

# Carbon Literacy Guide



Section Three: Waste and resources  
Where emissions come from and how to reduce them

2018

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“

*How could I look my grandchildren in the eye and say I knew what was happening to the world and did nothing.*

”

David Attenborough

## Waste and resources

There are a huge amount of carbon emissions resulting from the resources that we buy, use and throw away. Communities and individuals can have a significant impact in this area, through decisions about what we buy, how we use and reuse items, and then how we finally dispose of them. However, it is not always easy to see which items and materials contain the most embodied carbon, or what we can do to reduce consumption.

### Production

Everything we buy has embodied emissions associated with the extraction of raw materials, manufacture, packaging and transport of that item. Even if we are buying a service instead of a physical item, for example a haircut or insurance, there are carbon emissions associated with providing that service – in lighting the hairdressers or running computer servers.

### Use

Many goods and services we buy also result in the use of energy and release of carbon emissions during the ‘use phase’. For example:

1. A pair of jeans: water use, washing powder and electricity required for washing clothes.
2. A mobile phone: energy used to provide mobile phone services e.g. phone calls and texts, internet connectivity.

A reduction in the use of these items and their emissions is dealt with in the home energy efficiency section but we should be aware of balancing the emissions produced during production with the emissions from the use phase. For example, LED light bulbs create more embodied emissions during production than traditional incandescent bulbs but last far longer and use much less electricity to produce the same amount of light. Therefore, the overall calculation shows that choosing an LED light bulb will reduce emissions over its lifetime.

### Disposal

End of life processes also produce carbon emissions. These result from the collection of waste, the transport to processing centres, energy used to recycle materials into new items, and emissions from the decomposition of waste in landfill sites.

## Examples of lifecycle emission sources

Production phase	Use phase	Disposal phase
Extraction/manufacture of materials e.g. steel, plastic, aluminium	Maintenance, including replacement of parts	Collection and transport of waste
Production of materials e.g. cotton, paper, rubber	Purchase of chemicals for cleaning	Waste sorting and processing
Transport and packaging of raw materials	Use of water and energy for cleaning, recharging batteries etc.	Reprocessing materials for recycling
Manufacture of products from raw material	Provision of auxiliary services e.g. phone towers, help desks	Recovery of energy from waste
Packaging and transport of products from factory to retail		Decomposition of waste in landfill

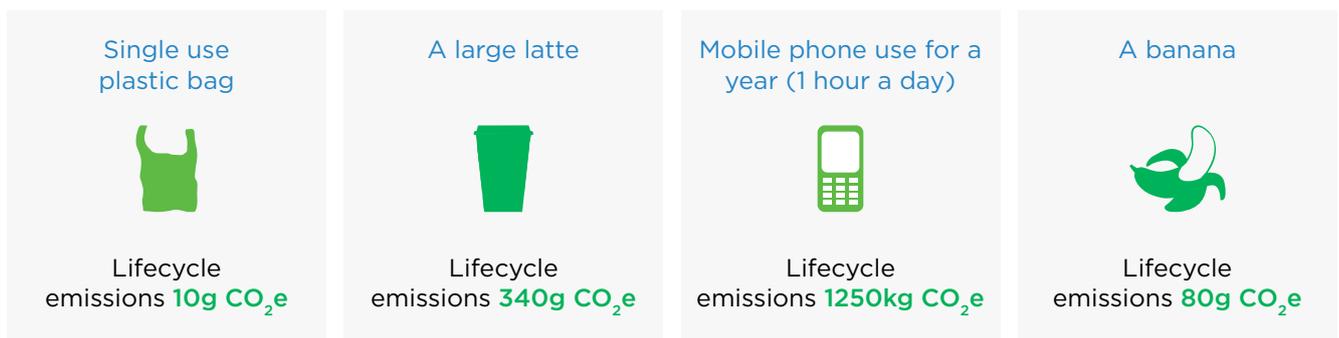


## What do we buy?

Every one of us spends money on different things. There are some things we buy weekly, others once a year, and some we only buy once or twice in a lifetime and all of these things have different amounts of embodied emissions. When thinking about reducing carbon emissions, it makes sense to focus on items that have high embodied emissions, or items that we buy a lot of.

