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Towards Zero Waste
One Wales: One Planet

Food Manufacture, Service and Retail Sector Plan

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Ministerial Foreword

Towards Zero Waste, the overarching waste strategy document for Wales sets out the Welsh Government's high level policies and targets for the management of waste in Wales. Sector plans are the key delivery documents that identify specific objectives and actions for each sector in order to make the necessary contribution towards the delivery of Towards Zero Waste.

The policies and targets in Towards Zero Waste reflect the importance of the need to change our wasteful ways urgently and to fulfil our commitment to sustainable development and well-being, which is at the heart of everything the Welsh Government does. Our Sustainable Development Scheme, 'One Wales, One Planet' shows clearly that our current levels of consumption are unsustainable. We have an obligation, to ourselves, to our children and to our fellow citizens to ensure that, proportionally, we use the resources of only One Planet - our "fair share". The planet on which we live, including the natural resources and economy that provide us with wealth, all depend on us using resources more wisely, with the added benefit that we will become far more resource efficient in the process. This is an important issue of social justice - both for citizens in Wales and for citizens in the developing and emerging economies of the world.

This sector plan covers food and associated packaging waste produced within the food supply chain and contains a number of objectives and actions about how we manage and treat this waste to achieve more sustainable and affordable outcomes. It focuses on the key role that the food manufacturers, wholesale and retailers and service sector play in reducing these key waste streams both produced from their own premises and generated further along the chain, including the ultimate consumer – the public. Together with Local Authorities these sectors have an extremely influential role in transforming the behaviour of those they serve.

The sectors involved are major players in Wales and this plan acknowledges the contemporary challenges facing businesses of all sizes – both small and large - wherever based in Wales. In this plan we recognise the importance of achieving common goals, and to enable Wales to build towards an inclusive, resilient food economy and maintain a healthy society. We must ensure synergy with other Welsh Government strategies particularly the food strategy, Towards Sustainable Growth – An Action Plan for the Food and Drink Industry 2014 – 2020. To provide a plan that is 'fit for Wales', we are advocating a whole food supply chain approach, where large businesses are supportive and encouraged to collaborate with their suppliers to adapt to changing needs, where small and medium sized enterprises (SMEs) are empowered to innovate and are given the opportunity to do so, and where preventative steps are taken to reduce food waste creation due to inefficiencies in production systems. We need to ensure that we develop our food system to incorporate all aspects of sustainability such as environmental, health and social impacts.

We are continuing our focus on developing a circular economy in Wales, which moves us away from the current linear model where materials are fed in to the economy at the start and discarded at the end. It's about being more resource efficient, producing more value with less material, re-using wherever possible,

developing the best possible recycling services and making the most of unavoidable waste.

I am proud to present the Food Manufacture Service and Retail Sector Plan to the stakeholders within this sector. Collectively, it is you who will contribute to a better, more sustainable economy in Wales, and you who will help Wales play its part in creating a better world; one where we can proudly say that the Food Manufacture, Service and Retail Sector has made its contribution towards the goal of zero waste and 'One Planet' living.

Carl Sargeant AM
Minister for Natural Resources

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1 Setting the Scene

1.1 The role of 'Towards Zero Waste' and the Sector Plan

Towards Zero Waste (TZW), the overarching waste strategy document for Wales is a long term high level strategic framework which describes the social, economic and environmental outcomes that resource efficiency and waste management will achieve and contribute towards a sustainable future. It also details our high level principles, policies and targets.

Sector plans are implementation plans that describe the role of the sector, the Welsh Government and others in delivering the outcomes, targets and policies in TZW.

The sector plans will be web based 'living documents' and there will be linkages between them, where the actions of one sector will affect and/or support those of another.

1.2 Scope of the Sector Plan

This sector plan addresses waste management and resource efficiency in the food and drink and associated packaging supply chain. This includes food and drink manufacturers and processors, wholesalers and retailers and service providers e.g. hospitality. This is to align with key policy objectives in TZW of tackling food and associated packaging waste in the commercial and industrial sector (the biggest contributor towards the ecological footprint of the sector), and addressing resource efficiency through greening supply chains.

The plan will cover directly the following types of waste:

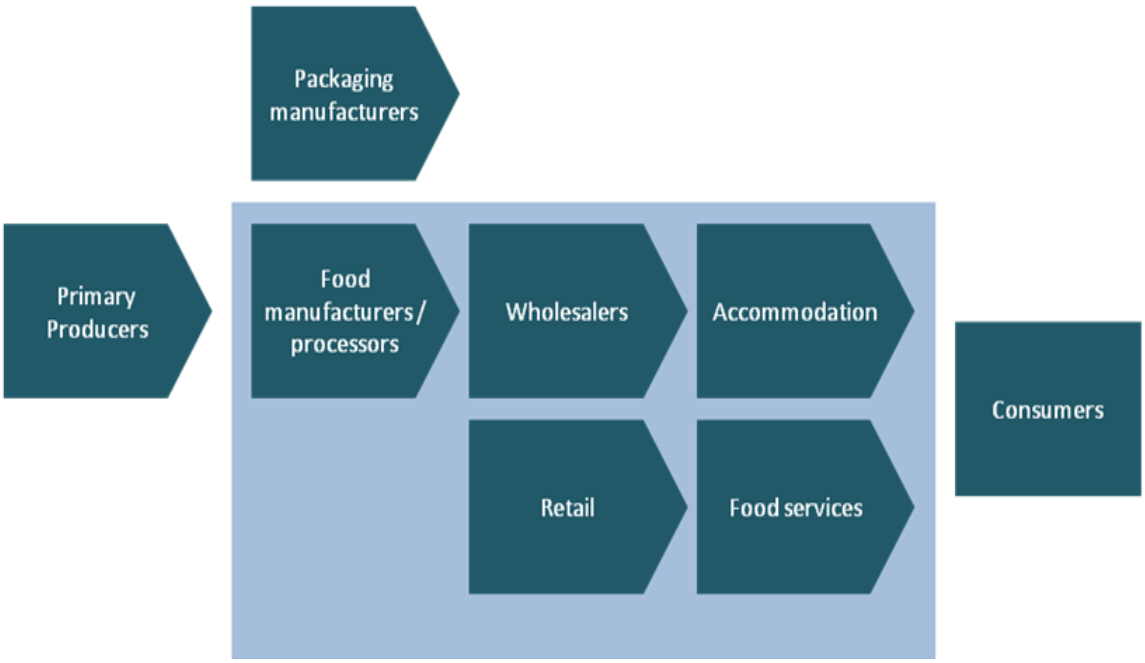
- Waste food packaging in the wholesalers and retailers waste stream.
- Waste food in the wholesalers and retailers waste stream.
- Waste food packaging in the food manufacturers waste stream.
- Waste food in the food manufacturers waste stream.
- Waste food packaging in the service sector waste stream.
- Waste food in the service sector waste stream.

The plan will influence indirectly the following:

- Waste food packaging in the household waste stream.
- Waste food in the household waste stream.
- Waste food packaging in other commercial and industrial waste streams.
- Waste food in other commercial and industrial waste streams.

Figure 1 defines the boundary for this plan. It illustrates the breadth of this sector plan and the stakeholder groups that this plan will target. It also shows the stakeholder groups that fall outside the boundary but will be influenced by the direction of this plan.

Figure 1: Boundaries of this sector plan



1.3 Who the Sector Plan is aimed at

This plan is primarily to guide action by the food and drink manufacturers, wholesale and retail sector and the service sector. It also identifies what the Welsh Government will do, including the delivery bodies that it funds.

It will also be of interest to other businesses, the public sector and householders because it will influence the quantity and type of waste that these parties generate, and its resultant management. It will help local authorities deliver the Municipal Waste prevention and recycling targets set in TZW.

Responsibility for delivery is identified for each sector involved in this plan, with the Welsh Government driving and overseeing its delivery in partnership with the delivery bodies.

1.4 Status of the Plan

The Food Manufacture, Service and Retail Sector Plan provides a record of the objectives, targets and actions for the food manufacturing and processing, wholesale and retailer and service provider sectors in Wales. It forms part of the suite of documents that together comprise the statutory waste management plan for Wales as required by UK and EU legislation. These include TZW, Waste Prevention Programme and the sector plans.

1.5 Key Drivers

The key drivers for the more sustainable management of waste covered in this sector plan include:

- The Welsh Government's goal that sustainable development should drive everything that we do in Wales.
- The imperative to ensure that the more sustainable management of waste helps contribute to the reduction of greenhouse gas emissions globally.
- The Welsh Government's stated goal to achieve One Planet living within the lifetime of a generation.
- The need to become more resource self sufficient, in order to ensure resilience for our economy in terms of the security of supply of affordable material resources.
- The increasing costs of landfill, including the effect of the £8 per tonne per year increase in Landfill Tax (rising from £48 per tonne in 2010/11 to £80 per tonne for 2014/15; and by inflation thereafter.
- The desire of many customers of retailers to help them achieve less impact on the planet.
- The need to meet European Directive targets set for the recycling of waste from households and to reduce the landfilling of biodegradable municipal waste.
- The 2008 Revised EU Waste Framework Directive requirement for action to be focused higher up the waste hierarchy, with far greater attention paid to waste prevention (including reuse), preparing for reuse and recycling.

1.6 Outcomes and Milestones

This section describes the outcomes that we are seeking to achieve in TZW and through the sector plans. Building a sustainable future is fundamental to our approach. This means we will consider the environmental, social and economic implications of our actions. Each is considered in turn below.

Outcomes

A sustainable environment
TZW shows how we will reduce the impact of waste in Wales to within our environmental limits by focussing on reducing the ecological footprint of waste to 'One Planet' levels by 2050. This approach will reduce the impact of climate change from waste activities, achieve sustainable consumption and production, sustain our economy and manage and conserve the planet's resources.

To do this we need to:

- Focus on waste prevention, and more sustainable ways of consuming and producing.

- Focus on very high levels of recycling of the waste that is produced, and make sure that it is the right type of recycling (i.e. closed loop).
- Send food waste to anaerobic digestion plants to generate valuable renewable energy and fertiliser.

A prosperous society
TZW shows how our actions on resource efficiency and waste management will support the development of a prosperous society that:

- Provides more 'green' jobs within the waste and resource management industry across a range of skill levels in Wales and increase the number of high skilled, high value green jobs.
- Is resilient against future competing demands including rising costs and security of supply of global material resources, saving money and maintaining or increasing profit through more efficient resource management.

A fair and just society
The sector plans will implement the targets, actions and policies in TZW in a manner in which citizens can, through actions on waste prevention, reuse and recycling:

- Achieve their full human potential.
- Enrich their communities.
- Contribute towards the wellbeing of Wales.
- Improve their local environment.
- Actively improve the quality of their life.

There will be equality of opportunity for all citizens of Wales to contribute to waste prevention, reuse and recycling irrespective of where they live, their health and ability, mobility or personal circumstances.

Milestones
To implement our outcomes, TZW sets the following two key milestones.

2025 Towards Zero Waste
By 2025, there will be a significant reduction in waste (27%), and we will manage any waste that is produced in a way that makes the most of our valuable resources. This means maximising recycling and minimising the amount of residual waste produced, and achieving as close to zero landfill as possible.

This is an intermediate step on the way to our 2050 target of achieving zero waste and 'living within our environmental limits'[1].
This is needed because reducing the impact of waste in Wales to 'One Planet' levels

1 Environmental Limits – 'Our Vision of a Sustainable Wales is one where Wales: lives within its environmental limits, using only its fair share of the earth's resources so that our ecological footprint is reduced to the global average availability of resources, and we are resilient to the impacts of climate change' (Source: One Wales: One Planet: A new sustainable development scheme for Wales).

will require big changes in the way that products and services are designed, and the actions that consumers and businesses take.

TZW requires:

- **Waste prevention** - Waste arisings need to be reduced by around 1.5 per cent (of the 2007 baseline) each year across all sectors in order to achieve the One Planet goal for 2050. We will move from a product orientated society to a service orientated society where products are leased / rented with repair centres being the norm. Citizens will be empowered to 'buy smarter' and they will take responsibility for the consequences of their purchases, avoid producing waste, and reuse products as far as possible. Reuse of unwanted items will be encouraged. As far as possible, items that are discarded as waste are 'prepared for reuse' and are able to continue to be a resource and reused by others. Retailers will sell products that generate significantly less waste and the lifespan of products will be increased.

- **A strong economy in resource management** - This means that recyclates will be collected and managed with supply to Welsh manufacturing in mind. We will need:

  - High levels of clean recyclates to drive the market - all sectors in Wales will be recycling at least 70 per cent of their waste – this includes businesses, households and the public sector.
  - Waste collection systems will enable high levels of high quality recycling to be achieved, so that the recyclate can feed as far as possible into reprocessing facilities in Wales (retaining the economic value of recyclate within Wales).
  - There will be a focus on serving local recyclate markets that are 'closed loop' recycling systems to achieve the best environmental benefits.
  - Strong markets for recyclates and anaerobic digestion digestate.

- **Residual waste will be minimised -** substantially less residual waste will be produced than at present, and it will be phased out of landfill sites to high efficiency energy from waste plants.

- **Landfill will be eliminated as far as possible -** to reduce Wales' greenhouse gas emissions and make the most of our valuable resources we need to divert waste from landfill, and manage the emissions from existing landfill sites.

- **Legacy wastes will be tackled -** alternative ways of treating these will be found, and efforts will be made to ensure that products are redesigned so that they do not become problematic legacy wastes in the future.

2050 – Achieving zero waste

By 2050, we will have reduced the impact of waste in Wales to within our environmental limits. Residual waste will have been eliminated and any waste that is produced will all be recycled. This means that the ecological footprint of waste in Wales will be at One Planet levels. It will be achieved by continuing and enhancing our current efforts on:

- **Achieving One Planet levels of waste – 'Living within our environmental limits'** - Greater effort will be made to challenge waste at all stages of its production. All products will use as little material as possible, with the majority of it sourced from recyclate, with as few virgin resources used as possible. Resources will be highly valued to a level that none will be wasted.
- **Aiming to phase out residual waste and achieve 'zero waste' through ensuring that all waste is reused or recycled** - Any waste that is produced, will be reused, recycled, composted (for green waste) or anaerobically digested (for food waste). All products and packaging will be designed for disassembly and reuse or recycling, and the collection services and facilities to recycle all of the material will be in place. All recycling operations will be 'closed loop', or employ 'upcycling'. As far as possible, recyclate will be used directly in Welsh manufacturing processes. This means there will be far less need for residual waste treatment facilities such as energy from waste plants with the number and/or capacity required progressively reducing from 2025 to 2050.

1.7 Approach

The approach being followed in this sector plan is to take forward actions in respect of the following elements of the waste hierarchy:

i. **Waste prevention** – to reinforce the important role of businesses in the wholesale and retail sector in association with the food and packaging manufactures and hospitality sector, to reduce waste generated through the supply chain and ultimately put out for collection. This helps to meet environmental outcomes, increasing opportunities for enhancing social wellbeing through waste reuse and reducing the costs of waste collection and management.

ii. **Preparation for Reuse & Recycling** – to ensure that recycling targets can be achieved in a sustainable way by this sector. Included here is the collection of food waste for anaerobic digestion and the use of food waste from the food manufacture sector as animal feed.

iii. **Treatment and disposal** – to ensure that this plan and sectors involved, support the Collection, Infrastructure and Markets Sector Plan with regards to supporting market development for recyclate and digestate and choice of waste management options.

The sector plan outlines the actions that will be developed through further sector engagement to provide clear guidance and support to the sector on their roles and responsibilities required to ensure Towards Zero Waste targets are met.

The actions are structured in accordance with the Waste Hierarchy; however there is also a section of overarching actions which cover more than one element of the Waste Hierarchy.

A Sustainability Appraisal (incorporating a Strategic Environmental Assessment), a Habitats Regulations Assessment and a Health Impact Assessment have been published to accompany this sector plan.

1.8 Links to other sector plans and other Welsh Government Plans

A suite of sector plans have been developed by the Welsh Government to implement TZW. Each of the sector plans is supportive of one another to maximise the opportunity for the common goals of TZW to be met. In addition, as a requirement of the Waste Framework Directive, a Waste Prevention Programme for Wales has been developed.

The **Collections, Infrastructure and Markets (CIM) Sector Plan** was published in July 2012. It outlines our approach to resource management by ensuring that services are set up in Wales to ensure the collection of a high volume of clean, source segregated recyclate that can then be delivered to reprocessors based in Wales as far as possible, and that closed loop end markets are developed for the recyclate (within Wales as far as possible).

The plan aims to ensure, as far as possible, that the economic value of the recyclate is retained within the Welsh economy.

The evidence presented demonstrated that there are still significant amounts of recyclable material (including food waste) being sent to landfill, especially from the household and commercial sectors. There is also some evidence that some materials are accessing end markets that are not the most sustainable option for Wales. The quality of collected recyclate also needs improving.

The plan identifies where improvements in recyclate collection are required and where opportunities to develop infrastructure exist. The plan aims to facilitate developments in infrastructure by demonstrating need for such investments.

This plan will support business in commercial and industrial sectors in ensuring that they have access to collection facilities they require and need to assist their segregation and recycling.

The **Construction and Demolition Sector Plan** addresses waste generated by the Construction and Demolition (C&D) sector. It contains a number of actions to achieve more sustainable and affordable outcomes. It focuses on the key role that the C&D sector plays through working with their clients, customers, suppliers, trades people and the wider communities, to achieve the twin goals of ‘One Planet living’ and zero waste.

Products and materials produced by Industrial and Commercial (I&C) businesses are used by the construction sector and ultimately end up in their waste streams.

The **Municipal Sector Plan** sets the agenda for the management of local authority municipal wastes for the next fifteen years and beyond.

This covers the waste collected specifically by “municipalities”, that is all of the Welsh local authorities. The sector plan does not cover other municipal waste that is not collected by local authorities, and which is collected instead by private or social economy waste management companies.

The plan focuses on actions for:

- Waste prevention, including the role of local authority service provision to influence householder behaviours.
- Preparing for reuse, including opportunities to improve the reuse of bulky wastes.
- Delivering a recyclate collection service focused on quality and not just quantity, with kerbside sort being the preferred best practice option identified.
- Managing collected recyclate, food waste and residual waste in a sustainable way that maximises job creation in Wales and contributes to global and local environmental improvements.

The sector plan is accompanied by the publication of a 'Collections Blueprint' that identifies the most sustainable approach for the collection of recyclate from households – the kerbside sort system.

The products and materials produced by businesses covered by this sector plan, are used by those groups covered in the Municipal sector, for example householders, and ultimately end up in their waste streams.

The **Public Sector Plan** will address how the public sector in Wales will manage resources efficiently, develop sustainable procurement activities and prevent waste production arising from provision of services in relation to health care, education, local government, justice administration and emergency response in Wales. It will set out a challenging action plan which will aid the public sector to provide leadership to all other sectors and become a driver of change.

Products and materials produced by organisations covered by this plan, are used by the public sector and ultimately end up in these waste streams.

The **Industrial and Commercial Sector Plan** is the latest document to be published and focuses specifically on:

- Commercial waste arising from any premises which are used wholly or mainly for trade, business, sport recreation or entertainment (excluding household and industrial);
- Industrial waste arising from any factory and from any premises occupied by an industry (excluding mines and quarries);
- Products (and associated packaging) produced or sold from the industrial and commercial sector that eventually become waste – in accordance with the principle of extended producer responsibility.

The Plan scope covers:

- Waste prevention – including of wastes produced by the sector, and in relation to producer responsibilities in respect of products produced by the sector (with a focus on eco-design);
- Preparation for reuse;
- Source segregation of food waste and diversion of food waste from landfill to anaerobic digestion plants;

- Source segregation and separate collection of key recyclate streams, including paper, card, metal, glass and plastic;
- Eco-design of products and packaging produced and/or sold by the sector in order to increase reuse and recyclability, and increase the recycled content; and
- Sustainable management of residual waste.

The **Agriculture Sector Plan**
In June 2014 the Welsh Government published 'the Agricultural Waste Call For Evidence on agricultural waste. The closing date for the consultation responses is 4 September 2014[2]. The call for evidence sets out the Welsh Governments aims and objectives for the wastes produced and managed by the agriculture sector in Wales.

The **Waste Prevention Programme** is a legal requirement of the 2008 Revised Waste Framework Directive. The Directive requires Member States to set out waste prevention objectives, describe existing prevention measures, and evaluate the usefulness of a range of measures, with the aim of breaking the link between economic growth and the environmental impacts associated with the generation of waste. The Waste Prevention Programme for Wales considers all waste streams, including wastes from householders, private businesses and the public sector, and provides evidence of the economic, financial and social impacts of waste prevention activities. It describes and quantifies actions to be undertaken in the short to medium term, and will provide a roadmap to the longer term aim of One Planet Living by 2050.

