

Waste and resource efficiency

Waste is produced as a result of economic activity but progress is being made to reduce waste and increase recycling in Scotland to deliver environmental and economic benefits.



Summary

In Scotland we consume large amounts of materials and generate waste. Overall levels of waste are reducing and we are recycling more. However, we are still heavily dependent on landfill sites for disposing of waste, which causes environmental harm and carries a cost to our economy. Scotland's Zero Waste Plan aims to ensure we use materials as efficiently as possible and maximise their value through high-quality recycling and re-use.

Introduction

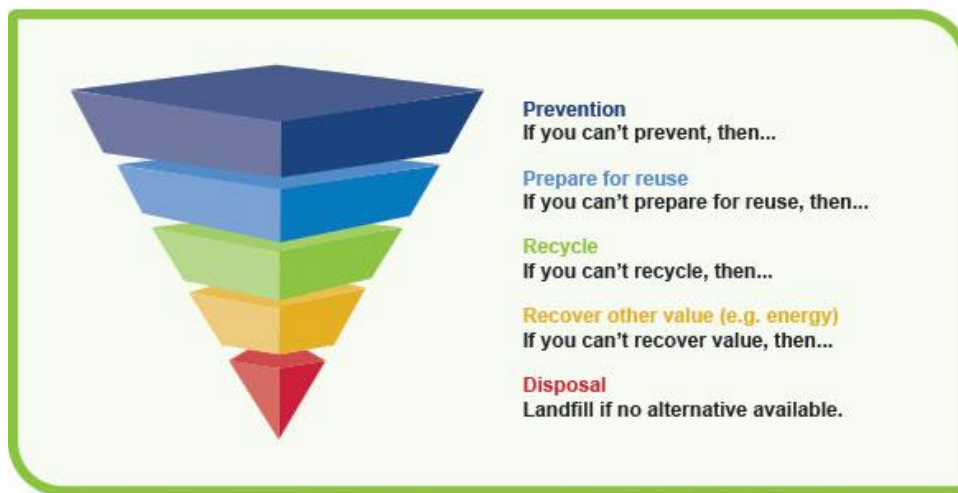
Like most developed economies, Scotland produces waste as a consequence of economic activity.

This is because our economic model follows a largely linear pattern where materials are extracted and turned into products, which are consumed and then disposed of at the end of their life.

It is at the point of disposal that materials become waste. Every year, Scotland generates [millions of tonnes of waste](#) from commercial, industrial and household sources.

We want to reduce the overall amount of waste and ensure that what is produced is managed in accordance with the waste hierarchy, which prioritises the best environmental outcomes.

Figure 1: The Waste Hierarchy. A five step guide to sustainable resource management



Disposal is the least preferred option because all the embedded energy and value of materials is lost, and also because landfill is associated with pollution problems including leachate run-off and odour as well as with major emissions of methane which is one of the most potent greenhouse gases.

Scotland has made progress on moving materials up the waste hierarchy, mainly through encouraging recycling. In 2011, 1.1 million tonnes of Scottish household waste was recycled, compared to less than 0.2 million tonnes in 2001. However, we are still heavily reliant on landfill for waste disposal (1.5 million tonnes of household waste, 4.7 million tonnes of all waste in 2011).

Many of the materials we still dispose in landfill sites are in fact resources which could have a value to the economy. Increasing recycling and reducing waste will reduce greenhouse gas emissions and help mitigate concerns regarding the future supply of finite resources.

[Scotland's Zero Waste Plan](#) (2010) sets ambitious recycling and landfill reduction targets. New [waste regulations](#) have been introduced to help deliver these targets. Action is also being taken to encourage the efficient use of resources.

In the longer term, the aim is to eliminate waste production through better design of products and services. This idea of a 'circular economy' is becoming more prominent with businesses, Governments and economic leaders.

