REA Response:

Environmental Audit Committee: Call for evidence on the Climate Change Committee's advice on the seventh carbon budget.

The Renewable Energy Association (the REA) is a not-for-profit trade association, representing British renewable energy producers and clean technology and promoting the use of renewable energy in the UK. It has around 400 corporate members, making it the largest renewable energy trade association in the UK.

The REA's Organics and its Green Gas forum together comprise approximately 280 members, many of which operate commercial composting facilities, commercial scale anaerobic digestion (AD) facilities and recycle organics to land. More info available at www.r-e-a.net

The REA welcomes the opportunity to provide evidence to the Environmental Audit Committee on the Climate Change Committee's advice on the seventh carbon budget. Our response covers the proposals for composting, biomass, geothermal and biomethane.

1 - Composting proposals in the CCC Carbon Budget 7 report

The CCC carbon budget 7 report includes the following for composting:

'***Composting improvements (1% of emissions reduction in 2040)***. *Composting plays an important part in recycling food and garden waste. The use of pumped air to improve compost aeration and product quality is rolled out to appropriate sites.*

• Around 30% of composting sites are suitable for aeration, which is rolled out to all these sites by 2030.'

The REA has concerns about the proposal to introduce a requirement for **forced aeration** at composting sites and has been engaging with the CCC to better understand the underlying assumptions. Our members have raised questions about the feasibility, costs, and emissions assumptions associated with the proposed measures — particularly given the already tight profit margins across the outdoor turned windrow composting (OTWC) sector.

Assumptions on emissions reduction
Well managed composting sites should not produce methane. Methane generation occurs under anaerobic conditions, whereas environmental permits require operators to maintain, monitor and check that composting batch conditions are aerobic. Furthermore, for most composting sites, measuring any methane emissions is extremely difficult, due to the nature of emissions. If any methane is generated, it's likely to be in 'pockets' within the composting batch and is likely to become oxidised to other gasses (as the molecules move towards the composting batch surface zone) and thus not be emitted.

Composting does produce biogenic CO_2, but we understand that these types of CO_2 emissions are excluded from accounting because biogenic carbon is short-cycled.

In the UK, considering sites operating at a scale that requires a permit, there are approx. 240 outdoor, turned windrow compost sites processing garden / plant waste, in comparison to approx. 40 in-vessel composting (IVC) sites – the latter being more likely to have measurable point-source emissions.

We understand the CCC assumptions cover both methane and nitrous oxide emissions and its recommendation was based on advice that forced aeration can reduce GHG emissions by 50-90%, with the modelling having used 70% as the 'average emissions reduction' they 'heard reported from existing sites'). There was not a specific data source the CCC's modeller could give us. One of our concerns is that industry's feedback about average gaseous emissions reduction via use of forced aeration was about the full range of gaseous emissions, so not specific to methane and nitrous oxide, yet in the modelling a 70 % reduction in emission of these two gasses has been assumed, through used of forced aeration.

In addition to this, we are unclear if the calculations were adjusted to reflect compost's potential to sequester carbon in soils. Studies have shown that over 4–12 years, between 11% and 45% of organic carbon applied as compost remains as soil organic carbon. Each tonne of soil organic carbon equates to roughly 3.67 tonnes of atmospheric CO_2 sequestered. This carbon sequestration benefit is an important factor in evaluating the overall greenhouse gas impact of composting and should be explicitly included in future modelling.

Assumptions on the suitability of forced aeration
The CCC assumption is that 30% of all non-household composting sites would be suitable for improvements. However, 'non-household sites' cover a wide range of operations, including both permitted facilities and small-scale permit-exempt sites, across both OTWC and in-vessel composting (IVC) systems. Since almost all IVCs already employ forced aeration, it appears the CCC's estimate primarily targets OTWC sites.

In our experience, the CCC's assumption that 30% of permit (and permit-exempt scale?) facilities could feasibly install forced aeration systems appears overly optimistic. Many OTWC facilities operate on impermeable surfaces with sealed drainage but lack the containment infrastructure required to accommodate forced aeration systems. Additionally, many small-scale sites lack the capital, technical capacity and staff resources to support such upgrades.

Capital expenditure and cost assumptions
The CCC's analysis indicates capital expenditure (capex) between 2025 and 2030, with assets assumed to have a 20-year lifespan and reinvestment required in the mid-2040s. The total estimated cost is £2.2 million, based on a per-site capex of £200,000 (as used in CB6 and updated to 2023 prices).

However, applying these assumptions to 30% of the approximate 240 composting sites operating at permit-scale (i.e. 72 facilities) would equate to approximately £14.4 million, before inflation is included. This figure does not align with the CCC's reported total capex, suggesting a potential inconsistency or underestimation in the modelling. It also doesn't take into consideration 30% of an unknown number of permit-exempt sites that may also be within scope of the CCC's modelling.

