

# Partial Regulatory Impact Assessment

## **Title of Proposal**

This regulatory impact assessment considers the impact of the Draft Food Waste Regulations (Northern Ireland) 2013 to introduce restrictions on the landfilling of food waste.

## **Purpose and Intended Effect of Measure**

### The Objective

The aim of this policy is to prevent food waste going to landfill, by encouraging the source segregation and separate collection of food waste and subsequent banning of separately collected food waste from landfill. The proposed policy will ensure that the maximum value of this resource is realised and help deliver against the objectives contained in the soon to be published Waste Management Strategy 'Delivering Resource Efficiency' ('the Strategy'), to increase resource efficiency and decrease greenhouse gas emissions.

### Background

The moves the emphasis of waste management in NI from resource management to resource efficiency, using resources in the most effective way while minimising the impact of their use on the environment. It has a renewed focus on waste prevention, preparing for re-use and recycling in accordance with the waste hierarchy set out in the Waste Framework Directive (2008/98/EC). Future EU policy is set to underpin the waste hierarchy through a revision of the Landfill Directive (1999/31/EC) and the stated intention of the European Commission to consider bringing forward proposals to introduce a ban on all biodegradable waste being sent to landfill by 2025.

Not all waste can be prevented, re-used or recycled, and some residual waste has value in the form of recoverable energy and other by-products. The Strategy therefore supports efficient energy recovery from residual waste in accordance with the waste hierarchy which can deliver environmental benefits, reduce carbon impacts and provide economic opportunities. It notes that thermal treatment facilities, including anaerobic digestion, provide energy from waste which can contribute to meeting our non-fossil fuel obligations and Government's policies on renewable energy. It is within this policy context that the

Department is consulting on legislative proposals to introduce restrictions on the landfilling of food waste. This honours a commitment to consult on the issue in the Strategy.

The proposals are also seen as in pursuance of Articles 11(1)(re-use and recycling) and 22(bio-waste), and in accordance with Articles 4(waste hierarchy) and 13(protection of human health and the environment) of EU Directive 2008/98/EC on waste (the “Waste Framework Directive”)<sup>1</sup>. The requirements of the Waste Framework Directive have been transposed into NI legislation through the Waste Regulations (Northern Ireland) 2011<sup>2</sup>.

The EU Landfill Directive sets out criteria which control the types of wastes accepted at landfill primarily to protect the environment and human health. As a result, certain wastes such as tyres, gypsum waste, liquid waste and infectious clinical wastes are not permitted in landfill.

There are, though, wider benefits in terms of resource efficiency and carbon impact in restricting certain other wastes from landfill. Research, commissioned by government administrations across the UK, was carried out through the Waste and Resource Action Programme (WRAP) in 2009/10 on the feasibility and practicalities of introducing landfill bans and restrictions. Their report<sup>3</sup>, issued in March 2010, concluded that there are significant net benefits to be derived from restricting food waste among other waste streams. Greater benefits were derived when upstream segregation was carried out. Appropriate lead-in times were found to be critical to effective implementation and to derive maximum outcomes, particularly given the need to develop appropriate infrastructure.

In relation to food the report found net benefits to society from a landfill ban on food waste i.e. where food is assumed to be diverted away from landfill into anaerobic digestion (AD) the estimated savings were 523kg CO<sub>2</sub> per tonne (2009-2024). Where it was diverted into composting, estimated savings were 426kg CO<sub>2</sub> per tonne. An updated version of the report was published in November 2012<sup>4</sup> and reflected changes to the modelling, and additional analysis. It was also felt appropriate to give consideration to the costs derived using the private cost metric (in addition to the social metric) given that it takes into account existing incentives to avoid landfilling, such as landfill tax. For food waste the updated report found that outcomes in terms of the cost to society varied depending on the technology chosen. Under the private cost metric, as with the analysis of benefits to society, it is sensitive to the

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<sup>1</sup> <http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=OJ:L:2008:312:0003:0030:en:PDF>

<sup>2</sup> <http://www.legislation.gov.uk/nisr/2011/127/made/data.pdf>

<sup>3</sup> Landfill Bans: Feasibility Research by WRAP/Eunomia, March 2010

<sup>4</sup> <http://www.wrap.org.uk/sites/files/wrap/Landfill%20Bans%20Feasibility%20Research%20Final%20Report%20Updated.pdf>

choice of treatment (especially the use of biogas) and has the potential for either costs or savings.


Based on the earlier research, the Department subsequently consulted in June 2010 on proposals for restricting the landfilling of certain biodegradable and recyclable wastes. It considered whether the introduction of such restrictions would make an effective contribution to meeting the key objectives of increasing resource efficiency and reducing greenhouse gas emissions. Respondents were broadly of the view that there was a case for a landfill restriction on all or most of the proposed waste types including food waste.

The EU Resource Efficiency Roadmap highlights the significant impact of the food and drink value chain in the EU, causing 17% of the direct Greenhouse Gas (GHG) emissions and accounting for 28% of material resource use. On this basis the Roadmap contains a milestone of halving the disposal of edible food waste by 2020. A waste compositional analysis for NI carried out in 2008 estimated that 25.6% of all kerbside collected waste per household is organic catering (food) waste, equivalent to 206kt per annum. Reduced food waste can contribute to improving resource efficiency and food security at a global level, and would contribute to a reduction in GHG emissions resulting from their disposal in landfill.

Landfilling of biodegradable material leads to the generation of Methane (CH<sub>4</sub>), a Greenhouse Gas that is around 25 times more potent than Carbon Dioxide (CO<sub>2</sub>). The latest Northern Ireland Greenhouse Gas Inventory 1990-2011 (published 7 June 2013) states that the waste sector contributed 454kt CO<sub>2</sub>e. The NI Executive's Programme for Government 2011-2015 has set an ambitious target of working towards a reduction in GHG emissions of at least 35% by 2025. The diversion of food waste from landfill will result in significant reductions in Carbon Impact.

### Risk Assessment

The Draft Food Waste Regulations (Northern Ireland) 2013 aim to ensure the maximum value of food waste is realised, helping deliver against the objectives contained in the Strategy, to increase resource efficiency and decrease greenhouse gas emissions.

Without regulatory intervention there is a risk that food waste will continue to be landfilled or disposed of into the public sewer network, which is contrary to the Waste Hierarchy. In addition to this, **without regulatory intervention, there will be a lack of certainty regarding feedstock for alternative waste treatment facilities, which may result in a lack of investment in this market.** 

## **Options**

Three options have been identified as explained below.

### Option 1 – Maintain the Status Quo

This option would involve making no changes to the current provision with little onus on district councils to provide households with the opportunity to recycle household food waste. In addition, recycling of commercial food waste would continue to be at the discretion of individual businesses. Finally, the disposal of macerated food waste would continue to be unregulated.

This is the baseline option and will be used for comparative analysis where possible.

### Option 2 – Introduce Food Waste Regulations

This would entail councils providing households with the means to recycle food waste by 1 April 2016; how this is provided will be at the discretion of individual councils. Non-domestic food waste producers that produce more than 5kg of food waste per week will be required to separate this for collection from 1 April 2016. In addition, there will be a ban on the non-domestic discharge of food waste into the public sewer network from 1 April 2017.

### Option 3 – Phased Introduction of Food Waste Regulations

This option is similar to Option 2 except that there will be a phased introduction of the regulations for non-domestic food waste producers based on the amount of food waste produced. Namely, those that produce more than 50kg of food waste per week will be required to separate this for collection from 1 April 2016. Subsequently, those that produce more than 5kg of food waste will be required to separate this for collection from 1 April 2017.

## Costs and Benefits of the Options

Essentially the regulations will have an impact on the following key stakeholders:

- 1) District councils – duty on councils where technically, environmentally and economically practicable to provide every household in its area with a receptacle for the separate collection of food waste;
- 2) Householders – will be provided with a receptacle for the separate collection of food waste and will be encouraged to source segregate food waste;;
- 3) Non-domestic producers of food waste – duty to present food waste separately for collection, targeted specifically on those food businesses involved in food production, food retail or food preparation;
- 4) Non-domestic food waste producers who dispose of food waste into the public sewer network – businesses that use food waste disposal units (macerators) and food waste digesters will not be permitted to discharge such waste into the public sewer network;
- 5) Waste operators – given the reduction in the amount of food waste landfilled and consequent increase in food waste sent to alternative waste treatment facilities; and
- 6) Central/local government to administer/enforce the regulations.

Information on the costs and benefits for each option has been provided below, with costs and benefits identified for the key stakeholders. Where possible these have been quantified.

### Option 1 – Maintain the Status Quo

This option would involve making no changes to the current provision with no onus on councils to provide households with the opportunity to recycle household food waste. In addition, recycling of commercial food waste would continue to be at the discretion of individual businesses. Finally, the disposal of food waste into the public sewer network would continue to be unregulated. Maintaining the status quo will mean that the amount of food waste sent to landfill will continue to be detrimental to the environment.

