



Food Waste Programme 2011/12 – Strategy

The purpose of this strategy is to demonstrate to all sectors of the resource management network in Scotland the importance of collecting food waste, and furthermore ensuring that the maximum recovery of the intrinsic carbon is achieved through the most appropriate treatment method.

Zero Waste Scotland believes that Anaerobic Digestion currently provides the most compelling case for treating food waste and aims to encourage both the private and public sector to collect food in a manner that allows this treatment process to occur.

The strategy will demonstrate to stakeholders, private companies and Councils why Zero Waste Scotland believes that food waste is important to Scotland's environment and energy policy and how it can contribute to the economy. Furthermore, the strategy aims to show that, where appropriate, Anaerobic Digestion should be pursued as the treatment method for food waste. Finally, this strategy aims to show that separate collection of food waste does not only provide the highest capture of material, it is best suited to the most beneficial treatment method, Anaerobic Digestion.

Background Reports

There have been a number of reports published on the subject of food waste collections and treatment. The following sections provide a summary of some of the key points from relevant reports and why they are relevant to this strategy. It is important to understand the reasons for the collection of food waste in a national policy context and this section also provides a summary of the key policy drivers from Scotland's Zero Waste Plan, which was published in June 2010.

Scotland's Zero Waste Plan

Scotland's Zero Waste Plan was published by the Scottish Government on 9th June 2010. The full plan can be viewed on the Scottish Government website.¹

The key points to note from the Zero Waste Plan in relation to the collection and treatment of food waste are summarised below: -

- Action 4 – The introduction of landfill bans for materials such as food waste.
- Action 5 – The introduction of a carbon metric measurement that will encourage the recovery of materials in a way that has greater environmental benefit.
- Action 8 – The introduction of regulations to support the separate collection of materials, and specifically food waste, in order to recover the energy value from the material.
- Annex A – Only materials that have achieved PAS100 or PAS110 quality specification for composted or digested materials will be counted as recycling.

¹ Scotland's Zero Waste Plan - <http://www.scotland.gov.uk/Resource/Doc/314168/0099749.pdf>



- Annex C – The intention of the Scottish Government to enact legislation to require the separate collection of food waste from households and commercial premises.

The Food We Waste in Scotland

The Food We Waste in Scotland Report was published in September 2009 following work carried out on behalf of WRAP and Waste Aware Scotland. The full report can be viewed on the Zero Waste Scotland website.²

The key points to note from the Food We Waste in Scotland Report are summarised below: -

- 341,000 tonnes of food waste was disposed of by households in Scotland in 2009.
- The avoidable food waste disposed of by households amounted to £430 per household.
- The top-5 food and drinks that were disposed of by weight in Scotland were, milk, bread, carbonated drinks, potatoes and pre-packed meals.

Anaerobic Digestion

Anaerobic digestion is a natural process in which micro-organisms convert animal and plant matter into useful products in the absence of air. AD is not a new technology. It has been used in the wastewater industry in the UK since the 1800s, but only relatively recently in the UK for the recycling of organic wastes. Feedstocks for the process are fed into sealed tanks where the digestion process occurs, a mixture of carbon dioxide and methane emitted and a nutrient rich digestate produced.

In 2007, WRAP undertook a review of AD technology options that were suitable for recycling food waste. This concluded that, although AD was widely used for waste treatment in Europe, it was under utilised in the UK. It also concluded that wet AD systems were the most suited to recycling food waste in terms of cost, environmental benefits and complexity.

In Scotland, the Government has recognised the range of benefits that AD can offer across a range of policy areas, and therefore is committed to maximising its potential to contribute to the following:

- Achieving the Zero Waste Plan recycling and carbon targets
- Achieving the Renewable Action Plan target of a de-carbonised heat sector by 2050
- Reducing the carbon impact of transport
- Improving the sustainability of food production through the use of biofertilisers
- Achieving the Water Framework & Nitrates Directives water quality targets
- Achieving sustainable economic development
- Improving soil health & biodiversity

² The Food we Waste in Scotland Report -

http://www.wrap.org.uk/downloads/Food_waste_in_Scotland_FINAL_report_28_August_2009.a2df338f.7550.pdf

Food Waste Collections

There have been several reports on the collection of food waste from households over the last 5 years, carried out by WRAP and also Remade Scotland. These reports can be viewed by following the links in the footnote.

The key points from each of these reports are summarised in the following sections.

WRAP - Dealing with Food Waste in the UK³

- Systems which include free garden waste collections tend to be more costly per household than those which target food waste *only*. In general, systems collecting garden waste, or mixed garden and food waste, *fortnightly* and free of charge, are more expensive than systems collecting food waste *weekly*.
- The additional cost associated with adding food waste to an existing free garden waste collection is significant. This is because the resulting mixture of food and garden waste must be treated by in vessel systems, which are more expensive than windrow composting of garden waste. In general this is a very expensive way of treating small amounts of food waste.
- Collecting only food waste allows the processing costs to be minimised and can increase the capture rate.
- As the costs of residual waste management increase, so the benefits of separate biowaste collections increase, relative to the baseline (in which no biowaste is collected).
- If the system chosen for biowaste collection and treatment is separate collection of food waste coupled to anaerobic digestion, the environmental performance of the system is likely to be the best compared to all the other systems examined in this report.
- Food waste exhibits less seasonal variation than garden waste and therefore anaerobic digestion of this material should enable capacity utilisation to be higher.

