

Policy Context

- Bioenergy with carbon capture and storage (BECCS) from forest biomass is a prominent carbon removal technology in UK climate pathways, assumed to produce negative emissions by capturing and storing CO₂ released when wood is combusted.
- Drax Group PLC has plans to install CCS on two of its four biomass units of its Yorkshire power station by 2030, with the intention of generating carbon removals as well as electricity, i.e. reducing the total amount of atmospheric CO₂e.
- This will rely on substantial Government and investor support, while bioenergy and BECCS operations have been controversial with certain scientists and campaigners.
- This analysis assesses the whole system carbon impact of CCS technology becoming fully operational on all four units at the Drax power station after 2030, with a 90% carbon capture rate. This assumption is unrealistically favourable towards the Drax system which proposes only two out of four of its biomass units to be converted to BECCS. The analysis uses data from US forests to assess the impact of projected Drax wood pellet demand on the overall carbon balance of the system.
- Results indicate that **the proposed UK BECCS system would in fact lead to more CO₂e in the atmosphere than the baseline scenario without the BECCS system until approximately 2053**, due to the more intensive forest management regime associated with additional wood pellet demand to feed the BECCS plant. It finds that the impact of the CCS technology is far smaller than the impact of wood pellet sourcing on forest carbon stocks and flows.
- This analysis is consistent with the Greenhouse Gas Protocol's pilot Land Sector and Removals Guidance (2022), which states that businesses should consider "avoided removals (removals that would have otherwise happened, but that, as a result of a company's activities, did not happen)," and "assess the GHG impacts of an action compared to the conditions most likely to occur in the absence of the action. Companies should use the results to ensure that actions lead to global net GHG benefits."
- Given substantial costs that may be associated with future BECCS projects, it is crucial to determine whether the project would in fact deliver its anticipated carbon benefits, compared to the counterfactual which would require no additional investment.
- Updates to policy and accounting regimes to reflect the full accounting of greenhouse gas removal and emissions, compared to counterfactuals, could substantially undermine the case for public and private investment in BECCS.

Executive Summary: Implications for UK Net Zero of Bioenergy with Carbon Capture and Storage (BECCS) utilising Southern US sourced biomass

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Summary

- **New analysis finds that a UK BECCS system based on wood pellets supplied from Drax pellet mills in the southern US would increase, rather than decrease, levels of atmospheric CO₂e compared to a scenario without the UK BECCS system, until approximately 2053.**
- To limit global warming to 1.5°C, greenhouse gas emissions must peak before 2025 at the latest and decline 43% by 2030. To this end, in 2019 the UK legislated to reach Net Zero emissions by 2050, with interim legally binding five-year carbon budgets.
- The additional atmospheric CO₂e from the projected BECCS system by the end of the UK's Sixth Carbon Budget period (2033-37) is 42 MtCO₂e. This is counter to what is expected in the UK's carbon budget plans, which expect that BECCS will instead *remove* around 20MtCO₂e from the atmosphere by 2035. In this report, the BECCS scenario does not begin to provide additional negative emissions until beyond 2050.
- Updates to policy and accounting regimes to reflect the full lifecycle of greenhouse gas removals and emissions, compared to realistic counterfactuals, could reveal that major projects including BECCS represent a substantial risk to Paris Agreement obligations.