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Towards Zero Waste
One Wales: One Planet

The Waste Prevention Programme for Wales

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Ministerial Foreword

The financial, social and environmental impacts of waste generation are a huge challenge, and in Wales we have made great steps to improve the way we manage our waste. But this is only part of the solution. The greatest benefits will come from reducing the amount of waste that we generate through our everyday activities.

Towards Zero Waste, the waste strategy for Wales, sets out the Welsh Government's high level policies and targets for the management of waste in Wales. This Waste Prevention Programme supports Towards Zero Waste by describing the outcomes, policies, targets and outline work programme to address waste prevention from businesses and households. It also delivers the EU requirement for Member States to develop waste prevention programmes.

Implementing this programme will help the Welsh Government to meet two key priorities – tackling poverty, and growth and sustainable jobs – as well as protecting the environment and contributing towards a sustainable Wales.

We will help tackle poverty by providing low cost, high quality goods to people in need in our communities, through actions on reuse, refurbishment and remanufacture. We will increase the amount of surplus food that is made available for people to eat. This will build on the success of initiatives such as Fareshare Cymru, which has redistributed the equivalent of around 1 million meals since 2010. Sustainable resource management also offers job creation and training opportunities for people who are not in employment, and we will work with businesses to maximise this potential.

Green growth not only protects our environment, but has the potential to drive Welsh wealth creation. It creates new jobs, commercial opportunities and saves businesses money. Green growth is a key driver for our vision for the sustainable future of Wales. Through our work on eco-innovation and ecodesign, we will encourage our businesses to develop sustainable products and services, use material resources efficiently and invest in high quality, sustainable jobs.

At a time when many people are struggling financially, there are lots of opportunities to both minimize waste and save money. For example, the average household throws away food worth £480 every year. This equates to £600 million per year for Wales as a whole. The Welsh Government will continue to fund national and local Love Food Hate Waste initiatives, which provide useful hints and tips to reduce food waste and save families money.

We are often unsure about how to look after and repair our possessions, and when we have finished with things we throw them away in the bin instead of thinking about alternatives. By developing our repair and reuse infrastructure, and raising the profile of these opportunities, we aim to make repair and reuse the natural first choice for faulty or unwanted goods, furniture and clothing.

A key objective of this programme is to break the link between waste generation and economic growth. A thriving economy with high levels of employment is key to the wellbeing of the people of Wales but we also need to secure a healthy and abundant supply of natural resources. These are not contradictory aims – there are huge financial savings to be made through waste prevention actions and the Welsh Government will support businesses and citizens to take full advantage of them.

The Welsh Government has identified some priority sectors which produce waste with a high environmental impact, and which show the potential to reduce the amount of waste they produce. Understanding these priorities has shaped the programme to optimise the financial, social and environmental return on our investment.

The construction and demolition sector, and others involved in the built environment, have a key role to play in reducing waste. The Waste Prevention Programme will address six key areas that were identified during the development of the Construction and Demolition Sector Plan.

Businesses know the challenges to preventing waste, and how the Welsh Government can provide support to make it happen. We used the consultation period to talk to a range of sector representatives to understand how we can support them with waste prevention, and to develop a programme for action. We will use this information to make sure that we work with the right businesses in the right way.

The Welsh Government is committed to leading by example through its own operations and also through its procurement practices, and we will urge the wider public sector in Wales to demonstrate leadership too. We will encourage the businesses that work with us to demonstrate waste prevention, and will make it easy for our staff and the citizens that use our services to do so.

Alun Davies AM
Minister for Natural Resources and Food

Summary

Reason for this Programme

The Welsh Government is responding to the tough economic situation that faces people and businesses in Wales. We are supporting businesses to improve productivity and use resources sustainably, to be innovative and gain competitive advantage, and to protect against rising commodity prices. We are also communicating the benefits of waste prevention to the people of Wales, helping to reduce poverty by wasting less and making more of the food and other goods that we buy. This document describes what we are doing to deliver on this commitment.

The waste prevention programme supports 'Towards Zero Waste', the waste strategy for Wales, by describing the outcomes, policies, targets and work programme to address waste prevention in Wales. The EU Waste Framework Directive requires Member States to develop waste prevention programmes and mandates some of its scope and content. A key objective is to break the link between waste generation and economic growth.

What are the Main Issues?

We are losing money and using up valuable resources by throwing too much away.

Household waste generation for 2011/12 was 1.36 million tonnes. In 2007, businesses in the industrial sectors produced 1.9 million tonnes, and those in the commercial sectors produced 1.7 million tonnes. The amount of construction and demolition waste managed away from the site of production was reported as 5.31 million tonnes in 2005/06.

The average Welsh household wastes around £480 worth of food every year; the value of unsold clothes discarded by retailers is around £27,000 per tonne; a skip produced on a construction site contains on average around £1,300 worth of products.

There are a number of waste prevention initiatives already underway in Wales, and there are many opportunities to do more by changing our behaviours.

Outline of the Programme

The Waste Prevention Programme will ensure that householders and businesses in Wales are able to reduce:

- The quantity of waste, including through the reuse of products or the extension of the life span of products.
- The adverse impacts of the generated waste on the environment and human health.
- The content of harmful substances in materials and products.

The main benefit of the programme is that households and businesses will be able to reduce waste, while at the same time saving money.

A '4Es' model of behaviour change is being taken forward, to ensure the outcomes are consistent with the Welsh Government's commitment to sustainable development (SD).

Waste prevention targets have been developed for the programme. They are not statutory but are indicative targets for us to work together to achieve.

Programme for Household Waste

The targets and priorities identified for household waste are described here.

- A waste prevention target has been set for household waste as follows:
  - A reduction of 1.2 per cent every year to 2050 based on 2006/7 baseline.
- Action will be targeted at food, paper, card, and plastic (primarily packaging), clothing and consumer goods (including electrical and electronic equipment and goods containing hazardous substances).

Household waste can be prevented at different points in the supply chain. The programme for household waste considers the 'demand side' actions of purchase choice, use in the household and disposal and collection.

The programme is as follows:

- Consumer engagement programme.
- Review of household reward schemes.
- Optimising service provision for householders.

Actions which consider the 'supply side' (that affect household waste) of product design, manufacture, distribution and retail are considered in the programme for industrial and commercial waste.

(Reuse of waste from all sectors is considered separately).

Programme for Industrial and Commercial Waste

The targets and priorities identified for industrial and commercial waste are described here.

- The target for industrial waste is a reduction of 1.4 per cent every year to 2050 based on 2006/7 baseline.
- The target for commercial waste is a reduction of 1.2 per cent every year to 2050 based on 2006/7 baseline.

These were proposed in Towards Zero Waste, and have been subject to public consultation.

Our priority areas for action are:

- Working with large retailers and their supply chains.
- Promoting Eco-innovation in the manufacturing sector in Wales.
- Public sector as an exemplar.

Our priority business sectors are:

- Food manufacturing sector.
- Accommodation and food services.
- Permitted Industry.
- Small and Medium sized Enterprises (SMEs), and particularly office based services, food and accommodation, and small retailers and wholesalers.

Programme for Construction and Demolition Waste

The targets and priorities identified for construction and demolition waste are described here.

- The waste prevention target for construction and demolition waste is a reduction of 1.4 per cent every year to 2050 based on 2006/7 baseline.
- Priority materials are wood; plastic; insulation and gypsum; hazardous waste (primarily contaminated soil); metals; concrete, bricks, tiles and ceramics, bituminous substances.
- The following key stages in the life cycle of construction products and buildings were identified, and will be the focus for the programme:
    - Design of buildings and construction projects.
    - Design of construction products.
    - Damage to construction products in transit.
    - Over-ordering by builders.
    - Use of excess products generated on site.
    - Demolition and refurbishment of buildings.

Projects include:

- Designing out waste.
- Education and guidance.
- Design for Deconstruction (D4D).
- Encourage use of value engineering on large construction projects. Sustainable construction products.
- Ecodesign within construction projects.
- Design solutions for construction products.
- Welsh Government support for SMEs to reuse surplus materials.
- Infrastructure to support the reuse of surplus materials for community benefit.
- Minimising 'wastage factor'.
- Greening construction related procurement.

A Programme for Reuse and Repair for Wales

A reuse and repair programme is being developed which will include:

- A communications campaign.
- Measures to encourage separate collections of Waste Electrical and Electronic Equipment (WEEE) at designated collection facilities and work with approved authorised treatment facilities (AATFs) to encourage more repair, reuse and resale at their facilities.
- The role of green procurement.
- A Reuse Network, to establish the infrastructure for a reuse network including shared warehousing, establishing a phone line, public communications.
- Standards for reuse, to allow reuse organisations to offer reuse products which have been subjected to a quality assured process.

Next Steps

The Welsh Government will report to the European Commission that it has produced a waste prevention programme in compliance with EU legislation.

Implementation projects and any associated project-specific target and monitoring plans will be developed.

To monitor progress against targets, assess the feasibility of our implementation projects, ensure we realise benefits, and evaluate our performance, we need access to appropriate data and evidence. We are producing a Data and Evidence Strategy to outline our requirements and identify suitable sources, and a plan for collating and analysing the data and other evidence in a timely and effective manner to support policy development and delivery.

The performance measures for each project will also be monitored to ensure that we are getting value for money in our projects. Annual progress reports will be published on the Welsh Government website.

Contents

1 Background

This section describes the vision and objectives of the programme and the context and policy framework within which this sits. It also explains the scope, and defines the initiatives covered by the Waste Prevention Programme.

1.1 Vision, Milestones and Objectives

The following vision and milestones developed for Towards Zero Waste[1] are reflected in the accompanying sector plans. Specific objectives for waste prevention have been developed for this programme, and will provide the framework for implementing projects.

1.1.1 Vision

The Welsh Government's vision is for Wales to be a prosperous, fair and just society enjoying a sustainable environment.

A sustainable environment

We will reduce the impact of waste in Wales to within our environmental limits by focusing 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.

A prosperous society

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 and programmes will implement the targets, actions and policies in Towards Zero Waste. 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.

1 Towards Zero Waste, Welsh Government (2010)

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.

1.1.2 Milestones

2025 Towards Zero Waste
By 2025, there will be a significant reduction in waste (27 per cent), 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'[2]. This is needed because reducing the impact of waste in Wales to 'One Planet' levels will require big changes in the way that products and services are designed, and the actions that consumers and businesses take.

Waste prevention - Waste arisings need to be reduced significantly 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.

2050 Achieving zero waste
By 2050, we will have reduced the impact of waste in Wales to within our environmental limits and will generate approximately 65 per cent less waste than in 2007. 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.

2 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).

- **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.

1.1.3 Objectives

1.1.3.1 Decoupling of waste generation from economic growth

The primary objective of the Waste Prevention Programme will be to de-couple economic growth from the environmental impacts of waste generation.

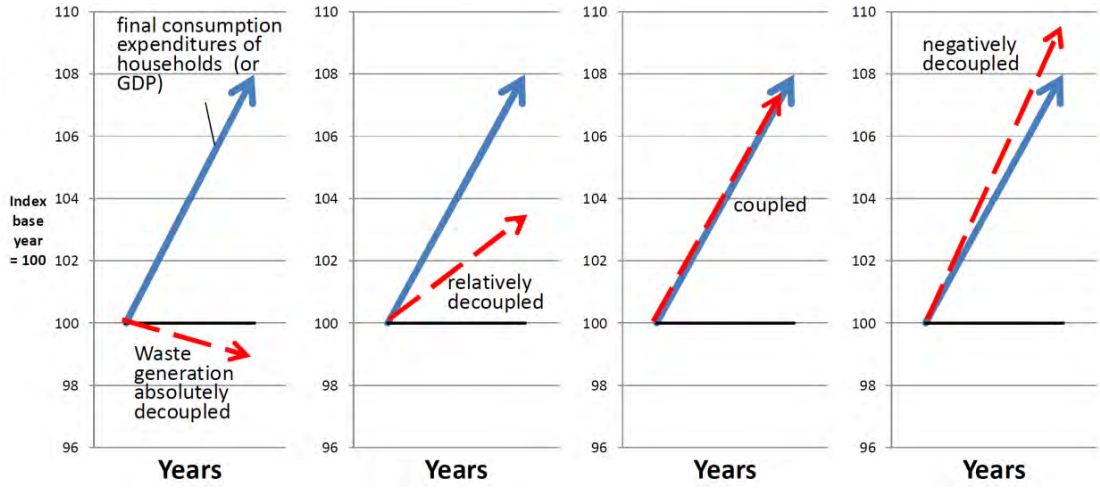
The Welsh Government also has the objective to enable households and businesses to reduce waste, while at the same time saving money.

"Decoupling economic growth from the environmental impacts associated with waste generation is a key objective of the EU's revised Waste Framework Directive (Directive2008/98/EC). Stabilising waste generation is no longer enough, waste growth in the EU must now reverse."
Preparing a Waste Prevention Programme. Guidance Document. European Commission (2012).

The Organisation for Economic Co-operation and Development (OECD) situates decoupling as follows: "The term "decoupling" has often been used to refer to breaking the link between "environmental bads" and "economic goods." In particular, it refers to "the relative growth rates of a pressure on the environment and of an economically relevant variable to which it is causally linked."

Figure 1 illustrates the concept of decoupling by describing various relationships between an economic indicator (final consumption expenditure) and waste generation for household waste.

Figure 1 Examples of the relationship between final consumption expenditure and waste generation for household waste



Source: Bio Intelligence Service

The Welsh Government's policy is that the environmental impact of waste should reach one planet levels by 2050, and that this can only be achieved through a reduction in waste generation accompanied by high recycling rates across all waste streams.

The approach that the Welsh Government has taken is to use the absolute reduction targets for each major waste stream (household, commercial, industrial, construction and demolition) as described in Towards Zero Waste. By doing so, it is virtually inevitable that decoupling, or relative decoupling, will occur. The only scenario in which decoupling would not occur would be if the economy were to contract at a rate equal to or greater than the waste reduction. The Welsh Government has policies in place to encourage growth and jobs which are designed to minimise the likelihood that the economy would contract. It is impossible to completely insulate our businesses from the global economic climate, but this programme will present businesses with opportunities to conserve natural resources, reduce costs and bring innovative solutions to the market.

1.2 Context

Waste has considerable environmental, social and financial implications and while waste treatment technologies have become increasingly sophisticated, rising global consumption patterns are putting pressure on our ecosystems and waste infrastructure. Waste contains resources of which we have a limited quantity, or the supply of which is under stress through scarcity or security of supply, and a new perception of resources is key to tackling the waste problem.

Waste prevention affects, and is affected by, a wide range of interested parties. It will only be achieved through changes in the attitude and behaviour of households and businesses and on new paradigms in industrial processes and product or service design.

