



Llywodraeth Cymru
Welsh Government

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Towards Zero Waste 2010–2050

Progress Report
July 2015



Textiles



Paper



Plastics



Metals



Electrical



Paint



Household
Organics



Brown
Glass



Blue Glass



Wood



**Towards Zero Waste 2010 - 2050
Progress Report
July 2015**

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Ministerial Foreword

I am pleased to introduce this progress report for 'Towards Zero Waste' (TZW), our overarching waste strategy document for Wales which sets out progress we have made towards our aims for waste management since the strategy's publication in 2010. The TZW strategy document sets out at a high level how we will manage waste in Wales to produce benefits not only for the environment, but also for our economy and social wellbeing.

Overall we have made good progress against the targets set in TZW, including reducing waste arisings, improving the rate of recycling, reuse, composting and recovery, reducing the amount of waste sent to landfill and exceeding the target reduction in greenhouse gas emissions from waste set out in our Climate Change Strategy.

Wales leads the UK in recycling municipal waste by a significant margin, achieving 54.3% in 2013/14. Our record also compares favourably in Europe and our municipal recycling rate ranks fourth among EU member states.

We have also published our Waste Prevention Programme (WPP) and five sector plans which have been developed to comply with the revised Waste Framework Directive. These set out our vision for implementation of the goals and targets set out in TZW in partnership with stakeholders across from industry, commerce, local authorities and the general public and reflect feedback received through public consultation on each sector plan.

The principles and actions in the WPP will make waste prevention an underpinning consideration across all sectors, and will ensure that waste prevention will become as commonplace and accepted as recycling is now. I look forward to seeing the impact of this far-reaching piece of work in achieving our goal of zero waste produced in Wales.

Our Collaborative Change Programme is supporting local authorities to evaluate their waste management performance and the Waste Infrastructure Procurement Programme, delivered through public private partnerships, is supporting local authorities to deliver sufficient treatment capacity to meet EU landfill diversion and statutory national recycling targets.

In December 2014 the Welsh Government renewed its commitment to tackling poverty and creating jobs, and our waste strategy will play its part in these important social issues.¹

Embedding waste prevention and resource efficiency throughout society will provide plenty of opportunity to help individuals as well as organisations to save money. For example, through our plans householders will have more opportunities to buy good quality refurbished furniture and appliances. Increasing product life in this way gives householders and businesses opportunities to save money and prevents these goods being disposed of.

¹Minister announces £30 million to tackle poverty' <http://wales.gov.uk/newsroom/people-and-communities/2014/141223-tackle-poverty/?lang=en>

Small traders will have opportunities to save landfill gate fees by having better access to recycling centres and being able to do more to contribute to our recycling and recovery rates.

In addition to providing opportunities to save money by being a more resource efficient nation, recycling and reuse enterprises will also offer communities the opportunity to make money to reinvest in the community through the sale of reconditioned goods via community enterprises that also offer new training and employment opportunities to those struggling to find work.

We need to break the link between waste generation and economic growth. The Welsh Government is committed to delivering on the economy, and securing a healthy supply of natural resources is key to this. These are not contradictory aims; there are huge financial savings to be made. TZW's commitment to green growth and resource efficiency complements the latest thinking in Europe and ensures this strategy remains future-proof.

The recycling targets set for municipal waste in TZW were made statutory by the Waste (Wales) Measure 2010 and our recycling targets are more stringent than the statutory EU targets. Wales has a recycling target of 64% by 2020, compared to an EU target of 50% for the same year. Wales also has a recycling target of 70% by 2025. In June 2013, the EU launched a consultation to gauge the appetite for raising the EU recycling rate to 60% by 2020. Our stricter recycling targets highlight the continued relevance and ambition of our waste strategy. In December 2012 the EU announced its commitment of transition to a circular economy, and in June 2013 it made recommendations on a resource efficient Europe that recognises at the highest level that as environmental resources and economic systems affect each other, it is rarely possible to reform one without reforming the other. Moving towards a circular economy will be a central theme of our work going forward.

I am proud of Wales' record in waste management and resource efficiency to date which have been achieved by working in partnership with commerce, industry, the public sector and third sector and the general public. I am committed to building on this foundation by revising and updating our strategy by summer 2016 to ensure that it reflects the aims set out in the Wellbeing and Future Generations Act, the Environment Bill and EU proposals on the circular economy, and also sets new targets to drive forward our ambitions in this important area.

Executive Summary

Since its publication in 2010 we have made good progress against the targets set in TZW, in terms of reducing waste arisings, improved recycling, reuse, composting and recovery rates, and reducing the volume of waste sent to landfill. Particular achievements include:

- Wales leads the UK in recycling municipal waste by a significant margin, achieving 54.3% in 2013/14. It is also in fourth place in relation to the performance of EU member states.
- We have reduced waste sent to landfill at permitted sites by 37% between 2009-10 and 2013-14.
- Since 2009-10 we have made progress in reducing household waste arisings by an average of 1.8% per year and the recycling rate of local authority collected waste has improved by 13.8 percentage points.
- We met the EU target 2020 for biodegradable waste collected by local authorities and others sent to landfill eight years early.
- We have also reduced the greenhouse gas emissions from waste by 6% per year since 2009, exceeding the target reduction of 3% per year set in our Climate Change Strategy.

The Waste Infrastructure Procurement Programme, established in 2008 and delivered through public private partnerships, is supporting local authorities to deliver sufficient treatment capacity to meet EU landfill diversion and statutory national recycling targets. The food waste treatment programme will treat 150,000 tonnes of municipal food waste per year and is expected to generate 7 Megawatts (MW) of renewable electricity, enough to supply 6,000 households. The residual waste treatment programme is currently predicted to treat 400,000 tonnes of residual municipal waste per year, and is expected to generate 46MW of recovered electricity, enough to supply 80,000 households.

The Collaborative Change Programme is supporting local authorities to evaluate their waste management performance. 20 local authorities have been assisted by the programme since its inception in late 2011, with the aim of working with all local authorities before the end of 2015-16. Where financial options modelling has been completed, savings of approximately £10m per year have been identified. The projected savings will rise to circa £20m per year when modelling has been completed and implemented for all local authorities.

In December 2013 we launched the Wales Waste Prevention Programme, in compliance with the revised Waste Framework Directive (2008/98/EC) which has been transposed into UK legislation via England and Wales and Wales only measures. It completes our suite of documents which together comprise the statutory waste management plan for Wales as required by Wales and EU legislation and to deliver Programme for Government and Ministerial priorities for green growth, resource efficiency, tackling poverty, and increasing resilience for businesses and the Welsh economy.

Section 1 - Introduction

It is five years since we published TZW, the overarching waste strategy document for Wales. It details high level outcomes, policies and targets for sustainable waste and resource management in Wales.

This progress report identifies the main areas of progress against our commitments and targets in TZW. This report broadly follows the structure of the TZW strategy document, to allow the reader to refer easily between the two documents.

Section 2 – Setting the scene - how it has changed since 2010

This section relates to 'Part 1 – Setting the Scene' of TZW and describes the changes in the key drivers from both Welsh Government and Europe that have occurred since TZW was published. It also gives an overview of key achievements to date, and details of new or updates to relevant legislation.

2.1 Drivers

2.1.1 Wales specific drivers

Aims set out in Welsh Government's Programme for Government

Since the publication of TZW the Welsh Government published its "Programme for Government" (PfG) – this is the Welsh Government's roadmap for this Assembly term (2011-2016). PfG emphasises the following outcomes we are working towards:

- healthy people living productive lives in a more prosperous and innovative economy;
- safer and more cohesive communities, with lower levels of poverty and greater equality;
- a resilient environment with more sustainable use of our natural resources;
- a society with a vital sense of its own culture and heritage.

PfG includes the aim for Wales to become a "one planet nation", putting sustainable development at the heart of government. Our goal is to ensure that we make the best possible use, in the wider public interest, of our nation's resources. We will support this through measures to significantly increase the efficiency with which these resources, including energy, are used.

Key actions the Welsh Government is undertaking to deliver improvements in waste and resource efficiency are identified in the PfG as being:

- support waste reduction and reuse initiatives delivered in collaboration with local government and business;
- continuing investment and procurement support for food waste and residual waste treatment, including energy from waste;
- reduce the amount of biodegradable materials going to landfill.

Well-being of Future Generations (Wales) Act 2015

The Well-being of Future Generations Act was passed by the National Assembly for Wales on 17 March 2015 and received Royal Assent on 29 April 2015. The Act sets ambitious, long-term goals to reflect the Wales we want to see, both now and in the future.

In outlining the Welsh Government's Legislative Programme 2011-16 on 12 July 2011, the First Minister said: "Sustainability lies at the heart of the Welsh Government's agenda for Wales; it also lies at the heart of this legislative programme. Taken as a whole, it will promote the economic, social and environmental wellbeing and enhance people's quality of life in Wales. It is about defining the long term development path for our nation. It means healthy, productive people; vibrant, inclusive communities; a diverse and resilient environment and an advanced and innovative economy. This

legislative programme provides new powers, duties and institutional capacity to advance our goals of building a sustainable Wales."

The Act strengthens existing governance arrangements for improving the well-being of Wales in order to ensure that the needs of the present are met without compromising the ability of future generations to meet their own needs. It aims to improve well-being in accordance with the sustainable development principle, which means seeking to ensure that the needs of the present are met without compromising the ability of future generations to meet their own needs.

The Act sets a number of well-being goals for the public sector (including the Welsh Government). These goals include 'A more prosperous Wales' which seeks to achieve a low carbon economy that makes more efficient and proportionate use of resources and a new goal for 'A globally responsible Wales' which requires public bodies in Wales, including the Welsh Government, to take into the account the contribution made to global well-being when improving the economic, social and environmental well-being of Wales. The One Planet 2050 resource use goal in TZW is consistent with this proposed new 'A globally responsible Wales' goal.

Ministerial priorities

The Minister for Natural Resources has determined his specific priorities for the remainder of this government's term of office (until May 2016). The priorities relevant to waste and resource efficiency and the delivery of TZW are as follows:

Green growth

We have key Government commitments of sustainable economic growth and a resource efficient, low carbon economy. Our vision is one of green growth where businesses are the custodians of our natural resources and are both environmentally and socially responsible, for example, producing safe food to secure improvements in the health and vitality of the people of Wales.

A study² published by Defra in February 2015 estimated that the core waste sector generated £6.8bn in gross value added (GVA) and supported 103,000 jobs in 2013. And, it states: "Broadening the definition to include repair, reuse and leasing activity that help extend the life of products, the contribution to the economy could be much greater. Data for 2013 suggests it could have been as high as £41bn to approximate GVA and 672,000 jobs, with £18.9bn of this being generated in the automotive sector, but it is difficult to determine exactly how much of this directly relates to activity that extends the life of products and reduces waste.

A new report entitled 'Employment and the circular economy - Job creation in a more resource efficient Britain' has published in January 2015 by Waste Resources Action Programme (WRAP) and the Green Alliance identified the potential jobs that can be created through achieving a circular economy. The scenario of being 'really transformational', with substantial progress in recycling and remanufacturing, but also major development of the reuse, servitisation (moving from goods to services) and bio-refining sectors, has the potential across the UK to create around half a million jobs (gross) by 2030 (equating to around 25,000 jobs in Wales), reducing unemployment

² Resource management: a catalyst for growth and productivity, Defra

by around 102,000, and potentially offsetting around 18 per cent of the expected loss in skilled employment over the next decade.

The delivery of TZW and its contribution towards achieving a circular economy in Wales helps contribute to the Welsh Government's green growth priority in terms of new jobs and training opportunities in waste prevention, reuse, recycling and energy recovery, and in ensuring that the products and services provided by Welsh companies and public sector are more resource efficient.

Resilience

We are building resilience to climate change and other stresses through a number of areas, including building a resilient economy. TZW is driving the more efficient use of resource within our economy, thus making it and our businesses more resilient to future resource security issues, including the availability and cost of critical raw materials needed by our manufacturing sectors.

Through improved waste management, Wales has had a sustained ambition to increase our recycling rates, to help generate secondary materials for the Welsh economy, and has worked closely with local authorities through the Sustainable Waste Management Grant, the Collections Blueprint, the Collaborative Change Programme and Waste Infrastructure Procurement Programme.

Modern, fit for purpose legislation

The Welsh Government is taking forward two major Bills on Planning and the Environment which are critical in delivering the Department's agenda in the long-term by providing the necessary legislative framework and processes. Together with the Wellbeing of Future Generations Act 2015, these Bills aim to enable better growth and the delivery of last public benefit for Wales, through better informed decisions through improved and more transparent evidence, better planning and more integrated delivery of public services. In secondary legislation there is scope for improvement. For example, the Environment Bill contains a number of new legislative provisions for waste that are aimed at increasing the recycling of industrial and commercial waste. These will help deliver some of the TZW targets for these waste producing sectors and will make a major contribution towards achieving a circular economy and green growth.

A fairer Wales

The Welsh Government wishes to tackle all aspects of poverty, including fuel/energy, food and basic consumer durables (e.g. see <http://www.poverty.org.uk/w11/index.shtml?2>). This includes tackling the cause of poverty – through providing employment, and training. Workless households are a priority. Diversity will also be tackled. The Love Food Hate Waste programme and food redistribution initiatives (e.g. Fareshare) supported by the Welsh Government help tackle food poverty. Support for reuse and preparation for reuse helps provides low cost everyday household items to those in poverty who cannot afford to buy new.

New Welsh Government strategies and initiatives

The following Welsh Government strategies published or revised after TZW's publication in 2010 are relevant to the aims of TZW.

Climate Change Strategy (2010)

The Climate Change Strategy and associated Delivery Plans outline the areas where the Welsh Government will act and where we will work with our partners, to reduce greenhouse gas (GHG) emissions and enable effective adaptation in Wales.

The Welsh Government has committed to investigate ways of monitoring and measuring the direct emissions of GHG from the waste sector in Wales through reducing GHG emissions from landfill sites, reducing indirect emissions associated with resource consumption by increasing reuse, recycling and composting, and implementing our Waste Strategy and Sector Plans.

The Climate Change Strategy has set a year-on-year target of reducing greenhouse gas emissions in Wales by 3% from 2011, and by 40% by 2020 based on a 1990 baseline. The Welsh Government estimates that actions in diverting biodegradable waste from landfill to recycling, composting and anaerobic digestion will deliver savings of direct emissions of 660 thousand tonnes CO₂(e) by 2020. The diversion of biodegradable waste collected by local authorities from landfill is measured through the Landfill Allowances Scheme (as described in Section 4.1.2).

Food for Wales, Food from Wales 2010:2020 - Food Strategy for Wales

This strategy sets out the Welsh Government's vision for the future of food for Wales and from Wales, and outlines our clear commitment to the key basic principles of sustainability, resilience, competitiveness and profitability. The strategy emphasises a greater acknowledgement of the wider food system including the need to reduce the impact of food waste and invest in research and development for sustainable technologies in waste management. The strategy also promotes education throughout the industry to increase understanding of the causes of food waste and how it can be reduced, and encouraging efforts toward reducing waste production by retailers, food outlets and households.

Green Growth Wales: Investing in the Future

This sets out how the sustainable use of our natural resources can create a new economic model that will deliver wealth creation and economic growth both today and into the future.

It notes that businesses have experienced significant disruption from major weather events, climate change, waste proliferation and raw material scarcity. We are focused on increasing the underlying resilience of Wales through investment in green infrastructure. This includes waste infrastructure investment up to £750 million through a Welsh Government led programme to support local authorities delivering next generation treatment facilities.

Resource Efficient Wales

Launched in September 2014, Resource Efficient Wales is the Welsh Government's single point of access to provide information to householders, communities, business and the public sector across a range of resource efficiency topics. More details on Resource Efficient Wales are in Section 7 of this report.

Fly-tipping strategy

The Fly-tipping Strategy for Wales was published on 26 February 2015. Fly-tipping is the illegal dumping of waste on to land. It can pollute the environment, be harmful to human health and spoils our enjoyment of our towns and countryside.

We are committed to improving local environmental quality, tackling fly-tipping and reducing the amount spent in clean up costs. It costs Wales nearly £2 million each year in clean up costs which ultimately has to be paid by taxpayers.

We believe that everyone in Wales should enjoy and be supported by a clean, healthy and safe environment, and that aim is at the heart of this strategy.

Tackling the issue of fly-tipping in Wales is an important step in achieving this goal, a goal that requires coordinated action by all partner organisations and communities across Wales.

Since 2007 we have funded Fly-tipping Action Wales; this initiative is coordinated by Natural Resources Wales (formerly by the Environment Agency Wales) and involves over 50 partners working together to tackle fly-tipping through education, enforcement and community engagement initiatives. This strategy highlights where we are now and the actions needed to achieve our vision in partnership with our stakeholders.

2.1.2 European drivers

Since the publication of TZW, the issue of resource efficiency has been formally identified by the European Commission as being an economic imperative as well as an environmental one. In January 2011 the European Commission published its Communication on an “A resource-efficient Europe – Flagship initiative of the Europe 2020 Strategy”. This recognises that natural resources, including raw materials such as food, fuels, minerals and metals, underpin the functioning of the European and global economy and our quality of life. The document stresses that population and economic growth in developing and emerging countries will increase pressures on resources. The Commission’s message is that continuing our current patterns of resource use is not an option; increasing resource efficiency will be key to securing growth and jobs for Europe. It will bring major economic opportunities, improve productivity, drive down costs and boost competitiveness. Allied to the Flagship Initiative, the Commission published later in 2011 its “Roadmap to a Resource Efficient Europe”. This set the following milestone for the EU in respect of sustainable consumption and production:

“By 2020, citizens and public authorities have the right incentives to choose the most resource efficient products and services, through appropriate price signals and clear environmental information. Their purchasing choices will stimulate companies to innovate and to supply more resource efficient goods and services. Minimum environmental performance standards are set to remove the least resource efficient and most polluting products from the market. Consumer demand is high for more sustainable products and services.”

In respect of waste, the Commission’s Roadmap set the following milestone:

“By 2020, waste is managed as a resource. Waste generated per capita is in absolute decline. Recycling and reuse of waste are economically attractive options for public and private actors due to widespread separate collection and the development of functional markets for secondary raw materials. More materials, including materials having a significant impact on the environment and critical raw materials, are recycled. Waste legislation is fully implemented. Illegal shipments of waste have been eradicated. Energy recovery is limited to non-recyclable materials, landfilling is virtually eliminated and high quality recycling is ensured.”

EU Environment Policy is guided by action programmes. Published in 2013, the 7th Environment Action Programme (EAP) sets out the EU priority objectives to 2020 which includes a special focus on turning waste into a resource with more prevention reuse and recycling and phasing out wasteful and damaging practices such as landfilling.

The European Union’s recently agreed 7th Environment Action Programme to 2020 "Living well, within the limits of our planet" contains a key priority: “to turn the EU into a resource-efficient, green and competitive low carbon economy” which seeks the following waste outcomes:

- The overall environmental impact of EU industry in all major industrial sectors is significantly reduced, and resource efficiency increased.
- The overall environmental impact of production and consumption is reduced, in particular in the food, housing and mobility sectors.
- 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.

Waste measures required include:

- 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.
- 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.

Circular economy

The circular economy concept has relatively recently come to the fore but it has deep-rooted origins. One of its key proponents has been Walter Stahel, who is credited with having coined the expression “Cradle to Cradle”. The Ellen MacArthur Foundation, an independent charity established in 2010, has more recently outlined the economic opportunity of a circular economy and has given impetus to the concept. In its simplest terms, a circular economy keeps materials in productive use for as long as possible

and eliminates waste so that the materials can be productively used again and again and hence create further value.

In recent years the principles of the circular economy have been emphasised in both Welsh Government and European Union policy. Both the first Wales Waste Strategy 'Wise About Waste' (2002) and TZW emphasise the sustainable development benefits of more waste prevention, reuse and closed loop recycling, the key elements of the circular economy.

The European Union's seventh Environmental Action Programme has a vision that:

"In 2050, we live well, within the planet's ecological limits. Our prosperity and healthy environment stem from an innovative, circular economy where nothing is wasted and where natural resources are managed sustainably, and biodiversity is protected, valued and restored in ways that enhance our society's resilience. Our low-carbon growth has long been decoupled from resource use, setting the pace for a safe and sustainable global society."

In July 2014, the Commission adopted a Circular Economy Package, including a Communication "Towards a circular economy: a zero waste programme for Europe", accompanied by legislative proposal for the review of waste legislation. The latter specifically was in response to the legal obligation to review the targets of three Directives: the Waste Framework Directive (WFD), the Landfill Directive, and the Packaging and Packaging Waste Directive (PPWD)⁶. In its 2015 Work Programme, the Commission announced the intention to withdraw the 2014 proposal on Waste Review (the withdrawal was finalised on 25/02/2015) and to replace it with a new, 'more ambitious' proposal by end 2015 to promote the circular economy.

2.1.3 Is TZW still relevant?

The delivery of TZW is keeping pace with the new policies and commitments laid down by the European Union and the Welsh Government, and with evolving thinking on resource efficiency and the circular economy.

2.2 Key achievements since 2010

This section gives a brief overview of our key achievements since the publication of TZW, including programmes put in place, progress against targets and legislation. A detailed examination of progress against all the targets in TZW is provided in Annex A.

2.2.1 Programmes

We have published our Waste Prevention Programme and five sector plans (further details in Section 3.2.) which have been developed to deliver the policies and targets in TZW and to comply with the Article 28 and 29 waste plan making requirements of the Waste Framework Directive and which include coverage of hazardous waste, packaging waste, biodegradable waste and priority wastes. The Public Sector Plan is currently being developed and is scheduled to be launched for consultation in September 2015, and a Position Statement on Agriculture is also planned for publication in September 2015.

The Waste Infrastructure Procurement Programme established in 2008 and delivered through public private partnerships, supports local authorities to deliver sufficient treatment capacity to meet EU landfill diversion, statutory national recycling and TZW landfill limitation targets. The food waste treatment programme will treat 150,000 tonnes of municipal food waste per year and is expected to generate 7MW of renewable electricity, enough to supply 6,000 households. The residual waste treatment programme is currently predicted to treat 400,000 tonnes of residual municipal waste per year, and is expected to generate 46MW of recovered electricity, enough to supply 80,000 households.

The Collaborative Change Programme is supporting local authorities to evaluate their waste collection service performance, with a particular focus on the recycling of dry recyclables, food and garden waste. 20 local authorities have been assisted by the programme since its inception in late 2011, with the aim of working with all local authorities before the end of 2015-16. Where financial options modelling has been completed, savings of approximately £10m per year have been identified. The projected savings will rise to circa £20m per year when modelling has been completed and implemented for all local authorities.

