



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



A leading producer of wood pellets from sustainably managed working forests; with operations in Arkansas, Louisiana, Mississippi and Alabama



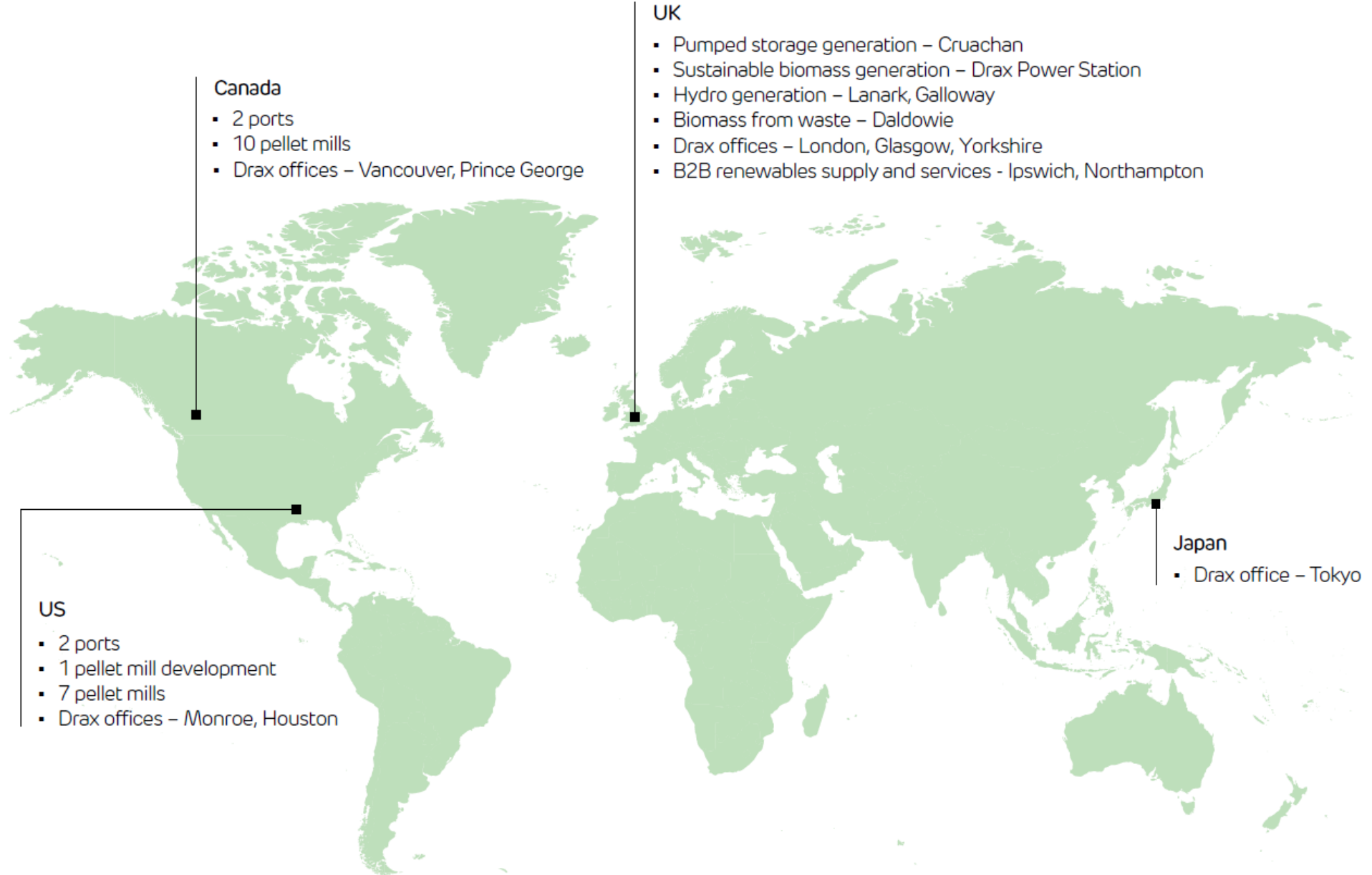
The largest renewable power generator in the UK (11%), providing power to over 5 million homes and businesses



Carbon Dioxide Removal (CDR) pioneer



# Where do we operate?



# Large-scale BECCS



CDR is not a substitute for deep emission cuts but an important tool in reaching net zero (and beyond)

Need for rapid scale up from effectively zero today to reach gigatonnes of CDR by 2050

e.g. IPCC 1.5°C SR median = 2.8Gt BECCS

Quality vs Quantity – land use, biodiversity, social factors, economics, carbon removal...

