



Department
for Environment
Food & Rural Affairs

Waste Prevention Programme for England

Towards a resource efficient economy

Consultation version

March 2021

We are the Department for Environment, Food and Rural Affairs. We're responsible for improving and protecting the environment, growing the green economy and supporting our world-class food, farming and fishing industries.

We work closely with our 33 agencies and arm's length bodies on our ambition to make our air purer, our water cleaner, our land greener and our food more sustainable. Our mission is to restore and enhance the environment for the next generation, and to leave the environment in a better state than we found it.



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Chapter 1 Introduction

The Resources and Waste Strategy is framed by natural capital thinking and guided by two overarching objectives¹:

- To maximise the value of resource use
- To minimise waste and its impact on the environment.

The revised Waste Prevention Programme will help deliver the above in order to:

- Reduce greenhouse gas emissions
- Reduce the pressure on our natural environment
- Help safeguard our resource security
- Increase growth in new sectors
- Enhance competitiveness by keeping products and materials in circulation
- Create jobs at all skill levels

The Resources and Waste Strategy is underpinned by five strategic principles:

- To provide the incentives, through regulatory or economic instruments if necessary and appropriate, and ensure the infrastructure, information and skills are in place, for people to do the right thing
- To prevent waste from occurring in the first place, and manage it better when it does
- To ensure that those who place on the market products which become waste take greater responsibility for the costs of disposal – the ‘polluter pays’ principle
- To lead by example, both domestically and internationally
- To not allow our ambition to be undermined by criminality

It is intended that the revised Waste Prevention Programme will help embed these principles by setting out steps towards:

- Transforming product design and supporting factors such as spare part provision
- Making it easier for consumers to make sustainable purchasing decisions
- Using extended producer responsibility and other financial incentives to ensure the polluter pays principle is embedded
- Aligning the regulatory framework with a circular economy approach
- Integrating the strategic principles into industrial policy and giving first movers the recognition they deserve

¹ HM Government (2018) [‘Resources & Waste Strategy’](#)

Action is already underway to enable action in this respect, in particular through our landmark Environment Bill. We are seeking new powers to drive design for durability, reparability and recyclability of products such as electronics and clothing, including through setting product design requirements, provision of information for consumers, taking forward extended producer responsibility schemes, and introducing charges to discourage single-use plastics. Defra is also working with the Department for Business, Energy & Industrial Strategy to make the most of repatriated EU powers to take forward ecodesign measures relating to energy-using products.

Purpose of this document

The purpose of this document is to set out for comment the measures which the Government intends to include in our revised Waste Prevention Programme for England.

Why do we need to take action on waste prevention?

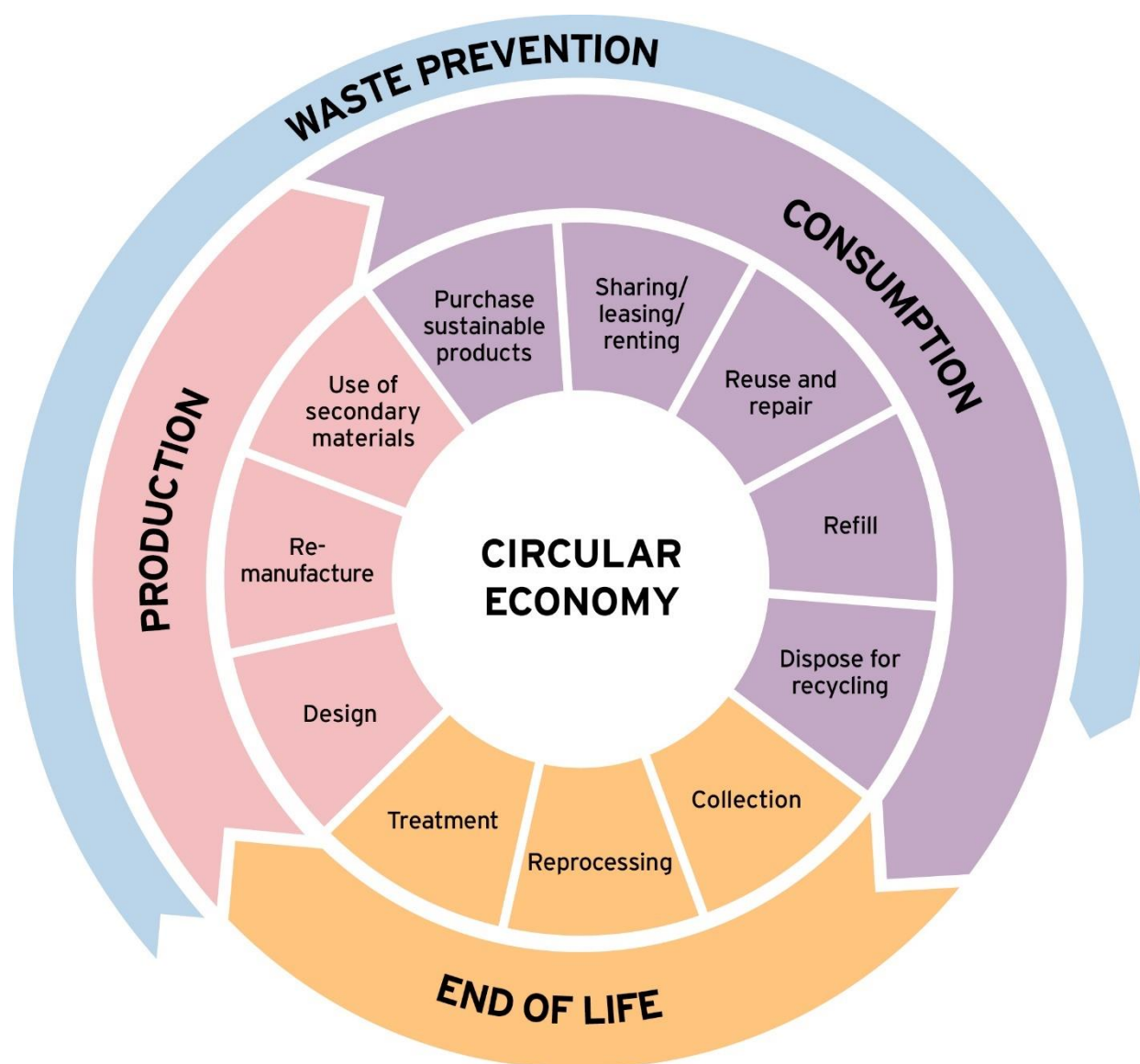
Growing populations and greater demand for products globally are putting increasing pressure on our natural resources and contributing to accelerating climate change. As a result, growing quantities of waste are becoming an increasing problem, with many countries being reluctant to import waste.

Sustainable consumption and production embodied by UN Sustainable Development Goal (SDG) 12 is vital for achieving transformative change. Using resources efficiently is one of the main pillars of this SDG, and we regard waste prevention as critical in this respect.

Waste prevention is often the most efficient way of addressing these pressures, as it reduces unnecessary production and processing, and therefore costs, as well as carbon emissions associated with those steps. For this reason, it is at the top of the waste hierarchy.

Waste prevention has huge potential: products and materials need not become waste. Products can be designed to support longer product lifetimes, and enable reuse, repair and remanufacture. We can reduce those products and types of packaging that are hard to reuse and recycle, such as plastic films. Manufacturers can use waste products of other industries as inputs – whether this be waste foundry sand or salty whey from cheese making. We can repair and remanufacture products locally. This is a win-win strategy in terms of economic efficiency, the environment, and jobs and growth in the UK.

Figure 1: Preventing waste across the product lifecycle

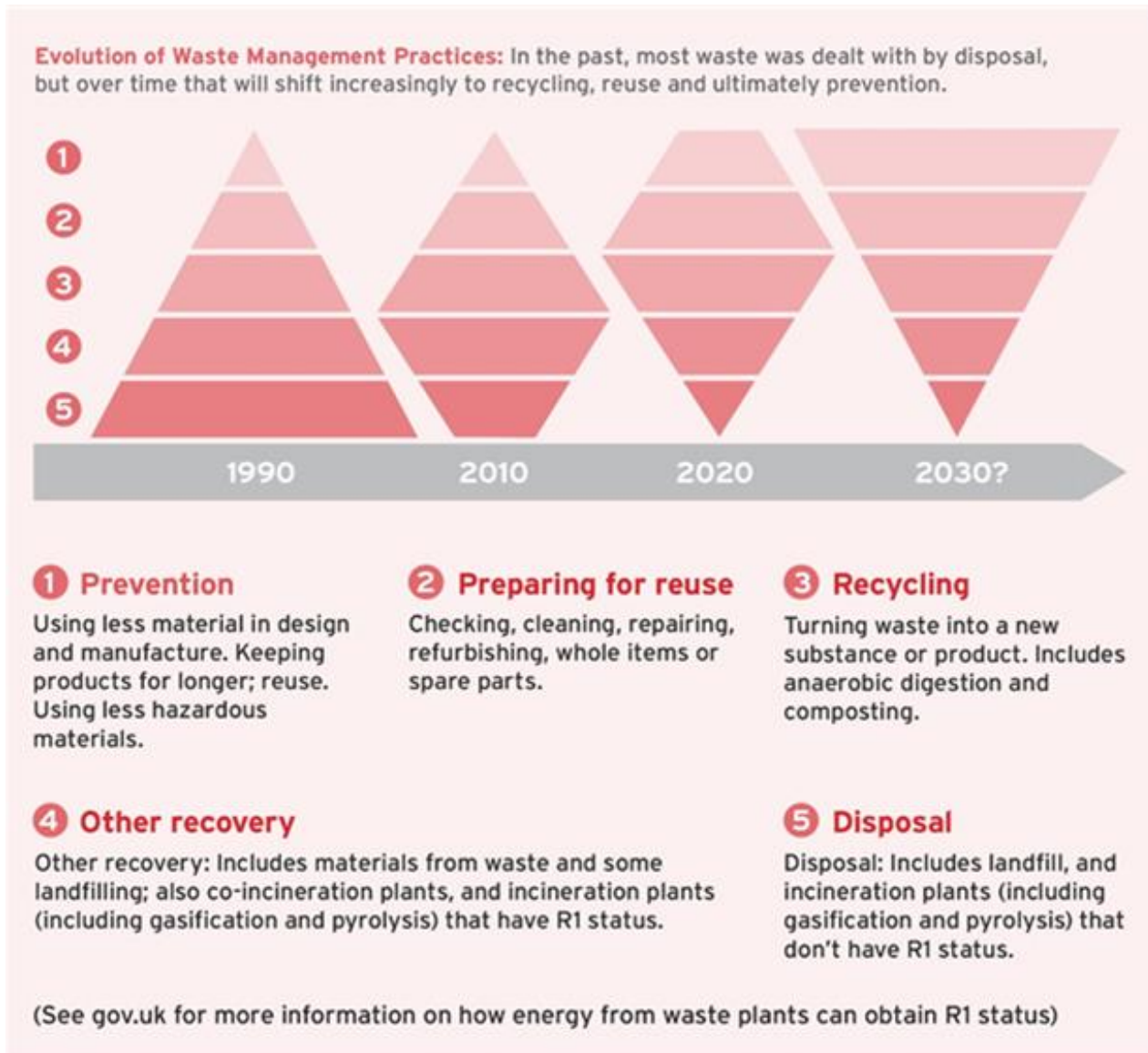


How will the Waste Prevention Programme relate to “Our waste, our resources: A strategy for England”?

“Our waste, our resources: a strategy for England”, referred to here as the Resources and Waste Strategy, states how we will better manage our material resources: how we will promote resource efficiency, move towards a circular economy, and minimise the residual waste produced. It aims to safeguard our natural capital: reducing greenhouse gas (GHG) emissions, mitigating risks from chemicals, and reducing the impacts of extraction on our natural environment. It sets out a comprehensive and overarching approach, covering in depth the immediate actions that need to be taken.

We will seek to build on this through the revised Waste Prevention Programme focusing on the top of the waste hierarchy, which means increasing reuse, repair and remanufacture, as well as use of industrial by-products. Our goal is to develop the key cross-cutting and sector-specific aspects of the Strategy. The aim is to embed our circular economy approach and retain products and goods in circulation for as long as possible and at their highest value.

Figure 2: Evolution of Waste Management Practices



What are we required to do under current legislation?

The Waste Prevention Programme for England was published in December 2013 as required by the Waste (England and Wales) Regulations 2011.² The programme complements the Waste Management Plan for England on recycling and residual waste management.

How does waste prevention relate to our wider environmental and industrial goals?

Delivery of Strategic Targets & Commitments

25 Year Environment Plan – work towards eliminate avoidable waste by 2050

25 Year Environment Plan – work towards eliminating food waste to landfill by 2030

Industrial Strategy – double resource productivity by 2050

Climate Change Act – net zero domestic greenhouse gas emissions by 2050

Resources & Waste Strategy – increase municipal recycling rate to 65% by 2035

Resources & Waste Strategy – no more than 10% of municipal waste to landfill by 2035

Waste prevention has numerous benefits, explained below. It will help us develop a more resource productive economy, vital for a 21st century economy, as well as protecting our natural capital. To support our drive towards resource productivity, we are exploring setting a relevant statutory target to meet the target-setting duty we expect to have once our landmark Environment Bill becomes law.

Natural capital: water, air and biodiversity

Keeping products and materials in use for longer reduces the pressure on our natural environment. Globally, we extract three times the amount of resources from nature than we did in 1970, and this is estimated to more than double by 2060. The International Resources Panel estimates that the extraction and processing of materials, fuels and food make up about 50% of total global greenhouse gas emissions and more than 90% of biodiversity loss and water stress.³

² <https://www.gov.uk/government/publications/waste-prevention-programme-for-england>

³ International Resources Panel, 'Global Resources Outlook 2019'

Greenhouse gas emissions

Ambitious action will help the UK reduce its domestic emissions (approximately 450Mt CO₂e in 2018)⁴ in support of achieving domestic carbon budgets. This is because emissions from manufacturing make up at least 17% of our domestic emissions.⁵ In addition, action will help reduce emissions related to the production of goods and services consumed here but generated overseas. The UK's consumption-based emissions or global carbon footprint stood at approximately 770MtCO₂e in 2017.⁶

Research estimates that from just five key sectors (construction, vehicles, food, textiles, and electronics) UK domestic emissions can be reduced by approximately 31 MtCO₂e by keeping products in use for longer, reusing rather than recycling, and sharing items such as tools and machinery.⁷ Better product design and increased reuse can deliver even more, estimates suggest a reduction of 81 MtCO₂e is possible between now and 2050 through a series of measures.⁸ Reuse saves more than recycling: for example, reuse of steel saves 0.36 kg CO₂ per kg more than recycling.⁹

Waste prevention policy relates to the Industrial Decarbonisation Strategy which sets out the Government's vision for a prosperous, low carbon UK industrial sector in 2050. The Strategy's aim is to set out:

- How the UK can have a thriving industrial sector aligned to Net Zero without pushing emissions abroad
- How and when Government will act to support decarbonisation, whilst sharing the costs fairly between industry, its customers and the taxpayer
- To start a conversation about the shape of industry in a Net Zero world

To meet Net Zero, industrial emissions must fall by at least 90% compared to today's levels. The Strategy will look at the role of different technologies and measures in achieving this, including using hydrogen, electrification, biomass and carbon capture, as well as improving energy efficiency and resource efficiency.