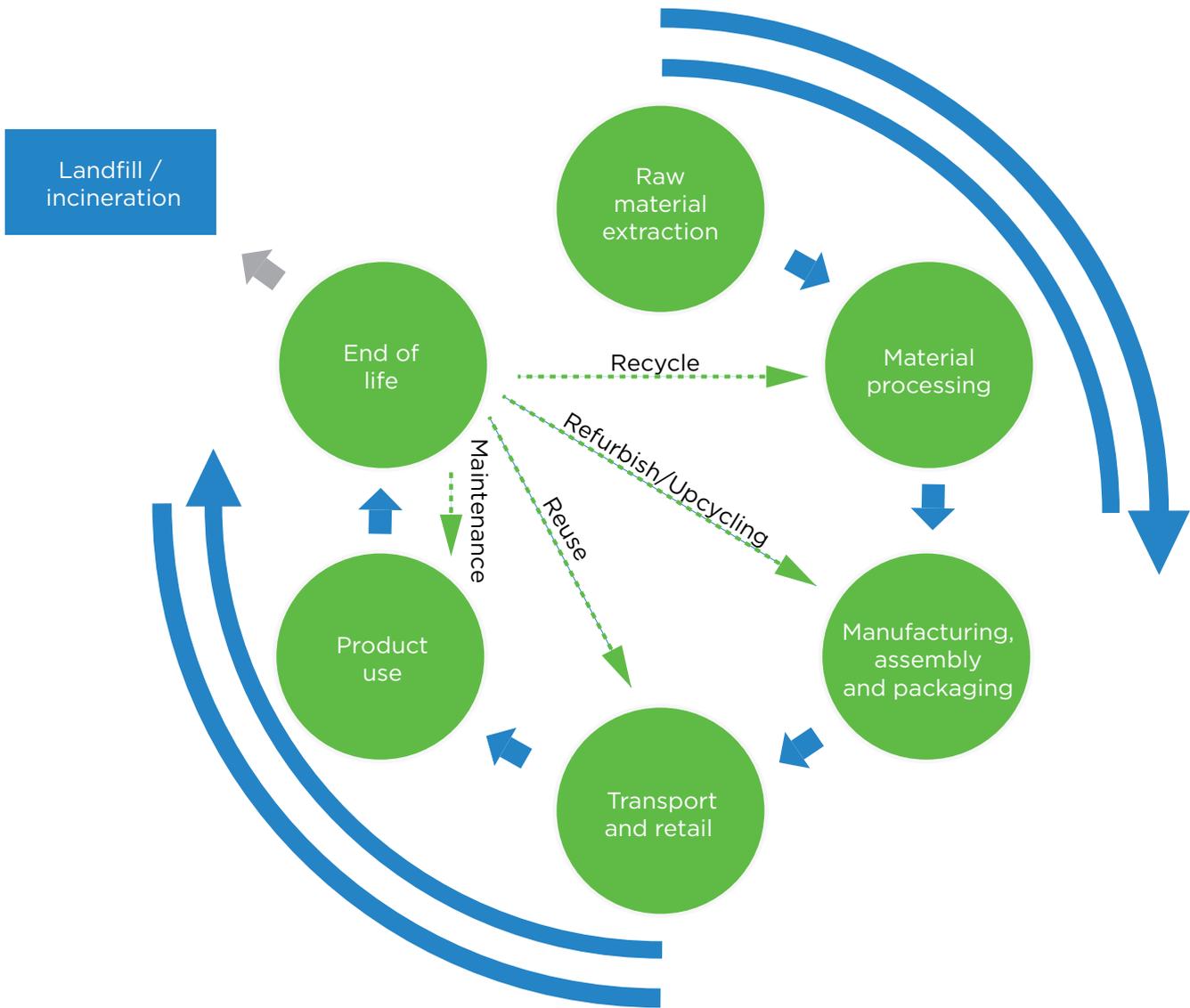
The following diagram contains information from the book “How bad are bananas?” By Mike Berners-Lee and takes a number of examples of common goods and services from different footprint size categories. The book is an excellent introduction to carbon footprints and well worth a read.

### Estimated carbon footprint data from “how bad are bananas”



## The Circular Economy

A circular economy is an alternative to a traditional linear economy where items are made, used and disposed of. In a circular economy, we aim to keep resources in use for as long as possible, extract the maximum value from them whilst in use, then recover and regenerate products and materials at the end of a products useful life. Different actions we take to ‘make things last’ lead to different carbon reductions – the shorter the loop in the circular economy, the bigger the savings.



**Maintenance** - Looking after the things we own and making repairs means that the things we own last longer, which avoids not only all the embodied emissions in producing new, but also avoids the emissions from disposal.