Towards Sustainable Growth – An Action Plan for the Food and Drink Industry 2014 – 2020 details the plans to grow the food and drink sector in Wales by 30% by the year 2020. The plan details the need to address waste reduction and management through the following actions:

Action 44 – Develop a Welsh Government proposition on green growth for business which will send a clear message that Wales is the destination for establishing and growing businesses that are environmentally and socially responsible.
Action 46 – Welsh Government to promote Wales as a low carbon food production country through ensuring effective signposting and easy access to environmental service providers that work with businesses to improve resource efficiency and reduce their ecological footprint.
Action 47 – Further develop the sub-sector roadmaps extending to all the sub-sectors to assist food businesses to reduce their ecological footprint.

1.9 Evolution of this Sector Plan

Stakeholders have engaged with the development of this plan including representatives from the Welsh Government (Food Division, Health Department, Tourism and Marketing and Communications), trade associations (British Retail Consortium, Association of Convenience Stores, Food and Drink Federation, Confederation of Paper Industries), representatives from the business community

2 http://wales.gov.uk/consultations/environmentandcountryside/agricultural-waste-call-for-evidence/?lang=en

(Co-Op, Really Welsh Trading Company), business support (WRAP, Ecostudio), regulation (Natural Resources Wales) and other interested parties. Feedback from stakeholders has been fed into the development of this sector plan.

Evidence from the commercial and industrial surveys undertaken for 2012 were used to develop this plan, along with other research undertaken for the Welsh Government. This was brought together with the waste prevention research undertaken for UK Government and devolved administrations[3].

A consultation event was held and, together with the separate written responses obtained, responses from this have assisted in the development of this final plan. Responses to the consultation of the Waste Prevention Programme for Wales have also assisted in the development of this plan.

3 http://randd.defra.gov.uk/Default.aspx?Menu=Menu&Module=More&Location=None&Completed=0&ProjectID=17499

2 Current Situation

2.1 Introduction

This section provides an analysis of the amount of waste produced by the food manufacture, retail and service sectors as part of the industrial and commercial (I&C) sectors, together with how it is managed. It includes an assessment of what will be needed in the future in order to meet the waste management targets set in Towards Zero Waste and the CIM Sector Plan.

This section describes the waste types and quantities produced by the plan sectors, and the management of those wastes. The data is taken from the Survey of Industrial and Commercial Waste generated in Wales 2012[4], commissioned by Natural Resources Wales on behalf of the Welsh Government.

The types of waste produced by businesses were described using Substance Oriented Classification (SOC) codes to allow for comparison across business types. Businesses were grouped into one of 25 sectors based upon EU NACE codes, and into one of 8 size bands determined by number of employees, which have been amalgamated into 4 for ease of reporting in this plan. Sectors covered in this plan are Manufacture of food products, beverages and tobacco products (hereafter referred to as **Food Manufacture**), Wholesale and Retail trade; repair of motor vehicles (referred to as **Wholesale and Retail**, and excluding motor vehicle repair) and Accommodation and Food services activities (referred to as **Service**). Materials included in this plan relate to food and associated packaging i.e. metals, glass, plastic, paper and card and wood.

The waste survey, used to determine data on waste quantities, discriminated between packaging and non-packaging components of different waste types collected for recycling, however did not discriminate the split of packaging and non-packaging components within the mixed residual waste.

In addition, an explanation of how priority wastes have been identified for the Waste Prevention Programme has been included and where appropriate, reference to this programme has been incorporated into this sector plan.

The current situation regarding arisings and management of waste streams and predicted future requirements for prevention, collection and infrastructure is also covered in this section.

To note, the precision levels vary and some differences may not be statistically significant when making comparisons between 2007 and 2012 survey data.

The actions needed to address future needs are provided in Section 3 ‘Actions’.

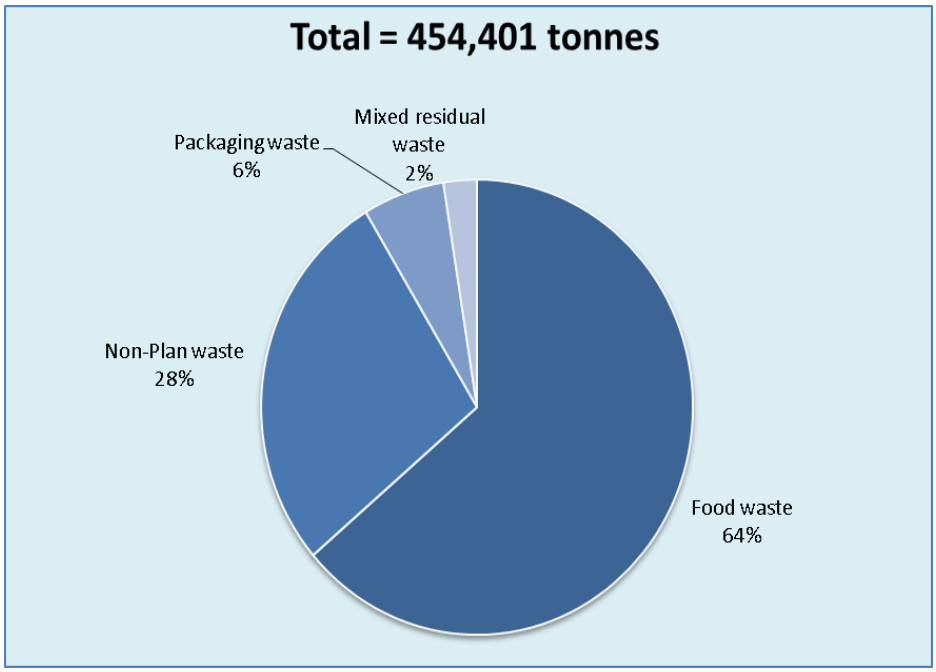
4 Industrial and Commercial Waste Survey, Natural Resources Wales, 2014

2.2 Waste arisings and management by sub-sector.

2.2.1 Total waste arisings from food manufacturing sector

The composition of waste arising from the food manufacturing sector is shown in Figure 2. This plan covers the estimated 328,727 tonnes of food and drink and associated packaging produced by the food manufacturing sector in Wales. This equates to 72% of the waste produced by the sector in 2012.

Figure 2: Composition of waste arising from the food manufacturing sector in Wales in 2012

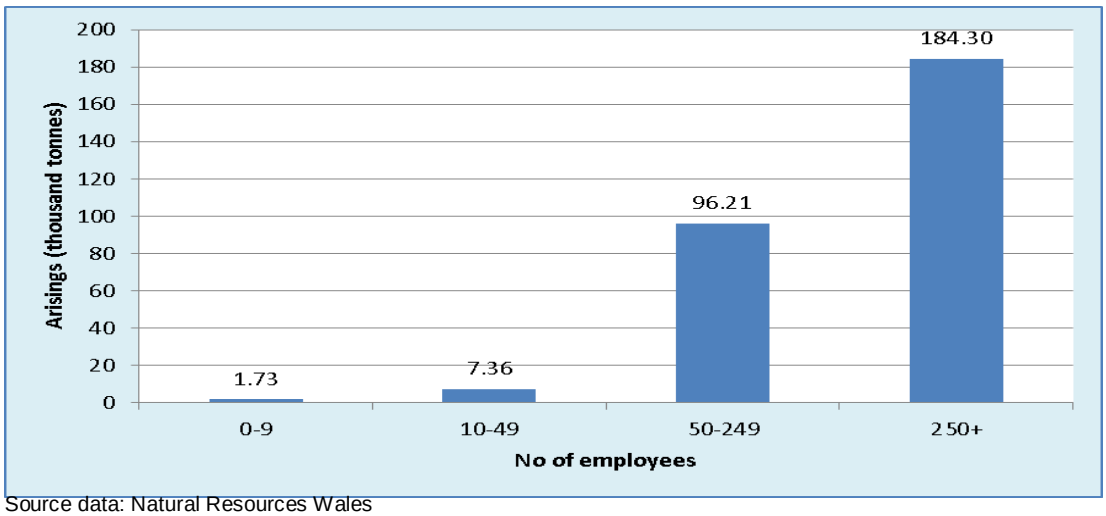


Source data: Natural Resources Wales

2.2.2 Segregated food waste arisings from food manufacturing sector

The food manufacturing sector produced a total of 289,599 tonnes of food waste in 2012. The large food manufacturers with 250+ employees produced around 64% of the food waste from this sector (see Figure 3).

Figure 3: Arising of segregated food waste from food manufacturing companies of different sizes in 2012

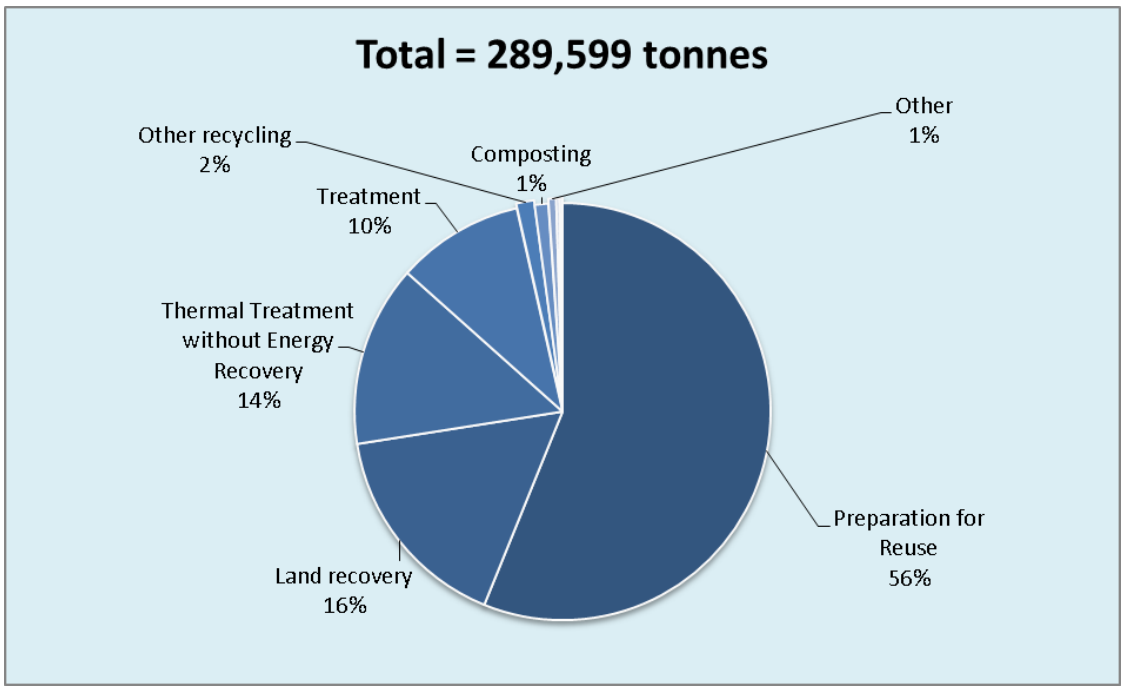


Source data: Natural Resources Wales

2.2.3 Management of segregated food waste from the food manufacturing sector

Figure 4 shows this sector has a high preparation for reuse rate (56%) and land recovery rate (16%) where food waste arises as a separate stream.

Figure 4: Management of segregated food waste from food manufacturing sector

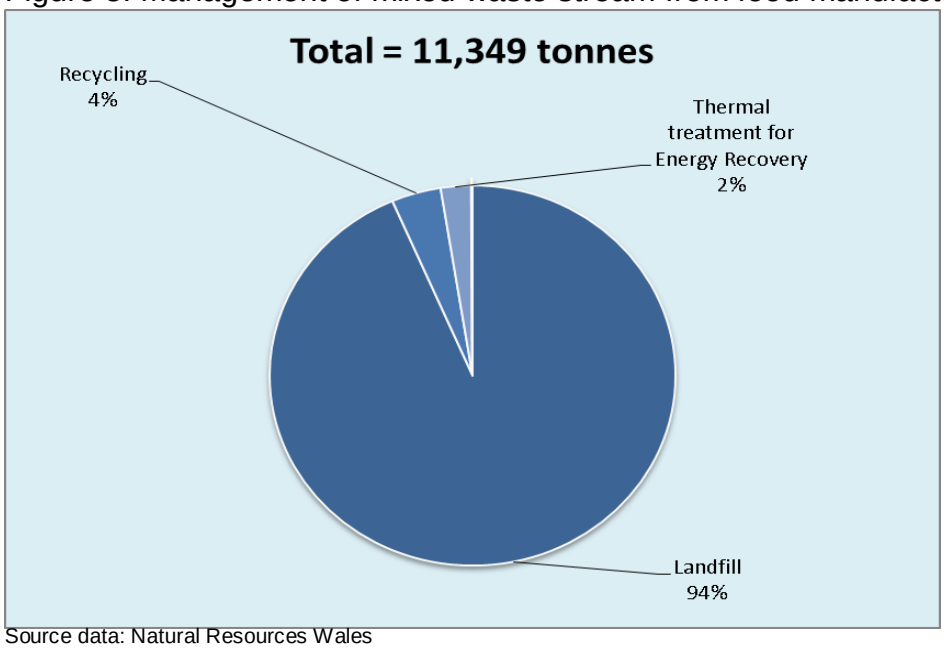


Source data: Natural Resources Wales

2.2.4 Management of mixed residual waste stream from the food manufacturing sector

When waste is not segregated its management is not sustainable, as illustrated in Figure 5. Around 94% of mixed residual waste produced by food manufacturers is disposed to landfill (over 10,000 tonnes).

Figure 5: Management of mixed waste stream from food manufacturers

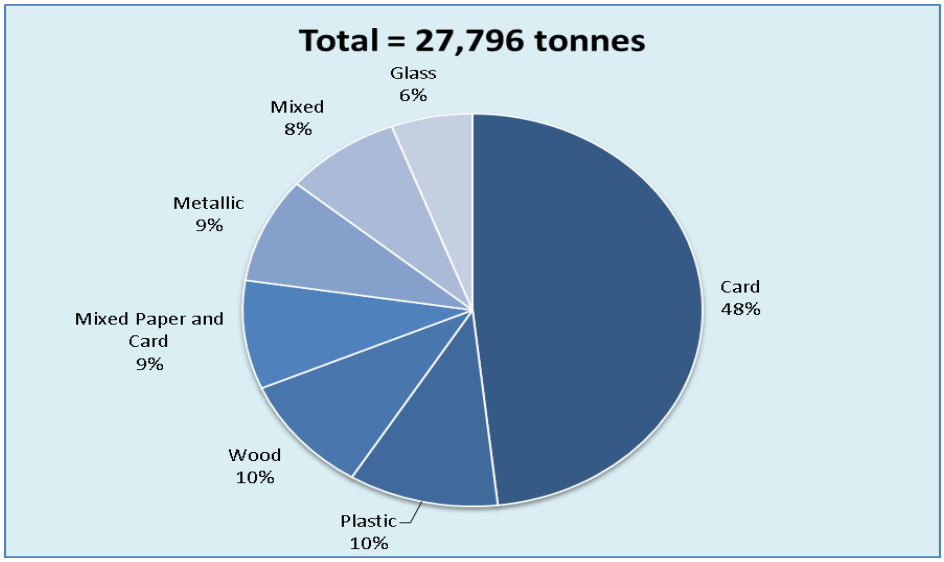


Source data: Natural Resources Wales

2.2.5 Segregated packaging waste arisings from the food manufacturing sector

Figure 6 shows that the food manufacturing sector produces 48% of card packaging waste alone which equates to over 13,000 tonnes.

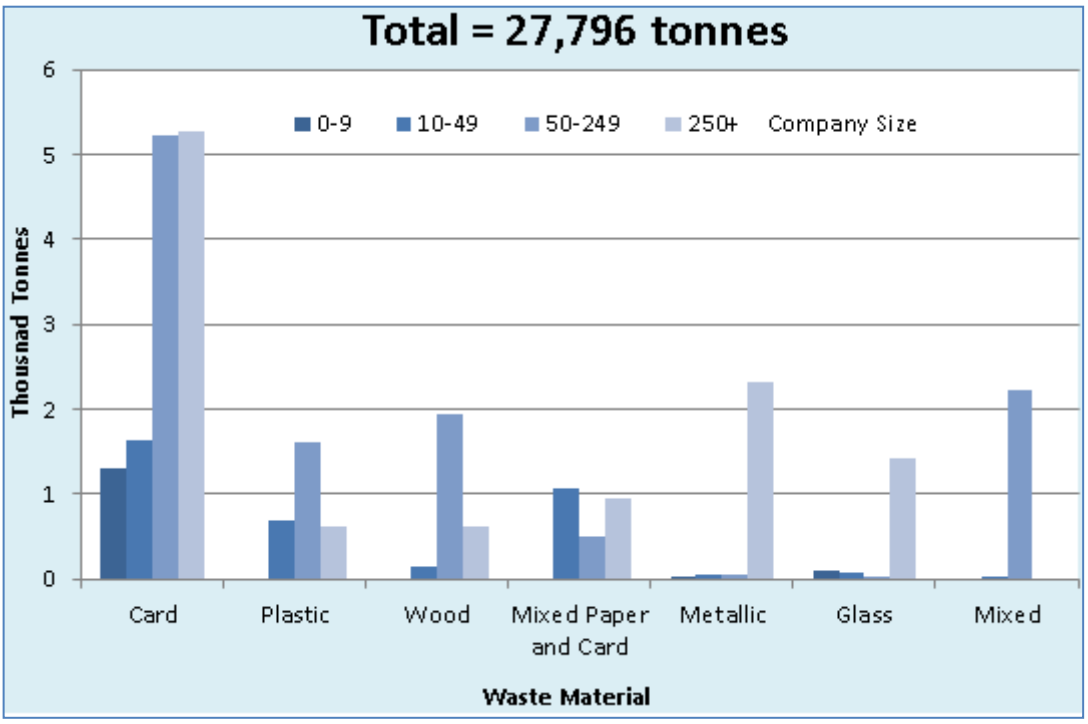
Figure 6: Composition of packaging waste arising from the food manufacturing sector in Wales in 2012



Source Data: Natural Resources Wales

Figure 7 shows that the food manufacturing sector produced 27,796 tonnes of segregated packaging waste in 2012. Just over 2,000 tonnes of packaging waste arose within the mixed waste stream.

Figure 7: Arisings of segregated waste packaging from the food manufacturing sector by company size



Source data: Natural Resources Wales

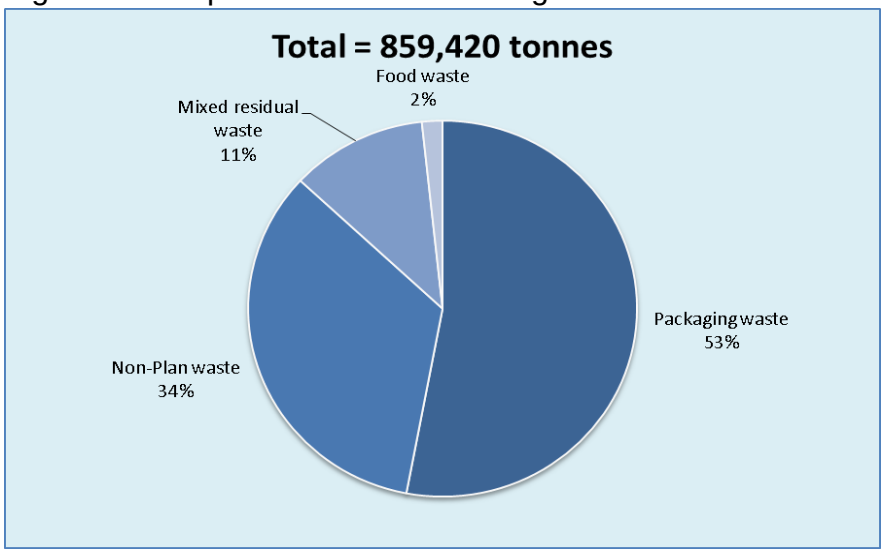
Figure 7 also shows that 80% of the segregated packaging waste arises from the companies with 50 employees or more, of which 51% is made up of card.

2.2.6 Waste arisings and management of waste from the wholesale and retail sector

2.2.6.1 Total waste arisings from the wholesale and retail sector

Figure 8 shows the composition of waste arising from the wholesale and retail sector. Nearly 470,000 tonnes of food and drink and associated packaging were produced by the wholesale and retail sector (not including mixed waste). This equates to around 55% of the approximately 859,420 tonnes of waste produced by the sector in 2012.