Resource Security

Waste prevention can increase our **economic resilience** and support our **defence systems**. Some materials like lithium, cobalt and rare earth elements are increasingly in

⁴ <https://www.gov.uk/government/statistics/final-uk-greenhouse-gas-emissions-national-statistics-1990-to-2018>

⁵ https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/904587/IC_emissions_tables_publication.xlsx

⁶ <https://www.gov.uk/government/statistics/uks-carbon-footprint>

⁷ Green Alliance (2018) '[Less in, more out: using resource efficiency to cut carbon and benefit the economy](#)'

⁸ Green Alliance (2019) '[Acting on net-zero now](#)'

⁹ WRAP (2015) 'Benefits of reuse calculator' <https://wrap.org.uk/resources/tool/benefits-reuse-tool>

demand, driven by the growth of clean technology sectors like electric vehicles and wind turbines, as well as the defence sector, which is important for our national security. Reuse of products and materials will help safeguard key sectors from scarcity and price shocks. Some materials such as sand, though not rare, may be difficult to extract without harm to the wider environment.¹⁰

Jobs & Growth

There is potential for a substantial, economy-wide increase in circular economy activities, such as remanufacturing, repair, rental, and recycling. Research has indicated that by the year 2030, we could deliver a potential net Gross Value Added (GVA) gain of £77 billion. The majority of these gains are likely to be from remanufacturing (£56 billion), with repair offering £3.5 billion in GVA gains, recycling offering £7.8 billion, and rental/leasing offering £23 billion.¹¹ To illustrate the benefits, in 2017, WRAP estimated that more repair, refurbishment and open market resale for waste electricals and electronics from Household Waste Recycling Centres alone could deliver £220 million in resale value¹²; while longer-lasting, repairable and modular products could deliver £4.4 billion in financial benefits up to 2025¹³ for electrical products alone.

Taking on board the fact that a significant proportion of products consumed in England are imported, shifting towards a more circular economy has the potential to increase jobs locally. According to WRAP and Green Alliance research from 2015, moving towards a more circular economy (including recycling) could create up to 100,000 net jobs across all skill levels and regions of the UK.¹⁴ Estimates suggest that the reuse/repair sector creates 75 jobs for each 1,000 tonnes of goods handled.¹⁵ At a European level, it has been estimated that ambitious policies could create 300,000 jobs.¹⁶

Litter

Dealing with litter places a significant burden on our local councils, costing the taxpayer hundreds of millions of pounds each year at the price of investment in other local services.

¹⁰ International Resource Panel states that sand extraction, when dredged from water sources can have negative environmental outcomes. (Source: 'Global Resources Outlook 2019')

¹¹ <http://www.rebus.eu.com/wp-content/uploads/2017/07/Extrapolating-resource-efficient-business-models-across-Europe.pdf>

¹² WRAP (2011) 'Realising the Value of Household WEEE', <https://wrap.org.uk/sites/default/files/2020-10/WRAP-realising-reuse-value-household-WEEE-summary.pdf>

¹³ WRAP (2017) 'Switched on to value: powering business change', <https://wrap.org.uk/resources/report/switched-value-powering-business-change>

¹⁴ WRAP and Green Alliance (2015) 'Employment and the circular economy' <https://wrap.org.uk/resources/report/employment-and-circular-economy>

¹⁵ RREUSE (2015) 'Briefing on job creation potential in the reuse sector'

¹⁶ RREUSE (2015) 'Briefing on job creation potential in the reuse sector'

Poor local environment quality also discourages people from going outside and reduces inward investment damaging local economic growth.

When resources and items are valued, people are less likely to litter them. Shifting to a waste prevention approach, which means moving away from single-use items to using, for example, reusable containers which have a value, should discourage littering. The provision of appropriate disposal infrastructure, which supports recycling and recovery of resources from discarded items will also help to signal and embed this change in attitudes, as will appropriate enforcement measures that nudge people to 'do the right thing'.

The 2017 Litter Strategy for England sets out our aim to deliver a substantial reduction in litter and littering within a generation by focussing on three key themes: education and awareness; improving enforcement; and better cleaning and access to bins. This work is supported by a robust approach to monitoring, including the development of our 'Litter Dashboard' and recent composition research identifying the prevalence of commonly littered items. This programme, in particular Chapter 10 on Packaging, Plastics and Single-use Items, details some of the measures that were outlined in the Litter Strategy that will help to tackle litter and littering.

What are the challenges we need to address?

There are a number of challenges hindering change, which have informed our views on the role the Government needs to play in this sphere:

a) Costs:

- **Labour costs and skills availability:** shifting to greater repair and remanufacture can be problematic as labour costs are higher in the UK than many of the countries from which we import. There also appears to be a skills shortage in terms of repair and remanufacture.
- **Achieving scale and efficiency:** primary production of goods is often at large scale serving extensive markets. Smaller scale reuse and repair combined with the challenge of "reverse logistics", including collections and costs of storage can mean higher costs.
- **Consumer willingness to pay:** Manufacturers may not be able to recover higher prices equal to the benefits of more durable products.

b) Regulatory alignment:

- The law in some cases supports recycling over reuse. For example, whilst the Waste Electrical and Electronic Equipment Regulations 2013 state that preparation for reuse should be prioritised over recycling, there is only a target for recycling but not for reuse.¹⁷ A second example is the

¹⁷ <https://www.legislation.gov.uk/uksi/2013/3113/contents/made>

Environmental Protection Act 1990, which contains a duty on local authorities to provide recycling and disposal services, but not reuse services.

- Certain provisions regarding chemical safety, for example Persistent Organic Pollutants (POPs) regulations, which require disposal of some products containing POPs when they become waste, may be in conflict with waste prevention policy, if not developed taking on board both sets of goals.

c) Information and trust:

- On the part of the consumer, lack of credible information on products combined with negative perception of second-hand goods such as textiles and soft-furnishings due to hygiene or aesthetic concerns.
- On the part of industry, lack of information as to the availability, material content of products, and lack of trust about the quality of secondary materials.

d) Business focus on growing sales

- Most businesses have a strong interest in increasing sales, and this can run counter to the interests of reuse/repair and remanufacture, however there are opportunities in the reuse/repair/remanufacture sector.
- Adapting business models - the risks for first movers can be higher than business as usual approaches.

In developing a revised Waste Prevention Programme, we will take on board [our review of the previous programme](#). Key findings from this review are:

- the £1.2 million Action Based Research Programme over the period 2013-2015 focussed on understanding how growth can continue without the unsustainable resource and materials use it often entails. It included work on influencing the sustainable habits of consumers; piloting shared resource efficiency manager models in SME manufacturers; piloting a nursery equipment Product Service System; developing strategies to improve design and testing for clothing longevity; and understanding motivations for product disposal
- good results from voluntary commitments, with increasing contributions from businesses. The Sustainable Clothing Action Plan is well supported by business and helped reduce the environmental footprint of clothing as did the Courtauld Commitment for food and packaging. The Electrical and Electronic Equipment Sustainability Action Plan (esap), resulted in guidance on improving product durability, including Better Appliances Guidance to help businesses procure and build more durable products
- the success of charging schemes, introduced for plastic carrier bags, in achieving behaviour change

What does this Waste Prevention Programme include?

It will embed the Resources and Waste Strategy's five strategic principles by working towards:

- **Transforming product design:** making reuse and repair, as well as recycling, viable by supporting a shift in product design and provision of spare parts and repair information
- **Producer responsibility ("polluter pays"):** by requiring the producer to bear the costs of managing and recovering waste
- **Making it easier for consumers to do the right thing:** making reuse/repair the default action
- **Aligning the regulatory framework:** for example so that targets encourage action at the top of the waste hierarchy, and ensure that the waste hierarchy duty as laid down in the Waste (England and Wales) Regulations 2011 is applied
- **Integrating into industrial policy:** through the Industrial Strategy and Local Industrial Strategies
- **Supporting shared responsibility:** recognising that action is required by business as well as a supportive framework by government, which gives recognition to the work underway by business in the UK.

A broad approach for addressing the barriers is as follows.

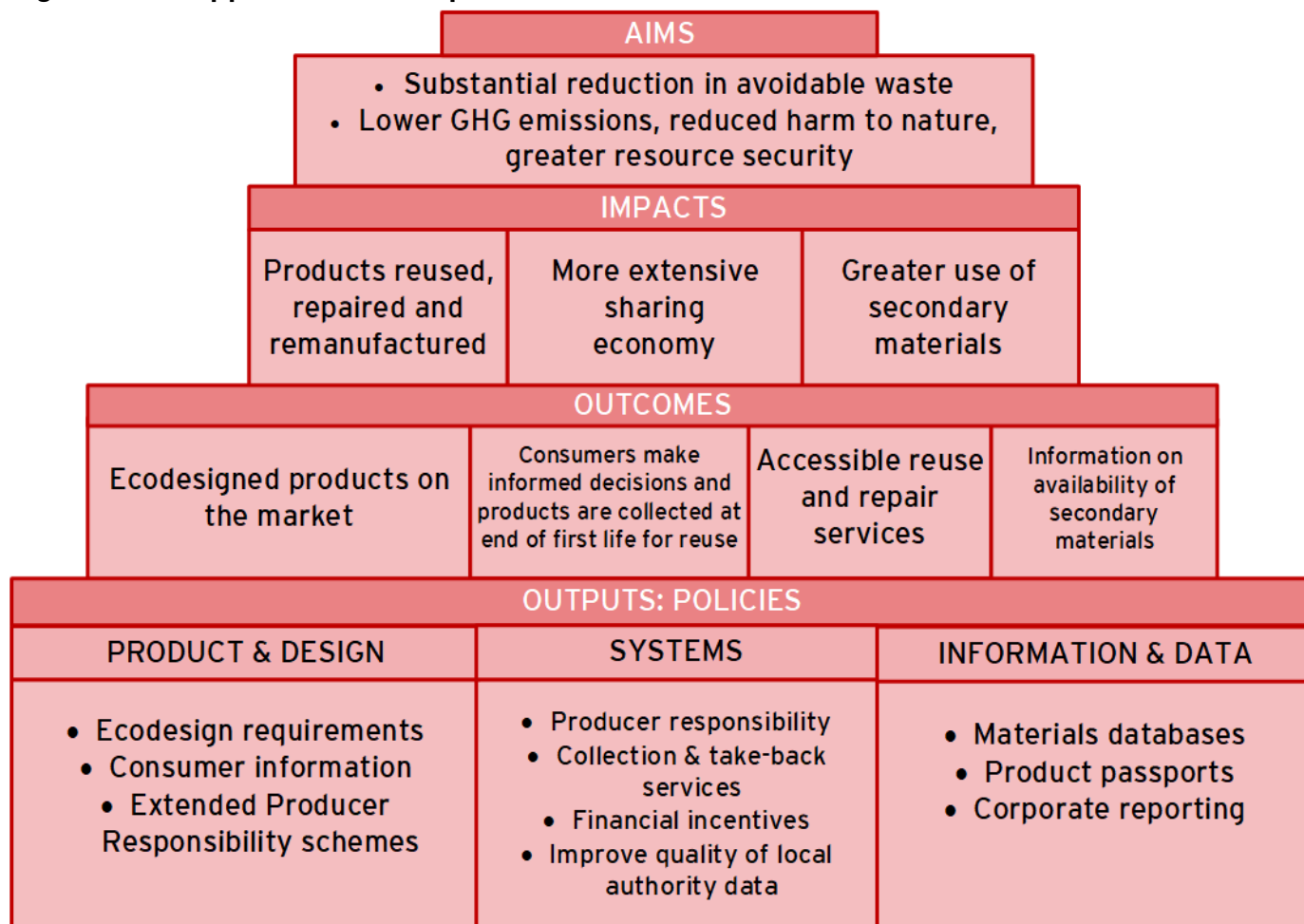
Aims: to substantially reduce products becoming waste, and for more products to be reused, repaired, and remanufactured.

Outcomes: We want to increase the momentum towards sharing and using products as services, utilising digital platforms and new business models such as product servitisation. This will be in time supported by more ecodesigned products on the markets, consumers making informed decisions, and collection of products once consumers no longer have use for them. Reuse and repair facilities and services will increasingly be available, and information about the availability of secondary materials will be readily available to manufacturers which want to use them.

To achieve these aims and outcomes, we will take a policy approach encompassing three broad themes:

- 1) **Products and design:** Including ecodesign and consumer information requirements, and Extended Producer Responsibility schemes.
- 2) **Systems:** Including producer responsibility and related collection and take back services, encouraging reuse, repair, leasing businesses and supporting facilities, and encouraging greater transparency by local authorities and businesses
- 3) **Information and data:** including developing materials databases, product passports and encouraging voluntary corporate reporting

Figure 3: Our approach to waste prevention



Question: Do you agree or disagree with our choice of impacts and outcomes as the right goals for us to be aiming to achieve?

- a. Strongly agree**
- b. Agree**
- c. Neither agree nor disagree**
- d. Disagree**
- e. Strongly disagree**

If you disagree, please briefly explain why.

Question: Do you agree or disagree that our policy approach covers all the areas for action that are needed?

- a. Strongly agree**
- b. Agree**
- c. Neither agree nor disagree**
- d. Disagree**
- e. Strongly disagree**

If you disagree, please explain what you think is missing.

Which sectors are included?

We have focused the programme on seven key sectors: construction, textiles, furniture, electronics, vehicles, food, and plastic packaging. These were chosen as the most significant in terms of tonnages of waste arisings, carbon emissions from production, public interest and other indicators.

The table below shows the latest data available on waste arisings for each of the sectors included. It also includes a projection of potential carbon emissions reductions available from taking a series of waste prevention measures based on research carried out by the Centre for Industrial Energy, Materials and Products.¹⁸

¹⁸ Green Alliance (2018) '[Less in, more out: using resource efficiency to cut carbon and benefit the economy](#)'

Figure 4: Significance of sectors covered by this programme

Waste stream	Estimated waste arisings			Carbon abatement potential from selected waste prevention measures (MtCO ₂ e between 2023-32)
	Waste arisings (Million tonnes)	Geography	Year	
Construction	59.6	England	2016	31.23
Food	9.5	UK	2018	24.12
Plastic packaging	2.3	UK	2017	0.49
Vehicles	1.3	England	2016	28.66
Furniture	1.1	England	2012	1.25
Electronics	1.5	UK	2017	16.36
Textiles	1.8 ¹⁹	UK	2017	6.09

Sources: Waste Arisings: UK Statistics on Waste; WRAP; PlasticFlow 2025; Resource Futures; Valpak, Textile Market Situation Report; Carbon abatement figures from University of Leeds

How will we measure progress?

Keeping track of progress is vital. We have identified a set of indicators that complement the indicators used to track progress in implementing the Resources and Waste Strategy. The indicators, set out in Chapter 12, will help us measure progress towards the goals of the Waste Prevention Programme.

Next steps

Following the publication of the final Waste Prevention Programme we will seek to develop further the policy proposals set out in this Programme. This will involve enhancing our evidence base and carrying out impact assessments in the usual way. Any new policy proposed in this Programme will be subject to public consultation prior to any legislation, which will include careful consideration of the individual and cumulative impacts on public expenditure, costs to business including SMEs, consumer choice and affordability, as well as compliance with World Trade Organisation rules, the integrity of the UK internal market, and the UK's international competitiveness.

¹⁹ This figure includes an estimate of used textiles in the commercial municipal residual waste in England (only) for 2017, estimated to be 267,000 tonnes. An equivalent figure is not included for the rest of the UK, and therefore the estimate should be considered as conservative

Chapter 2 Designing out Waste: Ecodesign, Extended Producer Responsibility and Consumer Information

Our aim: to drive change in product design so that products are made to be durable, repairable and recyclable, and can be remanufactured where appropriate.