**Reuse** - Choosing a second-hand item instead of brand new also means avoiding the embodied emissions in producing it new, and the emissions that would have arisen from disposal. Depending on how you get your second-hand items there may be some emissions associated with retail and transport, but more direct forms of reuse may avoid this – e.g. swap events held at work.

**Refurbish, remanufacture** - This refers to taking items that cannot be reused directly and working on them so they can. This may involve repair, or breaking products down into parts to be reassembled. The emissions from raw material extraction and production and disposal are avoided, and remanufacturing often results in lower emissions than manufacturing from scratch. The ability to repair or refurbish products is often limited by the way they are manufactured in the first place.

**Upcycling** - This refers to a special kind of remanufacture, whereby products or materials are reassembled into a different type of product, often of a higher value than the original. In this case disposal emissions are avoided, but the raw material, production and manufacturing emissions are related to the new product created. For example, if old tyres are turned into garden furniture, the avoided emissions will be from raw material extraction and manufacture of garden furniture, not tyres.

**Recycling** - This refers to breaking a product down back to its raw materials and using these to manufacture new products. In this case, emissions from the raw material extraction and production and disposal are avoided. The process of recycling raw materials creates some emissions but often significantly less than producing virgin materials.

## Doing it less: waste and resources

The aim is to be able to acquire less stuff. Challenging some of the reasons we want to buy an item could be a starting point, but there are many things we can't or won't do without and the cheap price of goods means repairs can cost almost as much as replacing an item. A way to avoid this trap is to think longer term when buying products. **Buying items that might cost more, but are likely to last longer** could be better in terms of reducing emissions.

### Why do we buy?

'Carbon Conversations' is a project that guides small groups of people to explore ways to reduce their carbon footprints. It uses techniques similar to those used in support and therapy groups to take account of people's psychological needs in finding ways to do this. This is perhaps particularly important when considering why we buy stuff and how we can do it less. The Carbon Conversations Handbook 'In time for Tomorrow?' lists some of the reasons why we make purchases:



When thinking about reducing the amount we buy, it's important to think about how we might go about meeting some of the above needs in a way that isn't connected to the purchase of physical goods. The other side of 'doing it less' is about **making things last**.

**Maintenance:** This means taking steps to ensure that an item is less likely to break or wear out sooner. An obvious example of this would be routine maintenance of a bicycle. Less obvious might be ensuring clothes are washed and stored correctly to reduce fading or shrinking, or running a clean-up on a computer to keep it operating smoothly.

**Repair and refurbishment:** Often, when an item stops working so well – from laptops to vacuum cleaners and microwaves – a simple repair can restore it to working order. Zero Waste Scotland estimate that 23% of small waste electronic and electrical equipment thrown out in Scotland could continue to be used with a small repair. Repairs can be done at home (with the right knowledge and equipment) or by a professional. We would also include 'aesthetic' changes in this – such as upcycling furniture we already own.

**Disposal:** The direct consequence of the above steps is that we also have less stuff to throw away.

## Doing it differently: Waste and resources

Here 'doing it differently' means meeting the need or desire for 'stuff' in a different way from buying new, and when we have items to dispose, of finding a different way than landfilling.

### Alternatives to owning

Many items are bought for the function they perform or the service they provide. But what if we can meet this need without owning an item?

Items bought for their entertainment value only fulfil their purpose for a limited time – for example books. Libraries are well established ways to loan books (many also loan CDs and DVDs), but many other items could be acquired in the same way, such as toys or board games. More and more people are meeting this 'entertainment value' without buying physical products through music and video streaming services, or with e-books.

Items we use infrequently are also suited to **borrowing, loaning or leasing** as a feasible option. Tools are often used as an example that many of us own, but aren't used very frequently. Other infrequently used items that could be borrowed or leased could include formal wear and decorating equipment. Many people lend these kinds of items informally between friends and family already.

**Alternatives to buying new:** For items we need or want to own, buying second-hand is an alternative. There are many existing markets for second-hand items, from car dealerships to charity shops and online platforms.

### Alternatives to disposal

**Make available for reuse:** Making items we want rid of available for reuse, avoids landfilling emissions, but also ensures there is a supply of good quality second-hand goods for people to buy. Many people also keep items they don't use or need anymore, when other people could be making use of these. The 'Love Your Clothes' campaign estimates that a third of clothes in an average wardrobe haven't been worn for over a year. The simplest way to make items available for reuse is to donate to a local charity, but many unwanted items can easily be sold using online platforms. Many charities will accept items that require small repairs before selling on.