Forced aeration also introduces an energy demand (most likely met by use of electricity). Yet the CCC's charts showing the composting sector's energy use (gas, oil, solid fuel, hydrogen, and non-biowaste inputs) appear flat, with no change under the Balanced Pathway scenario. The CCC has advised that they did not have the capacity to model these additional energy requirements.

While it is generally understandable that modellers limit their modelling boundaries, when considering forced aeration in REA's view it is essential to include such operational energy costs in future pathway analyses, as they will affect both the financial and GHG emissions balance of the composting sector. If there is any intention to make policy recommendations on forced aeration for the composting sector, we ask that first a dedicated study be commissioned to include financial and energy demand impacts in the modelling, use GHG emissions evidence where available, make clear which types and scales of composting site are included, and factor in composts' carbon sequestration value

Policy considerations
Should the CCC's recommendations be adopted into government policy, it is essential that this be recognised as a qualifying change in law. This would enable composting operators to adjust existing contracts and revise gate fees to reflect the cost of compliance with any new requirements.

The REA supports the principle of improving composting efficiency and environmental performance. However, the CCC's current assumptions on emissions reductions, site suitability, cost, and energy use require further evidence and refinement before they can form a credible policy basis.

We would welcome the opportunity to work with the CCC and government to help ensure that future modelling and policy proposals accurately reflect sector realities, financial viability, and the climate benefits of compost use and soil carbon sequestration.

2 - CCC's Assumptions– Role of Biomass

The CCC's balanced pathway rightly recognises the role of sustainable biomass in the UK's energy transition, currently providing around 9% of total energy supply across the power, heat, and transport sectors in 2023.

However, the Carbon Budget 7 commentary that "there is a limited and declining role for biomass imports as domestic supply increases to meet sector needs over time" understates both the current and future importance of responsibly sourced biomass within a diversified energy mix. While expanding domestic supply is essential, imports that meet the UK's rigorous sustainability standards will continue to play a critical role in ensuring supply security and supporting negative emissions technologies such as BECCS.

The UK already operates some of the most comprehensive bioenergy sustainability governance arrangements globally, with mandatory land use and lifecycle GHG emission criteria ensuring that biomass delivers genuine carbon savings compared with fossil fuels once harvesting, transport, and use are accounted for. These include mandatory land use and lifecycle GHG emission criteria, ensuring that biomass delivers significant carbon savings relative to fossil fuels once harvesting, transport, and use are accounted for. Independent schemes such as the Sustainable Biomass Program (SBP) further enhance assurance, providing over 30 forestry specific indicators covering forest maintenance, biodiversity, and environmental protection, and are fully benchmarked to meet Ofgem standards.

The Biomass Strategy (2023) updated the UK and Global Bioenergy Resource Model, finding that Carbon Budget 6 demand falls within sustainable biomass availability and, if managed properly, this balance can be maintained to 2050. The International Energy Agency's analysis supports this view. Nonetheless, domestic feedstock expansion, especially through perennial energy crops such as miscanthus and willow, remains under supported despite strong evidence of feasibility and co benefits for soil health, biodiversity, and rural incomes.

Domestically, biomass supply already demonstrates circular economy and regional benefits. The UK's 54 waste wood power stations process 4.6 million tonnes of non-recyclable residues annually, generating 5.4 TWh of low carbon energy and heat while diverting material from landfill. Straw projects use around 6% of the UK's 14 million tonnes of annual straw production, contributing over £12 million a year to rural economies and local heat networks, such as at Sleaford.

There are critical interdependencies between biomass availability, CCS infrastructure, and land use policy. Managing these links effectively will determine whether BECCS and other bioenergy applications deliver their potential. The CCC could enhance confidence in its modelling by more clearly communicating the flexible range of sustainable feedstock scenarios and incorporating findings from the DESNZ Biomass Feedstocks Innovation Programme, which highlights new domestic resource potential. The sector stands ready to engage through the forthcoming Common Biomass Sustainability Framework to ensure continued transparency and public trust.

3 - New and proven technologies - Geothermal

The CCC should recognise the contribution of geothermal energy and include it within its modelling for Carbon Budget 7. The UK possesses vast untapped geothermal resources, yet development remains minimal. Geothermal heat, even more than power, offers a major opportunity to reduce emissions from space and water heating, which together account for around 120 million tonnes of CO_2 annually, largely from burning fossil fuels.

Harnessing heat from flooded abandoned mines, shallow communal heating systems, and deep saline aquifers could deliver substantial carbon savings. According to the UK National Geothermal Centre, drawing on data from Germany and other countries, geothermal energy could supply around 4 GW of heat and 500 MW of power between 2038 and 2042. The corresponding carbon reduction, depending on the fossil fuels displaced, is estimated at 7 to 13 million tonnes of CO_2 per year from geothermal energy supply alone.

