



Assessment of resources and waste policy in England

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Limitations

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About Resource Futures

Resource Futures is a B-Corp certified environmental consultancy working with the private, public and non-profit sectors to enable positive management of material resources for a sustainable world.

About the Office for Environmental Protection (OEP)

The OEP was legally created in November 2021, under the Environment Act 2021. It is a public body that protects and improves the environment by holding government and other public authorities to account. Its work covers England and Northern Ireland. It also covers reserved matters across the UK (a matter on which only the UK Parliament in Westminster can make legislation).

Summary of findings and recommendations

Resource Futures carried out a high-level assessment of circular economy, resources and waste policy in England for the OEP in early 2024. Briefings were provided on key topics, then issues and incentives were assessed at each stage of the waste hierarchy. Opportunities were identified for the OEP to support progress towards a circular economy, better application of the waste hierarchy and elimination of waste crime.

Key findings were presented and finally recommendations were made on areas for further investigation by the OEP. The recommendations are intended to address key levers for improvement in the short and longer term. They take into account the views of the experts interviewed for this study, the findings of the assessment, as well as the judgement of the research team. A summary of the findings and recommendations for further investigation is presented below.

Findings

Policies are concentrated in the bottom stages of the waste hierarchy, due to factors such as legacy policy, the legally-binding target on residual waste reduction, Defra's remit, and the territorial boundary of the UK's net zero target.

England lacks a circular economy strategy or coordination mechanism capable of bringing about a systemic transition. Rather than responding to public perceptions and legacy concerns, science-based and targeted strategy is needed, with cross-governmental coordination, clear ownership and independent oversight.

Systems thinking is required to avoid unintended consequences, such as plastic restrictions driving up use of other materials, or end of waste rules aimed at waste crime but presenting barriers to reuse.

Better data is needed to underpin stronger circular economy policy. There are gaps related to C&I and C&D waste, and life cycle carbon impacts of waste streams. Data updates on material flows and consumption emissions lag and progress on a National Materials Datahub appears to have stalled. Robust, detailed and comprehensive data would enable targeted, science-based policy and monitoring.

There is limited recognition in policy of the potential economic and strategic benefits of a circular economy, such as in domestic jobs, international trade and resource security.

England can learn from earlier movers, both within the UK and elsewhere in the world. There is a growing array of case studies to learn from, in order to anticipate unintended consequences and develop better policy.

The opportunities and risks of EU Exit on the circular economy and waste are not adequately understood. While EU Exit offers opportunities to improve policy in England, divergence also presents

risks to the effectiveness of domestic policy. A nuanced understanding is required of where divergence is helpful and where alignment is preferable.

Recommendations for further investigation

Strategic opportunities

Update and strengthen the evidence base for science-based targets on resources and waste, including for resource consumption reduction, consumption emissions reduction, and life cycle environmental impacts of waste, to inform the next generation of data reporting requirements, targets and policy interventions. This could position England as a thought leader on science-based resources targets and present opportunities for international collaboration.

To inform decisions on a systemic approach to a circular transition, map out the potential roles and levers which could be used to drive progress, considering the agency of different departments, public bodies, local authorities, industry bodies, academia and other stakeholders. This could be informed by international case studies and a call for evidence.

Develop pathways for cutting resource use and residual waste that apply different assumptions on relative roles of reduction, reuse and different forms of recycling and composting, to understand the systemic impacts on other environmental goals, and to inform future infrastructure requirements.

Tactical opportunities

Assess the trade and economic opportunities of a circular economy. Review international evidence on the trade and economic opportunities presented by the circular economy, how England can position itself to benefit from these post-EU Exit, and the risks and downsides of not doing so.

Evaluate the impact of ecodesign policies and identify next steps. Policy on ecodesign, repair and planned obsolescence has stalled in England while progressing elsewhere. There is an opportunity to evaluate and benchmark progress, learn from the experience of other countries, and identify next steps.

Assess how effectively the new chemicals strategy supports circularity. With a chemicals strategy due to be published in 2024, conduct a review of how effectively it supports the waste hierarchy and a circular economy, and how it could be improved.

Conduct a systematic review of the opportunities for waste management policy to better support other environmental policy priorities. For example, mapping connections with climate change, water pollution, air pollution, biodiversity loss and chemical exposure; and applying a sector lens.

Conduct a deep-dive into one or more 'blind spots' in waste and circular economy policy, such as agricultural waste or soil conservation in the context of construction waste.

Identify more efficient approaches to waste crime, by developing and reviewing case studies from other countries and from other policy areas, such as health and safety, or food safety.

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1 Introduction

1.1 Objectives

The objectives of this work are:

- To provide an overview of the current status of policy, regulations, governance and reporting with respect to waste, resources and circular economy.
- To identify key risks and barriers to, and opportunities for, progress on the waste hierarchy and towards a circular economy.
- To recommend and prioritise areas for further research, with a focus on where the OEP could provide added value through its future work.

The geographical scope of the study is limited to England. Resources and the circular economy have been identified by the OEP as a key gap in the government's policy framework in England. Waste management and waste crime have also been noted as areas of poor progress in the latest Environmental Improvement Plan (EIP) monitoring report, with increasing residual waste and stalled recycling rates alongside significant pressure from waste crime, particularly fly-tipping and illegal waste sites.¹

1.2 Approach

In order to achieve the objectives, the following steps were taken.

- Short 'briefings' were developed on a series of policy topics, looking first at key areas of waste management policy, and next addressing different stages of the waste hierarchy. This was informed by desk research. The briefings are presented in Section 2.
- To gather insights into the key risks, barriers and opportunities related progress on the waste hierarchy and towards a circular economy:
 - An internal workshop was held within Resource Futures, with experts working across areas including local authority waste management, national and local waste composition studies, national policy, and community-led circular economy initiatives. Discussion was structured around the stages of the waste hierarchy.
 - In-depth interviews were conducted with five experts, representing a range of perspectives and specialisms. (For more information on the interviews, see Appendix A.)
 - Desk research was used to inform the approach to the workshop and interviews, and to build out and verify the findings, ensuring coverage of a broad range of issues and a balance of perspectives.
- Opportunities to support progress through further research were identified for each stage of the waste hierarchy. Drawing on these, a small number of opportunities were selected as priorities for further investigation, based on their potential to support progress in the short and long term.

¹ OEP (2023) Progress in improving the natural environment in England, 2021/2022. [Link](#). [Accessed 7 March 2024]

1.3 Definitions and abbreviations

Definitions

For the purpose of this study, **waste** is defined as in the European Union (EU) Waste Framework Directive as “any substance or object which the holder discards or intends or is required to discard”.²

Waste management is understood to refer to the collection, transport, recovery, preparation for reuse, recycling, and disposal of waste (regulated and illegal), together with the monitoring and regulation of these processes.³

The **circular economy** refers to an alternative to the traditional linear economy, in which resources are extracted, used for making products, consumed and thrown away. In a circular economy, products and materials are kept in circulation at their highest value for as long as possible, through processes like maintenance, reuse, refurbishment, remanufacture, recycling, and composting. Materials harmful to the environment and health are avoided, and nature is regenerated.⁴

Abbreviations

CCC	Climate Change Committee
Defra	Department for Environment, Food & Rural Affairs
DESNZ	Department for Energy Security & Net Zero
EV	Electric vehicle
HMRC	HM Revenue and Customs
POP	Persistent organic pollutant
WEEE	Waste electrical and electronic equipment

² EU Directive 2008/98/EC of the European Parliament and of the Council of 19 November 2008 on waste and repealing certain Directives 2008. [Link](#). [Accessed 7 March 2024]

³ This reflects the definition used by the OEP.

⁴ Ellen MacArthur Foundation (n.d.) The circular economy in detail. [Link](#). [Accessed 21 March 2024]

2 Overview of the policy landscape

2.1 Introduction

This section provides a brief overview of key topics in waste, resources and circular economy policy in England. First, the high-level policy and legislative context is introduced. Next, for each of a series of topics, a concise briefing is provided of key policies and legislation; roles and responsibilities; targets and reporting requirements; and recent developments. This section was informed by desk research.

2.1.1 The post-EU Exit context

Relevant policies and legislation in England were strongly shaped by European Union (EU) legislation until EU Exit. Since 2020, policy has started to diverge. For example, England is no longer keeping pace with the EU on measures to increase the circularity of products, as the EU implements new legislation on batteries⁵ and rolls out its Sustainable Products Initiative.⁶ The way that recycling targets are calculated has also diverged, with the EU adopting a stricter approach.⁷

This is a devolved policy area, meaning that England, Scotland, Wales and Northern Ireland each have their own distinct policies, plans and regulations. However, in the post-EU Exit environment, the UK Government has been keen to minimise domestic divergence where it affects the UK internal market. This is particularly relevant in the case of policies that regulate goods being placed on the market. For example, market access principles in the UK Internal Market Act 2020 have been interpreted to mean that Scotland's deposit return scheme (DRS) needs to align with the English scheme in terms of materials covered and requirements for logos and barcodes.⁸

The desire for regulatory alignment within the UK is complicated by Northern Ireland's land border with the EU and the special arrangements that apply in Northern Ireland as a result. These are beyond the scope of this study.

2.1.2 Key policies and targets

England's current approach to resources and waste policy was set out in 2018 through the **25 year environment plan**⁹ (later acknowledged as England's first EIP¹⁰) and the **Resources and waste strategy for England**.¹¹ The 25 year environment plan committed to "minimise waste, reuse materials as much as we can and manage materials at the end of their life to minimise the impact on the

⁵ Nicholson, M (2024) Divergence in UK/EU policy: The state of play. Institute for European Environmental Policy. [Link](#). [Accessed 6 March 2024]

⁶ Reland, J (2023) UK-EU regulatory divergence tracker Q4 2023. UK in a Changing Europe. [Link](#). [Accessed 6 March 2024]

⁷ Commission Implementing Decision (EU) 2019/1004 on the calculation, verification and reporting of data on waste 2019. [Link](#). [Accessed 6 March 2024]

⁸ Department for Levelling Up, Housing and Communities (2023) Policy statement: Scottish Deposit Return Scheme – UK internal market exclusion. [Link](#). [Accessed 21 March 2024]

⁹ HM Government (2018) A green future: Our 25 year plan to improve the environment. [Link](#). [Accessed 6 March 2024]

¹⁰ Defra (2023) Environmental improvement plan 2023. [Link](#). [Accessed 6 March 2024]

¹¹ Defra (2018) Resources and waste strategy for England. [Link](#). [Accessed 6 March 2024]

environment". The Resources and waste strategy stated the goal of moving towards a circular economy, and set out the following milestones:

- Double resource productivity by 2050.¹²
- Eliminate all avoidable waste by 2050.
- Eliminate all avoidable plastic waste by the end of 2042.
- Work towards all plastic packaging placed on the market being recyclable, reusable or compostable by 2025.
- Work towards eliminating food waste to landfill by 2030.

In terms of new legislation, the strategy proposed to introduce or consult on the following:

- Ensuring producers pay for the full costs of waste management via updated extended producer responsibility (EPR) rules for packaging and other product categories.
- Introducing a deposit return scheme for drinks containers.
- A tax on plastic packaging with less than 30% recycled plastic.
- Setting minimum ecodesign requirements for resource efficiency.¹³
- Introducing a chemicals strategy.
- Banning more avoidable and problematic plastic products.
- Improving consistency of recycling collections, including country-wide food waste collections.
- Mandatory food waste reporting by businesses.
- Strengthening waste regulations to prevent waste crime, for example by removing exemptions which are commonly abused and mandating digital recording of waste movements.

Significant delays have been experienced with regard to the proposed timeline for most of the above policies.

The Environment Act 2021, a key piece of post-EU Exit legislation, gave the Department for Environment, Food & Rural Affairs (Defra) a range of regulatory powers related to resources and waste. It required a long-term EIP to be in place and updated every five years—resulting in the 2023 EIP which guides current work on this policy area.¹⁴ It also required at least one legally-binding, long-term target to be set for resources and waste. Two targets were considered for England: one related to the aim of doubling resource productivity, and the other aimed at eliminating avoidable waste. Following research and consultation, only the latter was taken forward, in the form of a target to reduce residual waste (excluding major mineral wastes) per capita by 50% by 2042, from 2019 levels.¹⁵

The government is required to publish an updated **waste prevention programme (WPP)** at least every six years. The current WPP, Maximising resources, minimising waste, was introduced in 2023.¹⁶

¹² Initially defined as GDP per unit of raw material used, though this definition has since been called into question.

¹³ Ecodesign is where product standards require the design to address and minimise the life cycle environmental impacts of the product, for example by making it more energy efficient, easier to repair or recycle, reducing use of harmful materials or incorporating recycled content.

¹⁴ Defra (2023) Environmental improvement plan 2023. [Link](#). [Accessed 6 March 2024]

¹⁵ Defra (2022) Environmental targets consultation summary of responses and government response. [Link](#). [Accessed 6 March 2024]

¹⁶ Defra (2023) Waste prevention programme for England: Maximising resources, minimising waste. [Link](#). [Accessed 6 March 2024]

2.2 Waste management and illegal disposal

2.2.1 Waste management licensing and permits

Policies and legislation

The legality of waste management and disposal activities is determined by a system of licensing and permits. At the heart of waste management policy is the duty of care, a legal requirement introduced through the **Environmental Protection Act (EPA) 1990**.¹⁷ It requires those handling controlled waste to take all reasonable steps to “keep it safe, make sure it’s dealt with responsibly and only given to businesses authorised to take it”.¹⁸ This involves for example checking that recipients have the correct permits in place, and keeping records of the types of waste transferred between different actors. Despite facing less onerous requirements than businesses, householders also have a duty of care to ensure they only transfer waste to an authorised business.¹⁹

An individual, business or public authority which uses, recycles, treats, stores or disposes of waste must apply for a permit or register an exemption from the Environment Agency,²⁰ under the **Environmental Permitting (England and Wales) Regulations 2016**.²¹ These regulations combined earlier regulatory regimes for both waste management and pollution prevention and control. There are some limited exceptions, for example businesses that store their own waste for less than a year may not need to register an exemption, but must comply with certain limits and conditions.²² In regard to pollution control, permits are required for waste management activities and installations listed in Schedule 1 of the Environmental Permitting (England and Wales) Regulations 2016.²³ These include landfill sites, waste incinerators, anaerobic digestion plants and other forms of waste management and disposal infrastructure.²⁴

The person (individual or company) granted a permit must be the legal operator of the facility in question, and must be deemed a ‘competent operator’ by the Environment Agency. This is assessed with reference to the person’s technical and financial competence, and their environmental compliance record.²⁵

There have been efforts to tighten regulations in recent years to close loopholes. The **Waste Enforcement (England and Wales) Regulations 2018** granted the Environment Agency increased powers to tackle illegal disposal, including the power to block access to illegal waste sites.²⁶ Following EU Exit, further powers were introduced through the **Environment Act 2021** related to waste management, enforcement and regulation. These included powers to introduce electronic waste

¹⁷ Environmental Protection Act 1990. [Link](#). [Accessed 7 March 2024]

¹⁸ Defra (2018) The revised Waste Duty of Care Code of Practice. [Link](#). [Accessed 7 March 2024]

¹⁹ Defra and Welsh Government (2018) Waste Duty of Care Code of Practice. [Link](#). [Accessed 7 March 2024]

²⁰ Environment Agency and Defra (2024) Waste: environmental permits. [Link](#). [Accessed 7 March 2024]

²¹ The Environmental Permitting (England and Wales) Regulations 2016. [Link](#). [Accessed 7 March 2024]

²² Environment Agency (2019) Storing waste: waste exemptions. [Link](#). [Accessed 7 March 2024]

²³ Defra and Welsh Government (2020) Environmental permitting: Core guidance. [Link](#). [Accessed 7 March 2024]

²⁴ The Environmental Permitting (England and Wales) Regulations 2016. [Link](#). [Accessed 7 March 2024]

²⁵ Environment Agency and Defra (2019) Legal operator and competence requirements: environmental permits. [Link](#). [Accessed 7 March 2024]

²⁶ The Waste Enforcement (England and Wales) Regulations 2018. [Link](#). [Accessed 7 March 2024]

tracking systems at a national level, and enhanced enforcement powers related to waste crime. The Environment Act 2021 also enabled the Environment Agency to recover costs associated with certain regulatory activities, for example by charging fees for permits.²⁷

Key roles and responsibilities

- **Defra** develops policy and legislation for waste management licensing and permits.
- The **Environment Agency** is responsible for the implementation and enforcement of environmental permitting regulations for larger and more polluting waste installations. It operates a risk-based approach, for example targeting activities that pose the greatest risk to human health or the environment.²⁸
- **Local authorities** hold permit responsibilities for some smaller-scale facilities, such as small waste incinerators.²⁹
- **Any business producing, transporting, managing or disposing of waste** must comply with the duty of care.
- **All individuals** must comply with a basic duty of care when disposing of their household waste.