1.3 Scope, key principles and definitions

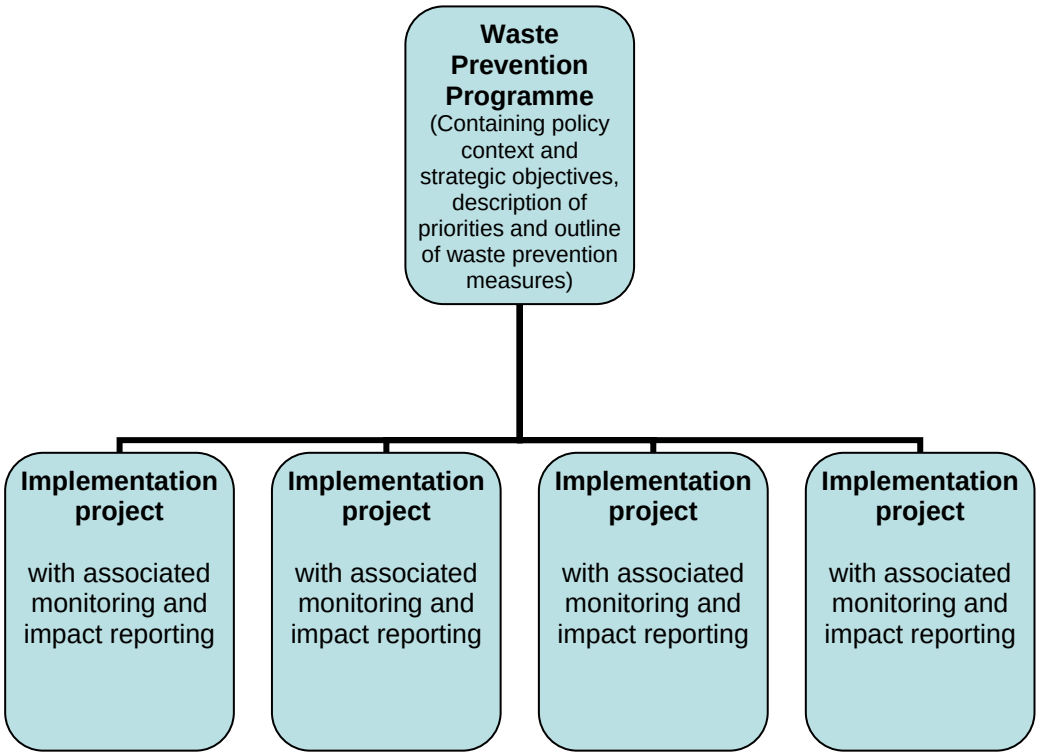
This programme is designed to meet the requirements of the Waste Framework Directive and the sustainable development outcomes described in Towards Zero Waste. This is reflective in the scope and key principles listed below.

- The programme focuses on the following waste streams:
  - Household.
  - Industrial and Commercial (businesses and public sector).
  - Construction and Demolition (waste from the built environment).
- Waste prevention targets are set for each of these streams.
- The programme of work will be targeted, concentrating on the materials that have the highest environmental impact (priority materials) and the sectors within which the opportunity for waste prevention are greatest.
- National level indicators to demonstrate 'decoupling' have been consulted on, and revised with the help of the programme steering group. The final versions are presented in this document, together with the high level waste prevention targets first proposed in Towards Zero Waste.
- The Waste Prevention Programme covers high level measures, but will be supported by a set of implementation projects (see Figure 2). Each project or work stream will be accompanied by suitable targets and indicators of progress. These will reflect the nature of the action, including its focus on specific waste materials or economic sectors.
- Sustainable Development (SD) outcomes have been considered during the evidence gathering and development stages of the programme. They are also key requirements in the development of the implementation projects.

The Waste Framework Directive describes how Member States may address reuse and repair (article 11) and extended producer responsibility (article 8) to achieve waste prevention. These are addressed in this programme as follows:

- A set of delivery projects covering reuse, repair and preparation for reuse will be developed as implementation projects to this programme. (Preparation for reuse is not a waste prevention activity, but there is considerable overlap in the delivery of direct reuse and preparation for reuse activities, and the environmental benefits are similar. They have therefore been considered together for the purpose of the implementation project).
- Voluntary extended producer responsibility will be explored where appropriate in the first instance, particularly in discussion with retailers in Wales. It is not proposed to consider mandatory extended producer responsibility in the short term until the impact of voluntary measures has been explored.

Figure 2 Content of, and relationship between, the Waste Prevention Programme and implementation projects



The Waste Framework Directive contains definitions which are used by all Member States to ensure consistency of understanding. The following definitions are relevant to this programme.

Waste: *"waste means any substance or object which the holder discards or intends or is required to discard"*.

Prevention: *"prevention means measures taken before a substance, material or product as become waste, that reduce:*
(a) the quantity of waste, including through the reuse of products or the extension of the life span of products.
(b) the adverse impacts of the generated waste on the environment and human health; or
(c) the content of harmful substances in materials and products.

Reuse: *"reuse means any operation by which products or components that are not waste are used again for the same purpose for which they were conceived".*

Preparing for Reuse: *"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.*

1.4 Policy Framework

The following EU Strategies and Initiatives are relevant to this programme; they are described in Annex C.

- EU Sustainable Development Strategy (SDS).
- The Thematic Strategy on Waste Prevention and Recycling.
- The Seventh Environment Action Programme (7EAP).
- Action Plan on Sustainable Industrial Policy (SIP) – Sustainable Consumption and Production (SCP).
- Roadmap to a Resource Efficient Europe.
- Single Market for Green Products Initiative.
- The EU Ecolabel.
- Registration, Evaluation, Authorisation and restriction of Chemicals (REACH) – whereby products in the future will have less hazardous materials in them – is a key driver to reducing hazardous household waste at source.

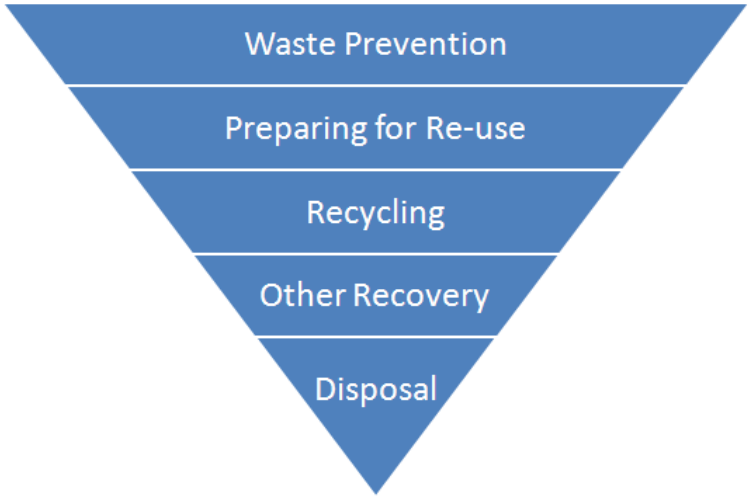
The Waste Framework Directive

The Waste Framework Directive provides a legal framework for all EU waste legislation. Established in 1975, it has been updated periodically with the most recent revision in 2008, seeking to position the EU as a 'recycling society' with broad aims "to avoid waste generation and to use waste as a resource"[3].

Article 4 of the Waste Framework Directive introduces the waste hierarchy, as illustrated in Figure 3, which ranks waste management options in terms of their environmental impact. Waste prevention sits at the top of the hierarchy and represents the most efficient and sustainable use of resources. Reuse, where a product is used again for the same purpose for which it was originally conceived, has an important role to play because it keeps products in the productive economy for longer.

3 Article 28, Waste Framework Directive 2008, European Parliament

Figure 3 EU Waste Hierarchy



Source: European Commission [DG Environment]

The following key requirements for Member States with regards to waste prevention are described in Articles 11 and 29 to 33 of the Waste Framework Directive and are covered by this programme of work:

- Establish waste prevention programmes by 12 December 2013.
- Set out waste prevention objectives.
- Describe existing waste prevention measures.
- Evaluate the usefulness of the examples of measures indicated in Annex IV or other appropriate measures.
- Determine appropriate specific qualitative or quantitative benchmarks for waste prevention measures.
- Take measures, as appropriate, to promote the reuse of products and preparing for reuse activities.
- Include relevant stakeholders and authorities and the general public in the elaboration of the waste prevention programmes, and provide access to it once elaborated.
- Inform the European Commission of the programme, once adopted, and of any substantial revisions to the programme.
- Review (and revise as required) waste prevention programmes at least every six years.

The European Commission is proposing to present a report on waste prevention by the end of 2014. It will propose measures, if appropriate, including waste prevention and decoupling objectives. These will need to be achieved by 2020. Future revisions of this programme will take account of any future developments at a European level.

1.5 Evolution of this programme

This consultation has been developed by:

Assessing the existing situation, and clarifying the issue
Data and information on waste generation, business sectors and their activities, economic and demographic statistics were used to assess the current situation in Wales with regard to the waste that we generate and the reasons for its generation.

Evaluating a range of policy measures
The Welsh Government commissioned some work to evaluate a range of measures which may be applied to tackle the barriers to waste prevention.

Drawing on the experience of others
A steering group has fed its expertise into the development of this consultation, and will continue to do so through to the final programme of work. We have also drawn on the views and opinions generated during the consultation of sector plans. We propose to use this public consultation, together with focused stakeholder workshops, to inform our final programme.

Conducting a Sustainability Appraisal
We have committed to carrying out a Sustainability Appraisal on our waste plans and programme. This has been carried out independently on our behalf with the aim of highlighting any specific impacts associated with the measures that we are proposing, and to suggest ways of limiting any adverse impacts.

Holding a Public Consultation
A 12 week public consultation was held between 28 March and 20 June 2013. Our priorities for action were described and proposals for addressing waste prevention were outlined. The consultation was published on the Welsh Government's public website and comments were invited from any interested party.

Hosting Business Engagement Workshops
A series of engagement workshops were held in parallel to the public consultation. These gave businesses an opportunity to give us their views on implementing our proposals effectively, and their comments will help to shape the delivery of our implementation projects.

Responding to comments and finalising the programme
All consultation responses were taken into account in the preparation of this programme. We have published a response summary and a Sustainability Appraisal Post Adoption Statement alongside this programme document.

1.6 Conceptual framework

A ‘4Es’ model of behaviour change is being taken forward, to ensure the outcomes are consistent with the Welsh Government’s commitment to sustainable development (SD), as shown in Figure 4. When applied to waste prevention the 4Es model can be characterised as follows:

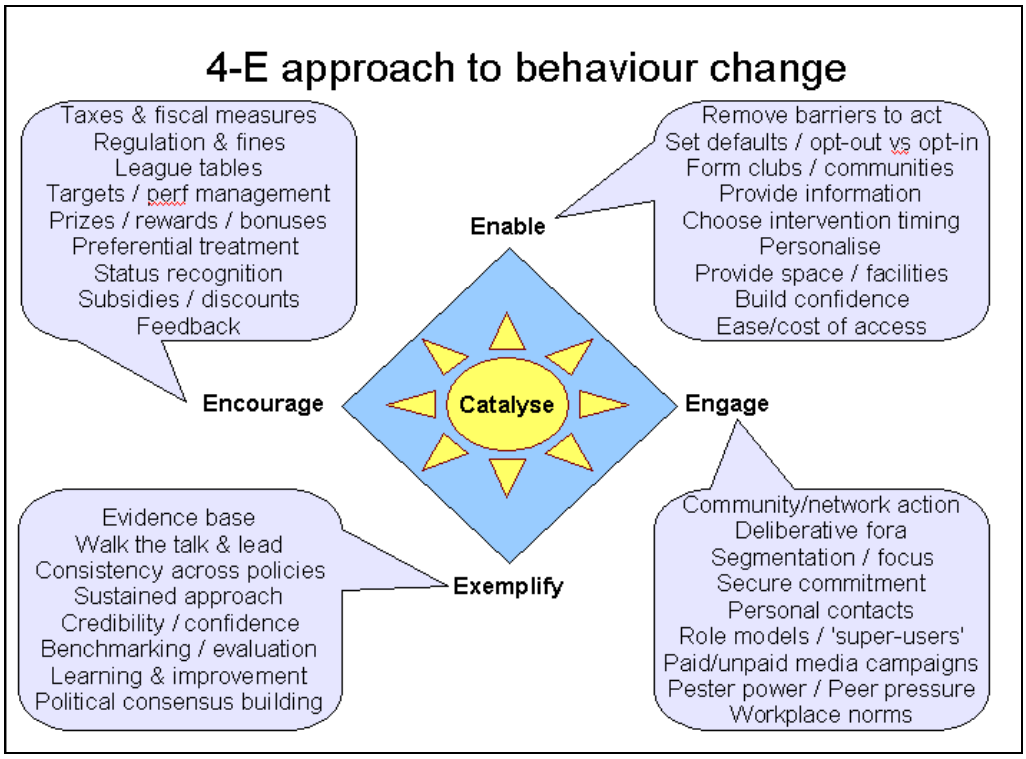
Engage – measures to engage households/consumers directly in voluntary behaviour changes, for example, through communications programmes or community engagement activities. In business, measures can include: educating the workforce through talks and awareness sessions and engagement with stakeholders in the supply chain to enable smarter decisions for products.

Enable – measures and activities by stakeholders which provide services that help consumers to prevent or reduce waste. This is notably producers, retailers, repair and reuse organisations from the third sector, public and private sector. This includes the configuration of waste services provided directly to the public. It also includes both sustainable consumption and production innovations (such as product durability), as well as infrastructures to enable products to have a second or prolonged life. For businesses activities may be: requesting designers to identify opportunities to prevent waste through product/project design, interventions to reduce operational inefficiencies such as just in time site deliveries to reduce damage and waste of construction materials.

Encourage – generally policy measures and incentives, and the activities of local authorities. This includes financial and other incentives to reduce waste at the household end, or switch consumption to products with a lower ecological footprint. For businesses this can be to acknowledge and applaud success such as reporting achievement against waste reduction targets during quarterly reviews and sharing good practice between trades.

Exemplify – monitoring impacts and sharing best practice, including demonstration projects and leading by example. Government procurement and practice is included here. Business can hold post completion reviews on projects to identify areas for improvement and reasons for waste generation during the life of the project, and share best practice across supply chains.

Figure 4 The 4Es model



Source: Proposals for a Sustainable Development Bill, Welsh Government (2012)

2 Household waste

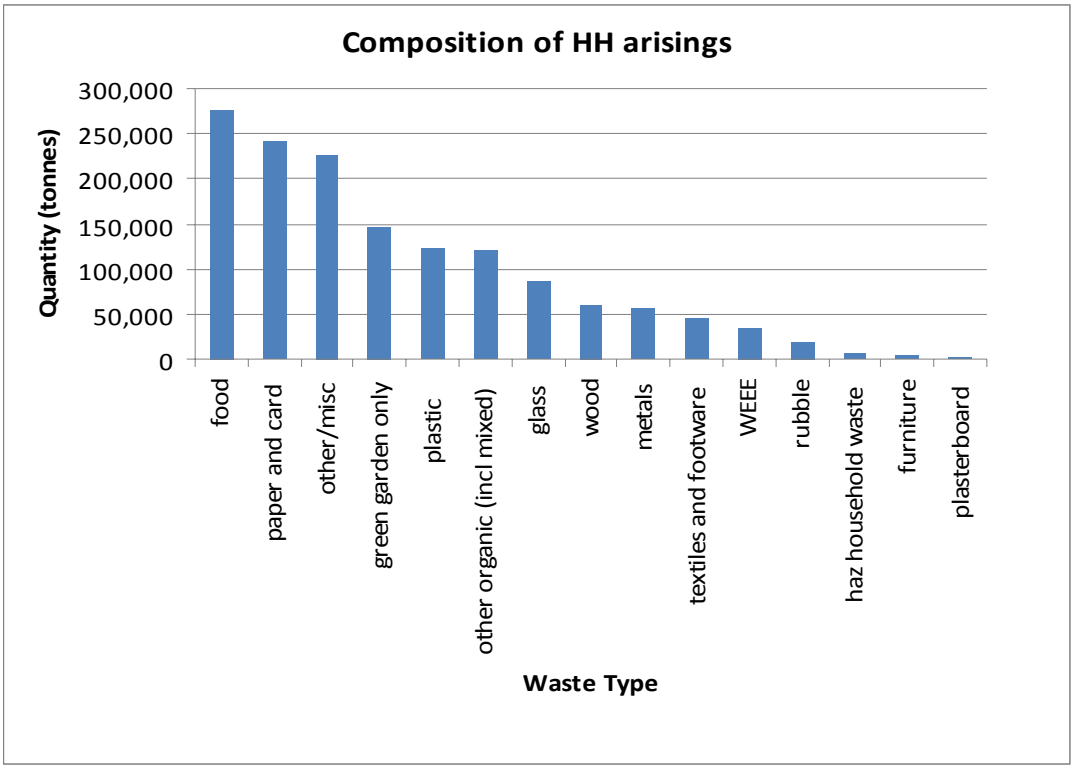
This section describes the quantity and type of household waste generated in Wales, and the policies and targets that are in place to tackle it. It then describes the proposed outline programme of work. It explains how the programme is being taken forward and finally outlines the proposed indicators, monitoring and progress reporting.

