House of Commons
Environmental Audit Committee
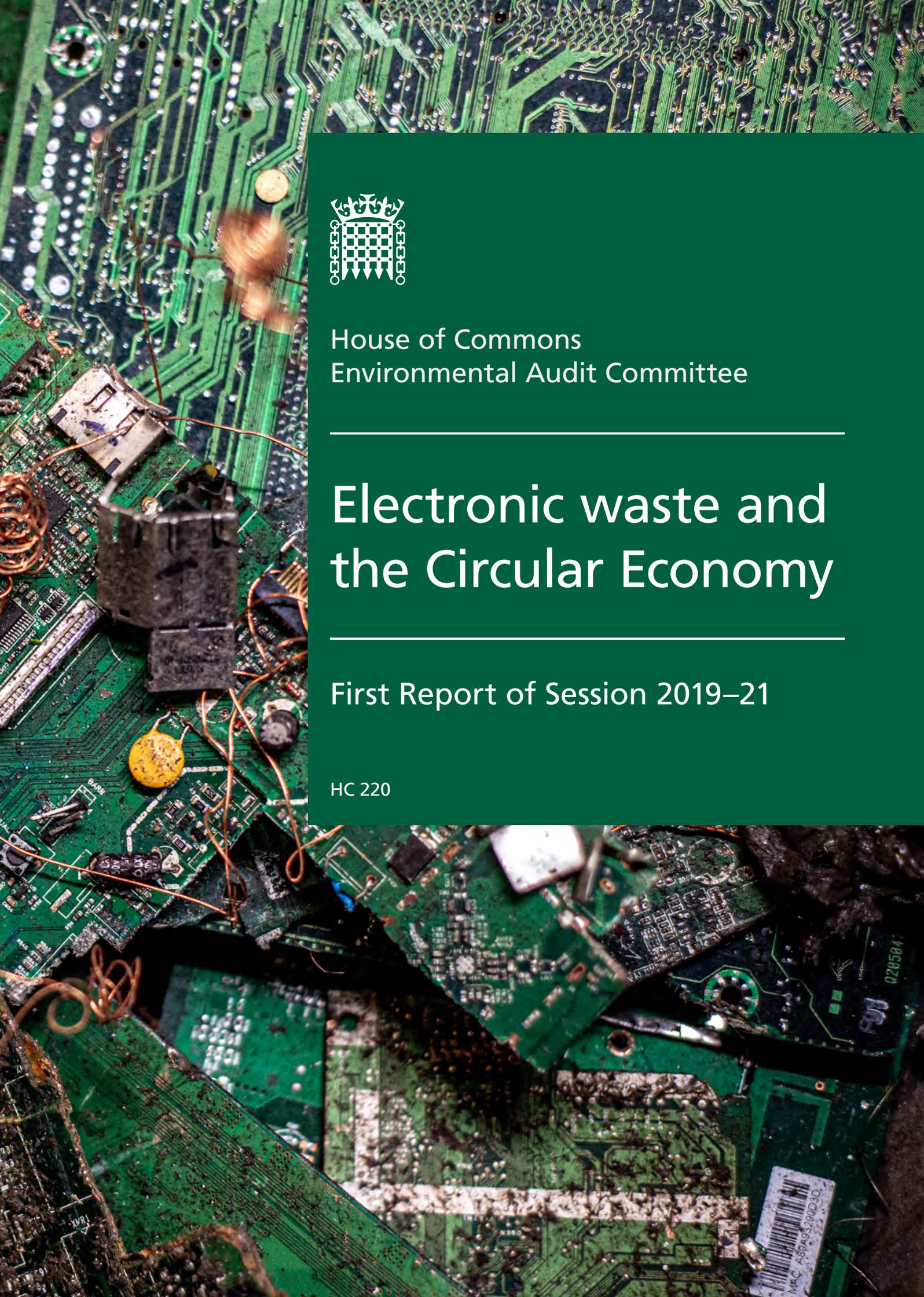
Electronic waste and the Circular Economy

First Report of Session 2019–21

HC 220

Environmental Audit Committee

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In the UK, as in the rest of the world, we are buying more and more electrical and electronic equipment. This is driving economic opportunities and improving the quality of our lives but is coming at a heavy cost to people and the environment.

Our electronic products are lasting less time than they used to, they are becoming harder to repair and they aren't being re-used when they could be. In fact, some companies are deliberately making it very hard for us to repair their items. This means we are buying and using more than we need to be.

In the UK we each create a huge amount of electronic waste—the second highest in the world. Yet we are not collecting and treating much of this waste properly. A lot of it goes to landfill, incineration or is dumped overseas. Under current laws producers and retailers of electronics are responsible for this waste, yet they are clearly not fulfilling that responsibility.

The UK is one of the largest exporters of electronic waste in the world. Some researchers think we send the equivalent of 40% of the electronic waste we collect overseas. This is illegal. In the countries that receive our electronic waste, it is often dumped, with toxic chemicals leaching into the environment and harming people. In this country, toxic chemicals are also causing harm whilst we use the electronics and when they become waste.

Most of us don't know what to do with our electronic waste. Even on the rare occasions that we do recycle it, it is not getting treated properly. Our recycling systems shred and incinerate it, wasting the rare, precious resources they contain—resources vital to our low-carbon future, our healthcare technologies and our defence systems. These valuable rare resources are already the subject of geopolitical struggles. Some are so rare that they are predicted to run out completely by the end of the century.

To start solving this large and growing problem we are calling on the Government to take action to prevent this—a full list of which can be found at the end of this report. In particular, we want to highlight the following recommendations from the report:

i)   We ask the Government to set ambitious long-term targets including for the collection, re-use and recycling of E-waste to be undertaken to a very high standard. We ask that these targets focus on reducing resource consumption; the environmental impact of the industry and on capturing and retaining value including critical raw materials.

ii)   Our high streets are under severe pressure and current regulations, coming into force from 2021, could unfairly entrench the competitive advantage of online retailers and marketplaces like Amazon. As a matter of urgency, and at the latest by the end of 2021, online retailers and marketplaces must have an equal obligation to collect electronic waste from customers. To prevent take-back only being offered at remote, inconvenient warehouses, we believe that the exemplary innovation shown by some companies should become a minimum—meaning all large online retailers and marketplaces must arrange

and pay for like-for-like electronic waste collection from a customer's home on delivery of new electronics. They must also offer to collect any electronic waste defined as "small" at the same time.

iii) Online marketplaces must also be made responsible for ensuring that all electrical and electronic equipment sold on their platforms is fully safe and compliant with the law. Producers should be required to pay exactly the same producer responsibility fees and follow the same rules selling online and they do offline.

iv) We ask the Government to ban the practice of intentionally shortening the lifespan of products through planned obsolescence.

v) The Government should also require all producers to label their electrical and electronic products with each item's expected lifetime, including how long a device will receive software security updates. The label should also include a repairability score based on the product's design, the availability and cost of spare parts and access and ease of use of repair manuals.

vi) We ask the Government to enshrine a right to repair electronic products in law, enforcing access to repair manuals, affordable spare parts for products and for products to be designed so that repair it not prevented through limited access to physical or software tools.

vii) We call on the Government to reduce the VAT charged on the repair of electrical and electronic products, as takes place in other countries, to reduce the financial barriers to repairing items.

viii) We are calling on manufacturers to ensure their products are recyclable and dismantlable by waste treatment operators. The Government should apply incentives for this, potentially through an extended product responsibility system. Manufacturers should also provide clear information to recyclers about the materials and quantities of those materials in their products. The national materials datahub should be fast-tracked to focus on the movements of rare materials critical to our healthcare, defence and low-carbon technologies.

ix) Government investment in low-quality Energy from Waste plants should at the least be matched by investment in higher quality recycling methods that mean materials, particularly rare and valuable ones being recovered for re-use. Energy from Waste, though important to prevent items going to landfill, should be treated as a low priority in UK waste infrastructure investment strategies.

x) The Environment Agency in England should be undertaking stronger enforcement activity and should be actively collecting data and information to estimate the actual quantities of E-waste being exported illegally.

Our Report

We want an electronics industry that inspires innovation, improves quality of life and contributes to the prosperity of the UK and sustainable development abroad. One where valuable technology has a long-life that befits the cutting-edge design, manufacture and precious materials that electronics and electrical equipment contains. Rare and precious materials contained in these products are vital to decarbonising our economy and protecting our country and must be re-used and recycled without polluting or harming our health and environment.

The current linear tech company business model is reliant on continuous consumption, a throwaway culture and short-lived products often impossible or expensive to repair. This is increasingly unsustainable given rising global consumption. It is contributing to significant environmental damage during the extraction of rare and finite materials; the carbon emitted throughout product lifetimes; and the dumping and polluting of materials and chemicals toxic to human and wildlife health.

Technology companies, so often at the forefront of revolutionary ideas, should now take the lead in creating sustainable and environmentally friendly business models that do not rely on the over-exploitation of nature and natural resources. This growing problem must be acknowledged and brought to an end, replaced by creating a truly circular economy for electronics.

Each UK household has 20 unused electronic items hoarded at home

159,000 bikes, **12,000** playground swings and **5 million** defibrillators could be created from the unused laptops we hoard at home in the UK.

There are enough unused cables in UK households to go around the world 5 times

Using all the washing machines, smart-phones, laptops and vacuum cleaners in Europe for just **1 year longer** would save **4 million tonnes** of CO_2 per year, equivalent to taking more than **2 million** cars off the roads for a year.

Source: European Environmental Bureau, Coolproducts don't cost the Earth, 2019
& Material Focus, Electrical waste – challenges and opportunities, 16 July 2020

Introduction: Electronics and E-waste, what are the problems?