Figure 8: Composition of waste arising from the wholesale and retail sector in Wales.

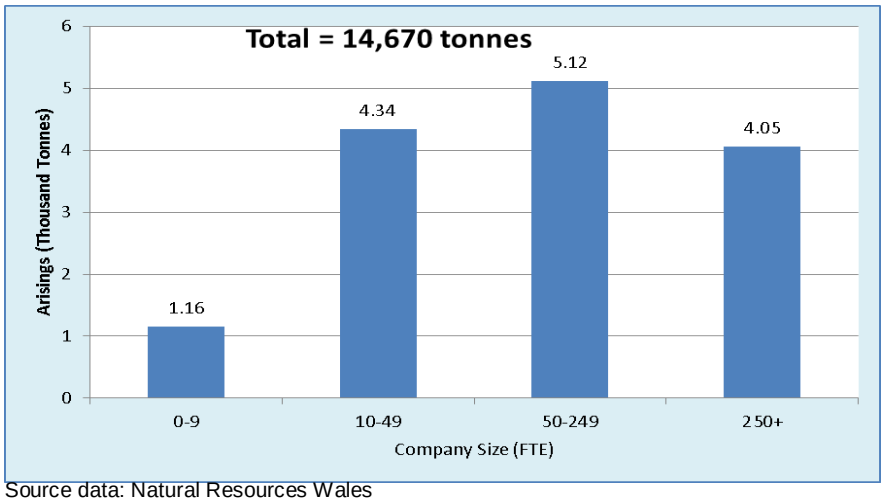


Source data: Natural Resources Wales

2.2.6.2 Segregated food waste arisings from the wholesale and retail sector

In figure 9 the wholesale and retail sector produced a total of approximately 14,670 tonnes of segregated food waste in 2012. Companies with fewer than 250 employees produced around 72% (10,616 tonnes) of the overall food waste.

Figure 9: Arising of segregated food waste from wholesale and retail companies of different sizes

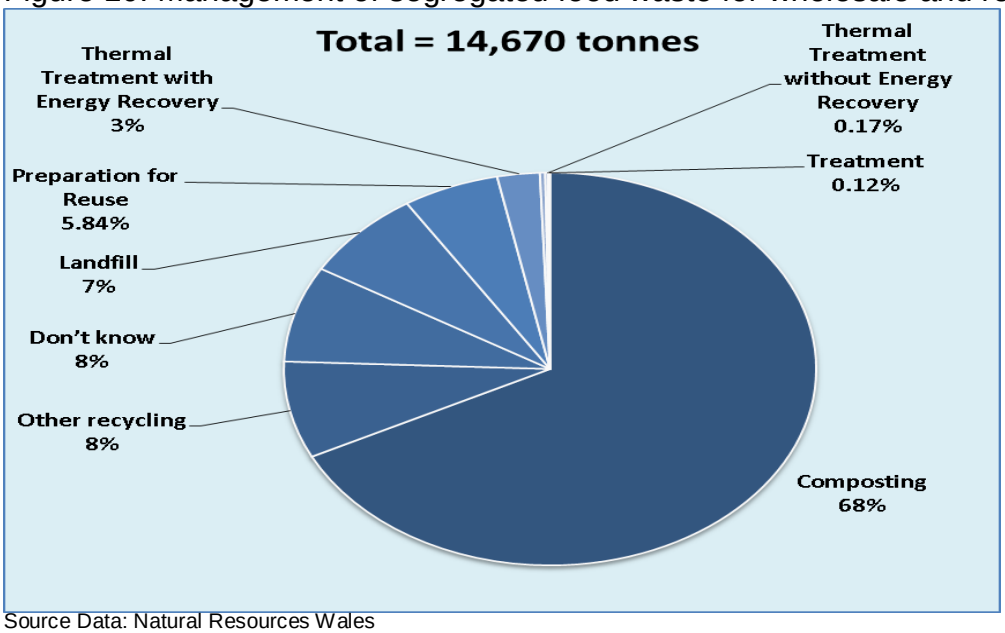


Source data: Natural Resources Wales

2.2.6.3 Management of segregated food waste arisings from the wholesale and retail sector

Figure 10 shows 14,670 tonnes of food waste from the retail and wholesale sector arises as a separate waste stream, of which just under 10,000 tonnes (68%) is composted whilst only 5.84% is prepared for reuse.

Figure 10: Management of segregated food waste for wholesale and retail sector

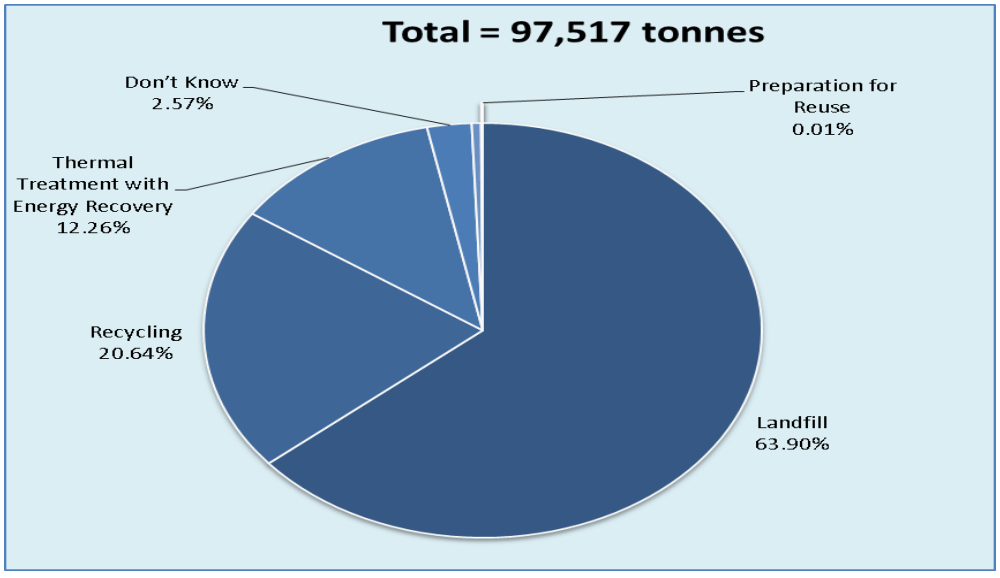


Source Data: Natural Resources Wales

2.2.6.4 Management of mixed waste arisings from the wholesale and retail sector

When waste is not segregated its management is not sustainable, as illustrated in Figure 11. Around 63% of mixed waste produced by the wholesale and retail sector is disposed of by landfilling. This equates to 62,315 tonnes.

Figure 11: Management of mixed waste stream from the wholesale and retail sector

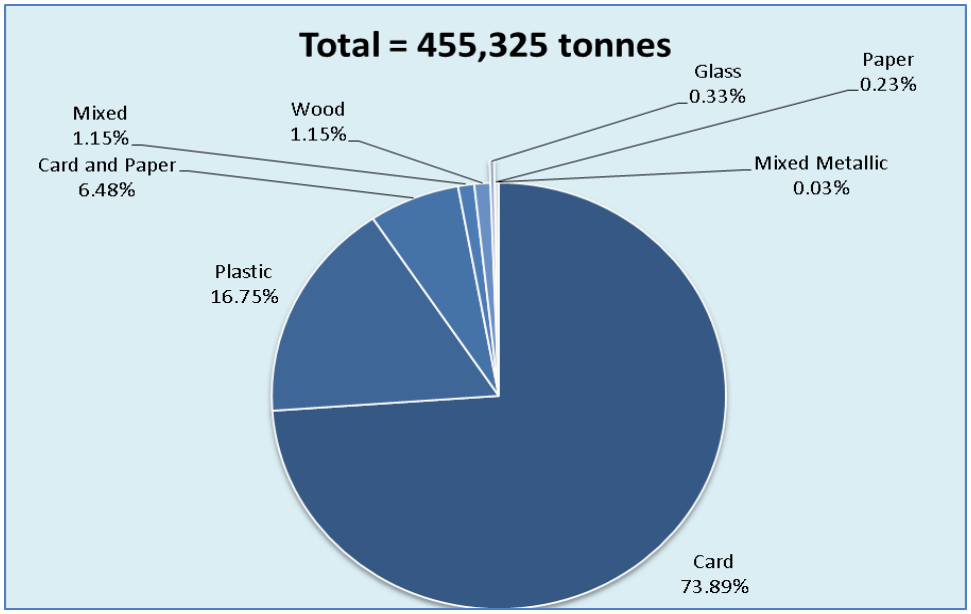


Source Data: Natural Resources Wales

2.2.6.5 Segregated Packaging waste arisings from the wholesale and retail sector

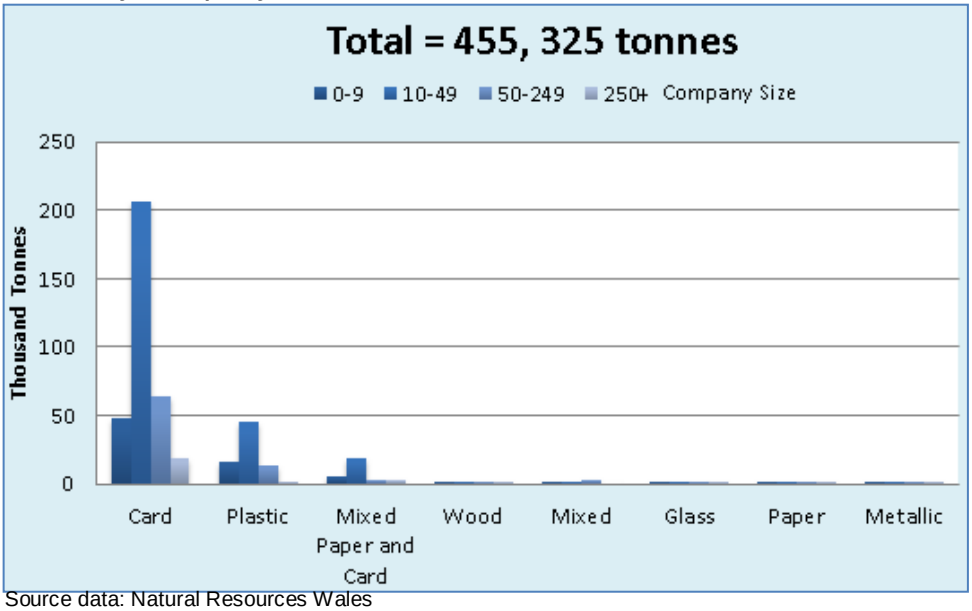
Approximately 455,325 tonnes of packaging waste is produced by the wholesale and retail sector as shown in Figure 12. Card packaging accounts for around 336,448 tonnes (73%) of all segregated packaging waste within the wholesale and retail sector. Mixed packaging; wood; glass; paper and mixed metallic only comprises of around 3% of the packaging waste stream.

Figure 12: Composition of packaging waste arising from the wholesale and retail sector in Wales in 2012.



The types and quantities of packaging waste produced by different company size bands are shown in Figure 13.

Figure 13: Arisings of segregated waste packaging from the wholesale and retail sector by company size



Source data: Natural Resources Wales

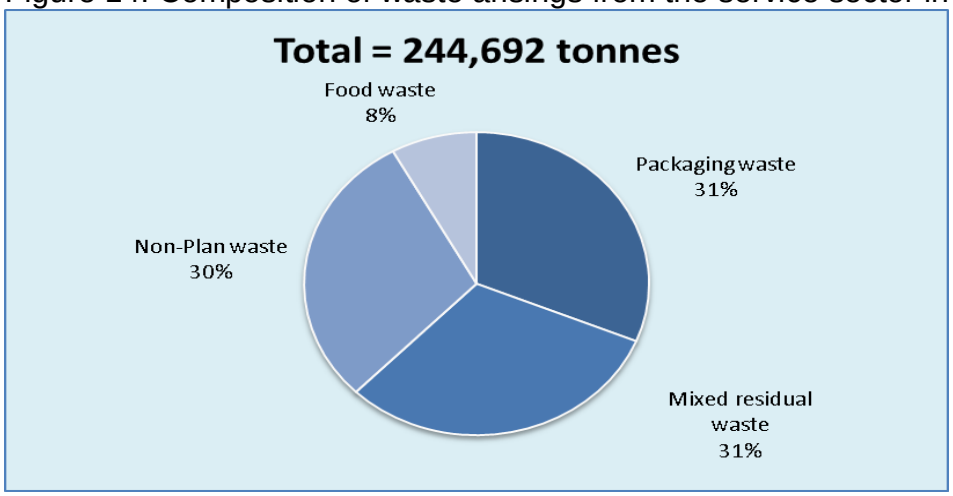
Figure 13 shows the companies with between 10 and 49 employees produce 272,053 tonnes of segregated packaging waste which is around 60% of the overall segregated packaging waste from the wholesale and retail sector. Of the 272,053 tonnes, around 76% of this is card.

2.2.7 Waste arisings and management of waste from the service sector

2.2.7.1 Total waste arisings from the service sector

The composition of waste arising from the Service Sector in Wales is shown in Figure 14. This plan covers the 96,049 tonnes of food and drink and associated packaging produced by the Service sector, which was around 39% of the waste produced by the sector in 2012. Mixed residual waste from the Service Sector equated to 31% of the overall waste arisings.

Figure 14: Composition of waste arisings from the service sector in Wales

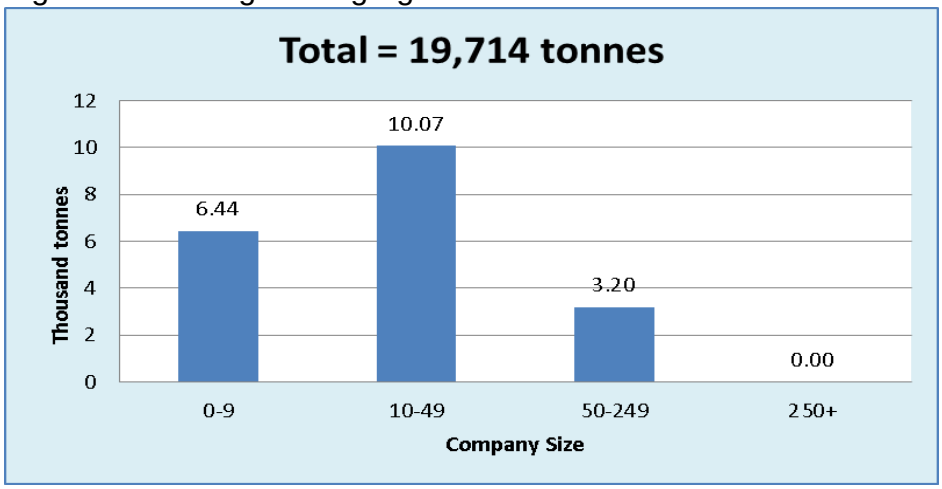


Source data: Natural Resources Wales

2.2.7.2 Segregated food waste arisings from the Service Sector

19,714 tonnes of segregated food waste is produced by this sector.

Figure 15: Arisings of segregated food waste from Service sector by company size



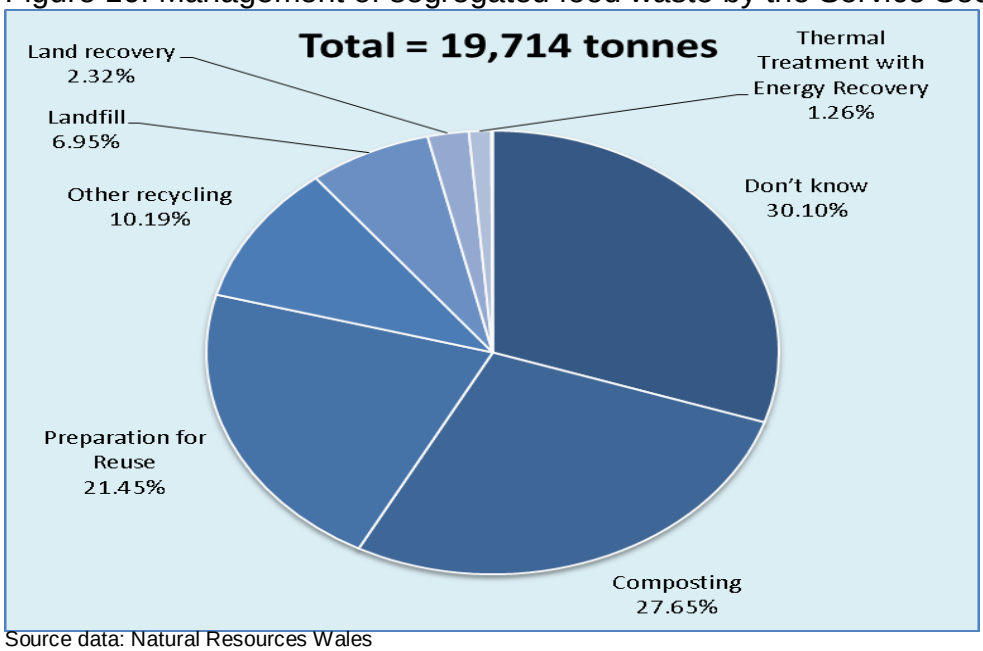
Source data: Natural Resources Wales

SMEs produced the majority of waste in this sector. Around 84% of the segregated food waste from this sector originates from companies between 1 and 49 employees.

2.2.7.3 Management of segregated food waste arisings from the service sector

The management of the 19,714 tonnes of food waste produced by the Service sector that arises as a segregated waste stream is shown in Figure 16.

Figure 16: Management of segregated food waste by the Service Sector.

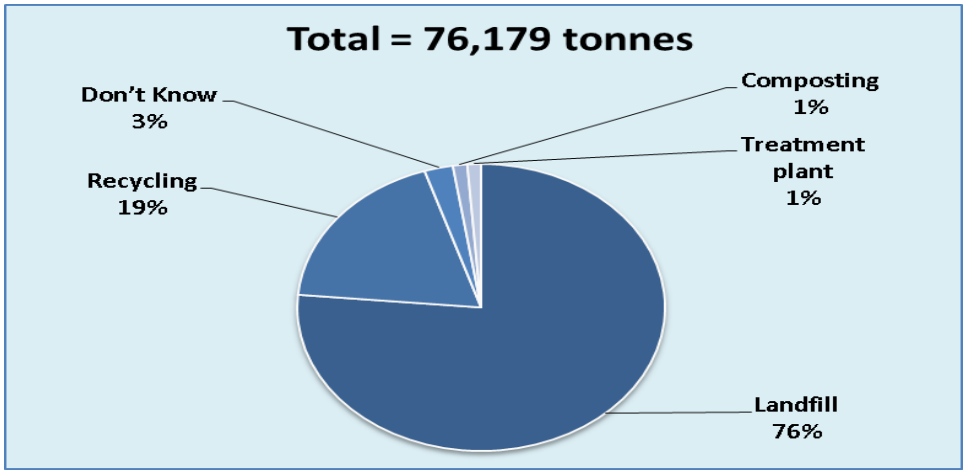


Source data: Natural Resources Wales

Where food waste arises as a separate stream, a variety of management routes are taken. Disposal to landfill accounts for around 7% and preparation for reuse accounts for around 21%. Management of 30% of segregated food waste by the Service Sector is unknown.

2.2.7.4 Management of mixed waste arisings from the service sector

Figure 17: Composition of management of mixed waste arising from the food service sector in Wales in 2012



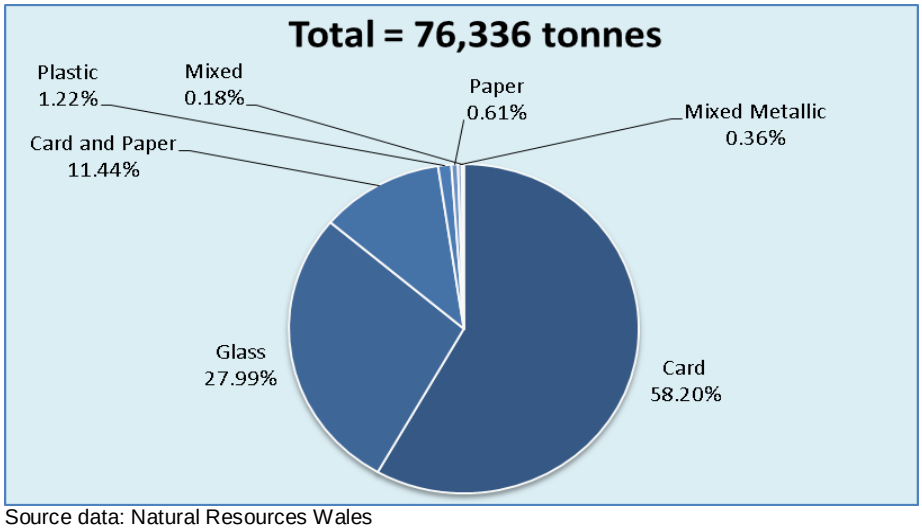
Source data: Natural Resources Wales

Figure 17 shows around 76% of the mixed residual waste is sent to landfill which equates to 58,000 tonnes. Previous surveys and compositional analysis of food waste within the mixed waste stream have shown that 20% of commercial waste contains kitchen waste. Further analysis is required.to gain a better understanding of what is within the mixed waste stream.