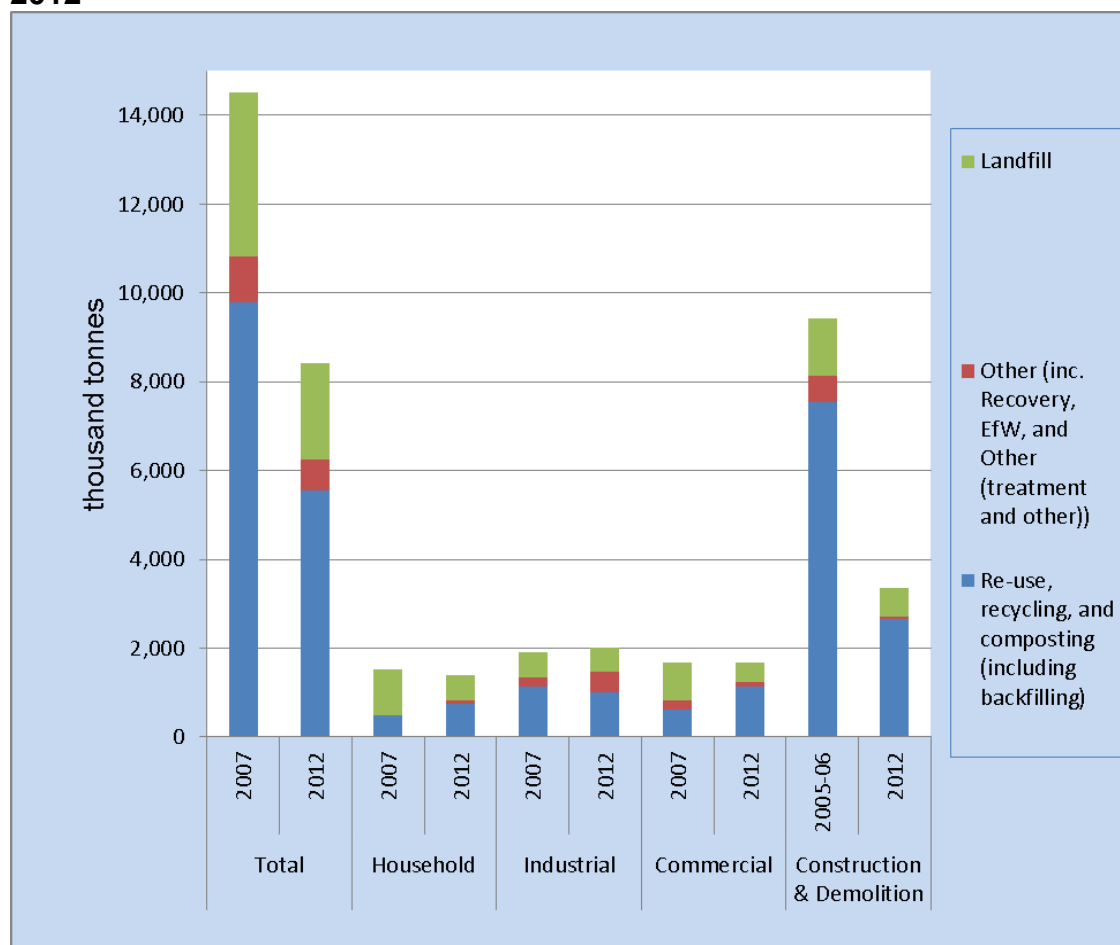
2.2.2 Key achievements against targets

This section highlights the main achievements against targets in the order of the waste hierarchy and by sector, with additional sections on hazardous waste and CO₂(e) savings. A full analysis of progress against all targets is provided in Annex A.

Arisings

Total waste arisings in Wales have fallen from approximately 14.5 million tonnes in 2007, to 8.4 million tonnes in 2012 i.e. a decrease of 8.4% per annum. The overall target for waste prevention is a reduction of 1.4% per annum. Figure 1 shows a full overview of waste arisings in Wales broken down by management method and sector. More detailed data on each sector is provided in the indicators in Annex B.

Figure 1: Total quantity and management method of waste in Wales, 2007 and 2012



Sources: Survey of Industrial and Commercial Waste Generated in Wales 2012, Survey of Construction and Demolition Waste Generated in Wales 2012, Recast of Building the Future 2005-06 survey, Waste Data Flow

Notes:

- Some commercial waste is double counted as some waste collected from commercial premises is included in the municipal data.
- Municipal data is taken from WasteDataFlow, which records municipal waste **managed** in Wales and includes waste imported from England and other countries.
- Industrial, commercial and construction and demolition waste figures are taken from surveys of waste **produced** by those sectors in Wales.

- All data shown is for calendar years except the municipal waste figures for composting and recycling are for financial year 2007-08, and the construction and demolition survey for 2005-06 financial year.

The total quantity of household waste decreased from 1,572 thousand tonnes in 2006-07 to 1,349 thousand tonnes in 2013-14, an average reduction of 31,880 tonnes per year or 2% of the 2006-07 baseline, exceeding the non-statutory target reduction of 1.2% per year to 2050.

Preparation for reuse, recycling and composting

In 2013-14, 54.3% of Local Authority Municipal Waste was reused, recycled or composted, meeting the target of 52%. This represents an improvement of nearly 20 percentage points compared to the 2007-08 rate of 33.4%. Wales' performance in this area leads the UK and if Wales was a separate country it would be the fourth best performer in the European Union against this measure.

We have made significant progress in reuse, recycling and composting of commercial waste since 2007. In 2012, 68% of all commercial waste generated in Wales in 2012 was reused, recycled or composted, representing an improvement of 31 percentage points on the 37% achieved in 2007,³ and also exceeding the target set in TZW of 57% to be achieved by 2015-16.

In 2012, we exceeded the 70% reuse, recycling and recovery target for construction and demolition waste.⁴ 87% of all construction and demolition waste generated in Wales was prepared for reuse, recycling and other material recovery compared to the target of 70% by 2020. This also represents good progress towards the 90% target to be achieved by 2019-20 set in TZW.

Disposal to landfill

The overall amount of waste produced in Wales that is sent to landfill at permitted sites continues to decrease, and was 2.1 million tonnes in 2013 compared to 2.3 million tonnes in 2010, a decrease of 7.2%.⁵ The total tonnage of waste landfilled has fallen by 52% since 2001.

We have met eight years early, our EU target of sending no more than 643 thousand tonnes of biodegradable municipal waste collected by local authorities and others to landfill by 2020. The amount that was sent to landfill in 2012 was around 599 thousand tonnes, 32% of the 1995 baseline. This is shown in indicator SE11 in Annex B of this report.

There has been a reduction of nearly 18% in the landfill of municipal waste in the 4 years between 2009-10 and 2013-14. 2011-12 was the first year that less than half of the local authority municipal waste generated in Wales was landfilled.

In 2012, 639,390 tonnes of construction and demolition waste were disposed to landfill, representing a 49.8% reduction on the 1.3 million tonnes generated in 2005-06 according to the re-cast of the 2005-06 survey.

³ Survey of Industrial and Commercial Waste Generated in Wales in 2012, Natural Resources Wales

⁴ Survey of Construction and Demolition Waste Generated in Wales 2012, Natural Resources Wales

⁵ Wales Waste Information 2013, (Table 2), Natural Resources Wales

Hazardous waste

In 2013, 310,407 tonnes of hazardous waste were managed at facilities in Wales, a decrease of 2.6% since 2010. 196,929 tonnes were imported from England, Scotland, Northern Ireland or abroad, whilst 149,852 tonnes were exported from Wales, meaning that overall Wales imported 47,404 tonnes.

In 2013, 263,415 tonnes of hazardous waste were generated in Wales - a 3.4% increase from the 2010 level of 254,701 tonnes.⁶

From 2010 to 2013, for hazardous waste produced in Wales and deposited in England and Wales: landfill increased by 31% (4,926 tonnes), treatment decreased by 0.8% (395 tonnes), recovery of hazardous waste increased by 6.9% (8,031 tonnes) and energy recovery decreased by 17.8% (2,213 tonnes). Some of the major hazardous waste types produced in Wales are thermal process waste (inorganic), oil and oil/water mixtures, petrol, gas and coal refining/treatment as well as construction and demolition waste and asbestos.

Greenhouse gas emissions

According to the National Atmospheric Emissions Inventory report 'Greenhouse Gas Inventories for England, Scotland, Wales and Northern Ireland :1990-2012', direct greenhouse gas emissions from the waste sector have reduced every year since 2009 to 2012, and the total reduction is 258 thousand tonnes. This represents a 6% reduction per year, exceeding the Welsh Government Climate Change target for all sectors of a reduction of 3% year on year.

In addition, Prosiect Gwyrdd, a partnership between Caerphilly County Borough Council, the City and County of Cardiff, Monmouthshire County Council, Newport Council and the Vale of Glamorgan Council, has demonstrated that on average it will divert over 160,000 tonnes of non-recyclable waste from landfill each year by using this waste as a fuel to generate electricity using an Energy from Waste (EfW) technology. This will provide an annual net benefit predicted carbon saving of over 50,000 tonnes CO₂(e) in comparison to continued landfill. More details on the project are provided in Section 5.

Between 2010 and 2014 Natural Resources Wales conducted 13 audits of landfill facilities in Wales. A number of follow up actions have been implemented resulting to date in 9,372 tonnes of methane captured, equating to a CO₂(e) saving of 234,000 tonnes.

2.3 Legislation

Part 1 of TZW identified key waste legislation. This section identifies key changes in European, UK and Welsh waste legislation since 2010 including how the legislative landscape has continued to evolve in line with development in EU policy and Wales' increasing legislative powers in the environment.

2.3.1 European Legislation

The following European waste legislation has been introduced or updated since 2010:

⁶ Wales Waste Information 2013, (Tables 3 and 4), Natural Resources Wales

Industrial Emissions Directive

The Industrial Emissions (Integrated Pollution Prevention and Control) (Recast) Directive 2010/75/EU (IED) streamlines seven existing Directives (including the Integrated Pollution Prevention and Control, Waste Incineration and Large Combustion Plant Directives) into one. The Directive's aim is to improve health and environmental protection by ensuring all industrial activities comply with stringent emissions limits. The main principles of the IED is to prevent, reduce and as far as possible eliminate pollution arising from industrial activities in compliance with the 'polluter pays' principle and the principle of pollution prevention.

Waste Shipment Regulation (Amended)

The Waste Shipments Regulation (EC) No 1013/2006 (WSR) controls the import and export of waste from EU Member States. It transposes into EU law the requirements of the Basel Convention on the Transboundary Shipments of Waste and their Disposal and sets out provisions for the import and export of waste. The WSR has since been amended by EC Regulation 660/2014. This regulation contains strengthened measures to ensure more uniform implementation of the waste shipment regulation throughout the EU. Member states have to establish inspection plans, which must include the objectives and priorities of the inspections, the geographical area covered by the inspection plans and the tasks assigned to each authority involved in the inspections. The inspection plans must be based on a risk assessment and to be regularly reviewed and updated at least every three years. Member states will make information relating to inspections publicly available (including electronically) on an annual basis.

Ship Recycling Regulation

The Ship Recycling Regulation (EU) No 1257/2013) transposes into EU law key aspects of the Hong Kong International Convention for the Safe and Environmentally Sound Recycling of Ships. It will apply to EU flagged ships of above 500 gross tonnes excluding warships and other government non-commercial services. The objective of the Regulation is to reduce the negative impacts linked to the recycling of EU-flagged ships, especially in South Asia, without creating unnecessary economic burdens. Any UK ship recycling facilities that wish to recycle EU flagged ships will need to be authorised and appear on the EU list of authorised facilities.

Changes to hazardous waste properties

The properties that render wastes hazardous are precisely defined in Annex III to the Waste Framework Directive (EC 2008/98/EC) and are further specified by the Decision 2000/532/EC establishing a List of Wastes (as amended by Decision 2001/573/EC). From 1 June 2015 Commission Regulation (EU) No 1357/2014 will replace Annex III to align the identification of hazardous wastes with criteria in the EU Regulation on Classification, Labelling and Packaging of Substances and Mixtures (European Regulation (EC) No 1272/2008) (the CLP). Concurrently, EU Decision 2014/955/EU amends Decision 2000/532/EC on the list of waste - the European Waste Catalogue (EWC) to reflect the criteria for hazardous waste as set out in the CLP.

Mercury Storage

European Council Directive 2011/97/EU, amends the Landfill Directive 1999/31/EC as regards specific criteria for the storage of metallic mercury considered as waste and

stored for more than one year. The aim of directive is to specify safe storage conditions for metallic mercury considered as waste. It ensures that any business that wishes to provide for the safe storage of metallic mercury waste for periods greater than 12 months can do so.

Waste Electrical and Electronic Equipment (Recast) Directive

The aim of The Waste Electrical & Electronic Equipment (WEEE) (Recast) Directive 2012/19/EU is to enhance the implementation and enforcement of the current provisions and lessen the regulatory and cost burdens on business. The main changes are to introduce the concept of an “authorised representative” who can be responsible for discharging a producers obligations within third countries; widen the scope of the directive so that more categories of equipment are covered; set more ambitious targets for the collection of WEEE (and for its recycling and recovery) 45% from 2016 increasing to 65% from 2019; and better control the illegal international trade of WEEE.

2.3.2 UK Legislation

The European directives have been transposed in the UK through further national legislation. Some of the key regulations are as follows.

Packaging

The Producer Responsibility Obligations (Packaging Waste) Regulations 2007 have been amended by The Producer Responsibility Obligations (Packaging Waste) (Amendment) Regulations 2012 which introduce new waste packaging recovery and recycling targets for the years 2013-2017, and include a new set of targets for waste glass packaging for recycling by re-melt for the years 2013 to 2017.

The Packaging (Essential Requirements) Regulations 2003 have been subject to a number of amendments. The European definition of “packaging” was amended by Directive 2004/12/EC, published on 18 February 2004. This amendment introduced an indicative list of what does and does not constitute packaging, in order to provide greater clarity and EU harmonisation on what is defined as “packaging”. The 2004 regulations include this amendment. The 2006 Regulations implement Commission Decision 2006/340/EC to extend indefinitely derogation to heavy metal concentration levels in glass packaging. The 2009 Regulations implement Commission Decision 2009/292/EC and remove the end date for the existing derogation to heavy metal limits in plastic crates and pallets.

The 2013 Regulations implement Commission Directive 2013/2/EU which revises Annex 1 of the Directive to add new illustrative examples.

The Waste Electrical and Electronic Equipment Regulations 2006, the Waste Batteries and Accumulators Regulations 2009, the Batteries and Accumulators (placing on the Market) Regulations 2015, the End of Life Vehicles Regulations 2003 and the End of Life Vehicles (Producer Responsibility) Regulations 2005

These similarly implement the directives in the UK and introduce producer responsibility schemes where producers finance the collection, recovery or recycling when the goods become waste and prevent the use of certain hazardous materials when the goods are manufactured. They also set targets which producers must meet, set out in the regulations.

The Waste Electrical and Electronic Equipment Regulations 2013 replaced the 2006 regulations. The regulations provide for all WEEE that arises to be collected at designated collection facilities and transported to an approved authorised treatment facility or approved exporter for treatment, recovery, recycling or reuse.

The regulations also provide for the registration of all producers who put EEE on the market in the UK and for the establishment and financing by producers of systems to collect, treat, recover and dispose of WEEE that arises in the UK. Distributors are required to take back certain types of WEEE free of charge, and provide for the approval of designated collection facilities, producer compliance schemes, authorised treatment facilities and exporters.

The Batteries and Accumulators (Placing on the Market) (Amendment) Regulations 2015 amend the Batteries and Accumulators (Placing on the Market) Regulations 2008 in order to implement the requirements of European Directive 2013/56/EU which amends Directive 2006/66/EC on batteries and accumulators and waste batteries and accumulators.

The aim of the Directive 2013/56/EU is to remove exemptions concerning placing on the market of portable batteries and accumulators containing cadmium for use in cordless power tools, and of button cells with low mercury content.

The 2008 regulations prohibit the marketing of portable batteries that contains more than 0.002% of cadmium by weight, with certain exceptions. Currently batteries intended for use in cordless power tools are exempt from this prohibition; however this exemption will be removed by the new regulations effective 1st January 2017.

It is also specified within the 2008 regulations that the marketing of a battery that contains more than 0.0005% of mercury by weight is unlawful, with the exception of button cell batteries with a mercury content of up to 2% by weight. The new regulations will remove this exemption effective 1st October 2015. The regulations do specify, however, that goods placed on the market before these two dates will still be able to be sold as normal.

The amendments also provide for the removability of waste batteries from appliances by the end user or by an independent qualified professional where ready removal by the end-user is not possible and for instructions enabling this to accompany the battery. The intention is to ensure the safe removal of batteries and increase competition and consumer choice by enabling consumers to go to independent qualified professionals, not exclusively those representing the manufacturers, for replacement of batteries in products.

The End of Life Vehicles (Amendment) Regulations 2010 amend certain aspects of the 2003 Regulations, key changes:

- Revision of a technical schedule
- Making it clearer to whom the schedule applies
- Amending certain disclosure requirements

The End of life Vehicles (Producer Responsibility) (Amendment) Regulations 2010 amend the 2005 Regulations by harmonising the way in which Accredited Treatment Facilities and vehicle producers report on their recycling achievement; and by extending the deadline which the above report has to be sent.

The Waste (England and Wales) Regulations 2011 and the Waste (England and Wales) (Amendment) Regulations 2012

These transpose The Waste Framework Directive and were laid before Parliament and the Assembly on 19 July 2012 and come into force on 1 October 2012. The amended regulations relate to the separate collection of waste. They amend the Waste (England and Wales) Regulations 2011 by replacing regulation 13. From 1 January 2015, waste collection authorities must collect waste paper, metal, plastic and glass separately. It also imposes a duty on waste collection authorities, from that date, when making arrangements for the collection of such waste, to ensure that those arrangements are by way of separate collection.

The Environmental Permitting (England and Wales) Regulations 2010

The Regulations transpose the provisions of a number of Directives which impose obligations on waste operations. The regulations have been updated several times since 2010 in order to update the provisions. The Waste Framework Directive requires that the recovery and disposal of waste requires a permit with the principal objective of preventing harm to human health and the environment. The legislation also allows member states to provide for exemptions from the need for a permit, providing general rules are laid down for each type of exempt activity, and the operation is registered with the relevant registration authority.

The Waste Electrical Electronic Equipment Regulations 2012, the Waste Batteries and Accumulators Regulations 2009 and the End of Life Vehicles Regulations (2003) and the End of Life Vehicles (Producer Responsibility) Regulations (2005)

These similarly implement the directives in the UK and introduce producer responsibility schemes where producers finance the collection, recovery or recycling when the goods become waste and prevent the use of certain hazardous materials when the goods are manufactured. They also set targets which producers must meet, set out in the regulations.

2.3.3 National Assembly for Wales legislation

The Government of Wales Act 2006 (GoWA) enables the Welsh Government to bring forward its own programme of legislation. Following the 'Yes' vote in the 3rd March 2011 referendum on further law making powers for the National Assembly and the commencement of Part 4 of GoWA 2006, the legislative programme is made up of Assembly Bills. If passed, Bills then receive Royal Assent and become Acts of the Assembly.

Welsh Ministers are also designated so that they may exercise the powers conferred by section 2(2) of the European Communities Act 1972 in relation to the prevention, reduction and management of waste.

In February 2010, Wales was awarded legislative competence⁷ in the area of environment. This enabled the passing of the Waste (Wales) Measure 2010,⁸ which received Royal Assent on 15 December 2010.

Through this Measure we have implemented further producer responsibility by way of the Single Use Carrier Bag charge in the retail sector and also set targets and penalties for Local Authorities about the amounts of waste that is recycled, reused or composted, going further than the current statutory EU and England targets through the Recycling, Preparation for Reuse and Composting Targets (Definitions) (Wales) Order 2011 and the Recycling, Preparation for Reuse and Composting Targets (Monitoring & Penalties) (Wales) Regulations 2011.

The Waste (Miscellaneous Provisions) (Wales) Regulations 2011

These Regulations are supplementary to the Waste (England and Wales) Regulations 2011. They make important amendments to the Hazardous Waste (Wales) Regulations 2005 to transpose the requirements for Hazardous waste in the revised Waste Framework Directive. They also make amendments to several Welsh Statutory instruments for the purposes of transposing in relation to Wales the revised Waste Framework Directive.

2.4 Other key principles

This section identifies actions taken in respect of the key principles that were laid out in Part 1 of TZW.

Protection of human health and the environment

Energy from waste plants can only operate if they have been issued with an environmental permit by Natural Resources Wales. The environmental permit will set stringent emission control standards that reflect the requirements of the Industrial Emissions Directive 2010. These are designed to protect human health and the environment. The same directive restrictions on emissions apply to all forms of energy recovery from waste via thermal treatment – whether it is incineration, pyrolysis or gasification.

Reviews of the available evidence undertaken by experts in the Health Protection Agency (now part of Public Health England (PHE)) in 2009 and 2010 concluded that modern Municipal Waste Incinerators (MWIs) that are well run and regulated do not pose a significant risk to public health.

Published in November 2013, the report ‘The impact on health of emissions to air from Municipal Waste Incinerators’⁹ commented that “while it is not possible to rule out adverse health effects completely, any potential damage from modern, well run and regulated MWIs is likely to be so small that it would be undetectable with current methods. This view is based on detailed assessments of the effects of air pollutants on health and on the fact that modern and well managed MWIs make only a very small contribution to local concentrations of air pollutants”.

⁷ http://www.assembly.wales/en/bus-home/bus-third-assembly/bus-legislation-third-assembly/bus-leg-legislative-competence-orders/proposed_environment_order_2009/Pages/proposed_environment_order_2009.aspx

⁸ http://wales.gov.uk/topics/environmentcountryside/epq/waste_recycling/legislation/measure2010/?lang=en

⁹ Available at: <https://www.gov.uk/government/publications/municipal-waste-incinerator-emissions-to-air-impact-on-health>

The Committee on Carcinogenicity of Chemicals in Food, Consumer Products and the Environment has reviewed recent data and has concluded that there is no evidence that would require a change its previous advice, namely that any potential risk of cancer due to residency near to municipal waste incinerators is exceedingly low and probably not measurable by the most modern techniques. Since any possible health effects are likely to be very small, if detectable, studies of public health around municipal waste incinerators are not recommended.

Public Health Wales concurs with these statements and, as such, can conclude from this work that adverse public health impacts related to municipal waste incinerators are unlikely.