1.   Electrical and electronic equipment (EEE) has become essential to modern life. It enables instant communication and higher standards of living for people all over the world. In the UK we each buy just under three new electrical items every year.[1] In 2015 the average European household had 44 electronic or electrical items at home plus another 45 lamps or light fittings.[2] And this is only set to grow. For every three items that we throw away we buy four new ones.[3] Researchers have found that 206,000 new electrical items are being bought each year that are not replacing old ones.[4] The electronics industry in the UK is an important one, especially in the area of semiconductors. The manufacture of computers and electronics added £8.4bn in value to the economy in 2017 and it is a sector where productivity is growing significantly.[5]

Box 1: Electrical and Electronic Equipment

> The UK Government defines electrical and electronic equipment (EEE) as equipment which is dependent on electric currents or electromagnetic fields to work and is used for generating, transferring and measuring these currents and fields. In simpler terms, it can be considered almost all equipment with a plug, electric cord or battery. The UK breaks EEE down into 14 categories that can be found in the Appendix.

Source: HM Government, Guidance: Electrical and electronic equipment (EEE) covered by the WEEE Regulations (26 October 2018), World Economic Forum, A New Circular Vision for Electronics: Time for a Global Reboot, (January 2019, p 7).

2.   Professor Tim Cooper, a leading thinker in sustainable consumption and design at Nottingham Trent University,[6] told us that the "current consumption of electrical and electronic goods is unsustainable" because of the sheer numbers consumed and the way we produce, use and dispose of them.[7] Higher levels of disposable incomes, urbanisation and further industrialisation in parts of the world are making the problems worse.[8] Worldwide estimates put just the number of devices connected to the internet between 25–50 billion in 2020, which is more than triple the number of people on the planet.[9]

3.   The waste hierarchy ranks how we should manage all these purchased electronics throughout their life according to what is best for the environment. It gives top priority to preventing waste in the first place ('Reduce'). When waste is created, it gives priority to preparing it for re-use ('Re-use'), then recycling ('Recycle'), then recovery (e.g. of energy), and last of all disposal (e.g. landfill).[10] Contributors to this inquiry have focused on the need to re-design products, and re-think the resources we use to achieve this. The Royal

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1   Recyclenow, HOW ARE ELECTRICAL ITEMS RECYCLED?, [accessed 08 October 2020].

2   ProSUM Project, Prospecting Secondary raw materials in the Urban mine and Mining wastes, (21 December 2017), p 4.

3   Green Alliance, (EWa0006); WRAP, Switched on to value: powering business change, (2017).

4   Material Focus, Electrical waste – challenges and opportunities, (16 July 2020).

5   MAKE UK, Sector Bulletin: Electronics, (January 2020).

6   Nottingham Trent University, Tim Cooper, Professor, [accessed 10 November 2020].

7   Professor Tim Cooper, (ELE0022).

8   Professor Tim Cooper, (ELE0022).

9   World Economic Forum, A New Circular Vision for Electronics: Time for a Global Reboot (January 2019), p 10.

10   Department for Environment, Food and Rural Affairs, Guidance on applying the Waste Hierarchy, (June 2011).

Society of Chemistry's addition of an extra layer to the waste hierarchy reflecting this priority is welcome (see figure 1). The waste hierarchy is linked and complementary to the concept of a "circular economy" (see box 2).

Figure 1: The Waste Hierarchy

Source: The Royal Society of Chemistry, Written Evidence to the EAC, (EWa0009)

4.   This report aims to look at tackling the vast and growing problems in the electrical and electronic industry, by taking steps to move away from a linear model and towards a truly circular economy in electronics. These are also the ambitions contained in *Our Waste, Our Resources: A Strategy for England*, and *The 25 year environment plan* where the UK Government committed to becoming a world leader in resource efficiency (by doubling resource productivity by 2050), maximising the value and use of resources whilst minimising waste and moving towards a more circular economy. They aim to do this by improving the life-cycle environmental performance of products including electrical and electronic equipment and increasing their reuse, remanufacturing and recycling through promoting the waste hierarchy.[11] [12]

Box 2: What is a circular economy?

> The concept of 'a circular economy aims to redefine growth', according to the Ellen MacArthur Foundation. A circular economy model aims to design out waste and pollution, keep products and materials in use, and regenerate natural systems–therefore 'gradually decoupling economic activity from the consumption of finite resources'. It replaces the 'end-of-life' concept with restoration, shifts towards the use of renewable energy, eliminates the use of toxic chemicals, which impair reuse, and aims for the elimination of waste through the superior design of materials, products, systems, and within this, business models.

Source: Ellen MacArthur Foundation, Towards the Circular Economy, (2013), p 7.; Ellen MacArthur Foundation, What is a circular economy? [accessed 14 October 2019].

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11   Department for Environment, Food and Rural Affairs, Our waste, our resources: A strategy for England (December 2018), p 7.

12   Department for Environment, Food and Rural Affairs, 25 Year Environment Plan, (11 January 2018, updated 16 May 2019), p 83.

5.   At present, the electrical and electronic goods industry operates on a traditional linear business model based on high throughput of goods.[13] Much of this waste is not returned to the system, for example it is estimated that only a maximum of 12% of electronics are re-used,[14] and we are not collecting, let alone recycling, more than 55% of electronics put on the market. Therefore, this has been called a linear economy model.[15] This contrasts to a circular economy. In its report on Circular Consumer Electronics, the Ellen MacArthur Foundation outlined how a Circular Economy for electronics would look like instead:

> They [consumer electronic products] are kept in use for as long as possible, either by the original user, or flowing to new users who will find new value and utility in them. Eventually, devices end up in the hands of specialists, who will professionally refurbish products, reuse or remanufacture the valuable components inside, and separate and recycle materials.[16]

6.   Green Alliance outlined to us the benefits of a more circular economy:

> In addition to generating considerable resource savings, such measures have the potential to create new jobs, to boost the economy through innovative circular business models and to build resilience by lowering demand for scarce resources while securing supplies of secondary material.[17]

7.   Green Alliance and WRAP undertook detailed analysis that showed, if there was a true transformation to a closed loop or circular economy for materials, 517,000 jobs in the UK could be created by 2030 in regions and at pay grades where there is persistent unemployment, making a net contribution to UK employment.[18] According to Green Alliance, UK manufacturers spend five times more on resource inputs than they do on labour. So, using resources better has been estimated to yield £10 billion in additional profits to the manufacturing sector.[19] [20] [21]

Electronics and E-waste – what problems are being caused?

Carbon emissions in consumption

8.   Natural resource extraction and processing makes up approximately 50 per cent of the total greenhouse gas (GHG) emissions produced worldwide.[22] If current trends for the consumption of goods, including electronics, continue, greenhouse gas emissions from resource extraction and processing will increase by 43 per cent from 2015 to 2060.[23]

9.   The Geological Society told us that the proportion of global energy used to crush rock, in order to remove the precious metals within it, is around 3–5%.[24] To make the

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13   Professor Tim Cooper, (ELE0022).

14   WRAP, Switched on to value: powering business change, (2017).

15   Ellen MacArthur Foundation, Towards the Circular Economy, (2013), p 22.

16   Ellen MacArthur Foundation, Circular Consumer Electronics: An initial exploration (April 2018), p 4.

17   Green Alliance, (EWa0006).

18   Wrap & Green Alliance, Employment and the Circular Economy, (2015) p 3.

19   Manufacturing Commission, Industrial evolution: making British manufacturing sustainable, (2015).

20   Green Alliance, Unemployment and the Circular Economy in Europe, (December 2015).

21   Institute for Manufacturing, The next manufacturing revolution: non-labour resource productivity and its potential for UK manufacturing, (2013).

22   United Nations, Global Resource Outlook, (2019), p 7.

23   UN, Global Resource Outlook, (2019), p 7.

24   Geological Society, (ELE0038).

electrical and electronic devices we own there is also an extensive global supply chain.[25] Greenhouse gas emissions are produced in the manufacturing of devices and Greenpeace points out that the majority of electronics production, from chip making to final assembly, is concentred in Asia, particularly in mainland China, but also in South Korea, Taiwan, Japan and Vietnam.[26] It states that currently: "electricity generation in all these countries is predominantly reliant on fossil fuels, particularly coal, with access to renewable sources of electricity extremely limited."[27] Products also release emissions during use and at the end of their life, particularly if the E-waste is treated incorrectly. For example, the incorrect treatment of fridges and air-conditioners caused 0.3% of global emissions in 2019 according to the UN.[28]

10.   DEFRA analysis in 2011 put Electronic Equipment and Machinery as the fifth most carbon emitting sector in the UK when measured by consumption of products.[29]

Resource extraction and use

11.   Global resource extraction has grown rapidly. Extraction reached 92 billion tons in 2017, compared with 27 billion tonnes in 1970.[30] The world's overall consumption of raw materials is expected to double by 2060.[31] High-income countries maintain the highest material footprint consumption of approximately 27 tonnes per person, which is more than 13 times the level of the low-income group.[32] The billion richest individuals account for 72 per cent of the consumption of global resources, while the poorest 1.2 billion consume only one per cent.[33] The International Resource panel has suggested that a sustainable level of resource consumption could be between six and eight tonnes per person per year[34] and similarly academics at the University of Leeds suggests that 7.2 tonnes is sustainable.[35] According to analysis the University undertook for DEFRA, the UK currently consumes 14.7 tonnes of material per person per year.[36]

12.   The Institute for Materials, Minerals, Mining told us that mining, crushing and grinding of ore to extract the required minerals for electrical and electronic products has a significant and lasting impact on ecosystems and local communities, and that the process is energy intensive and requires significant land management.[37] The extraction and processing of material resources (biomass, fossil fuels, metals and non-metallic minerals) currently contributes to more than 90 per cent of global biodiversity loss and water stress impacts.[38] This is often caused by the chemicals used in industrial mining and

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25   Institute for Materials, Minerals and Mining, (EWa0016).

