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Ember's response to National Grid's FES2022 call for evidence

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Question: *Are there any assumptions made in FES 2021 that you would challenge? If so please detail below.*

Answer: The assumption that burning biomass is carbon neutral and that therefore the addition of CCS means that BECCS generates negative emissions is highly problematic.

The impact of burning biomass for power is hotly debated at the moment, but the large and growing majority of scientific evidence suggests that it is both bad for climate and environment. Specifically, there are likely very few sources of biomass that, if burnt, can be considered carbon-neutral on the timescales relevant to reaching climate goals. These kinds of biomass are scarce, and difficult to identify. Given this, and the enormous scale of the biomass supply chains that are currently used by biomass burning power plants (and would be needed by any future BECCS plant), it is very unlikely that much existing and possible biomass burning is carbon neutral. This then brings into question whether BECCS can really deliver negative emissions.

This means that the scale and speed of negative emissions generated by BECCS in the FES scenarios are subject to very high uncertainty. Given that negative emissions from BECCS are essential to reaching net-zero in all FES pathways their credibility is weakened.

While FES does mention sustainability issues relating to biomass, its broad statement that (in short) all biomass used in these scenarios is sustainable/carbon-neutral is not adequate. While it is not the responsibility of National Grid to weigh in on the biomass debate it would be a very positive step to see the issues surrounding bioenergy more comprehensively addressed. For example, we would encourage National Grid to more clearly state the significant uncertainty around biomass use and understand that its inclusion in FES scenarios is necessitated by low societal behaviour change or land-use change.

The reduction of BECCS deployment in FES2021's *Leading the Way* scenario is a positive improvement on FES2020. However, we would welcome FES2022 including at least one net-zero scenario with very low or no BECCS deployment. This would allow FES to more comprehensively set out and quantify the trade-offs between BECCS and other negative emissions technologies (including nature-based solutions) and behaviour changes. A clear

statement such as: "to reach net-zero by 2050 will require X Mt of CO₂ removals. If this is not to be met by BECCS, which is a highly risk-laden technology, then it would require Y Ha additional forest planting or Z change in consumer behaviour" would provide a more nuanced and informative discussion on BECCS in net-zero pathways.

Question: *What role do you see for bioenergy in the future? Do we need to consider changes for FES 2022?*

Answer: There is no need or justification for including unabated bioenergy in future power systems. It is highly expensive, may well contribute to carbon emissions, and there are sufficient clean alternatives to providing both baseload and peaking power.

As discussed in section 12, given the high uncertainty around the carbon impacts of BECCS we see a much reduced role for bioenergy in the future. We do not advocate for a specific quantity of BECCS to be included/excluded from future energy pathways but instead encourage National Grid to view BECCS as a 'technology of last resort'. The scale of its inclusion in FES should not be determined by perceived future size of biomass supply (calculations of which are fraught and struggle to deal with any of the nuance around bioenergy) but should be determined by the size of residual emissions after all other emissions removal options have been fully explored and exhausted. Again we would reiterate that it would be very useful for FES2022 to include at least one 'no bioenergy/BECCS' net-zero scenario.