Despite reassurance public concerns remain and in January 2012, a new study was announced by the then Health Protection Agency (now part of the Department of Health) to further develop the evidence base as to whether emissions from municipal waste incinerators affect human health. Scientists will research whether there is a potential link between the emissions from municipal waste incinerators in England and Wales and health outcomes, including: low birth weight, still births and infant deaths. This study (being carried out by the Small Area Health Statistics Unit, Imperial College London, and the Environmental Research Group, King's College London, both part of the MRC-HPA Centre for Environment and Health) will extend the evidence base and provide further information to the public on this subject. The study's findings are not yet available. The current position statement on the potential health effects of well run and regulated modern Municipal Waste Incinerators remains valid.

Application of the waste hierarchy

In January 2012, we published guidance for Welsh businesses and operators on complying with the 'Waste Hierarchy'¹⁰, following transposition of Article 4 by the Waste (England and Wales) Regulations 2011.

Regulation 12 of the Waste (England and Wales) Regulations 2011 states that an establishment or undertaking may depart from the waste hierarchy to achieve the 'best overall environmental outcome' where this is justified by life-cycle thinking on the overall impacts of the generation and management of the waste.

The guidance illustrates how the hierarchy applies for a range of common materials and products. It includes departures from the hierarchy where, in the opinion of the Welsh Government, this is justified on the basis of life cycle thinking. The list is not exhaustive, and could be expanded in future years. The evidence base used by the Welsh Government to form its opinion on the departures is detailed within the guidance.

The revised Technical Advice Note (TAN)21 Waste (see section 3.2) updates the policy direction to enable waste facilities to move up the waste hierarchy through the introduction of a Waste Planning Assessment (WPA).

Proximity Principle

¹⁰ Article 4 of the Waste Framework Directive 2008/98/EC

The revised Technical Advice Note (TAN)21 sets out the land use policies in relation to the management of all waste and all waste management requirements for Wales. In particular, it provides advice on the siting and need for infrastructure for the management of mixed municipal waste in a period of changing waste composition. The revised TAN21 considers the application of the 'Proximity Principle' (as defined by Article 16 of the Waste Framework Directive). Chapter 2 sets out planning principles. Section 2.9 covers the 'nearest appropriate installation' aspect of Article 16. This states that waste falling with Article 16 (i.e. mixed municipal waste) should be disposed of or recovered in one of the nearest appropriate installations whilst ensuring a high level of protection for the environment and human health. This means taking into account environmental, economic and social factors, to ensure the right waste management facilities are located in the right place and at the right time. There are several reasons why it is important to manage such waste close to where it arises. This includes reducing the detrimental environmental impacts associated with the transportation of waste and retaining the intrinsic value of waste as a resource in line with the need to secure greater resource efficiency. TAN21 guides that planning authorities should not attempt to restrict waste management developments within their boundaries to deal only with arising in their areas. The proximity of a waste disposal or mixed municipal waste recovery installation will depend upon the quantities and types of arisings at local, regional and national levels.

Section 3 - Overview and Implementation

This section provides an update on the programmes and plans we have intended to put in place to support TZW, our commitment to developing an evidence base, the intended outcomes of TZW and the priorities we have set to achieve our goals as set out in Part 2 of TZW.

Since the publication of TZW on 21 June 2010 a suite of documents together comprise the statutory waste management plan for Wales as required by Wales and EU legislation and to deliver Programme for Government and Ministerial priorities for green growth, resource efficiency, tackling poverty, and increasing resilience for businesses and the Welsh economy. These include:

- Towards Zero Waste
- Collections, Infrastructure and Markets Sector Plan
- Municipal Sector Plan
- Industrial and Commercial Sector Plan
- Construction and Demolition Sector Plan
- Food, Manufacture, Services and Retail Sector Plan
- Waste Prevention Programme
- Planning Policy Wales
- Technical Advice Note 21

3.1 Waste Prevention Programme

Article 29 of the revised Waste Framework Directive requires member states to establish a waste prevention programme by 12 December 2013. Regulation 4 of the Waste (England and Wales) Regulations 2011 requires Welsh Ministers to develop such a programme.

Our Waste Prevention Programme for Wales and supporting evidence was published on 3 December 2013. The programme is overarching across all sector plans, and replaces any waste prevention actions in the existing sector plans. This demonstrates our commitment to keeping the plans as living documents with flexibility to change as new requirements and better ways of implementing the actions become apparent.

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 save money as well as reducing waste.

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

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

The Waste Prevention Programme will consider how to achieve a pathway to zero household hazardous waste, and as such will replace the planned Part 2 of the Municipal Sector Plan part 2 in this respect.

3.2 Sector Plans

All sector plans are being delivered in a way that contributes to compliance with the Waste Framework Directive (especially the Article 28 requirements for a waste plan). Each sector plan is accompanied by a Sustainability Appraisal that includes the statutory requirement for a Strategic Environmental Assessment and also includes a Habitats Regulations Assessment and a Health Impact Assessment.

Following formal public consultation, the following plans and programmes have been published. A brief overview of each of these is provided below.

- Municipal Sector Plan was published in March 2011;
- Collections, Infrastructure and Markets (CIM) Sector Plan was published in July 2012;
- Construction and Demolition Sector Plan was published in November 2011;
- Industrial and Commercial Sector plan was published in December 2013;
- The Waste Prevention Programme was published in December 2013;
- A call for evidence paper for agricultural waste was published for consultation May 2014;
- The final Food Manufacture, Service and Retail Sector Plan was published in September 2014

The forthcoming plans / programmes are:

- The draft Public Sector Plan will be launched for consultation in September 2015.
- The Agricultural waste position statement is scheduled to be published in September 2015.

Municipal Sector Plan (MSP)

The MSP focuses on action in four strategic areas:

- Waste prevention – to reinforce the important role of local authorities engaging with householders and communities to reduce waste put out for collection, thus helping meet environmental outcomes, increasing opportunities for enhancing social wellbeing through waste reuse and reducing the costs of waste collection and management;
- Preparing for reuse – to ensure that a far greater proportion of wastes collected by local authorities are “prepared for reuse”, in order to meet environmental outcomes, increase opportunities for enhancing social wellbeing through involvement in reuse activities and reduce the costs of waste management;
- Recycling collection service delivery improvements – to deliver sustainable development outcomes in a cost effective way and work towards the new municipal

waste recycling targets set in TZW, including a Collaborative Change Programme to help local authorities do this;

- Sustainable treatment – to provide sustainable and cost effective treatment solutions and to further reduce the landfill of municipal waste.

Collections Infrastructure and Markets (CIM) Sector Plan

The CIM sector plan covers the management of all waste in Wales regardless of sector. The plan focuses on:

- Making improvements in the separate collection of waste materials in order to achieve recycling rates set in TZW for all waste streams;
- The need for recycle collection services to be focused on quality which will enable materials collected in Wales to access the most environmentally beneficial end markets, ideally in Wales;
- Actions on commercial sectors that send the largest tonnages of recyclable materials (or resources) to landfill;
- Infrastructure requirements for “preparing for reuse”, the existing situation with regard to household waste recycling centres and other bring facilities;
- Implications for land use planning and for a review of TAN21;
- Identifying gaps in recycle markets in Wales for key waste materials, and actions to address those gaps where appropriate.

Food Manufacture, Service and Retail (FMSR) Sector Plan

The final FMSR plan covers food and associated packaging waste from the farm gate through to manufacturers to wholesale and retail, including hospitality. The draft plan focuses on influencing behaviour change in other end users such as householders, packaging manufacturers and the public sector. The final plan was published in September 2014.

Construction and Demolition Sector Plan

The construction and development plan covers the waste generated by Construction and Development Sector. This covers all waste produced during construction, civil engineering and demolition projects. Its aims are to prevent waste and reduce waste and increase recycling from businesses in this sector. The draft plan contains a number of proposals for discussion on how we manage and treat construction and development waste to achieve more sustainable and affordable outcomes. It focuses on the key role that the construction and development sector plays through working with their clients, customers, suppliers, trades people and the wider communities to achieve the twin goals of ‘One Planet living’ and zero waste.

Industrial and Commercial Sector (I&C) Plan

The I&C plan focuses on commercial waste arising from any premises which are used wholly or mainly for trade, business, sport recreation or entertainment (excluding household) and industrial waste arising from any factory and from any premises occupied by an industry (excluding mines and quarries). The scope includes:

- eco-design of products and packaging in order to reduce waste, increase reuse and recyclability and increase the recycled content;

- waste prevention including of wastes produced by the sector, and in relation to producer responsibilities in respect of products produced by the sector (with a focus on eco-design);
- preparation for reuse;
- source segregation and separate collection of key recycle streams including paper, card, metal, glass and plastic; and
- sustainable management of residual waste.

Public Sector Plan

The Public Sector Plan is scheduled for publication for consultation in September 2015. It will establish how the public sector in Wales will manage resources efficiently, develop sustainable procurement activities and prevent waste production arising from provision of services in relation to health care, education, local government, justice administration and emergency response in Wales. It will set out a challenging action plan which will aid the public sector to provide leadership to all other sectors and become a driver of change. Consultation events will be organised to engage with Welsh Government departments and bodies to ensure that there is a joined up approach throughout. Procurement is also a primary focus for the plan and how this can bring about the required change in the public sector.

Agriculture - position statement

A draft position statement / call for evidence document for the agriculture sector was published in May 2014. The document focused on wastes produced by the agriculture sector in Wales up until the “farm gate” and on wastes managed by the agriculture sector. It identifies opportunities for waste prevention, preparing for reuse, recycling, other recovery (including landspreading) and sustainable residual waste management.

The consultation document was informed by a stakeholder group meeting that was held in November 2013. The consultation on the call for evidence closed in September 2014. Welsh Government officials are preparing the analysis and position statement for publication in September 2015.

Technical Advice Note (TAN)21

In March 2013, the Welsh Government launched a consultation on the Planning TAN21 'Planning and Waste'. This consultation ran until June 2013 and the revised TAN21 was published in February 2014.¹¹ The Welsh Government also consulted in March 2013 on revisions to Chapter 12 of the Wales Planning Policy Guidance.¹²

The revised TAN21 acknowledges that waste policy targets and drivers have evolved since the previous TAN21 (2001) and consequently the Regional Waste Plans (developed following the publication of the original TAN21, with regional waste plans published in 2004 and revised regional waste plans published in 2008/2009), which are based upon land take, are now outdated and should be revoked. The benefit of this is that the revised TAN21 serves to more closely align planning considerations with the revised Wales Waste Strategy TZW.

¹¹ <http://wales.gov.uk/consultations/planning/planning-for-waste/?lang=en>

¹² <http://wales.gov.uk/topics/planning/policy/tans/tan21/?lang=en>

The revised TAN21 introduces a requirement for the collection of data and the provision of annual monitoring reports. The benefit of this is that these can be used as evidence to support development plans and planning decisions.

It also introduces a requirement to keep a minimum amount of landfill capacity in each region (North, South West and South East) relative to a trigger point. The trigger point is a landfill void availability of more than 7 years at current rates of tipping. Hitting the trigger will result in a site search and selection process for the region to identify suitable locations for landfill. The benefit of this is that instead of moving to a position where landfill void is actively sought, we are now in a position where we are keeping a 'watching brief' – as the availability of landfill void is directly related to reuse, recycling and recovery rates, as well as to waste arisings then it is quite possible that although the amount of landfill void decreases, the timescale over which it is made available may increase. This is due to residual waste tonnages falling faster than landfill void is being used, hence pushing the timeframe over which planners have to provide new landfill capacity back beyond the trigger point.

The revised TAN21 updates the policy direction to enable waste facilities to move up the waste hierarchy through the introduction of a Waste Planning Assessment (WPA). The benefit of this is that it replaces the previous 'Best Practicable Environmental Option' test with one more closely aligned to the waste hierarchy requirements of Article 4 of the Waste Framework Directive.

Accompanying the revised TAN21 is a waste technology guide. This guide advises planners on the major waste facility types and their impacts. It is not binding (it is merely an advisory guide) and is a 'living document' – it will be revised periodically to take account of new technology developments. The benefit of the guide is to give an easily accessible factual overview of key waste facility types, and provide references for further information.

Sections 2.6 and 2.7 of Chapter 2 of the revised TAN21 set out in detail the planning principles to be considered in order to ensure that waste is prevented, prepared for reuse, recycled, recovered or disposed of in accordance with the requirements of Article 4 of the Waste Framework Directive.

3.3 Reducing impacts of landfill facilities

Natural Resources Wales assumed responsibility for conducting technical reviews of landfills and working with operators to maximise the capture of methane gas from their formation in April 2013; this work was previously undertaken by Environment Agency Wales. Between 2010 and 2014, 13 audits have been undertaken of landfill facilities in Wales with a number of follow-up actions implemented. This has resulted to date in 9,372 tonnes of methane captured, equating to a CO₂(e) saving of 234,300 tonnes.

3.4 Development of a Waste Communication Plan

Behaviour change is currently one of our main policy tools to achieve the targets set out in TZW. We need to influence the public and businesses to voluntarily change their behaviour. People are generally aware of recycling services with many people participating at varying levels in local services. We now need to overcome any barriers to increasing recycling and other waste behaviours and motivate people to do more and review whether voluntary methods are working.

The long term delivery programme for this work is being developed by a Waste Communication working group which is currently made up of Welsh Government Waste Strategy Branch, Welsh Government Communications team, Waste and Resources Action Programme (WRAP) and Waste Awareness Wales. Overall the aim is to achieve targets set out in TZW by motivating people towards better waste behaviours whether this be food waste prevention or increasing the amount of materials they put out for recycling.

Initially the focus has been on household waste to help local authorities achieve the targets set out in TZW. Communications support has been provided to a number of Local Authorities which has impacted on waste behaviours locally. The working group is currently developing and testing messaging to be used both nationally and locally in communications campaigns. An overarching communications strategy will be developed during 2015 -16.

3.5 Developing evidence

Welsh Government officials have worked with the Department for Environment Food & Rural Affairs (Defra) as part of the ONE Network Evidence Programme which aims to achieve step change improvement in the delivery of evidence functions for Defra and the Network resulting in quality, resilience and value for money, against a backdrop of declining resources. Delivery of new ways of working on evidence initiated through seven work-streams with delivery due in early 2015 – commissioning, budgets, partnerships, procurement, capabilities, knowledge management and quality.

As part of this programme a new Evidence Strategy launched in June 2014 sets out priorities for evidence and how we will work together with Defra and the wider network to get the most from our evidence. The recommendations are being delivered through the ‘one business’ evidence. As part of the implementation of the Network Evidence Strategy, Defra is changing the way it commissions evidence and work with partners across the Network and beyond. Central to this is the development of Network Evidence Action Plans (NEAPs) which will:

- Ensure our evidence activities inform and are driven by policy and operational needs
- Enable greater strategic oversight of the Network’s evidence activities, and cross-network prioritisation in-line with business planning processes
- Allow us to adopt an outcome-led commissioning approach to influence the several billion available from evidence funders and providers beyond Defra
- Ensure we make best use of the network’s £200m investment, and its specialists.

Some Wales specific evidence needs are met through a Welsh Government budget. This includes funding updated surveys to determine the quantities and types of industrial and commercial, and construction and demolition waste generated in Wales in 2012. The two surveys were published in 2014.¹³

¹³ Available on the Natural Resources Wales website at: <http://naturalresources.wales/our-evidence-and-reports/waste-reports/?lang=en>

Section 4 - Towards Zero Waste Outcomes

This section reports progress against the indicators under the three main outcomes set out in Part 3 of TZW 'Outcomes: building a sustainable future'.

4.1 A Sustainable Environment

The following indicators relating to this outcome were included in TZW.

4.1.1 Ecological footprint of waste

TZW describes the Welsh Government's aim to reduce the ecological footprint of waste in Wales to one planet levels by 2050 through actions on waste prevention and recycling. Section 1 of Annex A shows how waste arisings in Wales have fallen since 2007. Section 2 of Annex A shows how recycling of waste has increased since 2007.

Indicator SE1 in Annex B illustrates how waste arisings have fallen across the municipal, industrial and commercial, and construction and demolition sectors between 2007 and 2012.

TZW identified that in 2007 the production and management of waste in Wales generated an ecological footprint impact of approximately 4,180,000 global hectares. In 2015 the Welsh Government will consider the value of updating the ecological footprint of waste in Wales.

4.1.2 Climate change

The Welsh Government has committed to investigate ways of monitoring and measuring the direct emissions of greenhouse gas from the waste sector in Wales. According to the National Atmospheric Emissions Inventory: 1990-2012, the waste sector in Wales produced 1.137 million tonnes of CO₂(e) in 2012.¹⁴

Both TZW and the Climate Change Strategy commit Wales to reducing direct greenhouse gas emissions from the waste sector – by diverting biodegradable waste from landfill to recycling, composting or anaerobic digestion through:

- Diversion of all biodegradable municipal waste collected by local authorities from landfill by 2020.
- Diversion of other biodegradable waste from landfill by 2025.
- Further reducing emissions from current sites.

The Climate Change Strategy has set a year-on-year target of reducing greenhouse gas emissions in Wales by 3% from 2011, and by 40% by 2020 based on a 1990 baseline. The Welsh Government estimates that actions in diverting biodegradable waste from landfill to recycling, composting and anaerobic digestion will deliver savings of direct emissions of 660 thousand tonnes CO₂(e) by 2020. The diversion of biodegradable waste collected by local authorities from landfill is measured through the Landfill Allowances Scheme.

¹⁴ National Atmospheric Emissions Inventory: 1990-2012, Department of Energy and Climate Change, available at <https://www.gov.uk/government/publications/devolved-administration-greenhouse-gas-inventories>

Table 1 shows the change in emissions from 2009 to 2012. Emissions have reduced every year, and the total reduction is 258 thousand tonnes. This represents a 6% reduction per year compared to 2009, exceeding the Welsh Government Climate Change target of a 3% reduction year on year.

Table 1 - Greenhouse gas CO₂(e) emissions from the waste sector (ktonnes) 2007-2012

Year	Landfill	Waste incineration	Waste water handling	Total
2009	1240.79	8.77	145.70	1395.26
2010	1084.67	9.17	140.60	1234.43
2011	1060.76	8.60	126.29	1195.65
2012	1009.72	7.83	119.94	1137.49

Source: National Atmospheric Emissions Inventory, Devolved Administration Tables

Note: These are direct emissions of greenhouse gases. The historic dataset is revised periodically.

This progress has been achieved through a range of Welsh Government measures including support for alternative treatment of Local Authority Municipal Waste, the Collaborative Change Programme, and a programme of work to further reduce greenhouse gas emissions and landfill.

Support for alternative treatment of Local Authority Municipal Waste

The Waste Infrastructure Procurement Programme was established in 2008 to help address the affordability of sustainable waste infrastructure in Wales and is delivered through public private partnerships. It supports local authorities to divert biodegradable waste from landfill by delivering sufficient treatment capacity to meet EU landfill diversion and statutory national recycling targets.

There are seven regional procurement consortia developing long term solutions for the treatment of food waste through anaerobic digestion (AD). Four hubs have awarded contracts, including two AD plants which have been built and are fully operating in north Wales (near Penygroes and St Asaph respectively). A third is being built near Aberdare, and is on target to be operating in July 2015. Other procurements are underway for Cardiff and the Vale and the Heads of the Valleys authorities. The programme will treat 150,000 tonnes of household food waste per year and is expected to generate 7MW of renewable electricity, enough to supply 6,000 households.

Three consortia are currently developing long term residual waste solutions. In South East Wales, Prosiect Gwyrdd (see case study below for forecast carbon savings) awarded its 25-year contract in December 2013, which is due to start in April 2016. The North Wales and Tomorrow's Valley Partnerships are due to award contracts in autumn 2015.

Case study on alternative residual waste treatment: Prosiect Gwyrdd

Prosiect Gwyrdd is a partnership between Caerphilly County Borough Council, the City and County of Cardiff, Monmouthshire County Council, Newport Council and the Vale of Glamorgan Council. The purpose of the partnership is to deliver the best long term environmental, sustainable and cost effective waste treatment solution after recycling has been maximised.

Prosiect Gwyrdd will receive £4.2m of Welsh Government funding per year to divert non-recyclable waste from landfill over a 25 year period. The project also received Welsh Government support throughout its procurement process.

Prosiect Gwyrdd has demonstrated that on average it will divert over 160,000 tonnes of non-recyclable waste from landfill each year by using this waste as a fuel to generate electricity using an Energy from Waste (EfW) technology. This will provide an annual net benefit predicted carbon saving of over 50,000 tonnes CO₂(e) in comparison to continued landfill. Ash produced by the EfW process will also be diverted from landfill to produce construction aggregate. Surplus heat will potentially be supplied to heat users in the vicinity of the site via a proposed heat distribution network. Furthermore, as the cost of sending waste to landfill continues to rise, it is anticipated that Prosiect Gwyrdd will save the partner authorities approximately £500m over the next 25 years as well as creating jobs in the waste and resource management industry.

Collaborative Change Programme

The Collaborative Change Programme helps divert biodegradable waste from landfill by supporting local authorities to optimise their potential to operate sustainable waste management services. 20 local authorities have been assisted by the programme since its inception in late 2011, and we aim to work with all before the end of 2015-16. This support covers many activities and for several authorities has included financial options modelling.

The option appraisals which are undertaken with authorities as part of the business plans process identify potential carbon savings. Where this modelling has been completed and implemented, savings of approximately £10m per year have been identified. It is expected that once modelling is completed for all other authorities, the savings will be approximately £20m per year.

Programme of work to reduce further existing greenhouse gas emissions and landfill

Natural Resources Wales (formerly Environment Agency Wales) is responsible for conducting technical reviews of landfills and working with operators to maximise the capture of methane gas.

Table 2 shows the number of technical reviews and extra priority work completed at Welsh landfills since 2010-11 and also methane emission savings estimated each year.

Table 2 – Number of technical reviews and priority works completed at Welsh landfills since 2010-11

Area	2010-11	2011-12	2012-13
Methane captured (tonnes)	4,033	2,513	2,826
Potential additional (tonnes/year)	5,512	7,806	8,708
North Wales	2 audits	1 audit 2 follow-up 2 extra work	1 audit 2 follow-ups 3 extra work
South East Wales	1 audit	1 audit 3 follow-up 3 extra work	3 audits 4 follow-ups
South West Wales	2 audits	2 audits 3 extra work	1 follow-up 2 extra work

Source: Natural Resources Wales

Note: audits and follow-ups are planned work; extra work is unplanned work that was identified locally and has been completed.