“BECCS Done Well” – 30 conditions

# Multiple Controls and Processes in Place to Ensure Sustainable Biomass Sourcing



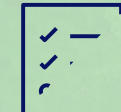
The economics of forestry mean we take low-grade material



We buy from regions where forest regulations are tight



Voluntary certification schemes



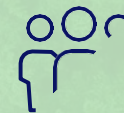
Sourcing policy, supported by our compliance procedures



UK regulations and compliance



Post-harvesting studies, to track impact



Independent Advisory Board of leading academics



Work with our sector to create a universal gold standard

## High quality wood, such as sawtimber for construction, is the primary economic driver for commercial forestry decisions (e.g., harvesting)

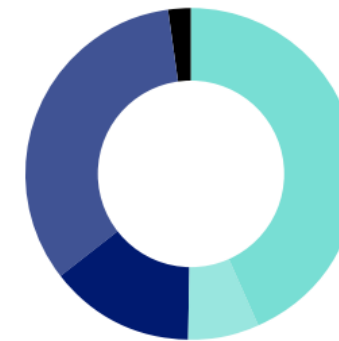
- Sawtimber is used in sectors like construction and furniture – displacing higher-carbon building materials such as steel
- It's simply not economic to use this premium high-value wood for bioenergy

## Sustainable biomass uses low-grade and low-value wood

- Drax, and our suppliers, use feedstock that includes:
  - Harvesting residues (including low-grade roundwood and wood that results from active forest management such as a thinning operation, wood not suitable for use in solid wood products, tops and limbs)
  - Sawmill residues (sawmill chips, shavings and sawdust)

## Commercial forest management is well-regulated and controlled

Fibre sources (%)



Sawmill residues	43
Branches, tops & bark	7
Thinnings	14
Low-grade roundwood	33
Agricultural residues	2

## c.60% of Drax Group fibre comes from USA

- Working forests harvested by landowners for timber and pulp
- Stable / growing carbon stocks
- Engagement with suppliers helps sustain and improve forest management practices
- Working with small and large producers

## c.25% of Drax Group fibre comes from Canada

- 80% – sawdust and sawmill by-products

### Drax Group sources of fibre

	Sawmill & other wood industry residues	Branches and tops	Thinnings	Low-grade round wood	Arbori & Agri. residues	Waste	Total
<b>USA</b>	19.7%	3.0%	13.8%	22.0%	1.4%	-	<b>59.9%</b>
<b>Canada</b>	20.2%	3.3%	-	0.8%	-	-	<b>24.3%</b>
<b>Latvia</b>	2.1%	-	-	6.8%	-	-	<b>8.9%</b>
<b>Portugal</b>	0.1%	0.3%	0.3%	1.2%	-	-	<b>1.9%</b>
<b>Brazil</b>	-	-	0.0%	1.8%	-	-	<b>1.8%</b>
<b>Estonia</b>	0.7%	-	0.2%	0.7%	-	-	<b>1.6%</b>
<b>Other European</b>	0.5%	-	-	-	1.1%	0.1%	<b>1.7%</b>
<b>Total</b>	<b>43.3%</b>	<b>6.6%</b>	<b>14.3%</b>	<b>33.3%</b>	<b>2.5%</b>	<b>0.1%</b>	<b>100.0%</b>

### Drax Pellet Production sources of fibre

<b>USA</b>	24.3%	0.0%	16.2%	12.3%	-	-	52.8%
<b>Canada</b>	38.9%	7.1%	0.0%	1.1%	-	-	47.2%
<b>Total</b>	<b>63.3%</b>	<b>7.1%</b>	<b>16.2%</b>	<b>13.4%</b>	<b>-</b>	<b>-</b>	<b>100.0%</b>

