

REA Response: Environmental Audit Committee Inquiry Sustainable Timber and Deforestation

The Association for Renewable Energy & Clean Technologies (REA) is pleased to submit this response to the Environmental Audit Committee Inquiry into Sustainable Timber and Deforestation. The REA represents industry stakeholders from across the whole bioenergy sector and includes dedicated member forums focused on green gas, biomass heat, biomass power, renewable transport fuels and energy from waste (including advanced conversion technologies). Our members include generators, project developers, fuel and power suppliers, investors, equipment producers and service providers. Members range in size from major multinationals to sole traders. There are over 500 corporate members of the REA, making it the largest renewable energy trade association in the UK.

In reviewing the inquiry, and our members interests, our response focuses on addressing the below question from the Terms of Reference:

“Are there sustainable sources of biomass for UK energy generation either from imported or domestically grown wood for pellet or woodchip? And how can future demand be met from sustainable sources?”

If appropriate the REA would also be happy to provide oral feedback to the Committee on the nature of current bioenergy supply chains, in terms of both imported and domestically grown feedstocks.

Covered below in this response are the following sections:

1. The role of bioenergy in the UK
2. Modelled sustainable biomass availability
3. Sources of domestic feedstock and increasing availability
4. The role of sustainable imports of feedstock
5. Overview of sustainability governance arrangements
6. Additional benefits of biomass feedstock production

Key Messages

- Bioenergy, utilising wood pellets and wood chip, along with other waste-based and energy crop sourced feedstocks, has an essential role to play in the decarbonisation of UK energy systems.
- The UK can do more to produce domestic feedstocks by encouraging woodlands into management and deploying innovative energy crops, grown on less-productive land. To achieve this, landowners and farmers must be appropriately rewarded for the environmental benefits that growth of such feedstock provide - this should be facilitated either through the existing Environmental Land Management Scheme or a separate dedicated scheme.
- Biomass imports will continue to play an important role in the decarbonisation of UK energy systems, especially in relation to delivery of bioenergy carbon capture and storage and negative emissions, which are critical to delivering net zero emissions.
- All biomass feedstocks, whether produced domestically or imported, are well regulated through world-leading sustainability governance arrangements which ensure positive impacts.

- Future UK Timber and Forestry policy must be designed around a strong understanding of forestry economics, where sustainable management practices are rewarded by the market. This includes ensuring ongoing demand for sustainably produced biomass feedstocks. This will enable further growth of healthy forests both in the UK and from where the UK imports feedstocks from.

1) Role of Bioenergy in the UK

Bioenergy is a crucial tool in decarbonisation, while also helping to deliver an affordable and secure energy system

Bioenergy, which uses sustainable biomass and biofuels produced from wood, crops and food wastes, is already the UK's leading source of renewable energy, meeting 7.4% of our total energy needs.¹ Biomass power and biomass heat are the main users of virgin wood pellets and chip, which are the focus of this inquiry. Other forms of waste-based or energy crop feedstocks are also used, especially in relation to the production of green gas or renewable transport fuels.

Biomass power production is the second largest form of low carbon electricity generation in the UK, behind wind power, accounting for about 13% of UK generation.² Biomass generation also provides firm power, which complements the further deployment of other renewables like solar and wind, helping to balance electricity demand and supply, and reinforcing energy security. Similarly, biomass boilers and green gas have provided 96% of non-domestic renewable heat in the UK via the, now closed, Non-Domestic Renewable Heat Incentive.³ This has been the largest contribution to heat decarbonisation to date.

Finally, future energy scenarios produced by the Climate Change Committee (CCC), the National Grid ESO, and the International Energy Agency all identify an essential role for bioenergy applications with carbon capture and storage (BECCS) to deliver negative emissions, critical to meeting the UK's 2050 net zero ambitions.

The use of sustainably sourced wood pellet and chip, from both domestic and international sources, is essential to deliver a decarbonised energy system, while simultaneously replacing our reliance on fossil fuels subject to volatile international markets. As such, bioenergy is also part of the solution to delivering an affordable and secure energy system, mitigating the impacts of the current energy crisis.