For the purpose of this impact assessment an incremental approach has been taken with regard to the cost and benefits; this means that only those costs and benefits over and above the status quo have been identified. As such, it is assumed that maintaining the status

quo will cost nothing and will result in no benefits. However, it is important to outline the current situation in NI to enable the costs and benefits of the other options to be identified.

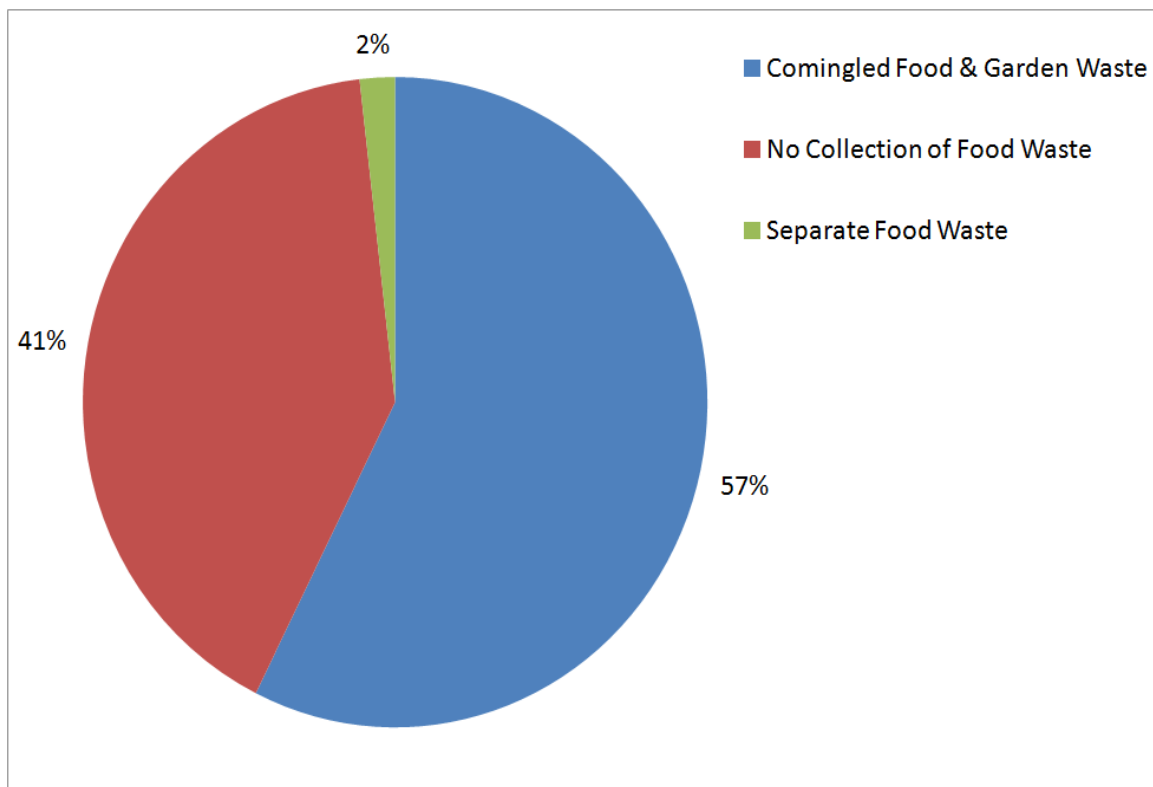
### Household Food Waste

With regard to the services currently provided by councils it is assumed<sup>5</sup> that:

- 18 councils currently collect food waste in some capacity;
- the majority of food waste is collected comingled with garden waste;
- 3 of the 18 councils provide a separate food waste collection service for a number of households in their council area (approximately 13,422 households throughout NI); and,
- of the 8 councils who do not currently provide a service for recycling food waste, 4 of these provide a service to collect garden waste only.

Figure 1 below illustrates the services available to households in NI.

*Figure 1: Food waste collection services available to households in NI*



<sup>5</sup> Source: WRAP Local Authority Portal & Waste Data Flow figures 2011/12

As shown in Figure 1, whilst the majority of households can have their food waste collected, 41% of households in NI do not have this option<sup>6</sup>.

In terms of waste data, it is difficult to provide an accurate estimate of the amount of food waste collected and the amount which is sent to landfill. This is because the majority of the food waste collected is comingled with garden waste and it is difficult to estimate, with certainty, the percentage of food waste content. Waste compositional analysis studies are not frequently carried out; therefore, there is limited information available on the level of food waste in NI. However, a recent comparison study by WRAP, on the performance of two district council food waste collection schemes, provides evidence of participation and capture rates for food waste collections in addition to the quantity and composition of food waste remaining in the householders' residual waste. Results from this study indicate that Northern Ireland is broadly on a par with the UK in terms of food waste arising and therefore gives confidence in using UK wide data to help estimate food waste arising.

Based on this evidence various assumptions have been made to allow food waste streams to be modelled. These have been based on the NI waste data available and studies completed throughout the UK. It also uses the food waste ready reckoners which have been developed by WRAP<sup>7</sup>. The methodology, limitations and sources of data have been outlined in Appendix 1b.

The relevant household waste information for NI is shown in Table 1.

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<sup>6</sup> Based on 2011/12 information, which is the most recent available on an annual basis.

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[http://www.wrap.org.uk/sites/files/wrap/Evaluation\\_of\\_the\\_WRAP\\_FW\\_Collection\\_Trials\\_Update\\_June\\_2009.pdf](http://www.wrap.org.uk/sites/files/wrap/Evaluation_of_the_WRAP_FW_Collection_Trials_Update_June_2009.pdf)

Table 1: 2011/12 Waste Figures for NI Local Authorities (all figures in tonnes)

<b>Council</b>	<b>Collected household waste for disposal</b>	<b>Compostable materials collected</b>	<b>Household Food waste in residual</b>
Antrim	9760	4055	2440
Ards	14058	6099	3915
Armagh	11536	3639	3368
Ballymena	13076	4554	3269
Ballymoney	6922	1252	2769
Banbridge	8109	6066	2027
Belfast	65106	11945	20085
Carrickfergus	7307	3570	1827
Castlereagh	12278	5776	3309
Coleraine	13833	0	5533
Cookstown	7764	1430	2558
Craigavon	20321	4572	5842
Derry	24474	0	9790
Down	15820	2887	6328
Dungannon & South Tyrone	11914	3285	3675
Fermanagh	13448	0	5379
Larne	6325	2801	1581
Limavady	7613	930	3045
Lisburn	22614	10113	5654
Magherafelt	8329	3771	2082
Moyle	3928	524	1571
Newry & Mourne	19057	3241	6451
Newtownabbey	16326	7362	4155
North Down	15908	6555	4693
Omagh	10028	2138	3244
Strabane	9555	0	3822
<b>TOTAL</b>	<b>375409</b>	<b>96563</b>	<b>118414</b>



Figures for collected household waste and the compostable materials collected were taken from DOE's 2011/12 municipal waste data report<sup>8</sup>, which were the most recent annual figures available. The food waste which remains in the residual waste has been estimated at 25% of the collected household waste for houses receiving a food waste collection (separate or comingled) and 40% for those households without a food collection. For an explanation of the assumptions see Appendix 1b.

As can be seen in Table 1, there appears to be scope to increase the level of food waste collected from households, thereby reducing the amount sent to landfill.

With regard to the level of food waste collected<sup>9</sup>, 18 councils provide comingled food and garden waste collections; 3 of these councils provide a food waste only collection for a portion of their residents.

It is **difficult to robustly estimate the amount of food** waste being collected as the level of food in the comingled collection is not separately recorded. Without doing compositional analysis for each council, assumptions need to be made. Table 2 illustrates an estimate of the level of food waste being collected by councils.

*Table 2: NI Estimated Food Waste Tonnages 2011/12<sup>10</sup>*

<b>Comingled Yield</b>	<b>Separate Food Waste</b>	<b>Total Food Waste</b>
12,113	707	12,820

Each district council will have different waste compositions, but this cannot be reflected in the calculations with the current data. Therefore, as shown in Table 2, it is assumed that 12,820t of food waste is currently being collected through comingled and separate food waste collections.

*Note that these figures (and indeed any figures modelled in this document) are merely indicative, particularly as each council will have unique waste compositions. In addition, there are constraints on each council in respect of how much food waste can be collected. It*

<sup>8</sup> [http://www.doeni.gov.uk/niea/waste-home/municipal\\_data\\_reporting.htm](http://www.doeni.gov.uk/niea/waste-home/municipal_data_reporting.htm)

<sup>9</sup> Based on 2011/12 information

<sup>10</sup> Councils currently providing separate food waste collections have been accounted for

is advised that each council appraises the options available to them to ensure that the optimum service is provided in terms of the costs and benefits of providing households with the means to recycle food waste.

