

# BEYOND THE BIN

Where is the waste in our economy?



# Beyond the bin: where is the waste in our economy?

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## Acknowledgements

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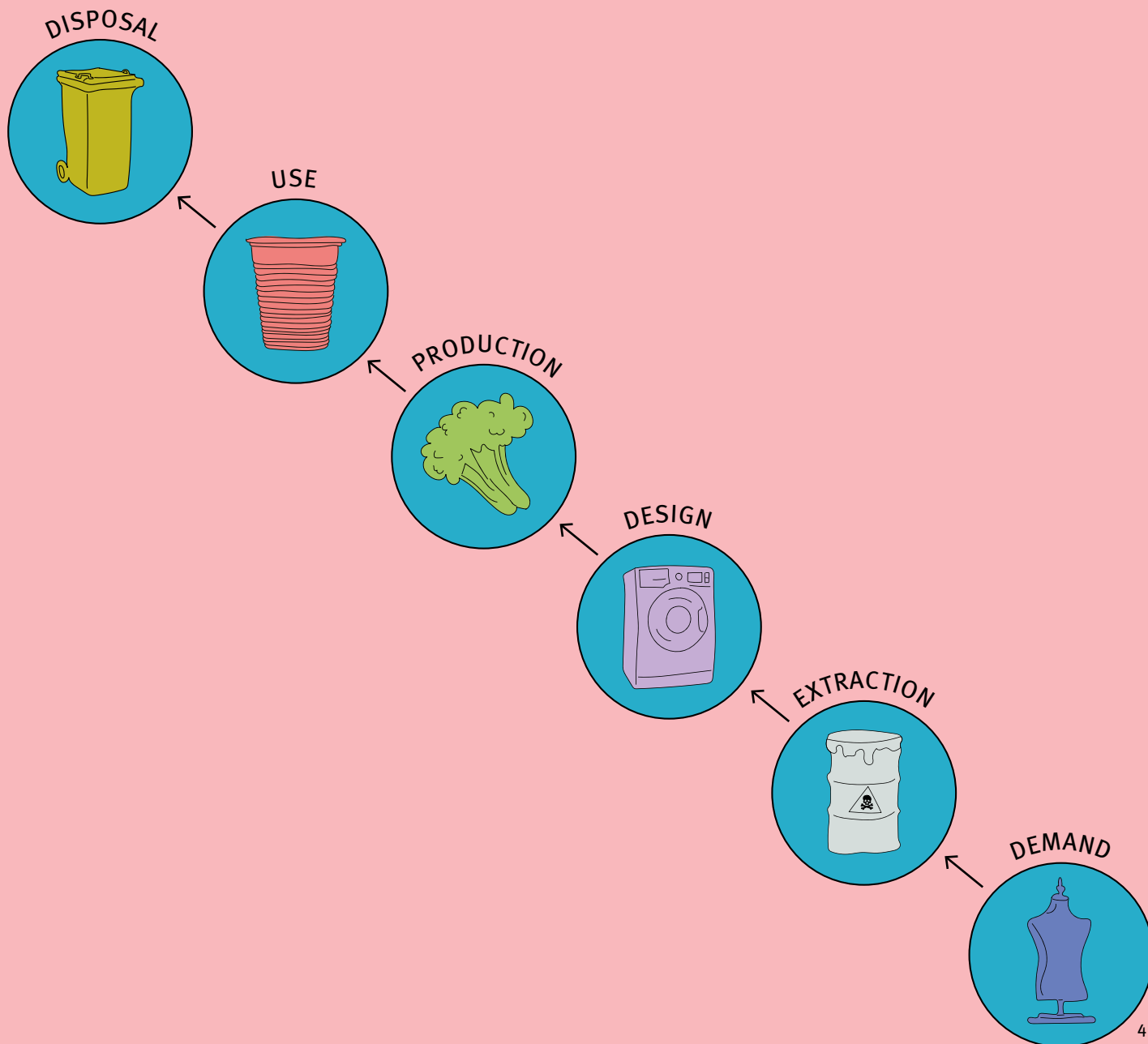


# In a linear economy, waste is everywhere

Today's economic model is mainly linear, ie it is based on a 'take, make, waste' approach. Waste isn't just an accidental byproduct; it is planned in and an inevitable failure of the linear system. It begins with the extraction of primary raw materials, which are then processed and used to manufacture products, many of which are used for only a short time before we throw them away. This is driven by artificially inflated demand for goods, many of which are low quality and not designed to last, and which are often neither needed nor truly valued.