Please note that these figures represent ‘a snapshot window’ in time at each of the landfills. Landfill gas management systems need to be regularly maintained in order to continue to achieve gas capture rates. Following the technical reviews, actions are progressed with the landfill operators and as part of the routine compliance work with the sites.

The reviews have delivered actual landfill gas extraction improvements since 2010-11 with estimated savings of 9,372 tonnes of methane captured. This would equate to a CO₂(e) saving of 234,300 tonnes, as methane has approximately 23 times the Global Warming Potential that CO₂ has.

4.1.3 Waste management

Action undertaken against the following three commitments in this section of TZW is described below.

Measure waste arisings, management, disposal and capacity across all sectors to monitor progress against the waste prevention and management targets

Progress against the waste prevention and management targets in TZW is set out in Annex A.

Measure progress towards establishment of an integrated and adequate network of recovery and disposal facilities

The Welsh Government’s approach to ensuring the establishment of the network is described in the Collections Infrastructure and Markets Sector Plan (section 3.2.4.4, Establishing and monitoring the development of a network of resource management facilities) and in the revised Technical Advice Note (TAN)21 (Waste).¹²

improve information on the destination of recyclates and how they are managed (i.e. whether by closed or open loop)

Local authorities are required to report the waste material flows they manage to the end destination under the Preparation for Reuse, Recycling and Composting Targets (Monitoring and Penalties) (Wales) Regulations 2011. Authorities are required to report via WasteDataFlow in order to meet this requirement.

This information has been publicly available each year since 2012 (covering data from October 2010). Three annual datasets have been released by the Welsh Government identifying the end destinations of materials collected by local authorities that are recycled. The latest information on end destinations (covering 2012-13) is available on the StatsWales website.¹⁵

4.1.4 Eco-design

The Welsh Government has committed to monitor the progress and outcomes of eco-design activity of Welsh companies that receive support from the Welsh Government, using key environmental performance indicators.

We commissioned an ecodesign baseline study¹⁶ published in April 2013 which identifies the issues which directly impact on wider ecodesign and eco-innovation activities of businesses in Wales.

4.2 A Prosperous Society

The following indicators relating to this outcome were included in TZW.

4.2.1 Employment and job type

The Welsh Government is committed to monitor and measure the number of people employed in the waste management industry in Wales, the type of jobs they are employed in, and the sector in which they are employed.

A Sector Skills Assessment produced by Energy and Utility Skills¹⁷ for the Welsh Government in 2014 estimated that there were around 8,800 people employed in the waste management industry in 2013 compared to 7,500 people employed in 2009, an increase of 1,300 or 17%.

The Welsh Government will continue working with Energy and Utility Skills to carry out annual reassessments of this research as the waste industry evolves.

4.2.2 Skills Level and Training

The Welsh Government is committed to measure skill levels in the Waste Management sector; developing a skilled workforce for the changing nature of waste management facilities is a key part of sector plans.

¹⁵ At: <https://statswales.wales.gov.uk/Catalogue/Environment-and-Countryside/Waste-Management/Recycling-Destinations>

¹⁶ Ecodesign Baseline Study for Wales Waste Prevention Programme, Ecodesign Centre Wales

¹⁷ Towards Zero Waste: A Review of progress made in employment and skills in the waste and resource management sector in Wales. Energy & Utility Skills (2014)

Skills

The Sector Skills Assessment report discusses the skills and recruitment issues facing the waste management industry in Wales, including skills gaps and a section relevant to the policy objectives in TZW along with details of training provision. It also provides the following data on the skill profile.

Table 3 - Highest qualification held by employees in the waste and resource management sector (compared to the all sector average)

Level of Highest Qualification Held	2009		2013	
	Waste & Resource Management (Wales)	All sectors (Wales)	Waste & Resource Management (Wales)	All sectors (Wales)
CQFW Level 4 and above	5.7%	34.7%	12%	37.4%
CQFW Level 3	14.4%	16.4%	21.1%	18.5%
Trade Apprenticeships	2.5%	3.9%	8.9%	5.4%
CQFW Level 2	17.5%	17.1%	9.3%	16.9%
Below CQFW Level 2	16.3%	11.5%	17.1%	10.0%
Other Qualifications	20.9%	7.4%	10.7%	6.2%
No Qualifications	22.8%	9.0%	20.9%	5.7%

Source: Towards Zero Waste: A Review of progress made in employment and skills in the waste and resource management sector in Wales. Energy & Utility Skills (2014)

The report makes the following observations:

‘The highest qualifications held by the workforce largely reflect the occupational structure of the sector – around 30 per cent of the workforce have no qualifications at all or a CQFW Level 1 equivalent.

Although the proportion of the workforce that hold a Level 3 qualification is slightly higher than average across the Wales economy, the proportion holding a Level 4 and above qualification is significantly below the national average – and somewhat lower than we might expect given that around one-third of the sector’s workforce is employed in technician-level roles or higher (see section 3.1.3 above) and, therefore, might be expected to be qualified to a higher standard than CQFW Level 3.’

The Welsh Government will work with Energy and Utility Skills to carry out periodic assessments of the waste industry as it evolves.

Training

There is also a commitment to explore the possibilities for measuring and monitoring the number and type of training courses that are available which are suitable for the

changing industry, together with the uptake of training places and qualifications achieved.

The Sector Skills Assessment 2010 used data taken from the Lifelong Learning Wales Record to estimate the number of learning opportunities related to the waste sector taken up during 2008-09.

Table 4 - learning opportunities in the Wales waste sector 2008-09 and 2011-12

Type of Learning	Number of starts	
	2008-09	2011-12
Work-Based Learning (Vocational programmes relevant to the waste industry, including Modern Apprenticeships)	560	620
Further Education (Courses relevant to the waste industry)	320	580

Source: Towards Zero Waste: A Review of progress made in employment and skills in the waste and resource management sector in Wales. Energy & Utility Skills (2014)

The Welsh Government will work with Energy and Utility Skills to carry out periodic assessments of training in the waste industry as it evolves.

The Chartered Institution of Waste Management is the professional body which represents waste and resource professionals. Indicator PS1 in Annex B also shows the numbers of staff in the waste industry in Wales who have the different classes of membership of it.

4.2.3 Resource use and efficiency

The Welsh Government is committed to explore the possibilities for measuring and monitoring the amount of energy (electricity and fuel) generated by the anaerobic digestion of waste.

The Waste Infrastructure Procurement Programme is described in the climate change indicator section. It is estimated that this programme will result in a total of 70MW of energy production, with 7MW as a result of anaerobic digestion and the remaining 63MW as a result of the residual waste treatment.

The Welsh Government will monitor the performance of these facilities when they are operational to establish whether the benefits identified have been realised.

4.3 A Fair and Just Society

The following indicators measure progress towards a fair and just society:

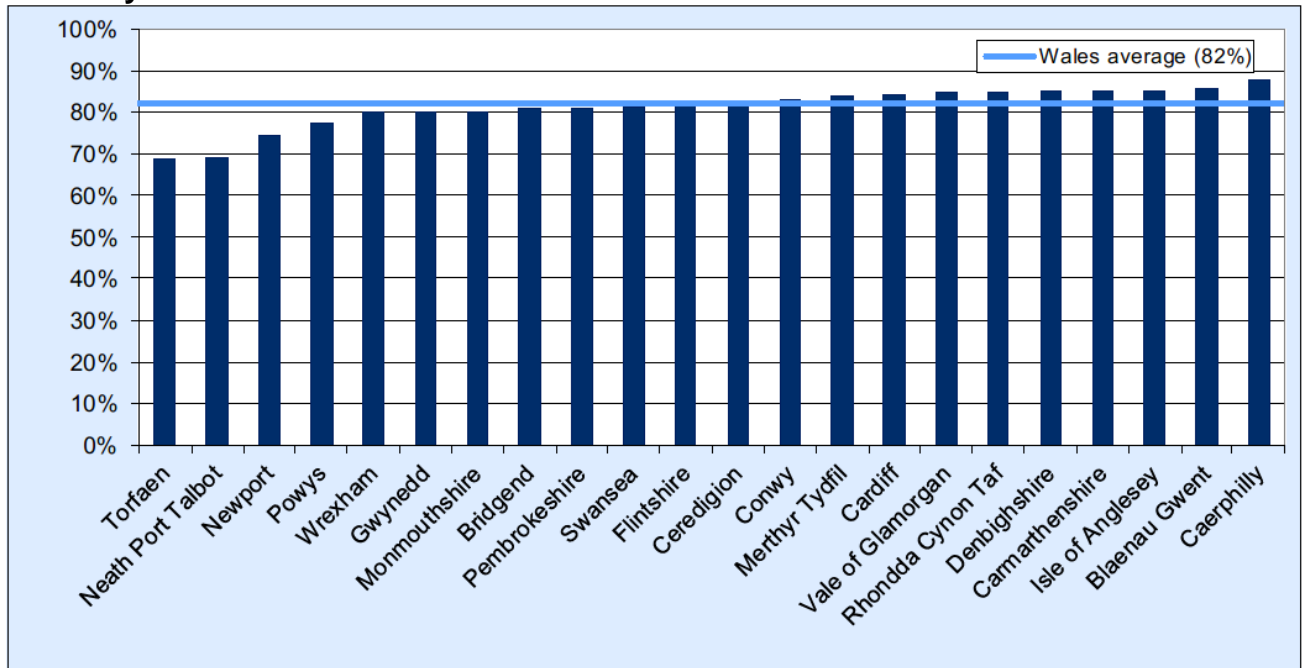
4.3.1 Contribution to wellbeing of Wales through an improved local environment and enriched communities which are empowered to shape their services

TZW included a commitment to measure community satisfaction of involvement in waste services and activities, through the 'Living in Wales Survey'. The survey has been replaced by the annual National Survey for Wales which, from 2014-15 includes

the question “How satisfied or dissatisfied are you with the recycling collection service provided by [council]? Please think just about recycling collection rather than general refuse collection.”

82% of people were satisfied with the recycling collection service provided by their council. Figure 2 shows how this varies by local authority. 69% were satisfied in Torfaen, compared with 88% in Caerphilly.

Figure 2: Satisfaction with the recycling collection service provided, by local authority



Source: National Survey for Wales 2014-15, Welsh Government

4.3.2 Full human potential

Increased employment

The number of jobs is being monitored and measured as described in section 4.2.1 ‘A Prosperous Society’.

Increasing employability

The TZW commitment to investigate ways of measuring and monitoring the potential for increasing employability through waste prevention, reuse and recycling activities has been addressed through the Energy and Utility Skills report described in section 4.2.1.

4.3.3 Equality of opportunity

Level of recycling services

As described in our Municipal Sector Plan we are measuring the level of recycling facilities services provided across all local authorities to ensure equality of service. The most recent comprehensive and published information is shown in Table 5 and is correct as of July 2015.

Table 5 - Local authority kerbside recycling service configurations

Recycling System	Recycling Frequency	Residual Frequency	Authorities
Kerbside Sort	Weekly	Fortnightly	Bridgend, Torfaen, Isle of Anglesey, Newport, Wrexham, Conwy, Powys, Flintshire, Neath Port Talbot, Merthyr Tydfil.
	Weekly	3 weekly	Gwynedd.
Two/three streams	Weekly	Fortnightly	Rhondda Cynon Taf, Blaenau Gwent, Monmouthshire.
	Fortnightly		Swansea.
Co-mingled	Weekly	Fortnightly	Pembrokeshire ¹⁸ , Caerphilly, Cardiff, Ceredigion, Vale of Glamorgan.
	Fortnightly	Fortnightly	Carmarthenshire, Denbighshire.

Source: Welsh Local Government Association and Local Authorities.

All 22 local authorities provide a kerbside food waste collection service to most or all of their households. As of 2015, around 99% of Welsh households were provided with a separate food waste collection service. Food wastes are either collected separately, or may be combined with garden waste.

Local authorities are now able to enter information about their service provision into WasteDataFlow and this information can be updated at any time when an authority makes a service change. The Welsh Government will report on this information in future progress reports.

Access to jobs

The Welsh Government monitors the gender and ethnic diversity of the waste management sector through the Sector Skills Assessment produced by Energy and Utility Skills.

The Sector Skills Assessment report 2014 states that the gender ratio of employees in the waste sector is 95.7% male to 4.3% female.¹⁶ For the total workforce in Wales, 52.7% of the workforce is male.

¹⁸ Glass is collected fortnightly with all other dry recyclables weekly.

The report also states that 0% (rounded) of the waste sector's workforce in Wales is from a black or minority ethnic group, compared to 3.3% of the waste sector's UK workforce. The report also states that 3% of the total workforce in Wales, and 10.2% of the total UK workforce is from a black or minority ethnic group.

The Welsh Government will continue working with Energy and Utility Skills to update this information annually.

Access to knowledge and understanding

TZW includes a commitment to measure citizens' access to knowledge and understanding of resource efficiency and waste management through Waste Awareness Wales surveys.

WRAP's Reduce, Reuse and Recycle survey shows that aerosols, garden waste and card are the main items that are often disposed of in residual waste which could be collected through the kerbside recycling service. Lack of awareness of what is collected in kerbside recycling is a significant factor in these materials not being recycled.

The items most commonly incorrectly placed in kerbside recycling are: drinks cartons/tetra paks (42%), plastic carrier bags (16%), foil (15%) and plastic pots, tubs and trays (12%).

A graphical illustration of the public's use of kerbside recycling and residual waste services in Wales in 2014 is provided in Indicator FJ2 in Annex B.

Section 5 - Implementing the outcomes: our achievements against the targets and priorities

This section provides an update on action taken to deliver the milestones targets and priorities outlined in Part 4 of TZW for 2025. Details of achievements against the targets set in Part 4 of TZW are set out in Annex A.

5.1 2025 Milestone: Towards Zero Waste

5.1.1 Targets and priorities for waste prevention

Waste prevention targets

Headline results against the targets for waste prevention across the household, industrial and commercial, and construction and demolition sectors set in TZW are described in section 2.2.2 of this report. Following formal Welsh Government public consultations, these proposed targets were adopted in the Municipal Sector Plan (March 2011), Industrial and Commercial Sector Plan (December 2013), and Construction and Demolition Sector Plan (November 2012). Details of performance against these targets are outlined in Annex A.

The following indicators in Annex B illustrate the key aspects of our performance to date as follows:

- Indicator SE2 in Annex B shows how the quantity of household waste has fallen between 2006-07 and 2013-14.
- Indicator SE5 illustrates industrial and commercial waste arisings in 2007 and 2012.
- Indicator SE6 illustrates construction and demolition waste arisings in 2005 and 2012 by material type

Hazardous waste, packaging waste and priority materials

TZW also identifies a priority of reducing hazardous, packaging and priority materials (food, plastic, paper, and waste electronic and electrical equipment) waste across the household, industrial and commercial, and construction and demolition sectors. Actions to take this forward are outlined in the Municipal, Industrial and Commercial, and Construction and Demolition sector plans respectively.

5.1.2 A strong economy in resource management

High levels of clean recyclables to drive the market

Actions to drive forward this aim in TZW are set out in the Collection, Infrastructure and Market sector plan.

5.1.3 The right kind of recycling facilities

TZW includes a commitment for all recycling operations to be 'closed loop', and to develop recycling facilities that accept recyclates depending on material type rather than the sector they come from. Actions to deliver this aim are set out in the Collections, Infrastructure and Markets Sector Plan.

We have improved information on end destinations for municipal waste and the data can be viewed on an individual local authority basis and the dataset for 2013-14 is

scheduled to be published in summer 2015.¹⁹ We have asked Natural Resources Wales to develop an up to date database of waste facilities by the third quarter of 2015 and we have also asked WRAP to develop a database of waste pre-processors (i.e. the end market) for the same time.

We have supported significant development of infrastructure since 2010 through the Waste Infrastructure Procurement Programme work on capacity for municipal food waste. We have supported WRAP in using European Regional Development Funding to run the Accelerating Reprocessing Infrastructure Development (ARID) project for the development of infrastructure, to manage recyclates from the commercial, industrial and construction and demolition sectors.

5.1.4 Strong markets for recyclates and anaerobic digestion digestate

We work closely with businesses in Wales to make sure that the right market is created for recyclate, and fund WRAP to work closely with businesses in Wales to make sure that the right material is created for recyclate, compost and digestate from AD plants.

5.2 Residual waste will be minimised

This commitment is being monitored through the capture of municipal waste data through WasteDataFlow and from periodic surveys of industrial and commercial waste and construction and demolition waste. Indicator SE1 in Annex B shows the level of residual waste sent to landfill and energy from recovery.

5.2.1 Landfill eliminated as far as possible

The landfill targets will continue to be monitored and Natural Resources Wales will continue to publish data annually on deposits of wastes at landfill sites in Wales.

5.2.2 Reducing the impacts of landfill facilities

With its formation in March 2013, Natural Resources Wales assumed responsibility for conducting technical reviews of landfills and working with operators to maximise the capture of methane gas; this work was previously undertaken by Environment Agency Wales. Between 2010 and 2014, 13 audits have been undertaken of landfill facilities in Wales with a number of follow-up actions implemented. This has resulted to date in 9,372 tonnes of methane captured, equating to a CO₂(e) saving of 234,300 tonnes.

5.3 Legacy wastes will be tackled

The construction sector uses a wide range of materials and products which, at end of life, would be considered 'legacy' wastes. Legacy wastes are defined as materials or products that are not feasible to recycle either now or in the foreseeable future due to their hazardous nature, composite make-up, the costs of treatment for recycling or the way their use leads to contamination at end of life. They therefore cannot feasibly be recycled or reused, the only options are energy recovery or disposal, and this is likely to continue to be the case if that material continues to be made and used in the same way.

¹⁹ More information can be found at:

<http://gov.wales/newsroom/environmentandcountryside/2014/140704recyclingdestinations/?lang=en>

and the dataset is available on the StatsWales website at:

<https://statswales.wales.gov.uk/Catalogue/Environment-and-Countryside/Waste-Management/Recycling-Destinations>.

In order for waste not to become legacy waste, the original product needs to be redesigned so that it can be reused or recycled. In the meantime, where feasible, energy recovery should be employed to avoid these materials or products being sent for disposal. The only exception would be when a life cycle assessment shows that the use of a material or product provides demonstrably greater environmental benefits which outweigh the environmental impacts of their recovery as energy or their disposal. In such cases, they will not be classified as 'legacy wastes'.

The Construction and Demolition Sector Plan identifies that ecodesign (a strategic design management process that considers the full life-cycle impacts of packaging, products, processes and services) can help provide practical and creative solutions to complex problems.

5.4 Targets and priorities for reuse, recycling and landfill reduction

Action to address the targets for reuse, recycling and landfill reduction set out in TZW for the household, industrial and commercial, and construction and demolition sectors is outlined in the Municipal Sector Plan (March 2011), Industrial and Commercial Sector Plan (December 2013), and Construction and Demolition Sector Plan (November 2012). Additionally, the following indicators in Annex B illustrate the different ways in which waste is managed across the sectors:

- Indicator SE7 illustrates the different ways in which industrial waste generated in Wales in 2007 and 2012 was managed
- Indicator SE8 illustrates the different ways in which commercial waste generated in Wales in 2007 and 2012 was managed
- Indicator SE9 illustrates the different ways in which construction and demolition waste generated in Wales in 2005 and 2012 was managed
- Indicator SE10 illustrates the landfill of biodegradable municipal waste collected by local authorities and others in 1995, and 2010-12.
- Indicator SE11 illustrates the landfill of biodegradable municipal waste collected by local authorities from 2010-09-10 to 2013-14
- Indicator SE12 shows the landfill of waste at registered sites in Wales in 2010-2013.
- Indicator SE13 shows the landfill of Local Authority Municipal Waste in Wales 2009-10 to 2013-14

5.4.1 Commercial and industrial waste

Commercial waste recycled

TZW sets targets for the recycling of commercial waste to be 57% by 2015-16, 67% by 2019-20, and 70% by 2024-25. Progress against these targets is set out in Annex A (para 2.2).

Industrial waste recycled

TZW sets targets for the recycling commercial waste to be 63% by 2015-16, 67% by 2019-20, and 70% by 2024-25. Progress against these targets is set out in Annex A (para 2.3).

Packaging waste and landfill of biodegradable waste

Action being taken regarding reusing and recycling packaging and reducing the landfill of biodegradable waste is described in our Industrial and Commercial and Food Manufacturing Services and Retail sector plans respectively.

Priority materials

Action to divert food waste from landfill to AD plants, recycle paper and card rather than landfill it, and recycle metals is set out in our Collection, Infrastructure and Markets Sector Plan.

Further actions

Setting separate recycling targets for priority materials

Following consultation, the Welsh Government decided not to adopt separate recycling targets for priority materials in the industrial and commercial sector.

Preparing for reuse targets

Following consultation, the Welsh Government decided not to adopt preparation for reuse targets for the industrial and commercial sector.

Phasing out hazardous waste from landfill in the medium term

Action to phase out hazardous waste from landfill in the medium term is described in our Collection, Infrastructure and Markets sector plan.

5.4.2 Construction and demolition waste

Preparing for reuse, recycling and other material recovery (including backfilling)

TZW sets a target for the preparation for reuse, recycling and other material recovery of construction and demolition waste to be at least 70% by weight by 2015-16, and 90% by 2019-20. This incorporates the target set in Article 11 of the Waste Framework Directive for reuse, recycling and other material recovery of construction and demolition waste to be 70% by 2020.

Progress against this target is set out in Annex A (para 2.4).

Landfill

TZW sets targets to reduce the percentage of construction and development waste produced in Wales as a percentage of the 2007 baseline, by 50% by 2015-16, and by 75% by 2019-20. Progress against this target is set out in Annex A (para 4.4).

Packaging waste and landfill of biodegradable waste

Our Construction and Demolition Sector Plan describes action being taken regarding reusing and recycling packaging and reducing the landfill of biodegradable waste.

Priority materials

Following consultation, the Welsh Government decided not to adopt separate recycling targets for priority materials in the construction and demolition sector.

Further actions

Reducing the quantity of waste to landfill towards zero will be a key objective in the Construction and Demolition sector plan.

5.4.3 Municipal waste collected by local authorities

Minimum levels of preparing for reuse and recycling composting (or AD) for municipal waste

TZW sets targets for the minimum level of preparation for reuse and recycling/composting (or AD) for the municipal sector. Progress against these target is set out in Annex A (para 2.1.1) and is also shown graphically in Indicator SE5 in Annex B.

Minimum levels of composting (or AD) of source separated food waste

We consulted on proposed minimum levels of composting (or AD) of source separated food waste from kitchens in our Municipal Sector Plan. Following consultation we decided not to introduce a separate composting target.