### Non-domestic Food Waste

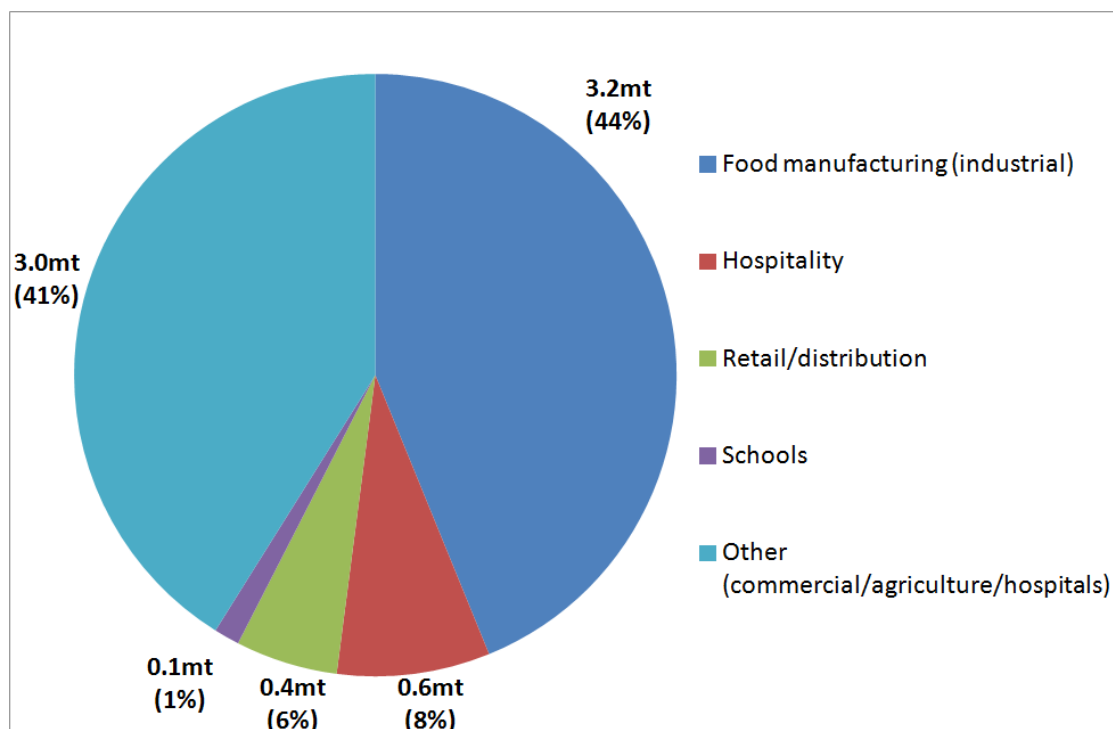


Given the lack of NI-specific data and the uncertainties involved, it is difficult to provide significant information on commercial food waste arising in NI and what impact the regulations could have on businesses and organisations. For the purpose of this regulatory impact assessment, the assumption is made that commercial food waste composition and arisings in the UK are broadly indicative of that in NI, and therefore UK data is cited in this report.

In the UK it is estimated that arisings of food waste is 15 million tonnes (mt) per year<sup>11</sup>; 7.5mt of this is assumed to be commercial food waste, which has been broken down in Figure 2 below.



**Figure 2: Estimated annual commercial food waste in the UK**



<sup>11</sup> Source: WRAP

As can be seen in Figure 2, the majority of commercial food waste is produced as a result of food manufacturing (3.2mt).

The majority (99.7%)<sup>12</sup> of businesses in NI are small and medium sized enterprises (SMEs)<sup>13</sup>; just over 5% of these are classified as accommodation and food services. However, the regulations are likely to have an impact on a number of different sectors.

In terms of the hospitality sector businesses, the amount of food waste in the commercial sector varies by business type according to factors such as whether food is prepared on or off site, the number of covers delivered per day, the food types sold, portion sizes and the size of the business.

It is likely that larger organisations who produce a high quantity of food waste will have at least considered separating and recycling food waste; particularly given the increase in landfill tax, which is due to be at least £80/t after April 2014. Increasing costs of landfilling waste will be passed onto businesses; therefore, it is beneficial to remove this material with the possibility of lowering their overall waste management costs (or at least keeping these at the same level). Furthermore, the level of cost increase for businesses will depend on how they re-configure all their waste management services to enable higher levels of recycling.

However, as most of the businesses in NI are small or micro businesses, many would not see food waste as an issue or may feel that the constraints to recycling food waste make it difficult to do so. Anecdotal evidence, based on audits undertaken by waste operators, suggests that small and micro businesses are capable of generating significant amounts of waste and there could be net savings to these businesses from managing their waste efficiently. Maintaining the status quo does not encourage these businesses to change their waste management practices, and realise any potential savings. The means to recycle food waste may not currently be accessible in all areas and private companies who collect recyclable materials may not view collecting food waste from smaller businesses as profitable. There are, however, potential economic opportunities for waste management companies that offer a food waste collection as part of their suite of services to attract clients. The provision of a food waste collection service will be essential to those who have signed up to or support the voluntary Hospitality and Food Service Agreement. The agreement aims to cut food and associated packaging waste by 5% and to increase the overall rate of food and packaging waste that is being recycled, sent to AD or composted to 70% by the end of 2015.

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<sup>12</sup> Source: DETI (2011 Figures)

<sup>13</sup> SMEs are businesses with less than 250 employees

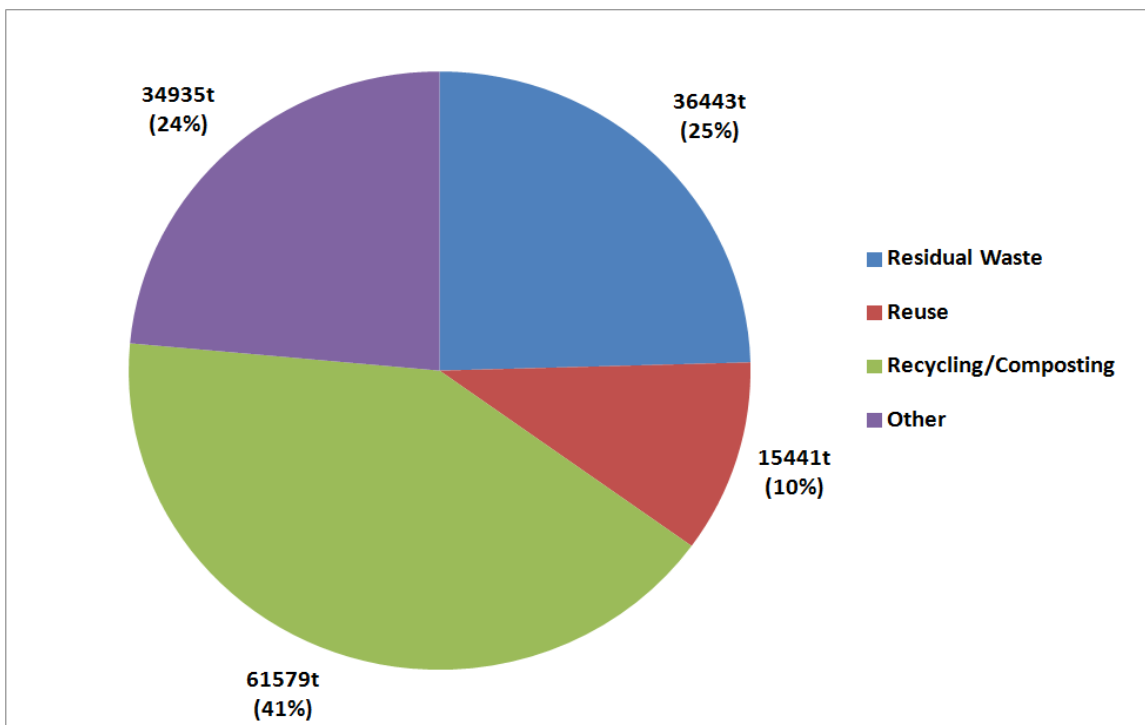


Studies have also shown that waste management companies<sup>14</sup> (or indeed councils) can make a profit, or at least cover their costs, in providing a food waste collection service. Maintaining the status quo will not encourage additional businesses to present their food waste for separate collection and hence waste management companies may not benefit from the potential economies of scale in providing the food waste collection service to more businesses.

It is not possible to provide robust figures for the current level of commercial food waste in NI given that the majority of SMEs do not receive individual site yields for the collections they receive and waste management companies are not obligated to provide tonnage data from specific commercial sectors. The most reliable figures available have been taken from WRAP's NI Priority Materials report<sup>15</sup> (2012). This suggested that 2009 Commercial and Industrial (C&I) waste arisings in NI were 1.3mt, and approximately 150kt of this was food waste. Figure 3 illustrates how this food waste was assumed to be managed. Note that these figures are indicative and based on assumptions, many of which had inherent uncertainties given the lack of available data.