This system is creating a constant and growing flow of waste, exhausting finite resources and causing environmental and social harms at every stage, from extraction to disposal.

In this briefing, we follow the trail of unnecessary waste, working backwards from the bin to the hidden sources you rarely see or know about. We show what can be done at every stage to address waste while reaping benefits for businesses and the public, as well as the wider economy and, of course, the environment.



# Disposal

## The problem

The disposal stage is what comes to mind when we think of waste: rubbish in household bins, landfills, incinerators and household waste recycling centres. Decisions made at the point of disposal often fail to maximise the value that could be extracted from products.

As a society, we throw away items that could be recycled, recycle more than we reuse and waste reduction is not prioritised. This contradicts the legally enshrined 'waste hierarchy,' which prioritises reduction first over reuse, and then reuse over recycling, before anything is sent to landfill or incineration.

So, how is the UK doing against the waste hierarchy? The UK's recycling rate was just 44.1 per cent in 2022, though there was a target to recycle 50 per cent by 2020. A new target was set in 2020 to recycle 65 per cent of waste by 2035.<sup>4</sup>

Electricals and electronics are a case in point: the UK produces more 'e-waste' per person than any country in the world, apart from Norway, reusing only 14 per cent and recycling just 53 per cent.<sup>5,6</sup>

## The opportunity

Respecting the waste hierarchy is an opportunity for material savings, including cost savings, and making the most of the resources we have. In the textiles sector, our analysis shows that, if 60 per cent of clothing was reused, fibre-to-fibre recycling reached its full potential and more reused items replaced new clothes, the UK's textile industry could use 63 per cent fewer raw materials.<sup>7</sup>

There is untapped value in the electronics sector too, since nearly 40 per cent of laptops currently sent for recycling are likely to be suitable for reuse.<sup>8</sup> Redirecting these to people who need them, like school students and those on low incomes, would provide significant social value. The social enterprise Tech-Takeback's partnership with charities, to refurbish and redistribute devices, has generated £18.8 million in social impact, through improvements to education, employment rates, health and wellbeing.<sup>9</sup>



# Use

## The problem

How we use products, throwaway culture, improper maintenance and the difficulty of repairing items all contribute to unnecessary waste. Single use products are a prime example of this, with the UK discarding over three billion single use cups a year.<sup>10</sup>

Even if people seek out reusable products that last, they often find that, when they break, they can't be repaired. When surveyed, 65 per cent of people were 'often frustrated' by how long products last and 62 per cent said they found their items 'too difficult to get repaired'.<sup>11</sup>

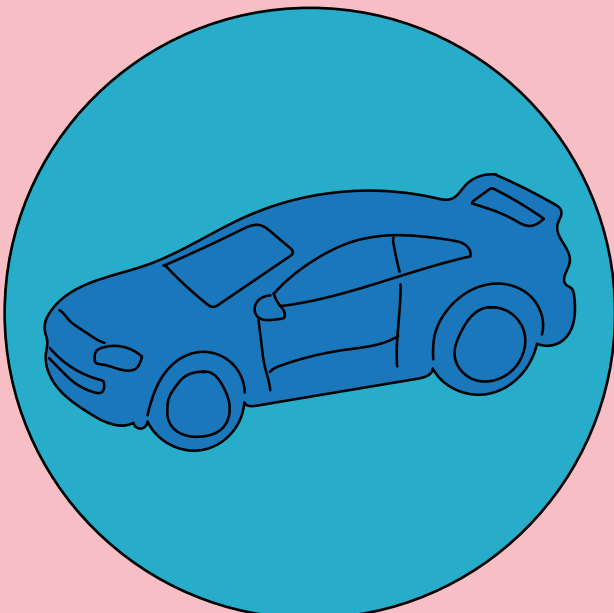
The economy is also built around an ownership model where some items are hardly used. For example, the average car in England is parked up for 23 out of 24 hours each day, while the average adult hasn't worn around a quarter of the clothes they own in over a year.<sup>12,13</sup>