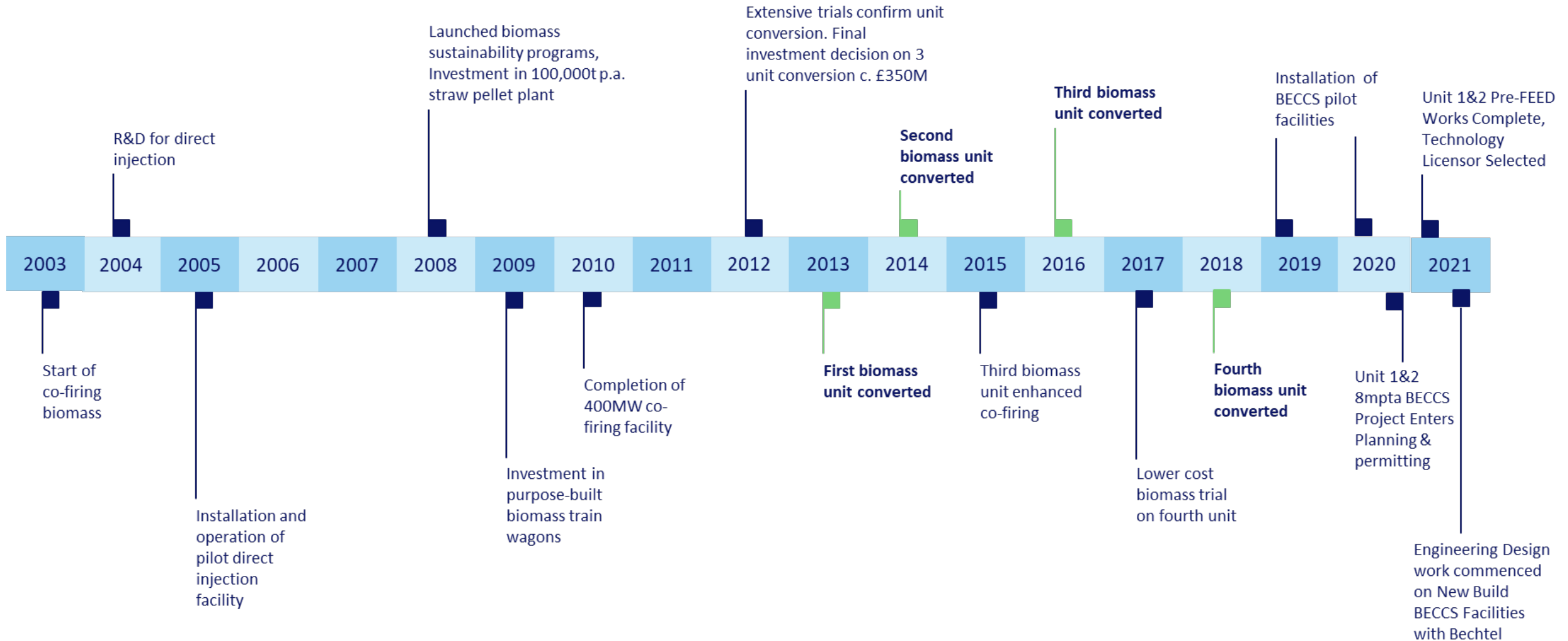


# BECCS at Drax Power Station





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



✔ **£26bn saved** with BECCS, on costs to get the UK to net zero.

✔ BECCS expected to need **13,000 tonnes of steel**.

✔ **80% UK supply chain** ambition for BECCS.

✔ MOU signed with **British Steel**.

✔ Protecting and creating **10,000 jobs**.

✔ **£2bn investment** into a new project for the region.

✔ Building on **5 year partnership** with Selby College.