Figure 3: Estimate of NI non-domestic food waste management<sup>16</sup>



<sup>14</sup> [http://www.wrap.org.uk/sites/files/wrap/Food%20Waste%20Collections%20to%20SMEs%20-%20Developing%20the%20Business%20Case%20-%20Final\\_0.pdf](http://www.wrap.org.uk/sites/files/wrap/Food%20Waste%20Collections%20to%20SMEs%20-%20Developing%20the%20Business%20Case%20-%20Final_0.pdf)

<sup>15</sup> <http://www.wrapni.org.uk/content/tackling-priority-materials-northern-ireland>

<sup>16</sup> It should be noted that a large proportion of "other" is presumed to go to options lower down the waste hierarchy such as landspreading.

Whilst figure 3 estimates data for 2009, it is thought that this is a reasonable estimate and as such, no adjustment was made in the WRAP report. Figure 3 suggests that there is approximately 36,443t of non-domestic food waste sent to landfill; therefore, it follows that there is scope to reduce this figure.

#### Disposal of Food Waste into the Public Sewer Network

Some businesses, particularly in the hospitality sector, have macerators installed which dispose of waste into drains or sewers. Examples of macerators are food waste disposal units and those designed for disposing of sanitary and hygiene products. Typically, they are installed and in use in commercial kitchens, care homes, hospitals, domestic properties and other premises.

Disposal in this way increases the risk of sewer blockages, sewer flooding, environmental pollution, odours and rodent infestations. There are also further associated risks to screening plants, the sewage treatment process, disposal of bio-solids and energy costs. Macerators therefore place an extra load on sewerage systems that they were not designed to handle and this can lead to flooding and environmental damage. In addition, macerators can use additional volumes of high quality drinking water which is wasted, The importance of water conservation and efficiency in order to protect supplies for the future is widely acknowledged.

It has not been possible to provide robust data on the usage of macerators in NI to dispose of food waste into the sewage system. A report was however commissioned by the Irish Environmental Protection Agency in 2008, which looked at the usage of these types of food waste disposers (FWDs) in Ireland<sup>17</sup>. The key results from this are shown overleaf.

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<sup>17</sup> [http://www.epa.ie/pubs/reports/research/waste/STRIVE\\_11\\_Phelan\\_Foodwaste\\_web1.pdf](http://www.epa.ie/pubs/reports/research/waste/STRIVE_11_Phelan_Foodwaste_web1.pdf)

Table 3: Key Results from Irish Study

	Quantity
Approximate number of domestic FWDs in Ireland	26,000 units
Estimate of food waste discharged from domestic FWDs to sewers	6.8 tonnes/day
Estimate of food waste discharged from commercial FWDs to sewers	35.9 tonnes/day
% of total SS influent loading at WWTPs discharged through an FWD <sup>18</sup>	2.3-8.2%

As can be seen in Table 3, the study estimated that 42.7t of food waste was being disposed of using FWDs; this equates to approximately 15,586t of food waste per year. Indicative figures for NI have been produced using the Irish figures, based on the comparable number of households and the number of businesses in the accommodation and food services sector, to which this element of the regulations would generally apply. The results are shown in Table 4 below and the assumptions can be found in Appendix 1b.

Table 4: NI Indicative Figures

	Quantity
Approximate number of domestic FWDs in Northern Ireland	13,000 units
Estimate of food waste discharged from domestic FWDs to sewers	3.4 tonnes/day
Estimate of food waste discharged from commercial FWDs to sewers	8.0 tonnes/day

Table 4 suggests that a total of 11.4t of food waste is being disposed of using FWDs in NI; this equates to 4,161t per year. Note this is merely indicative and should not be considered robust data, given how it was estimated. Nevertheless, the Irish report also highlights that the FWDs can use up to 16 litres of water per household per day and this would also be the case in NI.

Article 4 of the Revised Waste Framework Directive (WFD) requires the Waste Hierarchy to be applied in a priority order in waste management legislation and policy. The Waste Hierarchy is the cornerstone of EU waste policy and legislation. The primary purpose of the

<sup>18</sup> This is the percentage of total suspended solids treated in waste water treatment plants which was discharged using an FWD.

hierarchy is to minimise adverse environmental effects from waste and to increase resource efficiency in waste management and policy.

The Waste Hierarchy was introduced into NI legislation through the Waste Regulations (NI) 2011 and the Department produced guidance<sup>19</sup> on its application under regulation 17(5). The guidance describes what it means in practice for a number of common materials and products and includes an example of food waste for which current research shows that anaerobic digestion provides greater environmental benefits than composting and other recovery options.

The Waste Hierarchy is described visually in Figure 4 below and illustrates the priority order for waste management to be applied.

*Figure 4: Waste Hierarchy*




As shown in Figure 4, 'Disposal' is the least desirable option in the management of waste. Maintaining the status quo with the continued disposal of food waste into the public sewer network is not managing food waste in line with the Waste Hierarchy.

The polluter pays principle is a guiding principle at EU level. The principle holds that the waste producer and the waste holder should manage the waste in a way that guarantees a high level of protection to the environment and human health. Therefore the costs of waste

<sup>19</sup> [http://www.doeni.gov.uk/guidance\\_on\\_applying\\_the\\_waste\\_hierarchy.pdf](http://www.doeni.gov.uk/guidance_on_applying_the_waste_hierarchy.pdf)

management should be borne by the original waste producer, or by the current or previous waste holders.

There is concern that the continued disposal of food waste into the public sewer network is inconsistent with this principle . The cost of waste treatment is effectively borne by the water management companies and not by the waste generator and therefore there is no incentive for the polluter to reduce the amount of waste being produced.

## Option 2 – Introduce Food Waste Regulations

This would entail councils providing households with the means to recycle food waste by 1 April 2016; how this is provided will be at the discretion of individual councils. Non-domestic food waste producers that produce more than 5kg of food waste per week will be required to separate this for collection from 1 April 2016. In addition, there will be a ban on the non-domestic discharge of food waste into the public sewer network from 1 April 2017.

### Household Food Waste – Costs

This option requires councils to provide households with the means to recycle food waste by 1 April 2016; how this is provided will be at the discretion of individual councils. It is difficult to predict how each council will implement the regulations with regard to operational delivery. The cost of the chosen scheme will vary for each council depending on the services already in place and the food waste collection method chosen. It is not possible for this regulatory impact assessment to provide an accurate analysis of costs for each individual council.

Constraints faced by councils include the financial cost, locally available waste treatment facilities and the practicability of providing a food waste collection service for households. For example, it may not be possible to collect commingled food and garden waste using wheeled bins in built-up urban areas. In addition, rurality could mean separate food waste collections for some households are unaffordable. This will need to be looked at on a case by case basis as many separate food collections do operate cost-effectively in rural areas. Often the use of a split compartment vehicle to collect food waste alongside other waste streams, such as dry recyclables, is a viable option to minimise costs.

It is therefore essential that councils assess their own collection services, and the availability of waste treatment, to decide the best option for adhering to the regulations.

The main costs to be considered by councils include:



- bins, kitchen caddies and liners;
- additional lorries (if required);
- collection (operational) costs including staff costs, fuel, insurance and vehicle maintenance;
- storage and transfer; and
- disposal/treatment costs, including gate fees; and
- communications.

The capital costs for purchasing vehicles and receptacles will not be dependent on the level of food waste collected, given that these will need to be purchased up-front (particularly the receptacles). Furthermore, a portion of the collection costs would be considered fixed costs as vehicles will be required to follow a set route, regardless of the participation or set-out rates. With regard to receptacles, it is estimated that approximately 60% of households in NI already have a brown bin for garden waste or comingled food and garden waste, whereas only 2% have a separate food waste bin

However, a number of the costs will be proportional to the amount of waste collected; most notably the treatment, storage and transfer costs. Councils may also choose to provide households with free liners for caddies (which studies show increase participation rates<sup>20</sup>); nevertheless, replacement liners need only be given to participating households.

The regulations could have an indirect impact on ratepayers given that rates could change to reflect increased collection costs or a decrease in disposal/treatment costs. Nevertheless, the Department currently provides councils with funding to assist with costs associated with waste through the Rethink Waste Capital and Revenue Funds. The Fund is administered by WRAP and provides funding to initiatives which boost waste prevention and recycling in order to achieve EU targets. Food waste has been identified as a priority waste stream and funding has been provided to district councils to roll-out household food waste recycling in a number of areas.

As stated earlier, each council will experience different costs depending on the services already in place and the food waste collection methods chosen, Table 5 illustrates the results of a cost benefit exercise carried out by WRAP for one of the councils in NI. This represents broad indicative capital and operational costs of providing a food waste collection service. Note this may not be representative of all councils.

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<sup>20</sup> Eunomia, Kitchen Waste Collections: Optimising Container Selection, 2006.

Table 5: Cost of Food Waste Collections

	<b>Business as Usual (BAU)</b>	<b>BAU + LFT</b>	<b>Separate Food Collection</b>	<b>Comingled Food and Garden</b>
<b>Cost per HH</b>	£99	£118	£108	£112

Various assumptions have been made (see appendix 1b) and it should be noted that this particular council was not collecting food waste when the analysis was completed (although some garden waste was being collected).