## The opportunity

Replacing just 20 per cent of single use plastic packaging with a reusable option is a global opportunity worth over \$10 billion.<sup>14</sup> The reuse model can bring cost savings, improve user experience and brand loyalty, and provide businesses with valuable insights into customer behaviour.

The repair and reuse of items left at household recycling centres could generate over £63 million in sales revenue a year by 2028, if policy supported these businesses to grow.<sup>15</sup> This is an untapped market across many product types. The estimated 880 million unused electrical and electronic items accumulated in UK homes could yield £36.7 billion if they were sold second hand.<sup>16</sup>

And, instead of wasting resources in products that sit broken or unused, repair, reuse and sharing solutions should be developed. For example, one car in a car sharing scheme, shared between multiple drivers, could replace the need for 24 private vehicles on the road.<sup>17</sup>

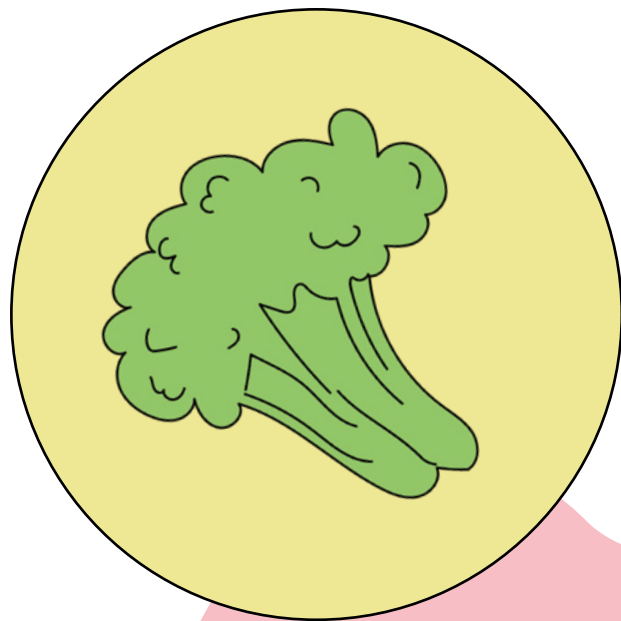


# Production

## The problem

Production inefficiencies create waste, from overproduction, where unwanted and unsold products are never used, to processes which fail to minimise material use or reuse discarded materials.

Food waste is a clear example, where much is wasted at the production phase before it even reaches consumers. Globally, 13 per cent is lost between harvest and retail due to factors including supermarket requirements and the lack of outlets for cosmetically 'imperfect' but otherwise edible produce.<sup>18</sup> It's estimated that food wasted on UK farms could provide 6.9 billion meals annually.<sup>19</sup> The textile industry has a similar problem, with up to 40 per cent of clothing made never sold or worn.<sup>20</sup>



## The opportunity

The status quo wastes both resources and money. So aiming for less waste in production can be a business opportunity. Food businesses, including manufacturers and hospitality, see an average return of £14 for every £1 spent on reducing waste, with value gained from avoiding wasted ingredients, energy and staff time.<sup>21</sup>

Overcoming logistical barriers and ingrained practices in the textiles industry could see unworn clothing transformed into valuable products through rental, resale and reuse. Barclays estimates that the 'recommerce' market for clothing and accessories was worth £1.22 billion to the UK economy in 2023, and commentators believe growth in this market will continue to outstrip traditional commerce in the years to come.<sup>22</sup>