1. Our linear model of ‘take, make, use and dispose’ comes with high social, environmental and financial costs. Currently, there are products on the market that break or wear out prematurely, are not easily repairable or recyclable, or contain chemicals that are harmful to human health or the environment, hindering reuse and recycling. Shorter product lifetimes and barriers to recycling mean that energy is unnecessarily wasted on extraction, processing and manufacture. Over-extraction of minerals also degrades the environment unnecessarily. Premature obsolescence is expensive and frustrating for consumers. This has driven an interest in “the right to repair” – which would mean that goods last a reasonable length of time, that faults can be fixed, and spare parts are readily available. Finally, managing waste, using infrastructure such as energy from waste and landfill, comes with costs that could be reduced or deferred by keeping products in use for longer.
2. Evidence suggests that 80% of the damage inflicted upon the environment when products become waste can be avoided if more thoughtful decisions are made at the design stage.²⁰ Therefore, we must start there. Better product design, leading to more durable, repairable and recyclable products being placed on the market, could address these negative impacts. For example, keeping clothes in active use for an extra year could save approximately 2.24 MtCO₂e²¹ over a 10-year period.
3. Low quality, single-use products can be attractive to consumers because they can be bought more cheaply than better quality and more durable equivalents, meaning that purchasing behaviour can favour less sustainable products. For the market to shift towards greater resource efficiency, the problem of cheaply produced single-use products undercutting more durable, reusable or remanufactured products needs to be addressed. Regulations that set ecodesign requirements can help remove trade

²⁰ WRAP (2013) Embedding Sustainability in Design <https://wrap.org.uk/resources/guide/embedding-environmental-sustainability-product-design>

²¹ Green Alliance (2018) ‘[Less in, more out: using resource efficiency to cut carbon and benefit the economy](#)’

distortions caused by the availability of cheap, low-quality products which are preventing more resource-efficient and sustainable options from gaining market share.

4. Informed consumer choice can help drive the market. Existing voluntary and private sector ecolabel schemes often do not focus on resource efficiency and have low consumer awareness. Providing information that consumers can trust, whilst also ensuring producer responsibility for managing products at end of life through take back schemes and funding for the management of waste, can support a shift toward greater resource efficiency. Research by WRAP has shown that products that are labelled with their environmental credentials may be preferred over unlabelled products.²²
5. The UK is well placed to make this shift due to its manufacturing and design expertise. Studies show that designing products to be repairable, and with components suitable for remanufacture can create new economic opportunities for industries focused on repair and remanufacturing.²³ Having left the EU, it is within our gift to drive progress in this field, working where necessary with other countries from across the globe.

What Government will do:

In accordance with our Resources and Waste Strategy, using powers sought through our Environment Bill, we propose to apply the following approach:

- Drive better product design through an integrated three-fold approach:
 - Set **product requirements** where this is a necessary step in tackling **premature obsolescence**.
 - Use **consumer information** schemes to enable consumers to identify **resource-efficient products** and **purchase more sustainably**.
 - Use **Extended Producer Responsibility (EPR)** schemes to ensure that producers cover the cost of recovery for reuse and recycling, encouraging products to be designed in such a way that minimises these costs.²⁴
- Product requirements and consumer information may focus on **durability, reparability and recyclability**, amongst other things, with scope to include other criteria where appropriate (for example water usage during production, release of microfibres or embodied carbon).
- Take forward **producer responsibility** schemes.
- Adopt a **precautionary approach** in relation to chemicals used in products, to guard against future chemical bans leading to products and materials being wasted.

²² WRAP (2019) [The Effectiveness of Providing Pre-Purchase Factual Information in encouraging more Environmentally Sustainable Product Purchase Decisions](#)

²³ Eunomia (2016) [A Resourceful Future – Expanding UK Economy](#)

²⁴ See [Resources & Waste Strategy](#) pp.31-39

- Adopt a **systematic approach** to identifying products for which it is appropriate to regulate as above, with consideration to impacts and costs of implementation, and consult separately on the detail of any regulations.

The actions we propose to take are as follows:

1. For **non-energy-related products, we will use our new Environment Bill powers, subject to Parliamentary approval, to set design requirements for selected products.** To begin this process, we will, following further assessment and prioritisation, pilot one or more initial standards with stakeholders. We will also encourage industry to set their own standards to reduce the need for regulation. The high environmental impact sectors that we propose to choose from initially are textiles, furniture, and construction products. Our aim will be to set horizontal requirements e.g. relating to spare part provision, recycled content, durability, or potential to disassemble and repair or upgrade, for one or more product groups. Examples of second phase products for consideration are nappies, car seats, tyres, and other vehicle components.²⁵ Our choices will again be dependent on an evidence-based prioritisation exercise. To take this forward, we will consider work taking place in other countries, making use of the G7 and G20 Resource Efficiency Alliance in particular. We will also work with standards bodies, recognising the benefits of supporting measures and alignment of goals.
2. **The Department for Business, Energy and Industrial Strategy (BEIS), working with Defra, will launch a new energy-related products policy framework.** This will push for products to use both energy and resources more efficiently. The Government has recently consulted on updated ecodesign requirements for a range of domestic and non-domestic products: these measures will include requirements for reparability and recyclability, which will increase the life span of products through more effective maintenance and ensure more value is retained through recycling at end of life. BEIS and Defra have commissioned research²⁶, to be completed in the first half of 2021, to help inform which energy-related products should be prioritised with regard to gains in energy and material efficiency in the context of our Net Zero commitment. This research will supplement evidence gathered during the recent BEIS Call for Evidence on Ecodesign for Energy-Related Products.²⁷ Government has committed to implement a further set of ecodesign measures that will come into force in 2021.
3. To support **consumers with information**, using the powers we are seeking under the Environment Bill, we will take forward one or more pilot schemes linked to

²⁵ Eurostat (2016) [Smarter, greener, more inclusive? Indicators to support the Europe 2020 strategy](#)

²⁶ <https://erpproductspolicystudy.uk/>

²⁷ <https://www.gov.uk/government/consultations/energy-related-products-call-for-evidence>

ecodesign and/or producer responsibility measures, following our prioritisation process including Defra and BEIS research. The three main approaches we would seek to implement are: a) binary approaches, for example whether a product is recyclable or not such as for packaging; and b) rating schemes based on multi-factorial labels including products' durability, reparability, recyclability/recycled content; and c) one or more wider sustainability conditions as appropriate e.g. release of microfibers. We will work with stakeholders to develop proposals as to the most effective approach for different product groups, and begin with one or more pilot schemes.

4. To drive producer action, we will **develop Extended Producer Responsibility (EPR) schemes for consultation**, and explore, where feasible, modulated fees related to environmental performance, to support a shift towards design for durability, reparability and recyclability, as well as responsibility for management of products at end of life. We expect to have powers to introduce such EPR schemes once the Environment Bill becomes law. More specifically:
 - Action is underway to review and enhance current UK producer responsibility laws on packaging, electrical and electronic equipment, batteries and end of life vehicles, and to introduce new schemes over a number of years, engaging fully with stakeholders in developing them.
 - Additionally, in accordance with our commitments in the Resources and Waste Strategy, by the end of 2025, we will review and consult on EPR for five new waste/material streams. These are textiles, bulky waste (which includes furniture), certain materials in the construction and demolition sector, vehicle tyres and fishing gear. We will seek to complete this for two material streams by 2022: textiles and fishing gear. More waste streams may be added if they become a priority in the future.
5. In parallel with regulatory work on EPR, ecodesign and product information, we will work with industry and key stakeholders to **develop principles and approaches** relating to material usage and good product design, whilst also seeking to incorporate emerging methodologies on lifecycle assessments, as well as conveying information. This will include examining IT-enabled labelling systems.

Question: Do you agree or disagree that the measures described are likely to achieve the overall aim set out at the beginning of this chapter?

- a. Strongly agree**
- b. Agree**
- c. Neither agree nor disagree**
- d. Disagree**
- e. Strongly disagree**

Please provide details / explain your answer

Chapter 3 Reuse, Repair, Refill, Remanufacture: local services and facilities

Our aim: to ensure there is a well-functioning system of public, private and third sector organisations and services operating at the local level that facilitate reuse, repair, refill and remanufacture of products.

1. Reuse and repair are not new practices; they were commonplace in the past. But modern production systems utilising automated assembly lines and global supply chains have changed this. Factories produce things so cheaply that the labour costs of reuse and repair can be more expensive than buying new. The complexity of sending individual products back to the manufacturer for repair, known as “reverse logistics”, makes this difficult to set up and costly, particularly for smaller businesses. However, whilst in some cases fast changing technology can render older products obsolete, most older products continue to be potentially useful, if resold, repaired, or remanufactured.
2. Some local authorities currently facilitate reuse through Household Waste Recycling Centres (HWRCs) and bulky waste collections, whilst the third sector and emerging digital platforms provide further opportunities for sharing and resale. Charity shops are important distributors of second-hand goods on the high-street. For instance, they diverted 323,000 tonnes of textiles from landfill in 2017.²⁸ Social enterprises, such as those within the Reuse Network, repair and resell consumer goods, providing cheaper products for low-income families, and employment to marginalised groups like ex-offenders.
3. Progress has been made in developing new business models in terms of hiring, sharing and leasing models. In this burgeoning “sharing economy”, consumer goods, food, and transport (such as bikes), are distributed on demand using digital platforms, which extends the useful life of products. Defra's Action-Based Research project on a product service system for baby buggies and infant car seats explored the potential for one such business model to be mainstreamed.²⁹ It identified

²⁸ <https://www.charityretail.org.uk/london-assembly-environment-committee-adopts-charity-retail-association-recommendation-on-waste-recycling/>

²⁹ <http://randd.defra.gov.uk/Default.aspx?Menu=Menu&Module=More&Location=None&ProjectID=18198&FromSearch=Y&Publisher=1&SearchText=product%20service%20system&SortString=ProjectCode&SortOrder=Asc&Paging=10%23Description>

liability and reverse logistics as the main challenges to be addressed. Despite these public and private services, a considerable share of products which are suitable for reuse - either collected as part of local authority-run bulky waste collections or taken to HWRCs – are often treated as waste and disposed of or at best, recycled. Of the 62 local authorities who reported on bulky items collected for recycling or reuse at HWRCs in 2019/20, reuse accounted for 8% of the total. Only 15 of these authorities reported more than 100 tonnes of bulky items being collected for reuse with the proportion varying between 4% and 44%.³⁰ A 2012 WRAP study of 14 HWRCs indicated that some 32% of bulky items deposited might be suitable for reuse.³¹

4. Our research suggests that waste prevention and reuse at the local level is held back by a number of factors: including lack of storage space, which is expensive in urban areas, and a regulatory framework which despite the waste hierarchy does not clearly promote waste prevention and reuse. Some stakeholders say the implications of the waste hierarchy duty and what it applies to are unclear. Also, with reusable items being defined as waste once deemed to be “discarded” by an owner, it is intimated that it can be uneconomical to reuse because of the extra regulatory burdens. This issue was also identified in the 2013 Waste Prevention Programme. As a result we updated the [Definition of Waste guidance](#) in 2016. We also supported WRAP to produce [general guidance](#) on the running of HWRCs in 2016.
5. Some local authorities have set up reuse shops in their HWRCs, sometimes in partnership with charities – for instance Warwickshire County Council’s partnership with Age UK. This partnership delivered not only around £90,000 in cost savings for the council, but also £300,000 income to each partner.³² In Hampshire, partnerships with charities have supported 390 low income families to get access to household goods that would have otherwise entered the waste stream.³³ However, we lack robust data on reuse rates at HWRCs, including how individual local authorities compare.
6. We would like to see local authorities taking waste prevention into account in the development of their Waste Management Plans, as well as Site Allocation Plans

³⁰ Information drawn from WasteDataFlow 2019/20 (Bulky waste collected at HWRCs for Reuse and Recycling as reported by Local Authorities in England in 2019/20, where bulky waste comprises bicycles, furniture, mattresses, WEEE – fridges & freezers, WEEE – large domestic appliances, and WEEE – TVs and monitors

³¹ WRAP (2012) ‘Study into the reuse potential of household bulky items’
<https://wrap.org.uk/resources/report/study-reuse-potential-household-bulky-items>

³² Figures from 2017-18, provided by Warwickshire County Council.

³³ Figures from 2016-19, provided by Hampshire County Council

and Local Plans that underpin development control decisions. The evidence suggests that the latter needs to reflect the importance of space for storage of reusable goods, and reuse and repair services. Local authorities are expected to report on “reuse & recycling” and reporting more clearly as to action against each of these would help them meet their duties under the waste hierarchy

7. The Government supports comprehensive and frequent rubbish and recycling collections alongside increasing the prevention of waste. The Environment Bill introduces requirements that will ensure local authorities collect a core set of recyclable materials for recycling, including paper and card; glass; metal; plastic; food waste; and garden waste, from households from 2023. The Environment Bill also contains measures to increase recycling from businesses and other organisations, which the Government is consulting on.

What Government will do:

To take forward our commitments in the Resources and Waste Strategy, we will seek to ensure that Household Waste Recycling Centres (HWRCs) perform a more effective role in resource efficiency and enhance the third sector’s role in promoting reuse. We will support local authority transparency and promote a “business cluster” approach.

To achieve this, we propose to:

1. **Develop an information note for local authorities, including examples of best practice on reuse and providing our interpretation of relevant regulations.** This will, with reference to the waste hierarchy, provide best practice examples as to what can be achieved on prevention and preparation for reuse, in particular through partnerships with social enterprises, and the business case for doing so. It will cover regulatory issues that have been raised with us, such as how best to interpret the definition of waste. It will build on engagement with local authorities and WRAP guidance published over the period of the previous Waste Prevention Programme and inform discussion and local level policy development.
2. Working with regulators and local authorities, **explore improvements to regulatory policy.** This is to encourage action to shift management up the waste hierarchy. It will involve consideration of whether action is needed to: address the interface with chemicals and product safety regulations, clarify the **waste hierarchy duty including its application** to those with substantial responsibilities for materials before they become waste and not simply on transfers of waste, and to amend the definition of waste.

3. **Encourage Local Enterprise Partnerships (LEPs), mayoral combined authorities and other local authorities to pilot local “circular economy hubs”.** These will support reuse, repair and remanufacture services and businesses, **by providing guidance on Local Industrial Strategies and enabling sharing of best practice examples.** These authorities and businesses will in the future be able to bid to other funds to support such schemes and we will seek to make funds available from EPR schemes as they are developed. This will help drive an economic recovery and create local jobs. We will make use of Defra research into possible models of “resource efficiency clusters”³⁴ which suggests alternative models from clusters focused on particular activities, for example repair and remanufacture.
4. **Enhance quality of data by providing voluntary guidance to local authorities on how to fulfil current reporting requirements on reuse and recycling.** The guidance will advise on how best to report on reuse and repair, so that progress is clearly stated. This will ensure the Government has the necessary evidence to understand and encourage action at a local level. We are giving consideration to encourage reporting on reuse through current methodologies. This includes reporting on reuse tonnages through WasteDataFlow and providing data on total waste arisings and for individual waste streams.

Question: Do you agree or disagree that the measures described are likely to achieve the overall aim set out at the beginning of this chapter?

- a. **Strongly agree**
- b. **Agree**
- c. **Neither agree nor disagree**
- d. **Disagree**
- e. **Strongly disagree**

Please provide details / explain your answer

³⁴ WRAP (2019) [‘Resource Efficiency Clusters Case Study Research’](#)

Chapter 4 Data and Information: from industrial symbiosis to research & innovation

Our aim: to ensure there is better access to information as to what secondary materials, including by-products and products, are in the economy, facilitating increased use in manufacturing, and providing for access to knowledge to drive change.