2) Modelled Sustainable Biomass Availability

Current modelled domestic and international supply can meet future demand

Within the REA's 2019 Bioenergy Strategy,⁴ it was shown that the bioenergy sector could sustainably provide up to 16% of the UK's energy needs across power, heat, and transport. The feedstock requirements for achieving this were mapped out against Ricardo's AEA's (2017) *Biomass Feedstock Availability*, commissioned by BEIS.⁵ The strategy concluded that meeting the levels of potential bioenergy growth was possible if the UK maintained sustainable biomass imports while making good use of the potential domestic feedstocks that could be developed within the UK by 2032. This includes the development of domestic forestry feedstocks and energy crops, including perennial crops like miscanthus and willow.

The REA Bioenergy Strategy proposed that domestic feedstocks could largely meet 2032 bioenergy heat and transport demand. It did note however, that additional imported resources would be required, notably solid biomass pellets, for large scale power generation and the delivery of negative emissions with BECCS. This is in line with the Climate Change Committee (CCC) sustainable bioenergy growth scenarios.⁶ It is the industry's view that with the presence of strong sustainability governance arrangements, additional import levels could be sustainably procured and be in accordance with UK's fair share of biomass resources.

Global innovation in biomass feedstocks suggest global demand for biomass is well below assessed sustainable potential.

Last year the International Energy Agency (IEA) published their analysis for a global pathway to reaching Net Zero Emissions. Within this pathway, bioenergy is seen to play a significant role with global modern bioenergy use raising to 100 EJ by 2050, meeting almost 20% of total energy needs. They compare this against recent estimates from the IPCC that suggest sustainable bioenergy potential to be between 150 -170 EJ, accounting for meeting the UN Sustainable Development Goals. Even when accepting a significant level of uncertainty, and accounting for more conservative estimates, the IEA conclude that global demand will fall well below potential sustainable availability.

Crucially they demonstrate that this potential is also due to a shift in biomass feedstocks being used. By 2050, forestry and wood residues will continue to play a significant role but will also be matched by an increase in the use of organic waste streams and short rotation woody crops, both of which are expected to increase significantly to be major players in meeting bioenergy demand. Longer term bioenergy policy in the UK therefore needs to be cognitive of the fact that global bioenergy supply chains will evolve, with sustainable production expected to remain ahead of demand.⁷

3) Sources of domestic feedstock and increasing availability

There will be a need to increase the level of domestic biomass feedstock availability, delivering both decarbonisation and domestic energy security, making best use of residues and offcuts from the timber industry. Some will also need to come from an increase in energy crops, such as innovative perennial energy crops, along with the UK making the most of waste-based feedstocks.

Forestry Commission statistics indicate significant potential for increased domestic biomass forestry resource

Forestry Commission Statistics for 2020 indicate trends of continued modest growth of UK forest inventory and increasing levels of forests coming under certified management. As at March 2020 there were 1.39 million hectares of certified woodland in the UK. Part of this growth can be attributed to increased demand for low-value forestry products driven by the Renewable Heat Incentive and Renewable Obligation, underwriting investment in new managed woodlands. However, there is 3.2 million hectares of woodland in the UK, suggesting there remains large areas of underutilised and unmanaged woodlands, a proportion of which would become available with higher demand of forestry products, including bioenergy feedstocks.⁸

Perennial Energy Crops (PECs)

Growth in domestic feedstock supply for bioenergy will also come from energy crops, in particular PECs, incorporating Short Rotation Coppice (SRC) like willow and miscanthus, as well as short rotation forestry (SRF). The CCC highlight the need to increase the growth of energy crops by around 23,000 hectares each year to deliver 2MtCO₂e emissions savings in the land sector and an extra 11 MtCO₂e from harvested biomass. Overall, the CCC's Ambitious Scenario, assumed bioenergy crops are grown on 0.7 million hectares, producing 15 oven-dried tonnes per hectare by 2050.⁹ Such crops are typically grown on economically less -productive land, and can be used as a feedstock across the heat, power and transport bioenergy sectors.

