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Ember's submission to the Environmental Audit Committee
RE: Call for Evidence - Technological Innovations and Climate Change: Negative Emissions Technologies

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Submitted 28th October 2021

Ember is an independent, not-for-profit energy think tank that produces cutting-edge research and high impact policies that aim to accelerate the global electricity transition from coal to clean. We have previously worked on issues around the replacement of coal with biomass in the UK and EU and continue to research and understand the role biomass will play in the clean energy transition. As a result we are increasingly working on BECCS in the power sector - the part it can play in reaching net-zero and its potential issues and pitfalls.

We are submitting this evidence as we are concerned with the ability of the current mainstream form of BECCS to deliver genuinely negative emissions on the scale or in the timescale promised by bioenergy companies and projected in net zero pathways.

BECCS is not one single technology - varying on type of biomass feedstock and final energy use (e.g. power generation, heat generation, hydrogen production etc.). However, as there is currently only one large-scale BECCS project in development in the UK at Drax power station, this model of the technology— the addition of CCS to a biomass-fired power plant— has become the mainstream conception of BECCS. Currently over 7 million tonnes of wood are burned every year at Drax and although burning wood for power is considered carbon-neutral in the UK and EU, there is an ever-increasing scientific consensus that burning wood for power is a net emitter of CO_2 and can be even more polluting than coal as well as damaging forest biodiversity, with the exception of a few specific sources of forestry waste that are unlikely to be included in bioenergy supply chains.

This means that despite the assurances of the biomass industry, there is a very high risk that current practices of burning wood for power are contributing to climate change. This has serious implications for the ability of a BECCS project such as the one proposed by Drax to genuinely deliver negative emissions. In other words, if burning wood for power is a source of net carbon emissions then the addition of CCS to this process does not generate negative emissions.

In theory, it is possible for some forms of BECCS to generate genuine negative emissions and make a contribution to reaching net zero provided numerous conditions are met, including choice of an appropriate biomass feedstock and optimisation of land use for

carbon sequestration. However, it will require significantly more independent research and investigation to turn this theory into practice and establish the true availability of these feedstocks. There will also need to be thorough, rigid and independently overseen monitoring, reporting and verification of biomass supply chains to ensure that BECCS plants really do generate the negative emissions they claim to.

The current state of understanding around the carbon and environmental impacts of large scale wood burning with CCS is very limited and has little consensus. This means that large BECCS projects such as that proposed by Drax are at a very high risk of failing to deliver negative emissions. As we have previously reported, Drax's proposed BECCS project could cost UK energy bill payers over £30bn across its lifetime - an enormous investment for such an risky technology. Not only could this investment fail to deliver any negative emissions but it also could represent a serious opportunity loss for investment in faster and deeper economic decarbonisation or emission removal strategies that are known to work (such as nature-based solutions).

The UK's Biomass Strategy 2022 should reflect the scope of uncertainty around BECCS. Instead of prematurely promoting BECCS projects in the UK, it should focus on building scientific knowledge and consensus on BECCS and the true extent of its possible contribution to UK climate targets. It would be especially useful for the Biomass Strategy 2022 to clearly set out the costs and implications of reaching net zero without BECCS so that we can better understand the trade-offs from minimised BECCS deployment in the future.