2.1 Assessment of the situation

2.1.1 Quantities and types of household waste

Household waste generation for 2011/12 was 1.36 million tonnes.
Its estimated composition[4] is shown in Figure 5 below:

Figure 5: Composition of household waste in Wales



Source data: Waste Data Flow and Composition of Municipal Waste in Wales. WRAP (2010)

Nearly 40 per cent of the overall household waste is food waste and paper and card waste; these fractions alone contribute over half a million tonnes. Food and paper waste have been identified by the European Commission as priority materials for waste prevention.

4 Composition is estimated from physical analysis of residual waste carried out in 2009 and data on recycled waste as recorded on WasteDataFlow. Other/miscellaneous includes co-mingled materials as well as other items arising in small quantities. Other organic includes mixed food and garden waste and other organics. WEEE = Waste Electrical and Electronic Equipment.

The majority of food waste is generated as a result of consumers buying food and then not using it, with a far smaller quantity generated from food cooked or prepared but not eaten. The types of food that are discarded are primarily food still in its packaging, raw fruit and vegetables and raw meat and fish.

Food packaging made of paper and card, such as cereal boxes and drink cartons, also contributes significantly to the total quantity of paper and card in the waste stream. Much of this packaging is necessary to preserve the food it contains and ensure it is transported in good condition; packaging is also used to provide consumers with information about the goods. The other main sources of paper and card are other packaging (including that from mail order retailers), newspapers, magazines and mailed items.

Other packaging waste, composed of glass, plastic and metal, clothing and other textiles, and consumer goods are also significant in their contribution.

The environmental impact[5] of products and their resultant waste materials was used to identify those wastes which should be the focus for greatest efforts in waste prevention. These were described in Towards Zero Waste. For household waste, the high impact wastes are:

- Food waste.
- Plastic (the majority of this is packaging).
- Paper (this is primarily packaging, newspapers and magazines, or mail).
- Waste Electrical and Electronic Equipment (WEEE), textiles (clothing and non-clothing), furniture and hazardous waste.
- Nappies and clinical waste (although these have little potential for reduction).

2.1.2 Benefits of waste prevention

The citizens of Wales could benefit from considerable financial savings by taking steps to change purchasing habits and reduce waste generation.

Wasting food[6] costs an average household £480 per year, rising to £680 per year for households with children[7]. When we look at Wales as a whole, householders produce 400,000[8] tonnes of food waste every year, with a financial value of £600 million per year.

5 *Ecological Footprint Impact of the Welsh Waste Strategy*, Arup (2009). The Ecological Footprint was used to determine these priorities, but carbon foot printing would deliver similar results.

6 The figure here represents the food which was still edible when it was thrown away.

7 *The facts about food waste*, WRAP (2012)

8 *Love Food Hate Waste*, WRAP (2009)

Households also have further opportunities to benefit financially from both supplying and purchasing second hand items. WRAP[9] identified that many households are storing unwanted items at home. For example, 60 per cent of Welsh households are storing unwanted clothing and shoes for later disposal or reuse, and this clothing could have a potential resale value of over £9,000 per tonne[10]. WRAP also estimate that Welsh households dispose of 6,000 tonnes of working electrical items, with a potential resale value of almost £15 million[11].

2.1.3 Policies and targets

The waste strategy for Wales "Towards Zero Waste" establishes the broad objectives for waste prevention. This is further elaborated on in the Municipal Sector Plan (MSP), which describes outline actions for the Welsh Government, Local Authorities and other interested parties for waste prevention.

The national waste prevention target for household waste has been set as follows:

A reduction of 1.2 per cent every year to 2050 based on 2006/7 baseline. This equates to 18,869 tonnes per annum of household waste.

2.2 Programme of work

Household waste can be prevented at different points in the supply chain. Figure 6 describes these together with the practical actions that can be taken and the key actors with influence over those actions.

In section 2, the outline programme for household waste considers the 'demand side' actions of purchase choice, use in the household and disposal and collection.

Section 3: Industrial and Commercial waste considers the 'supply side' actions of design, manufacture, distribution and retail.

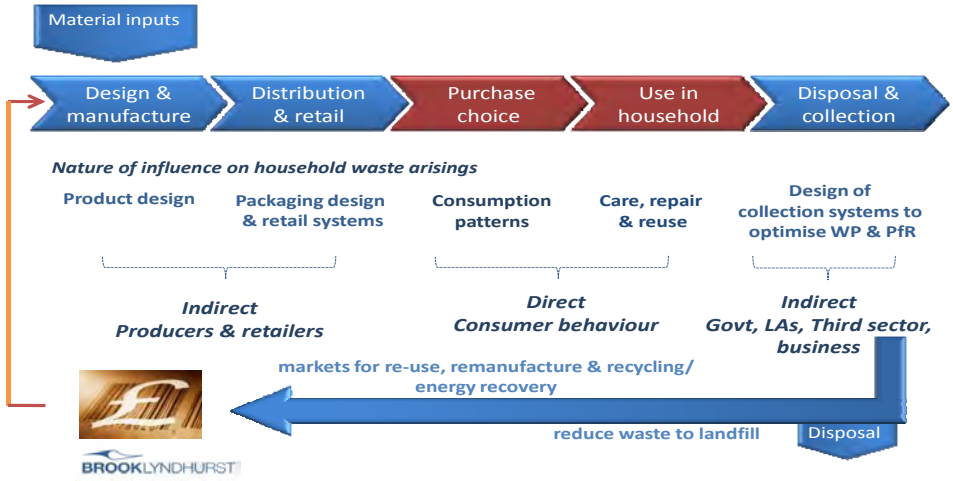
Reuse is considered in section 5.

9 *Evaluation of Recycling, Re-use and Repair (3R's) Consumer Behaviours*, WRAP (2012)

10 *Valuing Our Clothes*. WRAP (2012)

11 *Realising the Reuse Value of Household WEEE*. WRAP (2012). Results adjusted for Wales based on population.

Figure 6 Framework of intervention points for household waste prevention



Source: Brook Lyndhurst (2012)

The outline programme and indicative timeline for the 'demand side' actions is shown in Table 1.

Table 1 Outline measures and indicative timeline for the programme

	2013	2014	2015	2016	2017	2018 - 2025	2025 - 2050
Encourage - consumer / household engagement programme							
Food waste campaigns		R					
Nuts and bolts local campaigns		R					
Reuse campaigns	F	F					
Community based social marketing: Sustainable consumption campaigns	F				R		
Household rewards	F	F					
Household hazardous waste campaign	F	F					
Enable - services provided to householders							
Optimise design of service provision for waste prevention							

Key

Implementation		Review	R
Feasibility	F	Pilot	

2.2.1 Consumer and household engagement programme

Consumer campaigns and programmes will be implemented in the short term to offer potential for quick wins and to kick-start impetus on the wider culture change that will be needed to achieve waste prevention.

An enhanced waste prevention communications campaign is being developed. It will focus on 2 key areas:

- Communications activity to kick-start a widespread culture change which results in products and materials being seen in a new light – as valuable resources not waste. This campaign will signal the overall direction of travel, towards a zero waste and resource efficient society, and also supporting jobs and wellbeing in Wales.

- 'Products' will be a central focus in shaping this culture change. This includes the purchase, use and reuse of consumer products, as well as preventing food waste. Different actions will be appropriate at different levels – some will require strategic action by the Welsh Government (and its partners), others will be delivered locally.

The campaign will focus on the following waste prevention work streams.

- **Food** – enhancing the current Love Food Hate Waste (LFHW) campaign to align with other messages on food, such as healthy eating. So far this means:
  - LFHW mobile app has been launched in English & Welsh.
  - Cookery demonstrations in 22 local authorities designed to share 'love food, hate waste' messages.
  - Running a chef demonstration at a Freshers event to promote LFHW and how students can save money but being smart with their left overs.
  - Assisting Local Authorities in promoting LFHW by giving them pledge packs to distribute throughout their LA.

- **Consuming better – 'love stuff' (clothing and shoes and electronic equipment).** Rethink purchases – considered purchase, care in use, and passing on instead of binning. Work in this area includes:
  - The Welsh Government developing a pilot project based on the message "be kind to your clothes" to encourage people to run their washing machines at lower temperatures. This will have the benefit of being more energy efficient and knock-on effect of wasting fewer resources as clothes will last longer. We will be evaluating if this project can be developed so that it also covers more considered purchase and reuse of clothes.
  - Seasonal messages e.g. encourage people to bake own Easter treat to give to friends and family instead of buying an Easter egg with lots of packaging.

- **Longer product lifetimes – get the ball rolling.** Get more lifetime value out of products through small investments of money and time. This includes:
  - Promoting the use and understanding of eco-labels.
  - Providing the public with information on necessary packaging which prevents waste higher up the supply chain and if used correctly at home prolongs the life of a product.

- **'Nuts & bolts' campaigns – say no to junk mail, composting, and real nappies**. This includes:
  - Promoting waste reduction by informing people of how they can cut down junk mail.
  - Providing all 22 Welsh local authorities with information about how to home compost for dissemination to their residents.
  - A light touch, information only campaign on a real nappies.

- **Reuse and repair (see section 5)**.

- **Hazardous household waste** - developing a hazardous household waste campaign. This means producing a feasibility study and piloting the recommendations before establishing a national campaign. The campaign is likely to focus on:
  - Purchase choices - Promotion of reusable alternatives e.g. batteries. Encourage behaviour change in purchasing reusable option.
  - Purchase choices - Awareness and promotion of less hazardous alternatives e.g. water based paints rather than solvent based paints. Encourage behaviour change in purchase of less hazardous option.
  - Purchase choices - Planning and buying what is needed, avoiding over-buying items which have hazardous properties.
  - Use of product - Using up product (linked strongly to planning of purchase).
  - Disposal of product - Correct disposal of any hazardous household waste, guidance, awareness and behaviour change. Discover if there are any opportunities to work with the Dŵr Cymru/Welsh water on educating public on safe disposal of hazardous household waste (for example their 'Stop the Block' http://www.dwrcymru.com/en/Wastewater-Service/Lets-Stop-the-Block.aspxcampaign focusing on fats, oils and grease could be expanded to cover safe disposal of hazardous household waste). Promoting alternatives to disposal such as community paint reuse projects.

- Alongside these waste prevention options a Community Based Social Marketing (CBSM) programme is proposed to support local waste prevention and recycling behaviour projects. Community based social marketing is an alternative to information intensive campaigns. It has been shown to be effective at bringing about behaviour change. This approach involves identifying barriers to a sustainable behaviour, designing a strategy that utilises behaviour change tools, piloting the strategy with a small segment of a community, and finally evaluating the impact of the programme once it has been implemented across a community. The Welsh Government is looking into developing a CBSM type project through working with retailers to promote more sustainable shopping choices.

Household financial incentives will be explored further in the medium term, especially in respect of rewards. Options could be pull-interventions to draw people to change. An example could involve learning and building from Defra's trials of reward and recognition schemes in England, which will report in 2013/14.

There are no plans to introduce new charges for household waste collection while the recent progress on recycling is maintained. Similarly, there are no plans to introduce charges to encourage waste prevention while there is progress in this area.

The Environment Strategy First Action Plan 2006 committed the Welsh Government to scope the desirability and practicality of introducing charging for the collection and management of other types of household waste that at the moment cannot be charged for by Local Authorities, in particular the residual fraction. This scoping was carried out and the results were published as part of the evidence that supported the development of the consultation draft of Towards Zero Waste. Local Authorities already have powers under the Environmental Protection Act 1990 and the Controlled Waste Regulations 1992, to charge for the collection of bulky wastes and garden wastes from households, and for the collection and management of wastes from commercial premises.

Our aim is to create a truly comprehensive recycling society where everyone can recycle wherever they are – at home, at work, at leisure or on the go. To date, the public have responded magnificently, meeting recycling targets for municipal waste for 2003-04, 2006-07, 2009-10 and the 2012-13 target of 52 per cent. Also, household waste levels have reduced in recent years, even before the impacts of the recession have been taken into account. Whilst this progress is maintained there is no need for charging to be introduced.

2.2.2 Services provided to households

The Collaborative Change Programme (CCP) offers all local authorities in Wales an opportunity to benefit from additional support to develop and deliver a detailed business plan for their waste collection services. These plans set out how each authority will meet the objectives and outcomes of Towards Zero Waste and the requirements of the Waste Framework Directive. This approach is not only about how authorities will achieve the higher targets and high quality recycling, but also supports the active sharing of good ideas and practices leading to improved efficiency in terms of cost reduction and performance. It will also assist local authorities to move towards more sustainable waste management services, including playing their part to help meet waste prevention and preparation for reuse targets.

Local authorities also have a role to play in reducing the impact of household hazardous waste by ensuring all CA sites have reception facilities for items such as mineral oil and pesticides.

2.3 Monitoring Progress

2.3.1 Progress against the national target

The waste prevention target is an absolute reduction of 1.2 per cent of the 2007 baseline each year to 2050.

Data for this target is reported by local authorities on the WasteDataFlow[12] reporting system. Progress against the target will be recorded annually via the published annual monitoring report – this is a report of progress against Towards Zero Waste and associated sector plans and programmes.

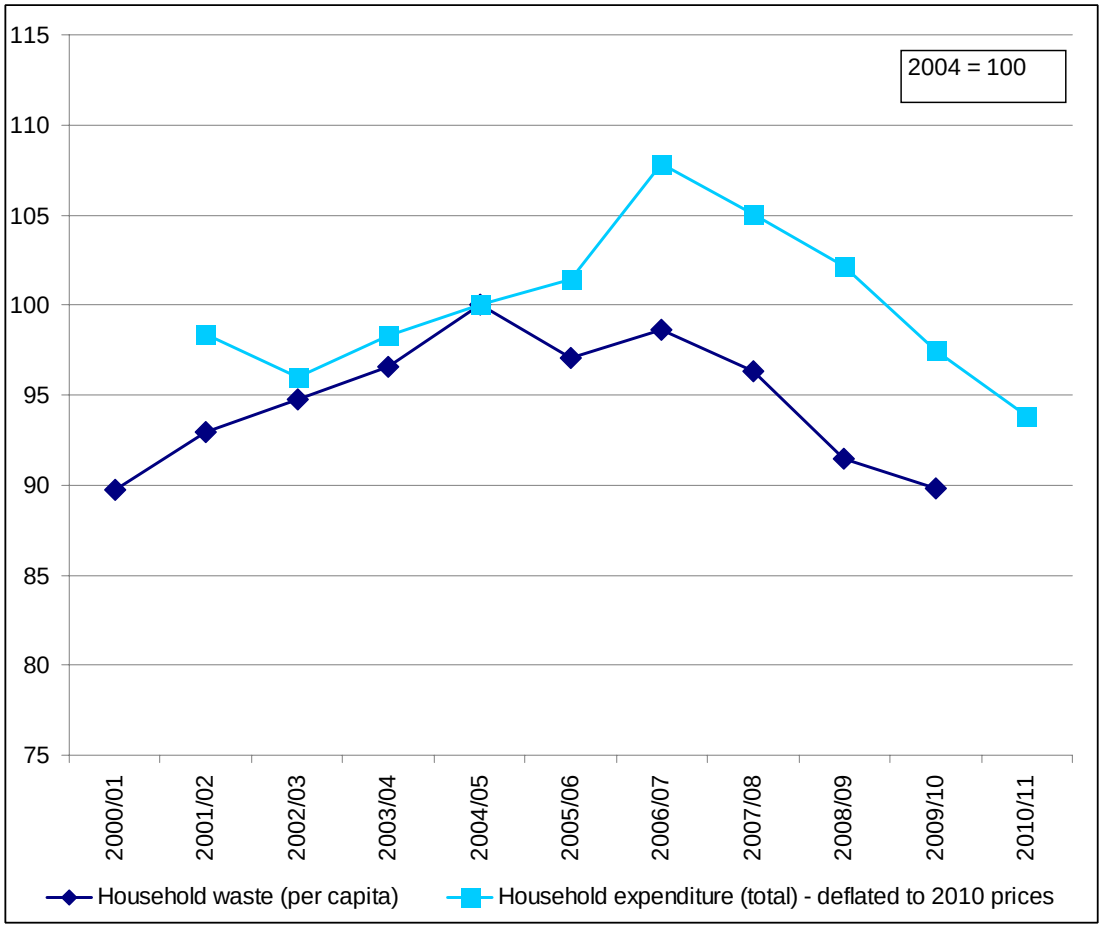
2.3.2 Indicators of strategic progress

The following indicators are proposed, which will be used to monitor progress at a strategic level, including monitoring against the objective of decoupling waste generation from economic growth. They have been chosen because they are good indicators and the data is easy to collate at regular intervals.

