What is carbon capture and storage?

Three categories:

- post-combustion carbon capture (the primary method used in existing power plants) – separates the CO2 from the exhaust of a combustion process
- oxy-fuel combustion systems - fuel burned in a nearly pure-oxygen environment, resulting in a more concentrated stream of CO2 emissions, which is easier to capture
- precombustion carbon capture – gasifying fuel and separating out CO2 – primarily for industrial processes, new installations only (not retrofit)
- CO2 compressed to supercritical state (behaves like liquid) and piped to storage in underground saline aquifers, spent oil and gas field or coal mines.

“Low carbon” industrial clusters

About 50% of high emissions UL industries are in one of 6 proposed “low carbon” clusters based on carbon capture

First two named for govt support: East Coast Cluster, comprising Zero Carbon Humber + Net Zero Teesside; and Hynet in the NW + N Wales

East Coast Cluster – based around CO2 pipelines and storage in Northern Endurance aquifer

Claims:

- support “levelling-up”: creating and supporting an average of 25,000 jobs per year to 2050
- Kick-start a ”hydrogen economy” supporting creation of “low-carbon” hydrogen projects to deliver 70% of UK’s hydrogen target for 2030.

Does Carbon Capture and Storage Work?

On paper – yes. The chemical process that separates CO2 from flu gas works

In practice – at plant-wide scale, in real-world conditions - not really.

All plant scale trials of CCS so far have been plagued by outages and technological issues. None has performed at anywhere close to its nameplate efficiency

The **only currently operating power CCS plant in the world –** Boundary Dam in Canada - averaged a capture rate of around 50% up to 2021.

In its best year so far (up to 2021) reduction in emissions intensity (compared with unabated coal) was around 65%

Note that all CCS has a high energy demand, so if powered by fossil fuels can actually *increase* total greenhouse gas emissions, largely due to increase in fugitive methane emissions from FF extraction. Methane is around 86% more potent a GHG than CO2 if measured over 20 years rather than 100.

CCS for industry and gas production

- Lobbyists for fossil fuels argue that carbon capture is the best solution for steel making (CO2 emitted from “reducing” of iron ore with coke, and from the reaction with oxygen used to remove excess carbon).
- Greener methods include “direct reduction” using green hydrogen (NOT “blue hydrogen” from fossil fuels with CCS!) and recycling scrap steel (with/without DRI) in an electric arc furnace.
- CO2 is a fundamental by-product of producing cement. CC could be considered as an interim while new types of cement are developed.
- Historically gas processing has been the main use for CCS – initially CO2 was vented, now then (and now) used/sold for enhanced oil recovery!
- Claims re “low carbon”/”carbon neutral” gas and oil refer only to extraction and processing emissions, not “Scope 3” emissions, ie from end users burning the stuff (ie c80% of emissions associated with fossil fuels)!

“Negative emissions technologies”

- The “Net Zero by 2050” scenario exists to facilitate perpetuation of FFs with CCS, but significant industrial “carbon removals” are also envisaged for the residual emissions.
- Various technologies being researched, but the biggest claims are for BECCS (Stuart) and Direct Air Capture (DAC).
- DAC would require vast amounts of renewably-produced electricity – a limited resource. The size of installations needed, and the extent of pipelines for transportation, would raise significant land-use issues.
- (Fun fact: to use DAC to remove the world’s current emissions from FFs would require more than five times the annual global electricity consumption in 2020. And that doesn’t even include the energy that would be required to then transport and store the captured CO2).

Greenwash and “jobswash”

- The greenwashing of fossil fuel technologies poses a threat to workers and their communities, concerned for their job prospects and incomes. Foregone investment in genuine green technologies, and in the millions of jobs needed to cut energy demand in buildings, transport, manufacture and food growing, means foregone investment in good, sustainable employment.
- As the climate emergency worsens, high emissions industries are bent on making emissions reduction plans seem electorally impossible, by portraying them as attacks on jobs and communities economically reliant on particular industries. Whether it’s coal mining, oil and gas extraction or burning trees for energy, those who profit from these industries have a vested interest in making it seem that this is the only way to protect jobs, or create new ones.

How to “jobswash” fossil fuels and biomass

Part one

- Massively exaggerate the numbers of jobs to be created or “supported” by your new FF installation.
- Refer to the jobs numbers at the peak of the construction period as if they were permanent (eg Drax – 10,000 jobs becomes 375 direct). Ignore the fact that there are no redeployment plans for workers after this peak.
- Refer to indirect and induced jobs as if they are specific to your industry and would not exist without it.
- Argue that other industries are dependent on your project (eg without Drax there would be no carbon capture so no blue hydrogen so no foundation industry)
- Use language that implies that technologies like CCS already exist and that holding them back will undermine “competitiveness” and cost jobs.

How to “jobswash” fossil fuels

Part two

In making your jobs claims, make sure you avoid giving any comparison scenarios.

Such comparisons could give the impression that the vast public subsidies you receive could have been put to better use creating public employment in a National Climate Service, building out a genuinely renewably-based energy system; retrofitting homes so that they only need a fraction of the energy input; improving public transport so that most people rarely need to use a car; growing food sustainably and sequestering carbon in forests, soil and peatland; and properly developing a circular economy of materials and goods.

Lobby MPs, and *above all,* capture the discussion about green jobs in communities, workplaces and educational settings to make sure people understand what a caring employer you are, and won’t cause trouble by organising together in their trade unions and communities for public employment in genuine climate jobs.