26   Greenpeace USA, Guide to Greener Electronics, (2017).

27   Greenpeace USA, Guide to Greener Electronics, (2017).

28   Forti, Balde et al., The Global E-waste Monitor 2020, (June 2020), p 3.

29   Sustainability Research Institute et al., Report for DEFRA: UK Consumption Emissions by Sector and Origin, (May 2011).

30   UN, Global Resource Outlook, (2019), p 7.

31   World Economic Forum, A New Circular Vision for Electronics: Time for a Global Reboot, January (2019), p 10.

32   UN, Global Resource Outlook, (2019), p 8.

33   UN, Global Resource Outlook, (2019), p 126.

34   International Resource Panel, Managing and Conserving the Natural Resource Base for sustained economic and social development, (February 2014), p 9.

35   University of Leeds, A Good life for all within planetary boundaries, Supplementary information, (2017), p 8.

36   HM Government, Department for Environment, Food and Rural Affairs, Resources and Waste Strategy – Monitoring progress, (August 2020), p 18.

37   Institute for Materials, Minerals and Mining, (EWa0016).

38   UN, Global Resource Outlook, (2019), p 126.

its contaminating by-products, including in mining tailings. The mining of copper, gold and other precious metals found in electrical and electronic devices is a particularly toxic process with dangerous levels of mercury and cyanide used in extraction.[39]

Critical Raw Materials

13. Electronic and Electrical equipment contains valuable and rare materials, often found in small quantities in each device. According to the Geological society:

> Many of the electronic devices we use every day such as computers, mobile phones and computers require a multitude of mined metals and materials to develop the sophisticated circuit boards, microchips and batteries in modern electronics required to deliver their function and performance. By way of example, the average smartphone requires 72 elements found in the periodic table, 62 of which are metals. These include zinc, gold, copper, palladium and tantalum to name just a few.

Box 3: Critical Raw Materials (CRMs)

Critical Raw Materials (CRMs) are all materials that are important to a nation, region or sector's economy and that are, or could become difficult to get hold of.[40]

The European Commission publishes a list of CRMs which considers the main global producers, sources of supply and reliance on imports. The most recent list, published in 2020, lists 30 CRMs of strategic importance requiring secure and affordable supply—these are outlined in the appendix.[41] The materials listed include indium, used in touchscreens and solar panels, and tantalum, used in micro-capacitors for a range of applications from mobile phones to wind turbines. The UK does not publish its own CRMs list.[42]

The Royal Society of Chemistry predicts that the earth's natural supply of six CRMs in smart phones will come under serious threat. These are: gallium, arsenic, yttrium, silver, indium and tantalum. [43]

Source: The Royal Society of Chemistry, (ELE0047)

14.   At our high rate of consumption and discard, vast quantities of Critical Raw Materials are used and lost. When we export waste for dumping, send it to landfill, incineration and even low-quality shredding, we are losing these materials. Yet they are vital to our future, not just for electronic items, but also in electric cars, wind turbines, solar panels; in healthcare products like pacemakers and artificial joints; and in our defence and aerospace sectors. The development of low carbon technologies to mitigate climate change

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39   UN, Global Resource Outlook, (2019), p 76.
40   Parliamentary Office for Science and Technology, Access to critical materials, (13 September 2019).
41   European Commission, Study on the EU's list of Critical Raw Materials, (2020).
42   Royal Society of Chemistry, (ELE0047).
43   Royal Society of Chemistry, (EWa0033).

and reduce global emissions is expected to increase demand for certain raw materials by a factor of 20 by 2030.[44] However recovery rates for many raw materials are low, often at below one per cent.[45]

Figure 2: Countries accounting for largest share of global supply of CRMs
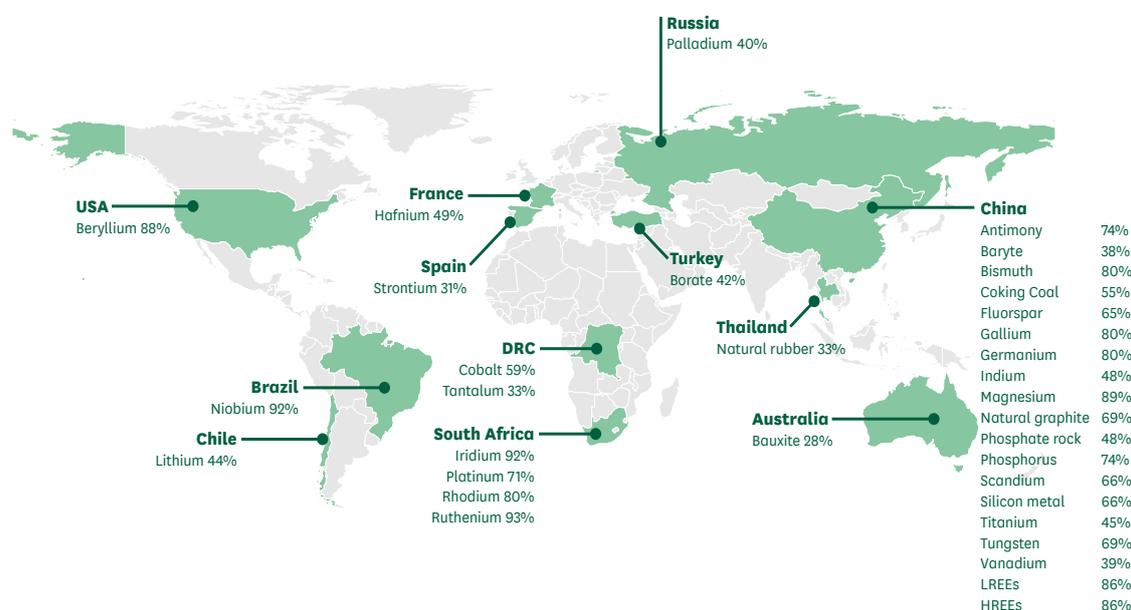
Source: European Commission, Study on the EU's list of Critical Raw Materials, 2020

15.   Due to their importance, we are seeing a global race to secure the supply of these rare materials, particularly as these materials often come only from very few countries. Germany and China have been competing for lithium rights in Bolivia,[46] Tesla has turned to mining its own lithium in Nevada,[47] there are trade wars between South Korea and Japan based on critical resources,[48] and the USA and China are competing for rare earth metals.[49] Since BP has declared that 'peak' oil consumption, if not here already, is around the corner, the struggles for materials needed in low-carbon technologies are only going to increase.[50] [51]

16.   The gold, tin, tungsten and tantalum used in electronics are considered "conflict minerals" because their mining and sale have been linked with funding killings, violence, rape, and other human rights abuses in the Democratic Republic of Congo (DRC) and other conflict zones.[52] Cobalt, another mineral used in lithium-ion batteries, is also

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44   Royal Society of Chemistry, (ELE0047).

45   World Economic Forum, A New Circular Vision for Electronics: Time for a Global Reboot (January 2019), p 11.

46   Reuters, Germany to urge next Bolivian leaders to revive lithium deal, (23 January 2020).

47   Forbes, Does Tesla's Lithium Announcement Mean All Battery Makers Are Set To Become Miners, (1 October 2020), [accessed 17 October 2020].

48   East Asia Forum, Semiconductor tech war underlies the Japan-South Korea trade dispute, (24 September 2019), [accessed 17 October 2020].

49   Financial Times, US-China: Washington revives plans for its rare earths industry, (14 September 2020), [accessed 17 October 2020].

50   Carbon Brief, Analysis: World has already passed 'peak oil', BP figures reveal, 15 September 2020, [accessed 17 October 2020].

51   New Statesman, How the dawning era of declining fossil fuel consumption will reshape geopolitics, (23 September 2020) [accessed 17 October 2020].

52   Which.co.uk, The Hidden Cost of your smartphone, (26 March 2019), [accessed 10 October 2020].

considered a conflict material due to its rising value. The DRC, one of the world's poorest countries, is the source of two-thirds of the world's cobalt, with the US Department of Labor highlighting high levels of child labour in its extraction.[53]

A tsunami of E-waste

17.   The UN has warned that we are facing a "tsunami of E-waste rolling across the world" because of growing consumption, short product lifespans, difficulty of repair and inadequate recycling.[54] Waste Electrical and Electronic Equipment (WEEE) is thought to be both the fastest growing waste stream globally and the fastest growing waste stream in Europe, where it is increasing at a rate of three to five per cent per year.[55]

18.   According to the Global E-waste Monitor published by the UN on 2 July 2020, the UK generated the second highest amount of E-waste per person in the world, after Norway, at 23.9kg of E-waste. This far exceeds the world average of 7.3 kg per capita and the European average (already the world's highest continent) of 16.2kg.[56] A report by the consultancy firm Eunomia for the Department for Environment, Food and Rural Affairs (DEFRA), highlights that, when comparing like-for-like, the UK has significantly lower collection and recycling rates for E-waste than other countries in the European region.[57]

19.   When we are not hoarding old electronics at home in cupboards, we often put them into our black bin bags where they get sent to landfill or incineration.[58] Old electronics often get sent overseas where they are dumped or treated in inferior conditions, leaching the toxic chemicals that they contain causing further environmental damage. In fact, the UK is one of the worst offenders for exporting waste electronics.[59] This wastage is all the more concerning because of the significant impact extracting new materials and creating new electrical and electronic items has on the environment.