Key targets and reporting requirements

- The Waste (England and Wales) Regulations 2011 require the Environment Agency to maintain a register of carriers, brokers and dealers.³⁰
- The Environment Agency sets itself a 'ceiling target' each quarter for the number of recorded high risk illegal waste sites, which was reduced from a 2019/20 baseline of 233 to 161 in Q2 of 2023/24.³¹ This data may not accurately reflect the number of high-risk sites in existence, as it relies on sites being reported.

Recent developments

- Reforms to the system of waste permit exemptions, to reduce abuses of the exemptions system.³² These are expected to come into force during 2024-2025, but the exact timing has yet to be announced.³³
- Reforms to bring waste transporters and controllers (formerly known as waste carriers, brokers and dealers) into the Environmental Permitting Regulations, meaning that they will be subject to similar enforcement measures and competency requirements as waste facility operators.³⁴
- Mandatory digital waste tracking is due to be introduced UK-wide from April 2025.³⁵

²⁷ Environment Act 2021. [Link](#). [Accessed 7 March 2024]

²⁸ Environment Agency (2024) Assessing and scoring environmental permit and licence compliance. [Link](#). [Accessed 7 March 2024]

²⁹ Defra (2017) Local Authority Pollution Control: general guidance manual. [Link](#). [Accessed 7 March 2024]

³⁰ The Waste (England and Wales) Regulations 2011. [Link](#). [Accessed 7 March 2024]

³¹ Environment Agency (2024) Environment Agency corporate scorecard 2023 to 2024 - quarter two. [Link](#). [Accessed 7 March 2024]

³² Defra and Welsh Government (2023) Reducing crime at sites handling waste, and introducing fixed penalties for waste duty of care: Consultation outcome - Supplementary government response. [Link](#). [Accessed 7 March 2024]

³³ Environment Agency and Defra (2024) Register, renew or change waste exemptions. [Link](#). [Accessed 7 March 2024]

³⁴ Defra (2023) Waste carrier, broker and dealer system reform: Consultation outcome - Government response and summary of responses. [Link](#). [Accessed 7 March 2024]

³⁵ Defra (2023) Mandatory digital waste tracking. [Link](#). [Accessed 21 March 2024]

2.2.2 Hazardous waste

Policies and legislation

Around 6 million tonnes of hazardous waste³⁶ were managed in England in 2022, mainly generated by six industry sectors: chemicals, oils, construction and demolition, waste and water treatment, and general industry.³⁷

A core piece of legislation is **the Hazardous Waste (England and Wales) Regulations 2005**³⁸ (amended in 2009 and 2016), which implemented the **1991 Hazardous Waste Directive (91/689/EEC)**.³⁹ A key aim is to ensure hazardous waste is kept separate from non-hazardous waste streams. Originally, the 2005 regulations required notification to the Environment Agency of any premises where at least 200kg of hazardous waste was produced or removed from in a 12-month period. In 2009, this was increased to 500kg; and in 2016, the requirement to notify was removed altogether. However, the consignment note system still requires that movements of hazardous waste are notified at least quarterly to the Environment Agency, enabling oversight where those involved comply.⁴⁰

The Hazardous Waste Directive was replaced in 2008 by the revised **Waste Framework Directive (2008/98/EC)**,⁴¹ which was amended again in 2018 to require separate hazardous waste collections from households by 2025,⁴² but England did not transpose this.

Hazardous waste management is also affected by legislation on persistent organic pollutants (POPs), which has been shaped by the **Stockholm Convention**, Article 6. This requires measures to reduce or eliminate the release of POPs from waste, for example by ensuring they are destroyed or irreversibly transformed (usually through incineration).^{43,44} In practice, this means that local authorities need to ensure that waste soft furnishings—which often contain POPs as flame retardants—are managed separately from non-hazardous waste.⁴⁵

Key roles and responsibilities

- **Defra** develops policy and legislation for hazardous waste management.
- The **Environment Agency** issues permits, monitors compliance (including through conducting periodic inspections), and enforces regulations with respect to environmental impacts.⁴⁶

³⁶ According to Defra: “Waste is generally considered hazardous if it (or the material or substances it contains) are harmful to humans or the environment.” Defra (n.d.) Hazardous waste. [Link](#). [Accessed 22 March 2024]

³⁷ Environment Agency (2024) 2022 Hazardous Waste Interrogator. [Link](#). [Accessed 11 March 2024]

³⁸ Hazardous Waste (England and Wales) Regulations 2005. [Link](#). [Accessed 7 March 2024]

³⁹ EU Directive 91/689/EEC on hazardous waste 1991. [Link](#). [Accessed 12 March 2024]

⁴⁰ Environment Agency (n.d.) Hazardous waste. [Link](#). [Accessed 7 March 2024]

⁴¹ EU Directive 2008/98/EC of the European Parliament and of the Council of 19 November 2008 on waste and repealing certain Directives 2018. [Link](#). [Accessed 7 March 2024]

⁴² Publications Office of the European Union (2022) EU waste management law. [Link](#). [Accessed 7 March 2024]

⁴³ Stockholm Convention on Persistent Organic Pollutants 2001. [Link](#). [Accessed 7 March 2024]

⁴⁴ The Persistent Organic Pollutants Regulations 2007. [Link](#). [Accessed 7 March 2024]

⁴⁵ Environment Agency (2022) Manage waste upholstered domestic seating containing POPs. [Link](#). [Accessed 7 March 2024]

⁴⁶ Hazardous Waste (England and Wales) Regulations 2005. [Link](#). [Accessed 7 March 2024]

- The **Health and Safety Executive (HSE)** plays a role in overseeing aspects of hazardous waste management where there is an impact on human health. For example, in the context of the Control of Major Accident Hazards (COMAH) Regulations, the HSE takes responsibility for human health impacts and the Environment Agency handles environmental impacts.^{47,48}
- **Local authorities** must ensure that certain types of hazardous waste are separately collected and managed; and also support the HSE with enforcing health and safety regulations.⁴⁹
- **Any business producing, transporting, managing or disposing of hazardous waste** must keep it separate from non-hazardous waste, apply a duty of care in passing it to others, and complete consignment notes. Recipients ('consignees') must send consignee returns to the Environment Agency and the entity which sent them the waste.⁵⁰
- **All individuals** must comply with a basic duty of care when disposing of hazardous household waste.

Key targets and reporting requirements

- Public bodies do not face any specific targets or reporting requirements for hazardous waste.
- The Environment Agency must retain records of consignment notes reported to it for at least three years.⁵¹

Recent developments

- Changes to the regulations on the disposal of items containing persistent organic pollutants (POPs).^{52,53} The Local Government Association has expressed concern that proposed changes could make it necessary to separate out more waste streams as hazardous, creating more complexity than current waste management infrastructure is capable of dealing with.⁵⁴
- Regulatory position statements on hazardous waste wood from demolition and refurbishment activities have been repeatedly changed in recent years.⁵⁵ At present, certain categories of hazardous waste wood can be mixed with non-hazardous wood. However, the Environment Agency intends to withdraw this rule by 1 October 2024.⁵⁶

⁴⁷ The Control of Major Accident Hazards (COMAH) Regulations 2015. [Link](#). [Accessed 11 March 2024]

⁴⁸ Environment Agency (2024) Control of Major Accident Hazards (COMAH) offences. [Link](#). [Accessed 22 March 2024]

⁴⁹ Health and Safety Executive (n.d.) Local authority enforcement. [Link](#). [Accessed 7 March 2024]

⁵⁰ Environment Agency (n.d.) Hazardous waste. [Link](#). [Accessed 7 March 2024]

⁵¹ Hazardous Waste (England and Wales) Regulations 2005. [Link](#). [Accessed 7 March 2024]

⁵² Department for Environment, Food and Rural Affairs (2023) Consultation on potential amendments to the Persistent Organic Pollutants (POPs) Regulation. [Link](#). [Accessed 11 March 2024]

⁵³ Resource.co (2023) What's happening with 'persistent organic pollutants' (aka POPs)? [Link](#). [Accessed 11 March 2024]

⁵⁴ Local Government Association (2023) LGA Response to Defra's consultation on potential amendments to the Persistent Organic Pollutants POPs regulation. [Link](#). [Accessed 7 March 2024]

⁵⁵ Environment Agency (2021) Hazardous waste wood from demolition and refurbishment activities: RPS 250. [Link](#). [Accessed 7 March 2024]

⁵⁶ Environment Agency (2023) Storing and treating hazardous waste wood: RPS 291. [Link](#). [Accessed 7 March 2024]

- Overlap with the issue of water pollution by agricultural businesses, in cases where waste pesticides and other horticultural chemicals are illegally dumped into waterways.⁵⁷
- Policy divergence from the EU: with EU member states set to introduce separate hazardous waste collections from households by the start of 2025,⁵⁸ it will be useful to observe the challenges involved and the positive and negative impacts.

2.2.3 Transfrontier waste shipments

Policies and legislation

The UK's regulations on transfrontier waste shipments are not devolved, and are informed by the international context. The **Basel Convention** aims to ensure that waste only moves across borders where it will be managed in an environmentally-sound way. It prohibits exports to Antarctica, to states not party to the Convention, and to states that have banned waste imports. To be legal, waste shipments must have 'prior informed consent' from the recipient country.⁵⁹

Waste movements between higher income countries are also controlled by the **OECD Decision of the Council on the Control of Transboundary Movements of Wastes Designed for Recovery**. 'Recovery' includes recycling, composting and use as a fuel other than in direct incineration. The Decision outlines risk-based procedures to assess the level of control needed for different categories of waste export between OECD members.⁶⁰

The EU's **Waste Shipments Regulation (1013/2006)** prohibits the export of waste for disposal other than to EU or European Free Trade Area countries, and prohibits the export of hazardous waste for recovery to non-EU, non-OECD Decision countries.⁶¹

The EU regulation was transposed in the UK by the **Transfrontier Shipment of Waste Regulations 2007**, which set out rules on waste imports and exports, including notification and record-keeping duties.⁶² The current UK plan for shipments of waste states that imports and exports of waste for disposal are prohibited in most cases.⁶³ Low-risk waste can move between the UK and other OECD countries if it is intended for a recycling or recovery operation; and the UK can export waste to non-OECD countries if it is intended for recycling or recovery and prior informed consent has been received.⁶⁴ Following the UK's withdrawal from the EU, the UK remains a signatory to the Basel

⁵⁷ Moore, D (2019) Somerset landowner fined £27,000 for illegally disposing of waste pesticides. Circular. [Link](#). [Accessed 11 March 2024]

⁵⁸ European Environmental Bureau (2020) Explained: Europe's new laws for the separate collection of waste. [Link](#). [Accessed 22 March 2024]

⁵⁹ Basel Convention (n.d.) Overview. [Link](#). [Accessed 7 March 2024]

⁶⁰ Organisation for Economic Cooperation and Development (2024) The OECD Control System for waste recovery. [Link](#). [Accessed 7 March 2024]

⁶¹ European Commission (n.d.) Waste Shipments. [Link](#). [Accessed 11 March 2024]

⁶² The Transfrontier Shipment of Waste Regulations 2007. [Link](#). [Accessed 11 March 2024]

⁶³ Department for Environment, Food and Rural Affairs (2021) UK plan for shipments of waste. [Link](#). [Accessed 11 March 2024]

⁶⁴ The Transfrontier Shipment of Waste Regulations 2007. [Link](#). [Accessed 11 March 2024]

Convention and a member of the OECD. The EU Waste Shipments Regulation was retained in UK law and will not be revoked under the Retained EU Law (Revocation and Reform) Act 2023.^{65,66}

Key roles and responsibilities

- **Defra** is responsible for setting out its approach to waste imports and exports.⁶⁷
- The **Environment Agency** is responsible for providing guidance on and enforcing the Transfrontier Shipment of Waste Regulations 2007.⁶⁸ In 2022/23, it prevented the illegal export of more than 17,000 tonnes of waste.⁶⁹
- **HM Revenue and Customs** (HMRC) officials may disclose information to the Environment Agency to help with enforcement; and customs officials may seize and detain waste if they suspect a breach.⁷⁰

Key targets and reporting requirements

- There are no specific targets related to transboundary waste movements, though the Basel Convention requires signatories to work to reduce waste generated and exported.
- The Environment Agency must inform Defra of any proposed waste shipments for disposal (imports or exports).^{71,72}
- Businesses exporting or importing waste must notify and gain consent from the competent authorities in transit and recipient countries. For higher-risk waste, they must also notify the Environment Agency and pay charges. For lower-risk 'green list' waste, they do not need to notify the Environment Agency but must keep information on the waste for three years.⁷³

Recent developments

- In late 2023, the Environment Agency consulted on proposals to increase charges for transfrontier waste shipments from April 2024 and to subsequently update charges annually in line with inflation to maintain full cost recovery.⁷⁴ This could result in strengthened enforcement.
- The Environment Agency reached a data-sharing agreement with HMRC in 2023, which will enable it to use customs export data in support of enforcement.
- In early 2024, it also launched a Waste Shipment Intelligence Service in partnership with Mediterranean Shipping Company, with a view to sharing knowledge and resources.⁷⁵

⁶⁵ International Waste Shipments (Amendment) (EU Exit) Regulations 2019. [Link](#). [Accessed 11 March 2024]

⁶⁶ Retained EU Law (Revocation and Reform) Act 2023. [Link](#). [Accessed 11 March 2024]

⁶⁷ The Transfrontier Shipment of Waste Regulations 2007. [Link](#). [Accessed 7 March 2024]

⁶⁸ The Transfrontier Shipment of Waste Regulations 2007. [Link](#). [Accessed 7 March 2024]

⁶⁹ Pow, R (2023) Waste: Exports – Response by the minister to a question for the Department for Environment, Food and Rural Affairs, 16 Oct 2023. [Link](#). [Accessed 7 March 2024]

⁷⁰ The Transfrontier Shipment of Waste Regulations 2007. [Link](#). [Accessed 7 March 2024]

⁷¹ The Transfrontier Shipment of Waste Regulations 2007. [Link](#). [Accessed 7 March 2024]

⁷² Department for Environment, Food and Rural Affairs (2021) UK plan for shipments of waste. [Link](#). [Accessed 7 March 2024]

⁷³ Environment Agency (2023) Waste: export and import. [Link](#). [Accessed 7 March 2024]

⁷⁴ Environment Agency (2023) Environment Agency charge proposal for notified international waste shipments. [Link](#). [Accessed 7 March 2024]

⁷⁵ Environment Agency (2024) We've joined forces with MSC to stop illegal waste exports. [Link](#). [Accessed 7 March 2024]

- In 2023, the EU agreed to prohibit the export of plastic waste to non-OECD countries by 2026. (Specific non-OECD countries may be able to apply for an exemption.)⁷⁶ This will affect UK plastic waste exports for recycling, in cases of transshipment via EU ports.
- A full UK ban on exports of plastic waste by 2027 has been recommended by the Environment, Food and Rural Affairs (EFRA) Committee⁷⁷ and a government-commissioned independent net zero review.⁷⁸ The current government has so far only committed to banning plastic exports to non-OECD countries, and this has yet to be taken forward.