2.2.7.5 Segregated Packaging Waste from the Service Sector

Around 76,336 tonnes of segregated packaging is produced by the Service sector as shown in figure 18.

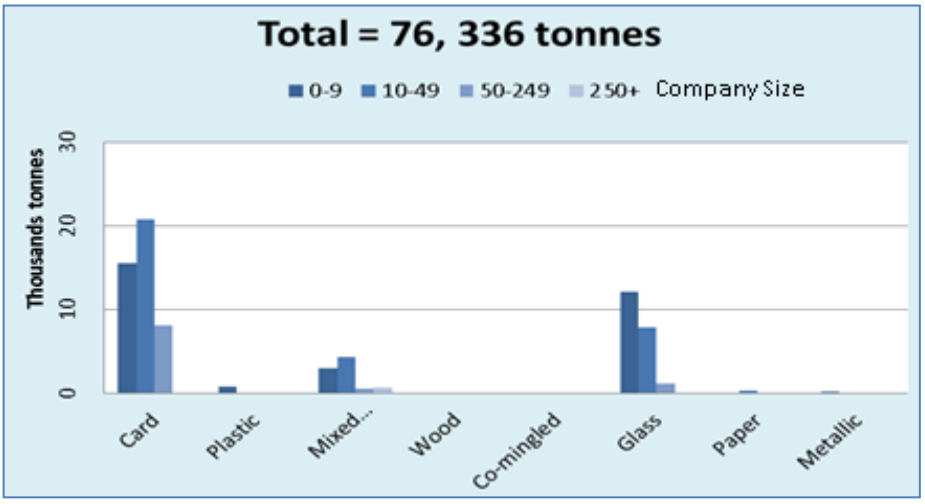
Figure 18: Composition of packaging waste arising from the Service sector in Wales in 2012



Source data: Natural Resources Wales

Figure 18 shows that around 70% of the overall segregated packaging waste is cardboard or mixed paper and cardboard which equates to 53,158 tonnes.

Figure 19: Arisings of segregated waste packaging from the service sector per company size



Source data: Natural Resources Wales

Figure 19 shows that over 80% of the segregated packaging waste from the service sector arises from companies who employ 0-49 employees.

All sizes of company are able to recycle packaging waste at high rates – the key is to segregate the packaging into different waste types.

There is little option to manage packaging in a sustainable way if it is mixed with other wastes. There is no evidence that larger companies are given any more opportunities to recycle mixed waste than SMEs.

2.2.8 Summary and Comparison of 2007 and 2012 Data

An overview of the waste arising from each of the three sectors, in respect of all wastes and the wastes specifically covered in this plan (food and packaging) is provided. Table 1 shows that for the two main waste streams there are differences between the sectors with regards to waste production and management.

To note, the precision levels vary from 2007 and 2012 therefore some differences may not be statistically significant.

Further research needs to be assessed on the biodegradability of mixed industrial and commercial wastes landfilled within Wales to be able to estimate the amount of food and packaging waste within the mixed waste stream.

Table 1: Summary showing waste arisings and management of waste within the three sectors of this plan

Indicator	Food Manufacture	Wholesale and Retail	Service
Total waste production			
Total waste produced (tonnes)	454,401	859,420	320,870
Waste covered by this plan not including mixed residual waste (tonnes	317,396	469,994	96,049
and % total production)	70	55	30
Food Waste			
Segregated food waste (tonnes)	289,599	14,670	19,714
Prepared for reuse (%)	56	5.81	21
Recycled (%)	2	75	38
Landfilled (%)	0.04	7	7
Packaging Waste			
Segregated packaging waste (tonnes)	27,797	455,325	76,335
Recycled (%)	87	96	98

Landfilled (%)	4	1	0
Mixed Residual Waste			
Mixed residual waste (tonnes)	11,349	97,517	76,178
Recycled (%)	4	21	20
Landfilled (%)	94	64	76

Source Data: Natural Resources Wales

Note: "recycling rate" above refers to the recycling/composting/AD management rate.

The following are the key points to note:

Segregated food waste

- The food manufacturing sector generated nearly 290,000 tonnes of segregated food waste in 2012, the largest sector to produce food waste. Companies with employees between 50-250+ produced 97% of the segregated food waste in this sector however 56% of food waste was prepared for reuse with less than 1% going straight to landfill.
- The wholesale and retail sector, and service sector, produce significantly lower segregated food tonnages – 14,670 tonnes and 19,714 tonnes respectively in 2012. SMEs produced the vast majority of the segregated food waste from the accommodation and service sector (84%).
- The wholesale and retail sector recycle 75% of the food waste generated but 7% still goes to landfill.

Segregated packaging waste

- Most segregated packaging waste arises in the wholesale and retail (over 455,000 tonnes). SMEs produce 76% of the segregated packaging waste from the wholesale and retail sector, and 76% arises from cardboard packaging. The service sector is similar, with SMEs producing 86% of the packaging waste.
- Only around 28,000 tonnes of segregated packaging waste is from the food manufacturing sector.
- The recycling rates of packaging waste across the sectors are high. The Service sector recycles nearly 98% of segregated packaging waste.

Figure 20: Comparison of total waste arising from all sectors in Wales in 2007 and 2012.

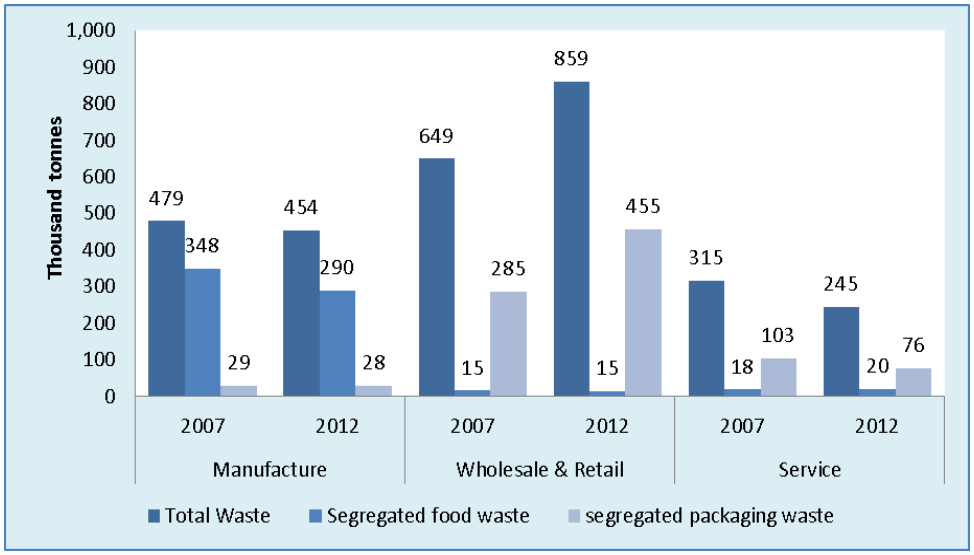


Figure 20 shows that segregated food waste arisings from the food manufacturing sector has decreased by around 58,000 tonnes in 2012 compared to 2007. The Wholesale and Retail sector have produced more than 200,000 tonnes of waste compared to 2007 with a significant rise in segregated packaging waste of around 170,000 tonnes. To note – the total waste column also includes mixed waste and non-plan waste.

2.2.8.1 Looking to the future

The scale of waste prevention required

It is difficult to estimate future arisings and types of packaging, and the scale of waste prevention required. Future quantities of packaging will depend upon, amongst other factors, changes in consumption patterns and the amount of packaging used per unit of product. Future types of packaging will depend upon a number of factors including the price and availability of packaging materials and innovations in packaging design. If waste prevention activities succeed then it would be expected that overall quantities of packaging will decrease at a commensurate rate.

The scale of preparation for reuse/recycling required

In terms of recycling rates laid down under the Packaging Waste Regulations, the four UK Nations have agreed to increase the overall recovery targets at 1% per annum from 74% in 2012 to 79% in 2017. Over the same period the overall recycling target will increase from 68.1% to 72.7%. Individual packaging material recycling targets are planned to increase substantially for plastic (from 32% to 57%) and aluminium (from 40% to 55%). Targets are planned to increase slightly for steel (71% to 76%) and no change for paper/card and wood.

Separate Collections

In terms of collections, more effort will need to be applied to collect more plastic and aluminium packaging for recycling. Effort will also need to be applied to ensure that glass is collected in a way that facilitates its use via re-melt.

The key issues for the collections of packaging for recycling:

- There needs to be increased collections of plastic and aluminium packaging;
- There needs to be a focus on ensuring higher quality collections for paper/card, glass and plastic bottles.

Article 11(1) of the Waste Framework Directive includes requires Member States:

- To "take measures to promote high quality recycling and, to this end," to "set up separate collections of waste where technically, environmentally and economically practicable and appropriate to meet the necessary quality standards for the relevant recycling sectors"; and
- To set up separate collection "for at least the following: paper, metal, plastic and glass" by 2015.

The specific obligation to collect at least the four materials by 2015 is subject to Article 10 (2) of the Directive which states:

- Where necessary to comply with paragraph 1 and to facilitate or improve recovery, waste shall be collected separately if technically, environmentally and economically practicable and shall not be mixed with other waste or other material with different properties."

This Article in turn has referred to Article 10 (1) which states:

- Member States shall take the necessary measures to ensure that waste undergoes recovery operations, in accordance with Articles 4 and 13.

The Waste (England and Wales) Regulations 2011 transpose the revised Waste Framework Directive in England and Wales.

Regulation 13 of the Waste (England and Wales) Regulations 2011, amended in 2012, implements the Article 11(1) requirement of the Waste Framework Directive to set up separate collection for paper, metal, plastic and glass by 2015. This applies to wastes from businesses and public bodies as well as from householders. It places a new requirement on local authorities, private waste companies and the social economy enterprises that collect waste materials, to offer separate collections of paper, metal, plastic and glass by 1 January 2015. Guidance on the separate collection requirement has been consulted on[5]. Final guidance will be provided by the Welsh Government in autumn 2014.

5 http://wales.gov.uk/consultations/environmentandcountryside/separate-waste-collection-guidance/?lang=en

3 Actions

3.1 Introduction

This section describes actions for the FMSR sectors to meet the policies and targets laid down in TZW. The actions are grouped accordingly to the Waste Hierarchy

The actions in this plan have been developed based upon the analysis and evidence in Section 2 and with reference to waste prevention research undertaken by Welsh Government as part of the Waste Prevention Programme. Consideration has been made of where specific gaps need to be filled and market failures addressed, in order to meet future targets and the sustainable development policies and outcomes laid down in Towards Zero Waste.

3.2 Roles and Responsibilities

In achieving waste prevention, increased preparation for reuse and recycling within FMSR sectors, each of the identified sectors has a role to play, not only individually but as a concerted effort through the supply chain:

Welsh Government has

- Full devolved responsibility for waste, with primary legislative powers in relation to waste.
- A strong role at a national and international level to drive waste prevention using instruments available to it to overcome market failures and drive change
- Responsibility for meeting European Directives, including producing waste plans and ensuring compliance in Wales.
- A strong role to drive the creation of a high recycling society for Wales using instruments available to it to overcome market failures and drive change.
- A strong role to drive waste up the hierarchy in order to achieve zero waste (no residual requiring other recovery or disposal) using instruments available to it to overcome market failures and drive change.

Local authorities are required to

- Enforce Packaging Essential Requirements Regulations.
- Develop local prevention regimes using a range of tools such as business support.
- Continuously improve the Municipal waste collection service and, in doing so, have regard to inter alia sustainable development (in accordance with their duty under Section 2 of the Local Government (Wales) Measure 2009).
- Comply with all relevant laws governing waste, particularly in a way that does not endanger human health or the environment (including living organisms and biodiversity).
- Meet statutory recycling and reduction in landfilling of biodegradable municipal waste targets.
- Provide, from 2015, a separate collection service for paper, glass, metal and plastic for households and businesses.

Business waste producers (food manufactures, wholesale and retail and service sectors) should

- Reduce their waste arisings.
- Ensure that products are stored for preparation for reuse rather than sent for landfill and passed on in a state that someone else can use them.
- Ensure that the workplace culture allows for behaviour change to facilitate waste prevention.
- Comply with all relevant laws governing waste, particularly in a way that does not endanger human health or the environment (including living organisms and biodiversity).
- Declare 'Written Information' (formerly Waste Transfer Notes) evidence they have taken the waste hierarchy (and hence reuse) into account and have taken into consideration government guidance on the practical application of the waste hierarchy[6].

Food Manufacturers

- Have a producer responsibility for the food and packaging and some are obligated under the Producer Responsibility Regulations.
- Produce their own food and packaging waste on site whose management has an impact on the environment in Wales.

Wholesale and Retailers

- Have a 'producer responsibility' for the items they sell and some are legally obligated under regulations such as the Producer Responsibility Regulations.
- Considerable responsibility for waste that is generated across the food supply chain particularly the major supermarket chains.
- Can play a very significant role in influencing the behaviour of their customers (both negatively and positively).
- Produce their own food and packaging waste on site whose management has an impact on the environment in Wales.

Service sector

- Can play a very significant role in influencing the behaviour of their customers (both negatively and positively).
- Produce their own food and packaging waste on site whose management has an impact on the environment in Wales.
- Has a potentially significant role to "green" its supply chain.

Waste Management Industry are requested to

- Provide a holistic service to the sectors covered in this plan that includes advice on waste prevention and recycling and a holistic service that facilitates preparing for reuse.
- Provide a separate collection service for paper, glass, metal and plastic, from

6 http://wales.gov.uk/topics/environmentcountryside/epq/waste_recycling/publication/hierarchyguide/?lang=en

2015.
- Ensure that waste is treated via the most environmentally beneficial means as far as possible.

The Waste Management Industry must
- Comply with regulations and carry out operations in a manner which does not endanger human health or the environment (including living organisms and biodiversity).
- Declare on 'Written Information' that they have taken the waste hierarchy into account and have taken into consideration Government guidance on the practical application of the waste hierarchy.

Regulatory Agencies (such as Natural Resources Wales) should
- Implement specific environmental regulation, working to 'better regulation' principles.
- Act as an independent adviser to devolved government in developing legislation and policy on environmental matters.
- Regulate compliance of the key producer responsibility regulations. The Natural Resources Wales needs to continue to robustly monitor and regulate compliance of the producer responsibility regulations covering packaging, End of Life Vehicles, Waste Electrical and Electronic Equipment and batteries, in order to ensure that the requisite recycling services are in place and are delivering the targets. The approach to regulation is explained on the Natural Resources Wales' website[7].

Support providers (for example - WRAP and Ecodesign Centre)
- Help deliver the aspirations of Towards Zero Waste.

Social enterprise sector is encouraged to
- Promote messages – the social enterprise sector is involved in many community food groups such as food co–operatives and Health Challenge Wales. These are mechanisms for disseminating message and reducing food waste.
- Take action – for example, FareShare UK is an established charity that redistributes surplus 'fit for purpose' food and drink products to community organisations, tackling food poverty as well as reducing food waste.

Consumers are encouraged to
- Let businesses know when packaging goes beyond what they regard as normal or acceptable. They can do so by choosing alternative products, bringing it to the attention of the retailer or manufacturer, or ask Trading Standards to investigate.
- Be responsible with regards to their purchasing and production of waste.
- Engage with the various waste prevention approaches, for example, reducing the use of single use carrier bags and applying the advice provided by the Love Food Hate Waste Campaign.

7 http://naturalresourceswales.gov.uk/?lang=en

Producer Responsibility Compliance Schemes are required to

- Register obligated producers and discharge their collection, treatment and recycling obligations and provide evidence of this to the Natural Resources Wales.
- Prioritise the reuse, recycling and recovery of whole appliances (in respect of Waste Electrical and Electronic Equipment).
- Provide evidence of this to the Natural Resources Wales.

Planners have

- A role to play in the development of waste management infrastructure and systems for Wales, this should include infrastructure for the preparation for reuse.
- To be aware of waste activities in their area and how the waste hierarchy should be promoted by their decisions.

3.3 Overarching Objectives & Actions

3.3.1 Introduction

To take into account that some objectives and actions for the sector will cover more than one element of the waste hierarchy, these have been grouped under the heading ‘overarching’.

The waste hierarchy guidance provides specific guidance for the treatment of food waste and is as follows;

- Prevention.
- Preparation for Reuse.
- Anaerobic Digestion with digestate applied to land.
- Composting of segregated food waste with compost applied to land.
- Other recovery.
- Disposal.

3.3.2 Overarching Objectives

1. To ensure that the products use fewer resources (reducing especially those that are non-renewable), are more durable and/or have an extended life, are more reusable and/or refurbishable/upgradeable and that opportunities are taken to deploy the products more efficiently through leasing and/or “collaborative consumption”. Products should also generate less waste at end of life, be more recyclable, and have a higher recycled content. The producer should take more extended responsibility for the product’s management at end of life, including costs of end of life management. Producers will also be expected to play a role in promoting behavioural change to customers/consumers.
2. To explore and implement the use of sectoral agreements, consumer/producer panels and/or sectoral negotiations in order that the relevant businesses or sectors set their own resource efficiency plans or objectives for the supply the production site, and in respect of product waste (to include waste prevention, increasing reuse and recycling, and increasing recycled content where feasible).
3. To ensure that the management of waste is guided by the waste hierarchy as a priority order (unless a life cycle assessment guides otherwise) as follows:
    - Prevention;
    - Preparing for reuse;
    - Recycling (encompassing composting and anaerobic digestion);
    - Other recovery, e.g. energy recovery and
    - Disposal.
4. To ensure that waste management is carried out without endangering human health, without harming the environment and, in particular:
    - Without risk to water, air, soil, plants or animals;
    - Without causing a nuisance through noise or odours and
    - Without adversely affecting the countryside or places of special interest, including in respect of conservation status.

5. To meet obligations for Wales under European and UK waste legislation, including the Habitat Regulations, especially in relation to the impact of waste facilities on areas of special conservation status.
6. To enable business in Wales to become more competitive in the world market through more efficient resource management ensuring that they are more resilient against future competing demands including, rising costs and security of supply of global material resources, thus saving money and maintaining or increasing profit.
7. To ensure the initiation and promotion of research and development into resource efficiency, including achieving cleaner and less wasteful products and technologies, and the dissemination and use of the results of such research and development.
8. To ensure that the management of waste will change in a way that contributes towards a more fair and just society through enabling all citizens of Wales to contribute to waste prevention, reuse and recycling irrespective of where they live, their health and ability, mobility or personal circumstances in order to:

    - Achieve their full human potential;
    - Enrich their communities;
    - Contribute towards the wellbeing of Wales;
    - Improve their local environment; and
    - Actively improve the quality of their life.

9. To deliver integrated and consistent behaviour change campaigns to secure resource efficiency at both the production and consumption stages, including campaigns that are specifically aimed at, and adapted to, small sized enterprises, including working through established business networks.
10. To obtain more reliable, accurate and up-to-date data in relation to waste generation and waste management methods, in order to monitor trends, progress in meeting targets and to help formulate better strategic plans.
11. To obtain additional evidence on all methods of waste treatment.

3.3.3 Overarching Actions

a) Products using fewer resources

The Product Sustainability Forum (PSF)[8] provides a platform for WRAP, the Welsh Government and other UK administrations, business and other interested parties to:

- Provide the evidence, data and tools that help businesses and governments prioritise their work to reduce the environmental impacts of everyday products; (Welsh food and drink companies can access this information on-line[9].

- Help businesses to work together to quantify, reduce and communicate the environmental impacts of the products they make and / or sell; and,

8 www.wrap.org.uk/psf

9 PSF Knowledge Base

- Test the feasibility of using this body of work to underpin any potential future voluntary agreements or actions such as the development of a post-2015 ‘Collaborative Framework’ (working title).

- The evidence from the PSF’s work is currently being used to inform the development of the collaborative framework. The aim of this new agreement will be to improve the sustainability and resilience of the food and drink chain; and to work with Welsh businesses to develop innovative, healthy and sustainable food products.