- Household waste generation per unit household expenditure.
- Waste generation per household.

12 http://www.wastedataflow.org/

Figure 7 Changes in Wales Household Waste and Household Expenditure



Source data: Waste Data Flow and Office of National Statistics

2.3.3 Monitoring progress of implementation projects

Service delivery change, including related communications, is delivered through the Collaborative Change Programme (CCP). The CCP covers a wide range of activities including waste prevention, reuse and recycling. Individual projects relating to waste prevention and reuse will be monitored and evaluated separately through the programme.

The waste prevention and reuse engagement campaign is delivered through the Waste Communications Campaign. The Waste Communications Campaign covers a wide range of activities including waste prevention, reuse and recycling and community engagement with residual treatment facilities. Individual projects relating to waste prevention and reuse will be monitored and evaluated separately through the campaign programme.

Arrangements are also in place to develop suitable targets and indicators for other projects developed during the implementation stage of this programme as appropriate.

We will report on high level results from this programme in the annual Towards Zero Waste progress report.

3 Industrial and Commercial sectors

This section describes the quantity and type of industrial and commercial (I&C) waste generated in Wales, and the benefits to business of waste prevention. It then describes the targets that apply to this sector, current business support measures, our priority sectors and areas for action and an outline programme of work, and how it will be monitored. The outline programme of work includes actions that businesses can take to influence household waste generation.

3.1 Assessment of the situation

3.1.1 Quantities and types of industrial and commercial waste

Around 3.6 million tonnes of I&C waste were produced in 2007 (the date of the last industrial and commercial waste survey for Wales). Industry produced 1.9 million tonnes and commerce produced 1.7 million tonnes.

The environmental impact[13] of products and their resultant waste materials was used to identify those wastes which should be the focus for greatest efforts in waste prevention. For I&C waste, the high impact wastes are:

- Food and putrescibles.
- Paper and card.
- Chemical waste.

In addition to these materials, some products have a high inherent financial value associated with their production. They also have high embedded impact per unit, and some also contain materials which are under supply pressure due to scarcity or security of supply. These products are:

- Clothing and non-clothing textiles.
- Electrical and electronic equipment.
- Furniture.

Industrial waste

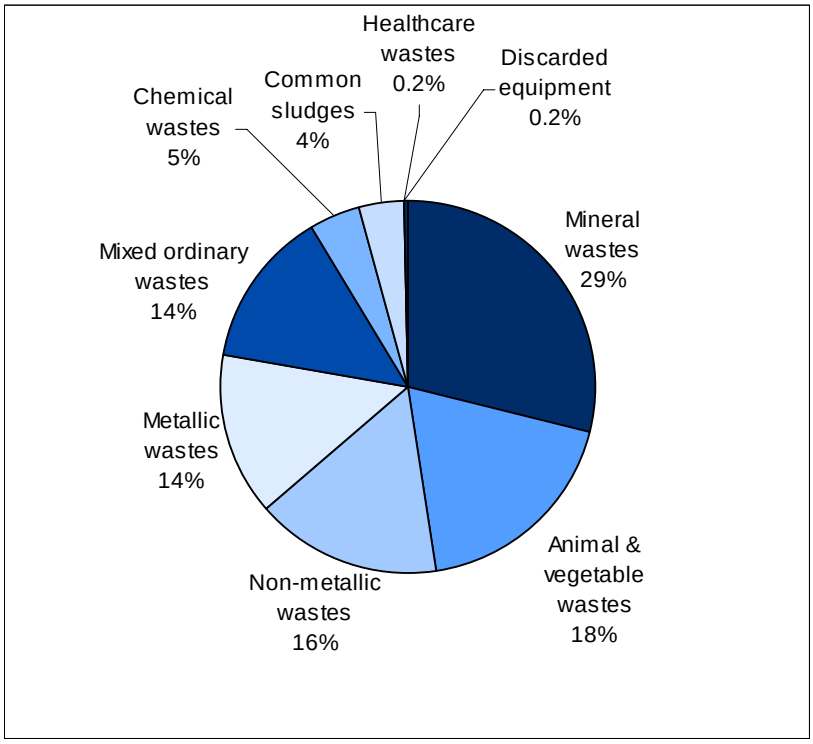
Mineral wastes, animal and vegetable wastes, non-metallic wastes[14] and metallic wastes collectively account for 78 per cent of the waste arising from industrial sectors (Figure 8). Most of the waste arises as discrete fractions, with only 14 per cent arising as mixed waste.

The type and quantity of industrial waste produced in Wales is highly variable and heavily influenced by the sector type.

13 Ecological Footprint Impact of the Welsh Waste Strategy, Arup (2009). The Ecological Footprint was used to determine these priorities, but carbon foot printing would deliver similar results.

14 Non-metallic wastes include glass, plastic, paper and cardboard, textiles, rubber, wood and wastes containing PCBs.

Figure 8: Composition of industrial waste produced in Wales (2007)

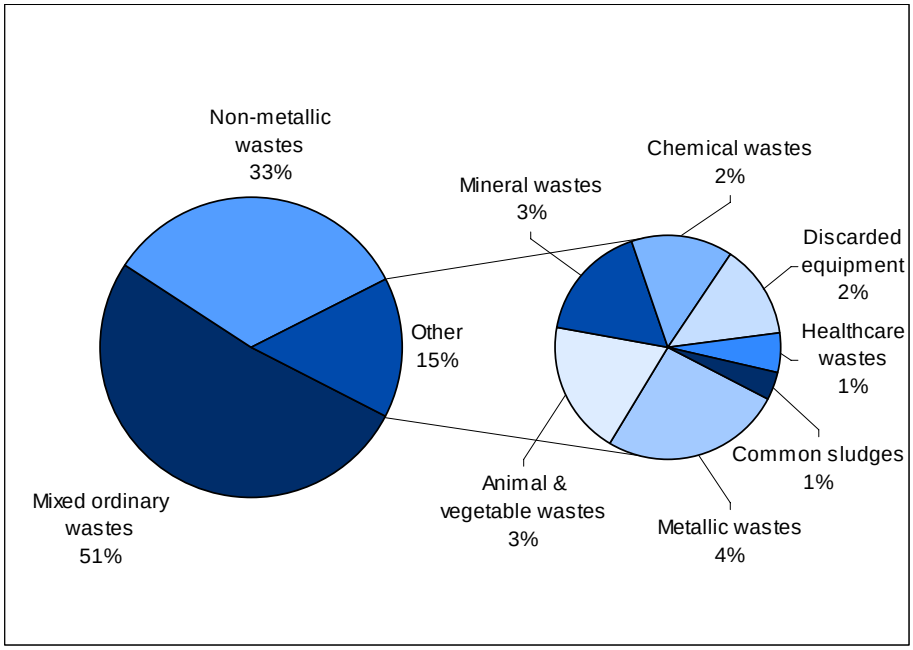


Source: Survey of Industrial and Commercial Waste in Wales 2007, Environment Agency

Commercial waste

51 per cent of the waste arising from commerce in 2007 was mixed waste, which contains valuable resources that can be recycled. 33 per cent of the waste was non-metallic waste, with the remaining 15 per cent consisting of small quantities of all other waste types. The composition of waste types generated by commercial business sectors in Wales is shown in Figure 9.

Figure 9: Composition of commercial waste produced in Wales (2007)



Source: Survey of Industrial and Commercial Waste in Wales 2007, Environment Agency Wales (2009)

The effect of economic and business activity on waste generation, and recent economic activity in Wales, is described in Appendix A.

3.1.2 Benefits of waste prevention

The full 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 and not these other embedded factors, which amount to many thousands of pounds per tonne.

WRAP provided the Welsh Government with the following estimates of cost savings to businesses in the supply chain, and to retailers, of avoiding waste for a selection of products (see Table 2).

Table 2 Cost savings of waste prevention to business for a variety of product types

Product Type	Cost savings 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

The following is summarised from a review of the evidence on business waste prevention, published in Waste Management & Research[15].

A report published by WRAP in 2010 on material-saving potential of resource efficiency[16] identified a range of opportunities for no- and low-cost resource efficiency savings. This was used to identify the total potential financial benefit to UK business of resource efficiency of £23 billion per year; £17 billion is a result of waste prevention, with £1 billion a result of recycling and landfill diversion[17]. Further analysis shows that 70 per cent of these shorter-term waste-prevention savings could be attributed to reduced material inputs into production processes and through the design of lighter and leaner products. While 80 per cent comes from just four industrial sectors - chemicals and non-metallic minerals, metal manufacturing, power and utilities, and construction. Longer-term savings increased the total savings to £55 billion per annum, of which £40 billion was a result of waste. These longer term investments are more costly, but the benefits can be several orders of magnitude greater than the investment required.

Several major reports on the global benefits of resource efficiency or a 'circular economy' have been published recently[18], with estimates of a global saving of $3 trillion or more by 2030[19] and of savings across the EU of $600 billion per annum by 2025[20].

15 *Business Waste Prevention: a review of the evidence*. Wilson et al (2012). Waste Management & Research.

16 *Securing the Future: The Role of Resource Efficiency* . WRAP (2010)

17 *The Further Business Benefits of Resource Efficiency*, DEFRA (2010)

18 *A Global Redesign. Shaping the Circular Economy*. Preston F (2012). Chatham House briefing paper.

19 *Resource Revolution: meeting the world's energy, materials, food and water needs*. McKinsey (2011).

20 *Towards the Circular Economy -Economic and business rationale for an accelerated transition*. Ellen MacArthur Foundation (2012). www.thecirculareconomy.org

3.1.3 Targets for waste prevention

Towards Zero Waste established the broad objectives for waste prevention and sustainable waste management. It sets out the goal of achieving "one planet living" by 2050, and the speed of travel required to get there is indicated through waste prevention and recycling targets for each waste stream. The targets below were proposed in Towards Zero Waste, and following consultation they have been adopted for this programme as non-statutory all Wales targets.

The target for industrial waste is a reduction of 1.4 per cent every year to 2050 based on 2006/7 baseline.

The target for commercial waste is a reduction of 1.2 per cent every year to 2050 based on 2006/7 baseline.

3.1.4 Support to businesses from Welsh Government

The Department of Economy, Science and Transport (ES&T) supports businesses on resource efficiency, environmental issues and sustainable business practices. There are also a number of European funded programmes operating in Wales, such as Innovation vouchers, ASTUTE, Institute of Sustainable Design, and WISE Network. They offer support to SMEs to incorporate resource efficiency and waste prevention into their business practices.

The Economic Renewal Programme sets out the role the Welsh Government can play in providing the best conditions and framework to enable the private sector to grow and flourish.

Nine key sectors have been identified for support.

- Creative industries.
- Information, Communication and Technology (ICT).
- Energy and Environment.
- Advanced materials and manufacturing.
- Life Sciences.
- Financial and Professional services.
- Food and Farming.
- Construction.
- Tourism.

Individual companies have also been identified as they are economically important to the communities in which they sit, or they are key to supply chains in Wales. They are classed as Anchor and Regionally Important Companies (RICs).

Jobs, wealth, growth are the over-riding priorities of ES&T. These are encouraged by:

- Building on the relationship the Welsh Government has with the business community and our social partners to create the flexible framework and conditions needed for companies and businesses to thrive and grow;
- Supporting high performing, quality companies in all those parts of the economy which can create employment, wealth and a sustainable Wales;
- Expecting any business seeking Welsh Government support, including public procurement contracts, to sign up to our principles of corporate social responsibility, with a commitment to sustainable development, training and good employment practice;
- Building strong links with our regionally important and anchor companies and developing strategic, mutually supportive / beneficial relationships with these key companies, embedding them in the Welsh economy through developing close links with our further and higher educational institutions and maximising supply chain opportunities.

The Department for Economy, Science and Transport provides the following services to help businesses:

- Business Wales service (network of eleven offices across the country will be delivered by a consortium comprising of Business in Focus, Centre for Business, Antur Teifi, and Menter a Busnes).
- Enterprise Zones Wales.
- Wales Economic Growth Fund.
- Support for business start-up.
- Business mentoring, advice and guidance through the One Stop Shop (business mentoring and the Business Wales website).
- Entrepreneurship and Responsible business - Corporate Social Responsibility programme with Anchor and Regionally Important Companies (identified through renewal programme).
- Business Innovation Programme.
- Academia for Business (A4B).
- SMART Cymru.
- Sponsorship of Knowledge Transfer Partnerships (KTPs) managed by the Technology Strategy Board).
- Support to participate in funding programmes run by e.g. the Technology Strategy Board.

A number of these services may be used to bring about waste prevention or resource efficiency, and realise the associated financial and environmental benefits. For example, a business may use the Academia for Business programme to gain expertise or carry out research into improved production efficiencies. A small business may use Business Wales to access support and advice on waste prevention. The Business Innovation Programme may help a business that is seeking to expand and access new markets through eco-innovation.

3.2 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.

3.2.1 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: Manufacture of basic metal and metal products; Manufacture of paper and paper products; Manufacture of chemicals, chemical products, pharmaceuticals.

3.2.2 Cross-cutting Priorities for Action

Our cross-cutting priorities 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.

3.3 Programme of work

Table 3 Outline measures and indicative timeline for the programme

	2013	2014	2015	2016	2017	2018 - 2025
Food manufacturing sector						
Options being scoped	**F**					
Hospitality and Food Service Voluntary Agreement				**R**		
Hospitality and Food Service sector grant programme				**R**		
Accommodation and Food Service sector						
Options being scoped	**F**					
Hospitality and Food Service Voluntary Agreement				**R**		
Hospitality and Food Service sector grant programme				**R**		

	2013	2014	2015	2016	2017	2018 - 2025
SMEs						
Options being scoped to enhance programme of support for office based services	F					
Options being scoped to enhance programme of support for retailers and wholesalers	F					
Options being scoped to enhance programme of support for accommodation and food services sector	F					
Permitted Industry Sector						
Options being scoped for manufacture of basic metal and metal products	F					
Options being scoped for manufacture of paper and paper products	F					
Options being scoped for manufacture of chemicals, chemical products, pharmaceuticals.	F					
Public Sector						
Public Sector Plan	F					
Large Retailers						
Options being scoped	F					
Courtauld Commitment				R		
Non food product packaging and retail innovation						
The Product Sustainability Forum						
Home and Workplace products						
Resource Efficient Business Models and Service Delivery						
Resource Efficient Clothing						
Welsh Government carrier bag charge						
Eco-Innovation and Welsh Manufacturing						
Options being scoped	F					

Key

Implementation		Review	R
Feasibility	F	Pilot	

3.3.1 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 per cent of the waste arises from companies with over 250 employees. Work by WRAP[21] suggests that waste reduction of around 10 – 15 per cent is possible by making relatively simple, low cost changes at food manufacturing facilities. The resultant cost saving is approximately £1,200 per tonne of waste prevented.