The report was completed in 2009 and the BAU option was estimated using the 2010/11 level of landfill tax (£48/t). The 'BAU + LFT' option in Table 5 was estimated by the Department to show the cost of the business as usual, accounting for the 2014/15 landfill tax of £80/t. However, it is important to recognise that this calculation was completed using the key assumption of ceteris paribus i.e. all other things remaining equal. Therefore, the results are merely indicative to illustrate the impact that the increase in landfill tax could have on waste management costs.

Table 5 shows that whilst the business as usual was estimated to cost less than the other options when the report was completed, it is likely that the landfill tax escalator will mean that the cost of providing a separate food waste collection for this council will be less than the cost of landfilling the waste. Furthermore, the case for separate weekly collection gets stronger each year, given the large capture differentials benefitted with food treatment costs becoming cheaper on average and the gap widening to increasing refuse disposal costs.

#### Household Food Waste – Benefits

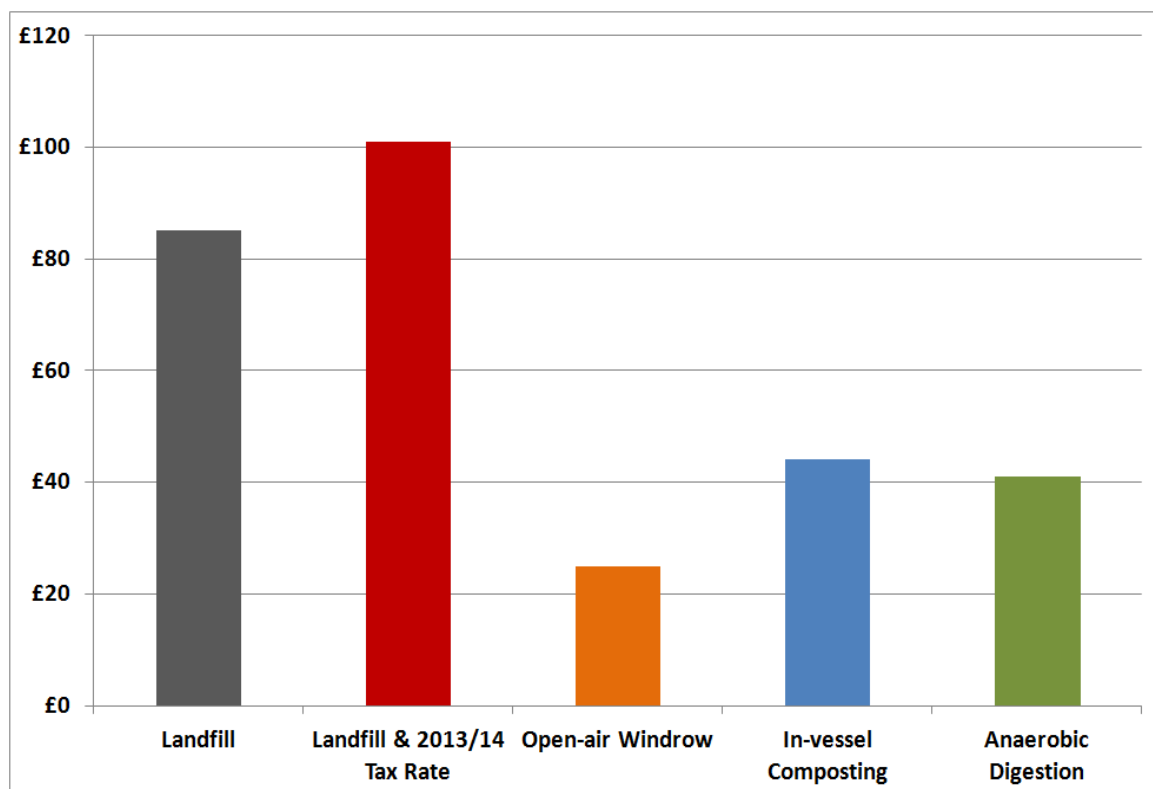
Diverting food waste from landfill could have both environmental and financial benefits. When wasted food is thrown away and breaks down in landfill, together with other organic materials, it becomes the main contributor to the generation of methane – a gas 25 times stronger than carbon dioxide at trapping heat in the atmosphere. Furthermore, food waste can produce a liquid called leachate which can contaminate water supplies. Diverting food

waste from landfill to AD is estimated to save 523kg CO<sub>2</sub>e per tonne, whereas composting rather than landfilling saves 426kg CO<sub>2</sub>e per tonne<sup>21</sup>.

It should be noted that the environmental benefits depend on the chosen method of collection. High frequency collections divert significantly more yields (3-5 times on average) than the fortnightly collection scheme. Vehicle emissions from additional vehicles, required for weekly collections, account for very small additional impacts, which are negated by the diversion savings from recycling.

In terms of the financial benefits, landfilling can be the most expensive method of disposal given the level of landfill tax, which is due to increase to £80/t from 2014. Figure 5 illustrates a comparison of indicative gate fees in 2012.

Figure 5: UK Median Waste Treatment Gate Fees 2012<sup>22</sup> (£ per tonne)



As shown in Figure 5, the gate fee for landfilling is the most expensive method of treatment (£85/t). Note that this includes landfill tax of £56/t, which was the level when the survey was

<sup>21</sup> Equivalent CO<sub>2</sub> (CO<sub>2</sub>e) is the concentration of CO<sub>2</sub> that would cause the same level of radiative forcing as a given type and concentration of greenhouse gas – in this case, methane from food waste.

<sup>22</sup> Source: WRAP Gate Fees Report 2012

undertaken; it has since been increased to £72/t which can also be seen in Figure 5 for comparative purposes. Open-air windrow was the least expensive (£25/t), whereas in-vessel composting and anaerobic digestion had similar gate fees, £44/t and £41/t respectively. It is likely that in future the cost of anaerobic digestion will continue to fall given a reduction in the cost of the technology.

Figure 5 indicates that removing as much food waste as possible from the amount of BMW landfilled should result in a financial benefit for councils in relation to gate fees. Naturally the scale of overall financial benefit is dependent on the level of other costs associated with treating and disposing of the food (and garden) waste.

Indicative modelling has been completed to provide an estimate of the amount of food waste that could be diverted from landfill if councils were to offer a separate food waste or comingled collection service. The results of this are shown in Table 6 below.

*Table 6: NI Indicative Food Waste Collection Yields*

<b>Collection</b>	<b>Ave Yield (t)</b>	<b>Increase on Baseline</b>
Baseline	12,821	0%
Comingled	21,119	65%
Separate	58,841	359%

The assumptions and explanation of the figures have been included in Appendix 1b. It should be noted that these are indicative figures as it is not possible to provide robust estimates given the uncertainties involved, particularly with regard to the baseline and comingled collections as the level of food waste cannot accurately be calculated for the councils; therefore, a number of assumptions have been made.

It is acknowledged that in some circumstances, where it can be demonstrated to deliver equivalent or better environmental outcomes, councils may provide a co-mingled biowaste collection rather than a separate food waste collection. Key to achieving an equivalent outcome is achieving similar yields for food waste.

The figures illustrate an estimate based on 2011/12 waste data, showing what could have been possible had separate food collections been in place. In addition, the figures show the possible yield for all households receiving comingled collections based on the level of mixed

food and garden waste collected in 2011/12. Naturally, the roll-out of providing either a mixed or separate food collection will be done gradually, with all households given the option to recycle by April 2016.

Modelling future streams would also have to account for a change in waste arisings as a result of a change in population and number of households.

Nevertheless, to provide an indication of possible financial benefits in relation to waste management and CO<sub>2</sub> savings, a non-traded value<sup>23</sup> for carbon of £56/t has been used along with the gate fees outlined in Figure 5 above. See Tables 7 and 8 below for the estimated financial benefits.

*Table 7: CO<sub>2</sub> Financial Benefits<sup>24</sup>*

<b>Collection</b>	<b>Yield (t)</b>	<b>CO<sub>2</sub> Reduction (AD)</b>	<b>CO<sub>2</sub> Reduction (IVC)</b>	<b>Saving AD (£)</b>	<b>Saving IVC (£)</b>
Baseline	12,821	6,705	5,462	375,501	305,858
Comingled	21,119	11,045	8,997	618,533	503,815
Separate	58,841	30,774	25,066	1,723,335	1,403,711

Table 7 shows the monetised carbon savings compared to landfilling. As can be seen, providing a separate food collection service and treating the waste via AD could save over £1.7m per annum based on the 2011/12 figures, whereas composting could save £1.4m. Note this does not account for an increase in future waste arisings or a future increase in the price of carbon; therefore, it is likely that this benefit would increase in the future.