Materials in E-waste

20.   E-waste has a potential value of $62.5 billion annually.[60] The economic value comes from precious metals used in products such as gold, silver, copper, platinum and other critical raw materials such as tungsten and indium. According to the World Economic Forum the average smartphone contains electrical components valued at $100.49 at the point of retail. They also estimate that recycling these raw materials could be worth up to $11.5 billion. Additionally, plastics, glass and ceramics could be used as secondary raw materials.[61] There could be significant environmental and economic benefit from keeping these materials in use and not wasting them. The World Economic Forum said that mining discarded electronics for gold uses 80 per cent less emissions than compared with mining it from the ground. Further, recycled metals are two to ten times more energy efficient than

53   U.S. Department of Labor, 2018 list of Goods Produced by Child Labor or Forced Labor, (September 2018).

54   UN, UN environment chief warns of 'tsunami' of e-waste at conference on chemical treaties, (05 May 2015), [accessed 10 September 2020].

55   City University (ELE0036).

56   Forti, Balde et al., The Global E-waste Monitor 2020, (June 2020), p 3.

57   See "Collection Targets" below.

58   The University of Leeds research suggests that 18% of WEEE goes, incorrectly, for incineration before any disassembly takes place. This doesn't take into account components of WEEE that are incinerated after disassembly or shredding. (Resource Recovery from Waste, University of Leeds, (ELE0046).

59   Basel Action Network, Holes in the Circular Economy; WEEE Leakage from Europe, (February 2019).

60   World Economic Forum, A New Circular Vision for Electronics: Time for a Global Reboot, (January 2019), p 15.

61   World Economic Forum, A New Circular Vision for Electronics: Time for a Global Reboot, (January 2019), p 15.

their virgin equivalents to extract.[62] There is often far more valuable material per tonne of E-waste then the equivalent weight of mined ore—particularly for gold and copper. As a result, one study found that mining from ore could, with the right processes in place, be 13 times more expensive than recovering metals from E-waste.[63]

21.   However, after passing through current waste management processes, the secondary raw materials retain a fraction of the value of their components or used appliances for resale.[64] Even when E-waste is disposed of correctly at household waste recycling centres, and not exported,[65] there are concerns about the way it is recycled. The Green Alliance told us:

> At the end of life, most [electronic waste] is treated through low quality recycling that relies on shredding, leading to the loss of highly engineered parts and valuable critical raw materials.[66]

22. Shredding also releases chemicals and contaminants including polychlorinated biphenyls and polychlorinated dibenzodioxins.[67] This 'shredder mix', considered hazardous, is exported to Belgium and Sweden amongst other countries where it is put through high temperatures, destroying most of the mix at a high energy cost, to extract only small quantities of metals.[68] There is very little materials recovery infrastructure in the UK and no major government funding source for recycling infrastructure that is not incineration or energy from waste.[69] [70]

Exportation and toxic chemicals

23.   Many of the chemicals contained within electronic products are toxic including arsenic, beryllium, cadmium, lead and mercury.[71] Flame retardants are also found in waste electronics,[72] though some companies are reducing the amounts they add to newer electronics. These can persist in the environment and in the dust in our homes and can be particularly harmful.[73] [74] This means electronic products need high-quality treatment and recycling infrastructure when they become waste. The Basel Convention, to which the UK is a signatory, has made it illegal to export electronic waste to address the risks of waste being transferred to countries with inadequate infrastructure to safely process E-waste. However, an investigation in 2019 by Basel Action Network (BAN) found that the UK is the worst offender in Europe for illegal E-waste exports to developing countries, with

62   World Economic Forum, A New Circular Vision for Electronics: Time for a Global Reboot, (January 2019), p 11.

63   Zeng et al. Urban Mining of E-Waste is Becoming More Cost-Effective Than Virgin Mining, (4 April 2018)

64   Baldé, C.P. et al., The Global E-waste Monitor 2017: Quantities, Flows and Resources, (2017), p 7.

65   Q74.

66   Green Alliance, (EWa0006).

67   The Institute for Materials, Minerals and Mining (IOM3), (EWa0016).

68   AATF Forum, (EWa0030).

69   Green Alliance, (EWa0006).

70   Resource Recovery from Waste, University of Leeds, Written evidence to the EAC, (ELE0046).

71   Environmental Services Association, (ELE0026).

72   Q78.

73   Sjödin A, et al. Concentration of polybrominated diphenyl ethers (PBDEs) in household dust from various countries, (2008).

74   Kademoglou, K. et al. Legacy and alternative flame retardants in Norwegian and UK indoor environment: Implications of human exposure via dust ingestion. (2017).

most of its waste going to Africa.[75] This re-iterated the findings of the UN study "Person in a Port" that found the UK to be the second worst offender world-wide for sending used and waste electronics to Nigeria.[76]

24. Green Alliance and the Joint Trade Association, the UK association of Electronics manufacturers, told us that workers in countries where E-waste is exported risk physical injury by manually breaking up electronics without protective equipment and through the burning of plastic to access valuable metals like copper, which exposes people to heavy metals with neurotoxic effects and development problems.[77] [78] The Basel Action Network highlighted the risks of allowing the export of E-waste for the communities living near to dumps where it ends up:

> A recent study we did with IPEN, the group working on POPs [persistent organic pollutants], found some of the highest levels of brominated dioxins ever recorded in the world at the Agbogbloshie dumpsite in Ghana, where so much of the European electronic waste ends up and where it is burned. They tested the chicken eggs in the slum there—where the workers are living among these chickens, eating the meat and the eggs—and every day they are poisoning themselves, not only from what they breathe but from what they eat as well.[79]

75   Puckett et al., Basel Action Network, Holes in the Circular Economy: WEEE Leakage from Europe, (2019).

76   Odeyingbo, Olusegun, Nnorom, Innocent and Deubzer, Otmar, Person in the Port Project: Assessing Import of Used Electrical and Electronic Equipment into Nigeria. UNU-ViE SCYCLE and BCCC Africa., (2017), p 35.

77   Joint Trade Association, (ELE0045).

78   Green Alliance, (ELE0023).

79   Q72.

1   Collecting E-waste

25. In this chapter we will examine how the collection, treatment and re-use and recycling of E-waste can be improved as part of the move to a circular economy. At present a significant amount of E-waste goes uncollected or is disposed of incorrectly. Research by Eunomia suggests that the UK is one of the worst in the European Economic Area for official E-waste collection.[80] UK households are throwing 155,000 tonnes of waste electricals in general household rubbish bins each year—according to research recently carried out for Material Focus. A further 190,000 tonnes of electrical or electronic equipment is languishing in people's drawers and cupboards. The cables hoarded in UK homes (140 million) could circle the earth more than five times. And 2.8 million tonnes of CO_2 emissions could be saved, equivalent to taking 1.3 million cars off the road, if all our old small electricals that are being thrown away or hoarded were returned to the economy.[81]

26. 'Producers' are considered organisations that either manufacture and sell; resell; import or supply Electrical and Electronic Equipment (EEE) in the UK. They are also responsible for Waste Electrical and Electronic Equipment (WEEE) under the Waste Electric and Electronic Equipment Regulations 2013 which became law in January 2014 and which were updated in 2018.[82] To comply, producers placing more than five tonnes of EEE on the market must join a producer compliance scheme.[83] Producer Compliance Schemes (PCS) are separate companies that are tasked with facilitating the collection and recycling of E-waste. Although the number of schemes fluctuates there are currently around 28 in the UK.[84] These schemes are set E-waste collection targets linked to the amount of electronics that the producers they represent have placed on the UK market. To meet those targets, they purchase evidence of E-waste collection and treatment from Authorised Approved Treatment Centres (AATFs) which are Environment Agency approved E-waste treatment and recycling centres. PCSs arrange the pick-up and transportation of E-waste from local authority household waste recycling centres (HWRC) for treatment. When the E-waste collection targets are missed, they pay a compliance fee (see below).

80   Eunomia report for DEFRA, Electrical and Electronic Equipment, (6 January 2020) p 114.

81   Material Focus press release, UK residents could save the economy over £370 million by recycling their old electricals, (24 June 2020), [accessed 10 November 2020].