Further sources of domestic feedstock - making the most of our waste streams

While not of direct relevance to this call for evidence, focused on timber and deforestation. It is also important to note that there remains a range of further waste-based feedstocks that the UK is also utilising. These include:

- **Waste Wood and Municipal Solid Waste (MSW)** – Waste wood and MSW have high proportions of biogenic material typically used in large scale combined heat and power plants.
- **Wet and agricultural wastes** – include sewage sludges, food wastes and animal manures used in biogas production, which can either be used directly or upgraded to methane for heat and transport uses.
- **Non-wood fuels** - currently a number are used in the renewable heat market, as registered on the Sustainable Fuels Register (SFR).¹⁰ For Example: waste coffee, refined olive stones, and conservation arisings e.g. bracken, gorse and heather.¹¹
- **Other biofuels crops** - can be produced where this provides agricultural benefits without impacting on food production and supplemented by fuels imported from the international market.

Increase domestic feedstock availability by promoting forest economies to grow supply.

The primary barriers to realising growth of domestic bioenergy feedstocks is a lack of landowner and investor confidence in a consistent and stable demand for future bio-based products. This makes it difficult to have long term stable offtake contracts with bioenergy users, which are necessary to provide confidence to landowners to considering in investing and growing trees for commercial purposes, including wood products and biomass supply. Forestry and growth of energy crops must be seen by landowners and developers as a long-term profitable exercise with strong market signals to plant more trees and better manage existing woodlands.

Forestry policy in the UK so far fails to recognise forest economics for increasing afforestation. It is especially disappointing that the Government's England Tree Action Plan fails to support this, despite ambitious targets for increasing tree cover and perennial energy crop planting. The absence in the Action Plan for ensuring long term revenue and paybacks for landowners, and recognition of end uses for forestry products, means the Action Plan is unlikely to succeed and the ambitious targets will, again, be missed.¹²

Use a scheme like the Environmental Land Management Scheme to reward domestic feedstock production.

The UK could design of the Environmental Land Management Scheme (ELMs), or create a new dedicated scheme, to reward the growth of the domestic supply of sustainable biomass for

bioenergy along with the further environmental benefits that can be realised such as flood mitigation, biodiversity, soil improvement, pollination services etc. This involves rewarding landowners for growing commercial short rotation forestry plantations, perennial energy crops or other energy crops on their land where it is appropriate to do so. In addition, carbon sequestration within these crops, such as within soil or in root systems, should also be rewarded within an active carbon market. In doing so, landowners will be provided with a clear business case for the growth of domestic feedstocks and environmental benefits are encouraged.

Consistent and stable bioenergy policy, such as provided by the RHI, RTFO or RO, drives demand for domestic feedstocks.

As it stands the main demand for domestic forestry pellets in the UK is expected to decline due to their being no comparative replacement to the Non-Domestic Renewable Heat Incentive or the Renewable Obligation (which starts to come to an end in 2027). Both mechanisms drove the installation of biomass systems and demand for domestic feedstocks. Both schemes can be seen to have helped bring significant amounts of UK forestry into management, with the revenues from biomass feedstocks forming an important part of the business case for developing access to and managing healthy productive forests.¹³

4) Sources of International Feedstock Imports

Imported biomass will continue to have an important role to play in helping the UK meet future net zero energy demands.

Imported biomass has so far been fundamental to the development of bioenergy industries in the UK. While it is crucial domestic supplies increase, imports will also continue to be essential to meeting UK net-zero energy demands. This is recognised by the CCC in their sustainable net zero scenarios where biomass imports are required to deliver both energy and, crucially, negative emissions to reach the UK's 2050 decarbonisation targets.¹⁴ The industry is confident that such levels can be procured for the UK in line with, and exceeding, stringent sustainability standards, as outlined below.

US Southeast Forest resources continues to grow, allowing for increased UK and global imports.