While overproduction is embedded in the economic system, distributing surplus at reduced or no cost rather than wasting it has significant social value and community benefits, providing people with essential food, clothing or other items. FareShare, a national charity, redistributed 57,000 tonnes of surplus food in 2024, generating £5.72 in social value for every £1 invested in its operations.<sup>23</sup>

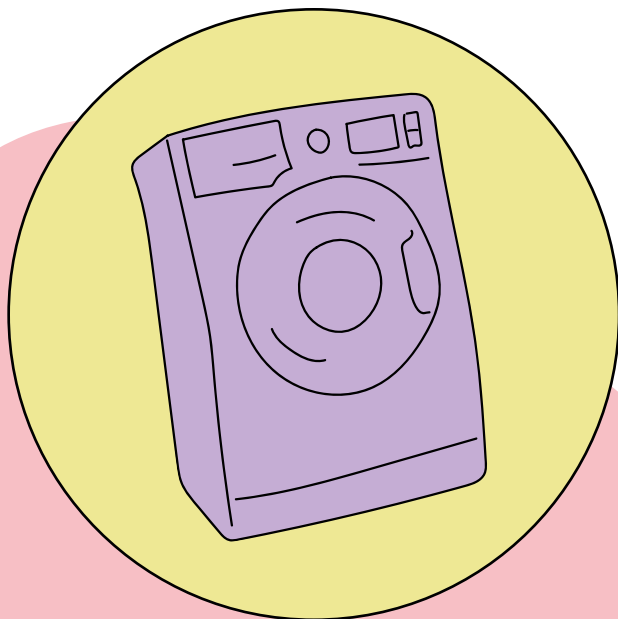


# Design

## The problem

The initial design phase of a product or system is where waste becomes locked in, influencing what subsequently happens to resources. Poor product or system design leads to avoidable waste at the manufacturing phase and after something is made. The failure to design durable or repairable products – in its worst form, deliberately designing in obsolescence – forces people into cycles of repeatedly replacing products.

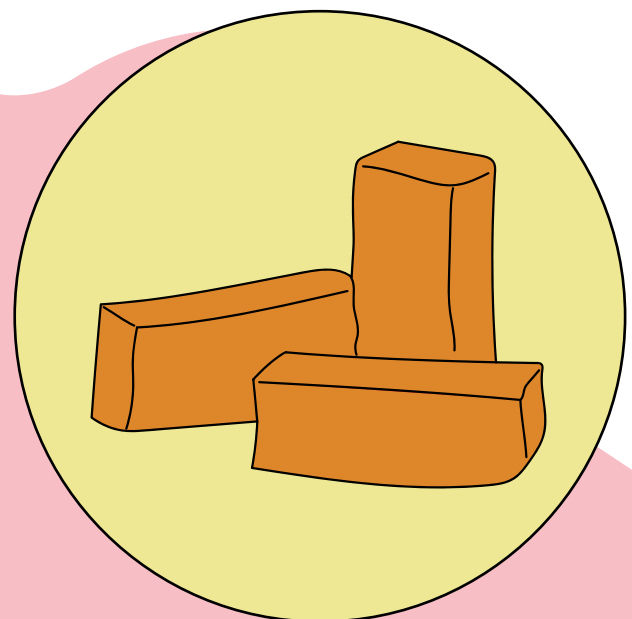
This has equity implications, as those that can't afford the upfront cost of products that last end up paying more in the long run. Sixty five per cent of the UK public are frustrated by products that break prematurely.<sup>24</sup> In some instances, instead of designs improving with technological progress, the opposite is happening. The average washing machine in the UK now lasts just 6.3 years, compared to around ten years in 2000.<sup>25,26</sup>



## The opportunity

Mandatory standards have a clear role in improving design. Already in the UK, new product specifications, set in 2021, mean some new white goods will be repairable for up to ten years, but there's potential to go much further.<sup>27</sup> For instance, the EU has recently implemented new requirements for tablets and phones which include durability and repairability standards. It plans to do more, establishing a new Ecodesign for Sustainable Products Regulation (ESPR), allowing it to set standards for broader product categories, rather than individual products, including for durability, reusability, upgradability and repairability.<sup>28</sup> The UK should follow suit.