1. Ease of access to data is fundamental to the new industrial economy. One example in the resources and waste context, is enabling better use of industrial secondary materials as inputs (known as industrial symbiosis). In 2018, England produced 10.1 million tonnes of industrial waste.³⁵ In some cases this waste could be used as an input in other processes, replacing use of virgin materials. For instance, blast furnaces, which are used in the steelmaking process, create a slag by-product which can be used as a substitute material to make cement.³⁶ Materials critical for low-carbon industries, such as those needed to manufacture turbines and electric vehicle batteries, can also be derived from industrial waste such as steel slag and fly ash.³⁷
2. The UK is increasingly a net importer of materials. In 2017, the UK's material footprint was estimated at 1.2 gigatonnes.³⁸ By using more secondary materials and industrial by-products in manufacturing, and thereby reducing consumption of raw materials, we can significantly reduce waste, greenhouse gas (GHG) emissions and increase resource efficiency.
3. Industrial symbiosis can also generate jobs across different regions and promote growth for the UK economy. A study suggests that if fully implemented, industrial symbiosis could create approximately £6.9 billion of extra value for the UK economy through money saved from landfill diversion alone.³⁹ However, due to data limitations this estimate does not account for the upstream market potential of resources not becoming waste through greater reuse and recirculation of materials, and if included the estimate could be much higher. The National Industrial

³⁵ [UK Statistics on Waste](#)

³⁶ <https://www.globalcement.com/magazine/articles/419-steel-slag-a-supplementary-cementitious-material-and-basis-for-energy-saving-cement>

³⁷ Resource Recovery from Waste (2018) '[Making the most of industrial wastes: strengthening resource security of valuable metals for clean growth in the UK](#)'

³⁸ <https://www.ons.gov.uk/economy/environmentalaccounts/articles/materialfootprintintheuk/2017>

³⁹ Technopolis Group (2018) [Cooperation fostering industrial symbiosis: market potential, good practice and policy actions](#), number in publication: €7,642,871,207

Symbiosis Programme (NISP) which operated between 2005 and 2013, is reported to have generated value and delivered significant savings for businesses.⁴⁰ This programme demonstrated to businesses what could be achieved through better collaboration on use of industrial by-products and secondary materials.

4. Many stakeholders identify lack of access to data and information about material stocks and flows as a key barrier to industrial symbiosis in the UK. There is no single, reliable source of data on the availability of by-products or the location of materials which have already become waste. Other barriers include insufficient resource or knowledge to invest in symbiosis, negative perceptions about the quality of secondary materials and possible regulatory provisions on movement of materials across borders. Actions are underway to address this information and the data barrier as explained in the following section.
5. “Product passports” could also improve access to data and enable more efficient use of resources. Product passports involve accessible information on the material constituents of products to facilitate more effective recovery and reuse of their materials, including critical raw materials such as rare earth elements, cobalt or lithium. These materials are mostly imported and are important for low-emission technologies such as electric vehicles, wind turbines, batteries and solar farms.⁴¹ Improved access to information through product passports can aid the extraction, reuse and recirculation of these valuable materials which will contribute towards improved resource security and, where possible, prevent those critical raw materials from becoming waste. Defra has recently published a report on these materials.⁴²
6. Reducing the use of hazardous substances in materials and products can encourage use of secondary materials as they are more likely to comply with the potentially more stringent future restrictions on the use of hazardous substances, including restrictions on the use of future Persistent Organic Pollutants. This can partly be achieved by better identification and tracking of chemicals in products. We are currently considering how best to address this across supply chains to reduce barriers to reuse and recycling. We are committed to the safe and effective management of chemicals, including the use of substances of very high concern.

⁴⁰ Reported recovery and reuse of at least 47Mt of materials, savings of £1bn for businesses, and creation or safeguarding of 10,000 jobs. Figures from International Synergies, independently verified.

<https://www.international-synergies.com/projects/national-industrial-symbiosis-programme/>

⁴¹ Resource Recovery from Waste (2018) ‘[Making the most of industrial wastes: strengthening resource security of valuable metals for clean growth in the UK](#)’

⁴² Eunomia (2020) ‘Review of the Future Resource Risks Faced by UK Business’
http://scienceresearch.defra.gov.uk/Document.aspx?Document=14982_EunomiaFutureResourceRisk-FinalReportv3.pdf

7. Recent studies on the use of secondary materials and by-products in industry have identified facilitation as a crucial element that is needed to advance the implementation of industrial symbiosis.⁴³ Facilitation accelerates symbiosis through the identification of potential opportunities to use secondary materials as inputs between potential partners or businesses. Further research is needed to establish the economic and material potential for increased symbiosis activity in the UK and the role of a facilitated network within this.
8. Symbiosis programmes could be managed at a regional level, for example through the 38 Local Enterprise Partnerships across England. However, only one local area (in the West Midlands) is currently running an Industrial Symbiosis (IS) programme. We are aware that the new business-led UK Resources Council is investigating the possibility of such regional hubs and may be well-positioned to support this going forward.
9. Another important area to make progress in is corporate transparency. Considerable headway has been made on common standards of carbon reporting, but not yet on resource efficiency, use of secondary materials or levels of reuse of products and materials.

What Government will do:

The Government committed in the Resources and Waste Strategy to address information barriers to the use of secondary materials. To take this forward we propose to:

1. The Office for National Statistics (ONS) with input from Defra and key stakeholders from academia and industry, will work to develop a plan for a **National Materials Datahub** so that it can support investment in the UK by companies that will use secondary materials as inputs. A core objective is to provide a detailed and integrated data system to enable visibility of material flows to drive greater resilience and circularity. This is an ambitious long-term project still in its early stages and the means of funding this project is being explored.
2. Take action to establish an **electronic waste tracking** system, subject to consultation, as committed to in the Resources and Waste Strategy. This will enable more granular data on the location and content of waste materials. Working with industry, we will explore how this electronic waste tracking system could be taken forward so users will be able to access the information they need to better

⁴³ <https://op.europa.eu/en/publication-detail/-/publication/f26dfd11-6288-11ea-b735-01aa75ed71a1>

understand and manage their waste and find the right destination for it. We will also explore how else it may offer opportunities for use of waste as a secondary material.

3. Explore using the powers we are seeking in the Environment Bill for the introduction of **“product passport”** requirements, to support reuse and extraction of secondary materials. This could be in combination with an Extended Producer Responsibility scheme or ecodesign/consumer information pilots such as for energy-related products.
4. The Department for Business, Energy & Industrial Strategy (BEIS) will consider **the potential role of industrial symbiosis in reducing emissions from industry**. BEIS is also commissioning early-stage research on how a facilitated industrial symbiosis network could operate.
5. Support the new **National Interdisciplinary Circular Economy Research programme (NICER)**, set up under the Strategic Priorities Fund, which was developed to match academic research to government strategic need. With the support of Defra, a total of £30 million for research funding has now been allocated through the Engineering and Physical Sciences Research Council to establish five circular economy research centres and a central hub to coordinate activity. These five programmes cover textiles, chemicals from waste, metals, critical minerals and construction. In addition to government research funds, the programmes will receive substantial support from UK industry. The circular economy programme therefore harnesses both industry expertise and academic excellence to deliver for the Government.
6. Working with businesses, explore how they can improve voluntary **reporting systems** to include information on use of secondary materials and rates of reuse of products. We will consider using existing voluntary schemes such as the Global Reporting Initiative and CDP (previously known as the Carbon Disclosure Project).

Question: Do you agree or disagree that the measures described are likely to achieve the overall aim set out at the beginning of this chapter?

- a. Strongly agree**
- b. Agree**
- c. Neither agree nor disagree**
- d. Disagree**
- e. Strongly disagree**

Please provide details / explain your answer

Chapter 5 Construction

Our aim: to reduce construction waste and increase the reuse of construction materials at their highest value. This means designing buildings for adaptability and deconstruction, increased reuse of components, use of materials that can be reused and recycled, and improved demolition systems.

1. The UK construction sector uses the most resources of any sector.⁴⁴ This sector is also the largest generator of waste, producing over 60 million tonnes of non-hazardous waste each year in England, with up to 15% of materials being wasted during the construction process, and around 50,000 buildings demolished annually.⁴⁵ Around 90% of construction waste is recycled or recovered, but much of this is “downcycling” – for instance, when waste is used to fill holes on sites or is crushed into aggregate, which is inefficient in terms of the energy used to create these materials.⁴⁶
2. The manufacture of construction materials is responsible for 11% of global CO₂ emissions.⁴⁷ Much of the focus on carbon emissions in the built environment has been on operational energy use and its associated emissions, but at least 25%, and in some cases as much as 60%, of a building’s whole life emissions derive from its materials.⁴⁸
3. Therefore, reusing materials in construction can significantly reduce whole life carbon emissions of a building, with one study showing an average of 25% reductions across different material types in a 30% reuse scenario.⁴⁹ If we were to reduce these emissions through optimising building design and increasing reuse of materials, alongside using more low-carbon materials (such as using timber instead of steel and bricks, where it is safe to do so), we could reduce carbon emissions by 79.14 MtCO₂e between 2023 and 2032.⁵⁰

⁴⁴ Ellen MacArthur Foundation (2019) ‘[First steps towards a circular built environment](#)’

⁴⁵ [UK Statistics on Waste](#); Ellen MacArthur Foundation (2019), ‘[First steps towards a circular built environment](#)’; Adams K (2013). CD&E WASTE: Halving Construction, Demolition and Excavation Waste to Landfill by 2012 compared to 2008,

⁴⁶ [UK Statistics on Waste](#)

⁴⁷ UN Environment (2017) ‘[Global Status Report 2017](#)’

⁴⁸ The percentage depends on the type of materials used and the type of building. Source: <http://ciemap.leeds.ac.uk/wp-content/uploads/2018/05/Briefing-Note-5.pdf>

⁴⁹ Unpublished research provided to Defra by University of Exeter

⁵⁰ Green Alliance (2018) ‘[Less in, more out: using resource efficiency to cut carbon and benefit the economy](#)’

4. After the Second World War, reuse of building materials from redundant military buildings was commonplace but reuse of materials in construction is now rare. It is possible to reuse many elements of buildings, from structural elements such as steel beams, bricks, and roofing, to fixtures such as windows and windowpanes, and flooring materials. Reusing is substantially better than recycling in terms of reducing emissions.⁵¹ Buildings are generally not designed with end-of-life in mind, meaning that much of the potential value of a building is lost once it is demolished. Low rates of reuse can also be attributed to the high volume, low value nature of most construction materials, which means that reused materials are not price competitive, as well as a lack of information on materials that are available for reuse, and unreliable markets for secondary material.
5. We want the sector to meet the challenges of net zero and reducing waste, by transforming their practices to improve resource efficiency, and to recognise the value in construction materials and products as long-term assets. This includes designing buildings to be disassembled rather than demolished, and to be adaptable to meet changing future needs. Waste should be properly managed during the construction process, such that different waste streams are properly segregated, and recyclable or reusable materials are identified, properly stored and put on the market. The sector is undergoing a digital transformation, and part of this digitalisation should include improving data on what makes up our building stock, using technology such as Building Information Modelling.
6. There are initiatives across the sector seeking to drive the transition towards circularity. MI-ROG, a grouping of major infrastructure operators convened by the consultancy AECOM, is exploring opportunities to share materials between projects through a “Resource Exchange Mechanism”.⁵² The Steel Construction Institute recently published a [protocol](#) to help construction companies reuse structural steel.⁵³ BREEAM, Home Quality Mark and other sustainability assessment schemes seek to encourage better practice by awarding credits for keeping waste generation under a certain level – through best practice techniques such as pre-demolition audits, designing for adaptability and disassembly, and setting up systems to segregate and sort on-site waste.

⁵¹ Data from University of Exeter, unpublished.

⁵² https://www.aecom.com/content/wp-content/uploads/2019/10/MI-ROG-White-Paper_3-The-Case-for-a-REM_Oct2019.pdf

⁵³ <https://steel-sci.com/assets/downloads/steel-reuse-protocol-v06.pdf>

Spotlight: Construction of the Queen Elizabeth Olympic Park

The Olympic Park, constructed for the 2012 London Olympics, is an example of the level of waste prevention that can be achieved if circular principles are embedded into the design of a project.

Various steps were taken during the construction process to minimise waste, such as proper segregation of waste, avoiding over-ordering, pre-deconstruction auditing and material assignment, and correct storage of materials. The Olympic Stadium was designed with resource efficiency in mind, using 90% less steel than Beijing's Bird Nest stadium.

Many of the Park's structures were designed to be partly disassembled after the end of the event, to ensure that the facilities could then be scaled down in size to create a site more suitable for post-Olympic levels of usage.

The project achieved a 98.5% reuse and recycling rate, equivalent to 425,000 tonnes of demolition waste diverted from landfill. Nine steel-framed buildings were deconstructed for reuse. Demolition material was processed into aggregate on site, saving 20,000 tonnes of new material and over 20,000 lorry movements.

(Source: Resource Efficient Use of Mixed Waste
ec.europa.eu/environment/waste/studies/cdw/CDW_Task%20Case%20studies_Olympic.pdf)

What Government will do:

The Government has recently announced proposed reforms to streamline and modernise the planning process, bringing a new focus to design and sustainability. We have made significant progress in recent years to increase house building, with construction rates at a 30-year high. We will work with the sector to ensure new construction is carried out in a timely but resource efficient manner. To do this we propose to:

1. **Work with industry through the Green Construction Board** to publish a routemap to achieving **Zero Avoidable Waste in the sector by 2050**. The routemap, due for publication in Spring 2021, will set out further short-term actions to facilitate this transition, including promotion across the industry of best practice in managing waste on construction sites.
2. Enable a shift in the design of construction products to encourage greater reuse and use of recycled materials. This could be to ensure, for instance, that windows are designed so they can be dismantled, or precast concrete panels designed so that they can be reused, as well as encouraging a shift towards recyclable materials and those with high recycled content. To do this we will begin by working with

industry through the Green Construction Board and, as stated in our Resources and Waste Strategy, **review and consult on Extended Producer Responsibility, for “certain materials in the construction & demolition sector”, by the end of 2025**, including considering the potential for supporting ecodesign and labelling schemes building on existing industry standards.

3. In relation to the Ministry of Housing, Communities and Local Government (MHCLG)’s ongoing work towards ensuring that all new homes are aligned with a zero-carbon future, **MHCLG will with Defra’s input explore how embodied carbon can be reduced through waste prevention solutions**. This will be presented by MHCLG in a discussion document on the future of low carbon new buildings.
4. MHCLG will encourage local authorities **to take action through the planning process to promote sustainable resource use in new construction** – which could include, for example, a preference for reuse and refurbishment of existing building stock or setting embodied carbon targets for new developments.
5. Work across Government to explore how to improve building-level information on the materials and components in individual buildings.

Question: Do you agree or disagree that the measures described are likely to achieve the overall aim set out at the beginning of this chapter?

- a. **Strongly agree**
- b. **Agree**
- c. **Neither agree nor disagree**
- d. **Disagree**
- e. **Strongly disagree**

Please provide details / explain your answer

Chapter 6 Textiles

Our aim: to address the negative environmental impacts of the textiles sector and fast fashion, including by supporting more sustainable design, improved consumer information, new business models and better recycling.

1. Global Fashion Agenda and McKinsey reported that the global fashion industry produced around 2.1 billion tonnes of greenhouse gas (GHG) emissions in 2018, equalling 4% of the global total.⁵⁴ This is equivalent to the combined annual GHG emissions of France, Germany and the UK.⁵⁵ 17 to 20% of industrial water pollution globally arises from textile treatment and dyeing.⁵⁶ Clothing in use in the UK accounts for 26.2Mt CO₂e of our carbon footprint and has a water footprint of 8 billion m³ on a consumption basis, with the greatest impact coming from fibre production.⁵⁷
2. We buy and throw away increasing amounts. The purchase of clothing in the UK rose by almost 20% between 2012 – 2016.⁵⁸ Globally, clothing production approximately doubled between 2000 – 2015, whilst the average number of times a garment is worn before it is disposed of has decreased by almost 40% over the same time-span.⁵⁹ If growth continues at this rate, the fashion industry could use more than 26% of the world's carbon budget by 2050.⁶⁰ Fast fashion contributes to this growth, as inexpensive clothing supported by low labour costs, often poor working conditions globally, seasonal trends, and increased purchasing power, lead to many consuming and disposing of more clothes.
3. Approximately 921,000 tonnes of used textiles are disposed of in household residual waste in the UK each year, destined for landfill and incineration, including around 530,000 tonnes of clothing, shoes, bags and belts, and 391,000 tonnes of non-clothing textiles (2017).⁶¹ While we have made progress on collections, with 620,000 tonnes of used textiles collected for reuse and recycling in 2018, there is scope for further action

⁵⁴ Global Fashion Agenda and McKinsey (2020) Fashion on Climate. Available at <https://www.mckinsey.com/~media/mckinsey/industries/retail/our%20insights/fashion%20on%20climate/fashion-on-climate-full-report.pdf>

⁵⁵ Global Fashion Agenda and McKinsey (2020) Fashion on Climate

⁵⁶ R Kant (2012) 'Textile dyeing industry: An environmental hazard', Natural Science, Vol. 4, 1, p.23

⁵⁷ WRAP (2017) '[Valuing Our Clothes](#)'

⁵⁸ WRAP (2017) '[Valuing Our Clothes](#)'

⁵⁹ UNEP, Ellen MacArthur Foundation (2017) '[A new textiles economy](#)'

⁶⁰ Note: based on 2° pathway. Source: Ellen MacArthur Foundation (2017) '[A new textiles economy](#)'

⁶¹ WRAP (2019) 'Textiles market situation report' <https://wrap.org.uk/resources/market-situation-reports/textiles-2019>

in this field. In terms of end markets for collected textiles, 60% is exported to international used textiles markets predominantly for reuse, around 32% reused in the UK mostly through charity shops and only 3% is recycled.⁶²

4. Progress has been made by industry, with the Sustainable Clothing Action Plan 2020 (SCAP), a voluntary agreement coordinated by WRAP, playing a key role.⁶³ Signatories have succeeded in reducing their water footprint per tonne of clothing by 19.5%, and their carbon footprint per tonne of clothing by 15.9% between 2012 – 2019, exceeding the 15% reduction target. There has also been a 2.3% reduction in waste produced over whole product lifecycles since 2012, against a target of 3.5%.⁶⁴ We have seen innovation by some brands and small businesses leading to increased use of sustainable fibres and exploration of business models to increase reuse, collection, and recycling.