82   HSE, Waste Electrical and Electronic Equipment recycling (WEEE) [accessed 22 October 2020].

83   HM Government, Guidance - Regulations: waste electrical and electronic equipment (WEEE) [accessed 22 October 2020].

84   Mr Adrian Hawkes, (EWa0013)

Figure 3: Ideal Waste Electrical and Electronic Equipment (WEEE) flow in the UK
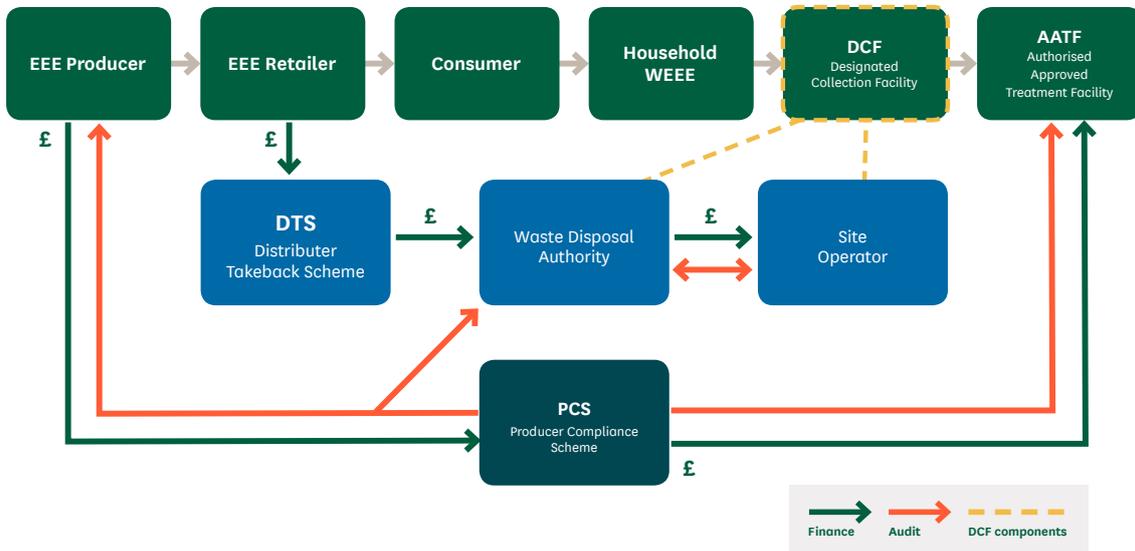
Figure 4: Sub-optimal Waste Electrical and Electronic Equipment (WEEE) flow
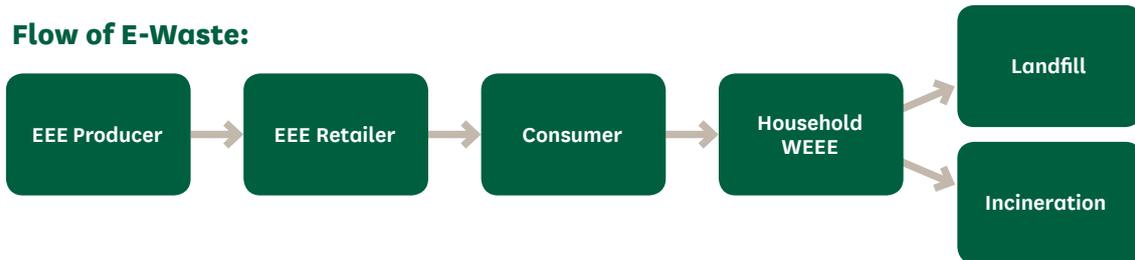
Collection targets

27.   There are two separate collection targets in the UK, which can lead to some confusion over whether targets are being achieved or not.[85] There is a nationwide collection target which, before 2020, was set at 65% of new products put onto the market over the last three years. The 65% target was set by the European Union and rose from 45% in 2018.[86] There is also a target for the official collection of E-waste to be funded by producers via producer compliance schemes (which we will return to below). In relation to the former target, DEFRA Minister Rebecca Pow MP told us that:

> the UK has done pretty well on its targets. It was 45% of the average tonnage of equipment on the market in the previous four years. That was what the target was, so it was a weight-based target. The UK actually achieved 50% in 2017. That was up 14% from 2014 and in 2018 it will be 54% … Overall, our collection rates have gone up year by year on the WEEE and we are doing pretty well, which is not to say there is not still a great deal more to do.[87]

85   Qq199–200.

86   letsrecycle.com, Defra slashes WEEE collection targets, (10 March 2020), [accessed 10 October 2020].

87   Qq199–200.

28.   DEFRA told us that in 2018 the collection rate relating to the first target was 816,397 tonnes or 54% of equipment placed on the UK market taken as an average over the previous three years. Of this 253,726 tonnes was a 'substantiated' estimate of waste electronics that were collected, processed and recycled outside of the official electronic waste system, for example by scrap metal recyclers due to the economic value of the parts.[88] Much of the waste collected outside the system calculated by these 'substantiated estimates' is processed by operators that are not Approved Authorised Treatment Facilities (AATF) by the Environment Agency, so they are not required to monitor their treatment in the same way as official E-waste treatment centres.[89]

29.   The use of substantiated estimates has been criticised during this inquiry for being "educated guess work to meet targets".[90] Using them in decision making is not an approach common in European Economic Area (EEA) countries who follow the same EU Directive, yet have similar unofficial recycling routes. This means that although it appears that the UK performs well compared to other EEA countries, it is only because of these substantiated estimates that it is unique in using.[91] Eunomia, a consultancy with specialism in the waste sector, found that without substantiated estimates the actual collection rate in the UK was just 29% in 2018 (the 2019 figures provided by DEFRA are closer to 37%). This means the UK ranks worst amongst the nine EEA countries studied by Eunomia—the next worst E-waste collector was Belgium with 42.6%. Only one EEA country, Sweden, has met the 65% E-waste collection target in recent years.[92]

30.   **The system of collection targets in the UK is unclear. National figures on collection rates include a significant amount of estimation about electronics that have been collected in different ways, with no clear understanding as to whether those collected electronics are treated in a high-quality manner. This leads to a perception that all is well compared to other countries that do not use these estimates.** *We recommend that the Government reconsiders the use of substantiated estimates in the E-waste system when evaluating performance.*

31.   There is also a target for producer compliance schemes (PCS) set by the Secretary of State for each different WEEE category and apportioned to each PCS depending on the market share of the producers they represent. These targets consider historical trends on collection, the average weight of items placed on the market and those discarded. DEFRA states that for 2020 it was decided that, due to the impact of Covid-19, the targets would "be broadly in line with actual household collections in 2019".[93] In 2019 a total of 494,976 tonnes of WEEE was collected through the UK's WEEE collection system, missing the DEFRA set 2019 target of 550,577 tonnes for PCSs to collect.[94] [95] This is the third consecutive year that PCSs have missed their targets.[96]

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88   Department for Environment, Food and Rural Affairs, (EWa0010).

89   Eunomia report for DEFRA, Electrical and Electronic Equipment, (6 January 2020), p 40.

90   Ecosurety, (ELE0036).

91   Eunomia report for DEFRA, Electrical and Electronic Equipment, (6 January 2020), p 114.

92   Eunomia report for Defra, Electrical and Electronic Equipment, (January 2020).
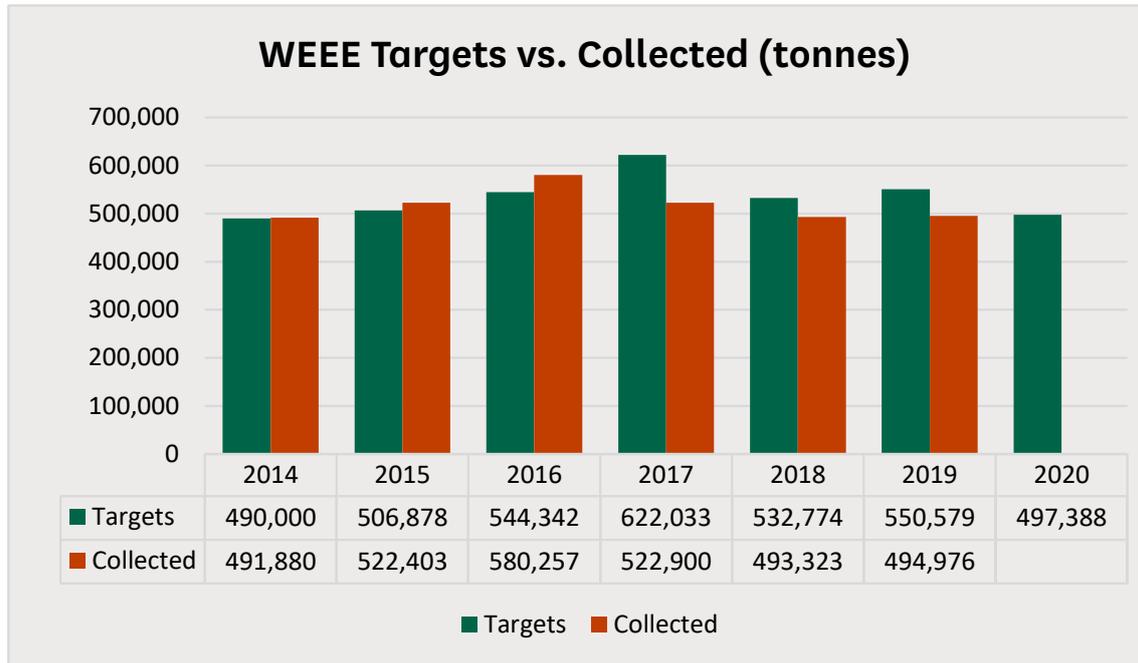
93   Department for Environment, Food and Rural Affairs, (EWa0025).

94   letsrecycle.com, Defra slashes WEEE collection targets, (10 March 2020), [accessed 10 November 2020].

95   Environment Agency, WEEE collected in the UK [accessed March 2020].

96   letsrecycle.com, Defra slashes WEEE collection targets, (10 March 2020), [accessed 10 November 2020].

Figure 5: WEEE Collection Targets for Producer Compliance Schemes compared to actual amounts collected

WEEE Targets vs. Collected (tonnes)

	2014	2015	2016	2017	2018	2019	2020
■ Targets	490,000	506,878	544,342	622,033	532,774	550,579	497,388
■ Collected	491,880	522,403	580,257	522,900	493,323	494,976	

■ Targets ■ Collected

Source: Analysis of Environment Agency figures, WEEE collected in the UK, (September 2020).