As the committee will be aware, the largest source of international wood pellets is from the US Southeast, imported largely for use in biomass power production. The US Southeast continues to have huge areas of forest resource, with over 1.1 million square kilometres of forest land. Harvesting in this area is driven by primary wood sectors such as construction or furniture production, sourced from certified managed forest areas. These sectors drive the availability of low-value residues, or by-products, that are ideal for bioenergy use. About 3% of the forest in the US Southeast is harvested for all forest products each year. Of this, less than 4% goes to the export pellet industry. Overall, industrial wood pellet manufacturers are using less than 0.1% of the total forest resources in the region each year to produce bioenergy.¹⁵

Studies on Southeast US Forest activities have shown a steady increase in forested areas since the mid-1950s, with carbon stocks having nearly doubled.^{16 & 17} Studies suggest there is no evidence to show that the biomass industry is driving any decreases in carbon stocks.^{18 & 19} This further accords with Forest2Market research showing that the number of timberland acres has remained stable in the US South, increasing by 3%. At the same time, total inventory has doubled (+108%, from 142.1 to 296.1 billion cubic feet) as growth has outpaced removals.²⁰

The US Department of Energy estimates that the US has over 1 billion dry tons of additional forest and agriculture resources available each year to sustainably supply a growing global bioeconomy.²¹ This suggests that the US South-eastern region alone can sustainably increase biomass supply, not only to the UK, but globally as well.

5) Sustainability Governance Arrangements

The UK's current sustainability governances are world leading and are working - delivering increasing forest inventories both domestically and internationally

The UK's bioenergy sustainability governance framework has evolved considerably over time and is widely regarded as one of the most comprehensive frameworks globally. Policy and regulations have evolved to take account of new issues and scientific understanding. Industry has worked with government bodies to develop and implement these regulations, and will continue to do so, ensuring that the carbon emissions claimed can be reliably, and independently, verified.

All the government bioenergy support schemes – the Renewable Heat Incentive (RHI), Renewables Obligation (RO), Contracts for Difference (CfD), Feed-in Tariff (FIT), and Renewable Transport Fuel Obligation (RTFO) schemes – have associated bioenergy regulations and reporting requirements that must be fulfilled. This includes:

- Projects supported under the RHI, RO, FIT and CfD schemes must provide information on the land from which the biomass is sourced, to minimise impacts on carbon stocks and biodiversity, and on criteria which account for the life cycle GHG emissions of the biomass.²²
- Additional sustainability requirements apply for the use of feedstocks for electricity or heat use that are based on virgin wood. The Timber Standard for Heat and Electricity sets out wood-fuel land criteria covering a range of social, economic and environmental considerations that reflect good sustainable forest management practices and are based on internationally agreed principles.²³
- Projects under the RTFO must also meet sustainability criteria to be eligible for support, including minimum greenhouse gas criteria and must not be produced from areas with high biodiversity nor from land with high carbon stocks.²⁴

The UK's sustainability governance has both influenced, and been informed by, the development of the EU Renewable Energy Directive (RED), with UK requirements going beyond even the latest revisions to biomass sustainability criteria introduced as part of RED II in Europe.²⁵ Government should have a high degree of confidence in the existing governance sustainability arrangements.

Governance arrangements do consider biodiversity and land use change.

Governance arrangements also consider both direct land use change (LUC) and indirect land use change (ILUC). UK sustainability arrangements, in accordance with RED, excludes support for biofuels (including imports) made from raw materials obtained from converted high-carbon stock land or land with high biodiversity value. All UK support mechanisms make specific provision to include emissions from direct land-use change into the calculation of GHG.

In terms of biodiversity, to be eligible under the UK support schemes, it is necessary to demonstrate that the production of bioenergy feedstocks does not take place on land classified

as having a high biodiversity value since 2008, as previously defined by the European Commission and now maintained in UK regulation.²⁶

Air quality is also well regulated with modern biomass heat systems

Air quality is also an area that is well regulated but remains frequently cited as area of concern with biomass boilers. Modern biomass systems (like the ones supported by the RHI/ROC etc), unlike conventional domestic stoves and fireplaces, have built-in abatement systems to reduce Nox and PM emissions. Even the smallest and most basic modern systems will have lambda probes, which measure the oxygen content of the flue gas and adjust the air intake accordingly to continuously optimise combustion – vastly improving emissions compared to non-automate stoves and fireplaces. Larger system will have filters, which the industrial scale system are closely regulated with environmental permits.