An enhanced programme will be developed with this sector in Wales, building 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. An estimated 37 per cent of the food waste is generated by businesses operating with the benefit of an environmental permit, and the regulations require all operators to minimise waste production and use resources efficiently. We will build on previous work carried out with Environment Agency Wales (now Natural Resources Wales) with a view to optimise the effectiveness of the regime.

Options to take this work forward are currently being scoped.

3.3.2 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 significant waste reduction potential within the sector, and the Welsh Government is working with businesses in 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 £1,800. The vast majority of waste generated by this sector comes from SMEs, and our programme of work will reflect this waste generation profile.

Our current programme in this sector is the WRAP led Hospitality and Food Service (HaFS) Voluntary Agreement and supporting activities. The objective of the agreement 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. In Wales there are specific supporting actions including WRAP run grant programmes such as Recycling on the Go and the Hospitality and Food Service Sector grant programme.

21 *Waste arisings in the supply of food and drink to households in the UK* (2010) WRAP

Table 4 Hospitality and Food Services Agreement targets

	Targets	Further Explanation
Prevention target	Reduce food and associated packaging waste arising by 5 per cent by the end of 2015	This will be against a 2012 baseline and be measured by CO_2e emissions.
Waste management target	Increase the overall rate of food and packaging waste being recycled, sent to anaerobic digestion (AD) or composted to at least 70 per cent by the end of 2015.	

The HaFS Agreement will run until the end of 2015, and WRAP aims to ensure Welsh businesses benefit through participation and on-the-ground support. Businesses will benefit financially by participating in the agreement, by realising cost savings through preventing food waste, optimising packaging and recycling more. This will help offset projected food price inflation - estimated at 5-10 per cent for this sector over the coming year - thereby keeping the sector competitive and protecting jobs.

The Agreement's sector-wide targets are a 5 per cent reduction in carbon impact through waste prevention, and an increase in recycling rates to 70 per cent (see Table 4). Activity within the programme will focus on three areas:

1. Working with large signatories to the Agreement, where big hits can be achieved. This activity will focus on one-to-one tailored support that will embed the targets within business plans and develop good practice, which can be shared.
2. Working with smaller signatories that individually produce small quantities of waste but have a high collective impact (around half of the waste produced within the sector comes from businesses with fewer than 10 employees). The Welsh Government is liaising with tourism bodies to develop support for SMEs in the sector. We will encourage the adoption of good practice, without the need to measure and report.
3. Working with government departments to encourage their commitment as supporters to the Agreement.

3.3.3 Small and Medium Sized Enterprises

We have prioritised office based services, food and accommodation, and small retailer and wholesalers in our support for SMEs because:

- Office based services don't represent a single sector, but the office based activities carried out in many service sectors and public sector functions, and to a lesser extent in other industry sectors. Most of the service sectors produce small quantities of waste individually, but have good potential to reduce the waste they generate and collectively contribute a reasonable quantity of waste to the commercial waste stream. A thematic approach will be taken to reducing paper and other typical office based wastes (such as office furniture, IT equipment, floor coverings and window dressings) in order to instigate best practice.

- Retailers and wholesalers are important because they are the link between suppliers or manufacturers and consumers. Small businesses often provide local employment and are key to keeping our communities vibrant. As small businesses are often short of time, staff and financial resources; they need targeted support to make simple changes that result in meaningful benefits.

- As mentioned in 3.2.2 above, 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. Other reasons for working with this sector include:
  - A significant reduction potential within the sector.
  - Its economic importance in Wales.
  - Significant financial benefits to business (e.g. £1,800 per tonne of food waste).

The Welsh Government is evaluating a range of options to enhance our programme of support for SMEs. This is important particularly for the priority sectors outlined above - small retail and wholesale businesses, accommodation and food services sectors - but could be applied more broadly.

3.3.4 Permitted Industry sectors

The industry sectors covered in this section operate with the benefit of an Environmental Permit, which sets out conditions including the requirement for a waste minimisation plan. Permitted industry is a priority because it generates large quantities of waste, some of which is difficult to manage or hazardous to the environment.

The industries we are interested from a waste prevention perspective are:

- Manufacture of basic metal and metal products.
- Manufacture of paper and paper products.
- Manufacture of chemicals, chemical products, pharmaceuticals.

A number of food manufacturing businesses also operate within the permitting regime, but are included separately under Food Manufacturing Sector above (section 3.3.1).

The true degree of resource efficiency across the breadth of activities covered by these sectors is not known. The cost and supply issues around some feedstock materials, together with the high value of the products, has driven process efficiency to a degree.

The Welsh Government will work with industry, process efficiency experts and Natural Resources Wales to better understand the degree to which industry has optimised its processes. Hazardous waste will be included in this work. It will also review the regulator's role in monitoring the performance of permitted industry. This work will form part of a waste evidence plan, which is being developed to support policy development and delivery.

3.3.5 Public Sector

The public sector is a significant employer in Wales, and also procures goods and services from private sector businesses and individuals. It can therefore act as an exemplar in its working practices and its procurement activities. Improving the material resource efficiency of the education sector also has the benefit of engaging with children and young adults to embed sustainable behaviours at an early age.

Sustainable development is the central organising principle of the Welsh Government, and there are proposals within the Future Generations Bill consultation to roll out this approach across those public sector bodies whose remit or functions have the greatest impact on the economic, social and environmental wellbeing of Wales, and those who have the strategic policy and corporate planning functions. Waste prevention and resource efficiency measures adopted by public sector organisations would demonstrate their commitment to environmental sustainability, and would send a clear signal to the workforce and suppliers that their obligations in terms of sustainable development are taken seriously.

In Wales public procurement accounts for around 10 per cent of GDP, therefore it could have a significant role to play in encouraging waste prevention and acting as a driver for the uptake of resource efficient products and ecodesign.

Green public procurement and the use of Government buying standards and clauses in public sector contracts to encourage waste prevention is viewed as a key measure of generating external change. In fact a recent study[22] noted that using procurement for external change is a key driver in waste prevention and one that offers the greatest potential when one or more organisation (such as a local authority) apply a common strategy.

In December 2012, Jane Hutt AM, Minister for Finance, announced a 'Wales Procurement Policy Statement' which sets out the procurement practices and the specific actions that will be required of every public sector organisation in Wales. It stated that while procurement decisions should be made on a quality/cost/risk basis, public sector organisations should also be mindful of the long-term impact. By doing so, they would be supporting the principles upon which the Future Generations Bill will be shaped.

Value Wales have developed a toolkit of training and resources for public sector organisations, such as the Sustainable Procurement Assessment Framework (SPAF), and they will continue to work closely with these organisations and the National Procurement Service for Wales (once established) 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.

A separate document – the Public Sector Plan - will take forward these actions and is currently being drafted for public consultation.

3.3.6 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, processors and distributors who supply them. They also generate large quantities of waste from their own operations, including priority waste types.

There is significant opportunity for impact reduction, and 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.

22 *Business Waste Prevention Evidence Review*. Oakdene Hollins (2010)

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 eco-design, 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.

Products with high environmental impact include food, clothing and other textiles, home and workplace furniture, chemicals, and electrical and electronic equipment.

There is currently a large amount of activity in this area, which is described below. The Welsh Government is also developing options on how this activity can be further enhanced.

3.3.6.1 The Courtauld Commitment

The Courtauld Commitment is a voluntary agreement between UK Governments and the British retail grocery and manufacturing sectors, and is managed by WRAP. The aim of the Commitment is to prevent 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. Interim results for Phase 2 show a reduction in the carbon impact of packaging of 8.2 per cent in two years, and a reduction of 8.8 per cent in product and packaging waste in the supply chain.

Following discussion with industry, it was determined that the Courtauld Commitment would be extended to a further phase – Courtauld 3.

Courtauld 3

Courtauld Commitment 3 will run for three years from 2013 to 2015 with targets measured against a 2012 baseline. The targets are shown in Table 5.

Table 5 Courtauld 3 targets (2013-15)

Title	Target	Further explanation
Household food and drink target	Reduce household food and drink waste by 5 per cent by 2015 from a 2012 baseline. Taking into account external influences, this target represents a reduction of 9 per cent relative to anticipated changes in food and drink sales.	Taking into account external influences, this target represents a reduction of 9 per cent 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 per cent by 2015, from a 2012 baseline.	Taking into account external influences, this target represents a reduction of 8 per cent 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 per cent relative to anticipated sales volumes.

3.3.6.2 Non food product packaging and retail innovation

Plastics, paper and card are identified as priority waste streams from households. Much of this waste originated as packaging, and so reducing the impact of packaging is a priority. Excess packaging is frequently quoted as a concern to the public, and there will be a continued emphasis on optimising packaging through supply chain actions. The focus should be on right weighting, which means designing packaging which uses the minimum quantity of material possible whilst retaining the integrity of the product it contains.

Work will also be extended to non-food consumer goods, and to secondary and tertiary packaging used to transport and store goods. The packaging waste generated by online shopping, which has increased significantly over recent years, will also be tackled.

Learnings from the food sector are being taken forward by WRAP into non food products.

3.3.6.3 The Product Sustainability Forum (PSF)

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

- Provide the evidence, data and tools that help businesses and governments to prioritise their work to reduce the environmental impacts of everyday products.
- Help businesses to work together to quantify, reduce and communicate the environmental impacts of the products they make and/or sell.
- Test the feasibility of using this body of work to underpin any potential future voluntary agreements or actions and other policy instruments as agreed with the UK Governments.

The current focus of the forum's work is on the life cycle environmental impacts of grocery and home improvement products, and it acts as a knowledge hub to support other programmes.

Pathfinder projects are being developed in Wales.

3.3.6.4 Home and Workplace Products (HWP)

The purpose of this WRAP programme is to make resource efficiency an integral part of product specification and distribution. It focuses on the HWP products that offer the greatest potential for reductions in their resource impacts, particularly electrical and electronic equipment (EEE) and furniture.

This objective is being delivered through:

- Evidence for the prioritisation of action and consensus among interested parties through the Product Sustainability Forum.
- Involvement of Welsh supply chains to reduce product damage and increase product lifetimes through dissemination of information and targeted engagement.

The programme will build on the success of the Home Improvement Sector Commitment (HISC), with its associated targets:

- Reduce packaging by 15 per cent by the end of 2012*.
- Reduce waste to landfill from their operations by 50 per cent by the end of 2012*.
- Help consumers to recycle more.

*measured against a 2007 baseline.

This commitment ended in 2012, and results will be published by WRAP in due course.

The programme of work going forward in Wales includes working with major retailers of electrical products in Wales with the highest potential for reduced whole-life impacts (e.g. white goods). These businesses will be encouraged and supported to take action to reduce impacts, for example through increased lifetime guarantees, trade-in schemes for used goods, and revised design specifications. The electrical products work could also lead to business model pilots (using support from the WRAP Programme Area on New Business Models) as discussed in the following section (3.3.6.5).

3.3.6.5 Sustainable EEE and New Business Models

This WRAP programme will demonstrate the case for alternative business models with a focus on high-impact products, including electrical and electronic products, clothing and furniture, and the services that use them. This programme is focused in three areas.

1. Alternative business models in the retail sector – with a particular focus on electrical products and clothing. Included are models based on product life extension, product take-back for re-sale, and service provision.
2. Alternative business models in the business to business service sector of Facilities Management (FM) – with a particular focus on efficient management of mobile assets (such as electrical products, furniture and spare parts).
3. Changes in client procurement practice for FM services (including catering), particularly through exemplar organisations in the public sector.

3.3.6.6 Sustainable Clothing

This WRAP programme will make resource efficiency an integral part of the specification process for clothing by 2015, reducing the carbon, waste and water footprints across the clothing life cycle. It will encourage businesses to push for behaviours which are inherently resource-efficient as part of their consumer messaging.

This will be delivered through publishing data and resources, issuing guidance for retailers, designers and buyers, and facilitating UK-wide collective sector action involving the major players in Wales. The Sustainable Clothing Action Plan brings together industry, government and the third sector to reduce resource use and develop sector-wide targets.

3.3.6.7 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 consumers took home an estimated 350 million carrier bags from the major supermarkets alone. This is 273 bags per household, and does not include the bags picked up when shopping at high street stores and smaller shops. The bags were usually only used once for shopping, which meant they were wasted and could become a litter problem.

WRAP has reported that between 2010 and 2012 carrier bag supply in Wales has reduced by as much as 81 per cent in the supermarket sector. The WRAP findings are further supported by new research published in July 2013 by the 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.

3.4 Promoting Eco-Innovation in the Welsh manufacturing sectors

The Welsh Government is proposing to develop an initiative to enhance eco-innovation in manufacturing businesses in Wales.

In terms of new or improved products, ecodesign means 'changing the way that products are designed to: reduce the amount and type of material in products (including hazardousness); improve longevity; and design for reuse, separation and recycling.

Eco-innovation is defined in the Eco-innovation Observatory, Methodological Report 2012 as the 'introduction of new or improved product (good or service), process, organisational change or marketing solution that reduces the use of natural resources (including materials, energy, water and land) and decreases the release of harmful substances across the whole life cycle'. This Waste Prevention Programme considers options that reduce the use of natural *material* resources, including new business models that reduce the consumption of goods through leasing, producing more durable goods and enabling repair and reuse.

While ecodesign and eco-innovation are closely linked they are different. Ecodesign implies taking into account all the environmental impacts of a product right from the earliest stage of design. In particular, this avoids uncoordinated product planning (for example, eliminating a toxic substance should not lead to higher energy consumption, which on balance could have a negative impact on the environment).

This will include:

- Targeting sectors and businesses where there is greater potential for resource efficiency gains through eco-innovation.
- Staged interventions according to where businesses are on their 'innovation journey'.

Delivery could be either through:

- Enhancing eligibility within the existing Welsh Government Economy, Science and Transport Department innovation offering, such as innovation vouchers, Knowledge Transfer Networks and Research Development &Innovation funding.
- Developing new programmes.

The initiative will prioritise businesses within the three Grand Challenge areas, identified in *Science for Wales*: Life sciences & health, Low carbon, energy and environment, and advanced engineering and materials, but will not exclude excellent eco-innovation projects in any sector.

These 3 sectors are also targeted in *Innovation Wales* as areas where major interventions are to be concentrated. *Innovation Wales* specifically refers to eco-innovation as forming part of the broader definition of innovation which the Welsh Government would like to adopt going forward.

Because the initiative prioritises Wales' Grand Challenge areas, it will accord with the European Commission's Smart Specialisation approach which the Welsh Government has now adopted, and which is important when accessing EU Structural Funds.

Finally, the initiative's target areas have a significant overlap with the EU's identified societal challenges outlined *Horizon 2020*, the new Common Framework for Research and Innovation for 2014-2020.

3.5 Monitoring Progress

3.5.1 Progress against the national target

The waste prevention target for industrial waste is an absolute reduction of 1.4 per cent of the 2007 baseline each year to 2050.

For commercial waste, the target is an absolute reduction of 1.2 per cent of the 2007 baseline each year to 2050.

These are not statutory targets being placed against any particular industry sector or business, but are indicative targets for us to achieve collectively.

Data for these targets are currently collected by periodic waste generation surveys, the most recent of which was in 2007. A data strategy is being developed which assesses the means of collecting waste data in the short, medium and long term. A survey of business waste generated in 2012 is underway and it will report in early 2014.

3.5.2 Indicators of strategic progress

The following indicator is proposed, which will be used to monitor progress at a strategic level, particularly against the objective of decoupling waste generation from economic growth.

- Industrial and commercial waste generation against Gross Value Added (GVA).

3.5.3 Monitoring progress of individual implementation projects

There is currently a lack of comprehensive evidence on the efficacy of waste prevention measures, so by monitoring our implementation projects identified above, we will not only be able to assess progress internally but also contribute to the evidence base in the public domain.

Alongside the development of each implementation project there will be an associated monitoring plan, target or indicator(s) as appropriate. The Welsh Government will collate outputs from the monitoring plans and will report progress in its annual Towards Zero Waste progress report, and periodically evaluate and review the impact and value for money.