The current focus of the forum’s work is on the life cycle environmental impacts of grocery and home improvement products, which acts as a knowledge hub to support other programmes. Pathfinder demonstration projects to test a range of solutions to the environmental impact hotspots identified in the PSF’s work are being developed in Wales; and Welsh companies will benefit from the dissemination of findings from Pathfinder projects taking place in other parts of the UK.

b) Voluntary Sectoral Agreements

Hospitality and Food Service (HaFS) voluntary agreement, managed by WRAP.

The overarching objective is to prevent food and packaging waste arising within the HaFS sector. Where waste does arise, the objective is to increase recycling and recovery rates, thereby reducing waste being sent to landfill. The principal route to deliver this objective across the UK is through the launch and delivery of an agreed Voluntary Agreement (VA) with the HaFS sector. WRAP aims to ensure Welsh businesses benefit through participation and on-the-ground support.

The Agreement’s sector-wide targets are 5% reduction in carbon impact through waste prevention, and an increase in recycling rates to 70%. Activity within the programme will focus on three areas:

1. Through working with large signatories to the Agreement, this is where the majority of tonnage contributions will be delivered. This activity will focus on one to one tailored support that will embed the targets within their business plans and develop good practice, which can be shared.
2. With the nature of the sector in Wales working across government departments (e.g. Tourism and Marketing), engagement with tourism bodies and SME support is of particular relevance to Welsh businesses. We will work with them to encourage the adoption of good practice, without the need to measure and report. This work will include continuing to work with key stakeholders to develop and build a strategic approach to engagement and delivery in Wales.
3. Working with government departments to support their commitments as supporters to the Agreement.

A supplementary outcome of the Agreement will be to help businesses realise cost savings through preventing food waste, optimising packaging and recycling more.

This will help offset projected food price inflation estimated at 5-10% for this sector over the coming year, thereby keeping the sector competitive and protecting jobs.

Also in Wales there is specific associated action including grant programmes such as Recycling on the Go and the Hospitality and Food Service Sector grant programme.

Collaborative Framework

Discussions have also begun on a post-2015 follow-on agreement to Courtauld 3, which will draw on the evidence developed by the Product Sustainability Forum.

Courtauld Commitment

The Courtauld Commitment is a voluntary agreement between UK Governments and the British retail grocery and manufacturing sectors, managed by WRAP. The aim of the Commitment is to reduce food and packaging waste, and WRAP works with industry signatories to agree and implement actions that contribute towards meeting collective targets.

Phase 1 and 2 were successful in reducing packaging, household waste and supply chain waste. Action across the UK during Phase 1 resulted in the prevention of 1.2 million tonnes of food and packaging waste and Phase 2 resulted in a further 1.7 million tonne reduction.

Following discussion with industry, it was determined that the Courtauld Commitment would be extended to a third phase.

Courtauld 3

Courtauld Commitment 3 will now run for three years from 2013 to 2015 with targets measured against a 2012 baseline (Table 2).

Table 2 Courtauld 3 targets (2013-15)

	Target	Further explanation
Household food and drink target	Reduce household food and drink waste by 5% by 2015 from a 2012 baseline.	Taking into account external influences, this target represents a reduction of 9% relative to anticipated changes in food and drink sales.

Manufacturing & retail target	Reduce traditional grocery ingredient, product and packaging waste in the grocery supply chain by 3% by 2015, from a 2012 baseline.	Taking into account external influences, this target represents a reduction of 8% relative to anticipated production and sales volumes.
Packaging target	Improve packaging design through the supply chain to maximise recycled content as appropriate, improve recyclability and deliver product protection to reduce food waste, while ensuring there is no increase in the carbon impact of packaging by 2015, from a 2012 baseline.	Taking into account external influences, this target represents a carbon reduction of 3% relative to anticipated sales volumes.

c) Waste hierarchy guidance

Guidance on applying the waste hierarchy has been provided by the Welsh Government for any business or public body which generates, handles or treats waste[10]. This will be updated on an ongoing basis as evidence dictates.

The current 'duty of care' Code of Practice is to be reviewed. Waste Management companies are required to ensure dissemination of this guidance and with producers, to ensure that 'Written Information' correctly record steps taken to move up the waste hierarchy with waste prevention as the first priority.

d) Overarching EU Initiatives

Legislation is one of several interventions that are available to Welsh Government to encourage a more sustainable approach to waste and resource management along the supply chain. The Welsh Government will work with the EU and UK Governments and Devolved Administrations to develop and implement such initiatives as and when appropriate.

10 http://wales.gov.uk/topics/environmentcountryside/epq/waste_recycling/publication/hierarchyguide

e) Overarching UK Regulations

Welsh Government has a role to work with the EU and UK Governments and Devolved Administrations to implement and develop such initiatives and regulations

f) Legislation, regulation and enforcement

Legislation is an important tool for Welsh Ministers to implement policy to the benefit of the citizens of Wales. The purposes of regulation are to protect public interests and to create a level playing field in which business can thrive. Citizen interests must be the primary focus of both. These interests are broad and will include interests as diverse as protection of the environment, protecting and improving the health of the wider public, job creation, creation of markets for environmental goods and services, increased innovation, reduced business risk and increased confidence of the investment markets, all of which can be enhanced by the right type of legislation.

g) Behavioural Change

The Welsh Government proposes to extend its consumer campaign to work with WRAP to develop behavioural change and awareness campaigns and guidance material, to help the sector motivate their workforce to facilitate the necessary changes. In particular, guidance for small and medium sized enterprises will be developed. Engagement with the sector will be driven through established business networks as well as national campaigns. Campaigns will be developed which enable people in Wales to have the same message on waste prevention whether at home, work or leisure.

Consumer and industry groups e.g. WI, FSB, CBI, Consumer Focus Wales will be approached to help with the campaign.

WRAP is working closely with these sectors to improve messaging for consumers and customers for example through the Courtauld Commitment, the Hospitality and Food Services Agreement and Love Food Hate Waste.

h) Updating Waste Arisings and Management Data

The 2012 Industrial and Commercial Waste Survey results were published on 9 June 2014, commissioned by Welsh Government and project managed by Natural Resources Wales. This data has been used for this sector plan. A further survey is likely to take place in 2017.

i) Sustainable food business clusters

A food business cluster is a geographic concentration of interconnected food businesses and suppliers. They provide ways to increase the productivity in which companies can compete, nationally and globally. This can offer consumer's alternatives to cheap, imported and often over packaged food. There are several working examples of food business clusters across Wales such as farm shops, community markets and food co-operatives.

In November 2013 WRAP worked with a cluster of tourism businesses in the Swansea and Gower area to raise awareness of the commercial benefits of waste reduction whilst also looking at opportunities to collaborate on recycling.

WRAP, in association with the Carbon Trust, has also worked with clusters of food businesses in the Carmarthen and Llandeilo areas to provide direct support in identifying ways for businesses to save money by reducing waste and increasing recycling.

WRAP's support is provided through the Hospitality and Food Service (HaFS) Agreement and Hospitality, Tourism, Food & Drink (HTFD) Grant, which has supported over a hundred SMEs throughout Wales.

Good practice case studies are being developed from which other businesses will be able to benefit[11].

j) Additional Evidence

Welsh Government will work with Defra, WRAP and other delivery bodies to gather additional evidence to form part of any future policy decisions on all methods of waste treatment.

11 http://www.wrapcymru.org.uk/content/funding-and-advice-hospitality-tourism-food-and-drink-sectors

3.4 Waste Prevention (including reuse)

3.4.1 Introduction

Waste prevention is seen as a priority step regarding resource efficiency and is a requirement of the 2008 Waste Framework Directive. This section covers details on approaches and findings that have been undertaken as part of the development of Wales' Waste Prevention Programme with regard to the FMSR sectors.

3.4.2 What is "prevention"?

What is "prevention"?
The 2008 Revised Waste Framework Directive states in Article 4 that the following waste hierarchy shall be applied as a priority order in waste prevention and management legislation and policy:

- **Prevention.**
- Preparing for reuse.
- Recycling.
- Other recovery – e.g. energy recovery, and
- Disposal.

The 2008 Waste Framework Directive defines waste prevention as:-
'Measures taken before a substance, material or product has become waste, that reduce the quantity of waste, including through reuse of products or the extension of lifespan of products the adverse impacts of generated waste on the environment and human health or the content of harmful substances in materials and products'.

The Organisation for Economic Co-operation and Development (OECD) breaks down waste prevention into three components:

- Strict avoidance involves the complete prevention of waste generation by virtual elimination of hazardous substances, or by reducing material or energy intensity in production, consumption and distribution.
- Reduction at source involves minimising the use of hazardous substances and/or minimising material or energy consumption.
- Product reuse involves the multiple use of a product in its original form, for its original or alternative purpose, with or without reconditioning. This includes refurbishment and repair. Reuse is important, and is the part of the waste hierarchy most often overlooked. Not only does it move material use up the waste hierarchy, but it also provides social and economic benefits to Welsh communities, such as opportunities for jobs and increasing skills.

Article 29 of the Directive also requires that Member States shall establish, in accordance with Articles 1 and 4, waste prevention programmes no later than 12 December 2013. The Waste Prevention Programme for Wales was published on 3 December 2013.

3.4.3 Priority waste types identified

The results of the Ecological Footprint analysis demonstrates that **food and putrescible waste** has the largest impact of all materials (31% of the total ecological footprint) generated by the industrial and commercial sectors. This is followed by **paper and card** (16% of the impact).

Priority waste types in respect of their management are metals, paper and card, where the emphasis is on increasing recycling, and food waste where the aim is to divert this waste type from landfill to anaerobic digestion. Packaging waste, residual mixed wastes, hazardous wastes and batteries are priority materials either because they are covered under specific European Directives or because of their impact on the environment.

3.4.4 The impact of the economy and business activity on waste generation and the benefits of waste prevention

Benefits of waste prevention

The true benefits of waste prevention are often huge, based on saving the embedded investment in raw materials, labour, production and distribution costs required to bring a product to the point in the supply chain where the decision is made not to sell it but rather consign it as waste. Waste is often perceived as a relatively small and unimportant cost to businesses because consideration is only given to the direct waste management/disposal cost (say around one hundred pounds per tonne) and not these other embedded factors, which amount to many thousands of pounds per tonne.

WRAP has estimated the financial value of waste prevention at the retailer stage in the life cycle for a number of products. The values range from £2,727 per tonne of food waste prevented, to £27,000 per tonne of clothing.

WRAP provided the Welsh Government with the following estimates of financial benefits to businesses in the supply chain, and to retailers, of avoiding waste for a selection of products (see Table 3).

Table 3: Benefits of waste prevention to business for a variety of product types

Product Type	Benefits of waste prevention (£ / tonne)	
	Supply Chain	Retailer
Food	1,200	2,727
Electrical & Electronic Products	4,800 – 7,100	11,000 – 13,000
Furniture	2,900	5,000
Clothing	-	27,000

Source: WRAP

3.4.5 Targets

The Industrial and Commercial Sector Plan (I&C) set the waste prevention targets of 1.2% in the commercial sector and 1.4% in the industrial sector, with the aim of reducing the ecological footprint of waste to 'One Wales: One Planet' levels by 2050. Within these targets, priority materials – food, paper and card – have been identified. The ecological footprint of waste can be reduced more quickly if the focus is on preventing arisings of these materials. For food waste this is because it has a high ecological footprint. For paper and card, it is because large quantities arise in the waste stream.

For all the sectors covered in this plan – food manufacturing, wholesale and retail, and service – we will focus action on reducing arisings of these materials as a priority (within the overall prevention targets set) where it is feasible to do so.

In respect of the waste prevention targets set in the I&C Sector Plan, the food manufacturing sector is part of the industrial sector, and the wholesale/retail and services sector form part of the commercial sector. The waste prevention targets for each sector covered in this plan are identified in Table 4.

Table 4: Proposed waste prevention targets

Waste type/sector	Proposed waste prevention target
Industrial waste	
Food manufacturing	To reduce the amount of waste produced by 1.4 per cent (of the 2007 baseline) a year to 2050.
Commercial waste	
Wholesale and retail	To reduce the amount of waste produced by 1.2 per cent (of the 2007 baseline) a year to 2050.
Service sector	

3.4.6 Priorities

The Welsh Government has identified *priority sectors* and *priority areas for action* for the programme. These are based on the high impact materials and products identified in our review of the evidence and sectors, which have the greatest potential to prevent waste, either directly through its own operations or through influence over other businesses and sectors.

Priority Business Sectors

Our priority business sectors are:

- Food manufacturing sector.
- Accommodation and food services.
- SMEs, and particularly office based services, food and accommodation, and small retailers and wholesalers.

- Permitted industry sectors: Food Manufacture, basic metal and metal products; Manufacture of paper and paper products; Manufacture of chemicals, chemical products, pharmaceuticals.

Priority Areas for Action

Our priority areas for action are:
- Public sector as an exemplar.
- Working with large retailers and their supply chains.
- Promoting eco-innovation in the manufacturing sector in Wales.

3.4.7 Waste Prevention Actions

Details of specific actions for the relevant Sectors are provided below.

a) The Food Manufacture Sector

The food manufacture sector is a priority because it produces almost all of the food waste – a priority waste type from industry. It also contributes significantly to the arising of chemicals and paper and card, and generates a quarter of all industrial waste by tonnage. Approximately 80% of the waste arises from companies with over 250 employees. According to WRAP estimates, the estimated financial value of a tonne of food and drink waste for food manufacturing is £950 per tonne, rising to £1200 figure for the retail sector. Whilst many companies have focused on recycling or diverting waste from landfill, WRAP's studies have demonstrated that significantly higher savings are available by adopting a waste prevention approach using relatively simple, low cost changes[12].

It is proposed that an enhanced programme be developed with this sector in Wales. It will increase the range of interventions and their associated impact. Options to take this work forward are currently being scoped.

Larger food manufacturers (>250 FTEs) produce the majority of the food waste generated by the food manufacturing sector. The biggest gains in terms of reducing the ecological footprint caused by food waste can be made here. Given the quantity of food waste produced by large food manufacturing companies in Wales, this is an area that needs further attention in respect of prevention. Many of these companies are regulated under the Environmental Permitting Regulations. The Welsh Government will explore with Natural Resource Wales to follow up previous work undertaken to audit such companies. This will be in order to ensure that companies can achieve effective waste prevention measures and would look to include improved guidance. The main guidance provided for this sector is that from WRAPs 'Self-assessment review for food and drink manufacturers'[13]. It is unclear how many companies are using this guidance, how effective it is and whether any further guidance is required by industry.

12 WRAP estimates of food and drink waste in the supply chain, October 2013.

13 http://www.wrap.org.uk/content/self-assessment-review-food-and-drink-manufacturers

It is proposed that an enhanced programme be developed with this sector in Wales to build on the existing work to extend the scope beyond food and its associated packaging to incorporate all the priority materials, such as chemicals and non packaging paper and card. It will also increase the range of interventions and their associated impact. It is of interest that an estimated 37% of the food waste is generated by businesses operating with the benefit of an environmental permit, and each permit contains a condition requiring waste minimisation plans.

b) The Accommodation and Food Services Sector

The accommodation and food services sector is a priority because it is the second largest commercial waste generating sector in Wales in terms of total tonnage, and its contribution to segregated food waste and priority materials in the mixed fraction is very high. There is a significant reduction potential within the sector, and the Welsh Government is working with the sector due to its economic importance in Wales. The financial benefit of each tonne of food waste prevented by the hospitality sector is around £2,800. The vast majority of waste generated by this sector comes from SMEs, and any programme of work will need to reflect this waste generation profile.

Actions that are currently being undertaken is found under the overarching actions section.

c) Public Sector

Value Wales have developed a training toolkit that provides resources for public sector organisations, such as the Sustainable Procurement Assessment Framework (SPAF).They will continue to work closely with these organisations and the National Procurement Service for Wales, to raise awareness of the need for a more sustainable approach to public procurement.
The Welsh Government will build on this work to ensure that all public sector organisations in Wales are in a position to introduce resource efficiency and waste prevention clauses into their contracts, and will lead by example in its own procurement activities.

The Public Sector Plan will take forward these actions and is currently being drafted for consultation early in 2015.

d) Working with large retailers and their suppliers

Retailers and wholesalers provide a vital link between the businesses that manufacture goods and the consumer. Their product buying criteria can be used to influence the growers, manufacturers and processors and distributors who supply them. They also generate large quantities of waste from their own operations, including priority waste types.

Retailers and wholesalers have a role to play in:

- Improving the environmental impact of their product portfolio by influencing growers, processors, designers, manufacturers and distributors within Wales and

internationally through ecodesign, resource efficient business models, green procurement and green supply chains.

- Reducing the waste generated through their own activities.
- Supporting national and local initiatives such as food redistribution schemes.
- Providing clear information to consumers about the environmental performance of their products.
- Providing information and guidance on practical steps that consumers can take to reduce the impact of their products during use and at end of life.

There is currently a large amount of activity in this area, which have been described under the *overarching objectives*

i. The Courtauld Commitment - see overarching objectives 3.3.3

ii. The Product Sustainability Forum (PSF) & the Collaborative Framework – see overarching objectives 3.3.3

iii. Tackling unwanted food in the retail supply chain through social enterprise initiatives

FareShare is a social enterprise initiative that collects edible food from retailers and their supply chain that would normally be thrown away (for example because of incorrect packaging or surplus stock) and then redistributes it to organisations that provide support to vulnerable and disadvantaged people, such as hostels, women's refuges and night shelters. In 2013, the food redistributed by FareShare in the UK contributed towards more than 12 million meals, across 1,290 charities helping to reach 62,200 people each day.

FareShare North Wales was established in 2010 and was the first Welsh franchise of national charity FareShare UK. Between the period 01/01/2014 and 30/06/2014, 130,730 meals were provided, which equates to 67 tonnes of food from going to landfill.

Since July 2011, Fareshare Cymru South Wales has diverted 751 tonnes of food waste, whilst contributing to over 1.5 million meals.

iv. Welsh Government Carrier Bag Charge

Since 1 October 2011, there has been a minimum charge of 5p on all single use carrier bags in Wales. This charge was introduced to dramatically reduce the number of carrier bags used in Wales. It affects all retailers in Wales, not just those who sell groceries.

During 2009 in Wales we took home an estimated 350 million carrier bags from the major supermarkets alone. This is a staggering 273 bags per household, and does

not include the bags we pick up when shopping at high street stores and smaller shops. Single-use bags have not been around forever, but they have become part of our everyday life. The problem is that we tend to only use them once for shopping, which means they are wasted and can become a litter problem.

WRAP has reported that between 2010-12 carrier bag supply in Wales has reduced by as much as 81% in the supermarket sector. The WRAP findings are further supported by new research published in July 2013 by Welsh Government which looked at the use and reuse of carrier bags in both Wales and Scotland.

The report indicates that Welsh consumers now dislike using new single use carrier bags and that the use of bags for life and other reusable bags is becoming second nature. The study reports that the success is primarily in supermarkets but acknowledges that real progress is also being made on the high street and in small independent stores.

The charge has also resulted in more money for charities and not for profit organisations, as the Welsh Government has called on retailers to pass proceeds from the 5p charge onto environmental or good causes. Since the introduction of the charge, over a sample of retailers' records shows that £4 million has been earmarked or donated to good causes in Wales.

e) Support from the sector for behavioural change and awareness campaigns to reduce post consumer wastes

Consumers need to know where food comes from and realise its value; this in turn will lead to less wasteful forms of production, distribution and consumption. It will strengthen local economies and build resilience in food supply chains. Consumers also need to better understand the impact of their consumption behaviour, including how they shop and manage what they purchase. This includes, for instance, understanding date labels on food packages and how to store food and drink correctly at home to keep it fresher for longer. Retailers have an important role to play in helping raise awareness of these types of issues, thereby helping their customers to identify what they can do differently to become less wasteful.

WRAP are working with a national supermarket to deliver a pilot project testing Community Based Social Marketing (CBSM) techniques in one of their stores in South Wales (during autumn 2014). The objective is to change the way consumers in the store buy and use their packaging and help keep their food fresher for longer, thereby reducing the amount of food they waste. In addition information will be provided to customers explaining that food waste is an issue and that they can save money by taking steps to reduce the food they waste. A number of CBSM interventions will be utilised from prompts on shelves to face to face engagement between customers and local Coop members/ LFHW champions.