32. Throughout our inquiry there has been considerable criticism of the target setting for Producer Compliance Schemes. For example in written evidence to us many organisations, including the Department for Environment, Food and Rural Affairs and the WEEE forum of Producer Compliance Schemes, highlighted doubts over the 'placed on the market' figures because they are self-reported by Producer Compliance Schemes, who are incentivised to under-report the figures to reduce the amount of waste they are required to collect.[97]

33. We have been told that the fact that targets are only set for one year at a time inhibits advanced planning by producers, local authorities or recyclers as to how much E-waste they will be working with.[98] Nor does it allow a level of certainty about future flows of waste which would allow recycling and treatment plants to invest and raise finance.[99] Veolia said that this approach lacked ambition.[100] The WEEE Scheme Forum said the current system "does not currently deliver the necessary level of certainty, in part because the regulations drive compliance one year at a time".[101] Contributors have told us that this drives a short-term outlook that is having a significant impact on all parts of the system. For example, these yearly targets are reflected in the contracts between Producers and Producer Compliance schemes, local authorities, and recycling plants which are also one year long—something we will return to in chapter 3. REPIC told us:

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97   Department for Environment, Food and Rural Affairs, (EWa0010).

98   Q41.

99   E.g Mr Adrian Hawkes (EWa0013), Environcom (EWa0029).

100   Veolia, (ELE0042).

101   WEEE Scheme Forum, (ELE0025).

> Producers can move between PCSs annually, and this restricts the ability of PCSs to offer longer term contracts to treatment facilities that could help them underwrite investments.[102]

34. This short-termism has led contributors to say that this is a "transactional rather than contractual marketplace"[103] and that "it detracts from the willingness of both treatment operators and producer compliance schemes to work together to define and justify suitable projects".[104] The CEO of Environcom, the largest privately-owned WEEE recycling business in the UK told us:

> … it is very difficult to obtain finance or plan a business beyond a 12-month basis, [that is] ludicrous![105]

35. As contributors to this inquiry have stated, long-term, timely guidance and targets with clear milestones can help business adapt, invest and respond correctly by adjusting to clear market signals set by Government.[106] Related higher level targets currently in existence include: no waste to landfill by 2050 and the UK's Net Zero by 2050 target. The current scheme of annual targets does not currently have a clear link to these longer-term goals despite the clear impact the electronics sector and waste industry has on these targets.

36. **Targets for producer compliance schemes have been missed over recent years. For 2020 the target has been brought down to match the actual amount collected in 2019 due to the impact of Covid-19. Targets are set annually, which prevents all parties in the system from investing in long term collection and treatment.**

37. *DEFRA must set long term targets that align with existing commitments like zero waste to landfill. The targets should have milestones at clear intervals, to allow certainty for businesses and investors. They must be set using independently verified data not self-reported data. It must be clear that these are collection targets for both re-use and recycling to prevent recycling being prioritised over keeping valuable EEE in circulation —an area we will return to later in this report.*

Increasing the collection of E-waste

Collection methods

38. Under the UK WEEE regulations there are different methods for the collection of E-waste in the UK which include:

a) Designated Collection Facilities (DCFs) located at Household Waste Recycling Centres (HWRCs) or Civic Amenity (CA) sites operated by Waste Disposal Authorities;

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102   REPIC, (ELE0027).
103   Environcom, (EWa0029).
104   Mr Adrian Hawkes, (EWa0013).
105   Environcom, (ELE0006).
106   WEEE Scheme Forum, (ELE0025), Comply Direct Ltd, (ELE0039), Ecosurety, (ELE0035).

b)   Regulation 50 collections set up by Producer Compliance Schemes (PCSs) which include kerbside and bulky waste collections operated by Local Authority Waste Collection Authorities and often then taken to HWRCs;

c)   Regulation 43 collections which is better known as retailer take-back of E-waste from consumers. This is what is called one-for-one, like-for-like take-back. When somebody buys a new product, retailers offer to take back a similar type of old product for treatment and recycling.[107] [108] [109]

The system in the UK is dominated by the public dropping off electronic waste at DCFs (see figure 6). Changing this dominance will be important to improving E-waste collection (see consumer awareness below).

Figure 6: Collection methods for Electronic Waste in the UK
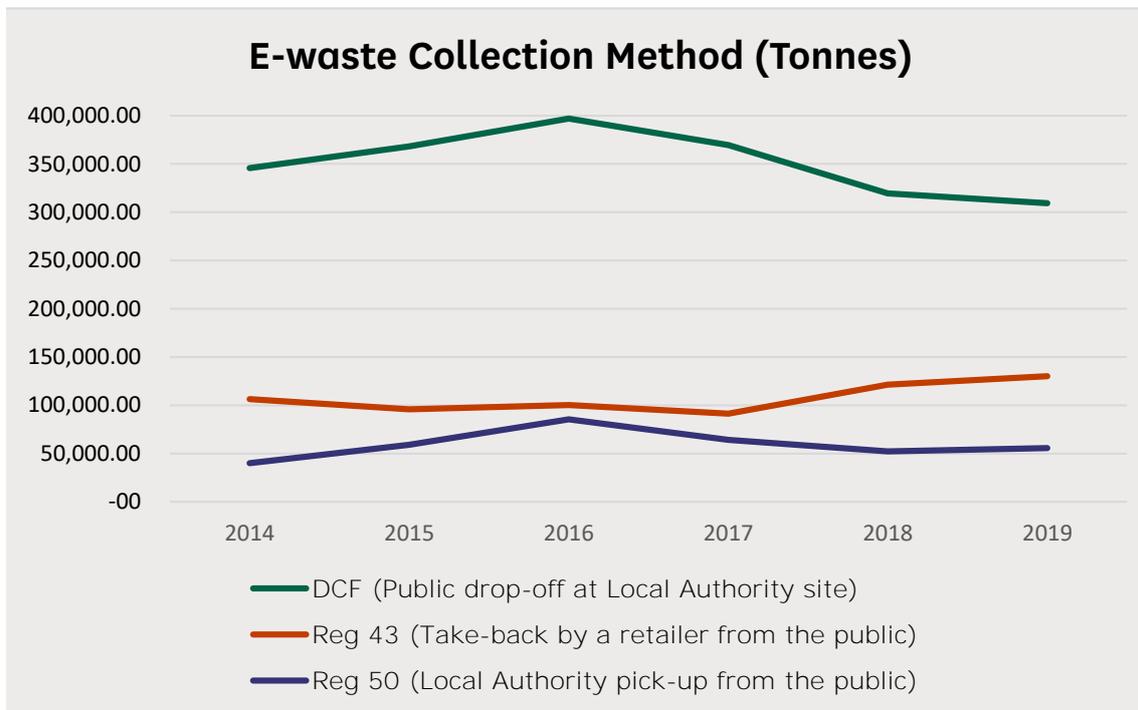
Source: AATF Forum, Written Evidence to the EAC, (EWa0018); Environment Agency, household and non-household Electrical and Electronic Equipment placed on the market by members of Producer Compliance Schemes, (June 2020)

Improving E-waste collection

39.   Several contributing factors were cited as reasons for PCS targets being missed:

- the compliance fee mechanism;

- the producer compliance scheme system;

- online free-riding; and

- poor consumer awareness, difficulty for consumers and low trust.

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107   WRAP, WEEE collection guide, (22 February 2018), [accessed 10 October 2020].

108   AATF Forum, (EWa0018)

109   Q52.

The compliance fee

40.   The compliance fee aspect of the system has come into criticism for allowing Producer Compliance Schemes (PCSs) to ignore expensive-to-recycle or hard-to-collect electronic waste by instead allowing them to pay a lower fee.[110] The system allows PCSs to pay the compliance fee instead of (a) paying for the collection of E-waste or (b) purchasing evidence of collection from other actors in the system who have collected it. There is a market for E-waste collection and treatment evidence notes, so the compliance fee effectively puts a cap on the price of evidence being traded and prevents the collection of any E-waste if it costs more than the compliance fee. If a PCS has collected more than required tonnage at the end of the year, it has no evidence value beyond the compliance fee and the PCS is often left with the costs it has incurred collecting that extra E-waste.[111]

41.   In our second hearing Louise Grantham, representing producer compliance schemes in the WEEE Scheme Forum told us that the cost calculated by this methodology in recent years has been based on the cost of collecting from local authority household waste collection centres and treating WEEE at treatment facilities.[112] Contributors such as Veolia,[113] the National Association of Waste Disposal officers[114] and others told us that the compliance fee system is a significant contributor to the UK's low E-waste collection. Phil Conran, Chairman of the AATF Forum representing Electronic Waste treatment facilities, and a witness in our second hearing stated that:

> The shortfall in waste collected is largely due to the compliance fee mechanism which has enabled producer compliance schemes to meet targets without physically collecting material.[115] [116]

Free riding by online retailers and marketplaces

42.   For much of what is sold on their online marketplaces, Amazon, Ebay and others are considered neither a producer nor a retailer (as often items sold on them are sold by a third party). Only around 50% of Amazon's sales are direct, for the other 50% of sales it acts as a marketplace for third party sellers.[117] It is likely that the contractual arrangement between online marketplaces and the overseas supplier is such that the supplier is responsible for the import of the product and delivery through to the online platform's warehouse. This is despite the fact that "most of the products are available for next day delivery in the UK", even if producers and retailers selling on Amazon in the UK "are mainly based in China".[118] Consequently, while the sale is being made through the online platform, and fulfilled via their warehouse, the legal responsibility still lies with the overseas supplier for both contributing to the electronic waste system and for safety.[119]

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110   For example: see Veolia, (ELE0042).

111   Eunomia report for DEFRA, Electrical and Electronic Equipment, (6 January 2020), p 17.

112   Q42.

113   Veolia, (ELE0042).

114   Q2.

115   Letsrecycle.com, Compliance fee 'largely to blame' for WEEE target miss, (4 March 2020).

116   AATF Forum, (ELE0051).

117   OECD, EXTENDED PRODUCER RESPONSIBILITY (EPR) AND THE IMPACT OF ONLINE SALES – ENVIRONMENT WORKING PAPER N° 142, (2019).