4 Construction and Demolition waste

This section describes the quantity and type of construction and demolition (C&D) waste generated in Wales, the financial benefits of waste prevention, policies and targets, and initiatives to prevent waste that are in place. It outlines the priority areas for action, and describes the programme of work including an indicative timetable. Finally it outlines the associated indicators, monitoring and progress reporting.

4.1 Assessment of the situation

4.1.1 Quantities and types of construction and demolition waste

The most recent data for C&D waste generated in Wales comes from a survey carried out by Environment Agency Wales on behalf of the Welsh Government, and reflects waste arising in 2005/06. The source of this data was a survey of businesses involved in civil engineering, construction, demolition and general building. The survey took place before the European Commission published its revision to the Waste Framework Directive. The Directive gave definitions of waste, and explained that some materials fall outside the definition of waste. The data has been re-calculated to align to the definitions within the Directive.

The total amount of C&D waste arising in Wales in 2005-06 is estimated to be 9.4 million tonnes.

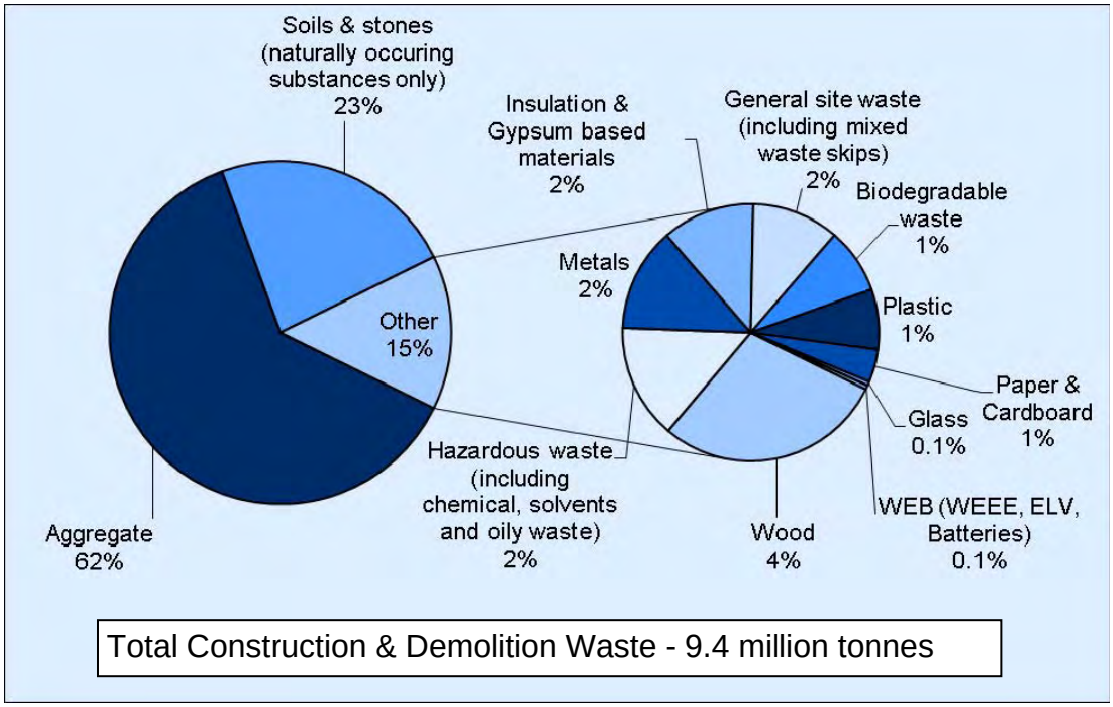
The composition of waste arising from the C&D sector is shown in Figure 10. Aggregates[23] (5.9 million tonnes), such as concrete and bricks, and soils (2.2 million tonnes) account for 85 per cent of waste arising from the sector. The remaining 15 per cent consists of a mixture of plastic, wood, glass, metals, hazardous waste, insulation and gypsum, paper and cardboard, waste electrical and electronic equipment, end of life vehicles and batteries, biodegradable and general site waste.

4.1 million tonnes of C&D waste were reused on site and 5.3 million tonnes were managed away from the site of production.

The Welsh Government has commissioned a new survey, which is taking place in 2013, and will determine the quantity and type of industrial, commercial and C&D waste generated in Wales in 2012. This will update our evidence base and help to focus future action.

23 The survey defined the term aggregate as follows: Materials used in construction. Usually composed of two types: 1) primary aggregate sources such as sand, gravel, crushed stone, slag, or 2) waste produced by the C&D sector that are recycled or reused. These are termed secondary aggregates, i.e. crushed concrete. Waste Group comprises of concrete (EWC 17 01 01), bricks (EWC 17 01 02), tiles & ceramics (EWC 17 01 03), mixtures of the above (EWC 17 01 07) and bituminous mixtures (EWC 17 03 02).

Figure 10 – The composition of waste arising from the C&D sector in Wales (2005-06)



Source data: Environment Agency Wales

The environmental impact[24] of products and their resultant waste materials was used to identify those wastes which should be the focus for greatest efforts in waste prevention. For construction and demolition waste, the high impact wastes are:

- Wood.
- Plastic.
- Insulation and gypsum.
- Hazardous waste (primarily contaminated soil).
- Metals.
- Concrete, bricks, tiles and ceramics, bituminous substances[25].

For a description of economic and business activity in the construction sector see Appendix A.

24 *Ecological Footprint Impact of the Welsh Waste Strategy*, Arup (2009). The Ecological Footprint was used to determine these priorities, but carbon foot printing would deliver similar results.

25 These materials were combined with natural stone and rock in the C&D survey, and subsequently modelled as natural materials in the Ecological Footprinting exercise. However these are high impact materials which should be considered for waste prevention measures.

4.1.2 Benefits of Waste Prevention

An Envirowise study into construction waste estimated that the true cost of one skip of mixed construction waste was approximately £1,300[26]. The most significant cost element was attributed to unused materials, which includes products broken in transit and storage, and products that have been over-ordered. WRAP estimates that the financial value of construction products wasted in their production and supply is approximately £250 per tonne, and the cost to builders at the construction site is around £400 per tonne.

A report by the UK Department for Business, Innovation and Skills (BIS) Low Carbon Construction Innovation & Growth Team[27] found that 10-15 per cent of the materials sent to a building site end up as waste, so there is considerable opportunity for financial savings in this area.

4.1.3 Policies and targets for C&D waste prevention

The target for construction and demolition waste proposed in Towards Zero Waste and confirmed in the Construction and Demolition Sector Plan is a reduction of 1.4 per cent every year to 2050 of waste treated off-site based on 2006/7 baseline.

To support the delivery of Towards Zero Waste, the Construction and Demolition Sector Plan was developed to help steer action within the sector and the organisations that support it. The Waste Prevention Programme for the C&D sector will be implemented alongside the sector plan.

4.1.4 Current initiatives on waste prevention

Targeted delivery on waste prevention is funded by the Department of Natural Resources and Food of the Welsh Government. The Department of Economy, Science and Transport also supports businesses on resource efficiency, environmental issues and sustainable business practices.

To support the delivery of Towards Zero Waste and the associated sector plans, the Welsh Government grant funds a number of organisations to deliver specific waste prevention initiatives on its behalf.

The current main delivery organisation for construction and demolition waste is Constructing Excellence in Wales (CEW), and their work on waste prevention within the sector is described below. The Welsh Government supports social enterprises that have the potential to reuse or repair items from the sector. There is also collaboration with other organisations such as Ecodesign Centre Wales where appropriate.

26 http://www.wrap.org.uk/content/estimating-waste

27 Low Carbon Construction Innovation & Growth team – Final Report (November 2010)

http://www.bis.gov.uk/assets/biscore/business-sectors/docs/l/10-1266-low-carbon-construction-igt-final-report.pdf

Constructing Excellence in Wales (CEW)
During 2012/13, CEW's actions on waste prevention and resource efficiency within the built environment[28] sector focused on:

- Aligning carbon reduction and waste prevention/minimisation activity within the sector.
- Increasing the use of surplus materials in construction.
- Increasing the procurement and use of materials efficient construction products in Wales.

Aligning carbon reduction and waste prevention / minimisation activity
CEW are also responsible for hosting the Wales Low/Zero Carbon Hub (LZCH) on behalf of the Welsh Government. The purpose of the Hub is to act as a dissemination and engagement mechanism to stakeholders and a source of advice to Welsh Ministers regarding activities and actions needed to achieve the aspiration of zero carbon new build and the contribution to be made by the built environment that will help to deliver the three per cent annual target to cut green house gas emissions.

The hub's objectives are to:

- Advise Welsh Ministers on the most effective way to deliver relevant commitments of the Climate Change strategy in respect of the built environment, and contribute to related policy review, development and implementation.
- Raise awareness among the stakeholders about solutions aimed at reducing emissions in new and existing buildings. To disseminate developing best practice and act as a focal point for obtaining the views of industry and wider stakeholders.
- Work with existing knowledge networks and organisations working in the field.
- Identify, propose and promote practical actions and policy options, including the uptake of research findings.
- Identify any gaps in current policies (having regard for the limits of Assembly Government devolved responsibilities) which would usefully contribute to the achievement of policy objectives.

CEW's C&D waste programme team work with the LZCH to eliminate the potential conflicts between the carbon reduction agenda and waste prevention programme, with particular focus on issues related to difficult wastes which will become a legacy for the future.

28 The built environment includes construction and demolition, civil engineering, other building activities including refurbishment activities etc.

Increasing the use of surplus materials in construction
This programme has developed mechanisms to facilitate the use of surplus materials from one site into use at another site. Activity has centred on the development of two specific projects: a web based platform to enable industry–to-industry exchange of surplus materials and the establishment of a centre to redistribute surplus from construction projects and construction product manufacturers and suppliers into community use.

Support from Economy Science and Transport
The Welsh Government's department for Economy Science and Transport, and its support for businesses, is described in section 3.1.4.

4.2 Priorities and programme of work

4.2.1 Priority areas for action

The Welsh Government has worked with stakeholders to identify the causes of environmental impact and waste generation within the sector. In addition, AMEC Environment and Infrastructure Ltd were commissioned to carry out an evaluation of a range of measures which could be used to tackle waste prevention[29]. This was a high level piece of work using existing evidence which was designed to build on actions set out in the C&D sector plan and inform the elaboration and implementation of the waste prevention programme for this sector. The report recommended that the following measures would lead directly to waste being prevented:

- Ecodesign.
- Green Private Procurement & supply chain influence.
- Green Public Procurement.
- Resource Exchanges.

In addition, the report identified a number of other supporting measures which could facilitate waste prevention in combination with the main programme of work.

In response to this report and following consultation with a range of industry representatives and other interested parties, 6 key areas of work have been identified as having greatest potential for waste prevention within the sector:
- Design of buildings and construction projects.
- Design of construction products.
- Damage to construction products in transit.
- Over-ordering by builders.
- Use of excess products generated on site.
- Demolition and refurbishment of buildings.

29 *Evaluation of a range of Waste Prevention initiatives for Construction and Demolition waste produced in Wales to support the Waste Prevention Programme* – AMEC Environment & Infrastructure UK Limited, March 2013

4.2.2 Programme of work

An outline programme of work for each key area is described in the sections below, and an indicative timeline is given in Table 6. This is based on actions already identified in the Construction & Demolition Sector Plan (issued in November 2012) and suggested measures set out in the evidence base.

During the consultation period, a workshop was held with representatives from across the sector. A range of initiatives were suggested to address the six work areas, and these will be appraised and taken forward as implementation projects as appropriate.

Table 6 Outline measures and indicative timeline for the programme

	2013	2014	2015	2016	2017	2018 - 2025
Engage						
Designing out waste						
Education and guidance		R	R			
Design for Deconstruction (D4D)		R	R	R		
Enable						
Ecodesign within construction projects	F	F				
Design solutions for construction products	F	F	F			
Welsh Government support for SMEs to reuse surplus materials						
Infrastructure to support the reuse of surplus materials for community benefit						
Encourage						
Use of value engineering on large construction projects						
Sustainable construction products	F	F				
Exemplify						
Minimising 'wastage' factor		F				
Greening construction related procurement						

Key

Implementation		Review	R
Feasibility	F	Pilot	

4.2.2.1 Design of buildings and construction projects

The design of buildings and infrastructure impacts heavily on the environmental sustainability of construction projects. This area of work will focus on encouraging wider use of a range of sustainable design principles:

- Design for reuse and recovery.
- Design for off-site construction.
- Design for materials optimisation.
- Design for waste efficient procurement.
- Value engineering (for large projects).
- Design for deconstruction and flexibility.

Ecodesign within construction projects

There are 5 recognised ecodesign approaches, of which the following four could be applied to construction materials and projects to assist with waste prevention:

- **Life Cycle Thinking** - considering the full life cycle impacts of a product, packaging or service. This includes material extraction, manufacture, distribution, retail, use and end-of-life. Completing a Life Cycle Assessment (LCA) can make a comparison between different design options allowing the least damaging option to be selected.
- **Design for Disassembly** – considering the easy separation of different types of material from a product once its useful life has come to an end, to allow for effective recycling.
- **Reduce** the negative impact of a product on the environment, for example by removing hazardous chemicals or materials, without compromising the design.
- **Re-Design** the product or product system, for example by re-designing the product to take advantage of more sustainable materials and cleaner production methods.

Ideally ecodesign would become a thread that runs through the design, planning and development of all construction activities. It can ensure construction is not undertaken in isolation, but that a holistic, life cycle perspective with superior resource management is applied. The Welsh Government will support the use of ecodesign approaches within the sector in Wales.

Design solutions for construction products

The Welsh Government will seek to work with construction product manufacturers to identify ecodesign solutions for issues of production inefficiencies, generation of legacy waste and recyclability. This could include (amongst other things) focusing on the promotion and development of Modern Methods of Construction (MMC) as well as simpler solutions such as the use of standardised sizes for materials to help reduce the amount of off-cuts produced on site.

Encouraging use of value engineering for large construction projects
The Welsh Government will encourage the transfer of learning and best practice from the civil engineer sector to the construction sector by raising awareness, and promoting the use, of the value engineering methodology and associated tools.

Designing out waste
The Welsh Government will seek to increase awareness about 'designing out waste' among clients, designers and architects and encourage them to utilise these principles at the commencement of a construction project.

Greening construction related procurement
The Welsh Government Construction Procurement Strategy was instigated by Minister for Finance, Jane Hutt, in response to the 2010 CEW report "No Turning Back"[30]. The strategy was launched formally by the Minister on 15th July 2013. While primarily aimed at the public sector as the largest construction client in Wales, the strategy will highlight best practice examples which will be relevant to private sector clients as well. There are clear links between the strategy and waste prevention opportunities, and these will be communicated to the industry.

In addition, there will be a review of the range of guidance and tools available to assist businesses in procurement.

Site Waste Management Plans
The purpose of site waste management plans (SWMPs) is to help companies in the C&D sector to think and plan to prevent, minimise and recycle the waste being produced and divert waste away from landfill. They are an important tool, which provides a framework that encourages resource efficiency and waste reduction, recycling and reuse both on-site and off-site. The Welsh Government has consulted on the introduction of Site Waste Management Plan Regulations and is currently considering options for how best to increase their usage in Wales.

30 No Turning Back: The Case for a Renewed Emphasis on Best Value and Collaborative Working in Public Sector Construction Procurement – Constructing Excellence in Wales, 2010

4.2.2.2 Design of construction products

As with the design of buildings and projects, the design of construction products impacts heavily on the environmental sustainability of a construction project.

Sustainable construction products

Two lists of construction materials, characterised in relation to their environmental impact, have been produced by Ecodesign Centre Wales on behalf of the Welsh Government. The next step is to explore existing systems, in particular the BASTA[31] (Guidance to Sustainable Construction Materials) system developed in Sweden, with the potential to develop a similar system for use in Wales. In addition, there will be opportunities to have a greater influence on manufacturers of construction products via the EU Construction Products Regulation, which took effect from 1 July 2013.