⁷⁶ European Commission (2023) Commission welcomes political agreement on stronger control of exports of waste. [Link](#). [Accessed 7 March 2024]

⁷⁷ Environment, Food and Rural Affairs Committee (UK Parliament) (2022) The price of plastic: ending the toll of plastic waste. [Link](#). [Accessed 11 March 2024]

⁷⁸ Skidmore, C (2022) Mission Zero: Independent Review of Net Zero. [Link](#). [Accessed 11 March 2024]

Spotlight on waste crime

What is waste crime? Waste crime occurs when individuals or businesses fail to comply with legislation on waste management, deliberately or not. Perpetrators include individuals, companies, and organised crime. Crimes range from small-scale littering and fly-tipping, to large-scale or repeated fly-tipping and illegal dumping of waste. Companies may operate without the correct permits, or those with permits may mis-classify waste to send the wrong items to landfill or to non-OECD countries. Responsibility for clearing illegally dumped waste falls to the land owner or manager, which may public or private. In practice, this often places a burden on local authorities.⁷⁹

How are waste laws enforced? The Environment Agency has published a list of all the waste offences on which it can take action, and the associated enforcement measures.⁸⁰ The Proceeds of Crime Act 2002 can also be used to recover illegally-gained profits.⁸¹ HMRC can take enforcement action where there are breaches of Landfill Tax. Local authorities can seize vehicles they suspect are being used for waste crime.⁸² However, a National Audit Office investigation in 2022 and the National Waste Crime Survey 2023 both concluded that current enforcement was not providing an effective deterrent.^{83,84}

What is being done to strengthen compliance? In 2018, the government stated its intention to eliminate waste crime in the 25 year environment plan and commissioned an independent review into the topic.⁸⁵ Since then it has taken a number of steps.

A Joint Unit for Waste Crime has been established to enable collaboration between the environmental regulators, HMRC, law enforcement and the National Crime Agency.⁸⁶ Data-sharing (for example of police databases and customs export data) has been strengthened.⁸⁷ An Economic Crime Unit has been set up within the Environment Agency to tackle financial crimes such as money laundering in the waste sector.⁸⁸ Powers have been taken to introduce digital waste tracking, and this is set to be introduced from 2025. As discussed in Section 2.2.1, reforms are being made to the permitting system for waste transporters and controllers and to rules on waste permit exemptions.

Higher civil penalties are now possible: the £250,000 ceiling on fines on operators found in breach of permit rules has been removed;^{89,90} and at the lower end of the waste crime scale, the maximum fines that councils can impose for litter and fly-tipping have been raised.⁹¹

⁷⁹ Defra (2018) Litter and refuse: council responsibilities to keep land clear. [Link](#). [Accessed 22 March 2024]

⁸⁰ Environment Agency (2024) Waste offences. [Link](#). [Accessed 7 March 2024]

⁸⁰ National Audit Office (2022) Investigation into government's actions to combat waste crime in England. [Link](#). [Accessed 7 March 2024]

⁸¹ Environment Agency (2024) Waste criminals – we've got you in our sights. [Link](#). [Accessed 7 March 2024]

⁸² Defra (2015) Local authorities: seizing vehicles for suspected waste crime. [Link](#). [Accessed 22 March 2024]

⁸³ Environment Agency (2023) National waste crime survey 2023: results and findings. [Link](#). [Accessed 7 March 2024]

⁸⁴ National Audit Office (2022) Investigation into government's actions to combat waste crime in England. [Link](#). [Accessed 7 March 2024]

⁸⁵ Defra (2018) Serious and organised waste crime: 2018 review. [Link](#). [Accessed 7 March 2024]

⁸⁶ Environment Agency, HM Revenue & Customs, and National Crime Agency (2021) Successful first year for waste crime taskforce despite pandemic. UK Government News. [Link](#). [Accessed 7 March 2024]

⁸⁷ Environment Agency (2024) Waste criminals – we've got you in our sights. [Link](#). [Accessed 7 March 2024]

⁸⁸ Environment Agency, Defra, and Moore, R (2024) Ensuring crime doesn't pay: New Economic Crime Unit to tackle money laundering and carry out financial investigations. UK Government News. [Link](#). [Accessed 7 March 2024]

⁸⁹ Defra, Environment Agency, Pow, R, and Coffey, T (2023) 'Polluters must pay' says Environment Secretary, as unlimited penalties unveiled. UK Government News. [Link](#). [Accessed 7 March 2024]

⁹⁰ The Environmental Permitting (England and Wales) Regulations 2016. [Link](#). [Accessed 7 March 2024]

⁹¹ Defra, Environment Agency, Pow, R, and Coffey, T (2023) Bigger fines possible for littering and fly-tipping. [Link](#). [Accessed 7 March 2024]

2.3 Waste hierarchy and circular economy

2.3.1 Residual waste prevention

Policies and legislation

Residual waste prevention has been at the forefront of resources and waste policy in England for three decades and remains a focus, as can be seen from Section 2.1.1 'Key policies and targets'. Landfill Tax, a weight-based tax introduced in 1996, is credited with reducing the amount of local authority waste sent to landfill in England by 90% since 2000.⁹² There are two rates of tax: a standard rate and a lower rate for non-hazardous, least polluting materials. The standard rate per tonne has been ramped up from just £7 in 1996 to £102.10 in 2023, whereas the lower rate remains at just £3.25.⁹³

Landfill Tax contributed to a sharp rise in household waste recycling rates from 11% in 2000 to 41% in 2010.^{94,95} However, in the following decade the recycling rate stagnated, reaching just 44% in 2020.⁹⁶ The share of waste sent to incineration with energy recovery ('energy from waste', EfW) grew rapidly during this period. Nearly half of local authority waste is now incinerated.⁹⁷

In the 2018 Resources and waste strategy, the government recognised that it was necessary to reduce all residual waste generation—including landfill *and* EfW. Besides measures aimed at increasing recycling and reuse (see Sections 2.3.2 and 2.3.3), Defra aimed to achieve this by "working towards" eliminating all biodegradable waste to landfill by 2030, and sending no more than 10% of all municipal waste to landfill by 2035 (in line with the EU's Circular Economy Package).⁹⁸ It consulted in 2023 regarding the interim aim of "near elimination" of biodegradable waste to landfill by 2028.⁹⁹ To support these goals, from 2026, all local authorities in England will be required to arrange separate weekly food waste collections from households for recycling.¹⁰⁰

The strategy did not commit to any measures or targets specifically aimed at reducing waste sent to EfW. Rather, it aimed to make EfW facilities more efficient, for instance by making better use of the heat as well as electricity generated. (Of 40 EfW plants in England in 2018, just 8 were combined heat and power plants.) However, it stated that the government might consider a tax on EfW, if other policies failed to reduce residual waste in the longer term.¹⁰¹ Since 2018, the government has shifted its focus to reducing greenhouse gas (GHG) emissions from EfW, something which is critical to the Climate Change Committee (CCC)'s pathway for the waste sector.¹⁰² It has started providing support to the roll-out of

⁹² HM Treasury (2021) Landfill Tax: call for evidence. [Link](#). [Accessed 8 March 2024]

⁹³ HMRC (2023) Environmental Taxes Bulletin historical rates. [Link](#). [Accessed 8 March 2024]

⁹⁴ Defra (2018) England's local authority recycling statistics published for 2017/18. [Link](#). [Accessed 8 March 2024]

⁹⁵ Defra (2023) ENV23 - UK statistics on waste. [Link](#). [Accessed 8 March 2024]

⁹⁶ Defra (2023) ENV23 - UK statistics on waste. [Link](#). [Accessed 8 March 2024]

⁹⁷ Defra (2024) Local authority collected waste management - annual results 2022/23. [Link](#). [Accessed 8 March 2024]

⁹⁸ Defra (2018) Resources and waste strategy for England. [Link](#). [Accessed 7 March 2024]

⁹⁹ Defra (2023) Call for evidence to support the near elimination of biodegradable waste disposal in landfill from 2028. [Link](#). [Accessed 7 March 2024]

¹⁰⁰ Defra (2023) Simpler recycling collections and tougher regulation to reform waste system. [Link](#). [Accessed 8 March 2024]

¹⁰¹ Defra (2018) Resources and waste strategy for England. [Link](#). [Accessed 7 March 2024]

¹⁰² CCC (2020) The Sixth Carbon Budget: Waste. [Link](#). [Accessed 22 March 2024]

carbon capture, usage and storage (CCUS) for EfW plants,¹⁰³ and in 2023 it announced that EfW would be included in the UK's emissions trading scheme (ETS) from 2028.¹⁰⁴

Key roles and responsibilities

- **Defra** is responsible for developing policies to reduce residual waste generation and for meeting the long-term target, working with the stakeholders below.
- **Local authorities** are responsible for implementing policies aimed at reducing residual waste.
- **HM Treasury and HMRC** are responsible for the Landfill Tax and any future decisions related to an incineration tax.
- The **Department for Energy Security and Net Zero (DESNZ)** is responsible for incentivising the decarbonisation of EfW plants, though does not focus on residual waste reduction.
- The **Climate Change Committee (CCC)** is responsible for advising the government on how to decarbonise the waste sector in line with net zero pathways, and reporting to parliament on progress.

Key targets and reporting requirements

- The Waste (England and Wales) Regulations 2011 require Defra to publish a WPP with associated indicators and targets, updated at least every six years.¹⁰⁵
- A legally-binding target to reduce residual waste (excluding major mineral wastes) per capita by 50% by 2042, from 2019 levels.¹⁰⁶ This is supported by interim targets for 2028 regarding per capita and total quantity of residual waste; and per capita municipal waste broken down by key waste streams such as food, plastic, paper and card, metal and glass.¹⁰⁷
- Stated targets to eliminate all biodegradable waste to landfill by 2030, and to send no more than 10% of all municipal waste to landfill by 2035.

Recent developments

- In 2021-2022, HM Treasury ran a call for evidence on Landfill Tax to ensure that it could meet England's updated environmental objectives. No policy change has since been announced.¹⁰⁸
- There is growing pressure to remove plastic waste from EfW to cut GHG emissions, for example by making use of advanced sorting infrastructure to remove materials for recycling.

¹⁰³ Department for Energy Security and Net Zero (2023) Carbon capture, usage and storage: Industrial carbon capture business models update. [Link](#). [Accessed 8 March 2024]

¹⁰⁴ Department for Energy Security and Net Zero (2023) The long-term pathway for the UK Emissions Trading Scheme. [Link](#). [Accessed 8 March 2024]

¹⁰⁵ The Waste (England and Wales) Regulations 2011. [Link](#). [Accessed 8 March 2024]

¹⁰⁶ Defra (2022) Environmental targets consultation summary of responses and government response. [Link](#). [Accessed 8 March 2024]

¹⁰⁷ Defra (2023) Environmental improvement plan 2023. [Link](#). [Accessed 22 March 2024]

¹⁰⁸ HM Treasury (2023) Landfill Tax Review: call for evidence. [Link](#). [Accessed 8 March 2024]

2.3.2 Recycling

Policies and legislation

England's **household recycling** rate has plateaued since around 2012, reaching 44% in 2020 compared to the target of 50%, and sitting at 43% in 2023.¹⁰⁹ To stimulate plastic recycling, in April 2022 the Plastic Packaging Tax (PPT) came into force, applying a rate of £210.82/tonne on plastic packaging with less than 30% recycled plastic content.¹¹⁰ At present, three key policies are being pursued to increase recycling from households and non-household municipal premises (such as businesses, schools and hospitals), collectively known as the 'collection and packaging reforms' (CPR):

- Consistent recycling collections, now known as Simpler Recycling (expected in 2026-27) – including separate collections of dry recyclables, and weekly food waste collections.¹¹¹
- A deposit return scheme (DRS) for drinks containers (currently expected in late 2025). England will include PET bottles and steel and aluminium cans up to 3 litres in size.¹¹²
- Updated packaging EPR, requiring producers to cover the full costs of end-of-life management and incentivising the use of recyclable materials (being phased in during 2024-25).¹¹³

The CPR are behind schedule. Two reviews by the Infrastructure and Projects Authority (IPA) in 2022 concluded that the CPR project was unachievable and would need significant re-scoping.¹¹⁴ EPR reforms are also planned for batteries, waste electrical and electronic equipment (WEEE), and end-of-life vehicles. A consultation on WEEE EPR, originally planned for 2020,¹¹⁵ was held in early 2024.¹¹⁶

The residual waste reduction target does not cover major mineral **construction and demolition (C&D) waste**. To encourage C&D waste recycling, an Aggregates Levy applies of around £2/tonne on sand, gravel and rock that has been dug up, dredged or imported.^{117,118} The C&D recovery rate was 92.6% in 2020, against a 70% target.^{119,120} This mainly represents low-value recycling of materials as aggregate.

Reporting of data on **commercial and industrial (C&I) waste**¹²¹ in England is limited, though Defra estimates that it accounted for 19% of all waste generated in 2018. (Due to waste regulations and commercial practices, detailed data on waste quantities is likely to be available at company level, but is

¹⁰⁹ Defra (2023) Local authority collected waste management - annual results 2022/23. [Link](#). [Accessed 8 March 2024]

¹¹⁰ The Plastic Packaging Tax (General) Regulations 2022. [Link](#). [Accessed 11 March 2023]

¹¹¹ Defra (2023) Consultation outcome: Government response. [Link](#). [Accessed 8 March 2024]

¹¹² Defra (2023) Consultation outcome: Introduction of a deposit return scheme in England, Wales and Northern Ireland. [Link](#). [Accessed 8 March 2024]

¹¹³ Defra and Environment Agency (2024) Extended producer responsibility for packaging: who is affected and what to do. [Link](#). [Accessed 8 March 2024]

¹¹⁴ Infrastructure and Projects Authority (2023) Infrastructure and Projects Authority Annual Report 2022-23. [Link](#). [Accessed 11 March 2024]

¹¹⁵ Defra (2018) Resources and waste strategy for England. [Link](#). [Accessed 8 March 2024]

¹¹⁶ Defra (2023) Consultation on reforming the producer responsibility system for waste electrical and electronic equipment 2023. [Link](#). [Accessed 8 March 2024]

¹¹⁷ HM Government (n.d.) Environmental taxes, reliefs and schemes for businesses: Aggregates Levy. [Link](#). [Accessed 8 March 2024]

¹¹⁸ HMRC (2024) Rates and allowances — Aggregates Levy. [Link](#). [Accessed 8 March 2024]

¹¹⁹ Defra (2023) UK statistics on waste. [Link](#). [Accessed 8 March 2024]

¹²⁰ Defra (2020) Progress report on recycling and recovery targets for England 2020. [Link](#). [Accessed 8 March 2024]

¹²¹ Agricultural waste is included under C&I – industrial waste.

not collated or published.) Household waste accounted for an estimated 12%.¹²² Around a third of C&I waste is described as “household-like”, and is included under Simpler Recycling. Defra estimated in 2021 that the recycling rate for household-like business waste was 43%.¹²³

Key roles and responsibilities

- **Defra** sets recycling policy and monitors progress.
- **HM Treasury and HMRC** work with Defra to determine and implement the PPT and Aggregates Levy.
- **Local authorities** implement recycling collections.
- **Households and non-household municipal premises** producing household-like waste will need to comply with the Simpler Recycling reforms.
- **Scheme administrators** will play a key role in designing and implementing EPR schemes.