But improving design for material efficiency is both practical and can be profitable for businesses. In construction, better design could reduce material use by 22 per cent.<sup>29</sup> Optimising building design with digital tools can cut material demand by seven per cent, while reducing overspecification in infrastructure projects could lower the materials needed by a quarter.<sup>30</sup> As materials can account for 60 per cent of project costs, these changes could reduce a developer's overall costs by 13 per cent and significantly boost their profits.<sup>31</sup>





# Extraction

## The problem

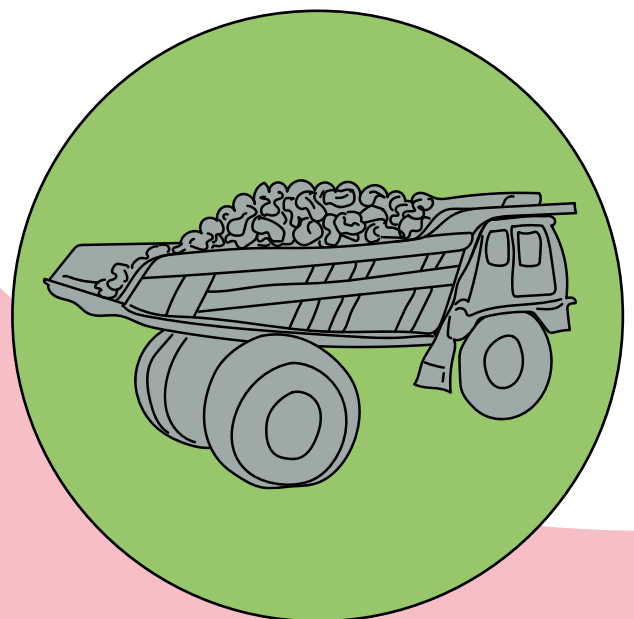
Mining and extractive activities generate vast amounts of waste. Producing the 75g of metal for a smartphone takes 6.5kg of ore, nearly 90 times the weight of the metal used.<sup>32</sup> Material extraction operations are immense. Mining is the fourth largest driver of deforestation globally, with tropical forests particularly impacted. A quarter of global deforestation related to mining is in Indonesia, with 12 per cent in Brazil.<sup>33</sup>

The hazardous waste that results from mining activities pollutes ecosystems, causing biodiversity loss and crop failures, and endangering human health.<sup>34</sup> Globally, 23 million people live on floodplains contaminated by metal mining waste.<sup>35</sup> The impacts vary by material, as well by location and mining practices. Around 16 million miners, including four to five million women and children, are affected by toxic mercury exposure from gold mining.<sup>36</sup> Producing a tonne of aluminium generates over two tonnes of highly toxic alkaline 'red mud', which can cause serious respiratory harm.<sup>37</sup>

## The opportunity

Advances in mining techniques are being developed to make old mining waste less hazardous, as well as to extract additional critical metals, like copper and nickel, from previously mined material.<sup>38</sup> This will increase the availability of such material for the green transition and make economies more resilient to volatile supply chains.

Reusing materials as production inputs instead of using newly mined materials is even more significant in reducing the need for virgin resources. It not only mitigates the negative social and environmental consequences of resource extraction, but often makes good business sense. Used batteries contain valuable resources businesses can exploit and 'mine'. By 2040, nickel, lithium and cobalt from end of life electric vehicle batteries accumulated in the UK could be worth £745 million.<sup>39</sup> Electronic waste, another rich source of these minerals, contains 100 times more gold per tonne than ore. The Royal Mint has sought to make this into a business opportunity, using new technology to recover metals from old devices, like phones and laptops, to use in products instead of virgin materials.<sup>40,41</sup>



# Demand

## The problem

Inflated demand for goods people would not otherwise want drives an enormous flow of waste throughout the economy, pushing more and more extraction, processing, design, production, use and disposal. Omnipresent advertising drives overconsumption. And this is accelerating.

