

BIOMASS SUSTAINABILITY AND AVAILABILITY

Supplementary Note to REA submission to BEIS Call for Evidence

Provided by Biomass UK. Biomass UK is part of the REA – the Association for Renewable Energy & Clean Technology – representing the REA’s biomass power sector members.

Summary:

1. Imports of bioenergy feedstocks should be maintained and allowed to increase alongside greater domestic production if the market requires;
2. Available resources have increased at the same time as the UK has increased demand for bioenergy feedstocks;
3. There is significant potential for bioenergy feedstocks to increase sustainably;
4. Continuity of regulations (such as Sustainability Criteria) is essential if landowners and bioenergy operators are to invest in sustainable bioenergy supply;
5. It will be costly and difficult to achieve Net Zero without building on the UK’s current bioenergy sector.

Imports should be maintained and allowed to increase

Strong and sustainable trade partnerships have been enforced by the UK’s Sustainability Criteria. They play a key role in bioenergy sustainability.

This document draws most on data relating to the US Southeast region, from which the UK has sourced most of its wood pellets for energy (particularly power) generation. However, the UK’s stringent Sustainability Criteria play an important role by regulating all regions where the UK sources wood pellets. The Sustainability Criteria also help to prevent the sourcing of unsustainable biomass from catchment areas that lack mature forestry sectors and/or appropriate land sector regulations. This is one of the reasons for the UK to have built a strong partnership with suppliers in the Southeastern USA, Canada and the EU in particular.

The leading reason for the UK to source from imported stocks is that the UK has relatively low availability at present, compared with the very high abundance of low-value wood fibres seen in areas such as the Southeastern USA. Such areas have far larger forestry sectors as well as far larger forest cover (the Southeastern USA’s working forests are three times larger than the UK’s entire landmass).

The market, operating under the IPCC’s carbon accounting regime and a high carbon price together with continued Sustainability Criteria, should be permitted to allocate resources efficiently. This means drawing on international resources as well as boosting domestic feedstocks. This does not preclude the UK from encouraging other sectors that might develop increasingly efficient options for feedstock use, but this should happen through investment in research and development in such technologies, rather than attempting to tilt the market wholesale towards one technology or another. The latter approach would likely create market inefficiencies and unintended consequences, such as creating unnecessary pressure on wood fibre supply in the UK.

The UK can and should be making more use of bio-resources in order to create carbon sinks (such as through greater timber use in buildings¹) and to support sustainable management of forests. The market for low-value wood fibres increases the efficiency of such operations, while the UK's Sustainability Criteria add a layer of regulatory protection to forests internationally. The UK, which has the institutional capacity and expertise to scrutinise its supply chains, should not shy away from this role in supporting higher standards and ambitions in global forestry.

Useful evidence/research on high value of imports:

| Source | Author/Publisher | Link |
|--|-----------------------------------|----------------------|
| Wood Supply Trends in the US South | Forest2Market | Link |
| Status and prospects for renewable energy using wood pellets from the southeastern United States | Dale et al., <i>GCB Bioenergy</i> | Link |
| Land Use Policies for a Net Zero UK | Climate Change Committee | Link |
| Biomass in a Low-Carbon Economy | Climate Change Committee | Link |

Resources have increased alongside largescale biomass supply

Supply under the current Sustainability Criteria has led to net growth, not depletion, of relevant resources.

In the Southeastern USA, which supplied 63% of the wood pellets imported to the UK in 2019,² the relevant supplier forests have increased tree cover by 3% and forest inventories by 112% since 1953 (when USFS records began), indicating a larger carbon sink. This trend has continued in the past decade, during which around 3-4% of standing forest inventories were harvested for multiple industries, mainly timber. Of this harvested volume, around 4% typically goes towards pellet exports, meaning that around 0.1% of forest inventories are used for pellet production, compared to around 0.7-1% annual net growth (overall growth is around 4-5%).³ Therefore the forests are increasing inventories year-on-year whilst also supplying multiple industries.

These positive trends are shown in analysis of independent US Forest Service data. For example, Drax's Catchment Area Analyses, conducted by Hood Consulting and Forisk Consulting, show that the supply areas across the Southeastern US increased forest inventory by 6.10-15.66%.⁴ Other analyses have shown an excess available resource across the US. The US Department for Energy estimated over 1 billion dry tons of forest and agriculture resources were available.⁵ Similar trends are seen in other supplier regions

¹ <https://www.theccc.org.uk/publication/biomass-in-a-low-carbon-economy/> p.11

² <https://www.gov.uk/government/statistics/dukes-foreign-trade-statistics>

³ https://www.forest2market.com/hubfs/2016_Website/Documents/20151119_Forest2Market_USSouthWoodSupplyTrends.pdf

⁴ <https://www.drax.com/sustainability/sustainable-bioenergy/catchment-area-analyses/>

⁵ https://www.energy.gov/sites/prod/files/2016/08/f33/BillionTon_Report_2016_8.18.2016.pdf

around the world, although regional conditions are relevant, and the UK’s Sustainability Criteria are highly effective in monitoring such conditions.

Such positive trends are the direct result of revenues from wood products. Analysis of US Forest Service data shows a clear and consistent positive correlation between the presence of market investment in forests and growth rates, standing inventories and tree cover across hardwoods and softwoods.⁶ Even in the UK, woodland management has been dependent on revenues and woodland health and tree cover has fallen where forestry has not been incentivised. For this reason, a coalition of environmental NGOs supported the government’s woodfuel strategy of 2007, and the strategy has been credited with supporting woodland management improvements in England and Wales.⁷ Looking internationally, the same principles apply: not-for-profit or state management of woodlands are the exception, not the rule. In the face of higher risks from land use change, climate change and other threats, forests around the world can benefit from private sector investment in market operations.