Minimum proportion of preparing for reuse/recycling/composting that must come from source separation

The target relating to source separation has not been monitored because to a significant extent the original policy aims of the target (i.e. to deliver high quality recycling) are being delivered via the implementation of the separate collection requirements of Regulation 13 of the Waste (England and Wales) Regulations 2011. This requires local authorities (and other collectors of waste) to ensure that, from 1 January 2015, paper, metal, plastic and glass are collected separately as long as this is necessary to facilitate or improve recovery, and it is technically, environmentally and economically practical.

Maximum level of landfill of municipal waste

TZW sets targets for the maximum landfill of municipal waste to be 10% by 2019-20 and 5% by 2024-25. Progress against this target is set out in Annex A (para 4.1). Indicator SE14 in Annex B also illustrates this graphically.

Maximum level of energy from (municipal) waste for individual local authorities

TZW sets targets for the maximum level of energy from municipal waste of 42% by 2015-16, 36% by 2019-20 and 30% by 2024-25. Progress against these target is set out in Annex A (para 3).

Minimum levels of preparing for reuse (excluding WEEE)

Progress against the targets for minimum levels of reuse of municipal waste excluding WEEE is set out in paragraph 2.1.3 of Annex A. We undertook research to build on this reuse target in the municipal sector plan and following consultation we decided not to introduce a revised reuse target.

Section 6 – Delivery

This section provides an update on delivery of the aims and targets as outlined in Part 5 of TZW. To avoid repetition it only provides additional information not already covered in previous sections.

6.1 Within the Welsh Government

6.1.1 Leadership by the Welsh Government

Between 2010-11 and 2013-14 waste production in the Welsh Government's estate decreased by around 183 tonnes, an average reduction of 8% per year. On average around 69% of our domestic waste is now recycled, compared to 61% in 2010-11, an increase of 2.7% per year. Between 2009-10 and 2013-14, Welsh Government use of recycled printing paper increased from 73% to 96%.

Holding an international conference in Wales on waste prevention has been considered but has been ruled out for the time being because of financial constraints. However, we will continue to talk to potential partners and will keep this under review.

6.1.2 Integrated Product Policy

The European Commission no longer runs the 'Integrated Product Policy' initiative, however, the Commission's 'Roadmap to a Resource Efficient Europe (2011)' identifies an action to 'address the environmental footprint of products, building on an ongoing assessment due in 2012 and following a consultation with stakeholders, including through setting requirements under the Ecodesign directive, to boost the material resource efficiency of products (e.g. reusability, recoverability, recyclability, recycled content, durability), and through expanding the scope of the Ecodesign directive to non-energy related products (in 2012)'. The Commission's new proposals on waste include additional requirements to achieve extended producer responsibility. The Welsh Government liaises closely with the UK Government in respect of framing the UK's response to the Commission's proposals.

6.2 Reuse, recycling and landfill reduction targets

6.2.1 Working with the National Assembly for Wales UK Government and the EU

The European Commission has recently issued new proposals on waste, and this includes proposals to introduce extended producer responsibility. The Welsh Government liaises closely with the UK Government in respect of framing the UK's response to the Commission's proposals.

We will also work with the UK and European Governments to explore initiatives such as compulsory take back schemes, laws defining minimum recycled content and secondary material utilisation rate requirements, eco-efficiency standards and restrictions and bans on the disposal of specific materials and products across the UK and Europe. The European Commission has issued the 'Roadmap for a Resource Efficient Europe' and has recently issued new proposals on waste, and this includes proposals to introduce extended producer responsibility. The Welsh Government liaises closely with the UK Government in respect of framing the UK's response to the Commission's proposals which proposals include bans on the disposal of specific materials to landfill and energy from waste.

6.3 Other commitments

TZW includes a commitment to ensure that our sector plans take account of the varying needs of different areas of Wales, especially in relation to rural, urban and valley areas, and that particular attention will be paid to the needs of small businesses.

The Collections, Infrastructure and Markets Sector Plan provided information on the spatial distribution of key waste infrastructure, and assessed provision and need on a regional basis.

TAN21 (Waste) provides the spatial framework for the development planning of new waste infrastructure in Wales. Paragraphs 3.3-3.6 focus on ensuring the adequate spatial distribution of facilities for the disposal of waste and recovery of mixed municipal waste. TAN21 identifies that the Welsh Government considers that collaboration between local planning authorities is necessary to monitor progress towards establishing an integrated and adequate network for the disposal of waste and recovery of mixed municipal waste. This monitoring will enable comparison to be made between the forecasted need range outlined in the Collections, Infrastructure and Markets Sector Plan and what is available or planned and will provide information on the spatial pattern of waste infrastructure to assist Welsh Government in assessing progress towards the development of an integrated and adequate waste network.

Local authorities assess the varying needs of their residents when designing their waste collection systems. The Welsh Government's Collections Blueprint is designed to be adoptable in all locations across Wales, with variations as necessary according to topography or housing type.

The needs of small businesses, especially in rural areas, have been considered in policy making, and will be included in the development of proposals brought under the provisions in the Environment Bill.

The Welsh Government's aim is to ensure that adequate services for recycling are available to all businesses and householders, where ever they are located in Wales.

Section 7 – Other areas of progress

This section outlines other developments in waste strategy that have occurred since the publication of TZW.

7.1 Landfills Disposals Tax Wales

On 24 February 2015 the Welsh Government launched a consultation on Landfill Disposals Tax, which will replace the UK Landfill Tax in Wales from April 2018. The new devolved power will allow Wales to design and shape a new Landfill Disposals Tax to reflect Welsh priorities and needs.

The existing Landfill Tax has been around for almost 20 years and the consultation aims to explore ways in which we can modernise the administration of the tax, enabling it to operate more efficiently, minimising the burdens on business.

The current Landfill Tax is a significant driver of environmental behaviour, encouraging greater prevention, reuse, recycling and recovery of waste. Its devolution therefore provides us with a useful additional lever to support Welsh Government policies, including the pursuit of our ambitious goal of zero waste.

An important aspect of the tax development work covers compliance. We want to ensure that all those who have waste to dispose of comply with the tax fully and properly. Avoidance and evasion deprive our valued public services. The consultation includes the possibility of including illegal deposits of waste within the scope of the tax, meaning that those who illegally dispose of waste would be required to pay the tax twice - firstly at the point where they disposed of it illegally, and again when it is deposited at a licensed landfill site.

The Welsh Government will also consider whether and how a proportion of the Landfill Disposals Tax may be used to enhance and deliver benefits to communities.

7.2 Resource Efficient Wales service

The Welsh Government is committed to resource efficiency as a key priority within our Programme for Government. There are many benefits to Wales and her citizens from saving energy and water and creating less waste, including increasing our prosperity, reducing bills and our carbon footprint.

In recent years there has been a great deal of change in the help and support available for people and organisations seeking to use resources more efficiently. Increases in utility bills are having major impacts on households, businesses and the voluntary and public sectors.

Resource Efficient Wales is the Welsh Government's single point of access to provide information to householders, communities, business and the public sector across a range of resource efficiency topics.

Section 8 – Review of TZW

We are committed to annual reporting of progress on actions in the sector plans and cross cutting programmes (e.g. Waste Prevention Programme) by way of an annual progress report. The Welsh Government is currently developing a tool to facilitate the capture and reporting of progress for service delivery partners and the sector plans to carry out this reporting requirement. We will review TZW to meet the six year review requirements of Article 30 of the Waste Framework Directive by 2016. In future we will align reporting to the goals outlined in the Wellbeing and Future Generations Act 2015 and Ministerial priorities.

Annex A – Performance against targets

This Annex provides details of progress by sector against the quantitative targets set in TZW in order of the waste hierarchy – reduction, reuse and recycling, recovery and landfill. It also provides details of progress against targets set by the European Union.

1 Targets for waste prevention

1.1 Household waste

The target for household waste is a 1.2% reduction every year to 2050 on the 2006-07 baseline. Table 6 shows performance against this target:

Table 6 – Household waste generated in Wales 2006-07 to 2013-14

Year	Household waste
2006-07 (baseline year)	1,572,420
2007-08	1,542,846
2008-09	1,471,826
2009-10	1,450,526
2010-11	1,401,963
2011-12	1,355,558
2012-13	1,350,906
2013-14	1,349,263

Source: StatsWales website

This target has been met to 2013-14. The total quantity of household waste decreased from 1,572 thousand tonnes in 2006-07 to 1,349 thousand tonnes in 2013-14, an average reduction of 31,880 tonnes per year or 2% of the 2006-07 baseline, exceeding the 1.2% target.

1.2 Industrial waste

The target for industrial waste is a 1.4% reduction every year to 2050 on the 2006-07 baseline. Table 7 shows performance against this target:

Table 7 - Comparison of industrial waste generated in Wales in 2007 and 2012

Year	Total waste generation (thousand tonnes)
2007	1,896
2012	2,001

Source: Survey of Industrial and Commercial Waste Generated in Wales in 2012

The data in Table 7 suggests that there has been no progress towards this target. There is no statistically significant difference in the quantity of industrial waste generated in Wales in 2012 compared to 2007.

1.3 Commercial waste

The target for commercial waste is a reduction of 1.2% every year on the 2006-07 baseline. Table 8 shows performance against this:

Table 8 - Comparison of commercial waste generated in Wales in 2007 and 2012

Year	Estimated total waste generation (thousand tonnes)
2007	1,677
2012	1,665

Survey of Industrial and Commercial Waste Generated in Wales in 2012, Natural Resources Wales

The data in Table 8 suggests that there has been no progress towards this target. There is no statistically significant difference in the quantity of commercial waste generated in Wales in 2012 compared to 2007.

The lack of reduction in waste from the industrial and commercial sectors is disappointing, but we are responding through actions outlined in the Waste Prevention Programme and the Industrial and Commercial Waste Sector Plan. Examples of this work include:

- Funding WRAP Cymru to work across the food supply chain.
- Exploring options for an EU bid for funding to work with Welsh manufacturers to use design techniques to minimise environmental impact, design out waste and reduce costs in the manufacturing of goods.
- Working with Natural Resources Wales to encourage waste prevention action in permitted industry installations.

1.4 Construction and demolition waste

The waste prevention target for construction and demolition waste is a reduction of 1.4% every year to 2050 based on a 2006 baseline. Table 9 shows performance against this target:

Table 9 - Comparison of construction and demolition waste generated in Wales in 2005-06 and 2012

Year	Estimated total waste generation (thousand tonnes)
2005	9,418
2012	3,359

Survey of Construction and Demolition Waste Generated in Wales in 2012, Natural Resources Wales, re-worked by Welsh Government

This target was met in 2012. The data in Table 9 shows that the 3.4 million tonnes of construction and demolition waste generated in 2012 represent an overall reduction of 64.3% compared to 2005-06, or 9.2% per year.

The following factors may partially account for the apparent reduction from 2005 to 2012, namely:

- The recession after 2005 impacted significantly on the construction sector, reducing output and therefore waste generation in 2012.
- There were no major infrastructure projects in Wales accounting for very large quantities of waste in 2012. This contrasts with 2005-06 when three of the five largest waste producers were involved in major projects in Wales.

2 Targets for reuse, recycling and composting

2.1 Municipal waste

2.1.1 Minimum levels of preparing for reuse and recycling/composting (or AD) - municipal waste

Statutory targets are set for minimum levels of preparing for reuse and recycling/composting (or AD) of municipal waste collected by local authorities under the Waste (Wales) Measure 2010. The targets are set out in Table 10:

Table 10 - Reuse/recycling (including composting/AD) targets

Sector	Target
2009-10	40%
2012-13	52%
2015-16	58%
2019-20	64%
2024-25	70%

Source: Towards Zero Waste

Table 11 shows progress to date:

Table 11 - Reuse/recycling (including composting/AD)

Sector	Progress
2009-10	40.5%
2010-11	45.3%
2011-12	50.0%
2012-13	52.3%
2013-14	54.3%

Source: Statistical Bulletin 'Local authority municipal waste management report for Wales, 2013-14', Welsh Government

Table 11 shows that the targets for 2009-10 and 2012-13 were met at an all Wales level. In 2013-14, the rate was 54.3% representing continued progress towards the 2015-16 target.

2.1.2 Minimum levels of preparing for reuse target (excluding WEEE) - municipal waste

These targets set in TZW are shown in Table 12:

Table 12 – Target minimum levels of preparing for reuse target (excluding WEEE) - municipal waste

Year	Target
2012-13	0.4%
2015-16	0.6%
2019-20	0.8%
2024-25	1.0%

Source: Towards Zero Waste

Table 13 shows progress against these targets and that all these targets were met in both 2012-13 and 2013-14:

Table 13 - Levels of preparing for reuse target (excluding WEEE) - municipal waste to date

Year	Percentage prepared for reuse
2012-13	1.53%
2013-14	1.76%

Source: WasteDataFlow

2.1.3 European Commission statutory target for reuse and recycling – waste from households

Article 11(2) of the Waste Framework Directive sets the following target:

by 2020, the preparation for reuse and the recycling of waste materials such as at least paper, metal, plastic and glass from households and possibly from other origins as far as these waste streams are similar to waste from households, shall be increased to a minimum of overall 50% by weight.

Table 14 shows progress against this target and shows that the 2020 target was met in 2012.

Table 14 – Progress against European Commission statutory target for reuse and recycling – waste from households

Year	Percentage prepared for reuse and recycling
2008	35.85%
2009	40.00%
2010	44.01%
2011	48.97%
2012	52.48%

Source: WasteDataFlow

Estimates for 'waste from households' provided above have been calculated in accordance with Article 11(a) of the EC Waste Framework Directive. This differs from 'household waste' as defined in the Environmental Protection Act 1990.

Wales publishes independent household recycling estimates using alternative measures and as such the 'household waste' figures shown in section 1.1 of Annex A of this report differ from those reported above.

2.2 Industrial waste

TZW sets a target for preparation for reuse, recycling and composting of 63% by 2015-16, 67% by 2019-20, and 70% by 2024-25 for the industrial sector. Table 16 shows performance against the targets:

Table 15 - Comparison of recycling rate of industrial waste generated in Wales in 2007 and 2012

Year	Estimated percentage of total waste recycled
2007	59%
2012	50%

Source: Survey of Industrial and Commercial Waste Generated in Wales 2012, Natural Resources Wales

Table 15 suggests that there has been no progress towards these targets and that there is no statistically significant difference in the preparation for reuse, recycling and composting rate for industrial waste; the rate was 59% in 2007 and 50% in 2012.

This rate is heavily influenced by the management of combustion wastes from the energy sector. By removing the data for the energy supply sector, the total preparation for reuse, recycling and composting rate for the remaining industrial sectors was 62% in 2012 compared with 64% in 2007.

2.3 Commercial waste

TZW sets a target for preparation for reuse, recycling and composting of 57% by 2015-16, 67% by 2019-20, and 70% by 2024-25 for the commercial sector. Table 16 shows progress against the targets:

Table 16 - Comparison of recycling rate of commercial waste generated in Wales in 2007 and 2012

Year	Estimated percentage of total waste recycled
2007	37%
2012	68%

Source: Survey of Industrial and Commercial Waste Generated in Wales 2012, Natural Resources Wales

Table 16 suggests that the commercial sector is on track to meet this target in 2015-16, as the current rate meets the target.

This recycling rate is heavily influenced by the management of wastes from the wholesale and retail sector, which generates more waste than any other commercial

sector and recycles 80% of its waste. By removing the data for the wholesale and retail sector, the total preparation for reuse, recycling and composting rate for the remaining commercial sectors was 55% in 2012 compared with 32% in 2007.

2.4 Construction and demolition waste

TZW sets the following methodology and target:

‘The preparing for reuse, recycling and other material recovery, including backfilling operations using waste to substitute other materials, of non-hazardous construction and demolition waste excluding naturally occurring material defined in category 17 05 04 in the list of waste shall be increased to a minimum of 70% by weight by 2015-16, and 90% by 2019-20.’

Table 17 shows progress against these targets:

Table 17 - Reuse and recycling of construction and demolition waste

Year	Estimated percentage of total waste recycled
2005-06	79%
2012	87%

Source: Building the Future 2005-06, Natural Resources Wales, reworked by Welsh Government; Survey of Construction and Demolition Waste Generated in Wales 2012.

Table 17 shows that in 2012 a rate of 87% was achieved for reuse and recycling of construction and demolition waste, thus meeting the 2015-16 target and representing good progress towards the 2019-20 target.

3 Energy from recovery

TZW sets targets for the maximum percentage of municipal waste collected by individual local authorities used for energy recovery to be 42% by 2015-16, 36% by 2019-20 and 30% by 2024-25.

Table 18 shows progress against these targets and suggests that Wales is on track to meet the 2015-16 target:

Table 18 - Percentage of municipal waste used for energy recovery

Year	Percentage used for energy recovery
2012-13	4.6%
2013-14	5.8%

Source: Waste managed (tonnes) by management method and year, StatsWales website²⁰

²⁰ <https://statswales.wales.gov.uk/Catalogue/Environment-and-Countryside/Waste-Management/Local-Authority-Municipal-Waste/Annual/wastemanaged-by-management-year>

4 Targets for landfill

4.1 Municipal waste

4.1.1 Total municipal waste

TZW sets targets for the maximum percentage of municipal waste sent to landfill to be 10% in 2019-20 and 5% in 2024-25.

Table 19 shows progress to date. It shows that the targets for 2019-20 and 2024-25 have not yet been met, although progress has been made:

Table 19 – Percentage of municipal waste landfilled

Year	Percentage landfilled
2012-13	41%
2013-14	38%

Source: Waste managed (tonnes) by management method and year, StatsWales website²⁰

4.1.2 Biodegradable municipal waste

TZW identifies further reducing the landfill of biodegradable municipal waste as a key aim. The Landfill Allowances Scheme (Wales) Regulations 2004 require waste disposal authorities in Wales to limit the quantity of biodegradable municipal waste collected by local authorities that is deposited to landfill. Each disposal authority is required to limit their deposit to a specified amount every year.

Table 20 shows the allowances and performance against the allowances:

Table 20 – Landfill Allowance Scheme allowances and performance

Year	LAS Allowance (tonnes)	Disposal to landfill (tonnes)
2010-11	630,000	458,264
2011-12	550,000	389,738
2012-13	470,000	364,784
2013-14	450,000	345,022
2014-15	430,000	
2015-16	410,000	
2016-17	390,000	
2017-18	370,000	
2018-19	350,000	
2019-20	330,000	

Sources: Report on the Landfill Allowances Scheme (LAS) Wales 2013/14; Register of the Landfill Allowances Scheme (LAS) in Wales, 2004 onwards, Natural Resources Wales²¹

In all years from 2010-11 to 2013-14, the allowances were met on an all-Wales level. In 2010-11, 2011-12 and 2012-13, all 22 local authorities met their maximum allowances. In 2013-14, 18 of the 22 local authorities met their maximum allowances.

²¹ <http://naturalresources.wales/waste/landfill-allowance-scheme/?lang=en>

4.1.3 European Commission target for landfill of biodegradable municipal waste

This describes targets for reducing the quantity of biodegradable municipal waste going to landfill that is collected by local authorities and others. The Landfill (Maximum Landfill Amount) Regulations 2011 set targets for each UK nation to ensure that each nation contributes to the achievement of the Landfill Directive target for the UK.

- The maximum amount of biodegradable municipal waste by weight in tonnes that may be sent to landfill from Wales must be 919,000 in 2012-13 and 643,000 in 2019-20.

This includes household waste and waste similar to household waste collected from commerce such as shops and offices.

Table 21 shows the target for Wales and performance against these targets. It shows that the targets for 2012-13 and 2019-20 have already been met. This information is also shown in Indicator SE11 in Annex B of this report.

Table 21 - Landfill of biodegradable municipal waste

	Biodegradable municipal waste sent to landfill (tonnes)
2010	677,728
2011	608,912
2012	599,172
2013	576,961

Source: Natural Resources Wales

Note: data is reported by calendar year for these targets.

4.2 Industrial waste

The target in TZW is for no more than 10% of industrial waste to be landfilled by 2019-20. Table 22 shows progress against this:

Table 22 - Comparison of landfill rate of industrial waste generated in Wales in 2007 and 2012

Year	Estimated percentage of total waste landfilled
2007	29%
2012	27%

Source: Survey of Industrial and Commercial Waste Generated in Wales 2012, Natural Resources Wales

Table 22 shows that progress is being made towards this target. This rate is heavily influenced by the management of combustion wastes from the energy sector. By removing the data for the energy supply sector, the total landfill rate for the remaining industrial sectors was 7% in 2012 compared with 22% in 2007.

4.3 Commercial waste

The target in TZW is for no more than 10% of commercial waste to be landfilled by 2019-20. Table 23 shows progress against this:

Table 23 - Comparison of landfill rate of commercial waste generated in Wales in 2007 and 2012

Year	Estimated percentage of total waste landfilled
2007	51%
2012	26%

Source: Survey of Industrial and Commercial Waste Generated in Wales 2012, Natural Resources Wales

Table 23 shows that good progress is being made towards meeting this target. This rate is heavily influenced by the management of wastes from the wholesale and retail sector. By removing the data for this sector, the total landfill rate for the remaining commercial sectors was 36% in 2012 compared with 56% in 2007.

4.4 Construction and demolition waste

TZW sets targets to reduce the percentage of construction and demolition waste landfilled in Wales, as a percentage of the 2007 baseline, by 50% by 2015-16, and by 75% by 2019-20.

Table 24 shows performance against these targets:

Table 24 – Landfill of construction and demolition waste

Year	Waste sent to landfill (thousand tonnes)
2005	1,300
2012	639

Sources: Building the Future 2005-06 survey, Natural Resources Wales, reworked by Welsh Government; Survey of Construction and Demolition Waste Generated in Wales 2012, Natural Resources Wales

The Survey of Construction and Demolition Waste Generated in Wales 2012 published by Natural Resources Wales reports that the quantity of waste landfilled in 2012 was approximately 639 thousand tonnes. This represents a 49.8% reduction on the 1.3 million tonnes generated in 2005-06 according to the re-cast of the 2005-06 survey.

In making a comparison with 2005-06 it should be noted that the geographical data for 2012 is reported based on the location of the construction / demolition site as opposed to the location of the business office. The impact of this is unknown (i.e. it could reduce or increase the differences between the two figures).

The following factors may also partially account for the apparent reduction in landfill from 2005 to 2012:

- The recession after 2005 impacted significantly on the construction sector, reducing output and therefore waste generation and, potentially landfill, in 2012.