Key targets and reporting requirements

- Defra has to publish a waste management plan and waste prevention plan.
- Target to recycle 65% of municipal waste by 2025.¹²⁴
- Material-specific recycling targets under existing producer responsibility schemes.
- Target to recover 70% of non-hazardous C&D waste by 2020.¹²⁵

Recent developments

- Detailed decisions on the Simpler Recycling reforms, for example related to the frequency and nature of collections, which will affect the impact on recycling rates.
- The timeline for CPR and wider EPR implementation, given previous delays, and the impact on targets.
- Harmonisation or divergence with the EU on EPR and eco-modulation design,¹²⁶ and with the devolved administrations on DRS.

2.3.3 Reuse and repair

Policies and legislation

The 2018 Resources and waste strategy stated the aims of extending the lives of products through repair, reuse and remanufacture, and bringing down barriers to reuse.¹²⁷ The 2021 WPP noted the need to ensure that “products are made to be durable, repairable and recyclable, and can be remanufactured where appropriate”. Proposed measures to address reuse included:¹²⁸

- Introducing further restrictions on single-use items, such as plastic wet wipes and vapes.

¹²² Defra (2023) UK statistics on waste. [Link](#). [Accessed 8 March 2024]

¹²³ Defra (2021) Waste management plan for England. [Link](#). [Accessed 8 March 2024]

¹²⁴ Defra (2018) Resources and waste strategy for England. [Link](#). [Accessed 8 March 2024]

¹²⁵ Defra (2021) Waste management plan for England. [Link](#). [Accessed 8 March 2024]

¹²⁶ Eco-modulation of fees is where producer fees under an EPR scheme are higher for less recyclable materials/products, and lower for those which are more recyclable or reusable.

¹²⁷ Defra (2018) Resources and waste strategy for England. [Link](#). [Accessed 8 March 2024]

¹²⁸ Defra (2023) Waste prevention programme for England: Maximising resources, minimising waste. [Link](#). [Accessed 8 March 2024]

- Promoting reuse through eco-modulation of EPR fees.
- Exploring ecodesign rules and mandatory extended warranties.
- Encouraging reuse at household waste and recycling centres (HWRCs) through contracts with charities, exploring reuse targets for local authorities, and clarifying their duties regarding reuse.
- Considering how to promote reuse through a new chemicals strategy.

Defra has introduced charges and restrictions on a range of single-use plastic items, such as carrier bags, cutlery, straws and plates, cotton buds, polystyrene food containers, and certain microplastics.^{129,130} The Environment Act 2021 gave Defra the power to restrict further single-use items, irrespective of material—which could be used to ensure that future restrictions result in reuse, rather than material substitution. In early 2024, the government announced plans to ban disposable vapes.¹³¹

It remains to be seen how eco-modulation may be used to drive up reuse in the various new EPR schemes. The Environment Act 2021 gave Defra powers to introduce producers obligations and targets related to reuse, which could be used to set reuse targets in the context of EPR schemes.¹³²

As for ecodesign requirements, the first ones related to resource efficiency were introduced in 2021, for a limited range of electrical appliances (household washing machines/washer driers, dishwashers, refrigerators, and electronic displays).¹³³ The Environment Act 2021 gave Defra powers to introduce ecodesign requirements for a wider range of product categories. The 2023 WPP said the government would consider expanding the range of ecodesign measures, but made no commitments.¹³⁴

No legislative changes have been made since 2018 to increase reuse at HWRCs, but Defra has committed to consult by 2025 on proposals to remove fees for household furniture collections.¹³⁵

In the construction sector, reusing products and assets at highest value is an important way of reducing the lifetime material and carbon footprint of a building.^{136,137} At present, new builds are zero-rated for VAT whereas refurbishment and refit face 20% VAT (with a temporary rate of 5% for installing certain

¹²⁹ Pow, R; Department for Environment, Food and Rural Affairs (2023) Plastic bag use falls by more than 98% after charge introduction. UK Government News. [Link](#). [Accessed 11 March 2024]

¹³⁰ Department for Environment, Food and Rural Affairs Press Office (2023) Coverage of the introduction of restrictions on a range of single-use plastics. Defra Media. [Link](#). [Accessed 11 March 2024]

¹³¹ Department of Health and Social Care et al (2024) Disposable vapes banned to protect children's health. UK Government News. [Link](#). [Accessed 11 March 2024]

¹³² Environment Act 2021. [Link](#). [Accessed 7 March 2024]

¹³³ The Ecodesign for Energy-Related Products and Energy Information Regulations 2021. [Link](#). [Accessed 8 March 2024]

¹³⁴ Defra (2023) Waste prevention programme for England: Maximising resources, minimising waste. [Link](#). [Accessed 8 March 2024]

¹³⁵ Defra (2023) Waste prevention programme for England: Maximising resources, minimising waste. [Link](#). [Accessed 8 March 2024]

¹³⁶ Climate Change Committee (2020) The Sixth Carbon Budget: Manufacturing and construction. [Link](#). [Accessed 8 March 2024]

¹³⁷ Defra (2023) Waste prevention programme for England: Maximising resources, minimising waste. [Link](#). [Accessed 8 March 2024]

energy-saving products).^{138,139} Building standards do not address design for reuse.¹⁴⁰ The WPP did not commit to any new legislative measures on reuse in construction, though showed willingness on Defra's part to explore ecodesign standards for construction materials. It also noted ongoing policy development work by DEZNZ, in line with the Industrial Decarbonisation Strategy, to support demand for reusable and secondary industrial products, for example through ecodesign and labelling requirements.

Roles and responsibilities

- **Defra** is responsible for building reuse targets into EPR schemes; for setting ecodesign and product information requirements for most products; and for increasing reuse at HWRCs.
- **DEZNZ** is responsible for ecodesign and product information requirements for energy-related products and for industrial products.
- The **Office for Product Safety and Standards (OPSS)** is responsible for compliance with current ecodesign regulations.¹⁴¹
- **Local authorities** are responsible for encouraging reuse at HWRCs.
- **HM Treasury and HMRC** are responsible for setting VAT and other tax rates, which could be used to incentivise reuse.
- The **Department for Levelling Up, Housing and Communities (DLUHC)** is responsible for building standards, which could drive circularity in building design.

Key targets and reporting requirements

- There are no specific national targets or reporting requirements for reuse at present.

Recent developments

- The EU is moving faster on expanding ecodesign requirements to more products. From June 2025, new requirements will apply to smartphones and tablets covering aspects such as damage resistance, battery durability, disassembly, repairability and upgradability.¹⁴²
- In March to June 2023, DEZNZ consulted on product-level reporting of embodied carbon emissions and mandatory caps on embodied emissions in certain products.¹⁴³ Such measures could support markets for reused and refurbished products and parts, which typically have a small fraction of the carbon footprint of new items. The government has since announced that it

¹³⁸ HM Government (n.d.) VAT for builders. [Link](#). [Accessed 8 March 2024]

¹³⁹ Peake, L, Plumpton, H and Dhaliwal, J (2023) Circular construction: Building for a greener UK economy. Green Alliance. [Link](#). [Accessed 8 March 2024]

¹⁴⁰ Department for Levelling Up, Housing and Communities and Ministry of Housing, Communities & Local Government (2023) The merged Approved Documents. [Link](#). [Accessed 8 March 2024]

¹⁴¹ Department for Energy Security and Net Zero and Office for Product Safety and Standards (2023) Regulations: ecodesign of energy-consuming products. [Link](#). [Accessed 8 March 2024]

¹⁴² European Commission (n.d.) Mobile phones, cordless phones and tablets. [Link](#). [Accessed 8 March 2024]

¹⁴³ Carbon leakage is where measures aimed at reducing the carbon footprint of UK businesses lead to carbon-intensive activities being moved to other countries, rather than leading to a fall in life-cycle carbon emissions of a product or service.

will support development of voluntary standards on product-level emissions reporting, including by standardising methodologies.¹⁴⁴

- New standards and certifications are emerging to build confidence in reused goods, such as the BSI Kitemark Certified Remanufacturer and Certified Reconditioner schemes.¹⁴⁵

2.3.4 Circular business models

Policies and legislation

The 2018 Resources and waste strategy and the 2023 WPP both talk about support for circular business, commonly understood to include models such as product-as-a-service, take-back and refurbishment, sale of reused or upcycled items, repair, and industrial symbiosis (where one business' side product is used as an input for another). This is an emerging area, so the range of models is still developing.

The relevant policy and legislative measures proposed in the WPP tend to either support businesses to adopt more reusable packaging, or enable diversion of waste for reuse, for example in the context of WEEE EPR or providing free household collections of bulky furniture (see Section 2.3.3). There is some financial support for research into circular business models: the government is funding UK Research and Innovation (UKRI)'s Circular Fashion Programme, and also funded the voluntary industry initiative Textiles 2030 (administered by WRAP). Wider policy measures in support of circular business models such as product-as-a-service are lacking.

Roles and responsibilities

- **Defra** takes a lead on circular economy policy.
- **DEZNS** leads on resource efficiency and decarbonisation policy related to industry and energy-related products.
- **HM Treasury, Defra and DEZNS** are jointly responsible for the Green Finance Strategy,¹⁴⁶ which has the potential to provide greater support for circular businesses to scale up.¹⁴⁷
- The **Cabinet Office** and the **Crown Commercial Service** have responsibility for public procurement rules, which could be used to stimulate circular business.¹⁴⁸

Targets and reporting requirements

- There are no specific targets related to circular business, though the commitment to double resource productivity (see Section 2.1.2) will require greater circularity by businesses if it is to be achieved.

¹⁴⁴ Department for Energy Security and Net Zero and HM Treasury (2023) Factsheet: voluntary standards and embodied emissions reporting. [Link](#). [Accessed 8 March 2024]

¹⁴⁵ BSI (2023) BSI – assuring remanufactured and reconditioned goods are quality goods. [Link](#). [Accessed 8 March 2024]

¹⁴⁶ HM Government (2023) Mobilising green investment: 2023 Green finance strategy. [Link](#). [Accessed 8 March 2024]

¹⁴⁷ Evans, S and Plumpton, H (2022) Circular business: What companies need to make the switch. Green Alliance. [Link](#). [Accessed 8 March 2024]

¹⁴⁸ Crown Commercial Service (2023) Public procurement policy. [Link](#). [Accessed 8 March 2024]

- Defra has committed to monitor progress on the numbers of enterprises, employment levels and gross value added in the repair, reuse and leasing sectors.¹⁴⁹

Recent developments

- In the 2023 Green finance strategy, the UK government committed to exploring how to support businesses to report their scope 3 emissions, which include the emissions generated during the extraction and processing of materials used in their products, and during waste management. By reducing reliance on material inputs and generating less waste, circular business models can cut scope 3 emissions compared to linear models. DEZNZ ran a call for evidence on scope 3 reporting in late 2023.¹⁵⁰ No further policy steps have been announced.
- In late 2023, DESNZ announced that the UK would introduce a carbon border adjustment mechanism (CBAM) by 2027, placing a price on the embodied carbon in products imported into the UK.¹⁵¹ This could help to improve the competitiveness of circular business models compared to linear models.
- A Critical minerals strategy for the UK was introduced in 2022 and updated in 2023.^{152,153} The 2022 strategy committed to accelerating circularity but did not propose any new policies to achieve this. It pointed to ongoing funding for research into circular metals, chemicals, construction and textiles, and noted that the updated WEEE regulations, including the new WEEE EPR scheme, would be helpful in this respect. Policies to promote circularity in important growth areas such as wind turbines and electric vehicle (EV) batteries are lacking.¹⁵⁴

¹⁴⁹ Defra (2023) Waste prevention programme for England: Maximising resources, minimising waste. [Link](#). [Accessed 8 March 2024]

¹⁵⁰ Department for Energy Security and Net Zero (2023) Scope 3 emissions in the UK reporting landscape: Call for evidence. [Link](#). [Accessed 8 March 2024]

¹⁵¹ Department for Energy Security and Net Zero and HM Treasury (2023) Factsheet: UK Carbon Border Adjustment Mechanism. [Link](#). [Accessed 8 March 2024]

¹⁵² Department for Business, Energy and Industrial Strategy / Department for Business and Trade (2022/2023) Resilience for the future: The UK's Critical minerals strategy. [Link](#). [Accessed 22 March 2024]

¹⁵³ Department for Business and Trade (2023) Critical Minerals Refresh: Delivering Resilience in a Changing Global Environment. [Link](#). [Accessed 22 March 2024]

¹⁵⁴ Evans, S; Plumpton, H; Peake, L. (2021) Critical point: securing the raw materials needed for the UK's green transition. Green Alliance. [Link](#). [Accessed 22 March 2024]

3 Assessment of incentives across the waste hierarchy

3.1 Introduction

The aim of this section is to assess what incentives currently exist to move management of waste and resources in England up the waste hierarchy and to establish a circular economy, highlighting where incentives may be insufficient or perverse; and then to identify opportunities to support progress through further research.

The analysis in Sections 3.2 to 3.6 is structured according to the stages of the waste hierarchy, taking a simple five-stage model: reduce, reuse, repair and remanufacture, recycle, and residual waste. This provides a useful framework but it is acknowledged that the lines between the waste hierarchy stages are blurred. Section 3.7 therefore looks at some cross-cutting issues.

An internal workshop within Resource Futures, interviews with five experts and desk research were conducted in support of the following steps:

- Identify key issues that need to be addressed at each stage in the waste hierarchy.
- Identify current incentives, stemming from policy, market or other factors.
- Identify the likely impacts and any unintended consequences of existing incentives.
- Identify potential incentives that could support progress on the issues in the short and long term—these are not intended as policy recommendations, but as a range of options.

The results are presented in tables titled 'Assessment of incentives' with a structure reflecting these steps, in Sections 3.2 to 3.7. This is a high-level assessment capturing key issues and incentives, and is not exhaustive. Subsequently, for each stage in the waste hierarchy, some 'Opportunities to support progress' are identified in a second table. These focus on key gaps in the evidence base, or where progress on a key issue has stalled. These steps lay the groundwork for Section 4, in which priorities are identified for further research.

The selection of opportunities to support progress takes into account the issues and possible policy solutions raised by the expert interviewees, and applies the judgement of the research team. A full, systematic review of what relevant work is being carried out in support of progress on these issues by policymakers, academics, think tanks, environmental NGOs and others around the UK would be desirable but was beyond the scope of this high-level assessment.