**Recycling:** Much of the stuff we throw out isn't useful to anyone in the form it is – used paper and food and drinks packaging for example. Ensuring the materials in these items are available for recycling into new products is easy through local authority collections.

**Upcycling and repurposing:** The internet is full of blogs on how to turn everything from jam jars, juice cartons and tyres into plant pots, wallets, furniture... the list is endless. There is a potential for carbon saving here as outlined above but only if the end product is truly displacing the purchase of a new item. If not, then the effect is that the material is prevented from re-entering the circular economy, where it could displace the extraction and production of raw materials.

Doing it less	Doing it differently
Reducing the amount we buy through understanding why we buy things and meeting our emotional and physical requirements from other activities	Getting items through borrowing or leasing e.g. tool and toy libraries, leasing formal wear etc.
Maintaining items and goods that we own so they last longer	Buying second hand or refurbished items rather than new
Repair and refurbishment of items to extend useful life rather than purchasing new	Making items available for reuse through donations to charity and swap shops
	Recycling rather than disposal to landfill to decrease the need for primary materials
	Choosing recycled goods to increase markets for recycled materials.
	Upcycling goods destined for landfill to displace the need for new items.

## Waste and resources: Government targets

The Scottish Government's ambition for a circular economy is set out in the "Circular Economy Strategy, Making Things Last", and by 2035, we would expect the principles of a circular economy to be well established.

<http://www.gov.scot/Resource/0049/00494471.pdf>



The Circular Economy Strategy focusses on four parts of the economy where potential benefits of opening up new markets and improving productivity are greatest: food/bio-economy; remanufacture; reuse of energy infrastructure and construction/built environment. This will have an impact on the kinds of jobs and industries we have in our communities, but the strategy also identifies opportunities for communities to be more active in moving Scotland to a circular economy through improving opportunities for reuse and repair, as well as driving the agenda through community engagement and local initiatives.

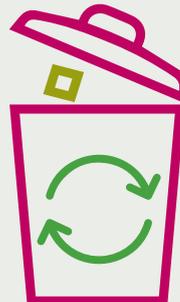
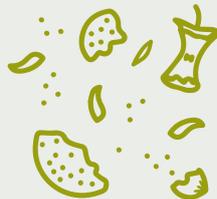
Below is a summary of some of the targets and priorities set out in the Circular Economy Strategy, relevant to community-led projects.

### IN WASTE SECTOR, WE AIM TO



**RECYCLE 70% OF ALL WASTE BY 2025**

**BY 2021 WE WILL END LANDFILLING OF BIODEGRADABLE MUNICIPAL WASTE**

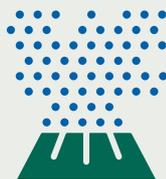


**ESTABLISH A MORE CIRCULAR ECONOMY**



**ACHIEVE 33% REDUCTION OF FOOD WASTE BY 2025**

**REDUCE ALL WASTE SENT TO LANDFILL TO 5% BY 2025**



**REDUCE EMISSIONS FROM CLOSED LANDFILL SITES**

## Waste and Resources: Support for low carbon action

### Greener Scotland

Information and resources regarding reducing, reusing and recycling.

<http://www.greenerScotland.org/reduce-reuse-recycle/why-reduce-reuse-and-recycle>

### Resource Efficient Scotland

Information on helping organisations to use resources more efficiently.

<http://www.resourceefficientscotland.com/>

### Green Champions Training

Is a free, online CPD certified course for Scottish organisations to train employees new skills and tools to successfully improve resource efficiency and environmental performance.

<http://greenchampionsresourceefficientscotland.com/>

### Warp It!

Is a redistribution network which makes it easy for organisations to give away or loan unwanted items.

<https://www.warp-it.co.uk/>

### Zero Waste Scotland

Delivers a range of support programmes, campaigns and other interventions to help people and organisations on the journey to zero waste.

<http://www.zerowastescotland.org.uk/>

### Scottish Food Coalition

Is a civil society coalition looking at the whole food system. Their report 'Plenty: Food, Farming and Health in a New Scotland'.

<http://www.nourishscotland.org/wp-content/uploads/2016/03/PLENTY-final.pdf>





We support the Sustainable Development Goals.

Keep Scotland Beautiful is the charity that works with organisations and communities to help people to reduce carbon emissions, improve local areas and adapt to the impacts of climate change. It's part of our work to make Scotland clean, green and sustainable.



# Keep Scotland Beautiful

Your charity for Scotland's environment

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