Description of waste types



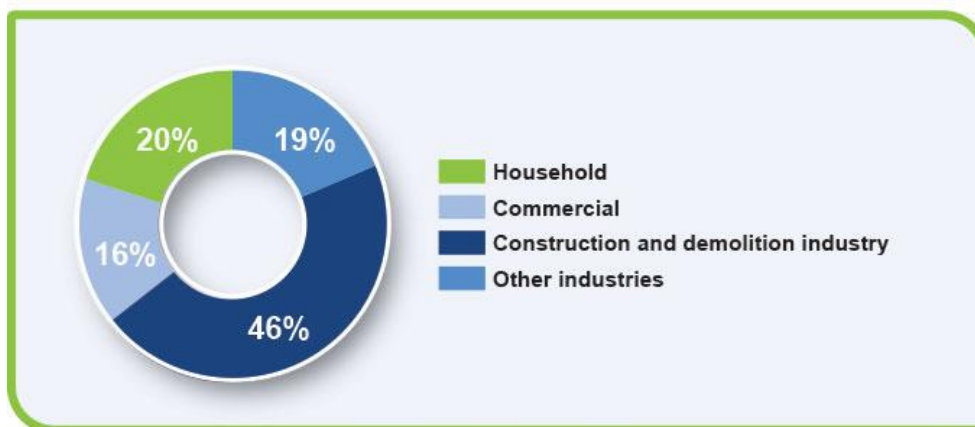
Our environment today

How much waste do we produce?

Scotland generates around 13.2 million tonnes of [controlled](#) (household, commercial and industrial) waste per year.

The largest single amount comes from the construction and demolition industry (46%), with waste from commerce, households and other industry making up the remainder (Figure 2). A small proportion of the total (about 4.6%) is hazardous waste.

Figure 2: Controlled waste generated in Scotland by source (2011)



Sources: WasteDataFlow, SEPA returns from licensed sites, exempt activities and accredited reprocessors.

The amount of [controlled waste](#) generated in Scotland has fallen over the past seven years from approximately 22 million tonnes in 2005 to 13 million tonnes in 2011 (Figure 3). This change was mainly because of reductions in commercial and industrial waste rather than household waste. At present, it is not known if this trend will last or if it is linked to the economy.

Figure 3: Controlled waste generated in Scotland (2005 to 2011)



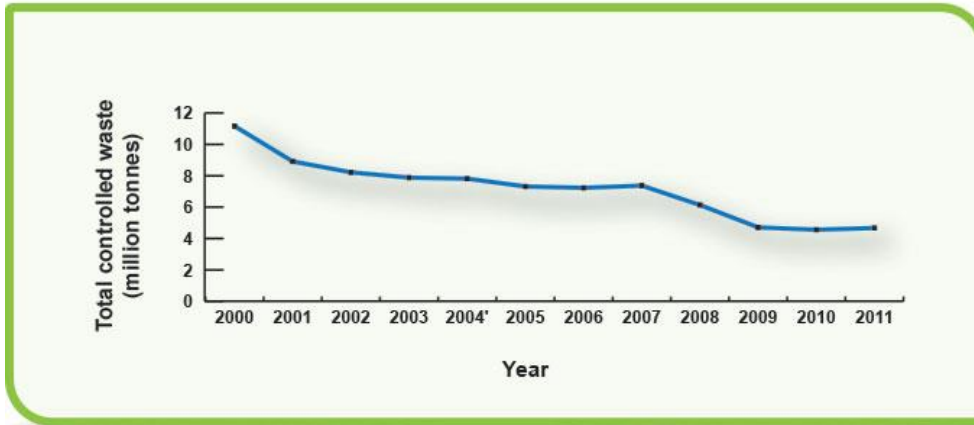
Sources: WasteDataFlow, SEPA returns from licensed sites, exempt activities and accredited reprocessors.

How do we manage waste?

There has been a general trend away from landfill and towards increased recycling in the management of controlled waste.

The amount of controlled waste landfilled in Scotland has fallen steadily from approximately 11.2 million tonnes in 2000 to 4.7 million tonnes in 2011 (Figure 4).