3.2 Reduce

Definition

'Reduce' is taken here to mean reducing resource consumption. Prevention of virgin resources entering the economy is the priority, sitting at the top of the waste hierarchy.¹⁵⁵ Non-renewable and strategically important materials need to be conserved for economic security as well as environmental reasons; but even renewable resources such as timber and agricultural products can be associated with significant

¹⁵⁵ Department for Environment, Food and Rural Affairs (2011) Guidance on applying the Waste Hierarchy. [Link](#). [Accessed 23 February 2024]

environmental impacts, for example when virgin forest or peatland is converted to farmland, losing biodiversity and releasing carbon;¹⁵⁶ or when agricultural and aquacultural practices lead to water eutrophication.¹⁵⁷ While most environmental policy focuses on domestic issues, cutting England's resource consumption would reduce its environmental impacts both at domestically and internationally.¹⁵⁸ Materials that are harmful to human health and the environment should also be removed from products where possible, whether these are hazardous substances or materials that cannot be made circular with current waste management technologies.¹⁵⁹

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- ¹⁵⁶ Luyssaert, S (2008) Old-growth forests as global carbon sinks. *Nature*, Volume 4, Issue 4. [Link](#). [Accessed 27 February 2024]; Centre for Ecology and Hydrology (2017) Implementation of an Emissions Inventory for UK Peatlands. *Sustainability*, Volume 15, Issue 23. [Link](#). [Accessed 27 February 2024]
- ¹⁵⁷ Chislock, M, Zitomer, R and Wilson, A (2013) Eutrophication: Causes, Consequences, and Controls in Aquatic Ecosystems. *Nature Education*, Volume 4, Issue 4. [Link](#). [Accessed 27 February 2024]
- ¹⁵⁸ Barrett, J (2013) Consumption-based GHG emission accounting: a UK case study. *Climate Policy*, Volume 13, Issue 4. [Link](#). [Accessed 27 February 2024]
- ¹⁵⁹ Peake, L; Ritson, J; Cripps, I. (2020) Fixing the system. *Green Alliance*. [Link](#). [Accessed 27 February 2024]

Assessment of incentives

Issue	Current incentives	Likely impact	Potential unintended consequences	Possible incentives
<p>England's resource use is around twice what the UN recommends is sustainable per person per year.¹⁶⁰</p>	<p>Non-legally binding target to increase resource productivity.¹⁶¹</p> <p>Gross value added (GVA) per unit of raw material consumption, and raw material consumption per capita are indicators tracked under the 25 year environment plan.¹⁶²</p>	<p>A lack of priority on resource productivity or resource use due to a lack of clear definition, ownership, or a plan to achieve progress.</p>	<p>A focus on resource productivity (rather than resource use) could lead to an increase in resource use, due to the Jevons Paradox, also known as the rebound effect.¹⁶³</p>	<ul style="list-style-type: none"> • Legally-binding target to reduce resource use per capita (under the Environment Act 2021).¹⁶⁴ • Sector-specific targets and strategies to reduce the impact of resource use, prioritising sectors with the highest impact.^{165,166} • Embed circular economy aims into economic, industrial and trade strategy,¹⁶⁷ and decision-making around plans and major projects in areas such as infrastructure and transport. • Support for circular business models through public sector procurement.¹⁶⁸ • To support more circular procurement: mandatory

¹⁶⁰ Peake, L; Booker, T. (2021) Targeting success. Green Alliance. [Link](#). [Accessed 28 February 2024]

¹⁶¹ Department for Environment, Food and Rural Affairs (2018) A Green Future: Our 25 Year Environment Plan to Improve the Environment. [Link](#). [Accessed 1 March 2024]

¹⁶² Defra (n.d.) J2: Raw material consumption. [Link](#). [Accessed 22 March 2024]

¹⁶³ Giljum, S. et al (2009) Overconsumption? Our use of the world's natural resources. Friends of the Earth. [Link](#). [Accessed 28 February 2024]

¹⁶⁴ Interviews with Libby Peake and Lee Marshall.

¹⁶⁵ Government of the Netherlands (n.d.) Circular Dutch economy by 2050. [Link](#). [Accessed 11 March 2024]

¹⁶⁶ Interview with Libby Peake.

¹⁶⁷ Interviews with Jack Barrie and Lee Marshall.

¹⁶⁸ Interview with Jack Barrie.

Issue	Current incentives	Likely impact	Potential unintended consequences	Possible incentives
				requirements for environmental product declarations (EPDs) for key materials/products, covering embodied impacts and end of life information. ¹⁶⁹
The carbon impact of resource use is not captured in market prices.	UK ETS places a carbon price on certain high-emitting industries. A CBAM will be applied from 2027 to imports of emissions-intensive industrial goods. The government plans to establish voluntary standards on product-level emissions reporting. ¹⁷⁰	UK ETS focuses on domestic emissions and applies to limited sectors, so its impact on consumption emissions is limited. CBAM will raise the price of items with high embodied carbon, reducing the market incentive to import these. It could therefore support a cut in	As UK ETS only covers territorial emissions, it risks causing carbon leakage. ¹⁷¹	<ul style="list-style-type: none"> • A consumption emissions reduction target.^{172,173} • A target based on the whole life cycle carbon impacts of waste.¹⁷⁴ • Sector-specific strategies to reduce consumption emissions,¹⁷⁵ prioritising sectors with the highest impact. • Align trade deals with the UK's need to cut territorial and consumption emissions.¹⁷⁶ • Mandatory product standards and information requirements related to embodied emissions, for example

¹⁶⁹ UK Green Building Council (2018) UKGBC Circular economy policy roundtable discussion. [Link](#). [Accessed 22 March 2024]

¹⁷⁰ Department for Energy Security and Net Zero and HM Treasury (2023) Factsheet: voluntary standards and embodied emissions reporting. [Link](#). [Accessed 8 March 2024]

¹⁷¹ Brandmayr, C; Peake, L; Avison, Z (2022) The bigger picture: Addressing the UK's hidden carbon footprint. Green Alliance [Link](#) [Accessed 28 February 2024]

¹⁷² Brandmayr, C; Peake, L; Avison, Z (2022) The bigger picture: Addressing the UK's hidden carbon footprint. Green Alliance [Link](#) [Accessed 28 February 2024]

¹⁷³ Interview with Jack Barrie.

¹⁷⁴ Interview with Lee Marshall.

¹⁷⁵ Burke, J; Serin, E; Sturge, D (2022) The future of UK carbon policy: how could the UK Emissions Trading Scheme evolve to help achieve net-zero. LSE. [Link](#). [Accessed 28 February 2024].

¹⁷⁶ Brandmayre, C; Peake, L; Avison, Z (2022) The bigger picture: Addressing the UK's hidden carbon footprint. Green Alliance [Link](#) [Accessed 28 February 2024]

Issue	Current incentives	Likely impact	Potential unintended consequences	Possible incentives
		<p>consumption emissions, in sectors covered.</p> <p>Voluntary product standards on embodied emissions may support some companies to reduce supply chain emissions, where they have other incentives to do so.</p>		<p>emissions caps in the construction sector.¹⁷⁷</p> <ul style="list-style-type: none"> Requirements for larger businesses to report and set targets for scope 3 emissions.¹⁷⁸
<p>Hazardous substances need to be prevented from entering the circular economy.</p>	<p>UK REACH, the post-EU Exit regulatory framework for chemicals, has similar aims to EU REACH but significantly less resource and access to data.</p>	<p>Divergence from the EU on chemicals regulation, with lower levels of protection in the UK.^{180,181}</p> <p>Restrictions on POPs will over time support a circular economy.</p>	<p>Weakened regulation would pose long-term barriers to circularity as once hazardous substances enter the supply chain, it is harder to reuse and recycle products.¹⁸²</p>	<ul style="list-style-type: none"> Develop a UK REACH system with environmental and health protections at least as strong as those applied in the EU, for instance by largely aligning with the EU while focusing resources on novel materials.¹⁸³ Prioritise controls on substances which are having the greatest negative impact on circularity.

¹⁷⁷ Climate Change Committee (2020) Briefing document - The potential of product standards to address industrial emissions. [Link](#). [Accessed 11 March 2024]

¹⁷⁸ Evans, S; Plumpton, H (2022) Circular business: What companies need to make the switch. Green Alliance. [Link](#). [Accessed 4 March 2024]

¹⁸⁰ Fidra (2023) UK REACH: Challenges and opportunities for improvement. [Link](#). [Accessed 28 February 2024]

¹⁸¹ ChemTrust (n.d.) UK policy. [Link](#). [Accessed 11 March 2024]

¹⁸² Nills, J (2022) The policy conflict between circularity and toxicity: problems, perspectives and strategies. KTH Royal Institute of Technology. [Link](#). [Accessed 1 March 2024]

¹⁸³ ChemTrust (n.d.) UK policy. [Link](#). [Accessed 11 March 2024]

Issue	Current incentives	Likely impact	Potential unintended consequences	Possible incentives
	<p>Many POPs are already banned.¹⁷⁹</p> <p>The UK Government is expected to publish a new chemicals strategy in 2024.</p>			<ul style="list-style-type: none"> Target circular business support or policy measures such as ecodesign rules at sectors which produce most hazardous waste. A target to reduce hazardous waste generated (note: unintended consequences such as misclassification would require careful consideration).
<p>England needs resilient supply chains for critical raw materials (CRMs). Limiting demand for CRMs—set to rise rapidly—would help to mitigate supply risks.¹⁸⁴</p>	<p>The UK's Critical minerals strategy points to WEEE regulations, innovation funding and international collaboration to increase transparency of resource flows.¹⁸⁵</p>	<p>The WEEE regulations only address a fraction of CRM applications and may not lead to effective CRM recycling.</p> <p>Funding to develop new recycling technologies could support domestic recycling of CRMs.</p>	<p>Increased CRM supply risk as countries compete for materials for the net zero transition and digital technologies.¹⁸⁷</p>	<ul style="list-style-type: none"> Address systemic demand reduction for key applications such as EV batteries, wind and solar, for example through policy on transport, housing and infrastructure planning.¹⁸⁸ Targets for CRM recycling. Ecodesign requirements for products heavily reliant on CRMs.

¹⁷⁹ Environment Agency (2024) Using persistent organic pollutants (POPs). [Link](#). [Accessed 11 March 2024]

¹⁸⁴ Evans, S; Plumpton, H; Peake, L. (2021) Critical point: securing the raw materials needed for the UK's green transition. Green Alliance. [Link](#). [Accessed 28 February 2024]

¹⁸⁵ Department for Business and Trade; Department for Business, Energy & Industrial Strategy (2022) Critical Minerals Refresh: Delivering Resilience in a Changing Global Environment. [Link](#). [Accessed 1 March 2024]

¹⁸⁷ Evans, S; Plumpton, H; Peake, L. (2021) Critical point: securing the raw materials needed for the UK's green transition. Green Alliance. [Link](#). [Accessed 28 February 2024]

¹⁸⁸ Evans, S; Plumpton, H; Peake, L. (2021) Critical point: securing the raw materials needed for the UK's green transition. Green Alliance. [Link](#). [Accessed 28 February 2024]

Issue	Current incentives	Likely impact	Potential unintended consequences	Possible incentives
	CRM are not recognised in connected strategies, such as the Powering up Britain strategy 2023. ¹⁸⁶	Little impact on demand reduction is expected.		<ul style="list-style-type: none"> Recycled content requirements, for example for EV batteries.¹⁸⁹ Improve data on CRMs through a National Materials Datahub to underpin strong decision making.¹⁹⁰

¹⁸⁶ Benham, K (2023) The UK's critical minerals refresh 2023- CMA's evaluation. Critical Minerals Association (UK). [Link](#). [Accessed 28 February 2024]

¹⁸⁹ Schröder, P, Bergsen, P and Barrie, J (2023) Europe's pursuit of securing critical raw materials for the green transition. Chatham House. [Link](#). [Accessed 28 February 2024]

¹⁹⁰ Evans, S; Plumpton, H; Peake, L. (2021) Critical point: securing the raw materials needed for the UK's green transition. Green Alliance. [Link](#). [Accessed 28 February 2024]

Opportunities to support progress

Issue	Short-term/tactical opportunities	Longer-term/strategic opportunities
Cutting resource use	<ul style="list-style-type: none"> Identify public procurement and planning levers to systemically support resource consumption reduction. Identify key opportunities and roles for wider government strategies and plans (on economy, trade, infrastructure and other areas) to support resource consumption reduction, in both reserved and devolved policy areas. 	<ul style="list-style-type: none"> Develop the evidence and data for science-based resource consumption reduction targets, overall and/or at the level of specific sectors or materials. Support the translation of overarching/sector/material resource consumption targets to business/organisation level requirements.
Pricing in the carbon impact of resource use	<ul style="list-style-type: none"> Review international evidence on the effectiveness and any unintended consequences of mandatory product standards and information requirements on embodied carbon and other environmental impacts, to understand what opportunities the UK may gain or miss from a voluntary approach. 	<ul style="list-style-type: none"> Monitor impact of CBAM on consumption emissions and explore ways to increase its impact.
Hazardous substances	<ul style="list-style-type: none"> Assess how well the proposed UK chemicals strategy supports a circular economy. Explore additional policy measures to limit the use of harmful substances, with a view to supporting reuse and reducing generation of hazardous waste, such as ecodesign requirements and a strong UK REACH. 	<ul style="list-style-type: none"> Monitor the impacts of divergence in chemicals regulations between the UK and EU, and associated impacts on the environment (looking at overlap with wider pollution issues) and the circular economy.
Resilient supply chains for CRMs	<ul style="list-style-type: none"> Systematically compare EU and UK CRM strategies with respect to demand reduction and circularity. 	<ul style="list-style-type: none"> Explore priority policies for reducing demand for CRMs, building on work by CREDS and Green Alliance on energy demand reduction scenarios.^{191,192}

¹⁹¹ Eyre, N (ed). (2022) CREDS research findings. Centre for Research into Energy Demand Solutions. [Link](#). [Accessed 11 March 2024]

¹⁹² Evans, S; Plumpton, H; Peake, L. (2021) Critical point: securing the raw materials needed for the UK's green transition. Green Alliance. [Link](#). [Accessed 28 February 2024]

3.3 Reuse

Definition

'Reuse' refers here to extending the life of products through reusing them for their original purpose rather than disposing of them. This includes circular business models such as resale, renting, and selling products as a service. It also includes reuse of items by individuals, such as refillable packaging and reusable bags and cups, that can help cut waste and litter. These models incentivise the purchase of more durable products and better product stewardship. Extending product lifetimes helps to reduce demand for new materials and products. Items can be reused before or after they are disposed of as waste. If they have been classified as waste, they need to undergo activities to prepare them for re-use, such as cleaning, repairing, checking and certifying.