Design solutions for construction products

The Welsh Government will investigate options for working with construction product manufacturers to identify ecodesign solutions to issues of production inefficiencies, generation of legacy waste and recyclability. This could include (amongst other things), focusing on the promotion and development of MMC as well as simpler solutions such as the use of standardised sizes for materials to help reduce the amount of off-cuts produced on site.

4.2.2.3 Damage to construction products in transit

It is estimated that on average, between 5 and 15 per cent of materials ordered for a construction project will be 'wasted' due to damage retained during transport or incorrect storage etc. This leads to over-ordering by the construction company. Effort will be put into packaging and transport solutions which minimise damage, and the construction industry will be encouraged and provided with clear guidance by CEW on the correct storage of materials on site.

Education and guidance

Increasing awareness about waste prevention within the sector is a fundamental step in assisting to meet the waste prevention targets. We are improving awareness through the development, with partners, of a number of guidance documents, including but not limited to guidance for manufacturers to ensure their product is handled appropriately to reduce the risk of damage/waste.

31 http://www.bastaonline.se/english/bastaonline/aboutbasta.4.386979f513a1a34373978f.html

4.2.2.4 Over-ordering by builders

This issue may be solved in part by addressing damage issues, but there should also be a re-focus on ordering. There are ordering mechanisms which optimise productivity whilst avoiding waste. These will be promoted for use by construction companies. Time pressure is often quoted as a reason to over-order; there is often no time within the schedule to wait for additional materials to arrive on site, so to avoid penalties for over running on time the construction company will order excessive quantities of materials at the start of the project.

The public sector will need to place greater emphasis on resource efficiency and waste prevention in its procurement of construction projects, and place less time pressure on construction projects. The Welsh Government launched its Construction Procurement Strategy in July 2013 and this contains a "shared commitment" that "Projects will incorporate best practice approaches to resource use, waste minimisation, low-carbon performance, employment, training and community engagement".

Minimising 'wastage' factor

The Welsh Government will ask CEW to investigate the viability of introducing an 80:20 per cent ordering scheme in Wales in order to minimise wastage through over-ordering. A similar scheme is currently operational in South East England and the results from this could be used to assess the potential benefits of such a scheme in Wales. The viability study will include a review of existing practice and industry review/opinion/feedback.

4.2.2.5 Use of excess products generated on site

There will inevitably be some projects which do not use all of their ordered materials, and for these cases there should be facilities available for companies to deposit excess materials for use by others. There are a number of options for this material including take back and sale by the original merchant, bring sites run by businesses or social enterprises (with associated websites for publicising available stock), and collection hubs for use by charities, social housing landlords or those on low income. There are challenges with this model in that it needs to match material donation to demand, but it is promising and could have wide sustainability benefits.

Welsh Government support for SMEs to reuse surplus materials

The Welsh Government has funded the development of an internet platform to enable the construction industry, in particular SMEs, to make surplus materials suitable for reuse visible to potential users. Originally launched as Builderscrap and rebranded as Recipro Wales, the site was launched in Wales at the Federation of Master Builders Conference in Swansea on 13 November 2010. It enables builders to upload the details of any surplus construction materials and advertise to others within the industry for reuse. The concept has been extensively trialled and developed over a three year period. The Welsh Government will continue to provide, develop and raise awareness of this mechanism to enable the construction industry, and in particular SMEs, to reuse its surplus materials.

Infrastructure to support the reuse of surplus materials for community benefit
The Welsh Government tasked CEW, working with Cylch, to determine the feasibility of establishing a network of surplus centres for the redistribution of surplus construction materials and products in Wales. In July 2012, the Minister for Environment and Sustainable Development opened the first surplus centre, Reciprocity Cardiff, which has been set up to receive surplus construction materials and redistribute them to community projects and schemes, for reuse.

4.2.2.6 Demolition and refurbishment of buildings

There is considerable scope to increase reuse and preparation for reuse of building materials and components that arise during the refurbishment and demolition of buildings. There are also opportunities in respect of architectural salvage. There will be a focus on raising awareness of these opportunities within the sectors and wider to their client base. As prevention is at the top of the waste hierarchy, the first stage in demolishing or refurbishing a building should be an assessment of reuse potential. This mentality is likely to have knock-on effects to improve the environmental sustainability of any resultant waste management options.

Public procurement could again have a role to play in encouraging sustainable refurbishment and demolition, and in producing case studies for dissemination. This will be covered in the Public Sector Plan.

Design for Deconstruction (D4D)
The Welsh Government will encourage designers/architects to design for the end-of-life of the building. This will ensure that the materials used in the construction of the development contain a high percentage of recycled content (helping to create a market for recycled materials and products) and that throughout the life of the building the materials can be either reused or recycled. We will work to raise awareness of the importance of designing for end of life. This will include: developing a series of design standards for common build types; working with others to promote principles of D4D within existing systems/standards; working with partners to develop guidance material for application; and dissemination of training/guidance material via events/webinars/website.

4.2.2.7 Review of additional measures suggested during consultation

During the consultation period, a workshop was held with a number of representatives from across the sector. A range of initiatives were suggested to address the 6 key work areas and are listed below. These will be reviewed in more detail, and where appropriate, taken forward via the C&D implementation projects:

Design of construction projects and construction products

- Planning guidance to encourage standard size materials; use of qualified architects and professionals to ensure control of projects; require Construction Design and Management (CDM) co-ordination.
- Introduction of house manuals - record of who built it, what/how/when (for maintenance purposes).
- Encourage designs of 'homes' not houses i.e. building for longevity. Local authorities could be encouraged to offer self-build plots rather than larger plots for large housing developments.
- Encourage refurbishment rather than demolition & new build. There is currently a VAT incentive for new builds but not for remodelling properties.

Damage to construction products in transit and in storage

- Encourage supply chain forums on large scale projects to enable efficient material use planning and instil a better ethos around waste 'ownership' and site management.
- Consider a sector wide charter / agreement / standard (based on percentage damage) for: the transport sector to encourage best practice (packaging used in-transit; organisation of loads to reduce movement in-transit and pallet reuse / take back).

Over ordering by builders and use of excess products generated on site

- Standard contracts off the shelf with case law built around it and relevant clauses.
- Standard waste plan as part of contract but with flexibility for contractor to alter i.e. a proposition that can be negotiated.
- Strategic mission statement from the Welsh Government considering competing priorities e.g. community benefits - local labour - choice.
- Consider possible legislation - procurement for best value not cheapest; targets to motivate e.g. max 10 per cent waste.

Demolition and refurbishment of buildings

- More education of clients required with regards to refurbishment or deconstruction for reuse / recycling vs. demolition.
- Encourage opportunities for closer working between clients, demolition companies and architectural salvage companies to build time into contracts for recovering architectural features and building materials prior to demolition.

4.3 Monitoring Progress

4.3.1 Progress against the national target

The waste prevention target for construction and demolition waste is an absolute reduction of 1.4 per cent every year to 2050 of waste treated off-site based on 2006/7 baseline.

This target is not statutory, but is an indicative target for us all to work together for a more sustainable sector in the future.

Data for these targets are currently collected by periodic waste generation surveys, the most recent of which reported on waste arising in 2005/06. A data strategy is being developed which assesses the means of collecting waste data in the short, medium and long term. A survey of construction and demolition businesses reporting waste generated in 2012 is underway, and it will report in early 2014.

4.3.2 Indicators of strategic progress

The following indicator will be used to monitor progress at a strategic level, particularly against the objective of decoupling waste generation from economic growth.

- Construction and Demolition waste generation per unit Gross Value Added (GVA).

Data collected during previous surveys of Construction and Demolition waste arisings is not sufficiently precise to discern historic trends in decoupling. The 2013 survey and future surveys (or other data collection methods) will aim to reduce the levels of uncertainty in order that the indicator may be tracked.

4.3.3 Monitoring progress of individual implementation projects

There is currently a lack of comprehensive evidence on the efficacy of waste prevention measures, so by monitoring our implementation projects we will not only be able to assess progress internally, but also contribute to the evidence base in the public domain.

Implementation projects are currently being developed, and will be accompanied by associated monitoring plans, targets or indicators as appropriate. The Welsh Government will collate outputs from the monitoring plans and will report progress in its annual Towards Zero Waste progress report.

5 Reuse

5.1 Background

Article 11 of the revised Waste Framework Directive requires that 'Member States shall take measures, as appropriate, to promote the reuse of products and preparing for reuse activities, notably by encouraging the establishment and support of reuse and repair networks, the use of economic instruments, procurement criteria, quantitative objectives or other measures'.

The Welsh Government has assessed options for increasing reuse, preparing for reuse and repair of household, business and construction and demolition products currently entering the waste system.

Three options were considered to 2025:

- **Business As Usual** considers what could be achieved if current activity continues.
- **Current Market Potential Realised** considers the effect of increasing reuse such that current levels of demand for reused goods are met.
- **Feasible Potential Realised** considers how the technically feasible potential for reuse could be realised, including repair where economically viable.

The available information indicates that:

- Currently, approximately 50,000 tonnes of household items are reused or sent for reuse by Welsh households, equivalent to 3 per cent of municipal solid waste.
- In 2011, households in Wales discarded products with a potential resale value of £140 million.
- Reuse of office furniture and electrical items accounts for 0.1 per cent of industrial and commercial waste. In 2011, businesses discarded products with a resale value of £14 million.

For all items, the resale value is estimated to be in excess of £2,000 per tonne.

By 2025, it is estimated that a 20 per cent increase in reuse of household and commercial and industrial items could occur based on current activities. Capturing this would create jobs, volunteering opportunities, training places and work placements.

Towards Zero Waste outlines a target by 2025 for reduction in household waste of 27 per cent from a 2007 baseline. Increases in reuse of products which do not enter the waste stream could provide 7 per cent of the required reduction.

5.2 A programme for repair and reuse in Wales

The Welsh Government is taking forward the initiatives below, which will collectively form a programme for repair and reuse in Wales.

5.2.1 Electrical items

Available information suggests that under the scenarios modelled for 'current market potential realised' and 'feasible maximum potential realised', demand exceeds supply for electrical items. There is therefore an opportunity to increase the supply of electrical items for reuse to meet that demand.

Options being developed are:

- Awareness raising through a communications campaign to increase the donation for reuse of electrical products by householders.
- A voluntary agreement to encourage separate collection at designated collection facilities and work with approved authorised treatment facilities (AATFs) to encourage more repair, reuse and resale at their facilities.
- Research to identify the proportion of waste electrical items entering an AATF that is suitable for reuse.

5.2.2 Furniture

Available information suggests that the scenarios modelled for 'current market potential realised' and 'feasible maximum potential realised' demand exceeds supply for furniture. There is therefore an opportunity to increase the supply of furniture for reuse to meet that demand.

Options being developed are:

- Green Procurement – require proportion of need for furniture to come from reused sources.
- A demonstration project/trial to be developed on an extended producer responsibility scheme for furniture.

5.2.3 Clothing

Available information suggests that current estimates for clothing reuse in Wales put consumer demand for reused clothing lower than supply; therefore there is opportunity to increase consumer acquisition of reused clothing to keep clothing donated for reuse within Wales.

The following option is being developed:

- A communications campaign to increase the purchase of reused clothing.

5.2.4 Overarching measures

An enhanced Reuse Network is also an option being considered for development. This would build on the existing infrastructure for reuse including potentially:

- Shared warehousing.
- Establishing a phone line.
- Public communications and other activities.

This network is complementary to the options above.

WRAP is developing a generic standard for reuse. The ultimate aim of the standard is to allow reuse organisations to offer reuse products which have been subjected to a quality assured process, thereby building confidence in the sector and aiding its development. The standard can be used to support the development of a Reuse Network.

6 Next Steps

6.1 Implementation projects

Implementation projects and any associated project-specific target and monitoring plans will be developed.

6.2 Data and Evidence Plan

To assess the feasibility of our implementation projects, ensure we realise benefits, and evaluate our performance, we need access to appropriate data and evidence. We are producing a Data and Evidence Strategy to outline our requirements and identify suitable sources, and a plan for collating and analysing the data and other evidence in a timely and effective manner to support policy development and delivery.

6.3 Monitoring Progress

High level targets and indicators will be monitored on an all Wales level to help us to monitor whether we are on track to meet our goal of 'one planet living' by 2050.

The implementation projects will have their own monitoring requirements, and the results will be captured and analysed to ensure that we get value for money from our work.

Progress will be reported annually on the Welsh Government website.

6.4 Reporting to the EC

We will report to the European Commission that we have produced the waste prevention programme, as required by EU legislation.

Appendix A Impact of the economy, business activity and demographic drivers on waste generation

A.1 Household Waste

The Welsh Government commissioned an assessment of the trend in household waste generated in Wales, which can be found as a separate document within the evidence base for this programme[32].

Over the past few years, since 2006, there has been a decrease in household waste generated in Wales. However for much of this time the country has been in recession, so it is difficult to determine whether this is a trend which will continue in the future.

The researchers' forecast for future waste generation suggests that if the economy recovers as the UK Government predicts, waste generation will level off and then increase again. To reduce the possibility of this happening, it is important that policies and initiatives for waste prevention are introduced at the earliest opportunity. The report also discusses whether de-coupling is inevitable as a country's population becomes more prosperous. There is an argument that as households become wealthier, their marginal expenditure will go towards discretionary items which generate less waste. For example, the household will eat the same quantity of food but may buy from more expensive retailers or brands. They may also choose to spend on experiences such as travel, gym membership, cultural events or eating out – these do not contribute towards household waste.

A.2 Industrial and Commercial Waste

It stands to reason that the size of the economy and the types of businesses will impact heavily on the types and quantities of wastes that are generated. However the lack of regularly reported, comprehensive data on waste generation makes an assessment of historic de-coupling impossible. Businesses are becoming increasingly influenced by rises in the cost of resources and some have responded by action, resulting in resource efficiency and waste prevention. The precision and frequency of waste data will make the future assessment of de-coupling difficult, but by working towards absolute prevention targets we can measure these through data from periodic business surveys.

32 *Assessment of Trends in Household Waste arising in Wales*, Eunomia (2012)

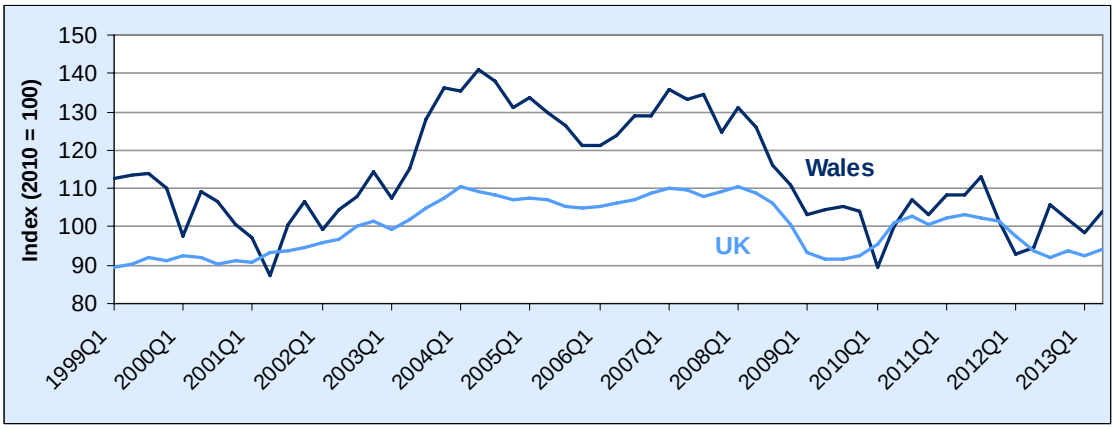
A.3 Construction and Demolition Waste

When the C&D waste survey was carried out (in 2006), the Construction sector in Wales had a turnover of £7,432 million[33] and employed around 110,000[34] people, including those self-employed. There were in 40,170 businesses, of which 39,410 (98 per cent) were micro-businesses employing fewer than 10 employees; the remainder were primarily self employed builders. A significant proportion of construction employees (>60 per cent) were low-skilled labourers[35].