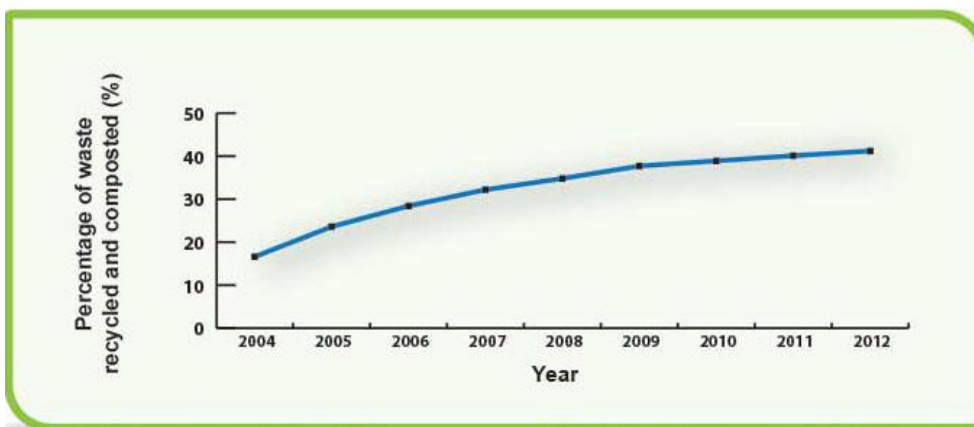
Figure 4: Total controlled waste landfilled in Scotland (2000 to 2011)



Source: SEPA licensed site returns.

In contrast, recycling and composting rates have been increasing, particularly for household waste, where rates have more than doubled since 2004 (Figure 5). This is good progress, but more challenges lie ahead. The Scottish Government has set [Zero Waste Plan targets](#) to recycle, compost and prepare for re-use 50% of household waste by 2013, 60% by 2020 and 70% of all wastes by 2025.

Figure 5: Recycling and composting rates of household waste (2004 to 2012)



Sources: SEPA Local Authority Waste Arisings Survey (LAWAS) and WasteDataFlow.

What is the impact of our waste?

The amount of waste we produce and how waste is managed also has an impact on greenhouse gas emissions. The Scottish Carbon Metric tool measures the greenhouse gas impacts of waste in Scotland. In 2011 the impact of Scotland's waste was 14 million CO₂eq. Achieving the Scottish Government's targets for recycling and waste reduction by 2025 will reduce this by 3 million CO₂eq (22%). The biggest reductions will be achieved through waste prevention.

How do we compare with Europe?

Scotland's record on waste management, particularly for [municipal](#) waste, can be compared with the countries of the European Union (EU). Per head of population, and compared with the EU average, Scotland:

- produces more municipal waste
- recycles and composts less municipal waste
- landfills more municipal waste
- incinerates less municipal waste

Further information is available in the accompanying [factsheet](#).

Pressures affecting waste production



Waste is produced as a consequence of our current, largely linear economic model where resources are extracted, manufactured, consumed and ultimately disposed of.

This may be seen most evidently in aspects such as litter which are symbolic of a 'throwaway society'. While there are many positive social norms (e.g. most people say they recycle regularly in Scotland), attitudes and behaviours are a major factor in whether waste is produced and how it is managed. Access to appropriate infrastructure (such as recycling bins) and information are also key factors in determining these outcomes.

At a global level, population and economic changes are major pressures. Current forecasts suggest the number of people on the planet will reach nine billion by 2050. Also, as many previously developing countries achieve greater economic prosperity, there are growing aspirations for larger homes, better diets, cars and other technologies such as mobile phones.

This all places ever greater pressure on natural resources such as minerals, ores and fossil fuels, which may be scarce and are ultimately finite.

Similarly, changes in what we consume and in demand for new technologies can create rapid cycles of product obsolescence, leading to waste management challenges.

Some businesses are adapting their models to mitigate many of these risks, for example by developing take-back schemes, supporting re-use and repair services, or leasing goods rather than selling them. This may impact on the types of things which end up as waste.

Consequences of a change in resource use



Current patterns of resource use cannot be sustained: we must change the way we manage waste and resources in Scotland if we are to protect our economy and environment for future generations.

Benefits from managing waste sustainably

Moving to a more 'circular' economic model will enable materials to flow continuously through the economy without ending up as waste.

This can be achieved by changing how we design products, for example using more easily recyclable materials or making it easier to upgrade and re-use products over a longer life, as well as changing how those products are recovered at the end of their life, for example manufacturers taking them back as part of a leasing arrangement.