Assessment of incentives

Issue	Current incentives	Likely impact	Potential unintended consequences	Possible incentives
Reuse should be prioritised over recycling.	EPR schemes could support reuse, but at present the focus is on recycling. Reuse targets are rolled into recycling targets, not set separately.	Businesses and local authorities will continue to prioritise recycling over reuse. More WEEE could be diverted to reuse after new regulations are introduced.	Reusable items are sent for recycling or to residual waste treatment, missing opportunities for environmental, social and economic benefits.	<ul style="list-style-type: none"> Reuse/preparation for reuse targets for businesses and local authorities. Support for reuse hubs.¹⁹³ Ban destruction of unsold stock in high impact sectors such as textiles and electricals.¹⁹⁴
Reuse of existing building stock and materials should be prioritised over new build.	New builds are zero-rated for VAT, while refurbishment/refit faces 20% VAT (with a temporary 5% rate for some energy efficiency measures). Planning applications that go via the Mayor of London now require lifecycle carbon assessments and circular economy statements addressing reuse. ^{195,196}	Developers and individuals will largely continue to favour new builds. Reused materials, and design for reuse, will increase in large projects subject to approval by the Mayor of London.	Existing building stock will degrade and become less suitable for lifetime extension. Nature loss as the footprint of England's built areas expands.	<ul style="list-style-type: none"> Design VAT and other taxes/fees to incentivise refurbishment and refit rather than new builds. Embed lifecycle carbon emissions and reuse requirements into urban planning beyond London and to a wider range of construction and infrastructure projects. Require and/or provide official guidance on pre-demolition audits and reuse targets for the materials identified. Require or incentivise design for deconstruction through building

¹⁹³ Scottish Government (2022) Delivering Scotland's circular economy - route map to 2025 and beyond: consultation. [Link](#). [Accessed 11 March 2024]

¹⁹⁴ Scottish Government (2022) Delivering Scotland's circular economy - route map to 2025 and beyond: consultation. [Link](#). [Accessed 11 March 2024]

¹⁹⁵ Evans, S and Plumpton, H (2022) Circular business: What companies need to make the switch. Green Alliance. [Link](#). [Accessed 8 March 2024]

¹⁹⁶ Mayor of London (2022) London Plan guidance: Circular economy statements. [Link](#). [Accessed 11 March 2024]

Issue	Current incentives	Likely impact	Potential unintended consequences	Possible incentives
	Building Standards do not address reused materials or design for reuse. ¹⁹⁷			regulations, planning or procurement rules.
Single-use culture uses resources wastefully and causes costly litter impacts. ¹⁹⁸	Non-legally binding government target to eliminate all avoidable plastic waste by 2042; ¹⁹⁹ UK Plastics Pact (UKPP) targets to eliminate unnecessary single-use plastic packaging, and for 100% of plastic packaging to be	Material substitution, shifting to non-plastic single-use packaging, and to lighter weight (flexible) plastic packaging. Very little decrease in plastic packaging used, ²⁰¹ very little increase in reusable packaging. ²⁰²	Material substitution changes, rather than eliminates, environmental impacts. ²⁰³ Replacing rigid plastics with lighter flexible/film plastics creates waste which is not widely recycled.	<ul style="list-style-type: none"> • Single-use packaging reduction targets, by weight and by item.²⁰⁴ • Reuse and refill targets for retailers and food and drink businesses.²⁰⁵ • Mandatory charges/separate pricing for single-use packaging and food and drink containers of any material. • Enabling reuse through DRS.²⁰⁶ • Bans on single-use packaging for fruit and vegetables in supermarkets.²⁰⁷

¹⁹⁷ Department for Levelling Up, Housing and Communities and Ministry of Housing, Communities & Local Government (2023) The merged Approved Documents. [Link](#). [Accessed 8 March 2024]

¹⁹⁸ WRAP (2021) Financial cost of packaging litter – Phase 2: Final Report. [Link](#). [Accessed 28 February 2024]

¹⁹⁹ HM Government (2018) A green future: Our 25 year plan to improve the environment. [Link](#). [Accessed 11 March 2024]

²⁰¹ WRAP (2023) Plastic market situation report 2022: Key themes summary. [Link](#). [Accessed 11 March 2024]

²⁰² WRAP (2023) UK Plastics Pact latest report. [Link](#). [Accessed 11 March 2024]

²⁰³ Peake, L; Ritson, J; Cripps, I. (2020) Fixing the system. Green Alliance. [Link](#). [Accessed: 27/02/2024]

²⁰⁴ Weir, L. (2022) What the EU can do to support the grocery retail sector in reducing packaging and plastic pollution: Policy briefing. Rethink Plastic Alliance. [Link](#). [Accessed 11 March 2024]

²⁰⁵ Condamine, P. (2021) France's law promoting bulk and reusable packaging. Zero Waste Europe. [Link](#). [Accessed 11 March 2024]

²⁰⁶ Weir, L. (2022) What the EU can do to support the grocery retail sector in reducing packaging and plastic pollution: Policy briefing. Rethink Plastic Alliance. [Link](#). [Accessed 11 March 2024]

²⁰⁷ BBC (2021) French ban on plastic packaging for fruit and vegetables begins. [Link](#). [Accessed 11 March 2024]

Issue	Current incentives	Likely impact	Potential unintended consequences	Possible incentives
	reusable, recyclable or compostable. ²⁰⁰			<ul style="list-style-type: none"> Support for area-wide reuse and refill systems with shared infrastructure. Ecodesign rules related to durability for certain product categories.
	Bans on specific single-use items, ²⁰⁸ and a mandatory carrier bag charge. ²⁰⁹	The piecemeal approach and focus on commonly-littered plastics (rather than items with biggest material footprint) limits the benefits. ^{210,211}	Material substitution. For example, the carrier bag charge led to repeated purchased of 'bags for life', resulting in an overall increase in material use. ²¹²	
Financial viability of circular business models	Second-hand and refurbished items are generally cheaper than new items. 20% VAT is payable on many new items, but some are zero-rated. For second-hand items, 16.67% is payable on the profit margin only. ²¹³ Charity shops do not pay VAT on donated	The lower price of reused goods supports demand for resale. VAT rules support resale models to some extent, with exceptions where new goods are zero-rated, and where businesses are re-selling donations.		<ul style="list-style-type: none"> Adjust tax rates such as VAT to better recognise the environmental and social benefits of reuse, and to support service-based models over sales of new items. A long-term green tax strategy would provide more certainty to circular businesses. Financial support for circular start-ups.

²⁰⁰ WRAP (2022) A roadmap to 2025: The UK Plastics Pact. [Link](#). [Accessed 11 March 2024]

²⁰⁸ Department for Environment, Food and Rural Affairs (2024) Single-use plastics bans and restrictions. [Link](#). [Accessed 4 March 2024]

²⁰⁹ Department for Environment, Food and Rural Affairs (2021) Carrier bags: why there's a charge. [Link](#). [Accessed 4 March 2024]

²¹⁰ Peake, L (2021) Plastic Promises. Green Alliance [Link](#). [Accessed 27 February 2024]

²¹¹ Peake, L; Ritson, J; Cripps, I. (2020) Fixing the system. Green Alliance. [Link](#). [Accessed: 27/02/2024]

²¹² Greenpeace (2020) Unpacked: how supermarkets can cut plastic packaging in half by 2025. [Link](#). [Accessed 27 February 2024]

²¹³ HMRC (n.d.) VAT margin schemes. [Link](#). [Accessed 11 March 2024]

Issue	Current incentives	Likely impact	Potential unintended consequences	Possible incentives
	goods, but businesses do. ^{214,215,216}			<ul style="list-style-type: none"> Changes to public procurement rules and training for procurement managers to understand circular models.
	Leasing and subscription models can take longer to generate returns on investment and require significant up-front investment in assets. ²¹⁷	Linear models have easier access to investment.		
	Public procurement does not favour 'product-as-a-service' models. ²¹⁸	Limited change from the status quo without procurement rule changes.		

²¹⁴ HMRC (2022) VAT rates on different goods and services. [Link](#). [Accessed 11 March 2024]

²¹⁵ RReuse (2017) Reduced taxation to support re-use and repair. [Link](#). [Accessed 11 March 2024]

²¹⁶ Dhaliwal, J; Peake, L; Plumpton, H (2023) Ready steady grow: how the Treasury can mainstream circular business. Green Alliance. [Link](#). [Accessed 11 March 2024]

²¹⁷ Dhaliwal, J; Peake, L; Plumpton, H (2023) Ready steady grow: how the Treasury can mainstream circular business. Green Alliance. [Link](#). [Accessed 11 March 2024]

²¹⁸ Dhaliwal, J; Peake, L; Plumpton, H (2023) Ready steady grow: how the Treasury can mainstream circular business. Green Alliance. [Link](#). [Accessed 11 March 2024]

Issue	Current incentives	Likely impact	Potential unintended consequences	Possible incentives
<p>Other barriers to scaling up circular business models, such as limited logistics, difficulties achieving end of waste status, and perceptions.</p>	<p>Proposed WEEE regulations could support better logistics for take-back.²¹⁹</p>	<p>Widespread collections and take-back of WEEE in good condition would support reuse charities and businesses.</p>	<p>A broad interpretation of what is 'waste', and rules on POPs mean that those erring on the side of caution may recycle or incinerate waste that could be reused.</p>	<ul style="list-style-type: none"> • A dedicated cross-governmental coordination body/mechanism tasked with bringing about a circular economy.²²⁰ • Ensure reuse is prioritised within EPR systems to support improved collections and take-back. • Make the process for achieving end of waste status easier, cheaper and better-aligned with national reuse aims.
	<p>A challenging process for achieving end of waste status, and requirements to destroy waste containing POPs (such as certain WEEE).²²¹</p>	<p>To deter reuse.</p>		
	<p>A perception that reused items are lower quality. Legal requirements to ensure resold electricals are safe.²²²</p>	<p>Mixed.</p>		

²¹⁹ Defra (2023) Consultation on reforming the producer responsibility system for waste electrical and electronic equipment 2023. [Link](#). [Accessed 11 March 2024]

²²⁰ Interviews with Jack Barrie, Lee Marshall and Libby Peake.

²²¹ Environment Agency (2021) Waste electrical and electronic equipment (WEEE): appropriate measures for permitted facilities – consultation. [Link](#). [Accessed 11 March 2024]

²²² Electrical Safety First (2021) A Study into second-hand 'bricks and mortar' sales of electrical and electronic products in the UK. [Link](#). [Accessed 11 March 2024]

Opportunities to support progress

Issue	Short-term/tactical opportunities	Longer-term/strategic opportunities
Prioritising reuse over recycling	<ul style="list-style-type: none"> Review international approaches to producer obligations and targets on reuse, both in the context of EPR and wider obligations, and identify best ways to apply relevant Environment Act 2021 powers. 	<ul style="list-style-type: none"> Develop pathways for cutting resource use and/or residual waste that apply different assumptions on relative roles of reuse and recycling, to inform future infrastructure requirements.
Reuse of existing building stock and materials		<ul style="list-style-type: none"> Identify how best to incentivise asset reuse through building standards, planning policies and rules.
Single-use culture	<ul style="list-style-type: none"> Explore ways to use the Environment Act 2021 to tackle single-use culture in a more holistic and material-agnostic way. 	<ul style="list-style-type: none"> Track developments in other countries, such as France, that are moving faster to tackle single use, identifying risks and opportunities.
Financial viability of circular business models	<ul style="list-style-type: none"> Pull together the evidence base on using the tax system to support reuse. 	<ul style="list-style-type: none"> Review international, city-level, and sector-specific progress on circular public procurement to identify opportunities and policy levers for England. Track international developments in finance for the circular economy and identify opportunities for England.
Other barriers to scaling up circular business models	<ul style="list-style-type: none"> Review international approaches to cross-governmental coordination and leadership on a circular economy, and identify options for England and the UK. Quantify the scale of the missed circular business opportunities in England related to the current end of waste criteria, including the potential environmental and financial benefits. 	

3.4 Repair and remanufacture

Definition

There are overlapping definitions of 'repair', 'refurbishment' and 'remanufacturing', all of which relate to restoring worn or broken items to a saleable or working condition. Repair relates to fixing an item for reuse in its current form. Refurbishment is similar, and is commonly used to refer to conducting checks and minor repairs to items such as smartphones prior to resale. (Where refurbishment refers to repairs and limited improvements to an existing building, this is covered under Section 3.3 in relation to reuse of building stock.) Remanufacturing is taken here to include activities by companies where working parts from broken or outdated products are incorporated into new products on a production line. The creation of a new product when remanufacturing makes it distinct from repair.

In relation to the waste hierarchy, repair is preferred to remanufacturing as it avoids the extra energy and resources required to make a new product. However, sometimes remanufacturing can improve the sustainability of a product, for example making it more energy efficient than an older model.

Assessment of incentives

Issue	Current incentives	Likely impact	Potential unintended consequences	Possible incentives
Repairability of products placed on the market.	The 2021 Ecodesign Regulations require access to spare parts and repair information, but do not address design for disassembly and repair. ²²³ Regulations requiring transparency on how long smart devices will receive security updates. ²²⁴	No information on the impact of current ecodesign rules is publicly available; in the absence of supporting measures and with low public awareness it is likely to be limited. Increased transparency on security update periods could help people to select smart devices which can be used for longer.	Lack of rules on design for repair may also limit the potential for high quality recycling, which is supported by easy disassembly. There can be trade-offs between repairability and resource efficiency in product design, as repairable smart devices tend to be larger and heavier.	<ul style="list-style-type: none"> Update ecodesign rules to explicitly address design for disassembly and repair. Use eco-modulation of EPR fees in support of design for disassembly and repair. Update product security rules to require longer minimum software update periods.
Access to spare parts and information to enable repairs.	The 2021 Ecodesign Regulations require access to certain spare parts and information to facilitate repairs, but some spare parts can be provided in 'bundles'	Limited impact.	May limit the safety and quality of repairs, as people opt to use alternative replacement parts.	<ul style="list-style-type: none"> Update ecodesign rules to ensure spare parts are individually available. Introduce more requirements for standardised accessories and parts, such as chargers.²²⁷

²²³ The Ecodesign for Energy-Related Products and Energy Information Regulations 2021. [Link](#). [Accessed 12 March 2024]

²²⁴ The Product Security and Telecommunications Infrastructure (Security Requirements for Relevant Connectable Products) Regulations 2023. [Link](#). [Accessed 12 March 2024]

²²⁷ European Parliament News (2024) Long-awaited common charger for mobile devices will be a reality in 2024. [Link](#). [Accessed 12 March 2024]

Issue	Current incentives	Likely impact	Potential unintended consequences	Possible incentives
	which typically cost more than individual parts. ^{225,226}			
Cost of repair compared to new production.	The 2021 Ecodesign Regulations do not address affordability of spare parts. Labour costs in England mean that repair costs often compare unfavourably with buying new.	The cost of repair will continue to deter people for lower-value items.	People buy new products even when a repair is straightforward.	<ul style="list-style-type: none"> Update ecodesign rules to address affordability. Legislation requiring extended guarantee periods. Financial support for businesses and charities carrying out repairs, such as repair vouchers.²²⁸
Limited coverage of ecodesign rules.	The 2021 Ecodesign Regulations only cover a small number of product categories such as white goods.	Limited impact.		<ul style="list-style-type: none"> Expand ecodesign rules to more product categories, such as smartphones and tablets.
End of waste criteria need to support remanufacturing.	The current interpretation of 'end of waste' can result in reusable materials and components not being recovered. ²²⁹	Limited opportunities for innovation in remanufacturing, repairing, and recycling. ²³⁰	Barriers to international circular value chains developing. ²³¹	<ul style="list-style-type: none"> Change the end of waste definition or its interpretation by the regulator in support of recovery for remanufacturing.

²²⁵ The Ecodesign for Energy-Related Products and Energy Information Regulations 2021. [Link](#). [Accessed 12 March 2024]

²²⁶ Peake, L (2021) The UK's new 'right to repair' is not a right to repair. Green Alliance. [Link](#). [Accessed 12 March 2024]

²²⁸ Right to Repair (2024) A comprehensive overview of the current repair incentive systems: repair funds and vouchers. [Link](#). [Accessed 12 March 2024]

²²⁹ Interviews with Anna Willetts and Lee Marshall.

²³⁰ Interviews with Anna Willetts and Lee Marshall.

²³¹ Interview with Anna Willetts.