The Welsh Government are working with Waste Awareness Wales (WAW) and WRAP to deliver the UK wide Love Food Hate Waste (LFHW) campaign in Wales. Two LFHW cascade trainers are delivering training to community groups, businesses and third sector organisations with a view that once trained, individuals will go on to

train, friends, family, peers at work and within other organisations. The LFHW 10 cities campaign was launched on 11 September 2014 in Cardiff working with LAs and retailers, with focused communications activity in each city linking to the UK wide campaign.

f) Existing legislation for food packaging waste prevention

The following legislation helps reduce food and packaging waste produced by the sectors covered in this plan:

Packaging Essential Requirements Regulations 2003 (amended 2004, 2006, 2009): The Regulations implement provisions of the European Parliament and Council Directive on Packaging and Packaging Waste (94/62/EC) ("the Directive") relating to the essential requirements to be satisfied by packaging in order to circulate freely on the single market. The *'essential requirements'* in the European Packaging and Packaging Waste Directive are measures which ensure that packaging designed in one Member State may be placed without barrier on the market of another Member State so long as it meets the requirements. They set a unified goal at the EU level for minimising the environmental impact of packaging. The Essential Requirement Regulations place a range of requirements on all packaging placed on the market in the UK including those related to packaging volume and weight. This should be limited to the minimum adequate amount to maintain necessary levels of safety, hygiene and consumer acceptance for the packed product. These are enforced by Trading Standards Officers represented by Local Government Regulation (formerly Local Authorities Coordinators of Regulatory Services (LACORS) in the UK. The effect of these regulations has so far been very limited, with very little enforcement action undertaken. The Department for Business Innovation and Skills publishes guidance every 12-24 months and recent guidance was published by the Department for Business Innovation and Skills in 2013. The Welsh Government will investigate with Welsh Local Government Association (WLGA) how the Packaging Essential Requirements can be used more effectively within Wales.

g) Deposit/Return schemes

Mandatory deposit/return schemes (e.g. for beverage or soft drink containers) are a tool for government that has been applied successfully in some other EU countries. However, it is concluded that such schemes would only have a major impact on waste arisings if they applied to packaged products widely used in Wales, and thus such schemes could only really work on a UK level. Research also suggests that the cost of implementing such a scheme would be significant, but that this may be negated by the avoided cost of managing litter deposits.

The Scottish Government has, through Zero Waste Scotland, trialled reverse vending in a number of locations and commissioned a feasibility study on deposit refund schemes. Conclusions will be considered by the Scottish Government following the feasibility study and shared with the Welsh Government for consideration.
The Welsh Government will keep under review the feasibility of introducing a deposit/return scheme in Wales.

3.4.8 Waste prevention indicators and review of progress

3.4.8.1 Monitoring and measuring

Table 5 identifies our indicators for waste prevention. The Welsh Government will be liaising with other Associations and trade bodies with regards to their reporting tools already in place or being developed. If this proves in-effective then full commercial and industrial waste surveys will be commissioned. These are a last resort due to cost implications.

Table 5: Indicators for waste prevention

What we will monitor	How	By Whom
Quantity of waste produced (this will be related to growth of sector where possible)	Via existing reporting tools/waste arisings surveys	Welsh Government
No and size of signatories to responsibility deals	Via programme reports/ waste arisings surveys	

Surveys, if used, will produce an estimate of waste arisings from the commercial and industrial sectors, and will be analysed to identify sectors that are performing well, and those where improvements may be needed. The Welsh Government will share examples of best practice and successful initiatives, and will update the actions in the plan to ensure that collectively we meet the target.

3.4.8.2 Review

It is accepted that waste prevention will become an increasing priority as higher proportion of waste is driven up the hierarchy. Consequently, the Welsh Government will carry out an ongoing review of how much waste can be reduced and what guidance is required to assist with the greater reduction of waste.

3.5 Recycling (encompassing composting and anaerobic digestion)

3.5.1 Introduction

Recycling is the next best option for wastes that cannot be prevented or prepared for re-use. This section covers what the FMSR Sector needs to do in respect of recycling, and the support the Welsh Government will provide.

3.5.2 What counts as recycling?

The 2008 **Waste Framework Directive** states in Article 4 that the following waste hierarchy shall be applied as a priority order in waste prevention and management legislation and policy:

- *Prevention*
- *Preparing for reuse*
- **Recycling**
- *Other recovery – e.g. energy recovery, and*
- *Disposal*

The 2008 **Waste Framework Directive** defines recycling in Article 3(17) as being: Any recovery operation by which waste materials are reprocessed into **products, materials or substances** whether for the original or other purposes. It includes the reprocessing of organic material but does not include energy recovery and the reprocessing into materials that are to be used as fuels or for backfilling operations.

3.5.3 The benefits of recycling and anaerobic digestion

Reducing our ecological footprint

The closed loop recycling of quality materials from all waste streams is of fundamental importance and is a key aspect of the sustainable development led approach of Towards Zero Waste. Delivering high quality recycling can make significant reductions in the ecological footprint of waste for the different sectors (based on modelling zero annual growth in arisings) as shown in Table 6.

Table 6: Percentage reduction in Ecological Footprint of waste achieved by 70% recycling

Sector	Ecological Footprint reduction resulting from 70% recycling
Commercial and Industrial	3 – 9% (depending on technology)

Source: Ecological Footprint Impacts of the Welsh Waste Strategy, ARUP, May 2009

Recycling organic matter back into the soil

It is the Welsh Government's policy that biowaste that cannot be prevented or reused should be recycled back into the soil where beneficial. Compost and Anaerobic Digestion (AD) digestate (bio-fertiliser) are natural, safe and environmental alternatives to inorganic fertilisers. They also provide significant long term benefits for the soil – and financial benefits for farmers and growers.

The financial benefits of using compost and AD digestate in agriculture include:

- Higher yields - compost and AD digestate increases organic matter in soil and improves soil structure and fertility and can increase a crop's yield potential. The organic action of compost can help to inhibit pests and diseases within the soil.
- Fertiliser substitution – compost and AD digestate contains crop-available nutrients which will help save costs. Slow release of useful P and K content can improve soil indices and reduce or remove the need for additional fertilisers.
- Better water management – compost and AD digestate can prevent heavy soils becoming water logged by increasing water infiltration. It will also help light soils hold on to water, making it available for crop growth during dry periods.
- Fuel savings and traffic tolerance – compost and AD digestate improves soil structure, making it easier to work whilst using less fuel. Improving soil structure will make it more resistant to compaction from traffic and will extend the conditions in which it can be worked.

In addition to the above there are the following benefits for landscaping and regeneration:

- Topsoil can be difficult and expensive to source and is a precious, finite resource.
- Compost offers a financially competitive and sustainable alternative to the importing of topsoil. BSI PAS 100 compost can be mixed with recycled inert materials such as surplus low quality soils or even crushed stone. The inert material provides a consistent, stable material and the compost provides the nutrients and minerals required for root development. The mixture of compost with existing indigenous soils can improve soil structure, reduce compaction in the surface layer, improve water holding capacity, improve soil drainage and significantly reduce the loss of nutrients into the groundwater.

Bio-fertiliser (AD digestate) can be used as a whole liquid digestate or a fibre fraction; it has the advantage of containing significant amounts of highly crop available nitrogen and useful amounts of potassium and phosphorous also. It can be used to reduce or replace chemical NPK fertilisers, which are a finite resource and currently cost approximately £300 / tonne.

Generation on renewable energy

In addition to delivering the key policy aim to recycle the organic matter and nutrients in biowaste back into the soil, AD also generates a valuable renewable fuel in the form of biogas. This can be used as follows:

- To generate renewable electricity.
- As a vehicle fuel.
- For injection into the natural gas grid.

The use of the biogas as a renewable fuel displaces the use of fossil fuels, with all of the greenhouse reduction benefits that this brings.

Jobs and Skills

In terms of job creation, research[14] shows that recycling creates approximately ten times more jobs than incineration or landfill per tonne of material processed.

It is estimated there are currently:

- 4,630 people employed in the waste collection, sorting and disposal businesses in 2008, and
- 10,000 people currently employed in the waste management industry in Wales[15].

Research shows that implementing a 70% recycling rate by 2025 would potentially create new jobs in Wales in the order of:

- 3,600 new jobs across municipal, commercial and industrial (including construction and demolition) sectors.
- 2,600 new jobs in the municipal sector alone.

Many of the jobs created (1,947) occur from 2008 to 2015.

In 2012, 9,700 people were employed within the Food and Drink Sector.

3.5.4 Key Objectives

In order to meet the key milestones and key social, economic and environmental outcomes identified in 'Towards Zero Waste', the following recycling objectives are identified for the sectors covered by this plan.

1. To achieve the waste recycling targets set in EU Directives and in 'Towards Zero Waste' in a cost effective manner.
2. To ensure high quality recycling, ensure the development of separate collections of waste to meet the necessary quality standards for the relevant recycling sectors (with a high priority to closed loop recycling or 'upcycling'), and to ensure that separate collection is developed for at least the following: paper, metal, plastic and glass (as required by Article 11 of the Waste Framework Directive). To also encourage the development of separate collection systems to include the collection of food waste, wood and card in Wales.

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14 More Jobs Less Waste' Friends of the Earth Report September 2010.

15 EU Sector Skills Sector Skills Agreement Stages 1 and 2.

3. To ensure adequate markets for recyclate, compost and AD digestates produced by the waste management industry in Wales through encouraging manufacturers in Wales to use more secondary materials (recyclate), rather than primary raw materials.
4. To ensure the collection and delivery to reprocessors / end users of high quality recyclate, meet relevant end-of-waste criteria (or Quality Protocols) and that the recyclate is used in closed loop applications (ideally in Wales), that maximise the reduction in ecological footprint and carbon footprint, with as much use as possible in Welsh manufacturing operations.
5. To ensure the source segregation of recyclable wastes by all businesses in Wales, with a focus on food, paper, card, wood, metal, plastic, glass, textiles, WEEE and batteries.
6. To achieve the separate collection of biowastes for the composting of green waste and anaerobic digestion of food waste, with priority given to recycling the treated biowastes by returning them back to the soil as a product meeting relevant end-of-waste criteria or Quality Protocols.
7. To send food waste to anaerobic digestion plants to generate valuable renewable energy and fertiliser.
8. To encourage businesses to recycle their wastes on site, where feasible, especially in respect of processing recyclable biowastes on site.
9. To ensure a focus on the reuse and recycling of packaging waste, including making packaging more recyclable and increasing recycled content.
10. To ensure collection and sorting systems are flexible enough to cope with all likely future changes in waste composition.
11. To ensure recycling operations are as sustainable as possible; this means a focus on local, closed loop systems where appropriate. Sending material to end markets which down-cycle the material should be avoided where possible.
12. To ensure that the waste industry is developed to benefit Wales economically by retaining the value of Welsh recyclate/compost/AD digestate and the potential reprocessing of these materials in Wales wherever possible.

Although this plan examines all wastes produced by the FMSR sector in Wales, it should be noted, as stated earlier, that the plan focuses on the recycling of specified priority materials which are: food waste and associated packaging.

3.5.5 Targets for recycling

Targets in Towards Zero Waste

Towards Zero Waste sets 70% recycling targets by 2025 for commercial and industrial waste. Specific targets, including those for intervening years, are highlighted in Table 7.

Table 7: Towards Zero Waste Recycling targets for Commercial and Industrial Waste (extract from Towards Zero Waste)

Targets for	Years		
	2015/16	2019/20	2024/25
Commercial waste –Preparation for reuse and recycling (including composting and AD) (%)	57	67	70
Industrial waste –Preparation for reuse and recycling (including composting and AD (%)	63	67	70

In order to achieve the overall targets identified in Table 7, the more easily recyclable materials – such as food, plastic, paper, metal and glass – need to be recycled at higher rates.

Targets in European and UK legislation

Targets have also been set via European Directives which are transposed into UK regulations. Refer to paragraph 3.3 (overarching objectives).

3.5.6 Recycling Actions

The evidence obtained by the Welsh Government has identified that significant amounts of potentially recyclable material are still being sent for disposal, particularly from the commerce sector. Actions in this section will look to increase the quantity of material diverted from landfill to the preferred management method.

In addition, reprocessors in Wales cite inappropriate quality of the provided recyclate as a reason for sourcing material from outside Wales, again indicating that the development of a collection system providing a large quantity of high quality material is key to achieving the objectives defined in Towards Zero Waste.

Delivery of a high quality recyclate stream will mean that a greater range of markets is available for Welsh recyclate and the option to access more environmentally beneficial management routes (closed loop recycling) is available.

For wastes produced by businesses and the public sector there remain a number of barriers and market failures in place that affect the likelihood of recycling levels increasing. There are indications that some form of intervention is required by the Welsh Government to ensure there is an efficient and effective collection system in

place, to increase the volume and quality of recyclates from business. Meeting the 70% recycling targets will be particularly challenging in respect of commercial waste.

Too much waste that can be recycled is still being landfilled. A study commissioned by Environment Agency Wales[16] indicates that half a million tonnes of waste (worth £30 million) that could have been recycled was sent to landfill in 2005. The vast majority of this waste is 'mixed' waste that is not segregated and contains a mixture of wastes very similar in composition to household waste. The majority of this waste – up to 77% - can be prepared for reuse, recycled or composted if it is separated at source. Cardboard boxes and containers are the largest component of the business waste making up 15% (or 100,000 tonnes) of the total. Kitchen waste made up 13% (90,000 tonnes).

A recent study was commissioned by the Welsh Government on 'Market Failures in the Collection of Commercial and Industrial Waste in Wales'. This study evaluated the level of recycling performance (compared against the recycling targets in 'Towards Zero Waste' and the material recycling targets in this plan), that would be expected to be achieved in the absence of interventions over and above the landfill tax escalator. For commercial waste, the study indicated that the 2015 recycling target will only just be met by the Landfill Tax escalator alone.

For industrial waste, the study indicated that the 2015 target will also only just be met by the landfill tax escalator alone. Thereafter there is a shortfall and the targets will not be met.

Having established that some of the targets will not be met through the Landfill Tax escalator alone, the study then evaluated the key market failures as the basis for further work on possible interventions. The report identified that the issue of collection is the more significant one for commercial wastes. Where industrial wastes are concerned, it is the availability of treatment capacity which is likely to have been the more pressing constraint.

In addition to increasing the collection of business recyclate across the board, attention also needs to be paid to glass, plastic, card and food for the following reasons:

- Glass is mainly prepared for recycling as secondary aggregate. This is not the best environmental option for glass. Colour separation is essential to improve the end destination of this material, and there is insufficient capacity to colour-separate glass in Wales, either by separate collections or by use of specialist separation technology.
- Plastics should be separated by type and polymer to ensure that quality, closed loop recycling can take place. There is currently insufficient capacity to separate mixed plastics in Wales.

16 Determination of the Biodegradability of Mixed Commercial and Industrial waste landfilled in Wales. SLR on behalf of Environment Agency Wales.

- Card is present in large quantities in mixed residual waste in the commercial waste stream and this needs to be separated out at source for recycling.
- Food similarly is present in significant quantities in the mixed residual commercial waste stream. It needs to be separated out at source to facilitate collection for AD.

Actions will focus on the key recycling objectives that have arisen from the earlier analysis of the current situation and which are key to delivering Towards Zero Waste, as follows:

- Businesses source segregating food and packaging materials that are currently arising in the mixed waste stream, and thus increasing recycling rates on site.
- Provision of a universal separate collection service for packaging and food waste.
- Recyclate to be recycled closed loop or 'up-cycled', ideally in Wales.
- Food waste to be sent to anaerobic digestion plants (where reuse, e.g. as animal feed, is not possible).
- Increasing the recyclability of packaging.
- Increasing the recycled content of packaging.
- Increasing the recyclability of wastes.

a) Increasing the recyclability of products and packaging

Currently there are a large number of products and packaging formats on the market, some of which are difficult to recycle. This variety can make recycling more difficult not only in terms of separating different materials from each other, but also for members of the public to recognise and recycle appropriately. In addition, some of the products and packaging formats are not recyclable in their current form. A rationalisation of these materials (where appropriate) could simplify recycling systems.

WRAP, through the Product Sustainability Forum and Courtauld, is already working with a number of manufacturers of packaging and products to investigate the development of more easily recyclable items.

The Welsh Government will continue to support this work.

Collection of recyclate

b) Mandatory provision of a separate collection service for paper, metal, plastic and glass

Article 11(1) of the Waste Framework Directive includes requires Member States:

- To "take measures to promote high quality recycling and, to this end," to "set up separate collections of waste where technically, environmentally and economically practicable and appropriate to meet the necessary quality standards for the relevant recycling sectors"; and
- To set up separate collection "for at least the following: paper, metal, plastic and glass" by 2015.

The specific obligation to collect at least the four materials by 2015 is subject to Article 10 (2) of the Directive which states:

- Where necessary to comply with paragraph 1 and to facilitate or improve recovery, waste shall be collected separately if technically, environmentally and economically practicable and shall not be mixed with other waste or other material with different properties."

This Article in turn has referred to Article 10 (1) which states:

- Member States shall take the necessary measures to ensure that waste undergoes recovery operations, in accordance with Articles 4 and 13.

The Waste (England and Wales) Regulations 2011 transpose the revised Waste Framework Directive in England and Wales.

Regulation 13 of the Waste (England and Wales) Regulations 2011, amended in 2012, implements the Article 11(1) requirement of the Waste Framework Directive to set up separate collection for paper, metal, plastic and glass by 2015. This applies to wastes from businesses and public bodies as well as from householders. It places a new requirement on local authorities, private waste companies and the social economy enterprises that collect waste materials to offer separate collections of paper, metal, plastic and glass by 1 January 2015. Guidance on the separate collection requirement has been consulted on[17]. Final guidance will be provided by the Welsh Government in autumn 2014.

c) Further interventions to secure greater recycling of industrial and commercial waste, especially for food and cardboard waste

There is market failure in terms of the adequate provision across the whole of Wales of a comprehensive recyclate collection service from businesses. This needs to be addressed to ensure that the recycling targets set in 'Towards Zero Waste' are met. This market failure will be partly addressed through the requirement on all waste collection undertakings to provide from 1st January 2015 a separate collection service for paper, glass, metal and plastic for householders and businesses. However, this, and the planned increase in Landfill Tax are likely to go only part of the way to ensuring that the recycling targets are met. Just because a recyclate collection service is in place does not mean that all businesses will use it. It is also possible for some businesses the increase in Landfill Tax will have little direct impact on their bottom line. Also, the separate collection service requirement under Article 11 of the Waste Framework Directive only covers four recyclate materials, and does not cover others such as food, card, wood and garden waste. All of these will need to be collected and recycled in order for the recycling targets for business to be met.

In securing additional recycling of business waste, collections need to focus on the priority waste materials identified in 'Towards Zero Waste'. Food waste has been identified as a priority material for reduction and recycling in 'Towards Zero Waste'

17 http://wales.gov.uk/consultations/environmentandcountryside/separate-waste-collection-guidance/?lang=en.

because of its significant contribution to the ecological and carbon footprints of waste. It is also a component of the municipal biodegradable waste that needs to be diverted from landfill in order to meet the Article 5 Landfill Directive targets (in this context “municipal” waste also includes most commercial waste). A key priority is to remove it from landfill by collecting it separately, and recycling back to the land following AD that also generates a valuable renewable fuel.

There is an imperative to make a step change in the amount of food waste collected separately from businesses, changing from a very low rate of separation at present to a level of at least 80% capture in the commercial waste stream and 90% capture in the industrial waste stream by 2025. Action is needed now so that the network of AD facilities currently being procured for the food waste collected from households by local authorities can also be sized appropriately for the food waste generated by the industrial and commercial waste sectors. Timing is critical in order for economies of scale to be achieved, and the most favourable financial position attained for all parties.

The Welsh Government consulted on the following proposals to increase the recycling of business waste in the Environment Bill White Paper[18] between 23 October 2013 and the 15 January 2014:

- A requirement for businesses and the public sector to present specified recyclable waste materials separately for collection;
- A requirement for persons who collect waste to collect specified recyclable waste materials separately;
- A ban on the incineration of specified waste materials;
- A ban on the landfilling of specified waste materials; and
- A ban on the disposal of food waste to sewer.

The Welsh Government published its consultation summary in March 2014 and is currently considering the further development of these proposals following responses received to the consultation.

d) Supporting business to secure high quality recycling of business waste

Towards Zero Waste emphasises the need for high quality collections of recyclate to achieve the required sustainable development outcomes. This is reinforced by the requirement of the Waste Framework Directive for member states to take measures to promote high quality recycling, and to achieve this via separate collections of waste where technically, environmentally and economically practicable (TEEP) and appropriate to meet the necessary quality standards for the relevant recycling sectors (Article 11(1, sub-paragraph 2)).

18 http://wales.gov.uk/consultations/environmentandcountryside/environment-bill-white-paper/?lang=en

Businesses, especially SMEs, will need to understand the requirements of the Waste Framework Directive and the policies, outcomes and targets laid out in Towards Zero Waste (and the sector plans) and the practical steps that they need to take.