Spotlight: H&M

In February 2013, H&M introduced a global garment collection programme in collaboration with I:Collect (I:CO) for the collection, sorting reuse, and recycling of used textiles and footwear. Globally, in 2019, the H&M Group (including & Other Stories, Monki and Weekday) collected 29,005 tonnes of textiles for reuse and recycling. Half of this is reused through resale platforms or charity partners, and the rest recycled into insulation, or new textiles fibres where recycling solutions exist. For each kilogram of textiles collected, €0.02 is donated to a local charity organisation. The H&M Innovation Hub have launched pilots to address other forms of textile waste, for example, the Weekday Re-Made collection refashioned unsold stock into new items to put back on the market. The H&M Group are also supporting companies innovating in the recycling of textiles fibres such as Worn Again, Ambercycle, Infinited Fibre and re:newcell.

(Sources: hmgroupp.com/sustainability/circular-and-climate-positive/recycling.html; and www.edie.net/news/5/H-M-reaches-clothing-take-back-target-early--collecting-29-000-tonnes-of-used-garments/)

5. Despite progress, barriers to better waste prevention remain. These include poor design leading to short clothing lifespan, a fast fashion culture with high quantities of clothing being purchased for minimal use, difficulties with collecting used textiles, and limited innovation such as on fibre-to-fibre recycling. Global supply chains with low labour costs elsewhere and the absence of measures globally to address carbon emissions and water usage increase the problem. The Environmental Audit Committee (EAC) explored these issues in 2019, making a number of recommendations in its

⁶² WRAP (2019) 'Textiles market situation report' <https://wrap.org.uk/resources/market-situation-reports/textiles-2019>

⁶³ <https://wrap.org.uk/resources/guide/textiles/sustainable-clothing-action-plan>

⁶⁴ <https://wrap.org.uk/resources/report/scap-2012-2019-progress-report>

report “Fixing fashion: clothing consumption and sustainability”, and has since launched a follow-up inquiry in October 2020. Government agreed with many aspects of the 2019 Fixing Fashion report, recognising the connection between poor labour standards, low-cost goods, and a disposable approach to fashion, and is committed to taking forwards the best mix of policy measures to reduce the negative impacts of the clothing industry.

6. There is significant scope to improve the durability, reparability, recyclability, and use of recycled content in garments. Extending the active life of 50% of the clothing purchased in the UK by nine months could lead to an 8% reduction in the total carbon footprint and 10% reduction in the total water footprint of clothing in the UK.⁶⁵ Increasing reuse and reselling of pre-owned garments, known as “recommerce” can significantly lower carbon emissions from clothing manufacture as the impact of reused items are far lower than new equivalents.
7. Research shows that shifting to new business models should generate new jobs, growth, and give rise to opportunities through technological innovation.⁶⁶ Innovation in these respects brings opportunities for the UK clothing sector to align itself with climate and other environmental goals. It could reduce waste management and local authority costs associated with landfill, generate revenue for reuse organisations and individuals who resell items, and help households save money. An estimated 0.82Mt of clothing and household textiles per year could be diverted from landfill or incineration, saving the UK economy approximately £82 million per year in waste disposal costs.⁶⁷

What Government will do:

We want to encourage a textiles and clothing sector where items are made to last from materials that are safe and renewable, and where items are easy to reuse, repair, and recycle. We propose to adopt an integrated approach, recognising the need to address social, behavioural, and technological aspects of the industry. The approach will also address other aspects of the textile sector that offer opportunities to design out waste. We propose to do so by taking the following steps:

1. Galvanise ambitious industry action through a **new voluntary agreement for 2021-2030, Textiles 2030**. This will build on the Sustainable Clothing Action Plan 2020 (SCAP), with its progress to date in reducing textile products’ environmental footprints, and WRAP’s expertise in the field. We have worked with WRAP and industry through the Textiles 2030 Advisory Group to develop the new agreement to place greater

⁶⁵ WRAP (2017) [‘Valuing Our Clothes’](#)

⁶⁶ WRAP (2013) [‘Financial viability of innovative business models in clothing’](#)

⁶⁷ WRAP (2014) <https://wrap.org.uk/resources/report/evaluation-end-markets-textile-rag-and-fibre-within-uk>

emphasis on reducing waste, aligning with global goals and driving the shift to a more resource efficient textiles sector in the UK. Our aim is to convene cross-sector action, which is focussed on clothing durability, recyclability, reuse business models and closed-loop recycling. The membership base will commit to reduce its environmental footprint and meet the following targets by 2030: reduction in greenhouse gas (GHG) footprint to align with limiting global warming to 1.5°C; 30% reduction in water footprint; and, through collaboration, create and deliver a UK-wide Roadmap for Circular Textiles. Signatories more advanced in sustainability will also collaborate to trial and champion circular pilots and projects.

2. **Develop a proposal for Extended Producer Responsibility (EPR) for textiles, supported by measures to encourage better design and information, and consult with stakeholders on options by the end of 2022**, alongside the other policy measures specified below. The objective is to increase the reuse and recycling of textiles, thereby reducing the amount of textiles going to landfill and incineration, and encourage sustainable design and material use. We will explore EPR as a means of supporting enhanced collection services and increasing recycling rates, and explore how an EPR scheme can support design for durability and recycling, encourage reuse and support circular business models such as rental schemes. This follows on from our commitment in the RWS to consult on the potential of extended producer responsibility (EPR) on five priority waste streams by 2025 (two by 2022), which identified textiles, including clothing, as a priority sector. We will consider EPR alongside measures such as a landfill/incineration ban, separate textiles collection requirements, and the ecodesign and information requirements referred to below to drive action higher up the waste hierarchy.
3. **Encourage industry to set effective standards on resource efficient product design.** Where they do not do so, we will seek to drive behaviour change by business and consumers using powers to be acquired through the Environment Bill. These powers will enable us to set minimum standards for textile products and introduce requirements for improved labelling and consumer information focused on durability, reparability, recyclability, and recycled content as well as production impacts. We are currently exploring the potential for product design requirements on, for example, resistance to abrasion, dimensional stability, and colour fastness in order to impact the durability and environmental impacts of clothing. We are also considering introducing requirements for improved labelling and consumer information, for example on recyclability and recycled content, conditional as with other policies on analysis of consumer and other impacts. With fast fashion contributing to climate change through extensive carbon emissions, these measures will help reduce the environmental footprint of clothing.
4. **Explore the need for and best means of enabling better textile waste collections**, including how best to fund this, with the expectation that this will be through EPR.

5. Building on insights from our research, as well as government support through the Resources Action Fund for textiles reuse and recycling, we **will identify how best to support investment and innovation in the textiles reprocessing sector.**
6. With support from Defra, £30 million of research funding has been allocated through the Engineering and Physical Sciences Research Council (EPSRC) to establish five circular economy research centres and a central hub to coordinate activity. One of the centres funded, the Interdisciplinary Textiles Circularity Centre, aims to support a more circular economy for textiles by leading research on technological innovation to create renewable materials for use in textiles products from post-consumer textiles and household waste. The centre also aims to develop UK-based circular supply chains from waste management and farming to textiles production and design. This programme will harness academic excellence and industry expertise to deliver for the UK Government.

Question: Do you agree or disagree that the measures described are likely to achieve the overall aim set out at the beginning of this chapter?

- a. Strongly agree
- b. Agree
- c. Neither agree nor disagree
- d. Disagree
- e. Strongly disagree

Please provide details / explain your answer

Chapter 7 Furniture

Our aim: to address the negative environmental impacts of the furniture sector, by supporting more sustainable design, improved consumer information, enhanced collection, reuse, and repair services.

1. Over 670,000 tonnes of furniture are disposed of annually in the UK, constituting around 2.5% by weight of all waste arising from UK households.⁶⁸ Many items which have the potential to be reused or recycled are instead disposed of in landfill or incineration. Only 17% of sofas are reused in the UK, for example, but this reuse saves 0.52Mt CO₂e per year.⁶⁹ In 2010/11, over 45% of furniture collected at the kerbside and deposited at Household Waste Recycling Centres was assessed as being reusable in its current condition or with slight repair.⁷⁰
2. The furniture industry, including hard and soft furnishings (e.g. mattresses, carpets) is carbon intensive. The furniture industry in the UK had a carbon footprint of 9.9Mt CO₂e in 2014.⁷¹ This represents over 1% of UK's carbon footprint on a consumption basis.
3. For those consumers and businesses who want to give their furniture a second life, avenues to donate or sell on items have grown substantially since the Waste Prevention Programme 2013. The Reuse Network estimate that they have provided reused furniture (and electrical items) to 1.6 million households, leading to £468 million in savings for households.⁷² However, many barriers continue to limit waste prevention and reuse in the furniture industry, including a lack of storage and householders' safety concerns in allowing collection of items from their homes.
4. Other barriers pertain to the design of products. An estimated 80-90% of the environmental impacts in the life cycle of furniture items is linked to the design and components of the products.⁷³ The variety of materials, prevalence of composite

⁶⁸ WRAP (2012) 'Study into the reuse potential of household bulky items'

<https://wrap.org.uk/resources/report/study-reuse-potential-household-bulky-items>

⁶⁹ WRAP (2011) 'Benefits of reuse case study: Domestic furniture' <https://wrap.org.uk/resources/case-study/benefits-reuse-case-study-domestic-furniture>

⁷⁰ WRAP (2012) 'Study into the reuse potential of household bulky items'

<https://wrap.org.uk/resources/report/study-reuse-potential-household-bulky-items>

⁷¹ CIEMAP for Defra, 2018

⁷² Reuse Network (2019) 'Social Impact Report 2019' <https://reuse-network.org.uk/wp-content/uploads/2020/02/Reuse-Network-Social-Impact-Report-2019.pdf>

⁷³ JRC 2017 'Revision of the EU Green Public Procurement Criteria for Furniture'

materials and sandwich designs (e.g. wood replacements, mattresses), and high chemical content (e.g. flame retardants and persistent organic pollutants) can significantly limit opportunities for reuse, disassembly, and recycling at end of life. Contamination and the removal of safety and fire labels by consumers further prohibits the reuse of many items.

5. A rise in a disposable culture, increased purchasing power, and a lack of time, skills, and repair services as well as a perception that “second hand” is inferior continue to encourage buying new items.
6. Increasing waste prevention in the furniture industry is key not only to reducing greenhouse gas emissions and risks of chemical pollution, but it can also generate jobs and growth. For instance, because an estimated 99% of sofas purchased in the UK are manufactured abroad, reuse does not displace domestic manufacturing jobs, instead creating employment opportunities through local authorities' waste management operations, repair services, and charities. It also reduces landfill costs and reduces household costs. Households can benefit by over £320 million a year as a result of the sale of items through reuse.⁷⁴
7. Many businesses are also taking action to reduce waste including through trade associations, reuse initiatives, innovative business models, sustainability programmes, and investment in research and reuse organisations. The Furniture Industry Research Association (FIRA), for example, is helping to collect evidence and support businesses to trial new models and action-based research projects. Some businesses, such as Ikea, have gone as far as setting highly ambitious targets and implementing extensive design, reuse, and repair initiatives (see inset box). Industry can take further action to develop the design of products and systems such as take back schemes that reduce products' and processes' negative impacts on the environment. A good example in terms of design is the National Bed Federation's free guide to ecodesign principles for the UK bed sector.⁷⁵ It describes ten key principles of ecodesign applicable to the sector, covers compliance requirements and presents recommendations for an ecodesign approach to mattress and bed products as well as a 'Red List' of practices which need to be avoided.

⁷⁴ WRAP (2011) 'Benefits of reuse case study: Domestic furniture' <https://wrap.org.uk/resources/case-study/benefits-reuse-case-study-domestic-furniture>

⁷⁵ Available at <https://www.bedfed.org.uk/nbf-green/ecodesign-principles/>

Spotlight: Business in the Community

One of the hidden impacts of COVID-19 has been the huge volumes of furniture, IT and other office assets that risk becoming waste as businesses reconfigure or relocate their offices. Business in the Community (BITC) estimate that for an average office reconfiguration to enable social distancing, as much as 44% of desks and chairs are put at risk of being wasted.

In collaboration with Circular Economy Taskforce members JLL, Crown Workspace and Amey, BITC developed a simple guide showing how businesses can prevent waste, save costs, lower embodied carbon, engage employees and support communities by prioritising reuse as they transition their workplaces. The guide builds on the successful Circular Office initiative – which saw over 120 companies embedding circularity into the design and operation of their workplaces – and BITC will work with its members to systematically design waste furniture and IT out of office transitions in 2021 and beyond.

8. Government too has focused on setting an example through its Greening Government Commitments, Government Buying Standards, and the introduction of a government-wide 'swap shop' for stationary, equipment, and furniture. The Reuse of Government Assets Pilot led to £103,000 savings in procurement costs and 55 tonnes of CO₂e emissions avoided between April 2016 and October 2017. The Government Property Agency continues to operate a swap shop via an online platform.

What Government will do:

To take forward our commitment to improve waste prevention in the furniture sector as outlined in the Resources and Waste Strategy, we will continue to work with industry and other stakeholders to stimulate action and determine the best policy measures. Our proposals at this stage are to:

1. **Encourage sharing of best practice** as to product design and take-back systems. This will be through trade associations, voluntary agreements, and industry standards, such as recent initiatives to reduce waste of mattresses led by the National Bed Federation.
2. In parallel, explore the benefits of using powers to be acquired through the Environment Bill to set **minimum standards focused on durability, reparability, recyclability, and recycled content of furniture, as well as requirements for improved labelling and consumer information in order to level the playing field**. We will begin with a pilot in one product area e.g. furniture or textiles, and then explore other product groups and sectors. Particular aspects of furniture

design that might be addressed have been identified including ease of dismantling and cleaning of fabrics as well as chemical content, for example in relation to mattresses.

3. To optimise the value we obtain from our furniture, **encourage Local Enterprise Partnerships and local authorities to offer support to businesses that adopt circular models** enabling longer life and ease of repair, as well as reuse platforms, and leasing systems. This could be through the reuse/repair/remanufacture clusters as explained in Chapter 3, or through supporting the operations of charities, social enterprises, and small businesses in the furniture sector, considering the important role that these organisations play in the sector.
4. In accordance with our commitments in the Resources and Waste Strategy, develop a proposal for Extended Producer Responsibility (EPR) for bulky waste (which is essentially furniture and furnishings) as a means of, amongst other things, encouraging improvement in design of furnishings and furniture, and seek to consult on this by the end of 2025.