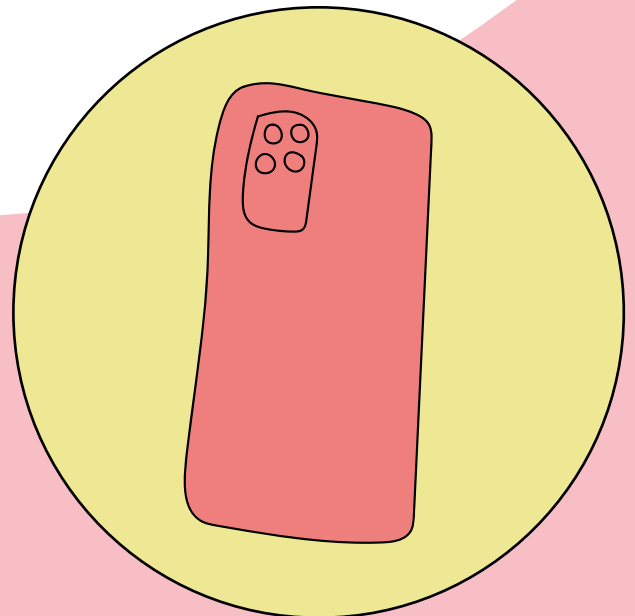
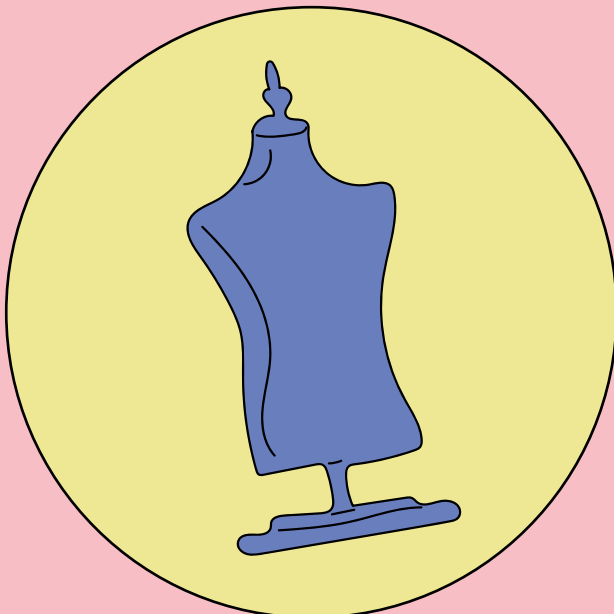
Fashion, once limited to two seasons, now churns out up to 100 per year; fast, cheap fashion encourages people to buy more.<sup>42</sup>

'Fast tech' is following suit. Every year, the average UK adult now buys nine cheap electronics, discarding eight of them.<sup>43</sup> Even high value items, like phones and tablets, are replaced frequently, driven by the upgrade cycle. Apple releases a new iPhone every 8.5 months on average, while Samsung updates its five smartphone lines annually.<sup>44,45</sup> This is despite 64 per cent of people in the EU – and 56 per cent in the UK – saying that they would prefer their phones to last more than five years. More than a quarter would like to use their devices for at least ten years.<sup>46</sup>

## The opportunity

The resource efficient businesses of the future are already looking to boost profitability in ways that avoid or counter this inflated demand. Rental or leasing businesses maximise value from products, generating income from items used by multiple customers. Clothing rental can yield businesses up to 260 per cent of a garment's original retail price through repeated use. This also saves customers money compared to buying new, as they pay just four to 30 per cent of the recommended retail price to rent instead.<sup>47</sup>

Modular and customisable products add value by letting customers upgrade or adapt them over time, reducing the need for replacements. Fairphone, a Dutch smartphone company, has created a modular, repairable smartphone designed to last ten years, far exceeding the typical two to three year lifespan of other models.<sup>48</sup>



# Cutting waste benefits us all

At every stage of a product's life, the waste that arises – both seen and unseen – harms the environment, contributing to climate change and creating social and economic problems. Cutting waste in all its forms should be a major government priority because it benefits businesses, communities and individuals.