If deployed at scale to displace liquefied natural gas (LNG) imports, this shift could offset a meaningful share of the £50 billion the UK spent on LNG in 2022. Beyond the carbon and financial benefits, expanding geothermal energy would stimulate domestic investment, create and sustain high value employment, particularly for skilled workers transitioning from the declining North Sea oil and gas sector, and strengthen energy security and sovereignty by providing a stable, local, low carbon heat source.

In short, geothermal energy could become a cornerstone of the UK's net zero transition, replacing imported fossil fuels with reliable, home grown, near zero carbon energy. With targeted policy support, expanded CfD access, and inclusion in CCC carbon budget modelling, geothermal can make a measurable contribution to meeting statutory climate goals while delivering regional economic and social benefits.

4. Anaerobic Digestion and Biomethane.

Currently the UK has around 1100 biogas producing plants across all scales and all technologies from landfill gas, wastewater treatment, municipal food waste and agriculture-based plants using animal wastes and rotational break crops. Around 130 of these plants upgrade the biogas to biomethane and in 2024 they produced around 5.5 TWh of biomethane which was injected into the UK gas network. The current support mechanism to support the development of new plants is intended to support an additional 3.3 TWh of biomethane. Not only can biomethane production replace natural gas in the gas grid, but the process of upgrading biogas to biomethane produces high-quality carbon dioxide as a bioproduct. This carbon dioxide is currently utilised in industry and food manufacturing but could also be sent to long term storage as a form of bioenergy carbon capture and storage (BECCS).

The CCC 7th carbon budget didn't indicate any ambition for significant growth in this sector. Previous estimates for the potential for biomethane production in the DESNZ biomass strategy (2023) indicated a range of between 30-40 TWh of biomethane from waste feedstock. This does not include any modelling of the potential for biomethane production from break crops used in a rotational cropping system. A recent study carried out by Alder BioInsights [1] estimates the potential for over 120 TWh of biomethane production by 2050 where rotational crops are used to boost agricultural output without any negative impact on food production. Additionally, the most recent NESO Future Energy Scenarios estimates the use of around 60TWh of biomethane required to meet Net Zero in 2050 in their Balanced Pathway. The lack of ambition for biomethane in the CCC's advice for the 7th carbon budget is in contrast to the multiple other studies indicating a significant role for biomethane in delivering net zero in 2050.

Large scale deployment of biomethane as identified in the Alder Bioinsight's report would also deliver whole system cost benefits in meeting net zero in 2050. A study carried out by Baringa[2] modelled the whole system costs of meeting net zero where the barriers to biomethane had been addressed and the costs of production reduced. Their modelling indicated cost savings of between £156 billion and £218 billion, with a central forecast of £174bn. For context, the OBR forecast the net cost of Net Zero to be around £800bn.

This is delivered through greater GHG removals through the CCS of upgrading biomethane, but also where biomethane is used to generate electricity in a power station equipped with CCS. Additionally, the widespread use of digestate to replace fossil-based fertiliser delivers significant cost savings and carbon savings as fertiliser production is one of the most carbon intensive industries. The negative carbon emissions associated with greater biomethane deployment

[1] https://greengastaskforce.co.uk/wp-content/uploads/2025/09/GGT-Unlocking-the-Potential-of-Biomethane.pdf
[2] https://greengastaskforce.co.uk/wp-content/uploads/2025/10/Cadent-GGT_Biomethane_Study.pdf

provides headroom for emissions in the most difficult and expensive sectors, which are anticipated to be high temperature industries and transport.

It is also important to recognise the impact of GHG emissions animal manures that are not currently treated through AD. Smaller scale biogas production on farms where the biogas could be used directly to generate electricity, upgraded to biomethane for use in transport and farm machinery or transported to a grid injection point, could deliver significant GHG emissions savings. Currently only 2 million tonnes of a potential 90 million tonnes are treated through AD and the lack of recognition of the emissions savings is a barrier to greater deployment in this sector. There is potential for around 13TWh of biomethane from the dairy and beef sector alone. This would provide additional support for agriculture and the rural economy outside of only food production.

The biomethane industries key ask for delivering greater biomethane production and fulfilling the potential include:

- A national target for biomethane production in 2050 with interim targets in line with several EU member states
- Long term financial support mechanisms to provide confidence to investors (highlighting the significance of the forthcoming consultation on the Future Framework for biomethane production).
- Recognition of biomethane in the UK ETS and alignment with the EU ETS to provide opportunities for developing production plants outside direct production support.
- Ensuring there are mechanisms for bioCO2 from biomethane production to access CCS clusters using non-pipeline transport
- Recognition and reward for carbon savings through methane abatement and fertiliser replacement which would incentivise anaerobic digestion of animal manures.