Opportunities to support progress

Issue	Short-term/tactical opportunities	Longer-term/strategic opportunities
Limited ecodesign rules	<ul style="list-style-type: none">Evaluate the impact of the current regulations on ecodesign and product security on trends in repair and refurbishment.	<ul style="list-style-type: none">Identify a suite of measures which would collectively increase repair in England, learning from domestic and international experience.

3.5 Recycle

Definition

'Recycling' refers to transforming a product or component into its basic materials and reprocessing them into new materials.²³² Items should be recycled as a last resort, meaning they should only be recycled when there are no opportunities to reuse or repair them. Not all recycling is equal. Higher quality secondary materials can be produced when waste streams are well sorted to eliminate impurities and contamination. This enables materials to stay in use at the highest possible value for as long as possible. Some materials are more readily recycled than others. For example, aluminium can be repeatedly recycled with relatively low process losses, whereas plastic faces more limitations and is often 'downcycled' into lower value products, which subsequently end up in residual waste.²³³ 'Closed loop' recycling, where for example a plastic bottle is recycled into another plastic bottle, sits higher in the waste hierarchy than 'open loop' recycling, where materials are subsequently lost from the circular economy.²³⁴ It is also important to consider the carbon and wider environmental impacts of recycling processes. For instance, chemical recycling of plastics has a higher impact than mechanical recycling, so should only be used where mechanical recycling is not possible.²³⁵

²³² Ellen Macarthur Foundation (2021) Circular economy glossary. [Link](#). [Accessed: 5 March 2024]

²³³ Eunomia (2022) Aluminium beverage can study. [Link](#). [Accessed: 12 March 2024]

²³⁴ Environment and Forestry Directorate, Scottish Government (2017) Applying the waste hierarchy: guidance. [Link](#). [Accessed: 12 March 2024]

²³⁵ Recoup (2022) UK Plastic packaging sorting and reprocessing infrastructure. [Link](#). [Accessed: 12 March 2024]

Assessment of incentives

Issue	Current incentives	Likely impact	Potential unintended consequences	Possible incentives
<p>Greater ambition is needed.</p>	<p>Targets and policies are focused on consumer waste.</p> <p>Around a third of C&I waste is “household-like” and will be included in Simpler Recycling. For the rest, Landfill Tax creates an economic incentive for businesses to recycle. Reported data on C&I waste is poor.</p> <p>The C&D recovery target and Aggregate Levy only incentivise low-value ‘downcycling’ into aggregate; and major mineral wastes are excluded from the overarching residual waste reduction target.</p>	<p>Opportunities to increase recycling of C&I waste and higher-value recycling of C&D waste will be missed.</p>	<p>High headline recovery rates for C&D waste may undermine the case for greater circularity in construction, which is the most resource-intensive sector.²³⁶</p>	<ul style="list-style-type: none"> • A target to reduce resource consumption or consumption emissions would incentivise circularity in the resource- and carbon-intensive construction sector. • Improve data requirements for C&I waste and introduce recycling targets for non-household-like waste.²³⁷ • Supplement the C&D recovery target with targets for reuse and higher value recycling, and broader policy support for circular construction. • Align eco-modulation of EPR fees with wider regional markets for maximum impact on recyclability. • Ecodesign rules related to recyclability.

²³⁶ Green Alliance (2023) Circular construction: Building for a greener UK economy. [Link](#). [Accessed 12 March 2024]

²³⁷ National Infrastructure Commission (2023) The Second National Infrastructure Assessment. [Link](#). [Accessed 12 March 2024]

Issue	Current incentives	Likely impact	Potential unintended consequences	Possible incentives
	EPR schemes may use eco-modulation of fees to incentivise product design for recyclability.	The effectiveness of eco-modulation to drive design for recyclability remains uncertain. ²³⁹ Companies selling into a regional market are unlikely to change product design due to eco-modulation in a single jurisdiction. ²⁴⁰	Over-reliance on eco-modulation may detract attention/policy development time from more effective mandatory ecodesign policies.	<ul style="list-style-type: none"> Update the definition of recycling targets to better reflect what is actually recycled.²³⁸ Require less frequent residual waste collections under Simpler Recycling.
	Targets typically relate to the share of waste sent for recycling, rather than the share actually recycled.	A focus on collections rather than recycling destinations and processes.	Complacency due to recycling rates appearing higher than they are.	
	Simpler Recycling will require residual waste collections from households at least fortnightly. ²⁴¹	Limited incentive to recycle. ²⁴²	Difficulty increasing household use of separate recycling collections. ²⁴³	
Progress is slow on key policies.	The CPR are running several years behind	Targets will not be met.	Policy development resource is unavailable to	<ul style="list-style-type: none"> Clear consequences of failing to meet the legally-binding

²³⁹ Lifset R, Kalimo H, Jukka A, Kautto P, Miettinen M (2023) Restoring the incentives for eco-design in extended producer responsibility: The challenges for eco-modulation. Waste Management, Volume 168. [Link](#). [Accessed 8 March 2024]

²⁴⁰ DSS+ and WEEE Forum (2023) The eco-modulation of producers' financial obligations for WEEE in the UK. [Link](#). [Accessed 8 March 2024]

²³⁸ Eunomia (2023) Mixed waste sorting to meet the EU's circular economy objectives. [Link](#). [Accessed 12 March 2024]

²⁴¹ Defra (2023) Consultation outcome: Government response. [Link](#). [Accessed 8 March 2024]

²⁴² Interview with Lee Marshall.

²⁴³ Resource Futures internal workshop.

Issue	Current incentives	Likely impact	Potential unintended consequences	Possible incentives
	schedule and there have been mixed policy messages.	Industry will be cautious about investing in recycling infrastructure until there is certainty.	pursue measures on reduction and reuse.	government target to halve residual waste by 2042, along with interim targets. <ul style="list-style-type: none"> Statutory recycling targets for individual local authorities.^{244,245}
Recycling infrastructure is insufficient for current quantities, which are expected to increase.	The packaging producer responsibility system has been criticised for relying on export to meet recycling targets, with exports facing less scrutiny. ²⁴⁶ Defra committed in 2022 to increase checks on exporters. ²⁴⁷ Multiple markets in Asia have placed restrictions on imports of plastic waste for recycling in recent years, ²⁴⁸ and the EU plans to ban all plastic	Shrinking export destinations for plastic waste will increase the incentive to develop domestic recycling infrastructure. Lack of long-term plans for achieving recycling targets or for increasing reuse, and repeated policy delays and changes, hinder long-term investment in recycling infrastructure.	Recyclable materials are sent to EfW or exported. Increases in quantities collected without new infrastructure could incentivise more waste crime.	<ul style="list-style-type: none"> Increase monitoring of exports. Ban or restrict plastic waste exports.²⁵¹ Detailed and funded long-term plans for achieving recycling targets. Capital investment support for domestic recycling infrastructure to develop.²⁵² Measures to reduce waste generated (see Sections 3.2-3.4).

²⁴⁴ National Infrastructure Commission (2023) The Second National Infrastructure Assessment. [Link](#). [Accessed 12 March 2024]

²⁴⁵ Interview with Jacob Hayler.

²⁴⁶ National Audit Office (2018) The packaging recycling obligations. [Link](#). [Accessed: 12 March 2024]

²⁴⁷ Department for Environment, Food and Rural Affairs (2022) Reforms to the packaging waste recycling note (PRN) and packaging waste export recycling note (PERN) systems and operator approval. [Link](#). [Accessed: 12 March 2024]

²⁴⁸ Asian Network Secretariat (2022) Summary of import regulation of plastic waste in Asian countries (as of November 2022). [Link](#). [Accessed: 12 March 2024]

²⁵¹ UK Parliament (2022) MPs call for ban on all plastic waste exports. [Link](#). [Accessed: 12 March 2024]

²⁵² National Infrastructure Commission (2023) The Second National Infrastructure Assessment. [Link](#). [Accessed 12 March 2024]

Issue	Current incentives	Likely impact	Potential unintended consequences	Possible incentives
	<p>exports to non-OECD countries from 2026.²⁴⁹</p> <p>Market incentives mean that some materials, such as aluminium and steel, are exported for recycling then re-imported as secondary materials.²⁵⁰</p>			
<p>The competitiveness of secondary vs virgin materials.</p>	<p>A weight-based tax on packaging with under 30% recycled content.</p>	<p>The PPT alone is insufficient to ensure competitiveness of recycled plastic.</p> <p>It is likely contributing to the trend of lightweighting plastic packaging.</p>	<p>A higher PPT could lead to material substitution, driving demand for alternative virgin materials and potentially leading to less recyclable packaging types being used.</p>	<ul style="list-style-type: none"> • Adjust PPT over time to increase the incentive to buy recycled plastic. • Introduce taxes on other virgin materials, and on items other than packaging.²⁵³

²⁴⁹ European Commission (2023) Commission welcomes political agreement on stronger control of exports of waste. [Link](#). [Accessed: 12 March 2024]

²⁵⁰ Kenyon, M, Wiffin, R, Scamans, G (2022) In the can? Making aluminium more sustainable. [Link](#). [Accessed: 12 March 2024]

²⁵³ Interview with Jacob Hayler.

Opportunities to support progress

Issue	Short-term/tactical opportunities	Longer-term/strategic opportunities
Greater ambition is needed	<ul style="list-style-type: none"> Review and summarise domestic and international evidence on the impact of residual waste collection frequency on recycling outcomes. Explore the opportunities and barriers with regard to data reporting on all non-household-like waste and recycling. Develop evidence related to the use of more detailed reuse and recycling targets for C&D waste, and supporting measures. 	<ul style="list-style-type: none"> See measures proposed under Reduce and Reuse.
Progress is slow	<ul style="list-style-type: none"> Research more efficient options for implementation of EPR and DRS, such as handing more responsibility to the private sector, assessing pros and cons. 	<ul style="list-style-type: none"> Identify high-level incentives that could drive recycling up, such as further tax changes and bans.
Recycling infrastructure is insufficient		<ul style="list-style-type: none"> Scenario analysis for future waste management in the transition to a circular economy, modelling how infrastructure needs are changed under different levels of ambition for reduction, reuse and recycling.
The competitiveness of secondary vs virgin materials		<ul style="list-style-type: none"> Explore options for increased use of taxes on virgin materials.

3.6 Residual

Definition

'Residual waste' refers to non-hazardous waste that cannot be reused or recycled and needs to be sent to disposal. The environmental, economic, and social impacts of disposal place it lowest in the waste hierarchy. Waste sent to landfill has a large land-use footprint, produces methane and carbon emissions, and leakages can pollute soil and water—though well-managed landfills can limit the latter impacts, including through methane capture. EfW is still regularly placed above landfill in the waste hierarchy due to the energy produced, but is arguably even less compatible with a circular economy as it destroys materials irreversibly. In light of the UK's net zero ambitions, it is important to remove carbon-intensive materials such as plastics from EfW streams.²⁵⁴

²⁵⁴ Client Earth (2021) What are the environmental impacts of waste incineration? [Link](#). [Accessed: 05/03/2024]

Assessment of incentives

Issue	Current incentives	Likely impact	Potential unintended consequences	Possible incentives
The low cost of landfilling inert waste.	<p>The fee for landfilling inert waste is just £3.25/tonne,²⁵⁵ compared to average gate fees for EfW of over £100 and for materials recovery facilities (for recycling) of approximately £80.²⁵⁶</p> <p>A voluntary code of practice for the construction sector guides the reuse of clean soil and other excavated materials.²⁵⁷</p>	<p>Little incentive to move up the waste hierarchy.</p> <p>A strong incentive to misclassify waste as inert, which is a form of waste crime.</p>	<p>Inert waste (such as non-hazardous C&D waste) may have a limited polluting impact after disposal, but may have large upstream impact. The low cost of landfill misses an opportunity to incentivise circularity of high-impact materials, or to make best use of important, finite materials such as soil.</p>	<ul style="list-style-type: none"> Apply life-cycle assessment of carbon emissions and other environmental impacts when making decisions on residual waste policy. Mandatory construction sector code of practice aimed at protecting soils, as a non-renewable resource.
Methane from biodegradable waste is a potent greenhouse gas.	Requirements to capture methane from landfill sites. ²⁵⁸	Separate food waste collections are an important step, but suitable recycling	Without parallel measures on EfW, landfill targets or bans can increase incineration, rather than	<ul style="list-style-type: none"> Support for capital investment in food recycling infrastructure.

²⁵⁵ HMRC (2023) Environmental Taxes Bulletin historical rates. [Link](#). [Accessed 8 March 2024]

²⁵⁶ WRAP (2023) Gate fees report 2022/23. [Link](#). [Accessed 12 March 2024]

²⁵⁷ Contaminated Land: Applications in Real Environments (CL:AIRE) (2011) The definition of waste: Development industry code of practice - Version 2. [Link](#). [Accessed: 25 March 2024]

²⁵⁸ Environment Agency (2020) Landfill operators: environmental permits. [Link](#). [Accessed 25 March 2024]

Issue	Current incentives	Likely impact	Potential unintended consequences	Possible incentives
	To support the aim of “near elimination” of biodegradable waste to landfill by 2028, separate food waste collections will be introduced by 2026. ²⁵⁹	infrastructure is also needed, such as anaerobic digestion. ²⁶⁰ If fortnightly residual waste collections are mandated under Simpler Recycling, this could undermine food waste collections.	reducing residual waste. ^{261,262}	<ul style="list-style-type: none"> Less frequent residual waste collections once food waste collections are in place.
Materials are lost from a circular economy through incineration.	Efw gate fees are lower than Landfill Tax rates. ²⁶³ Financing arrangements for infrastructure development and long-term local authority contracts can lock-in demand for Efw feedstock, running counter to incentives to	Contractual arrangements may slow progress on residual waste reduction.	Materials are destroyed and therefore lost forever to the circular economy. Air pollution.	<ul style="list-style-type: none"> A tax or levy on incineration/Efw. A long-term plan and targets to phase out Efw infrastructure.²⁶⁷

²⁵⁹ Defra (2021) Net Zero Strategy: Build Back Greener. [Link](#). [Accessed 8 March 2024]

²⁶⁰ Croner-I (2023) Landfill ban: will we be ready in time? [Link](#). [Accessed 8 March 2024]

²⁶¹ Hogg, D. (2021) Rethinking the EU landfill target. Zero Waste Europe. [Link](#). [Accessed 8 March 2024]

²⁶² United Kingdom Without Incineration Network (UKWIN) (2014) Written evidence submitted to the Environment, Food and Rural Affairs' Inquiry on Waste Management in England. [Link](#). [Accessed 8 March 2024]

²⁶³ Letsrecycle.com (2023) Efw, landfill, RDF 2023 gate fees. [Link](#). [Accessed 25 March 2024]

²⁶⁷ For example, Denmark aims to reduce incineration capacity by 30% from 2020 to 2030. Ministry of Environment of Denmark (2021) Action plan for a circular economy. [Link](#). [Accessed 25 March 2024]

Issue	Current incentives	Likely impact	Potential unintended consequences	Possible incentives
	<p>reduce, reuse or recycle.^{264,265}</p> <p>Legally-binding target to reduce residual waste (excluding major mineral wastes) per capita by 50% by 2042; with interim targets for 2028 regarding per capita and total quantity of residual waste; and per capita municipal waste broken down by key waste streams.²⁶⁶</p>			
<p>Carbon emissions from EfW need to be reduced.</p>	<p>Government support for the roll-out of CCUS for EfW plants.²⁶⁸</p> <p>EfW will be included in the UK ETS from 2028.²⁶⁹</p>	<p>The commercial and practical viability of CCUS in EfW plants has yet to be proven.</p> <p>UK ETS may incentivise more removal of plastics</p>	<p>Government policy time and financial support for CCUS in EfW plants may detract from support for new sorting and recycling infrastructure.</p>	<ul style="list-style-type: none"> Require all EfW facilities to use advanced sorting technologies to extract plastics for recycling. Require all new or extended EfW facilities to have CCUS technologies in place.²⁷⁰