- There were no major infrastructure projects in Wales accounting for very large quantities of waste in 2012. This contrasts with 2005-06 when three of the five largest waste producers were involved in major projects in Wales.

Annex B: Key indicators

This section provides key indicators which illustrate progress against targets and priorities in TZW.

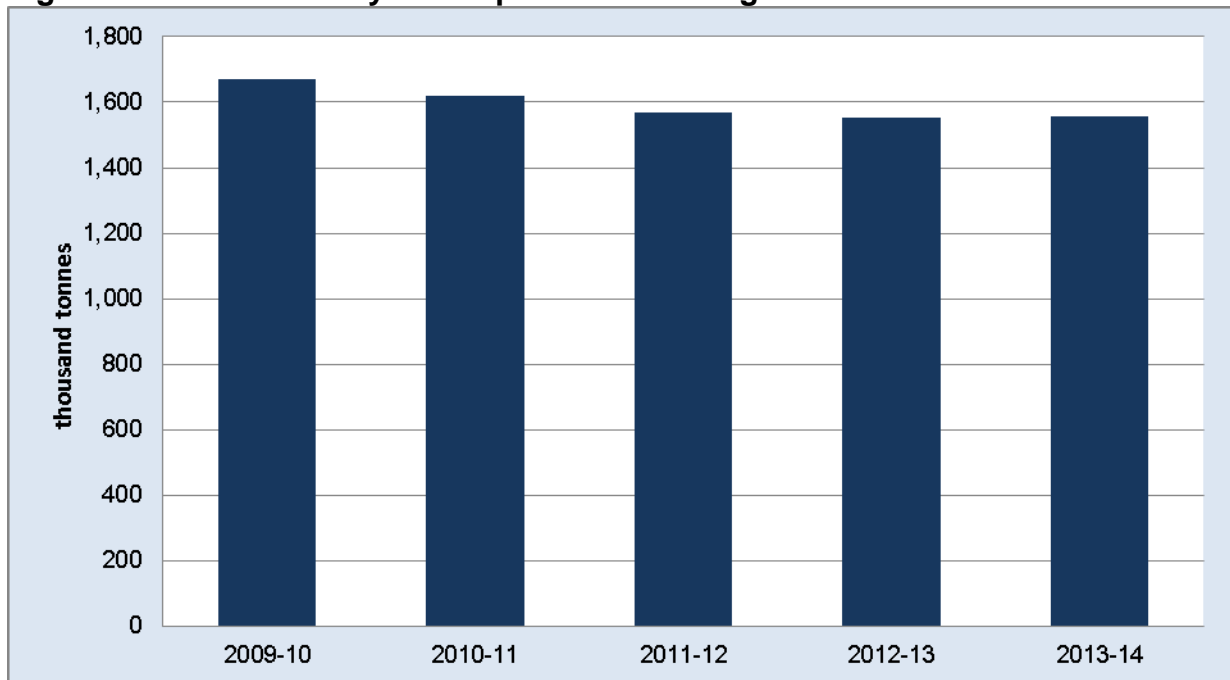
Indicator SE1: Total quantity of Local Authority Municipal Waste arising in Wales

This indicator does not relate to a specific target in TZW but illustrates progress towards the broad aim of reducing waste arisings.

Local Authority Municipal Waste is the waste collected by or on behalf of the local authorities. It includes the waste that householders produce, and also other wastes such as from organisations and businesses that use local authority waste services, waste from public parks and gardens, and from street cleaning operations.

Figure 3 shows the quantity of Local Authority Municipal Waste that was generated in Wales from 2009-10 to 2012-13.

Figure 3: Local Authority Municipal Waste arising in Wales 2009-10 to 2012-13



Source: WasteDataFlow

The total quantity of Local Authority Municipal Waste arising in Wales fell to 1,557 thousand tonnes in 2013-14, compared to 1,670 thousand tonnes in 2009-10. This equates to an average decrease of 28 thousand tonnes per year over the last four years.

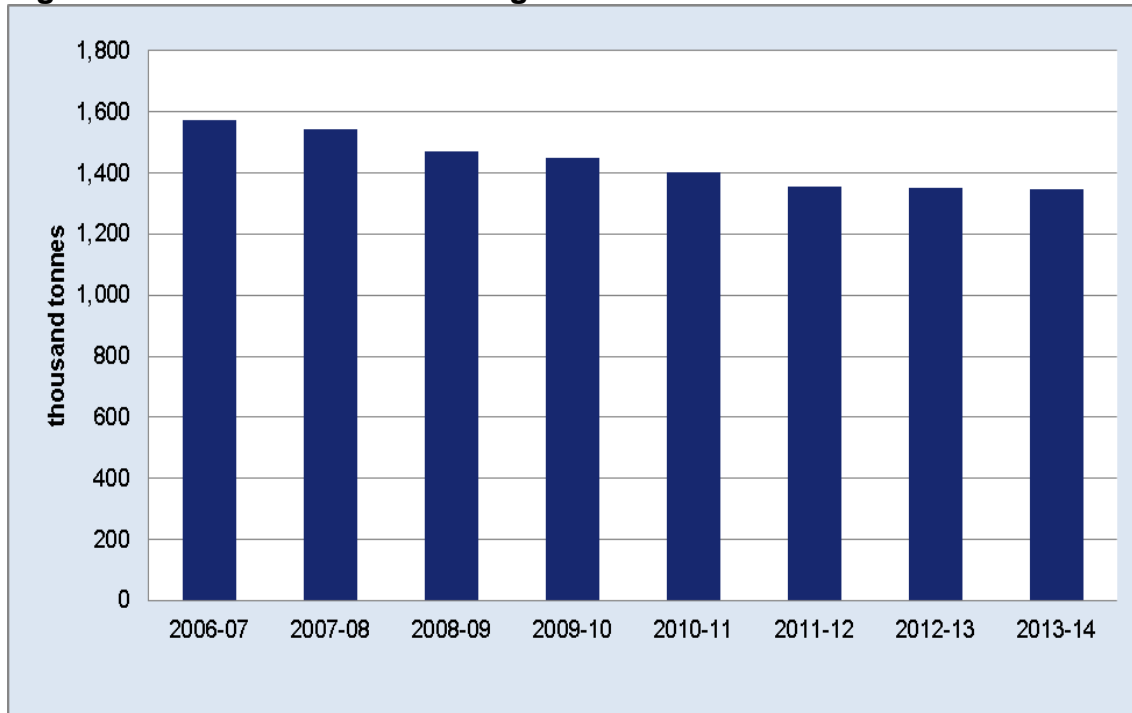
We would like to see this decrease in arisings continuing, as people's attitudes and behaviours to waste and consumption change.

Indicator SE2: Quantity of household waste arising in Wales

This indicator refers to the total household waste generated in Wales and relates to the target in TZW of reducing household waste by 1.2% per year based on the 2006/07 baseline. It is a better indicator for describing people's behaviour and their waste generation than local authority municipal waste because it focuses on waste generated by households, whilst local authority municipal waste includes waste from businesses.

The baseline year for this data is 2006-07.

Figure 4: Household waste arising in Wales 2006-07 to 2013-14



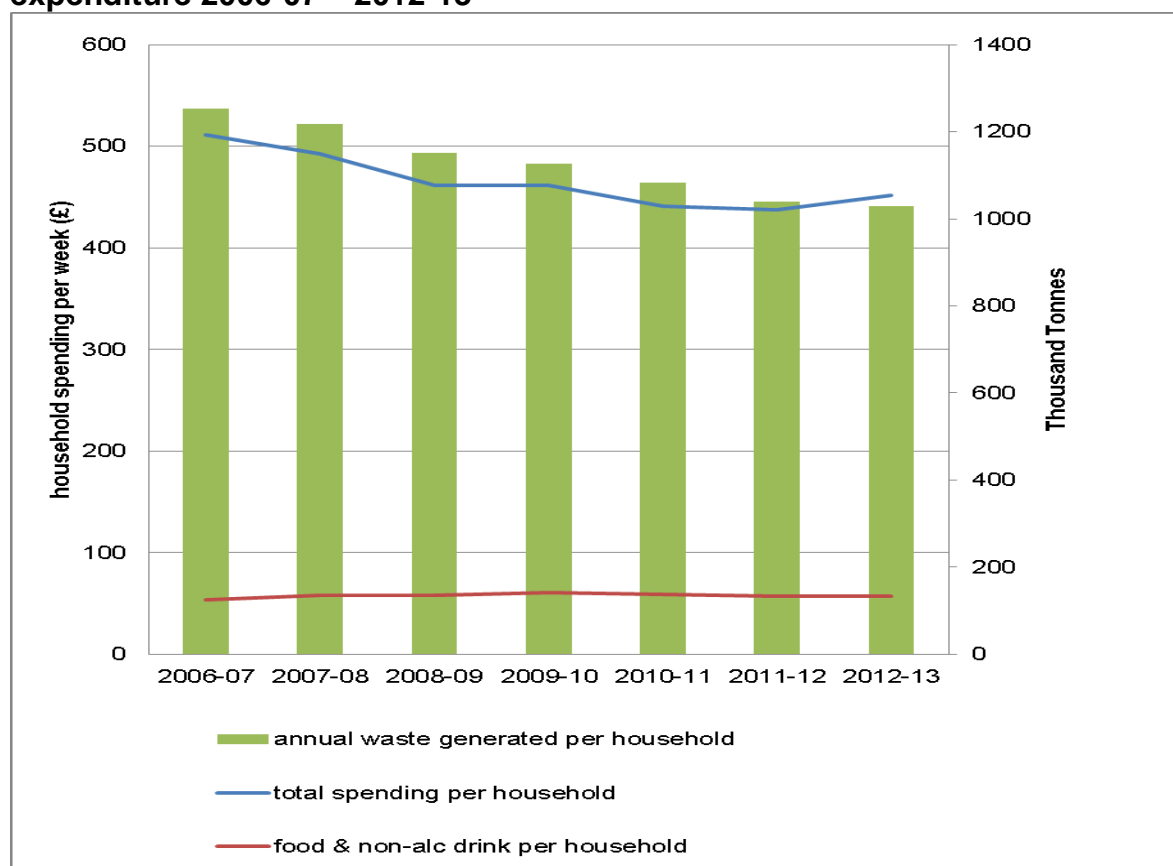
Source: WasteDataFlow

There has been a decrease in household waste from 1,572 thousand tonnes to 1,349 thousand tonnes over the last seven years, representing an average of 31,880 tonnes per year or 2% of the baseline. Therefore, performance is ahead of the TZW target for this period.

Indicator SE3: Quantity of household waste arising in Wales against average household expenditure

Figure 5 shows household waste generated in Wales plotted against expenditure per average household between 2006-07 and 2012-13. It shows that during this period, as average spending per household declined, the annual waste generated per household also declined.

Figure 5: Household waste generated in Wales against average household expenditure 2006-07 – 2012-13



Sources: mid-year population estimates for Wales, Office for National Statistics, WasteDataFlow, StatsWales.

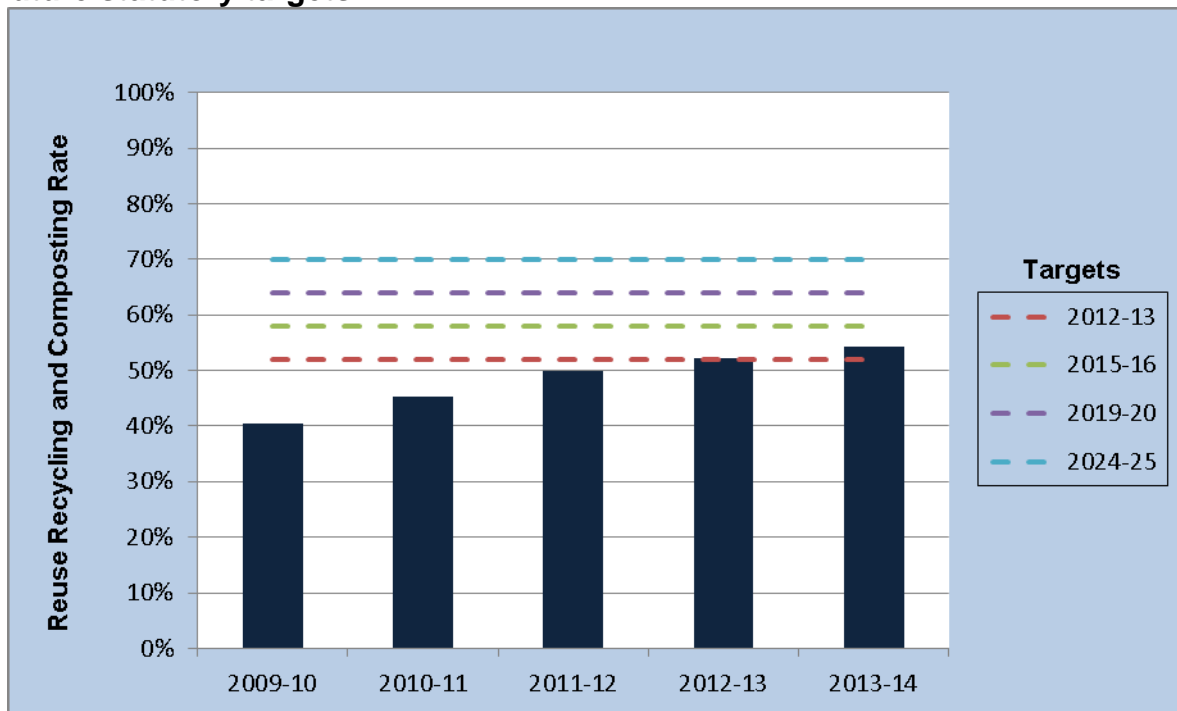
Notes:

- The number of households is derived from StatsWales “Households by type and year”, based on mid-year population estimates for Wales produced by the Office for National Statistics (ONS). The 2006 figure is used with the 2006-07 total household waste figure to produce the average per household, and so on through the series.
- Household spending figures are from the ONS “Family Spending” surveys, using sample sizes of between 720 and 1970 people, usually over three years. The data relates to the Living Costs and Food Survey, the Retail Price Index (RPI) weights being “primarily” based on this.
- Where a three year period is used, the middle year is plotted against the nearest reporting period for waste data
- Spending data has been adjusted to show 2013 values, using the Bank of England calculator, which uses a composite index based around the RPI.

Indicator SE4: Reuse, recycling and composting of Local Authority Municipal Waste in Wales

Increasing the reuse, recycling and composting of waste is a key aim of TZW. This indicator demonstrates the quantity of local authority municipal waste arising in Wales that was reused, recycled or composted (including waste managed by anaerobic digestion).

Figure 6: LAMW Reused, Recycled and Composted 2009-10 to 2013-14 and future statutory targets



Source: WasteDataFlow

Figure 6 illustrates progress against the target described in section 2.1.1 of Annex A, against the TZW targets for the reuse, recycling and composting (including anaerobic digestion) of local authority municipal waste as follows:

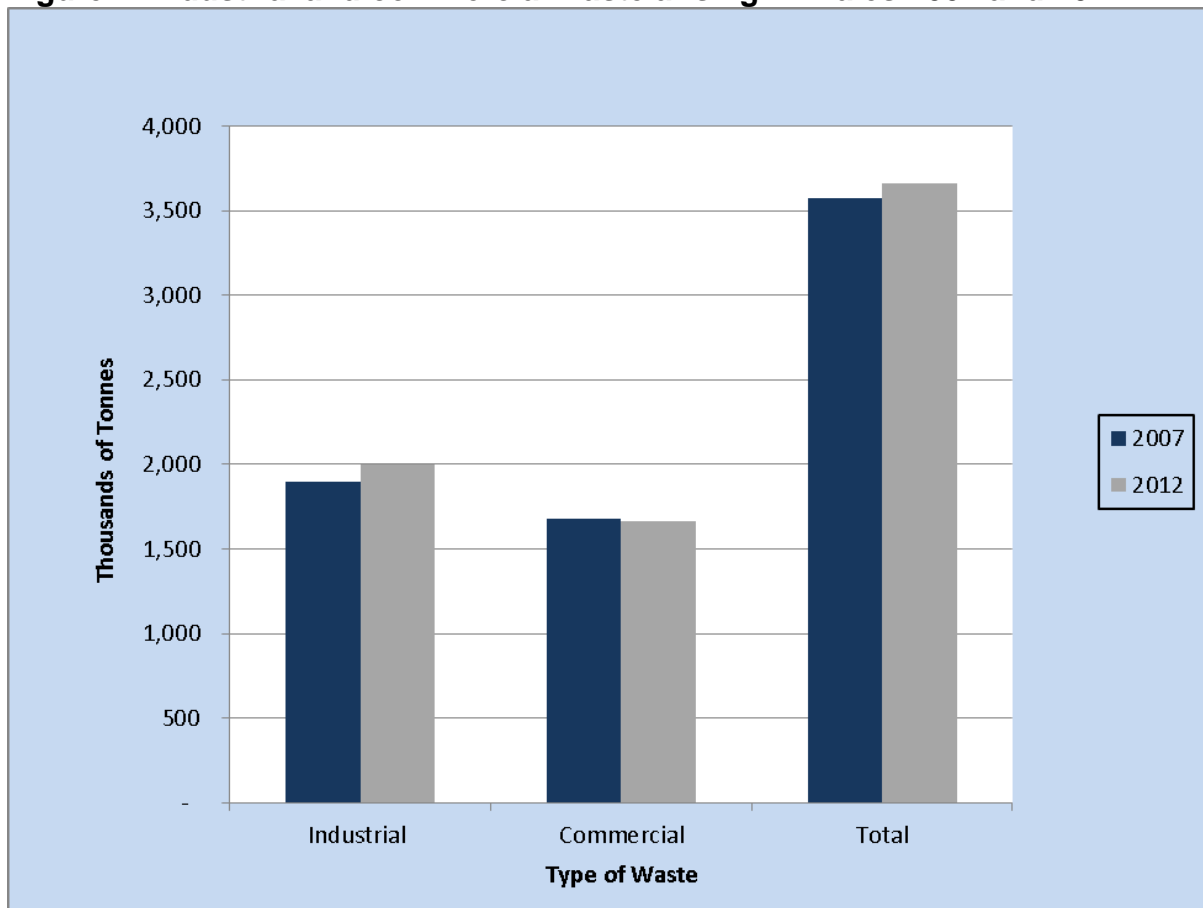
- 2009-10: 40%
- 2012-13 :52%
- 2015-16: 58%
- 2019-20: 64%
- 2024-25: 70%

The 2009-10 target was met, and there has been an increase of over 20 percentage points in the recycling rate over the last six years; in 2013-14, 54% of waste was reused, recycled or composted.

Indicator SE5: Quantity of industrial and commercial waste arising in Wales

This indicator refers to the total waste generated by businesses belonging to a range of industry sectors and illustrates progress made against the targets in TZW described in section 1.2 and 1.3 of Annex A. Industrial waste includes that from manufacturing and the supply of electricity, gas and water. Commercial waste comes from businesses in retail and wholesale, the service sectors, and the public sector. The baseline year for this data is 2005-06.

Figure 7: Industrial and commercial waste arising in Wales 2007 and 2012



Source: Survey of Industrial and Commercial Waste in Wales 2012, Natural Resources Wales (2014)

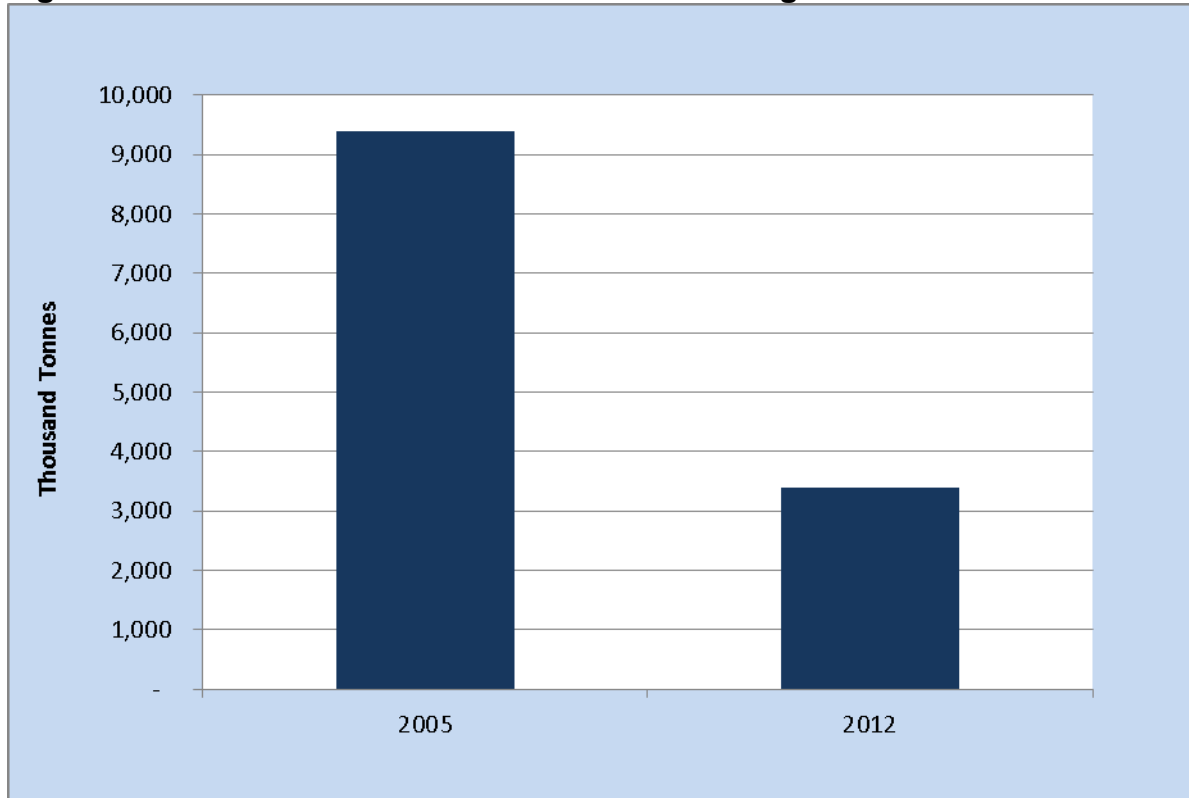
2 million tonnes of industrial waste and 1.7 million tonnes of commercial waste were generated during 2012.

- The target for industrial waste is a reduction of 1.4% every year to 2050 based on 2007 baseline. No progress has been made against this target to date. Industrial Waste has increased from 1.9 million tonnes in 2007 to 2 million tonnes in 2012, an increase of 5.5%.
- The target for commercial waste is a reduction of 1.2% every year to 2050 based on 2007 baseline. No progress has been made towards this target.
- Commercial Waste has remained at approximately 1.7 million tonnes in both 2007 and 2012.