The Welsh Government will ask WRAP to identify and communicate best practice on the segregation and separate collection of high quality recyclable materials from businesses and the public sector. This will identify how high quality recyclable materials can most cost effectively be collected separately from businesses, and in a way that minimises contamination. The aim will be to try to achieve the same high quality outputs as obtained by the kerbside sort method that is preferred for the collection of recyclables from households. The Welsh Government will also ask WRAP to provide guidance to businesses on how to segregate biowastes.

e) Support and encourage 'recycling on the go' collection systems

In September 2012, WRAP Cymru launched the Welsh Government funded Recycle on the Go (RotG) project to develop Wales' out-of-home recycling infrastructure and thus help normalise good recycling behaviours. The project comprised grants of up to £50,000 for businesses, local authorities and third sector organisations looking to introduce out-of-home recycling facilities, together with good practice technical and communications guidance and bilingual communications templates.

The grant fund closed in March 2014, by which time it had awarded £497,000 to 33 different organisations including local authorities, colleges and universities, events, hospitals, tourist attractions and holiday parks. Together, these have placed 1,561 bins across 156 sites Wales.

Case studies of the projects are now available on the WRAP Cymru website[19], along with the technical guidance and communication guidance; the communication templates are free to download from the WRAP Partners site[20].

The Welsh Government will explore, with WRAP, whether this initiative can be extended.

f) Provision of a directory of recycling companies

WRAP will undertake an exercise to develop an online directory of waste companies that collect and/or manage recyclate.

g) Recycling business support

Support for recycling companies in Wales is provided through two main routes. General support is provided through the Welsh Government's Department of Economy, Science and Transport (EST) under the Business Wales support

19 http://www.wrapcymru.org.uk/content/recycle-go-wales

20 http://partners.wrap.org.uk/collections/116/

programme, and more targeted support is provided through schemes run by WRAP with Welsh Government funding support.

h) Allowing businesses to use household waste recycling centres(HWRCs) or Civic Amenity (CA) sites (for recyclate only)

Local authorities are encouraged to allow businesses to deposit recyclable wastes at HWRC or CA sites, for a charge that would fully recover costs. Potentially HWRCs and CA sites could play an important future role within Wales, as there is sufficient unused potential capacity for HWRC and CA sites to take in recyclable materials from businesses. The Welsh Government is working with the Welsh Local Government Association to undertake an investigation to examine the potential to utilise these facilities to receive business waste for recycling and also become centres for receiving items for reuse and preparation for reuse from businesses.

i) Extending kerbside recycling services for business wastes

Local authorities are encouraged by the Welsh Government to extend kerbside recyclate collection services for businesses. Recycling collection from businesses varies widely dependent on the type of business and its proximity to other waste producers. The Welsh Government will ask WRAP to explore with local government in Wales the potential for enhanced trade waste recycling collection services to be introduced, where the private waste management sector does not provide a sufficient service.

j) Reporting on recycling performance by expanding the network of Waste Management Organisations inspected to PAS402:2009 via Green Compass Scheme

PAS 402:2009 is a BSI published specification for waste management organisations to demonstrate their performance. Sponsored by Constructing Excellence in Wales with funding from Welsh Government, the specification was developed with the waste management industry to provide guidelines for the reporting of performance. It requires waste resource management organisations to make an assessment of their performance and calculate their achieved landfill diversion and materials recovery rates against a defined methodology.

The accredited Green Compass Scheme provides the inspection framework for PAS 402, enabling waste management organisations to obtain independent third party inspection to verify their performance data.

Constructing Excellence in Wales has received funding from the Welsh Government and Welsh European Funding Office, to provide support to Welsh waste management organisations to achieve PAS 402 via the Green Compass Scheme.

The Welsh Government wishes to see all waste management companies in Wales operating to PAS 402:2009 Waste Resource Management – Specification for performance reporting and waste producers.

Waste producers are encouraged to use Green Compass companies or encourage their existing producer to engage on the specification.

k) Development of markets for recyclates in Welsh manufacturing

TZW sets an objective that the waste industry in Wales maximises carbon and ecological footprint reduction via the most effective outlet for the dry recyclates and digested food waste. This means a focus on developing closed loop recycling within Wales wherever possible. This requires investment in reprocessing infrastructure, including the use of secondary raw material in Welsh manufacturing and agriculture (for AD digestate). Provision of a consistent, high quality recyclate and biowaste stream to supply these businesses will help create the environment for this investment in Wales.

Currently the amount of recycled material being incorporated into products and packaging produced and consumed in Wales is variable. Products such as newspapers and metals already have a high recycled material content. However, this is less true for other materials such as plastics, magazines and glass. Development of recycled content specifications for these materials will create a more stable market for these products facilitating investment in these reprocessing industries.

Another barrier to the incorporation of recycled content into products and packaging is that of perception. Manufacturers may consider that by incorporating recycled material into their products and packaging, their goods may be perceived as poorer quality and not fit for purpose.

l) Actions to develop recyclate markets in Wales are as follows:

i. Working with Welsh manufacturers to increase the amount of recycled content for the target materials

WRAP provides support to manufacturing companies to assist them in increasing the recycled content of their products or packaging (See waste prevention actions).

WRAP is also researching barriers to the recycling and recyclability of key materials; aluminium, plastics and glass. These projects include:

- Development of a food grade recycling process for polypropylene.
- Categorisation of plastics based on their recyclability, similar to the categories established for PET bottles.
- Development of a road map for PET recycling in the UK.
- Promotion of a recycled content protocol for plastics.

ii. Promotion of agreements to incorporate recycled content into products and packaging

Agreements to incorporate greater amounts of recycled content into products and packaging should create greater demand for Welsh recyclate, for example the Courtauld Commitment mentioned previously.

Guaranteed end markets for recycled materials (especially plastics) may also promote investment in plastics infrastructure and remove the need for Government intervention to create markets for this material. This creation of a requirement for recycled content level for packaging and products where appropriate may facilitate this. The Welsh Government will discuss this further with WRAP and the other UK administrations.

iii. Development of standards for the incorporation of recycled content into packaging and products

In order to overcome the perceived issue that recycled content may not be "fit for purpose" the Welsh Government will work (via WRAP) with other UK Governments and trade bodies, to develop standards for the incorporation of recycled content into products and packaging where appropriate.

iv. Demonstration of recycled content incorporation into products and packaging

WRAP have already developed a number of case studies illustrating the successful incorporation of recycled content into products and packaging formats. The Welsh Government will continue to support WRAP in the development of these case studies and good practice guidance to encourage businesses to use recycled content in their manufactured goods, thus developing markets for Welsh recyclate.

v. Recycled Content Procurement

The Welsh Government will further stimulate demand for recyclate by investigating the development of a requirement for public bodies in Wales to procure products with high levels of recycled content. It will also ask WRAP to support public sector bodies in Wales to sustainably procure items with a high recycled content. The Welsh Government (via WRAP) will work with large organisations to do likewise for their own supply chains by facilitating responsibility deals where appropriate.

m) Support Changes to the PRN system

In the case of glass, there is a market distortion that results in a large quantity of glass being used as an aggregate – an "open loop" recycling operation that has undesirable environmental outcomes (a low embedded energy material – stone – is being replaced by a high embedded energy material – glass). This does not comply with the closed loop objective laid down in Towards Zero Waste. Nor does it comply with the high quality recycling objective of the Waste Framework Directive. The market distortion results from the use of the Packaging Recovery Note (PRN), issued under the Producer Responsibility Obligations (Packaging Waste) Regulations 2007). The PRN system enables companies to pay for the recovery and recycling of an equivalent amount of packaging to that used in their production operations and so offset their obligations under the Regulations. It is currently possible to claim PRN revenue for recycling glass into aggregate making this end market a viable option of glass recyclate. The availability of this end market, its perceived low cost (because of the PRN subsidy) and the less rigorous quality requirement of recycled glass used as an aggregate has meant that collection schemes have not been designed to produce

a high quality closed loop glass recyclate stream.

Around 30% of glass in the UK is recycled as aggregate and in Wales around 75% of the glass handled in accredited packaging reprocessors in Wales was recycled as aggregate. The amount of recovered container glass destined for uses other than re-melt, including aggregates, has more than doubled in the UK since 2005.

To achieve the best environmental outcome, there is a need to encourage more glass to go to closed loop re-melt applications and reduce the amount of glass going into aggregates over time.

At the end of 2011 the UK Government and Devolved Administrations consulted on the next phase of packaging recycling targets for the proposed period 2013 – 2017. Following the consultation, the four UK Nations have agreed a new target for glass should be set at:

75% for 2014 with 65% remelt
76% for 2015 with 66% remelt
77% for 2016 onwards with 67% remelt.

This change will ensure that the increased amount of material recycled as a result of this new target will achieve a better environmental outcome.

3.5.7 Monitoring and measuring

The following indicators will be used to monitor progress (Table 8).

Table 8: Indicators to measure progress on recycling, composting and anaerobic digestion

What will be monitored	How	By Whom
Quantity of recycling by sectors	Via waste arisings surveys	Welsh Government

3.6 Other recovery of source separated wastes

3.6.1 Introduction

This section covers a part of the waste hierarchy that is of less significance than the other parts; hence it is dealt with in less detail. But nonetheless, there are some important issues that need consideration and the section focus on these.

3.6.2 Definitions

Other recovery of source separated waste streams

Waste hierarchy

The **Waste Framework Directive** states in Article 4 that the following waste hierarchy shall be applied as a priority order in waste prevention and management legislation and policy:

a. *Prevention*
b. *Preparing for reuse*
c. *Recycling*
d. **Other recovery**, and
e. *Disposal*

The **Waste Framework Directive** defines recovery in Article 3 (57) as being:

- 'recovery' means any operation the principal result of which is waste serving a useful purpose by replacing other materials which would otherwise have been used to fulfil a particular function, or waste being prepared to fulfil that function, in the plant or in the wider economy. Annex II sets out a non-exhaustive list of recovery operations.

Annex II includes the following recovery operations which can apply when a separated waste stream has been used in an application where it has either not met the relevant end of waste criteria, or national quality standard, and is thus still a waste.

- R 1 Use principally as a fuel or other means to generate energy – for example the use of contaminated waste wood as a fuel.
- R 10 Land treatment resulting in benefit to agriculture or ecological improvement – for example where green or food waste is applied directly to land without prior biological treatment (composting or AD).

3.6.3 Benefits

For certain separated wastes, optimised energy recovery options offer the best environmental option due to their mixed nature or lack of preparation for reuse or recycling options. These include (but are not necessarily limited to):

- Treated, coated or composite wood and wood products which cannot be feasibly prepared for reuse or recycled – e.g. chipboard, melamine, and certain furniture items.
- Mixed and composite low-grade plastic residues.
- Mixed textiles and fabrics. (i.e. low grade flooring materials, mattress flock etc).
- Low grade or contaminated paper and card (i.e. food packaging etc).
- Mixed low-grade combustible waste streams (i.e. vehicle fragmentation fluff).

When considering such wastes, the efficiency of the energy recovery facility is key to ensuring that the material is managed in the most appropriate manner, and each waste stream needs to be considered on its own merits.

As well as the recovery of energy, “other recovery” also includes activities such as the spreading of biowastes to land, for agricultural or ecological benefit. The materials are spread as waste and are subject to the controls of the Environmental Permitting Regulations 2010. This is only allowed if agricultural/ecological benefit can be proven, and no environmental harm occurs.

3.6.4 Specific Objectives

In order to meet the key milestones and key social, economic and environmental outcomes identified in Towards Zero Waste, the following other recovery objectives are set:

- To ensure that source separated waste streams that cannot feasibly be recycled are recovered in an environmentally and economically beneficial way.
- To ensure that the recovery of source separated waste streams only takes place where this is the preferred route for these waste streams, taking into account the waste hierarchy and a life cycle approach.

3.6.5 Other Recovery Actions

In order to ensure that the best sustainable development outcomes occur for certain wastes, including biowastes and “difficult” wastes that cannot easily be recycled, the following actions are set.

Other recovery of untreated food waste

a) Landspreading of untreated food waste

Historically, significant tonnages of untreated food waste have been recovered via landspreading. There are potential environmental risks associated with spreading untreated food waste. It also means that the additional benefits which would be realised through AD (principally the generation of renewable energy) are being lost.

This landspreading activity is now more stringently controlled than it has been in the past and is not suitable for all food wastes.

The Welsh Government is promoting AD as the recycling route for food wastes in preference to landspreading as identified in TZW. The more stringent permitting requirements for landspreading these materials may make this route less economically attractive.

The Welsh Government will work with the food manufacturing industry via the FMSR Sector Plan to encourage the AD of food waste as a more sustainable way of managing this waste, rather than landspreading it in an untreated fashion.

b) Sink disposal of food waste

Food waste disposal units (FWDUs) are macerators or grinders which are usually installed in the kitchen sink outlet (in both domestic and commercial catering operations). Most foods are reduced to small particles and are flushed via the sink drain into the public sewer. As an alternative to kerbside collection of food waste, the use of FWDUs offers an opportunity for the diversion of food waste to sewer for co-treatment, through anaerobic digestion or composting (where in place), with sewage. It avoids the vehicle transportation of the food waste. The food waste from the FWDUs ends up mixed with sewage, which often contains trade effluent discharges. The output from a compost or AD plant processing sewage cannot comply with the relevant Quality Protocols, and the application to land of the resulting compost or digestate will be classified as “other recovery” process rather than as a recycling process. The recovery of food waste via FWDUs and the landspreading of the resultant sewage sludge thus come below recycling in the waste hierarchy.

Concerns about the use of FWDUs for the disposal of food waste via the sewage system have been raised by the water industry (Water UK). There are various concerns about the extra loading on the sewerage system and sewage treatment works, and the possible problem of the impact of additional fats, oils and greases. There is also a concern that flushing the food waste down the sink perpetuates the “out of sight out of mind” attitude that is not conducive to influencing waste prevention behaviours by either householders or businesses. It also appears to be the case that often the water companies are unable to extract payment for the discharge of FWDU effluent into their sewers because of difficulties in identifying those carrying out this activity. As a result the “polluter pays” principle is not being adhered to.

The Welsh Government considers therefore that there is no justification to deviate from the waste hierarchy, which promotes the recycling of separately collected food waste to land (via either composting or AD) over “other recovery” (via the use of FWDUs with the resultant sewage sludge land spread).

The Welsh Government will work with the water companies to ensure the appropriate use of FWDUs for the disposal of food waste.

Energy recovery

c) Energy recovery for "difficult" wastes

The Welsh Government will encourage the development of appropriate energy from waste routes for separated combustible wastes that are difficult to recycle where this is the best environmental option as determined by life cycle thinking. Guidance on allowable deviations from the waste hierarchy has been published by the Welsh Government[21].

3.6.6 Monitoring and Measuring

The indicators are identified in Table 9.

Table 9: Indicators for other recovery of source separated wastes

What will monitor be monitored	How	Who
Waste arisings and how they are managed in Wales will be monitored and measured. This includes landspreading of untreated food waste, and the maceration of food waste.	Comprehensive, reliable and up to date data and information on the production of waste in Wales and its management will be obtained and reported. This will be obtained via surveys for commercial and industrial waste.	Welsh Government

21 http://wales.gov.uk/topics/environmentcountryside/epq/waste_recycling/publication/hierarchyguide/?lang=en

3.7 Recovery and Disposal of residual wastes

3.7.1 Definitions

Waste hierarchy (definitions)
The Waste Framework Directive states in Article 4 that the following waste hierarchy shall be applied as a priority order in waste prevention and management legislation and policy:

a. *Prevention*
b. *Preparing for reuse*
c. *Recycling*
d. **Other recovery**, and
e. **Disposal**

Article 12 of the Waste Framework Directive requires Member States to ensure that, where recovery in accordance with Article 10(1) is not undertaken, waste undergoes safe disposal operations in compliance with Article 13 (protection of human health and the environment). This requirement is fulfilled by means of the proposed transposition of Article 13 Protection of the Environment and Human Health.

3.7.2 The benefits of diverting residual waste from landfill sites and recovering energy

Reducing the landfill of biodegradable waste

In accordance with the hierarchy, waste that cannot be prevented, reused, prepared for reuse or recycled should be subjected to another form of recovery rather than being landfilled. Diverting biodegradable waste from landfill significantly reduces greenhouse gas emissions.

Both Towards Zero Waste (TZW) and the Climate Change Strategy commit Wales to reducing direct greenhouse gas emissions from the waste sector, by diverting biodegradable waste from landfill through:

- Diversion of all biodegradable municipal waste (collected by local authorities) from landfill by 2020;
- Diversion of other biodegradable waste (from 'other' municipal, commercial, industrial and construction and demolition sectors) from landfill by 2025.

It is estimated that this will deliver direct savings of 0.66 million tonnes of carbon dioxide equivalents (CO_2e) by 2020, against a 2007 baseline of 1.31 million tonnes of CO_2e as a result of the reduction in landfill methane emissions.

Landfill also has the potential to cause pollution via landfill leachate, and amenity problems in the case of smells, although both are strictly controlled through the setting and enforcement of environmental permits Natural Resources Wales.

The benefits of High Energy Efficiency Plant, and heat mapping

Evidence gathered by the Welsh Government[22] indicates that the treatment method most likely to deliver best the sustainable development outcomes identified in One Wales, One Planet and in TZW for residual waste is the "Use as a fuel of the residual municipal waste left after recycling in energy recovery plants with high energy efficiency".

Treatment of residual waste in high efficiency energy from waste (EfW) facilities yield significant reductions in greenhouse gas emissions, as compared to other treatment options that include an element of landfilling, as verified by life cycle assessment studies.

The evidence obtained by the Welsh Government referred to above, indicates that the best performing residual waste options are combustion facilities operating in 'heat only' or combined heat and power (CHP) modes, and pyrolysis/gasification options operating in CHP modes. For both cases, the greater the process efficiency, the better the environmental return. Maximum efficiencies on gasification and pyrolysis plants are lower than for combustion facilities – but more electricity can be produced in CHP mode by these facilities. In order to achieve these levels of efficiencies a use needs to be found for heat generated.

3.7.3 Specific Objectives

In order to meet the key milestones and key social, economic and environmental outcomes identified in 'Towards Zero Waste', the following recovery and disposal objectives are set:

1. To reduce significantly the amount of residual waste generated.
2. To eliminate the landfilling of waste, with a particular focus on biodegradable waste and hazardous waste.
3. To meet targets and ceilings (including maximum levels) set for recycling, EfW and landfill in TZW and the sector plans.
4. To ensure an adequate collection system for residual waste, including for hazardous waste.
5. To encourage businesses to treat their own residual wastes on site.
6. To deliver good carbon reduction outcomes from residual waste treatment plants (e.g. high-energy efficiency EfW plants).

22 'Modelling of Impacts for Selected Residual Waste Plant Options using WRATE' – a report to the Welsh Government. AEA plc, September 2009.

7. To ensure access to an adequate network of facilities for the treatment and disposal of hazardous waste.

3.7.4 Targets

European Landfill Limitation Targets

EU Landfill Directive

The Landfill Directive (1999/31/EC) sets targets for Member States to reduce the amount of biodegradable municipal waste sent to landfill. This was in line with its overall objective to prevent or reduce as far as possible the negative effects of landfilling on the environment, including reducing the production of methane gas from landfills, as well as any resultant risk to human health. The Directive includes a definition of municipal waste (Article 2) as:

“waste from households, as well as other waste which, because of its nature or composition, is similar to waste from households.”

It defines ‘biodegradable waste’ as:

“any waste that is capable of undergoing anaerobic or aerobic decomposition, such as food and garden waste, and paper and paperboard.”

These definitions are used as the basis for the landfill diversion targets included in Article 5(2) of the Directive. The UK’s targets (with the 4 year derogation as the UK stated that it landfilled more than 80% of its municipal waste in 1995) are to reduce the amount of biodegradable municipal waste (BMW) sent to landfill to:

- 75% of the total amount produced in 1995 by July 2010.
- 50% of the total amount produced in 1995 by July 2013.
- 35% of the total amount produced in 1995 by July 2020.

Member States may be subject to Infraction (with subsequent fines) if they fail to meet their targets.

In respect of the targets set in the Directive and the “municipal” waste covered, the UK’s approach is based on waste classified using the List of Wastes Decision (or the ‘European Waste Catalogue’. It means that a significant proportion of commercial and (some) industrial waste is included within the definition.

Table 10 shows the target for the amount of biodegradable municipal waste (BMW) that can be landfilled in Wales; these form part of the UK’s figures that have been agreed with the European Commission.