Useful evidence/research on resource performance to date:

| Source | Author/Publisher | Link |
|--|---|----------------------|
| How is wood-based pellet production affecting forest conditions in the southeastern United States? | V. Dale et al. (2017), <i>Forest Ecology and Management</i> | Link |
| Historical Perspective on the Relationship between Demand and Forest Productivity in the US South | Forest2Market | Link |
| Use of high carbon North American woody biomass in UK electricity generation | DECC/BEIS/Ricardo Energy & Environment | Link |
| The US South’s biomass sourcing areas analysed – Catchment Area Analyses | Drax | Link |

Biomass has significant potential to increase supply

Biomass supplies can increase further to meet higher demand, without undermining sustainability.

Current estimates of biomass potential are conservative. It is very likely that rising demand for biomass can be met sustainably, based on trends seen in supply regions so far. The Government should not try to predict these (since they are dependent on highly diverse local conditions) and instead apply the existing Sustainability Criteria to ensure supply chains are properly managed and transparent.

The most obvious place for the UK to increase its supply of bioenergy feedstocks is from the UK. We encourage Government to continue investing in diversification of feedstocks, such

⁶https://www.forest2market.com/hubfs/2016_Website/Documents/20170726_Forest2Market_Historical_Perspective_US_South.pdf p.24

⁷ https://www.wcl.org.uk/docs/2009/Link_position_statement_Woodfuel_Strategy_03Jul09.pdf

as through its Biomass Feedstocks Innovation Programme and through further investment in bioenergy technologies. We would also encourage DEFRA to recognise the role of bioenergy in afforestation and investment in British woodlands. This was notably absent from the recent England Trees Action Plan,⁸ whereas Scotland, which has a more active forestry sector, officially recognises the role of bioenergy as part of a prosperous and sustainable land sector. Evidence from the ESME model, which has been supported by the National Farmers Union, suggests an additional 1.0 – 1.8 Mha of land could be potentially available for other agricultural uses, including bioenergy feedstock production (without impacting food production). Planting around 1.4 Mha of second-generation energy crops could deliver between 70-105 TWh of feedstock annually.⁹ This figure did not factor in the impending switch to ELMS, which may support additional energy crop production due to the environmental benefits of some crop species (e.g. supporting water management).

Despite this potential, Government should not attempt to bias the market against sustainable imports of bioenergy feedstocks. The market is best placed to identify and allocate efficient use of feedstocks through price signals, assuming robust international carbon accounting (as set out by the IPCC), a high carbon price and consistent Sustainability Criteria that apply to the whole supply chain.

As mentioned above, the Sustainability Criteria have a role in preventing feedstock supply from higher risk regions and encouraging the use of highly developed certifications such as the Sustainable Biomass Program. This permits flexibility for the market to seek out low-value fibres in areas with strong regulations and mature forestry sectors.

We encourage the UK Government to convene a working group with industry and academia to analyse the full potential of global feedstock supply, assessing both the UK’s possible usage and international demand in line with IPCC scenarios. This should draw on industry understanding of the use of particular feedstock types and not simply assume unrealistic worst-case scenarios, as some studies have done.

Useful evidence/research on potential availability in future:

| Source | Author/Publisher | Link |
|---|--|----------------------|
| UK Biomass Availability Modelling: Scoping Report | Supergen Bioenergy Hub | Link |
| Billion-Ton Report | US Department of Energy | Link |
| Forests: Carbon sequestration, biomass energy, or both? | A. Favero et al. (2020), <i>Science Advances</i> | Link |

Continuity is key for a thriving industry

⁸ England Trees Action Plan 2021 to 2024, <https://www.gov.uk/government/publications/england-trees-action-plan-2021-to-2024>

⁹ Energy Technologies Institute, *Increasing UK biomass production through more productive use of land*, <https://www.eti.co.uk/library/an-eti-perspective-increasing-uk-biomass-production-through-more-productive-use-of-land>

Government should use the current sector as a base for BECCS development and other innovations. Regulatory continuity is central to this because it supports investment confidence, which also lowers the cost of supply through more affordable finance.

Bioenergy feedstock supply is around 3% of forestry operations by harvest/removal volume.¹⁰ Forestry operations are typically led by timber supply. Bioenergy markets are a small but valuable addition to this, providing revenues for low-value wood fibres. Despite this, bioenergy supply is highly regulated and scrutinised, and involves higher requirements for management plans, reporting and well-managed market relationships. Therefore landowners and other supply chain participants will only invest in sustainable bioenergy market participation and compliance if there is a high degree of certainty and consistency.

Such consistency has been core to the success of the UK's supply chain relationships and should be maintained if we are to deliver BECCS and other emerging technologies that use biomass feedstocks. The UK's international supply chain is committed to its world-leading Sustainability Criteria, which are seen as the gold standard for other countries to follow.

We encourage the Government to build on the existing sector, which includes world-leading engineering and sustainability expertise, as well as highly developed infrastructure. This is the best basis for developing BECCS and other bio-based technologies well before 2030. Failing to do so will undermine investment in UK bioenergy, which would prove costly to reverse when the Government later decides to ramp up bioenergy use in BECCS.

| Source | Author/Publisher | Link |
|---|-------------------------------|----------------------|
| Value of Biomass with Carbon Capture and Storage (BECCS) in Power | Baringa Partners | Link |
| The Role For Bioenergy in Decarbonising the UK Energy System: Findings from the ETI Bioenergy Programme | Energy Technologies Institute | Link |

¹⁰ Forest2Market, *Wood Supply Market Trends in the US South, 1995-2015*, https://www.forest2market.com/hubfs/2016_Website/Documents/20151119_Forest2Market_USSouthWoodSupplyTrends.pdf