

The Role of Biomass in Achieving Net Zero

Call for Evidence

Closing date: 15 June 2021, 11.45pm BST

Response submitted by Ember to the Department for Business, Energy & Industrial Strategy

Summary

Further research is needed to understand the biomass supply chain before the country embarks on a commercial-scale BECCS project. BEIS must be confident that negative emissions promised are truly deliverable - before embarking on a large-scale subsidy programme.

Coal-to-biomass conversions, biomass-for-power, and BECCS are expensive sources of power generation compared to the alternatives, and so they must demonstrate other uses to be supported by government.

Limited global supplies of sustainable, low-carbon biomass are best used outside of the power sector, for instance in construction, or in hard-to-abate industry.

Ember is calling for:

1. **UK regulations on sustainable biomass to be tightened to regulate out feedstocks from primary, high-carbon, highly biodiverse or slow-growing forests.** This is in keeping with the Sixth Carbon Budget advice, where the Climate Change Committee states *“the development of BECCS is contingent on sourcing sustainable biomass, given concerns over the associated lifecycle emissions”*.
2. The assumption that biomass use for power is inherently carbon neutral is no longer supported by science. **Biomass generators in the UK should publish a full lifecycle assessment of the carbon impact of their biomass feedstocks**, with realistic counterfactuals, over a time-scale relevant to the Paris Agreement.
3. With BECCS playing an important role in many climate scenarios, BEIS should explore lower risk routes for biomass feedstock – **especially in sourcing domestic energy crops on degraded land**, which are less likely to have a large emissions impact.
4. Carbon accounting isn't just messy when it comes to biomass imports – the UK's carbon budgets also bundle emissions mitigation and negative emissions. **To give clarity on the scale of negative emissions necessary under our 2050 net zero law, residual emissions and negative emissions budgets should be unbundled.**

5. **Publication by generators of estimates for costs and subsidy requirements for BECCS** projects, to enable comparison with other sources of power or negative emissions.
6. Given BECCS cannot yet be relied upon to provide true net negative emissions, **there's an urgent need to understand other routes to provide negative emissions** – and reconsider the potential for further emissions mitigation to minimise the requirement for net negative emissions. Direct air capture should be explored, but comes with very significant energy costs, and so is best suited to areas of excess wind and solar production. Nature based solutions (such as afforestation and restoration) which do not burn wood can deliver negative emissions now at low cost and risk – the UK must begin to deploy at scale immediately.

Biomass Availability – How much biomass can we assume the UK will have access to?

1. Do you give permission for your evidence to be shared with third party contractors for the purpose of analysis?

Yes

2. What is the potential size, location and makeup of the sustainable domestic biomass resource that could be derived from the a) waste, b) forestry, c) agricultural sectors, and d) from any other sources (including novel biomass feedstocks, such as algae) in the UK? How might this change as we reach 2050?

Ref: <https://ember-climate.org/commentary/2020/10/28/gambling-with-biomass/>

3. What are the current and potential future costs of supplying these different biomass feedstock types, and the key environmental and land-use impacts (positive or negative) associated with supplying and utilising these different types of biomass, e.g. impacts on GHG emissions, air quality, water quality, soil health, biodiversity, food security, land availability, etc?

Costs ref: The Burning Question. <https://ember-climate.org/project/the-burning-question/>
Drax BECCS paper <https://ember-climate.org/project/cost-drax-beccs-plant/>

4. How do we account for the other (non-GHG) benefits, impacts and issues of increasing our access to, or production of domestic biomass (e.g., air quality, water quality, soil health, flooding, biodiversity)?

5. How could the production of domestic biomass support rural employment, farm diversification, circular economy, industrial opportunities, and wider environmental benefits? This can include considerations around competition for land, development of infrastructure, skills, jobs, etc.

No response.

6. What are the main challenges and barriers to increasing our domestic supply of sustainable biomass from different sources?

No response.

7. What is the potential biomass resource from imports compared to the levels we currently receive? What are the current and potential risks, opportunities and barriers (e.g., sustainability, economic, etc) to increasing the volumes of imported biomass?

Chapter 2: End use of Biomass

8. Considering other potential non-biomass options for decarbonisation (e.g. energy efficiency improvements, electrification, heat pumps), what do you consider as the main role and potential for the biomass feedstock types identified in Question 2 to contribute towards the UK's decarbonisation targets, and specifically in the following sectors?

- Heat
- Electricity
- Transport
- Agriculture
- Industry
- Chemicals and materials
- Other?

9. Out of the above sectors, considering that there is a limited supply of sustainable biomass, what do you see as the priority application of biomass feedstocks to contribute towards the net zero target and how this might change as we reach 2050? Please provide evidence to support your view.

10. What principles/framework should be applied when determining what the priority uses of biomass should be to contribute to net zero? How does this vary by biomass type and how might this change over time?

11. When thinking of BECCS deployment, what specific arrangements are needed to incentivise deployment, compared to what could be needed to support other GGR and CCUS technologies as well as incentivising wider decarbonisation using biomass in the priority sectors identified?

12. How can Government best incentivise the use of biomass, and target available biomass towards the highest priority applications? What should the balance be between supply incentives and demand incentives and how can we incentivise the right biomass use given one feedstock could have multiple uses or markets?

13. Are there any policy gaps, risks or barriers hindering the wider deployment of biomass in the sectors identified above?

14. How should potential impacts on air quality of some end-uses of biomass shape how and where biomass is used?

Chapter 3: Sustainability and Accounting for Emissions

15. Are our existing sustainability criteria sufficient in ensuring that biomass can deliver the GHG emission savings needed to meet net zero without wider adverse impacts including on land use and biodiversity? How could they be amended to ensure biomass from all sources supports wider climate, environmental and societal goals?

16. How could we improve monitoring and reporting against sustainability requirements?

17. What alternative mechanisms would ensure sustainability independent of current incentive schemes (e.g., x-sector legislation, voluntary schemes)?

18. What additional evidence could suppliers of biomass-derived energy (for heat, fuels, electricity) provide to regulators to demonstrate they meet the sustainability criteria?

19. How do we improve global Governance to ensure biomass sustainability and what role does the UK play in achieving this?

Accounting for Emissions – How can we improve the way we account for biomass emissions?

20. How should the full life cycle emissions of biomass be reflected in carbon pricing, UKETS, and within our reporting standards?

21. How should BECCS be treated for domestic and international GHG emissions accounting and reporting? What are the implications of existing reporting rules on our ability to deliver negative emissions, when for instance, land use change emissions and stored CO₂ are being accounted for in different countries?

Chapter 4: Innovation

22. Given the nature and diversity of the biomass feedstock supply (as referenced in Chapter 1), what specific technologies are best positioned to deliver the priority end uses (as referenced in question 9), and how might these change as we reach 2050?

23. What are the barriers and risks to increasing the deployment of advanced technologies (e.g., gasification, pyrolysis, biocatalysis) and what end use sectors do you see these being applied to?

24. In what regions of the UK are we best placed to focus on technological innovation and scale up of feedstock supply chains that utilise UK-based biomass resources?

25. Post-combustion capture on biomass electricity generation is one method in which BECCS can be deployed to deliver net-zero. Specifically, how could innovation support be targeted to develop the maturity of other BECCS applications, such as biomass gasification?

26. What other innovation needs to take place in order to reduce life cycle GHG emissions and impacts on air quality in biomass supply chains? Are all of these easily achievable, and if not, what are the barriers?

For reference: [Joint NGO response](#)