

# Waste Management and Climate Change

## Purpose

This Policy Position Statement (PPS) considers the impact of climate change on waste management and how to reduce the risks of waste and resources management contributing to climate change. This PPS should be read in conjunction with CIWEM's PPSs on Climate Change, Climate Change Adaptation and Waste and Resource Management. More information on waste prevention can be found in CIWEM's report *Less is More*<sup>1</sup>.

## CIWEM's Position:

1. Professionals working in waste management and associated areas need to be aware of the impact of their area of work on greenhouse gas emissions and the potential need for adaptation to climate change.
2. The focus for the UK should be on resource efficiency and waste prevention following the hierarchy in the revised Waste Framework Directive. Action at the recycling stage is too late into the life cycle of a product to deliver the kind of carbon savings that will be required to meet ambitious emissions reduction targets.
3. When climate change is being considered in waste management decisions, it needs to be considered in the context of identified impacts and risks and action should be proportionate to other issues in this respect.
4. CIWEM considers that managing waste in the UK makes a relatively modest contribution to carbon emissions at roughly four percent of the UK total emissions in 2013. However, in 2010 a UNEP report<sup>1</sup> suggested that the waste sector is in a unique position to move from being a minor source of global emissions to becoming a major saver of emissions.
5. Although minor levels of emissions are released through waste treatment and disposal, the prevention and recovery of wastes (i.e. as secondary materials or energy) avoids emissions in all other sectors of the economy.
6. There is a need to ensure that the regulatory landscape is appropriate to optimise waste prevention and the use of waste as a resource with the reclassification of waste as non-waste so as to facilitate material re-use, (provided this does not raise issues with chemicals legislation<sup>2</sup>). Policy should focus on driving reuse and eco-design as opposed to towards recycling and energy from waste.

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1 UNEP: United Nations Environment Programme (2010) Waste and Climate Change: global trends and strategy framework. Osaka: International Environmental Technology Centre.

2 For example REACH, the European Union regulation concerning the Registration, Evaluation, Authorisation and restriction of Chemicals.

7. Expenditure should be proportionate to the emissions savings which can be achieved over the whole lifecycle of the material in question and investment in the waste industry is arguably higher than in other sectors which have greater potential for emissions reduction (for example energy and transport) and where some of this investment may be better placed.
8. There is significant potential for use of alternative vehicle fuels within the waste industry, which would reduce emissions associated with transport.
9. Climate change adaptation will be increasingly important as risks to disruption will increase significantly. Waste companies should consider undertaking risk assessments of the impacts of climate change upon their waste operations and to integrate recommendations of the research into their business plans.

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## Context

There is broad scientific consensus that the climate is changing as a result of man's influence. The Intergovernmental Panel on Climate Change (IPCC)<sup>ii</sup> predicts that worldwide, long-term changes will be significant and affect many different aspects of life and its projections are increasingly understood to be conservative.

### The impact of climate change on waste management

The impact of climate change on waste management infrastructure is likely to become increasingly important and there are some threats which should not be ignored. Landfills have a significant long-lived pollution potential due to slow degradation of biodegradable content and insufficient flushing of leachate through the contained material. Current infrastructure may be vulnerable to flooding, with the incidence of more extreme weather events. The impacts need to be understood and measures put in place to ensure that resilience to such events is adequate. There are also potential waste and public health impacts in the aftermath of extreme catastrophic events.

There is a need to translate currently available evidence into adaptation strategies. These may need to account for both flooding and sea-level rise when considering the position and construction of future infrastructure and it is particularly important that hazardous waste infrastructure should not be sited in flood risk zones. The Environment Agency considers the implications for adaptation from climate change upon compliance management and how this might be reflected in its operations, as well as reducing emissions through permitting.

### The impact of waste management on climate change

The waste management sector was responsible for around 4 percent of UK greenhouse gas emissions in 2013, with methane being by far the most prominent gas (91 percent). The vast majority of these emissions are from landfill sites<sup>iii</sup>. Between 2012 and 2013, emissions from

waste management fell by 14 percent (3.7 MtCO<sub>2</sub>e), reflecting a continuation of the trend seen in recent years of a decrease in emissions from landfilled waste.

Between 1990 and 2013, greenhouse gas emissions from the waste management sector decreased by 67 percent. This was due to a combination of factors, including improvements in the standards of landfilling, changes to the types of waste going to landfill (such as reducing the amount of biodegradable waste), and an increase in the amount of landfill gas being used for energy. Emissions of methane alone have reduced by 69 percent over the period.