Question: Do you agree or disagree that the measures described are likely to achieve the overall aim set out at the beginning of this chapter?

- a. **Strongly agree**
- b. **Agree**
- c. **Neither agree nor disagree**
- d. **Disagree**
- e. **Strongly disagree**

Please provide details / explain your answer

Chapter 8 Electrical and Electronic Products

Our aim: to increase levels of collection of Waste Electrical and Electrical Equipment, increase reuse, repair and remanufacture of electronic and electrical products and develop options to design out waste using ecodesign principles.

1. The UK electronics sector experienced the fastest growth of any manufacturing sector in 2018.⁷⁶ It is estimated that the UK generated approximately 1.5 million tonnes of Waste Electrical and Electronic Equipment (WEEE) in 2017.⁷⁷ Of the WEEE generated in that year, 42% was treated and reported within the regulatory system; approximately 34% was likely to be treated or reused in some way but not reported; and around a quarter (24%) was potentially lost to the residual waste stream.⁷⁸
2. The UK has performed well in comparison to EU member states in terms of collections of WEEE for recycling. The next challenge is to increase waste prevention – reuse, repair and remanufacture. It is estimated that almost a quarter of electronic products people throw away could be suitable for reuse.⁷⁹
3. Reducing electronic waste can help cut carbon emissions. The resource extraction for, and manufacturing of, electronic products such as mobile phones contributes to more than 50% of their total lifetime CO₂ emissions.⁸⁰ The rise in purchases of electronic goods is a significant driver of emissions globally. By 2040 and on current trends, it is estimated that worldwide emissions from the production and use of electronics could rise to a level exceeding half that associated with the global transportation sector today.⁸¹
4. Rising consumption globally has a bearing on resource security: Electrical and Electronic Equipment (EEE) contains valuable critical raw materials such as gold, lithium and platinum. Ensuring WEEE is diverted from landfill and incineration by prioritising activities such as remanufacture, repair, reuse and recycling, is crucial

⁷⁶ Make UK (2019) '[Sector Bulletin: Electronics](#)'

⁷⁷ Valpak (2018) '[EEE Flow 2018 Report](#)'

⁷⁸ Valpak (2018) '[EEE Flow 2018 Report](#)'

⁷⁹ WRAP (2020) '[Realising the Reuse Value of Household WEEE](#)'

⁸⁰ UN Environment Programme (2017) '[The Long View: Exploring Product Lifetime Extension](#)'

⁸¹ Belkhir and Elmeligi (2018) '[Assessing ICT global emissions footprint: Trends to 2040 & recommendations](#)'

for retaining these materials within the economy. The value of raw materials in global e-waste stood at roughly \$57 billion in 2019.⁸²

5. There are also issues with inappropriate disposal of Waste Electrical and Electronic Equipment (WEEE), with a significant amount ending up in residual waste or losing its value due to being hoarded. This is mostly because of a lack of consumer awareness about what to do with unwanted electronics. Progress has been made by industry in trying to increase collections of WEEE to ensure it enters established treatment routes, including using funds raised through the WEEE Compliance Fee⁸³. This has been used to support local authority projects aimed at increasing the availability and convenience of collection points, for example through kerbside collections, and a communications campaign encouraging consumers to take their electronics to appropriate designated WEEE collection points and reusing their equipment, if able to do so.
6. Increasing rates of reuse, repair and remanufacture remains a challenge because of the dominant linear business models geared towards high sales volume and low upfront costs. Moreover, high costs, due to labour costs and complex logistics, discourage consumers from repairing products. A lack of consumer trust in claims of durability and reparability and in second-hand goods are a further challenge.
7. Some progress has been made in product design and supporting a shift higher up the waste hierarchy. WRAP has partnered with businesses in the electrical and electronics industry to identify opportunities for business growth through the adoption of more sustainable business practices. Launched in 2014, this resulted in various outputs including the Better Appliances Guides and guidance on how to improve product durability. These were published and are available online, though their impact is unknown. The proposed Sustainable Electricals Action Plan (subsequently renamed the Electrical and Electronic Equipment Sustainability Action Plan or 'esap'), was originally intended to be a voluntary agreement similar to those already in place for food and clothing. It was adapted and eventually replaced with a series of bespoke projects to tackle electrical waste, including to study the age of electronic products at the point of disposal to see where organisations can provide better product longevity and better lifetime guarantees.
8. In 2018/19 the Government supported a package of proposals for further ecodesign regulation of electrical and electronic equipment at EU level. The products covered by this package of new regulations include a range of industrial products, white goods, electronic displays and lighting products. The majority of these new

⁸² <http://ewastemonitor.info/>

⁸³ <https://www.recycleyourelectricals.org.uk>

regulations did not come into force in the EU until after the end of the Transition Period, so the Government consulted on proposals to introduce them in Great Britain (they will automatically apply in Northern Ireland under the Northern Ireland Protocol). The Government will introduce the new Ecodesign Regulations for industrial products, white goods and electronic displays included in this package later in 2021⁸⁴; and a decision on the proposal to introduce the new ecodesign requirements for lighting products will follow in due course. These Ecodesign Regulations set higher Minimum Energy Performance Standards (MEPS), as well as measures aimed at increasing the reparability and recyclability of products, including requirements relating to the availability of spare parts and repair instructions; the ease of disassembly; the provision of maintenance and repair information and firmware updates; and the marking of materials in components.

What Government will do:

We have already introduced measures to ensure more Waste Electrical and Electronic Equipment (WEEE) is made available for collection. As of 1st January 2021, retailers who sell over £100,000 of electrical and electronic equipment are now required to provide instore take back in line with Regulation 42 of the Waste Electrical and Electronic Equipment Regulations (the WEEE Regulations). This will contribute to higher levels of recycling and reuse of WEEE in the UK.

Building on the success of the 2013 WEEE Regulations, and in line with commitments in the Resources and Waste Strategy, we propose to take a series of measures:

1. **Review the WEEE Regulations in 2021.** The following areas will fall within the scope of the review:
 - Policies aimed at driving better ecodesign of EEE. By incorporating resource efficiency principles in future Ecodesign Regulation of energy-related products, and providing a financial incentive through the WEEE System, we can encourage action higher up the waste hierarchy. We will also explore other options, including consulting on applying eco-modulation of producer fees or other obligations.
 - Policies aimed at encouraging more reuse of EEE. This might include consulting on modulation of reuse evidence to give it a higher weighting than recycling evidence or addressing barriers to reuse at household waste and recycling centres.
 - Policies aimed at increasing collections of consumer and business WEEE. This may include consulting on reviewing the target-setting system

⁸⁴ This includes welding equipment, electric motors, household refrigeration, refrigeration with a direct sales function, household dishwashers, household washing-machines/washer-dryers, electronic displays and televisions.

and expanding the collection network through mandatory kerbside collections or enhanced retailer take-back obligations.

- Policies aimed at placing enhanced obligations on online marketplaces, to ensure they are paying their full producer responsibility obligation.

2. **Work towards improving systems of collection of WEEE for repair and reuse**, including through provision of non-statutory guidance to local authorities as to regulatory requirements and best practice. We will launch Material Focus pilots to understand the most cost-effective collection systems and how to address the barriers that may arise.

3. Use **public procurement** as appropriate. Defra has recently published a new strategy for Government estate procurement of electronic equipment⁸⁵ which sets out a range of ambitions and targets in respect of digital services and information, and communications equipment. The strategy aims to deliver, amongst other things, reduced carbon emissions, increased resilience and more accountability. Targets to be achieved between 2020-2025 in the strategy include:

- From a 2020 baseline, reduce the amount of Information and Communications Technology (ICT) waste going to landfill to 0%.
- From a 2020 baseline, continue to improve our waste management by reducing the overall amount of ICT waste generated and increasing the proportion which is reused and recycled.
- A yearly increase in the procurement of remanufactured ICT devices in £/volume
- A yearly increase in the amount of ICT that is reused and materials recycled.
- Continue to buy more sustainable and efficient products and services with the aim of achieving the best long-term, overall value for money for society.
- 100% traceability of ICT at end of life (mapping).
- Carbon footprint of the services we are consuming.

The strategy also includes commitments to publish an accurate ICT footprint based on the services consumed, on estates and with suppliers, encompassing embodied/embedded carbon, and to report the annual percentage in the procurement of remanufactured/refurbished ICT, to support the audits both nationally and internationally.

⁸⁵ [Greening government: ICT and digital services strategy 2020-2025](#)

4. **Work with the Department for Business, Energy & Industrial Strategy (BEIS) on future implementation of minimum ecodesign requirements in Great Britain.** BEIS and Defra have commissioned research⁸⁶ to help identify energy-related products where the greatest opportunity lies for gains in energy reduction and resource efficiency, and resultant contributions to Net Zero and Zero Avoidable Waste. This research is due to be completed in the first half of 2021 and will supplement evidence gathered during the recent BEIS Call for Evidence on Ecodesign for Energy-Related Products.⁸⁷
5. We will also develop proposals to **provide consumers and businesses with information on the durability, reparability and recyclability of the products they buy**, to enable them to make informed choices and drive the market towards more sustainable consumption of Electrical and Electronic Equipment (EEE). We will do this by making use of powers we are seeking through the Environment Bill, as well as considering the role of longer-term warranties in promoting design for durability. We will explore the use of rating schemes and other labelling schemes focused on extending the life of products, which would complement existing energy labelling schemes.

Question: Do you agree or disagree that the measures described are likely to achieve the overall aim set out at the beginning of this chapter?

- a. **Strongly agree**
- b. **Agree**
- c. **Neither agree nor disagree**
- d. **Disagree**
- e. **Strongly disagree**

Please provide details / explain your answer

⁸⁶ <https://erpproductspolicystudy.uk/>

⁸⁷ <https://www.gov.uk/government/consultations/energy-related-products-call-for-evidence>

Chapter 9 Road Vehicles

Our aim: to explore means of increasing reuse, repair, and remanufacture, in addition to design considerations such as light-weighting, to reduce waste in this sector and contribute towards Net Zero by 2050

1. The extraction and processing of materials and the manufacturing process to make a standard combustion engine car contribute approximately a fifth of the emissions resulting from its use, over a lifespan of 14 years.⁸⁸ The global emissions associated with the manufacture of all new cars that were registered in the UK in 2019 was between 10 - 13 MtCO₂e.⁸⁹
2. Regulatory measures have, to date, focused on end-of-life, setting clear targets for recovery and recycling.⁹⁰ These measures have led to an improvement in the treatment of scrap vehicles and dramatically increased recycling and recovery rates. The recycling rate for end of life vehicles (ELVs) rose 20% between 1999 and 2018, with overall waste to landfill having reduced more than 95% over the same period.⁹¹
3. There is also an active domestic market for second-hand cars and car parts, and vehicles are routinely repaired and maintained. Additionally, many automotive businesses have already taken significant steps to reduce waste. In 2018, the following original equipment manufacturer (OEM) signatories sent zero waste to landfill: Aston Martin, Ford, GM Vauxhall, Honda, Jaguar Land Rover, Leyland Trucks, Toyota Motor Manufacturing UK, Unipart and Volkswagen.⁹²
4. The sector has also seen a rise in “resource efficient business models” including rental and car clubs, which deliver environmental benefits whilst also potentially reducing the cost of living. These business models are growing in popularity, with the most recent available data showing car club membership in London reaching around 245,000 in 2017/18.⁹³⁹⁴ The Government’s Future of Mobility:

⁸⁸ The Use Less Group, ‘Vehicles’ <https://www.uselessgroup.org/research/vehicles>

⁸⁹ Defra estimate based on evidence from: [The Use Less Group](#); WRAP, [SMMT](#)

⁹⁰ [The End of Life Vehicles \(Producer Responsibility\) Regulations 2005/263](#).

⁹¹ The Society of Motor Manufacturers and Traders (SMMT) [2019 Automotive Sustainability Report](#)

⁹² The Society of Motor Manufacturers and Traders (SMMT) [2019 Automotive Sustainability Report](#)

⁹³ https://como.org.uk/wp-content/uploads/2019/09/London-Car-Club-Survey2017_18.pdf

⁹⁴ Government Office for Science (2019) [‘Review of the UK passenger road transport network’](#)

Urban Strategy⁹⁵, published in March 2019, set out nine key principles for shaping the future of urban mobility. One of these key principles is that mobility innovation must help to reduce congestion through more efficient use of limited road space, for example through sharing rides, increasing occupancy or consolidating freight.

5. Whilst there is evidence of some positive trends regarding waste prevention in the automotive sector, there are also continuing challenges. The number of cars on UK roads is increasing, from around 25 million in 2000 to around 39 million in 2019.⁹⁶
6. Greater resource efficiency in vehicle manufacturing and use can be achieved by supporting the design of lighter vehicles, as this has the dual benefit of decreasing both the demand for input materials and fuel consumption. For heavy goods vehicles, changes to vehicle design, for example, to reduce aerodynamic lag and rolling resistance (using lighter materials in vehicle manufacturing) have been shown to improve operational efficiency and reduce in-use emissions. Reducing the quantity of steel, aluminium and other materials used in vehicle production has been estimated to have the potential to deliver carbon emission reductions of 8.49 MtCO₂e between 2023 and 2032.⁹⁷
7. Designing vehicles that are more durable and longer lasting would also reduce the demand for materials and energy for manufacturing. One study shows that keeping cars in use for four more years could reduce carbon emissions by 9.15 MtCO₂e between 2023 and 2032.⁹⁸ However, there are clear trade-offs with the improved operational energy efficiency of new vehicles⁹⁹ alongside the improvements in safety and wider environmental standards.
8. The benefits of repair, reuse and remanufacturing of components in the automotive sector are clear: even the most resource-intensive of these, remanufacturing, can avoid in excess of 90% of the embodied material energy, emissions and demand on new material inputs compared to new production.¹⁰⁰ It has also been reported that remanufacturing can be up to twice as profitable

⁹⁵ Department for Transport (2019) '[Future of Mobility: Urban Strategy](#)'

⁹⁶ Department for Transport, Vehicle Licensing Stats; 2000 stat includes addition of <https://www.infrastructure-ni.gov.uk/sites/default/files/publications/drd/northern-ireland-transport-statistics-2000-2001.pdf>

⁹⁷ Green Alliance (2018) '[Less in, more out: using resource efficiency to cut carbon and benefit the economy](#)'

⁹⁸ Green Alliance (2018) '[Less in, more out: using resource efficiency to cut carbon and benefit the economy](#)'

⁹⁹ Since 2009 and 2011 for cars and vans respectively, EU regulations have set manufacturer CO₂ emission reduction targets, resulting in the improved fuel efficiency of the fleet, with fines applying for non-compliance. Following the end of the transition period, these regulations now apply in a UK-only scenario.

¹⁰⁰ International Resources Panel (2018) '[Redefining Value: the manufacturing revolution](#)'

as manufacturing.¹⁰¹ Remanufacturing also presents an opportunity to increase employment levels because in most cases additional process steps are required, including evaluation, cleaning, and additional quality testing.¹⁰²

Spotlight: eBay for business recycled car parts

This new recycled car parts scheme for business is helping the UK's automotive sector substantially reduce its carbon footprint and the UK achieve its overall recycling targets. Its aim is to raise industry standards and give consumers more sustainable options when garages and insurers complete vehicle repairs.

eBay is working with the Vehicle Recyclers Association (VRA) to lead the development of a certification programme, with the aim of removing any safety and provenance concerns, giving businesses the reassurance they need to use more green parts.

Major insurers have embraced the scheme and are partnering with eBay to drive the adoption of recycled car parts within its network of approved repairers.