Table 10: Amount of BMW that can be landfilled each year according to the collection route

Category of BMW	Amount of BMW that can be landfilled in each target year (tonnes)		
	2010	2013	2020
BMW collected by local authorities	710,000	470,000	330,000
BMW collected by others (mostly commercial waste)	668,000	449,000	313,000
Total BMW	**1,378,000**	**919,000**	**643,000**

There is a requirement to ensure that the requisite reduction is made in the landfilling of BMW not collected by local authorities – this will largely affect commercial waste collected by private waste management companies. Compliance is monitored via quarterly landfill site returns that are reported by landfill operators to Natural Resources Wales.

In terms of compliance against the 2010 target, the BMW landfilled figure for Wales for 2009 has been estimated to be 781,007 tonnes, significantly within the maximum allowed of 1,378,000 tonnes. It is also within the target set for Wales for 2013.

Landfill targets for industrial and commercial waste

Following consultation on the CIM Sector Plan, the Welsh Government has set a cap for limiting the amount of landfill of industrial and commercial waste in Wales (Table 11).

Table 11: Landfill targets for industrial and commercial waste*

Year	09-10	12-13	15-16	19-20	24-25
Maximum level of landfill of industrial and commercial waste (%)	-	-	-	10	5

*The 30% target will be for the waste produced, rather than waste managed.

Energy from waste ceiling

Industrial and commercial waste

As there is a target of 70% recycling for 2024/25, the maximum proportion of industrial and commercial waste that can go to EfW is 30%.

Table 12 identifies the new EfW ceiling for industrial and commercial waste that has now been set in the CIM Sector Plan.

Table 12: Energy from Waste ceilings for the industrial and commercial waste

Year	09-10	12-13	15-16	19-20	24-25
Maximum level of energy from waste of industrial and commercial waste (%)	-	-	-	-	30

The Welsh Government proposes to allow the recycling of processed Incinerator Bottom Ash (IBA) to count towards recycling targets as long as it meets an appropriate Quality Protocol (if one is agreed; work is underway to determine whether one can be developed), or relevant End of Waste criteria as agreed on a case by case basis with the Natural Resources Wales. If the recycling of IBA is counted as recycling, then the ceilings on energy from waste would be net of any recycling of IBA.

3.7.5 Actions

Introduction

The Welsh Government recognises that in the medium term (until all products are designed in way that can be recycled and the markets are available to recycle all of them), there will be waste arisings in Wales which cannot be recycled easily or cost effectively. These residual wastes need to be collected appropriately and treated in a sustainable way in Wales as far as possible, in accordance with the waste hierarchy which places priority to "other recovery" over disposal. High efficiency (EfW) options are the optimal management route for these wastes that cannot be prevented or recycled.

In order to ensure that the recovery of residual waste activities in Wales deliver the key sustainable development outcomes identified in TZW, that they deliver the objectives identified in Section 3.6.4 and that the gaps in provision identified in Section 2 are addressed, effort needs to be focused on the following actions in respect of infrastructure to recover residual waste markets to use the outputs from the recovery process.

a) Support for the treatment of industrial and commercial residual waste

The CIM Sector Plan identifies that additional infrastructure is required for the recovery of residual waste in Wales in order to meet the TZW and EU Directive targets. The future needs for residual mixed waste treatment and recovery cannot be predicted with any great certainty due to the variety of factors that will affect future tonnages and a variety of factors that affect actual existing capacity.

In addition, adequate landfill capacity is required for the landfill of residual waste until the new recovery facilities are in place and the 2024-25 goal of zero landfill is attained. Whilst 2024-25 is a key milestone in this regard, 2019-20 targets set in Towards Zero Waste and the EU Landfill Directive to substantially reduce landfill, are important drivers for accelerating the development of the residual recovery infrastructure.

Notwithstanding the above, with landfill prices now £80 per tonne from April 2014, and an annual increase based on the RPI thereafter, and the annual increases in landfill operator prices driven by increased environmental, health and safety and operations costs, means that the total cost of disposing on waste to landfill will outstrip treatment prices by 2014-15 for residual waste. As such the economic argument for the necessity for appropriate recovery infrastructure and its early delivery is also inescapable.

Through the Welsh Government supported Residual Waste Treatment Procurement Programme for local authority municipal waste, bidders are encouraged to provide additional capacity for residual industrial and commercial waste for the market, where this will provide better value for money for the local authorities through economies of scale.

b) Achieving high efficiency for Energy from Waste facilities in Wales – the use of heat

As discussed in the benefits section, it is important to ensure that residual waste treatment is as sustainable as possible and that the best options for residual waste management are promoted over less appropriate options. This includes obtaining high energy conversion efficiency levels for energy recovery options, and promoting the use of Combined Heat and Power (CHP) and heat only options TZW identifies the Welsh Government's policy that EfW should be conducted at high energy conversion efficiency.

A 2009 study[23] established there is a clear excess demand by industry, including the food manufacture sector, for processed heat in Wales, compared to the potential to meet this demand from the use of heat generated by the combustion of residual municipal waste. 37 significant potential heat users were identified, and it was calculated that, if residual municipal waste was used to displace natural gas (the default fuel for process heat supply), then the carbon savings from optimising the combustion of residual municipal waste alone would exceed 180,000 tonnes of carbon per annum.

Technical Advice Note 21 (TAN21) 'Planning and Waste' (2014) states in Section 2.7.4 'Recovery' that 'The recovery of energy from mixed municipal waste in high efficiency facilities is considered by Welsh Government to be a vital component of the waste management system in Wales. Such facilities are currently considered to represent the most sustainable outcome for mixed municipal waste. Co-locating these facilities with heat users is preferential in order to allow utilisation of waste heat from the combustion process. When preparing proposals, developers should give consideration to the location of these facilities and the potential for future user demand and planning authorities should identify any opportunities for co-location in their local development plans.'

The Welsh Government will also work with developers to ensure the creation of heat markets through the actions of its economic development functions in working to encourage local and inward investors to co-locate with energy recovery facilities to utilise synergies. The Welsh Government has worked with the Carbon Trust to help deliver this action with the creation of a toolkit to help develop costings for potential CHP development opportunities. Local authorities are currently in the process of procuring residual treatment facilities through the actions of a number of procurement consortia. The Welsh Government has specified that local authority procurement of

23 'The barriers to, and the potential for, EfW CHP in Wales – WSP Consulting for Carbon Trust Wales and the Welsh Government'.

energy recovery options should be 'heat enabled' to allow the development of CHP for these plants.

c) Consultation on the Introduction of Restrictions on, the energy recovery and landfilling of certain wastes

In September 2011, the Welsh Government issued the Programme for Government 2011-2016[24]. In this, the Welsh Government set out its intention to introduce regulations to restrict biodegradable materials going to landfill. Biodegradable waste is one of the major causes of methane from landfill. One tonne of biodegradable waste produces between 200 and 400 cubic metres of landfill gas and as such diverting it from landfill disposal is of major importance in meeting the one planet objectives set in Towards Zero Waste.

The Welsh Government consulted on the following proposals to increase the recycling and reduce the landfilling of business waste in the Environment Bill White Paper[25] between 23 October 2013 and the 15 January 2014:

- A requirement for businesses and the public sector to present specified recyclable waste materials separately for collection;
- A requirement for persons who collect waste to collect specified recyclable waste materials separately;
- A ban on the incineration of specified waste materials;
- A ban on the landfilling of specified waste materials; and
- A ban on the disposal of food waste to sewer.

The Welsh Government published its consultation summary in March 2014 and is currently considering the further development of these proposals following responses received to the consultation.

24 Welsh Government Programme for Government 2011-2016: Annex – Delivery Programme Manifesto Commitments.

25 http://wales.gov.uk/consultations/environmentandcountryside/environment-bill-white-paper/?lang=en

3.7.6 Monitoring and Measuring

The following indicators are identified (Table 13).

Table 13: Indicators to measure the treatment of residual waste.

What will be monitored	How	Who will monitor it
We will measure and monitor waste arisings and how they are managed (including recovery and disposal).	Comprehensive, reliable and up to date data and information on the production of waste in Wales and its management will be obtained and reported. This will be obtained via surveys for commercial and industrial waste.	Welsh Government.
The quantity of biodegradable waste diverted from landfill.	To monitor compliance with the Landfill Allowance Scheme, WasteDataFlow and mass balance calculations will be undertaken for local authority municipal waste. For other municipal waste from the commercial sector, it is likely that compliance will be monitored via quarterly landfill site returns and a periodic survey of the biodegradability of landfilled commercial waste. A separate indicator to monitor and measure the diversion of biodegradable waste from landfill for the climate change strategy is referred to in the Collections Infrastructure and Markets Sector Plan.	Natural Resources Wales.
Development of markets for heat from EfW plant and IBA	The heat utilisation and efficiency of energy from waste plants in Wales will be monitored and reported. The utilisation of IBA from energy from waste plants in Wales will be monitored and reported.	Welsh Government.

Monitoring, Measurement and Evaluation

Progress against the actions identified will be reported periodically.

The plan will be web based and will be maintained as a ‘living’ document.

The Welsh Government will work with other partners to ensure that tools are suitable for the information needed from the sectors identified in this plan.

Annex 1: Summary of Actions

Timescale	Key Objectives and Supporting Actions
Short Term – now until 2015	**Government:** To help support the delivery of the waste prevention, preparing for reuse, recycling, composting and landfill targets up to 2015 through: • The Landfill Tax escalator. • The introduction of Regulations under the Waste (Wales) 2010 Measure to delivery policies and targets in line with the sector plan and TZW. • Provision of support for current and proposed responsibility deals/sectoral agreements to reduce and recycle more waste. • Provision of directed support for SMEs to reduce their food and packaging waste and increase recycled content of packaging. • Provision of support for social enterprises to tackle surplus food in the supply chain. • Provision of support for eco design of packaging to increase recyclability and recycled content. • Investigation of effectiveness of existing legislation. • Provision of support for procurement of food waste and residual waste treatment. • Provision of support for markets in Wales for recyclate, compost and anaerobic digestion. • Funding the Waste Awareness Wales campaign to support Local Authority and National campaigns to reduce and recycle waste produced by the sectors and post consumer. • Provision of support to facilitate collections from SMEs. • Provision of support for further 'recycling on the go' initiatives. • Working with packaging compliance schemes to secure greater level of collection of packaging waste in Wales. • Provision of incentives to reduce reliance on landfill. **Others:** • Action by retailers to reduce the amount of waste generated by the packaging that they sell to consumers. • Action by sectors to engage with current and/or proposed sectoral agreements to reduce and recycle their and post consumer waste. • Action by sectors to engage with support provided and proposed. • Action by sectors to segregated waste for collection • Continued actions to reduce reliance on landfill
Medium term – 2015 until 2025	**Government:** To help support the delivery of the waste prevention, preparing for reuse, recycling, composting and landfill targets up to 2025

Timescale	Key Objectives and Supporting Actions
	through: • Introduction of new Measures and Regulations to further secure the delivery of the sector plan and TZW. • Support for procurement of residual waste treatment. • Support for the infrastructure for collection for recycling. • Securing further action from retailers, including voluntary extended producer responsibility to achieve waste reduction, increased recycling and greater recyclate content of products and packaging. • Funding the Waste Awareness Wales campaign to support Local Authority and National campaigns. **Others:** • Extended producer responsibility action by retailers to reduce the amount of waste generated by the products and packaging that they sell to consumers, to increase the recyclability of products and packaging, and increase recycled content. • Stimulation of market for AD digestate • Social economy sector to continue to provide added social return on investment.
Long term – 2025 until 2050	**Government:** To help support the delivery by 2050 of the One Planet levels of waste and zero waste (100 per cent recycling) goals of Towards Zero Waste, Government may need to: • Apply extended producer responsibility instruments to manufacturers and retailers. • Apply instruments to ensure that all packaging and products are eco-designed to achieve One Planet levels of consumption – with the use of raw materials and end of life waste also meeting One Planet goals. **Others:** Ensure the products and packaging conforms to One Planet levels and requirements.
Ongoing	**Government:** • Assess suitability of current legislation such as packaging essential requirements. **Others:** • Ensure continued compliance with legislation. • Ensure continued regulation of legislation. • Continue take up of environmental management systems.

ANNEX 2: Glossary

Anaerobic digestion	A biological process where biodegradable wastes, such as kitchen or food waste, is encouraged to break down in the absence of oxygen in an enclosed vessel. It produces carbon dioxide, methane (which can be used as a fuel to generate renewable energy) and solids/liquors known as digestate which can be used as fertiliser.
Biodegradable waste	Means any waste that is capable of undergoing anaerobic or aerobic decomposition, such as food and garden waste, and paper and paperboard.
Biopolymers	Are polymers derived from biomass. They may be natural polymers (e.g. cellulose), or synthetic polymers made from biomass monomers (e.g. Polylactic Acid) or synthetic polymers made from synthetic monomers derived from biomass (e.g. Polythene derived from bioethanol). Oxy-degradable (degradable) plastics are not biopolymers.
Biowaste	This includes biodegradable garden and park waste, food and kitchen waste from households, restaurants, caterers and retail premises and comparable waste from food processing plants.
Closed loop recycling	Recycling where recycled materials are being used continually for the same purpose, for example a glass bottle recycled into new glass product rather than downgraded, for example being used as an aggregate.
Commercial and industrial waste	Commercial waste is waste arising from any premises which are used wholly or mainly for trade, business, sport recreation or entertainment, excluding household and industrial waste. Industrial waste is waste from any factory and

	from any premises occupied by an industry (excluding mines and quarries).
Composting	An aerobic, biological process in which organic wastes, such as garden and kitchen waste, are converted into a stable granular material which can be applied to land to improve soil structure and enrich the nutrient content of the soil.
Dematerialisation	Considers, beside waste, natural resources involved in the products' life-cycle. It literally means the use of less materials. Dematerialisation is defined by UNEP as "the reduction of total material and energy throughput of any product and service, and thus the limitation of its environmental impact. This includes reduction of raw materials at the production stage, of energy and material inputs at the use stage, and of waste at the disposal stage."
Ecodesign	A strategic design management process that is concerned with minimising the impact of the life cycle of products and services. Approaches include life cycle analysis, design for disassembly and reducing the negative impact of a product on the environment (for example by removing hazardous chemicals or materials without compromising the design).
Ecological footprint	The ecological footprint methodology calculates the land area needed to feed, provide resource, produce energy and absorb the pollution (and waste) generated by our supply chains.
Energy from waste	Technologies include anaerobic digestion, direct combustion (incineration with energy recovery), use of secondary recovered fuel (an output from mechanical and biological treatment processes), pyrolysis and gasification. Any given technology is more beneficial if heat and electricity can be

	recovered. The Waste Framework Directive considers that where waste is used principally as a fuel or other means to generate electricity it is a recovery activity provided it complies with certain criteria, which includes exceeding an energy efficiency threshold.
Environmental Product Declaration (EPD)	An internationally standardized (ISO 14025) and LCA based method to communicate the environmental performance of a product or service.
Global hectares	One global hectare is equal to one hectare of biologically productive space with world average productivity. Global hectares are the unit of measurement for ecological footprinting.
Household Waste Recycling Centre (HWRC)	Site provided by the local authority for the recycling of household waste including bulky items such as beds, cookers and garden waste as well as other recyclables, free of charge.
Kitchen waste	This term refers to the organic component of household waste e.g. vegetable peelings, tea bags, banana skins. Often also referred to as "food waste".
Landfill sites	Any areas of land in which waste is deposited. Landfill sites are often located in disused mines or quarries. In areas where they are limited or no ready-made voids exist, the practice of landraising is sometimes carried out, where waste is deposited above ground and the landscape is contoured.
Life cycle	Consecutive and interlinked stages of a product system, from raw material extraction, through production of materials and intermediates, parts to products, through product use or service operation

	to recycling and/or final disposal.
Life Cycle Assessment (LCA)	Is a process of compilation and evaluation of the inputs, outputs and the potential environmental impacts of a product system throughout its life cycle.
Life Cycle Cost (LCC)	Two different uses for this term exist: a) The total cost linked to the purchase, operation, and disposal of a product (equivalent to "Total Cost of Ownership" (TCO)) b) The cost of a product or service over its entire life cycle including external costs.
Life cycle thinking (LCT)	The concept of LCT integrates existing consumption and production strategies towards a more coherent policy making and in industry, employing a bundle of life cycle based approaches and tools. By considering the whole life cycle, the shifting of problems from one life cycle stage to another, from one geographic area to another and from one environmental medium or protection target to another is avoided.
Municipal waste	For the purpose of this sector plan, municipal waste means ‘municipal waste as collected by local authorities’. It includes household waste and any other wastes collected by a Waste Collection Authority (WCA), or its agents, such as municipal parks and gardens waste, beach cleansing waste, commercial or industrial waste and waste resulting from the clearance of fly-tipped materials. WCA - A local authority charged with the collection of waste from each household in its area on a regular basis. They can also collect, if requested, commercial and industrial wastes from the private sector.

NACE	European Union classification system for economic activities.
Open loop recycling	Where the end product of recycling is used to replace something else, e.g. glass is recycled into aggregate which replaces virgin aggregate.
PAS100	The British Standards Institution's 'Publicly Available Specification for Composted Materials' (PAS 100) sets out a minimum compost quality baseline, upon which composters should build as appropriate to the product types and markets targeted.
PAS110	The purpose of this PAS is twofold: to ensure that digested materials are made using suitable inputs and effectively processed by anaerobic digestion (AD) for sufficient time; and to ensure that the process has been well managed and monitored so as to produce digested material that meets market needs and protects the environment.
Preparing for reuse	Means checking, cleaning or repairing recovery operations, by which products or components of products that have become waste are prepared so that they can be reused without any other pre-processing.
Producer responsibility	A ‘producer responsibility’ approach is intended to require producers who put goods or materials onto the market to be more responsible for these products or materials when they become waste. In some cases, producers will also be asked to reduce the level of hazardous substances in their products and to increase the use of recycled materials and design products for recyclability.
Recycling	Involves the reprocessing of wastes, either into the same product or a different one. Many non-

	hazardous industrial wastes such as paper, glass, cardboard, plastics and scrap metals can be recycled. Special wastes such as solvents can also be recycled by specialist companies, or by in-house equipment.
Reduction	Achieving as much waste reduction as a priority waste action. It can be accomplished within a manufacturing process involving the review of production processes to optimise utilisation of raw (and secondary) materials and recirculation processes. It can be cost effective, both in terms of lower disposal costs, reduced demand for raw materials and energy costs. It can be carried out by householders through actions, such as home composting, reusing products and buying goods with reduced packaging.
Reprocessor	A person who carries out one or more activities of recovery or recycling.
Residual waste	This is waste collected from households, commerce and industry (including certain construction and demolition activities) which has not been separated at source.
Resource efficiency	Managing raw materials, energy and water in order to minimise waste and thereby reduce cost.
Reuse	Using a product again for the same or different use.
SOC codes	Substance Oriented Classification describe wastes by materials only, regardless of their origin. The European Waste Classification (EWC) coding system describes waste both by its physical properties, and by the sector from which it was generated. SOC codes reflect only the material type of the waste, regardless of the source sector.

	This allows easier interpretation of the results, as several different EWC codes relating to similar materials which require the same treatment methods, can be grouped together.
Social enterprise	A social enterprise is a business with primarily social objectives whose surpluses are principally reinvested for that purpose in the business or in the community, rather than being driven by the need to maximise profit for shareholders and owners.
Sustainability appraisal	Single appraisal tool which provides for the systematic identification and evaluation of the economic, social and environmental impacts of a proposal.
Treatment	Physical, thermal, chemical or biological processes, including sorting, that change the characteristics of the waste in order to reduce its volume or hazardous nature, facilitate its handling or enhance recovery.
Upcycling	Upcycling happens where high embedded energy raw materials are substituted by lower embedded energy secondary raw materials that can be subsequently be closed loop recycled.
Waste arisings	The amount of waste generated in a given locality over a given period of time.
Waste hierarchy	Sets out the order in which options for waste management should be considered based on environmental impact. It is a useful framework that has become a cornerstone of sustainable waste management.
Zero waste	'Zero Waste is a goal that is ethical, economical, efficient and visionary, to guide people in changing

	their lifestyles and practices to emulate sustainable natural cycles, where all discarded materials are designed to become resources for others to use. Zero Waste means designing and managing products and processes to systematically avoid and eliminate the volume and toxicity of waste and materials, conserve and recover all resources, and not burn or bury them. Implementing Zero Waste will eliminate all discharges to land, water or air that are a threat to planetary, human, animal or plant health.' (Zero Waste International Alliance) http://www.zwia.org/.