118   Letsrecycle.com, Retailers disappointed by Defra WEEE decision, (3 January 2020), [accessed 19.10.2020].

119   OECD, EXTENDED PRODUCER RESPONSIBILITY (EPR) AND THE IMPACT OF ONLINE SALES – ENVIRONMENT WORKING PAPER N° 142, (2019).

43. For this reason, online marketplaces are currently not liable to contribute to PCSs for products sold by these third-party sellers on their platform, which is becoming an increasingly large proportion of electronics sold in this country. Yet Eunomia points out that online marketplaces host thousands of unregistered sellers, predominantly from overseas.[120] Therefore, other, legitimately registered producers must contribute financially to dealing with E-waste arising from products sold on online marketplaces. Recolight has stated that this gives online marketplaces "significant competitive advantage" that is adding pressure on those small producers and retailers already impacted by Covid-19, who are taking responsibility for safety and waste - risking business failure and job losses.[121] Robert ter Kuile from Amazon explained to us how its compliance structure works:

> We have three basic business models: Amazon retail, in which we are the producer and seller of the products; our fulfilment by Amazon, so FBA, where we provide a service to sellers and retailers; and our merchant fulfilment network, or MFN. Products that are within the FBA or the MFN on the online marketplace are the responsibility of those sellers and producers under the current EPR [Extended Product Responsibility] mechanisms that are in place.[122]

He added that:

> …one of the challenges that we have since we are not a regulatory enforcement body is actually knowing if somebody is registered or not. Some of the items that you will find on our website may have been purchased by a seller and the fee was already paid by whoever they purchased it from and they are simply putting it into the market with the fee already paid. Some of them may be registered; you find a different name on the website versus the registration that has already been placed with the EPR schemes. When we have had non-compliant sellers flagged to us, we take that very seriously and we perform our own research and investigation, notifying the sellers.[123]

44. Online marketplaces also give rise to concerns around product safety. Martyn Allen gave evidence to the inquiry about safety concerns exacerbated during the Covid-19 crisis:[124]

> Time and time again we see things that are deemed to be substandard, or counterfeit, or even on recall, on online marketplaces, and increasingly so in particular during the current situation where until recently all the shops have been closed and almost all of our retail has been done online…The marketplaces see themselves as outside of the product safety regulatory system. They do not consider themselves to be retailers; they are just facilitators of that trade. That needs to end. They need to be brought into that process and be accountable for some of the products that they are allowing to be sold by their third-party sellers.[125]

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120   Eunomia, Electrical and Electronic Equipment, (January 2020).
121   Recolight ltd, (EWa0027).
122   Q173.
123   Q173.
124   Q103, Q112, Q113.
125   Q113.

45. Amazon said that recycling compliance could be simplified across Europe by allowing online marketplaces to report and remit Extended Product Responsibility fees on behalf of sellers.[126] The WEEE Producer Compliance scheme Recolight sent us a submission drawing attention to the scale of WEEE non-compliance through online marketplaces.[127] It argued that the Simplified Compliance Model, proposed by Amazon, could result in the transfer of more market power and control to online marketplaces:

> That is because it would reduce both WEEE costs and WEEE administration for those producers selling exclusively through Amazon. In short, producers would be commercially incentivised to move all their sales to online marketplaces.[128]

46. Recolight said that under any revised EPR scheme (see below) producers should incur the same charges, whether they sell exclusively via an online marketplace, or whether they sell via other channels.[129]

47. Perhaps the most significant steps taken towards addressing the issue of online marketplaces facilitating free-riding of waste and safety obligations is found in France. In 2019 it announced new obligations for online platforms as part of the French Circular Economy Roadmap. These obligations require online multi-seller platforms such as Amazon to ensure that the collection and recycling of WEEE arising from products marketed and sold on such websites is properly financed. The online platforms will, by default, be held responsible if they cannot prove that a business that sells a product on their site makes an 'eco-contribution'. It is not yet clear how effectively this law will be enforced.[130]

48. A different solution highlighted by the WEEE scheme forum of Producer Compliance Schemes (PCSs) is an approach that DEFRA consulted on in relation to packaging in March 2019, but has not yet followed up. This approach stated that online marketplaces should take legal responsibility of the packaging of products for which they facilitate the import into the UK by creating a new class of producer. This could be applied to electronics. The WEEE Scheme forum said that it would be less burdensome and more achievable for regulators to monitor online marketplaces than overseas producers. It would also close what producer compliance schemes consider a current loophole, which allows companies based overseas to register as a small producer, regardless of the tonnage of EEE they supply and thus contribute significantly less to the waste producers by their products.[131]

49. Recolight stated that there is some urgency here because Covid-19 has accelerated the competitive advantage of online market-places and that:

> If the current timetable for the WEEE regulations to be updated is maintained, the situation will not improve until 2024. That may be too late for many producers.[132]

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126   Amazon, EPR policy brief, (2019).

127   Recolight Ltd, (EWa0027).

128   Recolight Ltd, (EWa0027).

129   Recolight Ltd, (EWa0027).

130   Resource, FRANCE TO FORCE ONLINE RETAILERS TO TACKLE COMPLIANCE FREE-RIDING, (27 Jan 2019), [accessed 09 July 2020].

131   WEEE Scheme Forum (WSF), (ELE0025).

132   Recolight ltd, (EWa0027),

Consumer awareness

50. Consumer awareness was cited as a key factor limiting the collection of small electronic waste—such as toasters or hairdryers. Research indicates that large quantities of these small items are being disposed of incorrectly in household bins.[133] A 2019 report by the Material Change Fund found that a significant proportion of householders were unaware of how they could recycle electrical items.[134] Eunomia's report stated that high performing countries place significant emphasis on the role of communication campaigns and activities to support WEEE collection efforts. For example, improvements in small WEEE collection across France have been largely attributed to targeted communication campaign efforts and investment—with small WEEE collection increasing 18.4% between 2013 and 2014, and by 23.7% between 2010 and 2014. French PCSs must allocate at least 0.3% of their income to national information campaigns.[135] Viridor has stated that public understanding of the issues with electronic waste are poor due to a lack of consistency of collection throughout the country. It stated that:

> As with other parts of the recycling system, the lack of a national consistent system of household collections make communicating challenging. Recycling services, on the whole, have seen cuts, particularly in communications, but also with HWRCs opening for fewer hours.[136]

51. The lack of consistency is exacerbated by the inconvenience citizens face if they try to dispose of E-waste in the right way. Though the UK collects most of its electronic waste at Household Waste Recycling Centres (HWRCs)[137] it is also the European country with the least HWRCs per inhabitant and one of lowest per 1000 km². Eunomia report that while the UK has at least one HWRC in most sizeable towns these are mostly out of town and only accessible by car.[138] Research found that drop-off of waste by residents at local authority collection centres (including HWRCs and Civic Amenity sites) is the E-waste collection method that causes the highest carbon emissions and has the highest operation costs.[139]

Retailer take-back

52. Ireland has very similar numbers of HWRCs by population and area to the UK. However, in 2015 Ireland deemed that this low level of HWRC infrastructure was not sufficient to meet its targets and so has instead focused on retailer take-back for electronics. It is now the highest collector of waste via retailers with approximately 56% of the E-waste collected taken via this route.[140] [141] DEFRA has announced that after 31st December 2020 large retailers will be obliged to offer to take back an item when a consumer buys a new

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133   LARAC, (ELE0019), pp 3–4.

134   Scott Butler, (EWa0019).

135   Eunomia report for DEFRA, Electrical and Electronic Equipment, (6 January 2020).

136   Viridor, (ELE0018), p 3.

137   Wrap, Household Waste Recycling Centre (HWRC) Guide, (October 2012).

138   Eunomia report for Defra, Electrical and Electronic Equipment: Ingredients for Successful Extended Producer Responsibility, (January 2020), p 27.

139   Nowakowski et al., Towards sustainable WEEE collection and transportation methods in circular economy - Comparative study for rural and urban settlements, Resources, Conservation and Recycling (2018), 135, pp. 93–107.

140   Eunomia report for Defra, Electrical and Electronic Equipment: Ingredients for Successful Extended Producer Responsibility, (January 2020), p 36.

141   Dixons Carphone Plc, (ELE0010).

similar item in store. It will apply to all retailers and wholesalers with annual sales of electrical items above £100,000 and so will apply to almost all retailers with a physical premise.[142] [143] However online marketplaces, such as Amazon, will not have a similar requirement to collect directly from consumers for at least another year (until 31 December 2021).[144] Even after December 2021 it is not clear whether online retailers will have to collect E-waste on delivery as they may instead allow customers to drop off E-waste at their warehouses and sites—which are often very inaccessible. This requirement on bricks and mortar establishments and not online retailers could further entrench the competitive advantage of online retailers if their exemption is extended beyond one year.[145]

53. Retailer take-back can be very convenient for people, especially when they order something online and their old product is collected in return. This is a model used by AO.com.[146] DixonsCarphone go a step further and allow anybody to hand-over waste electronics to them regardless of purchase at their stores and they will also collect any small mixed E-waste on delivery of larger products to households. The latter initiative started at the end of 2018 and has driven DixonsCarphone's small mixed WEEE collection up by 200% year on year. As DixonsCarphone often manufacture or import electronics this also helps them to meet their producer obligations. Amazon have expressed safety concerns about this method. However, to overcome this DixonsCarphone trains staff and allows them to reject waste if it looks unsafe.[147]

54. The London Waste and Recycling Board supported the claim that items collected via retailer take back schemes have a much higher rate of reuse than other methods.[148] [149] Research shows that this is because consumers have more trust in high street retailer brands to handle their data securely.[150] TechUK, which represents the UK's technology industry, also told us that they support a move towards more retailer take-back.[151] Universal retailer take-back could improve consistency and allow easier communication with consumers and the public about what to do with E-waste.[152]

Mandatory kerbside collection

55. Kerbside collection of E-waste around the country could also help improve the consistency of collection and make communications with the public easier.[153] The Environment Bill requires six recyclable waste streams that must be separately collected from all households and businesses for recycling or composting, yet electronic waste is not one of them.[154] Including E-waste whilst ensuring collection can be for re-use, could ensure a consistent system which is easy to communicate to households. Minister Pow indicated that despite E-waste not being named specifically, the Bill does give powers to

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142   Letsrecycle.com, Retailers disappointed by Defra WEEE decision, (3 January 2020).

