Public Accounts Committee – Government support for biomass

Written evidence from the REA (Renewable Energy Association)

The REA is submitting the below evidence on behalf of our biomass power and biomass heat members and as such, the response is split into two sections.

While the feedstock used – woody biomass – can be the same across both power and heat, the sourcing, supply chains, and applications vary significantly.

Biomass for power provides electricity, while biomass for heat provides space heating and hot water. In some cases, a biomass Combined Heat and Power plant (CHP), can generate both electricity and usable heat simultaneously.

Summary

- Biomass is vital for UK energy security, decarbonising both power and heat, and providing a cost-effective route to net zero.
- Biomass for power and biomass for heat are subject to stringent sustainability requirements.

Power:

- The Government has further tightened sustainability criteria for transitional payments for large-scale generators including higher greenhouse gas savings requirements for the supply chain and requirements to source biomass from 100% sustainable sources, up from 70% previously.
- Biomass power generated about 7% of the UK's electricity in 2023 – producing enough to supply almost 7 million homes with electricity.
- Industry requirements: The biomass power sector welcomes the recent transitional support for large-scale plants, but similar support must be extended to the 60 smaller plants which together supply enough power for c.1.5 million homes. At present there is no support for these plants beyond the end of their current mechanisms (starting in 2027), risking a significant drop in low carbon electricity supplies for the UK.

Heat:

- Biomass heat must comply with regulations like the Environmental Permitting Programme, Industrial Emissions Directive, Clean Air Act, Large Combustion Plant Directive, Renewable Heat Incentive and Ecodesign Certification for Small Scale Biomass. Biomass boilers are also subject to emissions testing, mandatory annual services, and must use approved sustainable fuels from the Biomass Suppliers List.
- Biomass heat is the single largest contributor to low carbon heat in the UK. In 2023, biomass provided 62% of fuel for heat.
- Industry requirements: the existing Boiler Upgrade Support scheme must be amended so that the full grant support can be used for installing a biomass boiler (currently it is limited to £5k while heat pumps can receive up to £7.5k per

installation). We also need existing heat policy to be much more ambitious. Alongside a comprehensive energy efficiency retrofit programme to save energy in the first place, a Heat CfD similar to that used in the power sector, and an industrial fuel switching support tariff could be introduced.

Biomass power

Value for money

The 2023 Biomass Strategy recognised the role that biomass power plays both now and in the future. The Government's most recent response to their consultation on providing transitional support arrangements for large-scale biomass generators recognised the "deployment of Power BECCS [as] part of cost-effective pathways to meeting net zero". Similarly, the same response noted that compared to other greenhouse gas removal (GGR) technologies, Power BECCS is a "relatively cost-effective and low-risk option expected to deliver a steady increase of engineered removals…".[1]

We will shortly be publishing economic modelling, produced in partnership with Baringa, that we will share with the Committee once available. Initial findings show that biomass power is good value for money both now and in the future as we transition to BECCS. On the other hand, if we exclude biomass from the energy system, total system costs increase by between 10-20% and it becomes less likely we will meet our net zero targets.

These findings support what other reports have shown internationally. For example, the IEA shows that a 10% lower bioenergy use globally means "achieving net zero emissions would require $4.5 trillion extra investment".[2] A study from Chalmers University concludes similar for the EU noting "excluding biomass at a net zero target increases the system cost by 14%".[3]

Sustainability

Sustainability governance arrangements

The UK has some of the most robust bioenergy sustainability criteria in the world, and this has been further strengthened by Government in its response to *transitional support arrangements for large-scale biomass generators.* Amongst other things, this includes increasing the proportion of woody biomass that must come from sustainable sources from 70% to 100% as well as the appointment of an independent sustainability

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[1] DESNZ (2024), *Transitional support mechanism for large-scale biomass generation: government response,* https://www.gov.uk/government/consultations/transitional-support-mechanism-for-large-scale-biomass-electricity-generators

[2] University of Chalmers (2023), *Diversity of biomass usage pathways to achieve emissions targets in the European energy system,* https://www.researchgate.net/publication/371991033_Diversity_of_biomass_usage_pathways_to_achieve_emissions_targets_in_the_European_energy_system

[3] IEA, (2021) *Net Zero by 2050: A Roadmap for the Global Energy Sector,* https://www.iea.org/reports/net-zero-by-2050
https://www.researchgate.net/publication/371991033_Diversity_of_biomass_usage_pathways_to_achieve_emissions_targets_in_the_European_energy_system

adviser who will work with DSENZ, LCCC and Ofgem to ensure monitoring and enforcement measures keep pace with the science.