Additional Environmental Benefits are also delivered with biomass production

In addition to delivering greenhouse gas savings from bioenergy production, additional environmental benefits are also realised:

- ***Wildfire Mitigation:*** bioenergy demand rewards the removal of deadwood, and management of the underbrush. The removal of this ‘ladder fuel’ creates fire breaks and is part of the solution to addressing the extended wildfire seasons that are expected to become more common due to climate change.^{27 & 28}
- ***Biodiversity:*** Where done correctly, in accordance with strong forestry and agricultural practices, bioenergy production has led to diverse habitats. In the US a recent synthesis of almost 20,000 articles concerning the effect of forest management techniques on biodiversity in South-eastern US, the research team found that most studies report no negative impacts of forestry practices on biodiversity.²⁹
- ***Flooding Mitigation:*** Trees play a key role in reducing the amount of water reaching the ground, as well as creating soils that can absorb more water. Perennial Energy Crops (PECs), such as dense willow or miscanthus, also have a high hydraulic roughness, slowing the spread of water across floodplains. ^{30 & 31}
- ***Carbon sequestration and utilising low-grade land:*** It is possible for land use change, or change in agricultural practice, to have positive impact leading to increased levels of carbon in plants and soils. ^{32 & 33}

6) Economic Benefits of Biomass Feedstock Production

Finally, it is appropriate to consider the additional social and economic benefits also delivered as a result of sustainable biomass feedstock production.

Bioenergy is the backbone of the wider Bioeconomy

Bioenergy feedstocks are typically setting a floor price for the lowest value residues and offcuts. Predictable demand for these products provides an additional secure revenue stream. As such, if Government encourages more wood being used in construction, as recommended by the CCC, then availability of offcuts and thinnings will also increase. Similar dynamics can be observed in the development of high-value specialist biobased materials from energy crops, including speciality chemicals based on cellulose or lignin, wood-based textiles or bio-based plastics. Such materials enter a bio-based circular economy, with waste produced from both production and disposal generating bioenergy feedstocks as the lowest-value product in the value chain. ³⁴

Bioenergy Jobs within the Bioeconomy

The UK's Bioeconomy Strategy, published in 2018, estimates that the sector is today worth £220 billion and indirectly supports 5.2 million jobs, of which the bioenergy sector is an integral part.³⁵ Overall, REA REview 2020 estimated that the bioenergy sector in 2018 contributed £6.5bn to the UK economy and provided over 34,000 jobs, which increases to over 46,000 jobs once biomass feedstock production is also included.³⁶

The REA Bioenergy Strategy made preliminary estimates for the number of jobs that would be stimulated if the projected growth of the bioenergy sector was realised. The results indicated a rise of between 80,000 to 90,000 by 2026 and to 100,000 to 120,000 jobs by 2032 across the whole bioenergy sector. In biomass feedstock production alone, growth in jobs was modelled to reach 13,500 jobs in 2026 and 22,000 jobs in 2032.³⁷

The nature and supply chains of bioenergy means the sector drives significant levels of job creation. For example, the operation of biomass boilers could involve professionals involved in sustainable forest management, transportation, pellet production, boiler installation, wood fuel supply and system maintenance. Furthermore, given the predominantly rural application of bioenergy and feedstock cultivation, jobs are well dispersed across the UK, especially benefitting rural employment.

Conclusion

The production of biomass feedstocks, both in the UK and internationally, is being done sustainably, and supplies a bioenergy industry that has a critical role in the decarbonisation of our energy systems. Future timber and forestry policy in the UK needs to build on these existing sectors, recognising both the strict sustainability governance that are in place and the need for farmers and landowners to be appropriately rewarded for the forestry products being produced. This will ensure vibrant and healthy forestry sectors in the UK and abroad.

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