WRAP - Performance Analysis of Mixed food and garden collection schemes

- This study focussed on reviewing the performance of 6 established mixed food and garden collections operating weekly and fortnightly frequencies.
- The capture of food waste from the weekly and fortnightly schemes was 1kg/hh/wk and 0.55kg/hh/wk on average respectively.
- The capture of food waste in the organics container was low at 26.6% and 9.3% respective to the frequency.
- The captures of food categorised as post preparation/consumed was low at 20.3% and 9.5% respective to the frequency.
- The captures of food waste that could have been home composted (vegetable peelings and fruit) was high at 62% and 73% respective to frequency.

³Dealing with Food Waste in the UK - http://www.wrap.org.uk/downloads/Dealing_with_Food_Waste_-_Final_-_2_March_07.322dc04a.3603.pdf

4 Performance Analysis of Mixed food and garden collection schemes
http://www.wrap.org.uk/downloads/Food_Garden_Waste_Report_Final.d86af52a.8564.pdf



WRAP Food Waste Trials Report⁴

- Average food waste yields per household served per week ranged from 0.32 kg (bring scheme) to 2.1 kg (kerbside); this is equivalent to each household avoiding the equivalent of between 0.11 kg and 0.94 kg of CO₂ each week.
- Experience from the trials suggests that – once deprivation is taken into account – separate food waste collections from areas with fortnightly refuse collections are proven to achieve higher food waste yields in comparison to collections from areas with weekly refuse collections using wheeled bins.
- Trials taking place alongside fortnightly refuse collections generally have achieved higher weekly yields per household served of collected food waste (average of 1.5 kg/hh/wk), in comparison with trials taking place alongside weekly refuse collections (average of 1.3 kg/hh/wk). The performance gap between the systems is likely to increase over time as participation under weekly refuse scenarios tails off.
- Trials taking place alongside fortnightly refuse collections generally have achieved higher weekly yields per participating household (average of 2.5 kg/wk) in comparison with trials taking place alongside weekly refuse collections (average of 2.3 kg/wk).
- Trials taking place alongside fortnightly refuse collections generally achieved higher weekly yields per household setting out (average of 3.4 kg/wk), in comparison with trials taking place alongside weekly refuse collections (average of 3.2 kg/wk).

WRAP Food Waste Collection 2008 Update⁵

- The report revisited the cost benefit analysis undertaken for the original 2006 report in light of operational data gathered from the actual collection trials and further reviews of residual and food treatment costs over time. The results strengthened the case for separate food waste collection and treatment through AD especially following the reviews of collection service efficiency, rising refuse disposal costs and reducing food treatment gate fees. It concluded that a sound management strategy for household biowaste is likely to include the following: -
 - Intensive promotion of home composting as a means of diverting appropriate biowastes from landfill at the lowest cost;
- Where kerbside garden waste collection services are provided, they should be designed so as to minimise the potential for attracting additional waste into the collection system. A number of measures are available to local authorities (notably appropriate containers and charging mechanisms);
- Separate collection of food wastes using efficient and lower-cost approaches to allow weekly collections at acceptable cost;
- Provision of appropriate containers to make the separation of food waste easy for residents and to encourage them to take part in the service; and close consideration to matching the method of collection to the treatment system being operated.
- AD and in-vessel composting could both be valuable, with AD bringing the higher environmental benefits.

⁴ WRAP Food Waste Collections Trials -

http://www.wrap.org.uk/downloads/Evaluation_of_the_WRAP_FW_Collection_Trials_Update_June_2009.287a5e3d.7271.pdf

⁵ http://www.wrap.org.uk/downloads/Update_to_Biowaste_CBA_Report.2f4d4d35.6164.pdf



Remade Report⁶

- Three of the trials operating in Scotland provided separate food waste collection to main door properties; the average yield from these trials was 1.5 kg/hh/wk of food waste for all households.
- Average yields for food waste only households **setting out** in Scotland was 3.52kg/hh/wk (WRAP 2.55 -3.84 kg/hh/wk)
- Two of the trials provided a combined food and garden waste collection to main door properties; the average yield from these was 4.49 kg of food and garden waste per household served per week.
- The average yield of food from the combined food and garden was 0.8kg/hh/wk.

The Case for Collecting Food Waste and Anaerobic Digestion

Eunomia Research & Consulting was commissioned by WRAP in 2007 to undertake a review of different food waste collection and treatment options³. This considered a wide range of different systems of garden / food waste collections and compared them to a base case of 'no garden / food collections & residual treatments'. The report looked both at the costs of delivering the services outlined and the environmental performance of each. The report also drew heavily on earlier work on collections options undertaken by Eunomia⁵.

It concluded that the environmental performance of the separate collection of food waste coupled to anaerobic digestion was likely to be the best of all the systems studied.

It also concluded that, in general, systems collecting free garden waste, or mixed garden and food waste, are likely to be more expensive than systems collecting food waste weekly. Also, that as the costs of residual waste management increase over time, so the benefits of separate food waste collections increase relative to the base case.

⁶ Scottish Food Waste Collection Trials -

http://www.wrap.org.uk/downloads/Scottish_Food_Waste_Collection_Trials.bb7f2ca5.10243.pdf



Action Plan

A number of tasks are underway or have been undertaken to provide Zero Waste Scotland and the relevant stakeholders with adequate information to develop the food waste programme. A summary of these tasks is shown in the table below*:-

Heading	Task	Status
Assessment of potential need	Completion of pro-forma with LAs	Complete
	Completion of dialogue with private sector*	In progress
Analysis of existing schemes	Review of performance of existing food waste services	In progress
Study Tours	Study tours to relevant LAs	As necessary
Agreement of assumptions	Completion of report on assumptions for options appraisal and business cases	TBC by April 2011

**Correct as of 15.3.11*