Existing requirements include land use criteria and greenhouse gas (GHG) emission savings criteria, requiring that life-cycle emissions associated with biomass meet certain thresholds to ensure they're delivering significant savings compared to fossil fuels.[4] Sustainability criteria also considers the full associated emissions of harvesting, transporting, and using the biomass.

We expect the Government's Common Sustainability Framework will build on the announcement made on 10 February, ensuring the same sustainability principles are followed across all bioenergy sectors and ensuring sustainability always remains at the heart of using any bioresources.

Imported woody biomass

The UK only sources biomass from working forests while complying with stringent sustainability governance arrangements. These forests are generally managed on a landscape level, with thousands of trees of different ages, harvested at different times, to produce a constant supply of wood products. As such, when a small number of trees are removed, others continue to grow and sequester carbon. In the forests where the UK sources biomass, and as per requirements set out in UK land criteria, annual growth always remains level or exceeds harvest rate. Therefore, there is no net reduction in forest carbon[5].

The US is the largest source of imported biomass to the UK, representing around three quarters of imports in 2023.[6] Other sources include Canada, Latvia, the Netherlands, Estonia and Brazil. In 2022 in the US Southeast just over 2% of forest inventory was harvested for all end uses of which wood pellets accounted for only 4% of this. Since its foundation, the US pellet export industry has had less than 0.1% of impact on the proportion of wood removed compared to forest inventory.[7]

Further, voluntary independent certification schemes, like the Sustainable Biomass Program (SBP) are also used by industry to audit and demonstrate compliance with relevant sustainability regulations. SBP-certified material has been benchmarked by Ofgem to fully meet the UK sustainability requirements and includes over 30 forestry specific indicators to ensure that forests are sustainably managed, that forest carbon stocks and inventory are maintained or increased, biodiversity is preserved, and that forests of high conversion value are protected.[8]

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[4] Ofgem, *Biomass Sustainability Reporting,* https://www.ofgem.gov.uk/environmental-and-social-schemes/renewables-obligation-ro/applicants/biomass-sustainability

[5] IEA Bioenergy (2019), *The use of forest biomass for climate change mitigation: response to statements of EASAC*, https://www.ieabioenergy.com/wp-content/uploads/2019/12/WoodyBiomass-Climate_EASACresponse_Nov2019.pdf

[6] Foreign Agriculture Service, Global Agricultural Information Network, (2024) *Wood Pellets Annual Report*, https://www.fas.usda.gov/data/united-kingdom-wood-pellets-annual

[7] USIPA, (2024), *Demand and Forest Productivity in the US South, https://theusipa.org/research-1*

[8] Sustainable Biomass Program, *Overview,* https://sbp-cert.org/wp-content/uploads/2018/10/SBP_Overview_Final_Mar18.pdf

Carbon accounting for biomass generation

Industry accounts for CO_2 emissions in accordance with internationally agreed and peer-reviewed carbon accounting methodologies, set out by the UN IPCC. The UN IPCC counts CO_2 emissions from the combustion of biomass in the Agriculture, Forestry and Other Land-Use (AFOLU) sector which recognises the change in carbon stocks when the biomass is harvested. The IPCC's methodology has been reviewed and reaffirmed multiple times since its development in 1995, most recently in 2019. It is set independently of industry, by the scientists of the IPCC and governments.

Domestic waste wood biomass

The UK has a fleet of 54 regional biomass power stations, fuelled by domestic waste residues. Together, they provide 4.6 million tonnes of waste processing capacity while producing 5.4TWh of low carbon energy.[9] Many of the assets also provide combined heat and power, piping low carbon heat to local communities and industry. Waste wood includes things like old furniture (kitchen countertops and units), construction debris, and other types of wood that can't be recycled. Using it to create low carbon energy is a great example of the circular economy in action, diverting non-recyclable wood away from landfill or export abroad.