<sup>23</sup> [https://www.gov.uk/government/uploads/system/uploads/attachment\\_data/file/41793/3136-guide-carbon-valuation-methodology.pdf](https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/41793/3136-guide-carbon-valuation-methodology.pdf)

<sup>24</sup> Diverting food waste from landfill to AD is estimated to save 523kgCO<sub>2</sub>e per tonne, whereas composting rather than landfilling saves 426kgCO<sub>2</sub>e per tonne

Table 8: Costs & Benefits of Disposal/Treatment

Collection	Ave Yield	Benefit	Costs		
		Landfill Saving	Open-air Windrow	In-vessel Composting	Anaerobic Digestion
Baseline	12,821	£1,089,785	£320,525	£564,124	£525,661
Comingled	21,119	£1,795,115	£527,975	£929,236	£865,879 <sup>25</sup>
Separate	58,841	£5,001,485	£1,471,025	£2,589,004	£2,412,481

Table 8 illustrates alternative costs and benefits in their simplest form i.e. purely based on gate fees in 2011/12. It does not account for any other costs such as haulage and storage costs; not least because each council would have different costs in relation to these.

Based on gate fees alone, table 8 illustrates that for all types of collection, regardless of the yield, the greatest benefits can be achieved by diverting food waste from landfill and sending it to AD.

For the business as usual option (maintaining the same collection yield) an annual saving of £526k can be achieved by diverting food waste from landfill to AD. In providing a separate collection service, increasing the food waste yield, the potential annual savings in switching to AD are estimated to be £2.6million (a landfill saving of £5m with a cost for AD of £2.4m).

#### **Non-domestic Food Waste – Costs**


This option requires non-domestic food waste producers that produce more than 5kg of food waste per week to separate this for collection from 1 April 2017.


Currently, it is assumed that non-domestic producers of food waste are required to pay for their waste to be collected. This may entail all of the waste being sent to landfill or being separated and recycled where possible. There is limited data available with regard to the levels of non-domestic food waste landfilled or diverted from landfill in NI. Therefore it has not been possible to robustly model the impact of the regulations to quantify the costs and benefits.

The onus will be on producers to separate food waste for collection. Naturally the collection of food waste will have a cost which producers will be required to pay. However, after

<sup>25</sup> Co-mingled is unlikely to go to AD as it is not usually suited to wet AD systems.



discussions with WRAP and private waste management companies, **the Department concludes that the regulations could be at least cost neutral to non-domestic food waste producers depending on the amount of food waste produced; indeed there is a chance that some producers could benefit financially given the increasing level of landfill tax.** 

However, this relies on effective waste management by the producer, ensuring to minimise the amount of waste going to landfill. In addition, this also requires private waste management companies or councils to optimise their service delivery to minimise costs; **thus avoiding passing increased costs on to customers/producers.** 

WRAP have undertaken research and published a report<sup>26</sup> on providing food waste collections to SMEs; this appraises options and outlines the viability of food waste collections using different methods of collection. **The report concludes that weekly collections may not be cost-effective for SMEs** producing less than 40kg of food waste per week. This is **because the costs of collection couldn't be covered in an attractive charge,** and the business itself wouldn't be able to make savings from the refuse to help subsidise the new service.

However, the report suggests that smaller businesses could become part of a bigger collection scheme coordinated by Business Improvement Districts<sup>27</sup> or shopping centres. Councils could also consider providing commercial food collection services for SMEs as part of their household food collection service (cost permitting).

The Department would encourage non-domestic waste producers and waste management companies to read WRAP's report and consider its conclusions. Furthermore, WRAP is currently working on a range of support tools and guidance aimed at SMEs and Hospitality businesses. It is intended that these tools would be modified for use in NI to help businesses implement affordable food collections.

**The Department recognises that the regulations could involve increased costs for those SMEs that cannot find a cost-effective solution to the collection of food waste.** However, it is important that producers take responsibility for their own food waste under the polluter pays principle, which is a key element of the Waste Framework Directive. The polluter pays principle suggests that those who pollute should bear the cost of polluting – this extends to food waste produced.

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<sup>26</sup> [http://www.wrap.org.uk/sites/files/wrap/Food%20Waste%20Collections%20to%20SMEs%20-%20Developing%20the%20Business%20Case%20-%20Final\\_0.pdf](http://www.wrap.org.uk/sites/files/wrap/Food%20Waste%20Collections%20to%20SMEs%20-%20Developing%20the%20Business%20Case%20-%20Final_0.pdf)

<sup>27</sup> <http://www.northernireland.gov.uk/index/media-centre/news-departments/news-dsd/news-releases-dsd-june-2012/news-dsd-250612-business-improvement-districts.htm>

## Non-domestic Food Waste – Benefits


The main benefit of diverting non-household food waste from landfill is the positive impact this will have on the environment. As illustrated in Figure 3, there was approximately 36,433t of non-domestic food waste sent to landfill in 2009. Although this is an estimate with a large number of uncertainties, it provides a useful indicative baseline.

Table 9 shows the CO<sub>2</sub> benefits if it is assumed that no non-domestic food waste is sent to landfill; although it should be noted that this may not be completely achievable, particularly as those producing less than 5kg of food waste per week are not included in the regulations.

*Table 9: Non-domestic Food Waste CO<sub>2</sub> Benefit*

Yield	CO <sub>2</sub> Reduction (AD)	CO <sub>2</sub> Reduction (IVC)	AD £	IVC £
36,443t	19,060t	15,525t	£1,067,343	£869,384

As shown in Table 9, diverting 36,443t of food waste from landfill should result in a reduction of 19,060tCO<sub>2</sub>e or 15,525tCO<sub>2</sub>e utilising AD and IVC respectively. In monetary terms this provides a range of between £869,384 and £1,067,343. Again, it is important to note the limitations of this estimate as it does not account for the change in future waste arisings and is reliant on a baseline which has a number of uncertainties.

Whilst Table 9 does not account for a change in future waste arisings, it is likely that the regulations will help to ensure that non-domestic producers manage their waste efficiently, and perhaps encourage producers to reduce or re-use waste where possible. Reducing food waste in particular is an aim which the Department would support, as it would remove as much food waste as possible from the waste streams. **Naturally, reducing food waste has the potential to reduce more CO<sub>2</sub> than any of the waste treatment options.** 

There is also the potential for businesses to accrue financial benefits as a result of diverting waste from landfill. As outlined in the costs above, the escalating cost of landfilling waste means that a number of businesses could save money by introducing a separate food waste collection. Furthermore, the regulations could result in increased revenue for companies and councils who provide the collection service.

In terms of providing an indication of possible savings for businesses, the Department sought information from private waste management companies. Table 10 illustrates the



possible collection costs for a range of businesses as supplied by private operators. This information is taken from actual waste audits as completed by the companies.

*Table 10: Possible Weekly Collection Costs for a Range of Businesses*

Type of Business	Current Waste to Landfill	Current Approximate Cost for Waste Management	Ideal Waste to Recycle	Waste to Landfill	Proposed Cost for Waste /Management
Takeaway	200kg	£30	150kg	50kg	£20
Takeaway	100kg	£15	75kg	25kg	£11.50
Takeaway	225kg	£46	175kg	50kg	£22.50
Hotel	800kg	£120	700kg	100kg	£68
Hotel	700kg	£105	550kg	150kg	£59
School	400kg	£60	350kg	50kg	£36
Bar	700kg	£105	600kg	100kg	£72
Bar	150kg	£21	100kg	50kg	£12
Café	400kg	£60	300kg	100kg	£48
Café	100kg	£20	78kg	23kg	£12.50



As can be seen in Table 10, these particular waste audits indicate that there is a possibility that businesses can reduce costs through efficient waste management, ensuring to recycle as much waste as possible including food waste and dry recyclables. In one instance this saving could be as much as 51%. Note these are indicative costs and each business will face their own costs.

In addition to the business opportunities associated with the collection of food waste, an increase in the amount of food waste collected will mean the demand for treatment facilities should increase. There is scope for the further development of alternative technologies including anaerobic digestion (AD) and in-vessel composting (IVC) to complement the potential increase in demand. Commercial food waste is typically sent to AD plants for treatment, this is partly due to the de-packaging requirements and availability of equipment at AD plants to facilitate this demand. The Department can confirm that there has been a sharp increase in the number of planning applications for AD facilities in the past 3 years

It is envisaged that the introduction of a landfill restriction on separately collected food waste will create confidence within the industry and indeed the lending sector. Together with the provision of Quality Protocols and a risk based approach to regulation, this should enable the market to expand to meet the processing requirements. **Therefore, there could be a financial benefit for those who operate waste facilities other than landfill sites.**


It is acknowledged diverting waste from landfill will result in less revenue for landfill site operators; however, the Department views this as an unsustainable practice as outlined in the Waste Framework Directive.

#### **Non-domestic Disposal of Food Waste into the Public Sewer Network**

Under this option, there will be a ban on the non-domestic discharge of food waste into the public sewer network from 1 April 2017. If this element of the regulations was not included there is a chance that waste producers would simply switch to using macerators as a means of waste disposal and hence there would be an increase in the amount of food waste discharged into the public sewer network. It is worth noting that disposing of food waste into the public sewer network is simply passing the costs of waste management to the wastewater system (the management and maintenance cost of which is borne by Government).

