

Deadline 3 submission from Leeds Trades Union Council: a response to the Applicant's response to some of the points made in Relevant Representations (Document 8.10.1)

Having read the Applicant's responses (in Document 8.10.1 to submissions made by parties concerned about climate and environment impacts of large-scale woody biomass burning, we are concerned by the Applicant's repeated dismissal of these concerns as not being within the scope of the present application. We have presented arguments for considering that these concerns must be within scope. For example, the Planning Act (2008) states that both the legality of a development and the UK's international obligations override the requirement to examine an application with reference to the relevant National Policy Statements. Several Parties have argued that the present application is likely to be in breach of the Climate Change Act 2008 (2050 Target Amendment) Order 2019, as well as undermining the UK's Nationally Determined Contributions to global emissions reduction, and the 6th Carbon Budget, as well as being unable to comply with the High Court's ruling that the government must be able to quantify the contributions to emissions mitigation from developments in each sector. The Applicant does not appear to have engaged with these concerns, which arise due to the strong scientific evidence that the large scale burning of woody biomass does in fact result in increased GHG emissions over the relevant time period. Instead, the Applicant has merely reiterated that the application is in line with government policy, and that the biomass burning has already been consented.

The Applicant states that treating the smokestack emissions as zero is in accordance with accounting regulations which "require that biogenic carbon emissions are calculated through changes in land carbon stock in the Agriculture, Forestry and Other Land Use (AFOLU) sector, not at the point of final emission (e.g. combustion or respiration)." (Document 8.10.1 – 3.2). This is not an acceptance that the emissions are negligible, nor that they are compensated by re-sequestration; it merely allows them to be attributed to the country from which the biomass is sourced rather than the country in which it is burned. Therefore, given that this harvesting and these land use changes demonstrably do result in loss of carbon sequestration capacity at least over several decades, the burning of them results in net emissions over this period regardless of where these emissions are accounted; and the permanent capture and storage of such emissions will either fail to mitigate the emissions accountable to the source country and/or fail to produce negative emissions accountable to the UK. Put another way, if the entire lifecycle emissions occurred within the UK, it would be apparent that the net result was a net increase in emissions from the biomass burning, only partially abated by any carbon capture.

The Applicant quotes the IPCC Guidelines:

"If the [CCS] plant is supplied with biofuels, the corresponding CO₂ emissions will be zero (these are already included in national totals due to their treatment in the AFOLU sector), so the subtraction of the amount of gas transferred to long-term storage may give negative emissions." (IPCC, 2006 Guidelines for National Greenhouse Gas Inventories, Chapter 2 Stationary Combustion, Section 2.3.4, Carbon Dioxide Capture, page 2.37).

The Applicant avoids the implications of the word "may" ("may give negative emissions"). This would only be so IF the emissions sequestered by the CCS are greater than the emissions attributed to the AFOLU sector. Furthermore, given the carbon debt and the very slow rate at which it can be repaid, the emissions from the AFOLU sector are large and persistent, and provide no justification for the biomass burning on this scale.

Under present rules concerning permitted lifecycle emissions for an energy source to be considered renewable for the purposes of RO, any new application for biomass burning at Drax would not meet the requirements; the lifecycle emissions are too high. As we have previously argued, the burners which are proposed to be retrofitted would be nearing the end of their design life by the time the proposed CC was added. The application is therefore in effect an application not just for the CC retrofit but for a new BECCS installation as a whole. Therefore, the entire lifecycle emissions are pertinent, including those from the biomass harvesting and land use changes.

In a report released this week by the Climate Change Committee (Delivering a Reliable Decarbonised Power System, the Committee notes that, as well as having significant emissions, biomass is a finite source of energy and therefore should be used sparingly, and that no further unabated biomass should be consented. Whilst accepting a role for BECCS, the Committee qualifies that the biomass must be sustainable, and that it should be sourced from within the UK with the emissions from changes to forest and land carbon stocks properly accounted.

It appears to us that the proposal for BECCS at Drax meets none of these requirements: for the wood supply to be sustainable it would have to result in no decline of forest and land carbon stocks, which we know is not the case; it is also impossible for biomass on this scale to be sourced from within the UK, and certainly not without taking almost all land out of other uses such as food production, and replacing existing biodiverse forests with monoculture plantations with low sequestration capacity.

We are further concerned by Drax's confident assertion, against all existing precedent, that the proposed carbon capture will achieve an average 95% capture rate.

At DOC 8.10.1 -3.3, the Applicant states that "The CO₂ released from the combustion process will be captured and the technology is designed to capture rate approximately 95%." The operative word here is "designed". The report by the IEA Greenhouse Gas Project: "Towards Zero Emissions CCS in Power Plants Using Higher Capture Rates or Biomass" (IEAGHG Technical Report 2019-02 March 2019), under the heading "CO₂ capture rates used in practice" states that "In the two large scale CO₂ capture and storage (CCS) projects in the power industry (Boundary Dam and Petra Nova projects), 90% of the CO₂ is captured from the flue gas that is directed to the capture plant". This is the design capture rate; we know in practice that the Petra Nova plant was mothballed due to serious underperformance, whilst the Boundary Dam plant has achieved a capture rate of no more than around 60% over any given year. It is apparent that, whilst

modelling studies often employ a notional 90% capture rate, and this may be achieved in smaller-scale pilots or demonstrations of restricted scope, this has never been borne out in the field, that is, over a sustained period of time, at large scale, and when the capture rate of the entire facility is observed. The IEAGHG study concludes that “While a comprehensive review of the literature and desktop modelling studies indicate that, when fitted with CCS, there are no technological barriers to achieving near-zero emissions from both coal and gas-fired power plants, validation is required. Higher capture rates urgently need to be demonstrated in practice across the range of capture technologies”.

In other words, far from providing assurance that BECCS at Drax will achieve the promised capture rate, what this review shows is that desktop studies and small-scale, time-limited pilots give no accurate indication of long-term capture rates at large scale in the field; on the contrary, they appear to indicate a persistent failure of the theoretical capture rate to be translated into practical success in the field; there have so far been no large-scale demonstration projects and no working installations that have achieved these rates.

If the Applicant had good reason to believe that they would have greater success, having overcome all the faults and shortcomings of the previous, underperforming, projects, presumably they would have laid out what those technical learnings had been, and shown how they were avoiding them; but instead, they simply cite these relatively failed projects as evidence of good precedent.

We have also consulted the article cited by the Applicant at 8.10.1 – 3.5:

In the article “How amine post-combustion capture can trap 100% of fossil CO₂ before it enters the atmosphere.” Professor Jon Gibbins states “Based on more recent experience, this generally accepted limit [of 90% capture rate] has been pushed up to 95% capture, but this is obviously still short of net zero”

It is clear upon reading this paper that it deals with capture rates that are feasible in theory, by adopting a range of engineering measures. What it does not say is either that these measures have been demonstrated at large scale in the field (they have not), or that they are applicable to the particular installation proposed here (presumably they are not, or the Applicant would have advanced far more convincing reasons to show that they are). Again, the very fact that the Applicant cites this to support their case, in fact appears to demonstrate that they have no research or examples to hand of successful application in the field.