Other domestic biomass

Perennial Energy Crops (PECs) like miscanthus offer large carbon sinks, superior water-use efficiency, and don't need to be replanted yearly. They enhance soil health by increasing organic matter, reducing erosion, and preventing nutrient runoff. PECs also provide year-round cover for birds, insects, and small mammals, supporting biodiversity. Further, intercropping strategies can boost pollinator populations and bird diversity, benefiting overall ecosystem stability. Importantly, poor-quality land unsuited for food crops can be used for PECs, meaning there should be no debate around food vs fuel as the better land can continue to be used for food production. This also provides another income stream for farmers and landowners.

Straw – Life cycle carbon emissions are around 20kg/MW, and these are mainly down to haulage and fuel used to bale the straw. In the UK there are approximately 14 million tonnes of straw produced every year as a by-product of cereal crop farming. The straw projects in the UK use approximately 800kt of straw each year, or just 6% of the available material. Straw projects support the rural economy, paying more than £12 million annually to farmers, hauliers, and agricultural contractors who help get the feedstock from field to plant. A number of straw-fired power stations are located close to towns and can give something back to the local community. For example, the site at Sleaford provides renewable heat to local authority facilities and the town's swimming pool via a small district heating network.

[9] Wood Recyclers Association (2024), *WRA calls for urgent clarity over future support for waste wood* biomass, https://woodrecyclers.org/wra-calls-for-urgent-clarity-over-future-support-for-waste-wood-biomass/

NAO report

The NAO recognised that biomass generators were meeting their sustainability requirements but called on industry and government to go further in demonstrating that compliance. The NAO recommendations on sustainability were also aligned with actions already committed to by the last Government and supported by industry. This included a priority use framework and the development of a Common Sustainability Framework as set out in the 2023 Biomass Strategy.

Biomass' role in generating power for the UK

In 2023, biomass power generated 20,789 GWh, equivalent to generating about 7% of the country's electricity. Biomass power provides low carbon, consistent (or baseload) power, complementing other forms of variable renewable energy like wind and solar, and ensures the UK has a range of technologies in its energy mix.

The REA's two largest biomass power members, Drax and Lynemouth produce around 2.6GW, equivalent to powering around 5 million homes per year, and 420MW (around 450,000 homes) respectively. The waste wood biomass fleet contributes a further 5.4TWh of low-carbon energy to the grid, supplying enough electricity to power 1.5 million homes a year.

The biomass power sector and its production provided more than 21,100 jobs across the UK in 2023. As Bioenergy Carbon Capture and Storage (BECCS) develops further, this figure will only increase.[10]

Government support for biomass power

On 10 February, the Government announced transitional support arrangements for large-scale biomass generators from 2027, following a consultation last year. As well as responding to the consultation, the Government has also agreed a new Heads of Terms for a low carbon dispatchable Contracts for Difference (CfD) with Drax. This specific mechanism will result in a net saving for consumers. Independent analysis from Baringa indicates the proposed agreement will result in a £1.6-3.1bn reduction in electricity system costs per year.[11]

The support offered by government will be for lower generating volumes than previously provided and comes with the further strengthening of existing sustainability criteria. This includes increasing the proportion of woody biomass that must come from sustainable sources from 70% to 100%, as well as the appointment of an independent sustainability adviser who will work with DSENZ, LCCC and Ofgem to ensure monitoring and enforcement measure keep pace with the science.

More than 60 sub-100MW generators – who contribute significantly to the UK's generating capacity – remain excluded from current transitional support arrangements. Many have been operating under support from the Renewables Obligation scheme, with contracts due to come to an end from 2027. As well as providing secure, low

[10] REA, (2024), *REview 2024*, https://www.r-e-a.net/resources/review24/

[11] Baringa (2025), *Value for money assessment of the low carbon dispatchable CfD for Drax Power Station, https://www.drax.com/wp-content/uploads/2025/02/Baringa_Report_February_2025.pdf*

carbon power, these generators also provide an essential environmental service by compliantly recovering around 4.5Mt of domestic waste residues each year. Without their continued operation there will be significant challenges in managing the wastes they recover. That's why these assets urgently require clarity regarding support to make investment decisions regarding retrofitting CCUS technology. Transitional support will be required for assets to contribute to BECCS, particularly given the slower rollout of non-pipeline (NPT) options for those located away from clusters. In addition to transitional support, NPT options must be joined up to the GGR business model and sequencing process quickly for investment clarity.

