Biomass is a broad term covering all organic carbon-based materials including plants and animals. We use it here to refer to forests, crops grown for energy (e.g. willow and miscanthus) and organic wastes (e.g. food waste, agricultural residues and sewage). Biomass can help tackle climate change in two ways:

1. Biomass growth removes carbon dioxide from the atmosphere and stores it for long periods of time in soils, trees and other plants.
2. When managed and harvested in a sustainable way, biomass can also be used to reduce fossil fuel emissions to the atmosphere.

Biomass is an integral part of the global carbon cycle

The careful management of biomass stocks will play a critical role in limiting the rise in global temperature in the 21st century…

…most pathways for mitigating climate change also require some harvesting of biomass to increase total carbon storage and provide useful low-carbon services (e.g. timber, energy).

Producing biomass in a sustainable, low-carbon way
Harvesting and using biomass can be sustainable and low-carbon, but only if the following critical criteria are met:
- Protects or enhances biodiversity, soils and water quality
- Minimises supply-chain GHG emissions
- Does not compete with food production and respects land rights
- Only from forests managed sustainably for a range of products
- Not from virgin slow-growth, highly-diverse or high-carbon forests
- No ‘mining’ of carbon stocks in the landscape
- Not using residues needed for soil carbon and quality or other existing uses
- Not producing harmful levels of air pollution when burnt

Stronger sustainability governance for managing risks
Achieving this in practice is the fundamental challenge. The UK Government must:

- Tighten sustainability criteria based on the latest evidence and drive a race-to-the-top
- Lead a shift towards high-quality independent monitoring and reporting (e.g. using satellite data, track-and-trace, better soil carbon monitoring)
- Encourage new supply-chains to drive up standards globally (e.g. in developing countries)
- Extend scope of governance beyond subsidy-schemes (e.g. trade and development policy, standards, procurement and finance rules)

The long-term role of biomass imports to the UK should depend on the success of these efforts.

How can biomass be used effectively?
In the future, demand is likely to outstrip sustainable supply. Harvested biomass will be used most effectively where it maximises the removal and minimises the release of carbon into the atmosphere.

Between now and 2050, the current uses of biomass in the UK need to change:

- **Bioeconomy**: Wood in construction
- **Buildings**: Biomethane, local district heating schemes and some efficient biomass boilers in rural areas
- **Industry**: Biomass use for processes with potential future BECCS** applications
- **Power**: Ongoing use in power sector in line with existing commitments or small scale uses
- **Transport**: Liquid biofuels increasingly made from waste and lignocellulosic feedstocks

Maximising abatement means using biomass to sequester carbon wherever possible (opportunities to do this will increase over time)