

What does this sector include?

Greenhouse gas emissions from the waste sector mainly comprise methane released from landfill sites, with the remainder (10%) from waste water treatment and incineration of waste. Methane is emitted when biodegradable wastes – most importantly food and paper/card – decompose anaerobically (i.e. in the absence of oxygen).

In 2011, the waste sector accounted for 3.1% of total greenhouse gas emissions in the UK (Figure 1). Emissions have fallen by 64% since 1990 due largely to reduced emissions from landfill sites (Figure 2). A key driver in this has been the EU landfill directive which requires significant reductions in landfilling of biodegradable municipal waste (to 75% of that produced in 1995 by 2010, to 50% by 2013 and to 35% by 2020).

Figure 1. Greenhouse gas emissions from waste (coloured slices) (2011)

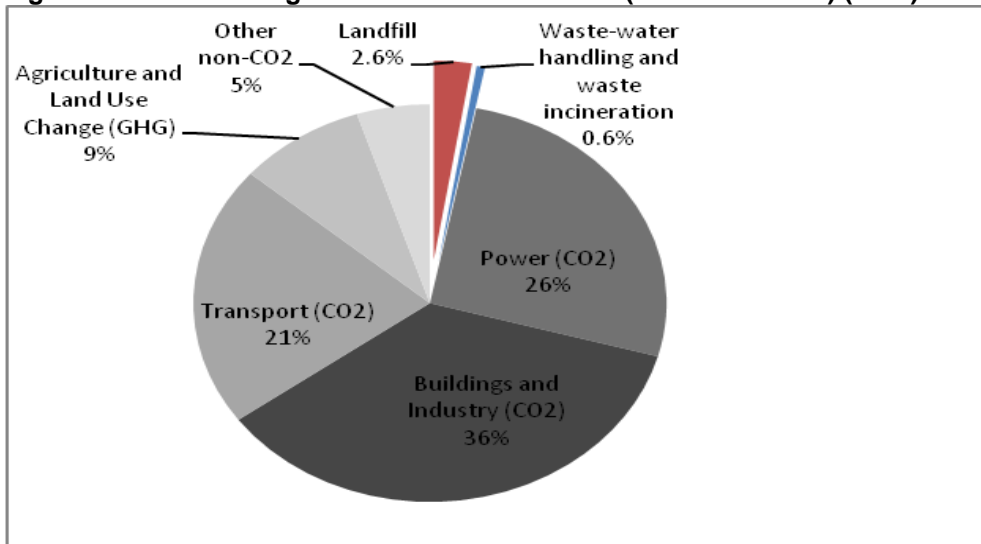
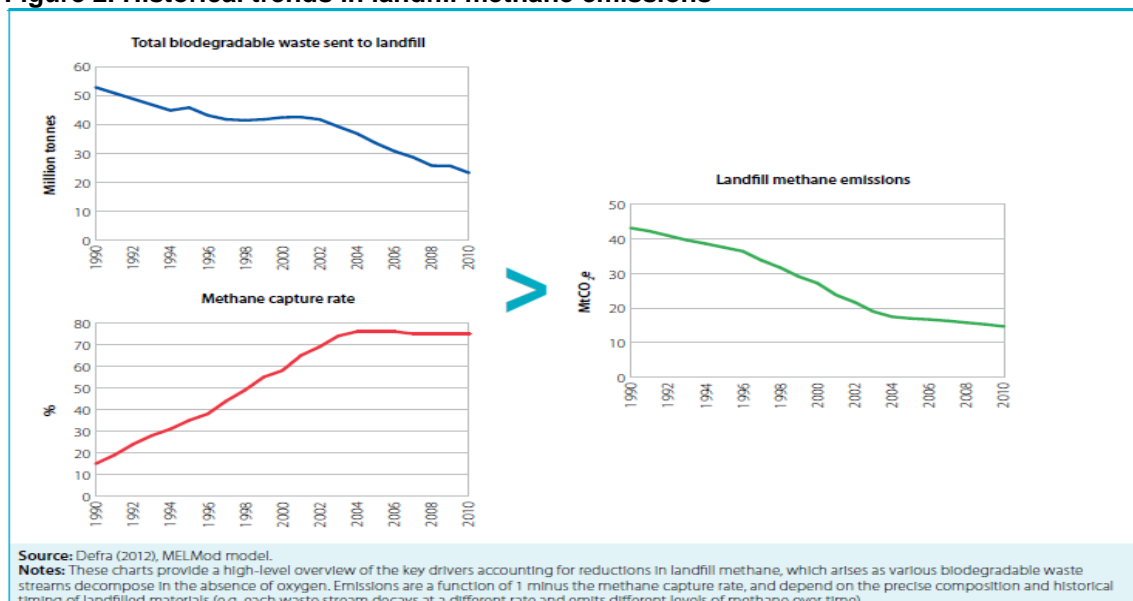


Figure 2. Historical trends in landfill methane emissions



What can be done to reduce emissions in this sector?