**Given the lack of data on the number of macerators that discharge food waste into the public sewer network in NI, it has not been possible to provide a robust quantitative analysis on the impact this proposed ban will have.** However, the type of costs and benefits will be similar to those outlined above for non-domestic producers of food waste, given that non-domestic food waste is also being addressed by this element of the regulations.

**There will be a cost for collection and management of the food waste that currently is discharged into the public sewer network.** As with general non-domestic food waste, it is the responsibility of producers and collectors to manage waste efficiently to minimise costs.

With regard to benefits, banning the waste being discharged into the public sewer network should result in environmental benefits as it will help lower the risk of flooding, blockages, environmental pollution, odours and rodent infestations. Furthermore, there could be a financial benefit for NI Water, who are responsible for maintaining the public sewer network throughout NI. 

Article 4 of the revised Waste framework Directive (WFD) requires the waste hierarchy to be applied as a priority order in waste prevention and management legislation and policy. Food waste is a valuable resource and a ban on the disposal of food waste into the public sewer

network will ensure that food waste is managed in compliance with the WFD, and its full resource value can be realised through in-vessel composting, anaerobic digestion or other means of recycling.

While it is accepted that 'Prevention', although included in the waste hierarchy, is not technically a waste management measure, as it occurs before a material or object becomes waste. The reduction of waste per capita, through re-use or other policy initiatives is key to achieving the Resource Efficiency Roadmap milestone of turning potential waste into a resource. The proposed requirement to present waste separately for collection aims to encourage businesses to reduce the amount of food waste they produce and manage their waste efficiently in line with the waste hierarchy. There is the potential risk that the proposed duty on businesses to present food waste separately for collection and a restriction on the landfilling of food waste, may lead to an increase in the amount of food waste being disposed of using FWDs, with businesses seeking to avoid any costs associated with a separate collection. Restricting this method of disposal could lead to an overall reduction in food waste arisings as it should encourage producers to reduce the amount of food waste produced where possible. It is important to note that businesses can continue to use FWDs so long as the macerated outputs are not discharged into the public sewer network. Macerated outputs can be discharged into a holding tank for subsequent separate collection and treatment. Anecdotal evidence suggests there may be opportunities for the development of a market for such holding tanks, to be sold alongside or to accommodate existing macerators.

Diverting waste from landfill will reduce the amount of landfill tax collected by HMRC. For instance, assuming a reduction of food waste landfilled of 50,000t would reduce the amount of tax paid by £3.6m. However, diverting more waste from landfill will also help to mitigate the risk of EU infraction proceedings, which could lead to fines if the UK fails to adhere to the Waste Framework Directive or meet Landfill Directive targets.

### **Option 3 – Phased Introduction of Food Waste Regulations**

This option is similar to Option 2 except that there will be a phased introduction of the regulations for non-domestic food waste producers based on the amount of food waste produced. Namely, those that produce more than 50kg of food waste per week will be required to separate this for collection from 1 April 2016. Subsequently, those that produce more than 5kg of food waste will be required to separate this for collection from 1 April 2017.

The costs and benefits of this option are generally the same as option 2; the key difference is that phasing the non-domestic element would give those producing less than 50kg of waste per week more time to amend their waste management practices and arrange for their food waste to be separately collected. This should allow enough lead-in time for smaller food waste producers to prepare for the impact of the regulations.



However, it also means that the full benefits of introducing the regulations would not be immediately realised. Nevertheless, the Department appreciates the financial constraints being faced by businesses in the current economic climate and does not want the regulations to disproportionately impact upon those who produce relatively less food waste. Additionally, it is assumed that those producing large amounts of food waste are likely to be already actively seeking to manage this, and should therefore be better placed to address the implications of the regulations sooner.

The proposed phased introduction of the regulations also aims to ensure that the waste industry is given time to respond to the increasing levels of food waste available for collection. This will allow the industry to plan for and build the appropriate level of infrastructure, to collect and subsequently process the food waste diverted from landfill in a sustainable manner. This approach will also allow time for government to further consider appropriate enforcement resource requirements and costs.

### Summary of Costs and Benefits

Although, due to a number of uncertainties, many of the costs and benefits could not be quantified, Table 11 below provides a summary of the costs and benefits identified.

Table 11: Costs and benefits for Options 2 and 3

	Costs	Benefits
	Increased separation and collection costs for a number of non-domestic food waste producers	A number of non-domestic producers will experience neutral or reduced collection costs 
		Increased collection revenue for waste management companies and councils 

<i>Private sector</i>		Increased food waste diverted from landfill resulting in reduced waste disposal costs
	Loss of revenue for landfill operators	Increased certainty re food waste streams and increased demand for waste treatment facilities
<i>Public Sector</i>	Increased collection and operational costs for domestic food waste collections by councils	Ensuring operational efficiencies could result in net savings for councils, given increasing cost of landfilling and decreasing cost of AD
		Councils could increase revenue from non-domestic food waste collection
		Possibility councils could open and operate waste treatment facilities, given more certainty in the in regards to food waste stream.
	Reduction in the amount of landfill tax collected	Reducing expenditure for NI Water re blocked and damaged sewers
Increased regulatory and enforcement costs		
<i>General</i>		Environmental benefits – including reduction in emissions and mitigating risk of flooding, blockages, environmental pollution, odours and rodent infestations
		Managing waste in compliance with EU policy and legislation

As shown in Table 11, the regulations will have an impact on both the public and private sectors. Although most of the costs and benefits cannot be quantified or monetised, it is clear that whilst there are likely to be costs associated with the regulations, they could also potentially result in a number of benefits to both sectors. This includes a number of environmental benefits, for example a reduction in CO<sub>2</sub> emissions.

## **Monitoring and Review**

A review will be undertaken two years after the implementation of the policy. The review should examine the extent to which the implemented regulations have achieved their objectives, assesses their costs and benefits and identify whether they are having any unintended consequences.

### Review objective

The review is intended to assess the effectiveness of the policy in achieving its objectives of preventing food waste going to landfill and diverting it to more environmentally friendly treatment facilities to ensure the maximum value of this resource is realised.

### Review Approach and Rationale

The review will monitor both the level of food waste separately collected and the chosen method of treatment. Waste dataflow supplemented by appropriate studies will be used to monitor the quantity of food waste collected by councils, both separately and co-mingled. The Department are also working to achieve a better reporting mechanism for C&I data, which may be used to measure the level of non-domestic food waste separately collected.

The review will also monitor the level of non-compliance and/or enforcement action taken for breach of the regulations.

### Success Criteria

An increase in the yield of food waste being separately collected and diverted to environmentally friendly treatment facilities.

## **Enforcement and Sanctions**

The Department are currently considering options for enforcement and will have discussions with NIEA and District Councils in the coming months to identify an appropriate enforcement

model. The Department is exploring with Councils through the Chief Environmental Health Officers Group, the feasibility, or otherwise, of Environmental Health Officers (EHOs) playing a part in the enforcement of a number of the policy proposals.

The Department will identify enforcement costs, if any, for inclusion in the final regulatory impact assessment.

## **Consultation**

The following Departments, agencies and organisations were consulted during the preparation of this partial RIA:

- Northern Ireland Environment Agency (NIEA)
- WRAP
- Waste Management Companies
- Northern Ireland Water
- The Planning Service (DOE)
- Department of Enterprise Trade and Investment (DETI)
- The Scottish Government
- Environmental Protection Agency (Ireland)
- Chief Environment Health Officers' Group

In addition to those listed above this partial regulatory impact assessment forms part of the formal public consultation. Any additional evidence presented as part of the consultation will be taken into consideration for the final regulatory impact assessment.

## **Summary and Recommendation**

This regulatory impact assessment compares the potential effectiveness of the three options identified in meeting the objective to prevent food waste going to landfill and ensuring the maximum value of this resource is realised. The analysis indicates that the objective is more likely to be realised with the adoption of regulatory measures as outlined in options 2 and 3, than under option 1 - Maintain the Status Quo, where the market is left to respond based primarily on individual local authority and business initiatives and higher gate fees at landfill sites in comparison to IVC and AD plants.

A regulatory approach will also provide greater certainty to the waste sector and their potential financial backers, that there is a viable market prospect and a surety of feedstock, to plan and implement the required infrastructure, creating new opportunities for economic growth and jobs in the organics market

Whilst both options 2 and 3 have the potential to meet the objective, rolling the regulations out in a phased basis, as suggested in option 3, will give sufficient lead-in time to facilitate the investment in infrastructure that is required, and give smaller producers of food waste a greater lead-in time, to make alternative arrangements, in preparation of the proposed regulations coming into effect.

The proposed ban on the discharge of food waste into the public sewer network will ensure that this valuable resource is managed in compliance with the WFD, and its full resource value can be realised through in-vessel composting, anaerobic digesting or other means of recycling.



**Declaration**

**“I have read the Regulatory Impact Assessment and I am satisfied the benefits justify the costs”**

**Signed** .....

**Date** .....

**Minister for the Department of the Environment**

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## Appendix 1b: Assumptions and Limitations

This appendix provides an explanation of the information provided in the Food Waste Regulations regulatory impact assessment and the assumptions made to provide this information.