9. However, remanufacturing remains constrained by a number of factors, including:
 - design features which make disassembly difficult, such as gluing and welding, and the increasing complexity of components
 - consumer attitudes favouring replacement with new, and perceptions that remanufactured components may be less reliable or of inferior quality
 - consumers not being aware of the availability of remanufactured, repaired or reused components, or simply not being presented with an alternative to new
 - price competition with new components, some of which may be of a lower quality than their remanufactured equivalents
 - a lack of availability of technical information for remanufacturers to use.
10. The transition from vehicles powered purely by internal combustion engines to hybrid and fully electric powertrains, or other alternatives, is accelerating. The Government has announced that it will end the sale of new petrol and diesel cars and vans from 2030 and, from 2035, all new cars and vans must be zero emission at the tailpipe. Government and industry are working in partnership to maximise the opportunities from the transition to zero emission vehicles. Action

¹⁰¹ The Society of Motor Manufacturers and Traders (SMMT) '[2019 Automotive Sustainability Report](#)'

¹⁰² International Resources Panel (2018) '[Redefining Value: the manufacturing revolution](#)'

is focused on products, technologies, and the electric vehicle supply chain, and delivering market transformation, including charging infrastructure and consumer adoption.

11. With the introduction of Clean Air Zones, the continued development, promotion and implementation of innovative retrofit technology is important for extending the life of some vehicles which otherwise might be scrapped. Retrofit technology can minimise a vehicles air quality impact and will help bridge the gap in the journey towards zero emissions by 2050. The Government has invested over £80 million in retrofitting vehicles with pollution reducing technology since 2013, retrofitting over 5,000 vehicles (mainly buses). The Government is funding the Clean Vehicle Retrofit Accreditation Scheme which provides independent evidence that a vehicle retrofit technology will deliver the expected emissions reductions and air quality benefits, there are currently accredited retrofit solutions for types of buses, coaches, taxis, vans and refuse collection vehicles.

What Government will do:

In the Resources and Waste Strategy we outlined a number of commitments of relevance to the automotive sector, including development of ecodesign standards, product information and labelling schemes, as well as exploring Extended Producer Responsibility (EPR) for tyres, and reforms to the End-of-life Vehicle Regulations. This remains our plan, subject to shifting delivery timelines as a result of the Covid-19 pandemic. For the automotive sector the additional actions we propose, and ongoing activity across government, are as set out below:

2. **Work across Government, and with industry and academia to consider ecodesign principles for the UK automotive sector**, focussed on capturing the win-win situation of reduced embodied and operational greenhouse gas emissions, for example lighter weight and more durable vehicle designs, without detriment to safety, as well as design for disassembly, repair and remanufacture. Complexities exist that require particular attention, including the fundamental changes to vehicle design that will accompany the transition away from combustion engines and the importance of identifying and mitigating for unintended consequences and trade-offs, for example extended use of combustion engine vehicles hindering transitions to greener alternatives.
3. **Encourage recommerce¹⁰³, including greater use of repaired, remanufactured and reclaimed vehicle components**, by:

¹⁰³ Primarily in relation to replacement parts used to repair vehicles, but potentially also in relation to new vehicles where existing regulatory and safety requirements are met.

- Supporting industry and consumers in efforts to reduce the resource intensity of vehicle repairs and increase the demand for and supply of reclaimed, repaired and remanufactured parts.
 - Continuing to explore how public procurement can help to increase the use of remanufactured and reclaimed parts.
 - Supporting research activities that contribute to the evidence base, identifying challenges and opportunities for automotive recommerce and in particular the role of value retention activities such as remanufacturing in reducing the environmental footprint of the sector.
 - Exploring the possibility of developing a more specific standard or quality assurance mark designed to increase consumer confidence in and positive perception of repaired, reclaimed or remanufactured automotive parts, working with a body such as the British Standards Institute.
4. **Seek to maximise the resource efficiency of electric vehicle batteries through the Faraday Battery Challenge.** The Government has committed £318m into the Faraday Battery Challenge to support the research, development and scale-up of world-leading battery technology in the UK. The Faraday Battery Challenge is focused on developing cost-effective, high-performance, durable, safe and recyclable batteries to capture the growing market. The Faraday Battery Challenge aims to ensure the UK builds on its strengths and leads the world in the design, development and manufacture of electric batteries through research, collaborative innovation and scale-up. The Automotive Council is establishing a new Transition to Zero Mission, that will strengthen government and industry cooperation in areas including R&D, manufacturing, charging infrastructure, and battery recycling. This group will play an important role in the electrification transformation.
5. To support ongoing work being led by other government departments, **capture evidence relating to the social and environmental benefits of car-sharing and ridesharing models**, and build these findings into our future strategy. This will inform further action as to how Government can support sustainable shared mobility business models to reduce congestion and carbon emissions.

Question: Do you agree or disagree that the measures described are likely to achieve the overall aim set out at the beginning of this chapter?

- a. Strongly agree**
- b. Agree**
- c. Neither agree nor disagree**
- d. Disagree**
- e. Strongly disagree**

Please provide details / explain your answer

Chapter 10 Packaging, Plastics and Single-use Items

Our aim: to encourage a shift away from hard to recycle and single-use products, and support research and innovation into more sustainable materials and systems, reducing litter and plastic pollution as well as conserving material resources.

1. Packaging helps reduce product damage, increase shelf life, reduce food waste, and provide product information. Annually, over 11 million tonnes of packaging are placed on the market in the UK. Figures¹⁰⁴ show that in the UK in 2017, 70% of all packaging waste was either recycled (64%) or recovered via energy from waste (6%). However, when looking at plastic packaging alone, just 46% was recycled in 2017. Of an estimated 4.9m tonnes of plastic waste generated in the UK in 2017, packaging accounted for almost half (around 2.4m tonnes).
2. At present, under the producer responsibility system for packaging and packaging waste¹⁰⁵ obligated packaging producers must take action to minimise product packaging¹⁰⁶, reduce how much packaging waste goes to landfill, and increase the amount that is recycled and recovered. Whilst the amount of packaging waste that is recycled has increased, the current system has a number of shortcomings. For example, local authorities receive limited direct financial support for collecting and recycling household packaging waste. While there is evidence that light-weighting of certain packaging formats has occurred, more action is required to reduce unnecessary packaging and increase the use of reusable packaging. We will change this through the new Extended Producer Responsibility (EPR) system explained below.
3. Industry has shown its willingness to lead and take action. The UK Plastics Pact, a voluntary initiative aimed at creating a circular economy for plastics, delivered through WRAP and funded by businesses, is the first of its kind. It encompasses 85% of the plastic packaging placed on the market in the UK. The Pact will stimulate innovative new business models to reduce the total amount of plastic

¹⁰⁴ UK Statistics on Waste

https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/918270/UK_Statistics_on_Waste_statistical_notice_March_2020_accessible_FINAL_updated_size_12.pdf

¹⁰⁵ The Producer Responsibility Obligations (Packaging Waste) Regulations 2007

¹⁰⁶ The Packaging (Essential Requirements) Regulations (1998)

packaging, as well as help to build a stronger recycling system. The four targets for 2025 are:

- i. Eliminate problematic or unnecessary single-use packaging through redesign, innovation or alternative (reuse) delivery models;
 - ii. 100% of plastics packaging to be reusable, recyclable or compostable;
 - iii. 70% of plastics packaging effectively recycled or composted;
 - iv. 30% average recycled content across all plastic packaging.
4. The Plastics Pact has already made good progress¹⁰⁷, with its members having already removed over 19 thousand tonnes of un-recyclable black plastic from supermarket shelves – equivalent to 1.5 billion ready meal trays. Pact members have also voluntarily committed to eliminating some of the most problematic single-use plastics, such as straws and cutlery. Defra supports the Pact and will continue to work closely with WRAP and its members as we implement this Waste Prevention Programme.
5. Some businesses are leading by example and reducing their packaging waste through discount schemes, removing plastic from certain supermarket produce lines, and removing plastic straws and other single-use items from shops.
6. Government has announced that a world-leading tax on plastic packaging will come into force from April 2022 which will apply to businesses producing or importing plastic packaging which does not meet a minimum threshold of at least 30% recycled content. This will help create demand for recycled plastic, stimulating innovation and investment in reprocessing, and in doing so support increased recycling. We also introduced legislation in October 2020 that restricts the supply of plastic straws, cotton buds and stirrers.
7. Together these actions will help reduce litter, including marine litter. We have identified that single-use items and certain food and drinks packaging are often littered. For litter we will continue to implement the strategic approach set out in the Litter Strategy for England, of applying best practice in education, enforcement and infrastructure. This includes awareness-raising campaigns such as the Respect the Outdoors campaign, which was promoted both online and in locations near to urban parks, beaches and national parks to highlight the impacts of littering. We will also work with businesses to promote appropriate disposal, supporting the provision of suitable infrastructure for on-the-go disposal, and ensuring that councils have the powers they need to take enforcement action against littering and fly-tipping.

¹⁰⁷ <https://www.wrap.org.uk/plasticsprogress>

8. However, there is also potential for businesses to reduce waste and litter by preventing products from becoming waste in the first place. Actions that could be taken by businesses include:
- Increasing the sale of unpackaged products: The WRAP Fresh Produce Guidance was published in November 2019 which included advice for retailers to help determine if fresh produce can be provided loose.
 - Providing and using refillable systems and services.
 - Removing the worst offending products from the market i.e. those that cannot be reused or recycled.
 - Designing products and packaging to reduce the likelihood of them becoming waste.

What Government will do:

To support the achievement of the above we propose to:

1. Build on our success in reducing the use of single-use carrier bags in the main supermarket retailers by 95% through a 5p charge, by **extending the charge to all retailers and increasing the minimum 5p charge to 10p from April 2021**. In addition, we will expand on the success of the carrier bag charge by seeking a new power in the Environment Bill to **place charges on other single-use plastic items** to encourage businesses and citizens to shift toward more reusable products.
2. **Build on our restrictions on the supply of plastic straws, cotton buds and drink stirrers** by consulting on potential bans on other single-use plastic items. Impact assessments for future bans on single-use plastics will continue to assess the potential for substitution to single-use items made of other materials, to ensure that any ban really is a sustainable approach.
3. Explore the extent to which the new Extended Producer Responsibility (EPR) system for packaging, which will require producers to pay the full net cost of managing their packaging once it becomes waste, **could be designed to encourage prevention, reuse, recycling and reduced littering of packaging waste**, including through modulated fees.¹⁰⁸ In response to the 2019 consultation, we are further considering the potential for EPR to drive reuse. We are consulting on specific policy measures for the introduction of EPR for packaging from 2023.

¹⁰⁸ https://consult.defra.gov.uk/environmental-quality/resource-and-waste-and-plastic-packaging-tax-consultation/supporting_documents/packaging_epr_consultdoc.pdf

4. **Review the Packaging (Essential Requirements) Regulations 2015.**¹⁰⁹ The main requirement of these Regulations is that a person who is responsible for packing or filling products into packaging (or importing packed or filled packaging into the UK) may not place that packaging on the market unless it fulfils the essential requirements¹¹⁰ and is within the heavy metal concentration limits. This review, which commenced in February 2021 and is expected to be completed later in the year, will consider how the essential requirements can be enhanced to support waste prevention through for example, increased reuse of packaging, and how the regulations will operate alongside the new Extended Producer Responsibility scheme for packaging.
5. Continue to support research and innovation. We are funding research into alternative materials, including through the £60 million Smart Sustainable Plastic Packaging Fund and the £20 million Plastics Research and Innovation Fund.

Question: Do you agree or disagree that the measures described are likely to achieve the overall aim set out at the beginning of this chapter?

- a. Strongly agree
- b. Agree
- c. Neither agree nor disagree
- d. Disagree
- e. Strongly disagree

Please provide details / explain your answer

¹⁰⁹ <http://www.legislation.gov.uk/uksi/2015/1640/contents/made>

¹¹⁰ <https://www.gov.uk/government/publications/packaging-essential-requirements-regulations-guidance-notes>

Chapter 11 Food

Our aim: reduce food waste in the home and across the supply chain and take forward key policy commitments in this area including for certain businesses to measure, report and act on food waste.

1. Food waste has substantial adverse environmental impacts. An estimated 9.5 million tonnes of food and drink, after the farm gate, are wasted annually in the UK. This is worth around £19 billion and it is estimated that around 70% of this is avoidable¹¹¹. Food waste occurring in households make up 70% of total UK food waste equating to 6.6 Mt. If the total global annual carbon emissions from food waste – some 3.3 billion tonnes – were released by a single country, that nation would be the world's third largest polluter behind China and the United States.¹¹² In the UK alone, the carbon footprint of food and drink consumed is estimated to be equivalent to one fifth of territorial emissions. Greenhouse gas emissions associated with food waste in the UK amounts to 25 MtCO₂e. The carbon associated with food which could have been eaten but is thrown away is equivalent to the emissions generated by a fifth of all cars on UK roads.¹¹³
2. We have made substantial progress in reducing food waste in the UK. Between 2007 and 2018, there was a 21% reduction in food waste per capita (27% if we exclude inedible parts). In total, household food waste had a 31% reduction in the total amount of food (excluding inedible parts) thrown away that could have been eaten per capita¹¹⁴. The latest figures from 2018 show that food surplus redistribution has doubled to nearly 56,000 tonnes, equivalent to 133 million meals. The biggest increase has been in charitable redistribution, nearly trebling between 2015 and 2018¹¹⁵. We have also made progress in reducing the greenhouse gas emissions associated with the food and drink industry in the UK with an estimated 7% reduction per capita decrease between 2015 and 2018. Of this total reduction, food waste prevention contributed 14%.¹¹⁶

¹¹¹ WRAP (2020) 'Food surplus and waste in the UK: Key facts' <https://wrap.org.uk/sites/default/files/2020-11/Food-surplus-and-waste-in-the-UK-key-facts-Jan-2020.pdf>

¹¹² <http://www.fao.org/3/a-bb144e.pdf>

¹¹³ WRAP (2020) 'Food surplus and waste in the UK: Key facts'

¹¹⁴ WRAP (2020) 'Food surplus and waste in the UK: Key facts'

¹¹⁵ <https://www.wrap.org.uk/content/uk-food-redistribution-continues-increase>

¹¹⁶ WRAP (2020) 'UK progress against Courtauld 2025 targets and UN Sustainable Development Goal 12.3' https://wrap.org.uk/sites/files/wrap/Progress_against_Courtauld_2025_targets_and_UN_SDG_123.pdf

3. Since the last Waste Prevention Programme was published in 2013, food, along with packaging, has accounted for most of the waste that has been prevented in that period.¹¹⁷
4. But there is no room for complacency as there are significant challenges remaining. The UK is committed to Sustainable Development Goal 12.3 (SDG12.3). In order to achieve this target of reducing retail and consumer food waste by 50% by 2030, based on a 2007 baseline, another 1.8 Mt of food waste will need to be prevented by 2030 compared to 2018: around 1.3 Mt from reducing household food waste, over 90,000 tonnes from retail, around 250,000 tonnes from manufacturing and almost 200,000 tonnes from hospitality and food service.¹¹⁸ We also need to continue to tackle food waste in primary production.
5. The Government has supported change through a series of voluntary agreements with food businesses and consumer campaigns since 2007, all of which are managed by WRAP. The latest of these, the Courtauld Commitment 2025 aims to bring together organisations across the supply chain to reduce food waste to approach the targets in SDG 12.3. This includes action to push food waste up the Food and Drink Waste Hierarchy and ensure that food surplus suitable for human consumption is redistributed. In terms of food waste prevention, Courtauld 2025 sets a target of a 20% per capita reduction in food waste between 2015 and 2025. It also includes a target of a 20% reduction in the greenhouse gas intensity of food and drink consumed in the UK between 2015 and 2025. A specific working group has been set up under the Courtauld banner to address this.
6. WRAP have estimated that £1.2 billion worth of food waste arises in UK primary production.¹¹⁹ Conversations with industry have suggested that a principal cause of food waste on farm is unfair business practices at the point of first sale, where unreasonably late cancellations or late specification changes can lead to produce being left unharvested or rotting in the field. The Government is working with WRAP to improve quality specifications to prevent food waste and improve relationships across the supply chain.
7. In the supply chain, more businesses from farm to retail, hospitality and food services need to be targeting, measuring and acting on food waste. The Institute of Grocery Distribution and WRAP collaborated with Courtauld signatories to develop the Food Waste Reduction Roadmap. It showcases actions that large businesses

¹¹⁷ <https://wrap.org.uk/resources/report/review-waste-prevention-programme-england-2013-summary-report>

¹¹⁸ WRAP (2020) 'Food surplus and waste in the UK: Key facts'

¹¹⁹ WRAP (2019) 'Food waste in primary production in the UK' <https://wrap.org.uk/resources/report/food-waste-primary-production-uk>

should take to address food waste in their own operations, support their suppliers in taking action, engage with consumers and innovate to reduce their food waste. By the end of its second year, 213 of the largest UK food businesses across the supply chain had committed to the Roadmap, representing over 60% of their sectors by turnover. Of these, 171 provided evidence of measuring and acting on food waste. The ambition is to have all 600 large food businesses doing so by 2026.