Indicator SE6: Quantity of construction and demolition waste arising in Wales

This indicator describes the total quantity of construction and demolition waste generated in Wales by material type. It relates to the aim in the Waste Prevention Plan of reducing construction and demolition waste treated off site by 1.4% per year on a 2006-07 baseline.

Figure 8: Construction and demolition waste arising in Wales in 2005 and 2012



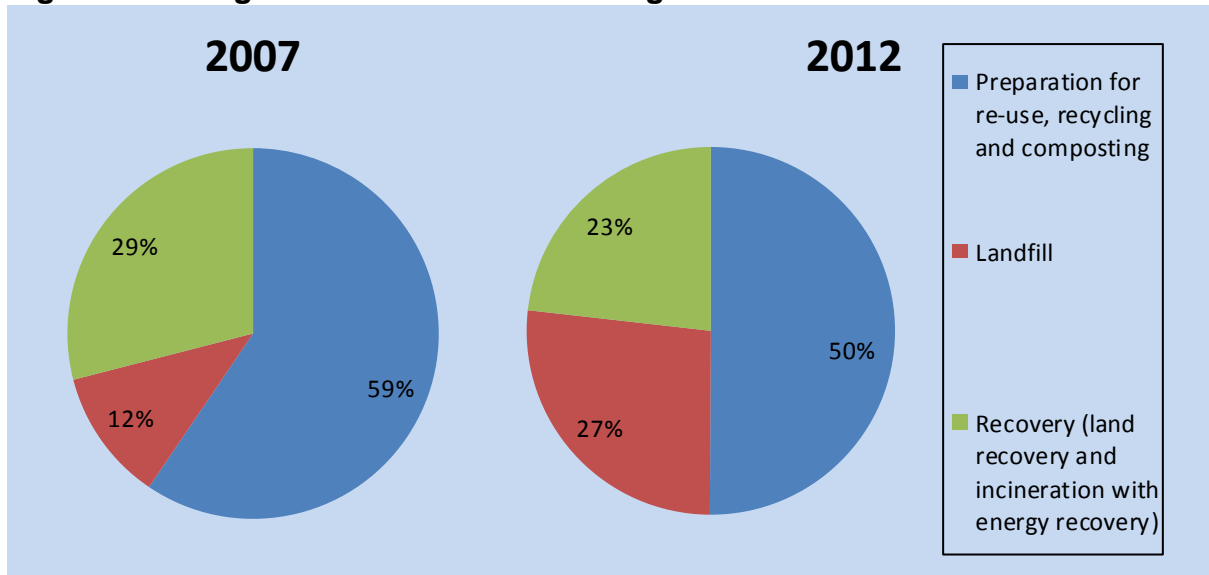
Source: Survey of Construction and Demolition Waste Generated in Wales 2012, Natural Resources Wales (2014)

The target is a reduction of 1.4% every year to 2050 based on a 2006 baseline. The 3.4 million tonnes generated in 2012 represent a reduction of 9.2% per year on the 9.4 million tonnes generated in 2005.

Indicator SE7: Management of industrial waste generated in Wales

This indicator shows the different ways that industrial waste generated in Wales is managed.

Figure 9: Management of industrial waste generated in Wales in 2007 and 2012



Source: Survey of Industrial and Commercial Waste Generated in Wales 2012, Natural Resources Wales

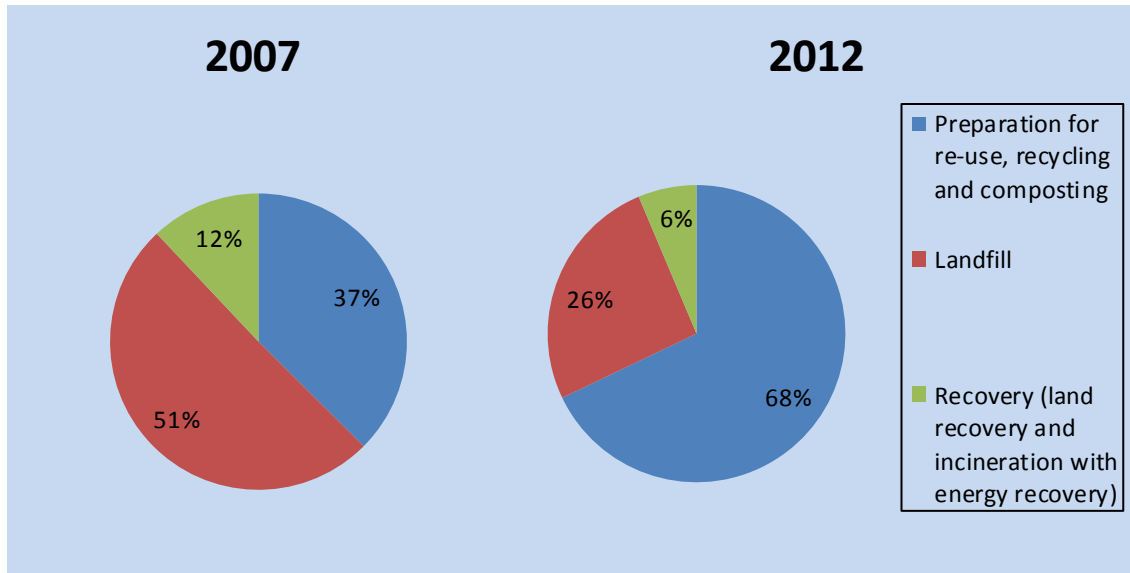
TZW sets a non-statutory target to increase the level of reuse, recycling and composting to a minimum of 57% by 2015-16, to 67% by 2019-20, and to 70% by 2024-25.

The data shows that 50% of industrial waste was reused, recycled or composted in 2012 compared to 59% in 2007.

Indicator SE8: Management of commercial waste generated in Wales

This indicator shows the different ways that commercial waste generated in Wales is managed. The baseline year for this data is 2007.

Figure 10: Management of commercial waste generated in Wales in 2007 and 2012



Source: Natural Resources Wales

*'Other' includes incineration without energy recovery, treatment, transfer, don't know and other.

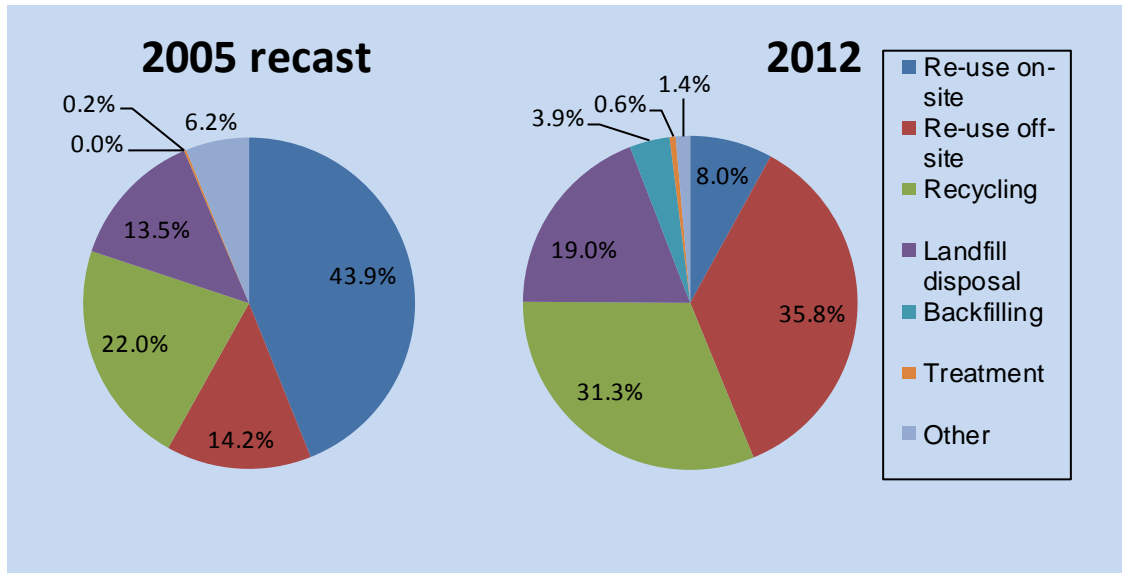
The Welsh Government has set a non-statutory target to increase the level of reuse, recycling and composting to a minimum of 63% by 2015-16, to 67% by 2019-20 and to 70% by 2024-25.

The data shows that 68% of the commercial waste generated in Wales in 2012 was reused, recycled or composted compared to 37% in 2007.

Indicator SE9: Management of all construction and demolition waste generated in Wales

This indicator shows the different ways that construction and demolition waste generated in Wales is managed.

Figure 11: Management of all construction and demolition waste generated in Wales in 2005 and 2012



Source: Survey of Construction & Demolition Waste Generated in Wales 2012, Natural Resources Wales (2014)

*Other includes composting, land recovery, incineration, transfer station and don't know.

This dataset suggests that in 2012, 8% (268 thousand tonnes) of construction and demolition waste was reused on the site of production, with 36% (1.2 million tonnes) prepared for reuse off site and 31% (1.1 million tonnes) recycled. 75% (approximately 2.6 million tonnes) of all waste was recycled or reused.

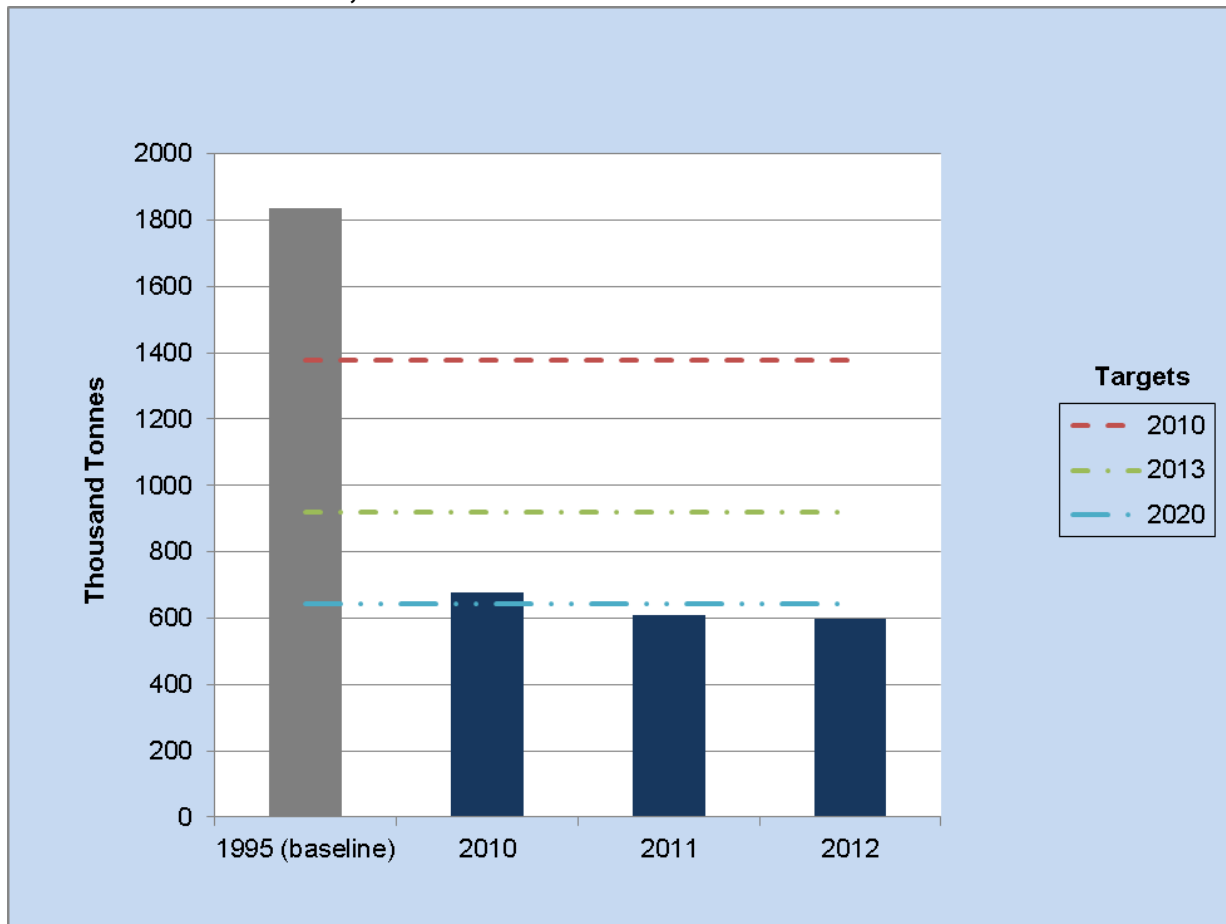
There is a target to reduce the landfill of construction and demolition waste by 50% of that landfilled in the baseline year by 2015-16, and by 75% by 2019-20.

The quantity of construction and demolition waste landfilled in 2012 was approximately 639 thousand tonnes. This represents a 49.8% reduction on the 1.3 million tonnes landfilled in 2005-06 according to the re-cast of the 2005-06 survey. In making this comparison, the caveats described in section 4.4 of Annex A should be noted.

Indicator SE10: Landfill of Biodegradable Municipal Waste collected by local authorities and others

Further reducing the landfilling of biodegradable waste is a key aim of TZW and the sector plans. Figure 12 shows the quantity landfilled in Wales in 2010-12 and 1995 and relates to the European Commission target outlined in section 4.1.3 of Annex A.

Figure 12: Landfill of Biodegradable Municipal Waste collected by Local Authorities and others, 1995 baseline and 2010-2012



Source: Waste Data Interrogator, Defra Statistics

This methodology includes biodegradable municipal waste collected by both local authorities and others.

The Landfill (Maximum Landfill Amount) Regulations 2011 target for biodegradable municipal waste from Wales that is landfilled is 1,378,000 tonnes in 2010 (75% of the 1995 baseline), 919,000 tonnes in 2013 (50% of the 1995 baseline) and 643,000 tonnes in 2020 (35% of the 1995 baseline).

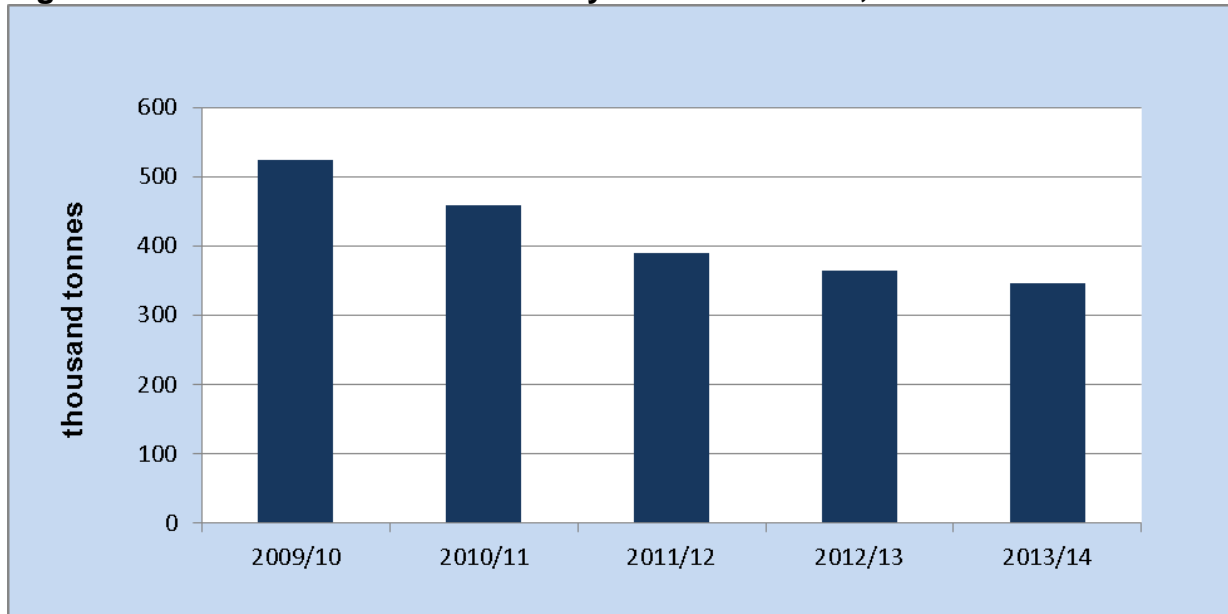
Figure 12 shows that biodegradable municipal waste to landfill has fallen considerably since 1995 and that all these targets have already been met.

Note: This data is reported in calendar years.

Indicator SE11: Landfill of Biodegradable Municipal Waste collected by local authorities

This indicator show the landfill of BMW collected by local authorities between 2010-11 and 2013-14 and relates to the TZW target outlined in section 4.1.2 of Annex A.

Figure 13: Landfill of BMW collected by local authorities, 2009-10 to 2013-14



Source: Register of Landfill Allowance Scheme (LAS) in Wales, Natural Resources Wales

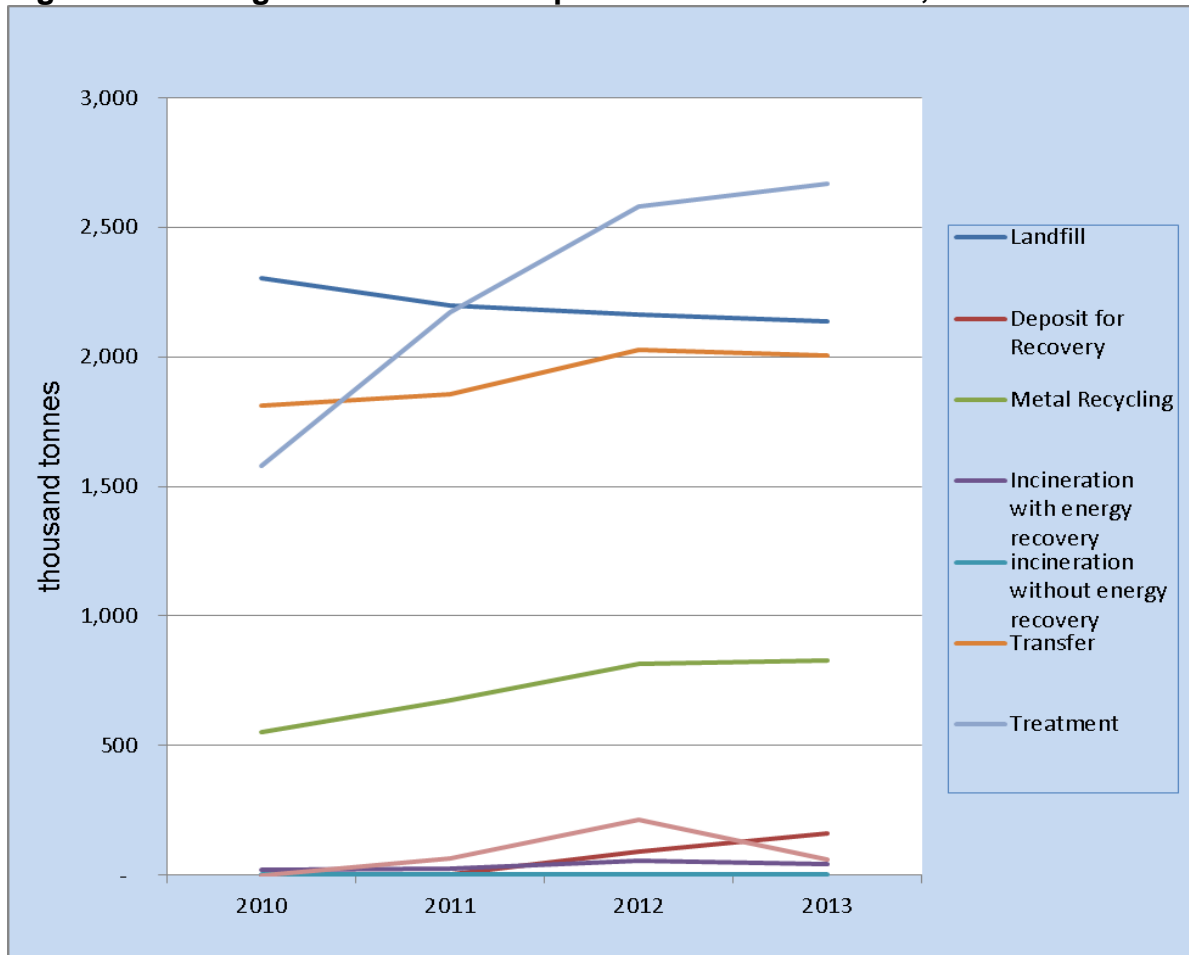
The Landfill Allowance Scheme (Wales) Regulations (2004) set maximum allowances for landfill of biodegradable municipal waste in Wales of 630,000 tonnes in 2010-11, 550,000 tonnes in 2011-12, 470,000 tonnes in 2012-13 and 450,000 tonnes in 2013-14.

Figure 13 shows that these targets have been met in each year since 2010-11.

Indicator SE12: Landfill of waste at registered sites in Wales

This indicator shows how waste is managed at permitted sites in Wales. It gives a good overview as permitted sites manage around two thirds of all waste arisings in Wales.