Note that the table numbers mirror those in the impact assessment for ease of reference.

### Waste Figures for Local Councils

Table 1: 2011/12 Waste Figures for NI Local Authorities (all figures in tonnes)

<b>Council</b>	<b>Collected household waste for disposal</b>	<b>Compostable materials collected</b>	<b>Household Food waste in residual</b>
Antrim	9760	4055	2440
Ards	14058	6099	3915
Armagh	11536	3639	3368
Ballymena	13076	4554	3269
Ballymoney	6922	1252	2769
Banbridge	8109	6066	2027
Belfast	65106	11945	20085
Carrickfergus	7307	3570	1827
Castlereagh	12278	5776	3309
Coleraine	13833	0	5533
Cookstown	7764	1430	2558
Craigavon	20321	4572	5842
Derry	24474	0	9790
Down	15820	2887	6328
Dungannon & South Tyrone	11914	3285	3675
Fermanagh	13448	0	5379
Larne	6325	2801	1581
Limavady	7613	930	3045
Lisburn	22614	10113	5654
Magherafelt	8329	3771	2082
Moyle	3928	524	1571
Newry & Mourne	19057	3241	6451
Newtownabbey	16326	7362	4155
North Down	15908	6555	4693
Omagh	10028	2138	3244

Strabane	9555	0	3822
<b>TOTAL</b>	<b>375409</b>	<b>96563</b>	<b>118414</b>

- a) Collected household waste for disposal figures taken from municipal waste data report 2011/12.
- b) Compostable materials collected figures taken from municipal waste data report 2011/12.
- c) Food waste in residual – this is assumed to be 25% for those households who receive a food waste collection of any kind, and 40% for those who do not. Based on a number of reports and compositional studies this seemed a fair assumption.

### Food Waste Currently Collected

Table 2: NI Estimated Food Waste Tonnages 2011/12<sup>28</sup>

Comingled Yield	Separate Food Waste	Total Food Waste
12,113	707	12,820

- a) Comingled yield was estimated using an assumption of a food waste yield of 0.55kg/hh/wk for households receiving a comingled collection. This figure is based on discussions with WRAP and their report on mixed collections<sup>29</sup>. The number of households receiving a comingled collection was attained from 2011/12 waste data flow (423,538 households).
- b) Separate food waste yield reported in 2011/12 waste data flow.

### Use of Macerators in NI

This was calculated using the figures taken from the Irish report and using a proxy based on number of households and number of businesses in the accommodation and food services sector<sup>30</sup>. The indicators are shown below. Note that the methodology used for estimating

<sup>28</sup> Councils currently providing separate food waste collections have been accounted for

<sup>29</sup> [http://www.wrap.org.uk/sites/files/wrap/Food\\_Garden\\_Waste\\_Report\\_Final.pdf](http://www.wrap.org.uk/sites/files/wrap/Food_Garden_Waste_Report_Final.pdf)

<sup>30</sup> ROI Data:

<http://www.cso.ie/en/media/csoie/releasespublications/documents/services/2009/businessinireland2009.pdf>

NI Data: VAT and/or PAYE based businesses information from DETI

the number of businesses in ROI and NI is comparable and includes the same type of businesses.

	ROI	NI	Revision Factor
<b>Number of Households</b>	1,478,200	732,800	0.50
<b>Number of businesses in relevant sector</b>	16,460	3,650	0.22

Calculations were made by multiplying domestic information by 0.5 and commercial information by 0.22.

Obviously using this proxy is quite a crude method given there will be other factors which affect the amount of waste produced e.g. the size of the household or business. Nevertheless, these figures are merely indicative and should be treated as such.

#### Household Food Waste – Costs

The key table used in this section is shown below.

*Table 5: Cost of Food Waste Collections*

	Business as Usual (BAU)	BAU + LFT	Separate Food Collection	Comingled Food and Garden
<b>Cost per HH</b>	£99	£118	£108	£112

The basis for this information was a food waste cost benefit exercise completed by WRAP for a council in NI. Various options were appraised but the key indicative options have been shown in the table. The main assumptions for this analysis are described below.

- An annual waste growth rate of 1.5%, reflecting a growth in the number of households and an increase in annual waste arisings per household;
- For organic waste, the gate fees within the contract are £37 per tonne for green waste and £56 per tonne for mixed green and food waste (including £9 per tonne for the provision of biobags). It should be noted that the contract does not specify a gate fee for the separate collection of food waste; therefore, it is assumed that, if collected separately, the food waste would still be delivered to the same facility at a gate fee of £56 per tonne
- All separate food waste collections use a 25 litre kerbside caddy, with a 10 litre caddy for inside the house and a replenished supply of biobags (biodegradable kitchen caddy liners), which have been shown to be essential ingredients in ensuring higher participation rates. Waste collected in a separate double-operative vehicle.

- Free garden waste collection service is expanded to cover all households with food waste collected commingled with the garden waste. 7 litre caddies and biodegradable liners are provided for the householder, with overall collection remaining in a 240 litre wheeled bin. Fortnightly collection.
- BAU + LFT calculated by calculating landfill tax element of costs and updating this using tax of £80/t, then reintroducing new value into calculations.
- The analysis includes all the relevant CAPEX & OPEX apart from communication costs.

### NI Indicative Household Food Waste Collection Yields

The table provided in the IA is shown below.

*Table 6: NI Indicative Food Waste Collection Yields*

<b>Collection</b>	<b>Ave Yield (t)</b>	<b>Increase on Baseline</b>
Baseline	12,821	0%
Comingled	21,119	65%
Separate	58,841	359%

- a) The baseline was taken from the info shown in Table 2.
- b) The comingled figure was estimated using an assumption of 0.55kg/hh/wk. It is assumed that all households who receive a residual collection would receive a comingled collection (estimated to be 738,413 households). However, it should be noted that in reality this may not be possible and the figure could be lower.
- c) The table below illustrates the figures used to estimate separate food collection yields.

Council	Yield/HH/Year	Total HHs	Total Yield	Min Range	Max Range
Antrim	0.09	21000	1788	1782	1795
Ards	0.09	33519	2984	2974	2994
Armagh	0.08	22361	1867	1860	1874
Ballymena	0.09	25000	2197	2189	2204
Ballymoney	0.08	11850	990	986	993
Banbridge	0.09	19000	1700	1695	1706
Belfast	0.06	124900	7923	7885	7960
Carrickfergus	0.09	16167	1449	1444	1453
Castlereagh	0.09	28500	2643	2634	2651
Coleraine	0.09	30000	2589	2580	2598
Cookstown	0.08	13894	1100	1095	1104
Craigavon	0.08	38000	3012	3000	3023
Derry	0.07	38500	2509	2497	2520
Down	0.08	27800	2357	2349	2365
Dungannon & South Tyrone	0.08	21583	1727	1721	1733
Fermanagh	0.08	26792	2181	2173	2189
Larne	0.08	14000	1179	1175	1184
Limavady	0.08	12342	965	962	969
Lisburn	0.09	44893	3844	3830	3857
Magherafelt	0.09	15700	1368	1363	1373
Moyle	0.08	7750	585	583	587
Newry & Mourne	0.07	37832	2818	2806	2829
Newtownabbey	0.09	34500	3022	3011	3032
North Down	0.09	37000	3503	3492	3514
Omagh	0.08	20086	1582	1576	1588
Strabane	0.06	15444	961	956	965
<b>TOTAL</b>		<b>738413</b>	<b>58841</b>	<b>58619</b>	<b>59062</b>

- The yield per household per year is calculated using an equation given in WRAP's report<sup>31</sup> on 'Evaluation of the WRAP Separate Food Waste Collection Trials'. The equation uses indices of multiple deprivation (IMD). However, this formula has been developed using 'average scores' for English local authorities from the Indices of Deprivation 2007. This is not directly transferrable to NI given slightly different factors are assessed to derive the

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[http://www.wrap.org.uk/sites/files/wrap/Evaluation\\_of\\_the\\_WRAP\\_FW\\_Collection\\_Trials\\_Update\\_June\\_2009.pdf](http://www.wrap.org.uk/sites/files/wrap/Evaluation_of_the_WRAP_FW_Collection_Trials_Update_June_2009.pdf)

indices. Nevertheless, after consultation with NISRA it was decided that the 2005 NI deprivation average scores were not dissimilar to their comparable English areas. E.g. based on ONS Area Classifications, Belfast is comparable to Middlesbrough, Salford, Sunderland, Newcastle-upon-Tyne and South Tyneside. Comparing the 2007 English 'average score' with the 2005 NI 'average score' gives similar results – Belfast is 34.59 and those other areas are 38.94, 36.51, 31.79 and 31.36 and 31.16. Therefore, it was decided to simply use the NI deprivation scores whilst outlining the limitations of doing so. Therefore, yield rates are merely indicative.

- Total households are the number of households receiving a residual waste collection service and would be receiving separate food waste collections.
- WRAP's equation enabled a max and min range to be found.