This will benefit Scotland's environment because less waste will be produced and sent to landfill, less energy will be used in the management of waste, and more value will be obtained from the materials used in the economy.

For example, it is estimated that better waste management over the past decade has contributed to a 10% reduction in Scotland's greenhouse gas emissions, largely through increased recycling and less landfill.

There are also economic benefits. Achieving the [zero waste recycling targets](#) is estimated to be worth about £180 million per year and will create more opportunities for 'green' jobs within Scotland. Businesses and individuals can save money by becoming more resource efficient.

Response by society



Scotland has set targets for achieving zero waste. Achieving these targets will require all parts of society to play their part. In particular the focus going forward will be on redesigning the products we use and how we use them to ensure value is not lost from the economy as waste.

Waste management in the EU

Since 1975, the EU has been setting legislation to minimise the harmful effects of waste and encourage Europe to conserve natural resources. This has driven waste management legislation and practices in Scotland and the UK.

The new [European Waste Framework Directive \(2008/98/EC\)](#) came into force in December 2010. It focusses on waste prevention and on turning EU member states into “recycling societies”.

What has Scotland done?

Scotland's latest strategy for waste is set out in the [Zero Waste Plan](#) which was published by the Scottish Government in 2010. The focus of the Zero Waste Plan is on moving materials up the waste hierarchy and into high-value markets with the maximum economic and environmental benefit to Scotland. It is a plan for waste from all sources, not just households, but commerce and industry too. It sets long- term targets of recycling and composting 70% and landfilling no more than 5% of all Scottish waste by 2025.

To support these aims, new [Waste \(Scotland\) Regulations](#) were passed by the Scottish Parliament in 2012. The regulations include requirements to separate key recyclable materials including food waste from homes and businesses and to ensure that these materials do not end up in landfill or incineration. There will ultimately be a ban on biodegradable waste going to landfill by 2021.

Combined, these actions will

- maximise the quantity and quality of materials available for recycling and
- minimise the need for residual waste treatment capacity
- move residual waste management up the waste hierarchy so as to extract resource value from those materials we can't recycle
- drive operational and cultural shifts in how waste is managed, including investment in new resource management infrastructure across Scotland
- improve public confidence in recycling and further engender a recycling culture across Scotland.

A new delivery programme – [Zero Waste Scotland](#) – has been created to deliver the actions in the Zero Waste Plan.

What is Scotland doing now?

The actions within the Zero Waste Plan are all now completed or underway. This includes the development of a distinct strategy – [Safeguarding Scotland's Resources](#) – which focuses on preventing waste and managing resource security risks.

Many of the actions within this strategy will be delivered through the new [Resource Efficient Scotland](#) programme, which combines support to businesses and public sector organisations on efficient use of materials, energy and water.

Litter and flytipping are to be targeted through Scotland's first [national litter strategy](#) which will prioritise prevention and behaviour change built around increased personal and corporate responsibility. This will be complemented by plans to introduce a levy on single-use carrier bags.

The [Climate Change \(Scotland\) Act 2009](#) is also important. This Act gives Scottish Ministers powers to request plans for the prevention and management of waste, and information on the types and quantities of waste produced—crucial for monitoring progress towards targets.

New tools are being developed to collect and report information on waste. This includes a UK-wide [Electronic Duty of Care](#) system to record waste transfers and the publication of the Scottish [waste data interrogator](#), an interactive data analysis tool. These, together with the [Carbon Metric](#), will help to fulfill the aims of the [waste data strategy](#) and build a better picture of the impact and management of waste and resources.

And for the future?

Scotland's aim is to become a zero waste society, benefiting from more jobs, a stronger economy, protected resources and a safe and healthy environment.

Ultimately this will mean eliminating waste from our economic system. This is the focus of making the transition to a circular economy, in which waste is avoided by designing better products and business models. This is a model which will deliver environmental and economic outcomes to be delivered in tandem. Scotland has committed to accelerating the transition to a circular economy and is a member of the [Ellen MacArthur Foundation's](#) CE100 global early adopter network.