²⁶⁴ Defra (2014) Energy from waste: A guide to the debate. [Link](#). [Accessed 22 March 2024]

²⁶⁵ L Peake (2020) Scandinavians call their waste incineration ‘crazy’, so why copy them?, Green Alliance: Inside Track. [Link](#). [Accessed 22 March 2024]

²⁶⁶ Defra (2023) Environmental improvement plan 2023. [Link](#). [Accessed 22 March 2024]

²⁶⁸ Department for Energy Security and Net Zero (2023) Carbon capture, usage and storage: Industrial carbon capture business models update. [Link](#). [Accessed 8 March 2024]

²⁶⁹ Department for Energy Security and Net Zero (2023) The long-term pathway for the UK Emissions Trading Scheme. [Link](#). [Accessed 8 March 2024]

²⁷⁰ Climate Change Committee (2020) The Sixth Carbon Budget: Manufacturing and construction. [Link](#). [Accessed 8 March 2024]

Issue	Current incentives	Likely impact	Potential unintended consequences	Possible incentives
		from EfW as well as investment in CCUS, depending on carbon prices.		
Waste crime needs to be eliminated.	<p>Target to eliminate waste crime and illegal waste sites by 2043.²⁷¹ Measures to tackle waste crime are outlined in the information box in Section 2.2.</p> <p>The Environment Agency takes a risk-based approach to monitoring compliance. The Joint Unit for Waste Crime investigates serious waste crime.²⁷²</p>	The scale of the problem is not fully understood, but it is thought unlikely by the industry that enforcement measures will eliminate it. ^{273, 274}	Strict end of waste criteria limit remanufacturing and recycling innovation.	<ul style="list-style-type: none"> • Incentivise major waste producers and their directors to self-regulate by creating a stronger corporate and individual duty of care for waste generated in their value chains (similar to health and safety rules).²⁷⁵ • Apply stronger penalties, including recovering clean-up costs from the perpetrator (applying the 'polluter pays' principle). • Increase the lower limit of Landfill Tax to reduce misclassification.²⁷⁶ • Reduce residual waste generated.

²⁷¹ Defra (2018) A Green Future: Our 25 Year Environment Plan to Improve the Environment. [Link](#). [Accessed 7 March 2024]

²⁷² Interview with Lee Marshall; National Audit Office (2022) Investigation into government's actions to combat waste crime in England. [Link](#). [Accessed: 05/03/2024]

²⁷³ Interview with Jacob Hayler.

²⁷⁴ Environment Agency (2023) National waste crime survey 2023: results and findings. [Link](#). [Accessed 7 March 2024]

²⁷⁵ Interview with Jacob Hayler.

²⁷⁶ Interview with Lee Marshall.

Opportunities to support progress

Issue	Short-term/tactical opportunities	Longer-term/strategic opportunities
The low cost of landfilling inert waste	<ul style="list-style-type: none"> Building on work by Zero Waste Scotland, develop enhanced metrics for England on the whole life cycle environmental impacts of waste.²⁷⁷ 	<ul style="list-style-type: none"> Explore a more nuanced approach to Landfill Tax, and a potential incineration tax, based on life cycle impacts. Explore a more holistic approach to soil conservation, considering interaction between Landfill Tax, industry codes of practice and wider soil-related policies.
Methane from biodegradable waste	<ul style="list-style-type: none"> Review and summarise the evidence on the impact of residual waste collection frequency on recycling outcomes. 	
Carbon emissions from EfW	<ul style="list-style-type: none"> Independent review of feasibility and timelines for CCUS in EfW, and of prioritisation of CCUS, advanced sorting and other decarbonisation measures. 	
Waste crime		<ul style="list-style-type: none"> Explore case studies from other policy areas, such as health and safety legislation, and from other geographies, to identify more efficient options for reducing waste crime.

²⁷⁷ Salemdeeb, R (2022) Scotland's journey with resources and waste metrics: Introducing the Scottish Waste Environmental Footprint Tool (SWEFT). [Link](#). [Accessed 12 March 2024]

3.7 Overarching findings

Some cross-cutting issues and findings emerged from the research, including the expert interviews and the assessment of incentives. These are set out below.

Policies are concentrated in the bottom stages of the waste hierarchy, on recycling and residual waste. This is partly due to legacy policy, but was reinforced by the decision to only introduce a legally-binding target on residual waste reduction under the Environment Act. Defra's traditional remit and the limitations of its policy levers play a role in this. It is also influenced by the territorial boundary of the UK's net zero target, which incentivises policymakers to reduce emissions from waste management but not from upstream material extraction and production, which often takes place overseas.

England lacks a circular economy strategy or coordination mechanism capable of bringing about a systemic transition. Ideally, a strategy would be science-based, aimed at achieving a sustainable level of resource consumption, supporting net zero targets, and minimising whole life cycle impacts of resources and waste. It would target the highest-impact material streams and sectors (on a life cycle basis), and prioritise action in the upper stages of the waste hierarchy. It would include a range of government departments—giving each ownership of specific objectives and actions—in order to deploy a coordinated package of policy levers. There would be a dedicated independent body to monitor progress. Instead, circular economy policy is packaged within waste policy, largely limited to Defra (with some involvement by DESNZ) and driven by factors ranging from public perceptions of which items are problematic, to the limiting factors mentioned in the previous paragraph.

Systems thinking is required to avoid unintended consequences, such as plastic restrictions driving up use of other materials; long-term EfW contracts undermining recycling (or even, in the future, long-term recycling contracts undermining reuse); or end of waste rules, with the best of intentions, presenting barriers to reuse.

Better data is needed to underpin stronger circular economy policy. The data underpinning policy is largely local authority data on municipal waste. There are gaps related to C&I and C&D waste, despite relevant data being available to industry stakeholders. Mandatory digital waste tracking opens additional possibilities for data collection. Waste composition studies can be used to shed light on less well-understood waste streams. Unlike Scotland, England does not track the life cycle carbon impacts of different waste streams. As for data on upstream material flows, this is only available at a high level on raw material consumption, for the UK as a whole, and was last updated for 2019.²⁷⁸ The Office for National Statistics, Defra and DESNZ²⁷⁹ have reportedly been developing a National Materials Datahub for at least five years,²⁸⁰ but no information is available regarding its progress. Consumption emissions

²⁷⁸ Estimated based on domestic material extraction, plus imports, minus exports. Office for National Statistics (2023) Environmental accounts on material flows QMI. [Link](#). [Accessed 25 March 2024]

²⁷⁹ Used to encompass DESNZ and its predecessor, the Department for Business, Energy and Industrial Strategy (BEIS).

²⁸⁰ Velenturf, A (2019) RRfW makes the case for better data to improve circular economy governance. [Link](#). [Accessed 25 March 2024]

have been estimated for England, but the latest data is for 2019.²⁸¹ Developing and maintaining robust, detailed and comprehensive data sets on England's resource use, waste and the environmental impacts associated with it would enable targeted, science-based policy and strong monitoring of policy impacts.

There is limited recognition in policy of the potential economic and strategic benefits of a circular economy, such as in domestic jobs, international trade and resource security. The "economy" part of the circular economy is not addressed in policy.²⁸² Some other countries are starting to apply the circular economy as a tool for international competitiveness and cooperation. There are opportunities (at UK level) to embed circularity in trade agreements.²⁸³ The UK's Critical minerals strategy acknowledges that circularity can play a role in supporting resource security but does not carry this forward into policies relevant to key materials and sectors.

England can learn from best practice, both within the UK and elsewhere in the world. For example, Wales has achieved higher recycling rates through various measures such as individual recycling targets for different local authorities; and Scotland has adopted a whole life cycle carbon metric for waste as well as introducing a Circular Economy Bill. France is moving ahead with a host of measures to incentive greater reuse, both in regard to single use packaging and in the construction sector. There is a growing array of case studies to learn from, in order to anticipate unintended consequences and develop better policy.

The opportunities and risks of EU Exit on the circular economy and waste are not adequately understood. While EU Exit offers opportunities to improve policy in England (given sufficient focus and resource), divergence also presents risks. For example, if England's rules on eco-modulation under EPR or ecodesign are not well aligned with the EU, it could undermine the effectiveness of incentives for sustainable product design. If the UK does not either regain access to EU chemicals data or develop and maintain a similarly robust data set, weakened controls on harmful chemicals could limit opportunities for circularity. If judges in England start to interpret retained EU law in a way that reduces incentives for strong, compliant waste management, standards could fall.²⁸⁴ A nuanced understanding is required of where divergence is helpful and where alignment is preferable.

²⁸¹ Defra (2023) J1: Carbon footprint and consumer buying choices. [Link](#). [Accessed 25 March 2024]

²⁸² Interview with Lee Marshall.

²⁸³ Interview with Jack Barrie.

²⁸⁴ Interview with Jack Barrie.

4 Recommendations for further investigation

Drawing on the analysis in Section 3, priority topics are recommended for further investigation.

Prioritisation takes into account:

- The need to support current government targets.
- The need to shift the policy focus higher up the waste hierarchy and to bring about a systemic transition to a circular economy.
- Key challenges and opportunities for improvement identified through the assessment.
- How to build on, or plug gaps in, the evidence base—aiming to complement work done by others.
- Opportunities for novel work.

Recommendations are divided into longer-term, strategic opportunities to support change and shorter-term, tactical opportunities, such as those presented by current policy developments. The strategic opportunities are all aimed at achieving a step change in England's approach to the circular economy, where it is recognised as going well beyond waste and recycling policy, and prioritised. Progress on these areas would have an indirect but substantial impact on all the other environmental protection goals that the OEP covers, due to the important role of resource extraction, production and end-of-life management in driving biodiversity loss and various forms of pollution.

Strategic opportunities

Update and strengthen the evidence base for science-based targets on resources and waste, including for resource consumption reduction, consumption emissions reduction, and life cycle environmental impacts of waste. Better evidence is required regarding appropriate target levels, to ensure consistency with national and global goals for net zero and biodiversity. For example, the UNEP figure commonly cited as a sustainable level of per capita resource use is based on work done over a decade ago, and the science behind it does not enjoy the same degree of consensus as that underlying net zero targets. The UK could lead the way in progressing the science on this. This work could be used to inform the next generation of data reporting requirements, targets and policy interventions, at national level as well as by specific materials and sectors. This could also position England as a thought leader on science-based resources targets and present opportunities for international collaboration.

To inform decisions on a systemic approach to a circular transition, map out the potential roles and levers which could be used to drive progress (overall; in the waste sector; and in other sectors which have a high material footprint), considering the agency of different departments, public bodies, local authorities, industry bodies, academia and other stakeholders. This could be informed by international case studies and a call for evidence.

Develop pathways for cutting resource use and residual waste that apply systemic, futures thinking and explore different assumptions on the relative roles of reduction, reuse and different forms of recycling and composting, to:

- Understand the systemic impacts on other environmental goals. For example, opting for energy-intensive or polluting modes of recycling may be preferable to landfill or incineration, but has implications for climate mitigation, air pollution and other impacts.
- Inform future infrastructure requirements and plans, to ensure that the government supports the right types of infrastructure for their future vision of a circular resources and waste system.

Tactical opportunities

Assess the trade and economic opportunities of a circular economy. The opportunities of a circular economy are not well recognised in England. It would be useful to review international evidence on the trade and economic opportunities presented by the circular economy, how England can position itself to benefit from these post-EU Exit, and the risks and downsides of not doing so.

Evaluate the impact of ecodesign policies and identify next steps. Policy on ecodesign, repair and planned obsolescence has stalled in England and there has been little evaluation of existing policies. Progress has continued elsewhere in the world. There is an opportunity to evaluate and benchmark progress, learn from the benefits and unintended consequences of relevant policies in other countries, and identify next steps.

Assess how effectively the new chemicals strategy supports circularity. With a chemicals strategy due to be published in 2024, it would be timely to conduct a review of how effectively post-EU Exit chemicals policy is supporting the waste hierarchy and a circular economy, and how it could be improved.

Conduct a systematic review of the opportunities for waste management policy to better support other environmental policy priorities. This could include, for example, mapping connections with climate change, water pollution, air pollution, biodiversity loss and chemical exposure; and could apply a sector lens.

Conduct a deep-dive into one or more 'blind spots' in waste and circular economy policy. For example:

- **Agricultural waste** receives little attention in current policies, but has potential overlaps with water pollution, chemical exposure and biodiversity loss.
- **Soil conservation in the context of construction waste** is a topic that would benefit from a holistic review, considering interaction between waste management rules, Landfill Tax, industry codes of practice, and wider policies related to soil, chemical exposure and nature protection.

Identify more efficient approaches to waste crime, by developing and reviewing case studies from other countries and from other policy areas, such as health and safety, or food safety.

Appendix A Interviews

Five interviews of up to one hour were conducted via video call as part of this research. Interviewees were selected by Resource Futures and the OEP with view to accessing:

- A variety of perspectives, from industry, research and an environmental NGO.
- Insights into resources, waste and circular economy policy and practice in England.
- Comparative insights across England and other jurisdictions in the UK and beyond.
- Insights across all stages of the waste hierarchy.
- Expertise on best practice in circular economy transitions.

The interviewees each had regular contact with wider groups of stakeholders, for example in the waste sector, circular businesses, policy or research. The limitations of conducting such a small number of interviews are acknowledged. Nonetheless, the interviews made a valuable and reasonably balanced contribution towards the project aim, which was to provide a high-level initial assessment to inform more in-depth future research.

The interviews were semi-structured and adaptive, using a set of questions while allowing the flexibility to explore other relevant issues, and evolving during the research. This enabled interviewees to comment on the topics which they felt were particularly important or urgent, and enabled researchers to follow up on new issues raised in previous interviews. Interview questionnaires were tailored to individual interviewees, to focus on their respective areas of research and experience.

Examples of questions are provided below. It was made clear to interviewees that these questions related to waste, resources and circular economy policy in England. Some interviewees focused more on waste policy, others on circular economy and resources policy.

Strengths/weaknesses and how to improve

- What is done particularly well in England compared to in other jurisdictions?
- What is your view on the current overarching objectives and the prioritisation of issues in this policy area?
- What do you see as the biggest gaps/blind spots in current policy?
- Can you give any examples of where the incentives in the system (policy/economic) work against the waste hierarchy, or where there are unintended consequences of policy, and how this could be changed?
- What do you see as the key factors holding back progress up the waste hierarchy / towards a circular economy; and how might progress be accelerated?
- What key data/evidence would help to support better policy making and implementation?

Potential opportunities from the transition

- What are some of the main potential opportunities presented to England as part of a transition to circularity?

Other issues

- Would you like to raise any other issues that have not yet been covered?
- The government now has a legally mandated target to halve residual waste. How effective do you think this will be at supporting the transition to a circular economy,
- What are some of the unintended consequences of [a policy with which this interviewee is very familiar]?
- Given your recent comparative analysis of the 70 national circular economy roadmaps and strategies (including England's Waste and Resource Strategy), could you comment on how England currently compares to other countries?
- What should be the main considerations when looking to prioritise policy effort to achieve a circular economy?