The Index of Construction for Wales[36] is a quarterly release produced by the Welsh Government. It shows the short-term movements in the economic output of the construction industry within Wales, which accounts for approximately 7 per cent of the Welsh economy. Figure 11 shows the Index of Construction for Wales and for the UK from Quarter 4 1999 to Quarter 2 2013.

Short term trends in the Welsh Index of Construction can be volatile. Since 2008 (around the start of the recession of 2008-09) Wales has had larger falls in output than the UK. Between the second quarter of 2010 and the end of 2011 Wales broadly tracked the movements of the UK. Since then output in Wales increased in mid 2012 recovering to levels above the UK before falling in the latest two quarters.

Figure 11 Index of construction for UK and Wales



Source: Stats Wales

33 Business Structure Statistics, available from StatsWales website.

34 ONS. Workforce jobs by industry (SIC 2007) - seasonally adjusted.

35 LEK Consulting. Construction in the UK Economy: The Benefits of Investment. London: UK Contractors Group, 2009.

36 Statistics for Wales. Index of production for Wales and Index of Construction for Wales Quarter 2, 2013.

Appendix B Evaluation of measures for the Waste Prevention Programme

B.1 Measures for Household Waste

The Welsh Government commissioned the evaluation of suitable measures to reduce household waste[37]. This section summarises the work, which can be found in the accompanying evidence base supporting this programme.

The work involved mapping existing activity and policy against:

- Its waste prevention impact.
- The measures listed in Annex IV of the revised Waste Framework Directive.
- Sustainable Development outcomes.

An outline programme of activity was drawn up to meet the waste prevention target of -1.2 per cent (of the 2007 baseline) per annum.

This evaluation of current activity highlighted that the challenge for this Waste Prevention Programme is to identify ways to maximise the effectiveness of measures already in place, rather than find additional new measures.

B.2 Measures for Industrial and Commercial Waste

In preparing this programme, the Welsh Government commissioned AMEC Environment and Infrastructure Ltd[38] to evaluate a range of measures which could be used to tackle waste prevention in respect of industrial and commercial (I&C) waste.

The evaluation identified the following measures that lead directly to waste prevention:

Ecodesign

Ecodesign is a strategic way of thinking about the design process, incorporating considerations around the sustainability impacts of product, processes and packaging across the entire life cycle of the product, from extraction of raw materials to disposal at end of life. Its broad ethos ensures that waste prevention and resource use is considered among a wide range of criteria and across the life cycle, thereby ensuring the best sustainability outcomes and avoiding negative unintended consequences.

37 *Evaluation of current activity and outline options for a waste prevention plan* (Phase 2 report), Brook Lyndhurst (2012)

38 *Evaluation of a range of Waste Prevention Initiatives for Industrial and Commercial wastes produced in Wales to support the Waste Prevention Programme*, AMEC (2013)

Ecodesign can be used to achieve waste prevention by changing the way that products are designed to reduce the amount and type of material in products (including hazardousness); improve longevity; design for reuse, remanufacture, separation and recycling.

Resource Efficient Business Models

Resource efficient business models can result in significant environmental and economic benefits, and take a number of forms including service systems, hire and leasing and incentivised return systems. New business models often require strong innovative leadership from within the business, as they are a departure from the traditional model of product manufacture and sale. The rise in the financial value of resources linked to an increase in awareness of sustainability issues, has led to innovation among a limited number of businesses, but there is a need to stimulate greater innovation if the full sustainable development benefits are to be realised.

Products with high environmental impact, including clothing and other textiles, home and workplace furniture, chemicals, and electrical and electronic equipment, have potential in the context of resource efficient business models.

Green procurement and supply chains

Supply chain measures and green procurement is an important driver of change in the I&C sector, where often businesses are driven by the needs and wants of those further up the supply chain. The ability of big business and the public sector to implement top-down approaches and influence businesses in their supply chain is important in encouraging waste prevention.

An organisation's procurement can influence waste in two ways: as a tool for internal change - whereby products they choose to buy are changed (such as reductions in office paper or the use of re-usable packaging materials); or as a tool for external change whereby they influence suppliers and stakeholders[39].

39 Oakdene Hollins (2011)' Business Waste Prevention Evidence Review'. Available from http://randd.defra.gov.uk/Default.aspx?Menu=Menu&Module=More&Location=None&Completed=0&ProjectID=17499

Supporting Measures
The AMEC report also identified the following measures that could be used to support implementation of the primary measures above, either on their own or as a basket of measures:

Enabling Measures - these support the primary measures:

- Awareness and Guidance Documents.
- Grants and Loans.
- R&D promotion and development.
- Use of Networks.
- Taxes.
- Legislation.
- Training programmes.
- Voluntary Agreements.
- Funded business programmes.
- Integrated Resources and Tools.

Measures which show less promise in respect of waste prevention:
(These measures should not be relied on in isolation to effect change, but could be used as complementary measures (e.g. eco-labelling to inform businesses during purchasing) or be used to publicise success (e.g. awards)):

- Awards.
- Eco-labelling.
- Environmental Management Systems.

B.3 Measures for Construction and Demolition Waste

A piece of work has been carried out by AMEC Environment and Infrastructure Ltd (see report published as part of the evidence base), to evaluate a range of measures which could be used to tackle waste prevention in the construction and demolition (C&D) sector. This was a high level piece of work using existing evidence, and was not designed to produce our programme of work in this area but rather to inform the elaboration and implementation of the programme.

The report recommended that the following measures would lead directly to waste being prevented:

- Eco-design.
- Green Private Procurement & supply chain influence.
- Green Public Procurement.
- Resource Exchanges.

Enabling Measures – these support the primary measures:

- Grants and Loans.
- Innovation Vouchers.
- Networks.
- Toolkits.
- Construction Products Register.
- Eco Labelling.
- Guidance documents.
- Regulation.
- Site Waste Management Plans.
- Standards.
- Funded business programmes.

Measures which should not be relied on in isolation to effect change, but could be used as supporting measures (e.g. information campaigns) or be used to publicise success (e.g. awards):

- Awards.
- Certification.
- Information campaigns.

Appendix C Policy Framework and Initiatives at a European Level

The following extract from the EC guidelines on waste prevention programmes describe relevant initiatives at the European level.

EU Sustainable Development Strategy (SDS)
One of the key challenges highlighted in the renewed EU SDS of 2006 is to improve the management and avoid the overexploitation of natural resources. Its main targets are to avoid the generation of waste and to enhance the efficient use of natural resources.

The Thematic Strategy on Waste Prevention and Recycling
The Thematic Strategy on the Prevention and Recycling of Waste adopted in 2005 sets as long term goal for the EU to become a recycling society that seeks to avoid waste and uses waste as a resource. To this end, the Strategy sets out key actions to modernize the existing legal framework and to promote waste prevention, reuse and recycling, with waste disposal only as last resort. The Commission has published a report in January 2010 on the implementation of the Strategy highlighting the accomplished progresses and remaining challenges, notably in terms of waste prevention. This report highlights the importance of the use of economic instruments, notably to favour prevention and improved waste management in line with the waste hierarchy.

The Seventh Environment Action Programme (7EAP)
The European Commission has published a proposal for the 7th Environment Action Programme (2013-2020). This sets out the EU's key environmental objectives. The aim is to step up the contribution of environment policy to the transition towards a resource-efficient, low-carbon economy in which natural capital is protected and enhanced, and the health and well-being of citizens is safeguarded. The programme provides an overarching framework for environment policy to 2020, identifying nine priority objectives for the EU and its Member States to attain. Waste prevention is addressed in Priority Objective 2: “To turn the EU into a resource efficient, green and competitive low-carbon economy.”

The Commission’s proposed programme requires (inter alia) that by 2020:

i) The overall environmental impact of production and consumption is reduced, in particular in the food, housing and mobility sectors.
ii) Waste is safely managed as a resource, waste generated per capita is in absolute decline, energy recovery is limited to non-recyclable materials and landfilling of recyclable and compostable materials is effectively eradicated.

The Commission's proposal identifies that the following are required, in particular:

i) Establishing a more coherent framework for sustainable production and consumption. Reviewing product legislation with a view to improving the environmental performance and resource efficiency of products throughout their lifecycle. Setting targets for the reduction of the overall impact of consumption.
ii) Fully implementing EU waste legislation. This will include applying the waste hierarchy and the effective use of market-based instruments and measures to ensure that landfilling is effectively phased out, energy recovery is limited to non-recyclable materials, recycled waste is used as a major, reliable source of raw material for the EU, hazardous waste is safely managed and its generation is reduced, illegal waste shipments are eradicated and internal market barriers for environmentally-sound recycling activities in the EU are removed.

Action Plan on Sustainable Industrial Policy (SIP) – Sustainable Consumption and Production (SCP)

SCP is about achieving more with less. In July 2008, the European Commission adopted, through coordinated efforts of DG ENV, DG ENTR, and DG TREN, an Action Plan on SIP and on SCP to support the economic competitiveness of the EU industry through improved energy and resource efficiency, as well as an improved capacity to develop appropriate technological solutions.

Resource Efficiency Roadmap

The European Commission has set out a roadmap aimed at transforming Europe's economy into a sustainable one by 2050. The Roadmap to a resource-efficient Europe adopted in September 2011, outlines how a resource efficient growth can be achieved, identifying the economic sectors consuming most resources and suggests tools and indicators to help guide action in the EU and at international level. In particular, the roadmap states that waste has to be regarded as a resource to be fed back into the economy and a higher priority needs to be given to reuse and recycling and incentives for waste prevention and recycling have to be created. In particular, the Roadmap includes the following "aspirational targets" for waste management, to be achieved by 2020: waste generation should be reduced in absolute terms, reuse and recycling should reach the 'maximum feasible' level and be economically attractive, energy recovery should be limited to not recyclable waste and landfilling should be virtually eliminated.

Single Market for Green Products Initiative
A company wishing to market its product as green in several Member State markets faces a confusing range of choices of methods and initiatives, and might find it needs to apply several of them in order to prove the product's green credentials. This is turning into a barrier for the circulation of green products in the Single Market.

Consumers are also confused by the stream of incomparable and diverse environmental information: according to a recent Eurobarometer, 48 per cent of European consumers are confused by the stream of environmental information they receive. This also affects their readiness to make green purchases.

The Single Market for Green Products initiative proposes a set of actions to overcome these problems:

- It establishes two methods to measure environmental performance throughout the lifecycle, the Product Environmental Footprint (PEF) and the Organisation Environmental Footprint (OEF);
- It recommends the use of these methods to Member States, companies, private organisations and the financial community through a Commission Recommendation;
- It announces a three-year testing period to develop product- and sector-specific rules through a multi-stakeholder process;
- It provides principles for communicating environmental performance, such as transparency, reliability, completeness, comparability and clarity;
- It supports international efforts towards more coordination in methodological development and data availability.

The EU Ecolabel
The EU Ecolabel helps consumers to identify products and services that have a reduced environmental impact throughout their life cycle, from the extraction of raw material through to production, use and disposal. Recognised throughout Europe, EU Ecolabel is a voluntary label promoting environmental excellence which can be trusted.

The EU Ecolabel scheme is a commitment to environmental sustainability. The criteria have been developed and agreed upon by scientists, NGOs and stakeholders to create a credible and reliable way to make environmentally responsible choices.

From the raw materials to manufacturing, packaging, distribution and disposal, EU Ecolabel products are evaluated by independent experts to ensure they meet criteria that reduce their environmental impact. The EU Ecolabel is an easy way to make an informed choice about the products you’re buying.

These products and services can be found in all EU Member States as well as in a wide range of countries throughout the world, including India, New Zealand, Canada and China.

All products bearing the EU Ecolabel have been checked by independent bodies for compliance with strict ecological and performance criteria. The label takes into account the main environmental impacts of a product as well as environmental performance throughout its life cycle. Authorities in every EU Member State, as well as in Iceland, Norway and Liechtenstein, are responsible for managing the EU Ecolabel.

The scheme is voluntary, but hundreds of companies across Europe have joined up because of EU Ecolabel's competitive edge and commitment to the environment. Customers can rely on the logo because every product is checked by independent experts.

Registration, Evaluation, Authorisation and Restriction of Chemicals (REACH)

REACH is a European Union regulation concerning the Registration, Evaluation, Authorisation and Restriction of Chemicals. It came into force on 1st June 2007 and replaced a number of European Directives and Regulations with a single system.

A major part of REACH is the requirement for manufacturers or importers of substances to register them with a central European Chemicals Agency (ECHA). A registration package will be supported by a standard set of data on that substance. The amount of data required is proportionate to the amount of substance manufactured or supplied.

REACH has several aims:

- To provide a high level of protection of human health and the environment from the use of chemicals.
- To make the people who place chemicals on the market (manufacturers and importers responsible for understanding and managing the risks associated with their use.)
- To allow the free movement of substances on the EU market.
- To enhance innovation in and the competitiveness of the EU chemicals industry.
- To promote the use of alternative methods for the assessment of the hazardous properties of substances e.g. quantitative structure-activity relationships (QSAR) and read across.

Appendix D Glossary

Approved authorised treatment facilities (ATTFs): These are waste management facilities that reuse or treat specific wastes as required by EU Directives, and issue evidence notes to the producers that appropriate treatment has taken place. An example is WEEE treatment facilities responsible for the reuse and treatment of WEEE and ensuring it's recycled and recovered.

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

Bring site: recycling point where the public can bring material for recycling, for example bottle and can banks. They are generally located at supermarket car parks, council car parks and similar locations.

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 biowastes, 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.

Construction and demolition waste: waste arising from activities carried out by construction companies, demolition companies, civil engineering companies and general builders. In the main, it relates to waste types listed in Chapter 17 of the List of Wastes (Wales) Regulations 2005, although it also includes other wastes generated by these organisations arising from their construction and demolition activities.

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 or refuse derived fuel (an output from mechanical and biological treatment processes), pyrolysis and gasification (including plasma 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.

Hazardous waste: this is waste that may be harmful to human health or the environment. Examples of hazardous wastes include asbestos, some chemical wastes, some healthcare wastes, electrical equipment containing hazardous components such as cathode ray tubes or lead solder, fluorescent light tubes, lead-acid batteries and oily sludges.

Landfill sites: any areas of land in which waste is deposited. Landfill sites are often located in disused mines or quarries.

One Planet Living: one Planet Living is a vision of a sustainable world, in which people everywhere can enjoy a high quality of life within the productive capacity of the planet, with space left for wildlife and wilderness. Organisations around the world are using the one planet living approach to take measurable steps towards genuine sustainability.

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.

Procurement: The act of obtaining or buying goods or services.

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.

Recyclate: this is material separated (either at source or following interim treatment) for the purpose of recycling.

Recycling: this means 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.

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.

Residual waste: term used for waste that remains after recycling or composting material has been removed from the waste stream.

Resource efficiency: managing raw materials, energy and water in order to minimise waste and thereby reduce cost.

Reuse: using again a product, that is not waste, for the same purpose.

Site waste management plan (SWMP): a tool to help the construction and demolition sector to improve on their management of waste at their place of work. It is a plan that details the amount and type of waste produced on a construction site and how it will be reused, recycled and disposed of, by doing so, will help to improve resource efficiency within the industry. The Welsh Government has consulted on Site Waste Management Plan Regulations.

Sustainability appraisal: single appraisal tool which provides for the systematic identification and evaluation of the economic, social and environmental impacts of a proposal.

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.

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 has a statutory basis within the Waste Framework Directive and the implementing regulations applying to Wales.

WEEE: this stands for ‘Waste Electrical and Electronic Equipment’. The WEEE Directive (2002/96/EC obliges electronic and electrical product manufacturers to assume responsibility for their WEEE.

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 www.zwia.org).