Figure 14: Management of Waste at permitted sites in Wales, 2010-13



Source: Wales Waste Data Information 2013, Natural Resources Wales

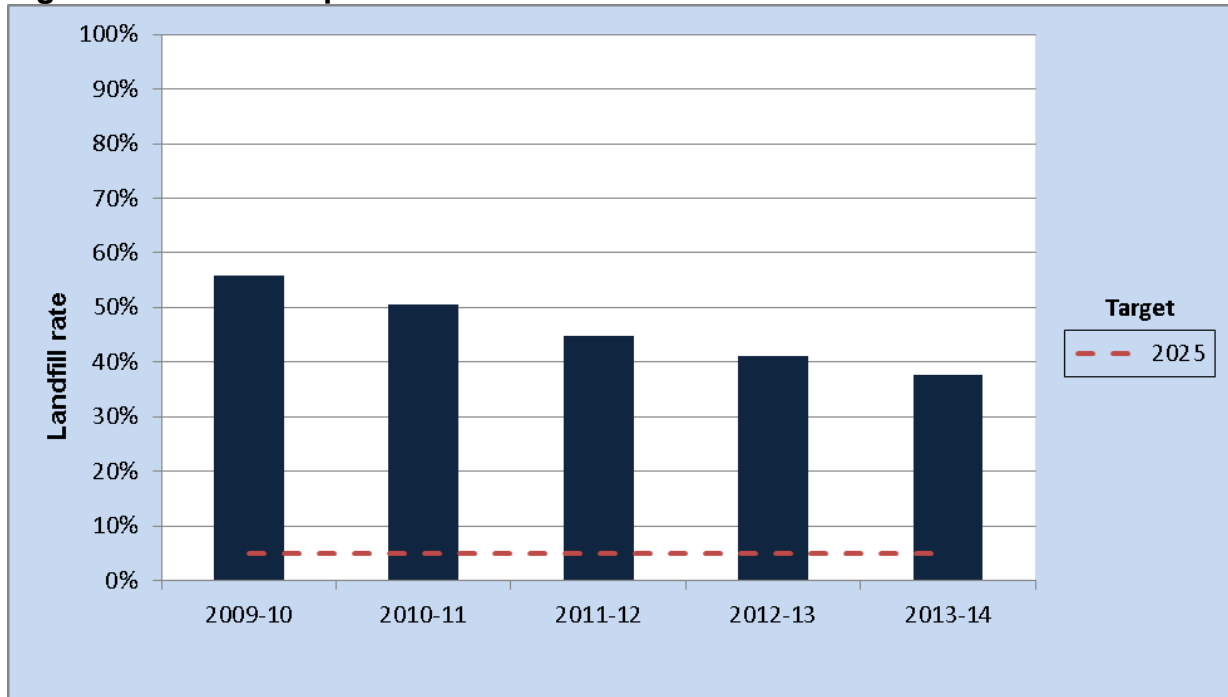
Figure 14 shows that the vast majority of waste managed by permitted sites was being managed in ways other than landfill. The overall amount of waste produced in Wales that is sent to landfill at permitted sites continues to decrease, and was 2.1 million tonnes in 2013, representing 27% of waste managed by permitted sites, compared to 2.3 million tonnes in 2010 (37%).²²

²² Wales Waste Information 2013, (Table 2), Natural Resources Wales

Indicator SE13: Landfill of local authority Municipal Waste in Wales

This indicator demonstrates the quantity of local authority municipal waste arising in Wales that was managed by disposal to landfill. It illustrates progress against the TZW target outlined in section 4.1.1 of Annex A.

Figure 15: LAMW disposed of to landfill 2009-10 to 2013-14



Source: WasteDataFlow

There is a non-statutory target in TZW to reduce the landfill of local authority municipal waste to a maximum of 5% by 2024-25.

There has been a reduction of nearly 18 percentage points in the landfill of waste in the four years between 2009-10 and 2013-14. 2011-12 was the first year that less than half of the local authority municipal waste generated in Wales was landfilled.

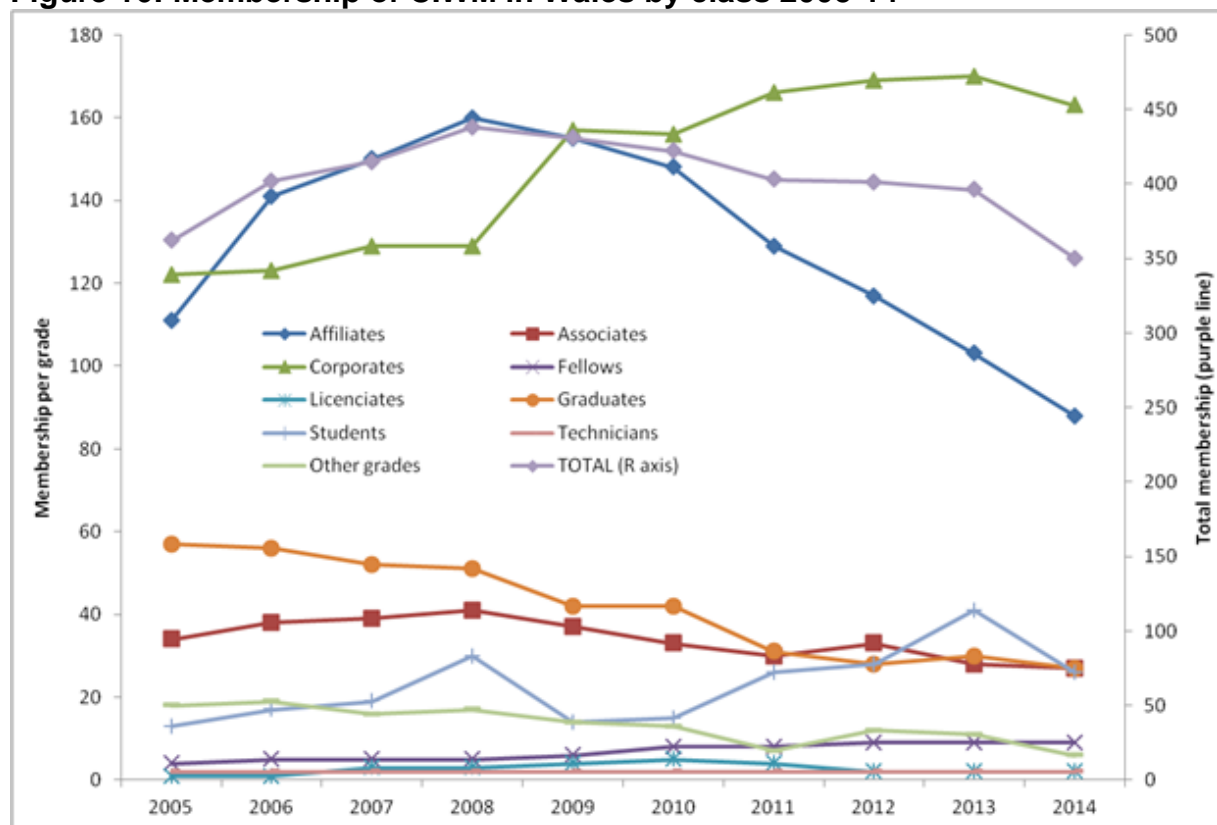
In the future, a continued increase in the reuse, recycling and composting rate will ensure that the amount of residual waste that needs to be disposed of is reduced over time. There will also be alternative facilities available to recover energy from residual waste, thereby reducing the use of landfill further.

Indicator PS1: Membership of the Chartered Institution of Wastes Management (CIWM) in Wales

This indicator relates to the aims relating to skills and training under a Prosperous Society in TZW, described in section 4.2 of this report. CIWM is the professional body which represents waste and resource professionals working in the sustainable waste and resource management sectors worldwide. CIWM sets the professional standards for individuals working in the industry and has various grades of membership determined by education, qualification and experience.

Membership of the institution is a sign of the degree of professionalism within the waste industry, and commitment to continuous professional development.

Figure 16: Membership of CIWM in Wales by class 2005-14



Source data: CIWM Cymru

Figures for total membership are shown on the right axis of Figure 16, whilst all other figures use the left axis.

Corporate (or full) membership is a professional grade available to people with a minimum of 4 years experience and a degree/post-graduate qualification/full membership of another professional institution and who pass a professional interview. It is the grade that all CIWM members should be working towards.

Affiliate membership is not a professional grade of membership, meaning anyone with an interest in waste management can join at this grade, with or without experience and qualifications.

The other membership grades differ from one another by experience and formal qualifications. They are for those who are not ready for corporate membership due to insufficient experience and/or the required qualifications.

The total number of individual members grew steadily between 2005 and 2008. In 2008, the general economic situation had a clear impact on the membership which started to slowly decrease for the first time before reaching a plateau at around 400 members. Recent budget cuts across the industry, specifically in local authorities, where CIWM has a high number of members, are now also impacting on the total membership. The current total number of members in Wales is 350.

Affiliate membership peaked in 2007-08 and then decreased; the economic downturn is partly responsible for the sudden drop in affiliate membership. It is also the result of a number of affiliates upgrading to a professional class and a significant number of them moving to different industries.

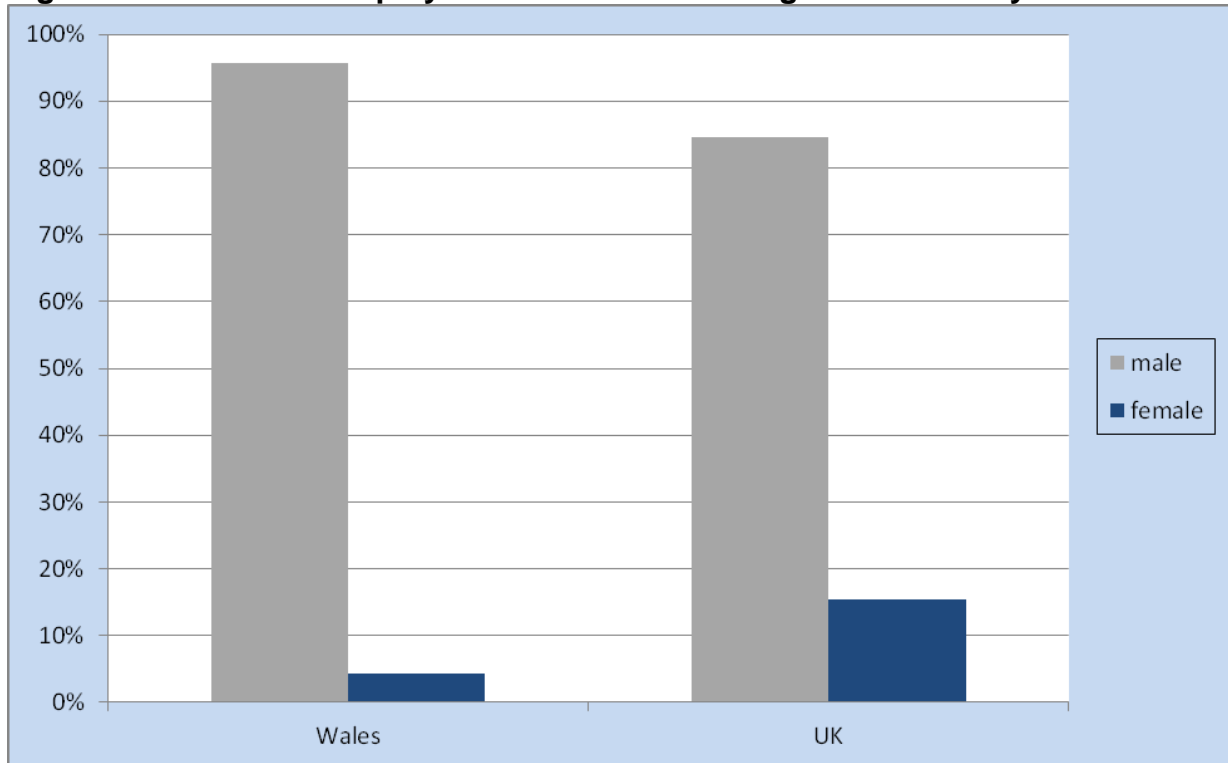
Corporate membership has shown a trend of increasing steadily over the years even through the financial crisis – the proof of the importance and need for high standard professionals especially in difficult times. Numbers in this class have risen by 41 over the last 10 years to its current level of 163 members. To allow a continuing growth of corporate membership, the lower grades need constant fresh recruits so the CIWM works with universities to introduce students and graduates, tomorrow's Chartered Waste Managers, to the institution.

The Welsh Government is supporting CIWM Cymru to further increase the number of corporate members, as well as introducing new members to the institution.

Indicator FJ1: Gender of employees in waste management industry

This data shows the gender split in employees within private businesses in the waste management industry in Wales in relation to the aims under access to jobs in TZW described in section 4.3.3.

Figure 17: Gender of employees in the waste management industry in 2013



Source data: Energy and Utility Ltd / Labour Force Survey, four quarter average (Jan-Dec 2013)

95.7% of employees in the waste sector in Wales were male, compared to 84.6% in the UK as a whole.

The Welsh Government would like to see the industry attracting and retaining more female employees.

Indicator FJ2: Public use of recycling services

This data shows the percentage of people correctly and incorrectly using kerbside recycling and residual waste services in Wales. It relates to the aims regarding access to knowledge and understanding of waste services in TZW described in section 4.3.3 of this report.

Figure 18: Public's use of kerbside recycling and residual waste services in 2014

	No of house holds in the total sample	% recycling correctly by any means	% contaminating (i.e. putting item in kerbside when not collected)	% who use the residual bin who should use their kerbside collection	% who use the residual bin who do not have a kerbside collection	% doing something else	TOTAL
Paper	918	95%	0%	3%	0%	3%	101%
Card	609	96%	0%	2%	0%	1%	99%
Glass	764	96%	0%	4%	0%	1%	101%
Cans/tins	940	96%	0%	3%	0%	1%	100%
Aerosol	857	74%	2%	23%	1%	1%	101%
Plastic bottles	841	97%	0%	3%	0%	0%	100%
Pots, tubs and trays	785	75%	12%	5%	7%	1%	100%
Carrier bags	787	39%	16%	5%	22%	18%	100%
Cartons /tetra pak	792	31%	42%	4%	22%	1%	100%
Foil	843	47%	15%	19%	17%	2%	100%
Batteries	924	62%	9%	3%	20%	6%	100%
Food waste	577	86%	0%	11%	0%	2%	99%
Garden waste	917	96%	0%	3%	0%	1%	100%

Source: WRAP: 3Rs Survey, Feb 2014

*excluding people in partial collection areas, living in flats and those who don't create the waste as these could not be matched against scheme type

Figure 18 shows that the items most commonly put in kerbside collection when that item is not collected are cartons / tetra paks (42%), carrier bags (16%) and foil (15%). The items most commonly placed in residual waste which could have been included in kerbside collections are aerosols (23%), foil (19%) and food waste (11%).

Abbreviations

AD	Anaerobic Digestion
BMW	Biodegradable Municipal Waste
CIM	Collections Infrastructure and Markets Sector Plan
CIWM	Chartered Institute of Waste Management
CLP	EU Regulation on Classification, Labelling and Packaging of Substances and Mixtures (European Regulation (EC) No 1272/2008)
C&D	Construction and Demolition
CO ₂ (e)	Carbon Dioxide equivalent
EAP	Environment Action Programme
EC	European Commission
EfW	Energy from Waste
EU	European Union
EWC	European Waste Catalogue
GHG	Greenhouse Gas
GVA	Gross Value Added
GoWA	Government of Wales Act
I&C	Industrial and Commercial
IED	Industrial Emissions (Integrated Pollution Prevention and Control) (Recast) Directive 2010/75/EU
MSP	Municipal Sector Plan
MW	Megawatts
MWI	Municipal Waste Incinerators
ONS	Office for National Statistics
PfG	Programme for Government
PHE	Public Health England
PPWD	Packaging and Packaging Waste Directive
RPI	Retail Price Index
TAN	Technical Advice Note
TZW	Towards Zero Waste
WEEE	Waste Electrical & Electronic Equipment
WFD	Waste Framework Directive
WPA	Waste Planning Assessment
WPP	Waste Prevention Programme
WRAP	Waste Resources Action Programme

Glossary

Anaerobic digestion: a biological process where biodegradable wastes, such as kitchen or food waste, are encouraged to break down in the absence of oxygen in an enclosed vessel. It produces carbon dioxide, methane (which can be used as a fuel to generate renewable energy) and solids/liquors known as digestate which can be used as fertiliser.

Biodiversity: the variability among living organisms from all sources including terrestrial, marine and other aquatic ecosystems, and the ecological complexes of which they are part; this includes diversity within species, between species, and of ecosystems.

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.

Biowaste: this includes biodegradable garden and park waste, food and kitchen waste from households, restaurants, caterers and retail premises, and comparable waste from food processing plants.

Circular economy: this concept reflects the need to make more efficient use of finite resources and keep products and resources in use for as long as possible through recovery, reuse and repair, remanufacturing and recycling.

Civic amenity site: site provided by the Local authority for the disposal and recycling of household waste including bulky items such as beds, cookers and garden waste as well as recyclables, free of charge.

Closed loop recycling: recycling where recycled materials are being used for the same or similar purpose, for example a glass bottle recycled into new glass product rather than downgraded, for example being used as an aggregate.

Commercial and industrial waste: commercial waste is waste arising from any premises which are used wholly or mainly for trade, business, sport recreation or entertainment, excluding household and industrial waste. Industrial waste is waste from any factory and from any premises occupied by an industry (excluding mines and quarries).

Composting: an aerobic, biological process in which 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: consists of all waste originating from construction, renovation and demolition activities, such as rubble, bricks and tiles.

Digestate: this is the fraction remaining after the treatment of segregated organic wastes through anaerobic digestion. It is a mainly liquid material, with an average solid content of between 5-20%. Digestate produced in accordance with the standard BSI PAS110 and the developing Environment Agency Quality Protocol for Anaerobic

Digestate can be used for appropriate agricultural and horticultural applications as a product, and is no longer considered to be a waste material.

Direct greenhouse gas mitigation: this term refers to actions taken to directly mitigate releases of substances with climate change potential, for example the capture and use of landfill gas at source to generate electricity.

Eco design: 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.

ELV: this stands for 'End of Life Vehicle', and refers to vehicles that are waste within the meaning of the Waste Framework Directive.

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.

Fly-tipping: this is the practice of illegally disposing of waste material on land.

Global hectares: one global hectare is equal to one hectare of biologically productive space with world average productivity. Global hectares are the unit of measurement for ecological footprinting.

Greenhouse gas emissions: emissions that contribute to climate change via the 'greenhouse' effect when their atmospheric concentrations exceed certain levels. They include emissions of Carbon dioxide, Methane, Nitrous oxide, Hydrofluorocarbons, Perfluorocarbons and Sulphur Hexafluoride.

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.

Household waste: includes waste from household collection rounds (waste within Schedule 1 of the Controlled Waste Regulations 1992), waste from services such as street sweeping, bulky waste collection, hazardous household waste collection, litter collections, household clinical waste collection and separate garden waste collection

(waste within Schedule 2 of the Controlled Waste Regulations 1992), waste from civic amenity sites and wastes separately collected for recycling or composting through bring/drop off schemes, kerbside schemes and at civic amenity sites.

Household Waste Recycling Centre (HWRC): site provided by the Local authority for the recycling of household waste including bulky items such as beds, cookers and garden waste as well as other recyclables, free of charge.

Intergovernmental Panel on Climate Change: established to provide the decision-makers and others interested in climate change with an objective source of information about climate change.

Integrated Product Policy: all products cause environmental degradation in some way, whether from their manufacturing, use or disposal. Integrated product policy, currently under discussion in EU, seeks to minimise these by looking at all phases of a product's life-cycle and taking action where it is most effective.

Kitchen waste: this term refers to the organic component of household waste e.g. vegetable peelings, tea bags, banana skins; often also referred to as "food waste".

Landfill sites: any areas of land in which waste is deposited. Landfill sites are often located in disused mines or quarries. In areas where they are limited or no ready-made voids exist, the practice of land raising is sometimes carried out, where waste is deposited above ground and the landscape is contoured.

Legacy wastes: legacy wastes, which are often hazardous – for example asbestos, are materials that it is not currently feasible to recover or recycle and therefore cannot be returned into the chain of utility. The only option is disposal, and this is likely to continue to be the case in the future if that material continues to be used in the present way. In order for waste not to become legacy waste the original product needs to be redesigned so that it can be recovered and reused. In the meantime, new treatment methodologies need to be developed wherever possible to avoid these materials being sent for disposal.

Material Recovery Facility (MRF): a specialized plant that receives, separates and prepares recyclable materials for marketing to end-user manufacturers

Municipal waste: for the purpose of this sector plan, municipal waste means 'municipal waste as collected by local authorities'. It includes household waste and any other wastes collected by a Waste Collection Authority (WCA), or its agents, such as municipal parks and gardens waste, beach cleansing waste, commercial or industrial waste and waste resulting from the clearance of fly-tipped materials. WCA - A Local authority charged with the collection of waste from each household in its area on a regular basis. They can also collect, if requested, commercial and industrial wastes from the private sector.

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.

Open loop recycling: where the recycled material is used to replace a different raw material, e.g. glass is recycled into aggregate which replaces virgin aggregate.

Packaging Waste: this refers to any packaging or packaging material that is waste within the meaning of the Packaging and Packaging Waste Directive.

Preparing for reuse: means checking, cleaning or repairing recovery operations, by which products or components of products that have become waste are prepared so that they can be reused without any other pre-processing.

Producer responsibility: a 'producer responsibility' approach is intended to require producers who put goods or materials onto the market to be more responsible for these products or materials when they become waste. In some cases, producers will also be asked to reduce the level of hazardous substances in their products and to increase the use of recycled materials and design products for recyclability.

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.

Regional Waste Plans: three Regional Waste Groups (RWGs) for North, South West and South East Wales were established following the publication of Technical Advice Note '(TAN)21: Planning and Waste' in November 2001, with the remit of preparing Regional Waste Plans within two years to help implement the first Wales Waste Strategy 'Wise About Waste' and meet the obligations of the EU Waste Directives.

The first set of Plans for each of the 3 regions were completed and agreed by the Welsh Government and endorsed by individual authorities in April 2004. These identified the most Sustainable Waste Management Option for the management of all wastes in each Region and then identified the type and capacity of waste facilities needed to deliver the preferred option. The Plans were complemented by a Hazardous Waste Supplement produced subsequently for each Region. The First Review of the Regional Waste Plans was subsequently published during 2008 (SE and SW Wales) and 2009 (North Wales).

Reprocessor: a person who carries out one or more activities of recovery or recycling.

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 use.

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 requirement for a SWMP is mandatory in England since April 2008. The Welsh Government is currently developing Wales' 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 economy: it includes voluntary organisations, community groups, self-help groups, community co-operatives and enterprises, religious organisations and other not for profit distribution organisations of benefit to the communities and the people of Wales. Also known as the "Third Sector".

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.

TAN21(Technical Advice Note 21 (2001) 'Planning and waste'): this is a Welsh Government guidance note providing advice about how the land use planning system should contribute to sustainable waste resource management.

The proximity principle: the Waste Framework Directive (Article 16) establishes the principle of 'proximity' within the context of the requirement for member states to establish an integrated and adequate network of waste disposal installations and of installations for the recovery of mixed municipal waste collected from private households, including where such collection also covers such waste from other producers, taking into account best available techniques. The Directive requires that the network shall enable waste to be disposed of, or the wastes referred to in the preceding paragraph to be recovered, in one of the nearest appropriate installations, by means of the most appropriate methods and technologies, in order to ensure a high level of protection for the environment and public health. The proximity principle also links to the Directive's requirement that the network shall be designed to enable Member States to move towards the aim of self-sufficiency in waste disposal as well

as in the recovery of waste referred to above, taking into account geographical circumstances or the need for specialised installations for certain types of waste. The Directive also makes it clear that each Member State does not have to possess the full range of final recovery facilities within that Member State. This principle must be applied in Wales when decisions are taken on the siting of appropriate waste facilities.

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).