The EU recognises the importance of methane as a powerful greenhouse gas that needs to be reduced in order to meet climate change targets. This is set out in the European Commission's Strategy Paper for Reducing Methane Emissions<sup>iv</sup> which states:

*"...action on methane looks particularly promising given first, that it would take only a 10% reduction in methane emissions to stabilise methane concentrations in the atmosphere, compared to a 60% reduction of CO<sub>2</sub> emissions to achieve the same result and secondly due to the short time methane resides in the atmosphere (12 - 17 years) compared to CO<sub>2</sub> (50 - 200 years) a strategy to reduce methane emissions would have a more immediate impact on the global greenhouse effect compared to CO<sub>2</sub>".*

Evidence on Climate Change projections such as those from the IPCC indicate that the speed at which emissions reductions are delivered is crucial, as well as the scale of such cuts. Whilst the recognition of the contribution waste management makes to greenhouse gas emissions and therefore climate change is welcome, it is important that a holistic and proportionate approach to reducing emissions across the economy is employed, reflecting the contribution that those sectors make to total UK emissions and the savings that could be most readily achieved.

## Reducing the impact of waste management

### Waste prevention

There is a need to be realistic about the potential benefits of committing resources to reducing the greenhouse gases from waste management facilities, as opposed to taking (potentially more effective) action on waste prevention.

Any reduction in greenhouse gas emissions from waste management practices will have been brought about through avoided landfill emissions, reduced raw material extraction and manufacturing, recovered materials and energy replacing virgin materials and fossil-fuel energy sources.

There is consensus, however, that the climate benefits of waste avoidance and material efficiency far outweigh the benefits from any waste treatment technology, even when energy is recovered.

Nevertheless although waste prevention is found at the top of the waste hierarchy, it tends to receive relatively little attention. It is a difficult concept to introduce in an economic climate where growth and increased consumption is encouraged. Tools are available to assist in making evaluations, whose application should be promoted. For example, the Waste Framework Directive promotes use of Life Cycle Assessment to assist with comparing the climate change impacts of waste management options.

## Recycling

There is presently a strong focus on recycling in the UK and other EU countries. Generally, recycling uses less energy than producing goods from raw materials. However, from a sustainability point of view, concentration of efforts on recycling may be misplaced as it occurs too late in the life-cycle of a product to be of maximum benefit to the environment. Recycling saves on the use of raw materials, however recycling uses energy and often produces products of quality inferior to the primary product. There has been a drive to meet weight-based targets at the expense of quality. Therefore, it is important to recognise where recycling delivers a net environmental benefit and where it does not.

## Recovery

Another element of the waste hierarchy is “recovery” where waste serves a useful purpose by replacing other materials that would otherwise have been used to fulfil a particular function. The current regulatory regime often penalises the beneficial use of waste. Regulation of waste recovery activities such as energy from waste should foster good environmental behaviours and practice. This will enable more resource and carbon efficiency.

There is significant potential for waste companies to fuel their collection fleets using alternative fuels such as waste derived biofuels. Whilst this would not make a large impact on the carbon intensity of the industry, it would represent a step towards sustainability given the close proximity of waste companies to waste products which can be used to produce fuel. A number of major waste operators are currently leading the way on development of alternative fuels.

CIWEM believes the encouragement to deliver biogas (methane) injection into either the national grid or more local networks, together with the maximisation of energy generation from waste via anaerobic digestion should continue, in addition to optimising landfill gas capture and utilising the potential for alternative fuelling of some waste industry vehicles. This would be strengthened by a consistent, long-term approach to government incentives in this area, as opposed to the current short-term initiatives.

CIWEM believes that more should be achieved in terms of reclassifying wastes as non-waste so as to facilitate their material re-use. We also suggest that consideration should be given to a new target for local authorities, which discourages them from contracting waste management companies whose facilities that are net users of energy.

One of the problems with attempting to mitigate climate change is that much of the technology to do so uses elements that are becoming increasingly scarce. Unless we make a greater effort to recover these materials rather than sending them abroad for recycling, we shall have to face significantly increasing costs to develop clean technology. In order to reduce greenhouse gas emissions, we must become more material efficient by considering the whole life-cycle of products. Extraction, production and processing of materials needs to be reduced significantly if we are to control the consequences of the growth in consumption. Both policies and financial incentives are required to encourage efficiency within new and existing processes so that the total requirement for material production and processing is reduced, so reducing both energy and water use and waste.

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*Note: CIWEM Policy Position Statements (PPS) represent the Institution's views on issues at a particular point in time. It is accepted that situations change as research provides new evidence. It should be understood, therefore, that CIWEM PPS's are under constant review, and that previously-held views may alter and lead to revised PPSs. PPSs are produced as a consensus report and do not necessarily represent the view of individual members of CIWEM.*

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- i CIWEM. 2013. Less is more: a lifecycle approach to waste prevention and resource optimisation.
  - ii IPCC. 2014. Climate Change Fifth Assessment Report
  - iii DECC. 2015. 2013 [UK Greenhouse Gas Emissions, final figures](#)
  - iv EC: Strategy Paper for reducing Methane Emissions, COM (96) 557, 1996