Biomass heat

Value for money

Biomass boilers can be costly to install initially, although support towards costs is available to consumers via the Boiler Upgrade Scheme. However, it's the running costs and carbon savings potential that make biomass boilers particularly good value for money. This is especially the case in large, hard-to-heat properties (hospitals, schools, hotels) and in decarbonising manufacturing. Wood pellet and wood chip costs are generally the same or less than fossil fuels. For example, between June 2021 and June 2024, prices went up across the board, but wood pellets remained cheaper than LPG and gas, which saw prices rise by 66%.[12]

According to the Energy Savings Trust, CO_2 emission savings [from biomass boilers] "are significant." When a biomass boiler replaces a coal fired system, consumers can save up to 11 tonnes of CO_2 emissions a year.[13] These savings increase even further when biomass boilers are used on an industrial scale. For example, one of our members, AMP Clean Energy, estimate that installing three biomass boilers coupled with an electric boiler at Simpsons Malt saves 25,000 tonnes of CO_2 annually - equivalent to the emissions of 11,000 homes.[14]

Clarity on assurance around sustainability

Biomass fuels used for heat production under the Renewable Heat Incentive (RHI) must be registered against the Biomass Suppliers List (BSL). Much of the industry goes further, using independent voluntary certification schemes, like EN Plus[15] or Woodsure[16], to audit and assess supply chain practices to ensure they not only meet, but go beyond, national sustainability requirements.

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[12] House of Commons Library, (2024), *Households off the gas-grid and prices for alternative fuels,* *https://commonslibrary.parliament.uk/research-briefings/cbp-9838/*

[13] Energy Savings Trust, *Energy at home: biomass*, https://energysavingtrust.org.uk/advice/biomass/

[14] Amp Clean Energy, *Simpsons Malt,* *https://www.ampcleanenergy.com/our-projects/energy-solution-tackles-industrial-decarbonisation/*

[15] ENplus, https://enplus-pellets.eu/language/en/home-uk/

[16] Woodsure, https://www.woodsure.co.uk/

In the UK, the timber sector, which supplies the majority of the feedstock for biomass heat, is tightly regulated. Any felling activity requires a licence, with trees restocked at standard densities much greater than the number of trees per hectare felled. This is done within 12-24 months, ensuring the cycle of planting, growth, and harvest continues.

Biomass heat also produces significant carbon savings. In 2021, the Biomass Thermal Energy Council and Life Cycle Associates found that biomass fuels from wood pellets and chips result in a 65-100% reduction in greenhouse gas (GHG) emissions in comparison to heating oil.[17]

Air quality

Due to conflation with more traditional wood heating systems, like open fireplaces, authorities and public bodies are often concerned about the particulate emissions of wood heat. However, not all wood heat is created equal. Unsophisticated wood burning creates radically different particulate emissions from advanced biomass boiler heating systems, highlighted in the table[18] below.

$PM_{2.5}$ emissions per GJ-1	Single home biomass boiler (<50kW)	Traditional heating stove (Non Ecodesign compliant)	Fireplace
Solid $PM_{2.5}$ (g GJ-1)	30	150	260
Condensable $PM_{2.5}$ (g GJ-1)	30	650	640

Further, biomass heat is governed by robust regulations like the Environmental Permitting Programme, Industrial Emissions Directive, Clean Air Act, Large Combustion Plant Directive, Renewable Heat Incentive and Ecodesign Certification for Small Scale Biomass. Biomass boilers are also subject to emissions testing, mandatory annual services, and must use approved sustainable fuels from the Biomass Suppliers List.[19]

Emissions from biomass boilers can be reduced even further using Electrostatic Precipitation Technology which can remove up to 99% of particulates. This means biomass heat can rival or better gas boilers for particulate matter emissions.

The current picture on biomass' role in generating heat for the UK

Biomass heat is the single largest contributor to low carbon heat in the UK. In 2023, biomass boilers produced more than 34,000 GWh of renewable heat – providing 62% of

[17] Biomass Thermal Energy Council and Life Cycle Associates, (2021), *Life Cycle Analysis of Renewable Fuel Standard Implementation for Thermal Pathways for Wood Pellets and Chips,* https://www.lifecycleassociates.com/wood-pellets-chips-reduce-ghg-emissions-by-65-100/
[18] REA, (2024) *Air quality leaflet*, https://www.r-e-a.net/resources/whf-air-quality-workstream/
[19] DESNZ, *Biomass Suppliers List*, https://www.biomass-suppliers-list.service.gov.uk/about/

fuel for low carbon heat, with heat pumps providing 26%.[20] In the same year, biomass heat provided over 20,000 jobs and contributed around £2.8 million to the UK economy.[21]

But decarbonising heat is one of the UK's greatest challenges with only 9.4% of heat consumption generated by renewables in 2023.[22] That's why we need a wide range of low carbon technologies to help decarbonise heat.