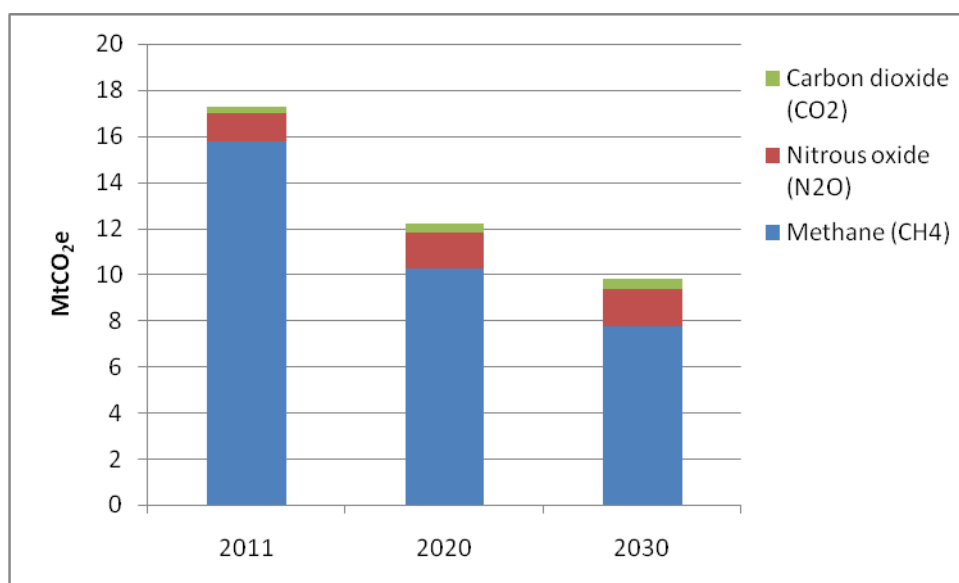
Landfill emissions can be reduced in three ways: creating less waste, sending less waste to landfill and capturing more of the methane released at landfill sites. Increased reuse and recycling and other waste prevention measures are generally low cost and can also contribute to reductions in upstream emissions (e.g. avoiding food waste not only avoids emissions in disposal of that waste, it also avoids emissions in production and processing of the food in the first place).

Besides **recycling**, waste treatment options that provide an alternative to landfill include:

- **Anaerobic Digestion (AD):** biodegradable waste degrades anaerobically in a controlled environment, with the resulting biogas captured and used as a low-carbon energy source
- **Composting:** biodegradable waste degrade aerobically to produce a compost which can be applied to land, potentially displacing fertiliser
- **Mechanical Biological Treatment:** breaking down waste by shredding, removing recyclable materials, and either composting or digesting the remaining waste to produce biogas.
- **Incineration with energy recovery:** waste is fed directly into a furnace or boiler without prior separation or sorting.

Figure 3 illustrates potential abatement up to 2030 from reducing biodegradable waste sent to landfill – most reductions are based on the Government's emissions projections assuming EU landfill targets are met, with some further potential reductions if more waste is diverted. By 2030, waste emissions could fall to 10 MtCO₂e.

Figure 3. Potential emissions trajectory 2011 - 2030



What is Government doing?

- **Landfill Tax.** The tax is paid by landfill operators, who pass on the costs as gate fees to Local Authorities and businesses, creating an incentive for them to reduce waste sent to landfill. The standard rate has increased from its initial rate of £7 per tonne to a current level of £64 per tonne, and will rise to £80 per tonne by 2014/15.
- **Waste reduction.** WRAP's Love Food Hate Waste Programme, introduced in 2007, encourages voluntary reductions in food waste. Food waste generated by English households has fallen by over

1 million tonnes between 2007 and 2010. The Courtauld Commitment, a responsibility deal in the grocery retail sector, prevented 0.7 million tonnes of food waste between 2005 and 2009 and aims to further reduce household food and drink waste by 4% between 2009 and 2012.

- **Diversion of waste towards recycling and other treatments.** Partly incentivised by the landfill tax, local authorities have supported the sorting of waste through providing for recycling (and in some cases separate food waste) collection, composting, and investment in waste treatment facilities.
- **Methane capture and anaerobic digestion.** A combination of permit conditions and financial incentives for capturing methane from landfill and anaerobic digestion (under the Renewables Obligation, Feed-in Tariffs, Renewable Heat Incentive and Renewable Transport Fuel Obligation) has driven investment to significantly increase capture of methane at landfill sites.

What is the CCC's position?

The CCC recommended in June 2012 that:

- **Increased ambition should be considered.** There is potential to go beyond current reductions required under the EU Landfill Directive, given further opportunities for waste prevention, recycling, and treatment through other methods such as anaerobic digestion.
- **Policy should be closely monitored** with stronger incentives for waste reduction and diversion from landfill introduced as required.
- **Specific strategies should be developed** to increase diversion of food, paper and card waste from landfill.

Links to recent work by CCC

- **2012 Annual Progress Report**, Chapter 7 - Progress reducing emissions from waste
<http://www.theccc.org.uk/reports/2012-progress-report>
- **The 2050 target**, Chapter 6 – Reducing emissions of non-CO2 greenhouse gases
<http://www.theccc.org.uk/reports/international-aviation-a-shipping>