## Protecting economic growth

As we have shown, opportunities at each stage of the supply chain are significant for the economy. But their combined impact through a whole system geared to be circular, prioritising at the outset reduction, reuse, remanufacture and recycling, in that order, would be transformative. Significantly, this could safeguard UK growth, combatting long term economic risks to supply chains of unsustainable resource use. It is estimated that these threats could shrink the UK's GDP by six per cent by the 2030s.<sup>49</sup>



## Quick wins on climate change

The drive for a circular economy is a major climate policy that has, so far, remained largely untapped. Improving resource efficiency could cut more carbon than most emission reduction policies the government has tried. It could cut emissions from UK consumption at home and abroad by up to two billion tonnes of carbon dioxide equivalent by 2050.<sup>51,52</sup> This would be the same as eliminating the cumulative impact of 20 coal-fired power stations for 25 years.<sup>53</sup>



## Jobs where they're needed

For communities, expanding industries around repair, remanufacturing, reuse and recycling could create over 450,000 jobs by 2035, many of which would be in occupations and regions suffering from high unemployment, such as manufacturing, machine operatives and skilled trades, in the West Midlands and the North West.<sup>50</sup>



## What next?

There is so much to gain from a circular economy, and so much at risk if business as usual continues. The first step for the government's Circular Economy Taskforce is to meet its mission over its short lifespan, to develop a strategy that transforms the way we think about and define 'waste', going beyond the bin to tackle inefficiencies throughout the whole economy. Effective delivery will be vital. Whole government action, not by just one department, is needed to transform business systems and realise the benefits for the economy, environment and people, as soon as possible.

Learn more about what the government can achieve with its forthcoming Circular Economy Strategy for England in, [Five tests for England's Circular Economy Strategy](#).

## Further reading

[Why a circular economy is good for the UK](#)

[Why a circular economy is good for people](#)

[Why a circular economy is good for business](#)

[Mission critical: safeguarding resources for UK energy security](#)

[Profit without loss: how conserving resources benefits the economy, businesses and consumers](#)

[Changing fashion: what people want from a greener clothing industry](#)

[Ready steady grow: how the Treasury can mainstream circular business](#)

[Circular construction: building for a greener UK economy](#)

[Design for a circular economy: reducing the impacts of the products we use](#)

[Circular business: what companies need to make the switch](#)

[Levelling up through circular economy jobs](#)

[By popular demand: what people want from a resource efficient economy](#)