Biomass boilers can provide the high process heat loads required in larger public buildings like hospitals, schools, and hotels[23]. This also makes it an ideal technology for use in hard- to-heat, and hard-to-treat sectors, as well as in manufacturing decarbonisation. Similarly, biomass boilers are particularly effective in the food and drinks industry[24] and in sawmills, which produce large quantities of waste wood that can then be used as a feedstock for the boilers – a great example of a circular economy in action. Biomass boilers can also be integrated into district heating networks, supplying hot water or steam to connected buildings for space heating, domestic hot water, or industrial processes.

Lastly, biomass boilers can also offer an effective heating solution in poorly insulated, off gas grid properties, were other technologies, like heat pumps, might not be the most economic or efficient solution. With 4.4 million such properties in GB, biomass boilers can play a role, alongside other low carbon technologies, of helping homeowners move to more suitable heating solutions.[25]

Government support for the deployment of biomass heat

The previous Government set a target of installing 600,000 heat pumps per year by 2028. While heat pumps undoubtedly play a critical role, and will in many cases be the right solution, they are not the only one. According to the Microgeneration Certification Scheme (MCS) almost 60,000 MCS-certified heat pumps were installed in 2024[26]. While this represents a jump of 43% from 2023, installations remain behind the government targets at a 10-fold rate.

The Government's Boiler Upgrade Scheme (BUS) provides grants of up to £7,500 for heat pump installation but only provides up to £5,000 for the installation of biomass boilers. The UK's Biomass Strategy recognised a role for bioenergy in decarbonising the heat system, especially in complex to decarbonise situations, but this is not reflected in current policy. Placing one technology above others by providing a higher grant limits

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[20] DESNZ (2024), *DUKES 2024: chapter 6*, https://www.gov.uk/government/statistics/renewable-sources-of-energy-chapter-6-digest-of-united-kingdom-energy-statistics-dukes

[21] REA, (2024), *REview 2024*, https://www.r-e-a.net/resources/review24/

[22] Ibid

[23] Amp Clean Energy, *Argyll Holidays,* https://www.ampcleanenergy.com/our-projects/argyll-holidays-sustainability-goals-supported-by-low-carbon-heating-system/

[24] Amp Clean Energy, *Simpsons Malt, https://www.ampcleanenergy.com/our-projects/energy-solution-tackles-industrial-decarbonisation/*

[25] DESNZ (2024), *Subnational estimates of properties not connected to the gas network, https://www.gov.uk/government/statistics/sub-national-estimates-of-households-not-connected-to-the-gas-network*

[26] Microgeneration Certification Scheme, https://mcscertified.com/

consumer choice, pushing them towards the option that costs the least, even if it's not the most efficient or suitable technology for their property. If someone is incentivised to choose one technology (e.g., heat pumps) over another (e.g., biomass boilers) based on cost alone, and later find it wasn't the right solution for their home, this will damage confidence in low carbon heating and could push consumers back to fossil-based systems.

Taking a narrow approach by disregarding bioenergy systems for decarbonising heat has already been attempted and abandoned in Scotland. The *Building (Scotland) Amendment Regulations 2023* came into force in April 2024. This banned biomass boilers and other bioenergy systems from being installed in new builds aside from in heat networks, for industrial heat processes, and in emergency backup. However, after a thorough review and substantial feedback from rural and island communities, and organisations including the REA, it became clear more resilient heating solutions would be needed. In response, the Scottish Government announced an amendment to permit the installation of bioenergy heating systems as well as wood burning stoves in new homes and buildings. The amendment to the New Build Heat Standard (NBHS) came into effect on 1 January 2025.

About the REA

The REA is the largest renewable energy trade association in the UK, with around 500 corporate members within membership. We work across 12 technology areas across power and flexibility, heat and cooling, transport, and organics. These technology areas are supported by dedicated member forums, including on biomass power – known as Biomass UK and biomass heat – known as the Wood Heat forum. More information is available on our website - https://www.r-e-a.net/

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