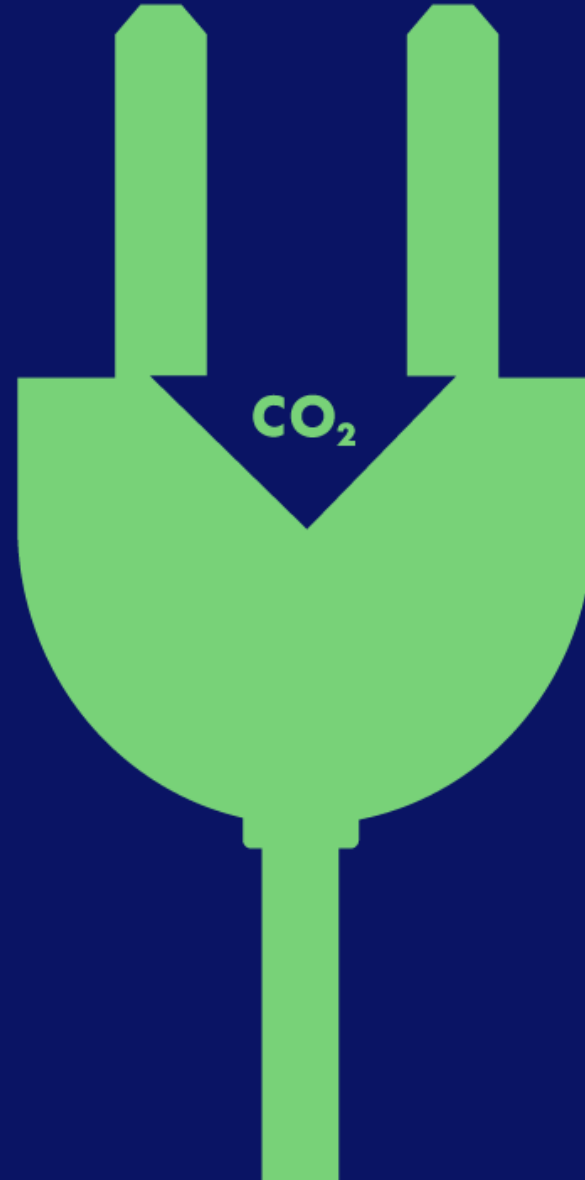
✔ **600 businesses** attended supply chain events across the Humber and Teesside.



drax

# US BECCS

Delivering 24/7 Renewable Power with  
Carbon Dioxide Removal in the U.S.





## Policy



Existing federal and state incentives enhance the U.S. carbon capture potential. e.g. IRA enhancement to the 45Q tax credit. CDR legislation in CA & MS. EFI report – holistic policy framework for responsible large-scale development needed



## Fuel & Carbon Storage



Access to one of the world's greatest fiber baskets, existing CO2 pipeline network and potential coal retirements by 2030 makes the U.S. an optimal location to deploy BECCS



## Sustainability



Established forestry sector with strong sustainability & forest growth practices will make BECCS an exciting addition to the U.S. sustainable forest products sector



## Delivery of BECCS



Develop a deep understanding of the regulatory landscape, local incentives and scoping potential power purchase agreements to deliver BECCS in the U.S.

# New-build BECCS Illustrative Site Layout

Through feasibility studies conducted with both Bechtel and Worley, we have identified the optimal size of the plant for a new build BECCS facility.



Generation capacity:  
**c.250MW net**  
c.400MW gross



Carbon dioxide captured:  
**2.9 Mt**  
of carbon sequestered annually



Healthy forests:  
**3M+**  
green tons of low-grade forest  
residues utilized



Renewable power generated:  
**2.0 TWh**  
of 24/7 renewable baseload power



Inward investment:  
**\$2B**  
initial capital investment from Drax



Job creation:  
**1,000+**  
permanent jobs supported by plant  
operations and across supply chain



Be a world leading, sustainability-driven company at the forefront of the fight against climate change

Set ambitious targets for carbon removals and hold ourselves to strict sustainability, socioeconomic and environmental standards

drax



# Thank you

**Gareth Johnson**  
**Head of CCS Sustainability**



+44 (0)7596 876570



gareth.johnson@drax.com



**drax**

[https://www.drax.com/press\\_release/drax-responds-to-jonathon-porritys-beccs-done-well-report/](https://www.drax.com/press_release/drax-responds-to-jonathon-porritys-beccs-done-well-report/)



SCCS

Annual Conference 2023

The Carbon Landscape:  
Methods & Metrics of CO<sub>2</sub> Storage

Thank you

#SCCSconference