# Endnotes

- <sup>1</sup> Green Alliance, 2024, *Getting on track for a circular economy*
- <sup>2</sup> HM Government, 18 December 2024, 'Circular Economy Taskforce'
- <sup>3</sup> For more on what Green Alliance and our business partners in our Circular Economy Task Force believe is essential to success, see the briefing, 'Five tests for England's Circular Economy Strategy: will it deliver transformation?'
- <sup>4</sup> Department for Environment, Food and Rural Affairs (Defra), 26 September 2024, 'UK statistics on waste'. The 2020 and 2035 targets cover slightly different sets of materials; the 2020 recycling rate was for household waste only, whereas the 2035 target is for 'municipal waste', which includes other household-like waste collected by local authorities from businesses.
- <sup>5</sup> United Nations, 2024, *Global e-waste monitor 2024*
- <sup>6</sup> Material Focus, 2020, *Electrical waste – challenges and opportunities: an independent study on waste electrical & electronic equipment (WEEE) flows in the UK*
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- <sup>8</sup> WRAP, 2017, *Switched on to value: powering business change*
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- <sup>10</sup> WRAP, 2022, *Single-use cups and on-the-go fibre-composite food packaging*
- <sup>11</sup> Green Alliance, 2021, *By popular demand: what people want from a resource efficient economy*
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- <sup>16</sup> Material Focus, 31 January 2024, 'Bank between £1,300 and £6,330 by re-selling your unused tech'
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- <sup>18</sup> United Nations Environment Programme (UNEP), 2024, *Food waste index report 2024*
- <sup>19</sup> 3.3 million tonnes of food is wasted on UK farms each year, of which 2.9 million tonnes is edible. This is equivalent to 6.9 million meals. See: WWF UK, 2022, *Hidden waste: the scale and impact of food waste in UK primary production*
- <sup>20</sup> OC&C Strategy Consultants and WGSN, 2023, *Doing more with less*
- <sup>21</sup> Champions 12.3, 2017, *The business case for reducing food loss and waste*
- <sup>22</sup> Barclays, 19 October 2023, 'Recommerce revolution: reusing, reselling and renting worth almost £7 billion to UK economy as consumers embrace more sustainable shopping habits'
- <sup>23</sup> FareShare, 2024, *FareShare's impact report 2024: transforming surplus food into support*
- <sup>24</sup> Green Alliance, 2021, op cit
- <sup>25</sup> WRAP, 2021, *Switched on to value: powering business change*
- <sup>26</sup> Green Alliance, 2021, *Better products by design*
- <sup>27</sup> House of Commons Library, 2021, 'Research briefing: right to repair regulations'
- <sup>28</sup> European Commission, 19 July 2024, 'Sustainable products to become norm for consumers as new law enters into force'
- <sup>29</sup> Green Alliance, 2022, *Circular construction: building for a greener UK economy*
- <sup>30</sup> Ibid
- <sup>31</sup> Analysis based on a 22 per cent reduction in material requirements, modelled as part of the analysis for Green Alliance, 2022, *Circular construction: building for a greener UK economy*, and an assumed 60 per cent material cost, as a central estimate based on sources in: Green Alliance, 2022, 'Circular construction: methodology'
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- <sup>33</sup> WWF Germany, 2023, *Extracted forests: unearthing the role of mining-related deforestation as a driver of global deforestation*
- <sup>34</sup> RAID, 2024, *Beneath the green: a critical look at the cost of industrial cobalt mining in the DRC*
- <sup>35</sup> M G Macklin et al, 2023, 'Impacts of metal mining on river systems: a global assessment', *Science*, vol 381, pp 1,345-1,350
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- <sup>37</sup> World Aluminium, 2017, 'Life cycle inventory data and environmental metrics for the primary aluminium industry'
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- <sup>45</sup> N C Hughes, 19 November 2024, 'All Samsung Galaxy phones in order: a full history of releases 2010-2024', *Techopedia*
- <sup>46</sup> 64 per cent of Europeans want to keep using their current devices for at least five years. See: European Commission, 2020, *Special Eurobarometer 503: attitudes towards the impact of digitalisation on daily lives*
- <sup>47</sup> Green Alliance, 2024, *Profit without loss: how conserving resources benefits the economy, businesses and consumers*
- <sup>48</sup> S Gibbs, 8 September 2023, 'Fairphone 5 review: could this be the first phone to last 10 years?', *The Guardian*
- <sup>49</sup> H Avery, 24 April 2024, 'Assessing the materiality of nature related financial risks for the UK', Green Finance Institute
- <sup>50</sup> Green Alliance, 2021, *Levelling up through circular economy jobs*
- <sup>51</sup> Green Alliance, 2021, *Less in more out: using resource efficiency to cut carbon and benefit the economy*
- <sup>52</sup> WRAP, 2021, *Net zero: why resource efficiency holds the answers*
- <sup>53</sup> Green Alliance analysis based on WRAP's figures. Twenty coal plants emit 80MtCO<sub>2e</sub> per year. Over 25 years (ie between 2025 and 2050) they would emit two billion tonnes of CO<sub>2e</sub> cumulatively. Emissions from coal plants taken from: US Environmental Protection Agency, 2023, 'eGRID year 2021 data'.