8. To increase surplus food redistribution and therefore prevent food waste, challenges range from building better relationships between businesses and redistributors, to a lack of infrastructure such as, vehicles to transport surplus food. These are areas we are tackling through support for Courtauld 2025 and a food waste reduction fund.

Spotlight: Resource Action Fund

The Government made a £15m pilot fund available for 2019/20 including supporting the redistribution of surplus food and reducing waste. The Resource Action Fund delivered by WRAP included a programme of grants to provide small and large scale capital infrastructure and revenue support to organisations redistributing surplus food from the likes of retailers and food manufacturers.

9. It is important that consumers are motivated and equipped to significantly reduce household food waste by changing their behaviours to prevent food from going to waste. This is a key area and one where we all have a role to play. We will continue to support consumer campaigns and behaviour change initiatives to:
 - a. Promote a better understanding of Best Before Date versus Use-By Date.
 - b. Encourage consumers to shop better – buying the right quantity for what is required.
 - c. Educate citizens on how to store or freeze food correctly and to make use of what they have already bought.

What Government will do:

In order to deliver on our goals in the Resources and Waste Strategy to cut down food waste, achieve the SDG12.3 target, and work towards eliminating food waste to landfill by 2030, we propose to:

1. **Continue to support the Courtauld 2025 Commitment and its action to reduce food waste across the supply chain.** Since Courtauld started in 2007, per capita total food waste in the UK has reduced by 21%.¹²⁰ In the September 2020 monitoring report of the Champions 12.3 group, the UK is cited as an exemplar in reducing food waste.¹²¹ WRAP is now leading discussions with stakeholders on the potential extension of Courtauld to 2030 in line with the UN milestone date.
2. **Introduce mandatory annual reporting of food waste by certain food businesses of an appropriate size, subject to consultation.** Evidence demonstrates that measuring and reporting of food waste often results in action to prevent and reduce food waste. However, voluntary engagement in measuring and reporting has limitations so we will consult on mandatory reporting of food waste by food businesses of an appropriate size. Powers we are seeking in the Environment Bill to apply producer responsibility obligations to food waste prevention and redistribution of food surplus could be used in future, subject to consultation. However, this will only be considered if voluntary measures combined with annual reporting are sufficient to maintain progress towards SDG 12.3.
3. Pending an evaluation of the first **Food Waste Action Week** in March 2021, deliver an annual week of action focused on addressing citizen food waste. A week to bring together stakeholders from across all sectors, to share messages about citizen food waste and why action to reduce it is needed.
4. **Support WRAP action to tackle consumer food waste through campaigns and behaviour change interventions (BCIs).** Campaigns include **Guardians of Grub** - which is aimed at raising the profile of food waste prevention in the Hospitality and Food Service sector to support reduction of food waste in the preparation and serving of food - and **Love Food Hate Waste** and **Wasting Food: It's Out of Date** - which support consumers to reduce food waste in their home through sharing advice, including on food storage and recipes for leftover food. BCIs are being designed, tested and rolled out to support these national campaigns and to help consumers waste less food.

¹²⁰ WRAP (2020) 'Food surplus and waste in the UK: Key facts'

¹²¹ Champions 12.3 (2020) 'SDG Target 12.3 on Food Loss and Waste: 2020 Progress Report'

<https://champions123.org/publication/sdg-target-123-food-loss-and-waste-2020-progress-report>

Question: Do you agree or disagree that the measures described are likely to achieve the overall aim set out at the beginning of this chapter?

- a. Strongly agree**
- b. Agree**
- c. Neither agree nor disagree**
- d. Disagree**
- e. Strongly disagree**

Please provide details / explain your answer

Chapter 12 Monitoring and Evaluation

Our aim: monitor changes in waste prevention via a structured set of metrics, while continuing to develop more detailed methodologies to evaluate waste prevention policies.

1. This chapter outlines the metrics we will use to continue to report on progress in achieving the intended outcomes and objectives of the Waste Prevention Programme (Figure 5). Key indicators of success in implementing the programme will include, among others, a reduction in waste arisings, an increase in the relative size of the circular economy, and a fall in greenhouse gas emissions (GHGs) associated with our consumption and the waste we produce.
2. Our approach reflects our obligations under the Waste (England & Wales) Regulations 2011 Part 2. As part of our landmark Environment Bill, we are exploring introducing targets to help drive increases in resource productivity and reduce tonnages of residual waste. The targets align with the indicator framework we have set out for monitoring key intended outcomes of the Waste Prevention Programme, and actions in the Programme will play a key role in delivering against these targets.

Waste Prevention Programme 2013

3. Having developed the Waste Prevention Programme 2013, Defra worked with stakeholders in 2014 to identify a suite of seven metrics to monitor progress in waste prevention. These metrics were:
 - i. waste arisings by sector (households, commercial and industrial (C&I), construction, demolition & excavation (C, D&E), and other¹²²);
 - ii. hazardous waste arisings by sector;
 - iii. waste from households;
 - iv. waste arising per unit of gross value added (GVA) for the C&I sector;
 - v. raw material consumption per unit of gross domestic product (GDP);
 - vi. gross value added of the repair, reuse and leasing sectors, and;
 - vii. GHGs from landfill
4. Progress against the metrics was reported on in the Digest of Waste and Resource Statistics, published on an annual basis between 2015 and 2018 inclusive,¹²³ as

¹²² Agriculture, forestry, fishing, mining and quarrying

¹²³ <https://www.gov.uk/government/collections/digest-of-waste-and-resource-statistics>

well as within the 2020 Waste Prevention Programme Review.¹²⁴ Since the first Waste Prevention Programme was released in 2013, significant improvements have been made by Defra and industry partners in measuring and monitoring waste generation, such as within the C&I sector.

5. Though there has been no further publication of the Digest of Waste and Resource Statistics after the 2018 release, much of the data presented in the Digest will continue to be tracked as part of the Resources and Waste Strategy (RWS) and presented in the RWS Indicator Framework '*Monitoring Progress*'.¹²⁵
6. The most recent data available suggests that the total tonnages of waste and hazardous waste in England increased between 2012 and 2016, though this was not the case for all sources. For instance, arisings of 'waste from households' in England remained roughly constant between 2012 and 2018, while on a per capita basis, they fell. After an initial decline in the tonnages of waste generated by the C&I sector between 2012 and 2014, commercial waste arisings have trended upwards, causing the waste intensity of the overall sector to rise between 2015 and 2018.
7. There are many encouraging signs. The size of the repair, reuse and leasing sectors of the UK economy have grown over the last five years, while GHG emissions from the waste management sector have fallen significantly over the last three decades. In addition, although England's raw material consumption has increased marginally since 2013 (based on our latest estimates available to 2017), resource intensity has fallen, indicating that growth in the economy is outpacing that in raw material consumption.
8. An independent evaluation of the previous Waste Prevention Programme was published in 2020.¹²⁶ This evaluation suggested that approximately 387,000 tonnes of food waste could be shown to have been prevented between 2013 and 2019 as a result of actions in the Waste Prevention Programme 2013. While some of the actions set out in the previous Programme are now complete, several are ongoing and therefore continue to generate impacts.
9. For instance, actions taken by signatories of the Courtauld Commitment 2025 (CC2025) are still in progress. The evaluation states that the Courtauld agreement's target of reducing UK food and drink waste on a per capita basis by 20% by 2025

¹²⁴ <https://wrap.org.uk/resources/report/review-waste-prevention-programme-england-2013-summary-report>

¹²⁵ https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/907029/resources-and-waste-strategy-monitoring-progress.pdf

¹²⁶ <https://wrap.org.uk/resources/report/review-waste-prevention-programme-england-2013-summary-report>

(alongside associated GHG emissions) is expected to be met. Assuming an even distribution of the agreement's anticipated total impact across its duration, approximately 2.7 million tonnes of food waste were estimated to have been prevented by the end of 2019 as a result of actions taken by signatories of CC2025.¹²⁷

Future Reporting & Evaluation

10. Going forward, we will continue to publish progress against the metrics monitored as part of the Waste Prevention Programme 2013 to ensure comparability of progress over time. Where we have identified that it can bring additional value, we have expanded the scope of the metrics we will use for monitoring progress. During the lifetime of the Waste Prevention Programme 2020, these metrics will remain under review to ensure we are reporting on the right areas and making use of new sources of data, where relevant, to fill gaps.
11. The macro-level metrics proposed for monitoring implementation of the Waste Prevention Programme 2020 are:
 - i. Total waste arisings, including by sector (household, commercial and industrial, construction, demolition & excavation, and other) and on a per capita basis;
 - ii. Total hazardous waste arisings, including by sector and on a per capita basis;
 - iii. Waste arisings per unit of economic output, nationally and for the C&I and construction sectors;
 - iv. The numbers of enterprises, employment levels and gross value added (GVA) in the repair, reuse and leasing sectors;
 - v. Raw material consumption, including per unit of national economic output and per capita;
 - vi. Carbon footprint on a consumption basis, including per capita; and
 - vii. GHG emissions associated with the waste management sector
12. These metrics will be monitored at an England level, with the exception of data on the repair, reuse and leasing sectors, where data are currently only available at a UK level. In addition to these metrics, we will monitor waste arisings and other key indicators across the waste streams of focus in the Waste Prevention Programme 2020. This will help provide more granular insight into the impacts of our proposed policies. It is important to bear in mind that estimates of arisings across these waste

¹²⁷ <https://wrap.org.uk/resources/report/review-waste-prevention-programme-england-2013-summary-report>

streams are not always collected regularly at present nor available at an England level. We will work where we can to fill these data gaps.

13. Lastly, there are many aspects to waste prevention and the circular economy for which data are currently limited, such as a national-level indicator of circularity, average product lifespans or product characteristics such as reparability. Recognising this, we will look to engage with academia and other stakeholders, such as those working at a regional and city level, to expand the metrics we use to track progress in the circular economy, while helping put data into the hands of those who can drive change across a range of geographical scales.

14. We have published an evaluation plan for the Resources & Waste Strategy which focuses on key policies committed to there. As specific policies are developed as part of the Waste Prevention Programme, we will incorporate them into that evaluation plan as appropriate.

Figure 5: Key indicators for the Waste Prevention Programme

Key indicators	Metrics	Sources of data
Waste production	- Total waste arisings, including by sector and per capita - Total hazardous waste arisings, including by sector and per capita	Defra UK Statistics on Waste publication ¹²⁸ Office for National Statistics (ONS) population data ¹²⁹
Waste intensity	- National waste intensity - Waste intensity of the C&I sector - Waste intensity of the construction sector	Defra UK Statistics on Waste publication Office for National Statistics (ONS) economic data ¹³⁰

¹²⁸ <https://www.gov.uk/government/statistical-data-sets/env23-uk-waste-data-and-management>

¹²⁹ <https://www.ons.gov.uk/peoplepopulationandcommunity/populationandmigration/populationestimates/datasets/populationestimatesforukenglandandwalesscotlandandnorthernireland>

¹³⁰ <https://www.ons.gov.uk/economy/grossvalueaddedgva/datasets/nominalandrealregionalgrossvalueaddedbalancedbyindustry>

Key indicators	Metrics	Sources of data
Number of enterprises, employment and gross value added of the reuse, repair and leasing sectors	- Number of enterprises in the reuse, repair and leasing sectors - Number of employees in the reuse, repair and leasing sectors - Gross value added of the reuse, repair and leasing sectors	ONS Annual Business Survey¹³¹ ONS Business Register and Employment Survey¹³²
Material footprint	- Raw material consumption - Raw material consumption per unit of GDP	University of Leeds footprint data published by Defra¹³³ ONS economic data¹³⁴ Office for National Statistics (ONS) population data
Carbon emissions	- Carbon footprint on a consumption basis - Greenhouse gas emissions from the waste management sector	University of Leeds footprint data published by Defra Department for Business, Energy and Industrial Strategy territorial emissions data¹³⁵ Office for National Statistics (ONS) population data

¹³¹ <https://www.ons.gov.uk/businessindustryandtrade/business/businessservices/datasets/uknonfinancialbusinesseseconomyannualbusinesssurveysectionsas>

¹³² <https://www.ons.gov.uk/employmentandlabourmarket/peopleinwork/employmentandemployeetypes/bulletins/businessregisterandemploymentsurveybresprovisionalresults/2018>

¹³³ <http://sciencesearch.defra.gov.uk/Default.aspx?Menu=Menu&Module=More&Location=None&ProjectID=20306&FromSearch=Y&Publisher=1&SearchText=ev0279&SortString=ProjectCode&SortOrder=Asc&Paging=10%20-%20Description>

¹³⁴ <https://www.ons.gov.uk/economy/grossdomesticproductgdp/datasets/regionalgrossdomesticproductallnutslevelregions>

¹³⁵ https://naei.beis.gov.uk/reports/reports?section_id=4

Question: Do you agree or disagree with the described approach to monitoring and evaluation of this Waste Prevention Programme?

- a. Strongly agree**
- b. Agree**
- c. Neither agree nor disagree**
- d. Disagree**
- e. Strongly disagree**

Please provide details/explain your answer

Glossary

By-products: an inevitable result of certain types of material processing. In a circular economy, by-products are a feedstock for another production process.

Circular economy: an economy where products and materials are kept in use for as long as possible, extracting maximum value from them. Products and materials are reused, recycled and regenerated whenever possible.

Embodied carbon: the CO₂ emitted in the production of the materials that make up a product or building. It is estimated from the energy used to extract and transport raw materials as well as emissions from manufacturing processes.¹³⁶

Product passports: information about a product's key characteristics such as material composition, instructions for disassembly, repair and recovery of components or materials. Making such information publicly available can improve the environmental performance of products throughout their lifecycle, as well as helping inform purchasing decisions.

Recycling: turning products at end-of-life back into materials which can be reused.

Refurbishment: modification of an object that is waste or a product to increase or restore its performance and/or functionality or to meet applicable technical standards or regulatory requirements, with the result of making a fully functional product to be used for a similar purpose to the one that it was originally intended.¹³⁷

Remanufacture: an industrial process that takes place within industrial or factory settings, in which cores are restored to original as-new condition and performance or better. The remanufacturing process is in line with specific technical specifications, including engineering, quality, and testing standards, and typically yields fully warranted products.¹³⁸

Repair: fixing a specified fault in an object that is a waste or a product and/or replacing defective components, in order to make the waste or product a fully functional product to be used for its originally intended purpose.¹³⁹

Reuse: using a product or material again for its original purpose, without any reprocessing taking place.

Servitisation: where a company retains ownership of their product and sells the product as a service to their customers, while retaining responsibility for the product's maintenance, therefore maximising the useful life of that product.

¹³⁶ University College London

¹³⁷ International Resources Panel (2018) [‘Redefining Value: the manufacturing revolution’](#)

¹³⁸ International Resources Panel (2018) [‘Redefining Value: the manufacturing revolution’](#)

¹³⁹ International Resources Panel (2018) [‘Redefining Value: the manufacturing revolution’](#)