143   Resource.co, Large Retailers will have to offer in-store WEEE take-back from 2021, (7 January 2020).

144   Department for Environment, Food and Rural Affairs, (EWa0010).

145   Q53

146   AO.com, (ELE0021), p 1.

147   Dixons Carphone Plc, (ELE0010).

148   Dixons Carphone Plc, (ELE0010).

149   London Waste and Recycling Board, (ELE0016).

150   LIFE 2014 CRM Recovery project, CRM RECOVERY, (2019).

151   Q96.

152   Viridor, (ELE0018), p 3.

153   Viridor, (ELE0018), p 3.

154   Environment Bill, Clause 54 [Bill 009 (2019–21)].

mandate kerbside collection through statutory instruments.[155] The National Association of Waste Disposal Officers (NAWDO)[156] representing local authorities suggested that E-waste should be included in this core set of materials to be collected at kerbside. This is because it is the most cost-effective solution, especially for smaller electrical items like hairdryers and toasters that may otherwise end up in the residual waste stream.[157] [158]

56.   However, NAWDO were clear, along with a similar body, the Local Authority Recycling Advisory Committee (LARAC), that in line with the current system of producer responsibility for waste, the full cost of this should be met by producers, not by local authorities themselves. They also emphasised that the solution was to have a mixture of collection methods, not just one.[159]

57.   A review of sustainable WEEE collection methods—which considered the convenience for residents as well as the collection costs and vehicles emissions—found kerbside collection of WEEE, at the same time as other waste pick-up, reduced emission levels associated with collection. The study showed that the cost of pick up decreased over time; and the potential income from the sale of WEEE components would additionally offset its cost.[160]

Designing a new Extended Producer Responsibility scheme

58.   The current UK approach to dealing with E-waste is classed as a Producer Responsibility (PR) scheme.[161] Extended Producer Responsibility (EPR) is a policy approach that can be used to 'price in externalities'[162] (i.e. the side-effects that businesses and their products have on the wider world—in this case those outlined in the introduction) and further shift the end-of-life cost burden away from taxpayers to producers and by extension direct consumers.[163] In December 2018, the Government published *Our Waste, Our Resources: A Strategy for England*—often simply referred to as the Resources and Waste Strategy.[164] The strategy promised a consultation, originally due by the end of 2020, on the reform of WEEE regulations including on the potential for a new EPR scheme.[165]

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155   Q218.
156   NAWDO is the primary network for senior waste managers at local authorities with statutory responsibility for waste disposal. They represent over 80% of local authorities in the UK.
157   NAWDO, (ELE0009), p 2.
158   Q31.
159   Q31.
160   Nowakowski et al., Towards sustainable WEEE collection and transportation methods in circular economy - Comparative study for rural and urban settlements, Resources, Conservation and Recycling (2018), 135, pp. 93–107.
161   Department for Environment, Food and Rural Affairs, Our Waste, Our Resources: A Strategy for England, (December 2018).
162   Q69.
163   Eunomia Report for DEFRA, Electrical and Electronic Equipment, (January 2020).
164   Department for Environment, Food and Rural Affairs, Our Waste, Our Resources: A Strategy for England, (December 2018).
165   Department for Environment, Food and Rural Affairs, Our Waste, Our Resources: A Strategy for England, (December 2018).

> **Extended Producer Responsibility (EPR)** policies place some responsibility for a product's end-of-life environmental impacts on the original producer and seller of that product. In theory EPR schemes are supposed to make producers meet the environmental costs of their products and also provide incentives for them to make design changes to products that would reduce waste management costs. Those changes could include improving product recyclability and reusability, reducing material usage and downsizing products, and engaging in a host of other so called 'design for environment' (DfE) activities.[166]

59. The Environment Bill has begun to implement the Resources and Waste Strategy. It has made an EPR for packaging the first priority, but the Bill also gives Ministers the power to establish new EPRs for other waste streams in the future and set financial incentives (or reduced 'modulated' fees) for producers as part of these schemes.[167] There are some key principles involved in EPR:

- Producers bear the cost of managing their products at the end of their life, rather than taxpayers or civil society (Local Authorities, charities, etc).

- Schemes are designed and implemented to make it easy for consumers to play their part and ensure more waste is collected for reuse or recycling.

- A scale of fees is used to incentivise producers to design products with circularity in mind. For example, producers may pay a lower fee for products which are easier to reuse, repair or recycle.

60. At our first hearing, Professor Tim Cooper from Nottingham Trent University, explained that the both EU and DEFRA are considering introducing variable EPR fees (known as modulated fees) in order to encourage eco-design:

> There's been a lot of criticism over the past decade or so that the secondary aim of the [EU's original waste] legislation […] to encourage the redesign of products, has not actually occurred significantly as a result of the directive. So, at present, the Commission is looking at, and DEFRA for that matter, are looking at ways to adapt legislation through what are called modulated fees. Broadly speaking, the aim of those modulated fees would be to reward producers, manufactures and importers, who produce goods that are more recyclable, more durable and more repairable and the detail of that of course is highly complex and still subject to discussion.[168]

61. The waste policy consultancy Eunomia says that Extended Producer Responsibility (EPR) has the potential to be a key mechanism to support the move towards a circular economy, but it cautions that an EPR scheme must be designed carefully with the right incentives for the relevant market participants.[169] We heard during the inquiry that EPR schemes introduced in the past have failed to live up to the promised potential of

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166   OECD, EPR Policies and Product Design: Economic Theory and Selected Case Studies, (February 2006).

167   Department for Environment, Food and Rural Affairs, 10 March 2020: Waste and resource efficiency factsheet (part 3), [accessed 16 March 2020].

168   Q15.

169   Eunomia Report for DEFRA, Electrical and Electronic Equipment, (January 2020).

this policy. The Basel Action Network's Jim Puckett warned that the way EPRs have been implemented had failed to move beyond promoting recycling to incentivise eco-design and reduce waste:

> EPR is one way that people have thought of to try to internalise costs and to keep things out of the landfill, but again it is so focused on recycling, sadly. When it was originally designed it was meant to drive green design but, unfortunately, with the way it has been implemented, that has not taken place. We can modify EPR—we can tweak it so that it does more for green design and we can make it more individualised to give a competitive advantage to companies that pursue green design—but […] we are not going to be able to recycle our way out of our waste crisis.[170]

62. Manufacturers were sceptical about the ability of EPR and modulated fees to incentivise sustainability in product design. Kevin Considine from Samsung maintained that design regulations were the most appropriate mechanism:

> Eco-design provides the right platform to influence product design, and the European eco-design requirements are setting design standards for the rest of the globe. I am a bit concerned about looking at extending producer responsibility as the mechanism to try to influence product design, because I simply think it won't work.[171]

63. Andrew Mullen from Beko said:

> Given we are all global and European manufacturers, eco-design within the European regulatory framework is really important. I think using EPR to drive eco-design, particularly given how recycling currently works in the UK, is going to present a challenge.[172]

International harmonisation

64. Stakeholders stressed the importance of incentives being harmonised internationally given the global nature of the electronics industry. Amazon said that the fact that implementation of EU product recycling directives is not harmonised across product categories and countries, creates:

> …disproportionate complexity especially for small and medium sized sellers. Currently, a seller shipping a single item into all EU countries would be required to register, report, and pay registration fees in nearly all 28 jurisdictions, under more than 60 different regimes for electronics, batteries and packaging.[173]

65. The industry body Tech UK said that the introduction of modulated fees for all products covered by producer responsibility legislation in the EU "could provide additional

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170   Q69.
171   Q126.
172   Q127.
173   Amazon policy brief, Simplifying recycling compliance for small and medium ecommerce companies, (2019).

design incentives if introduced intelligently."[174] It believes that "a harmonised approach with Europe would strengthen the fiscal design signal sent to global manufacturers of electronics."[175] Susanne Baker told us that:

> If modulated fees are going to have any impact on the design of electronics they have to be harmonised internationally. We would recommend DEFRA puts off making a decision until the European Commission publishes its guidelines for member states in December. Equally, we are also very supportive of continuing to align with Europe on eco-design standards.[176]

66. Louise Grantham from the WEEE Scheme Forum told us:

> … although obviously we are outside the EU, one thing for producers that is quite important is that they do manufacture for global markets, so a system that required them to take different approaches towards product design, durability and so on that was different to perhaps EU countries would cause issues. I think that is quite an important consideration to bear in mind when we are designing a new EPR system.[177]

67. DEFRA told us that its consultations on producer responsibility reform will be published in stages throughout 2021. It will first publish a consultation on extended producer responsibility for packaging, followed by a consultation on reviewing the WEEE Regulations later in the year.[178]

68. **Our inquiry has heard that making official collection routes for the public easy and consistent is key to ensuring products are correctly re-used, repaired and recycled. Retailer take-back is an effective method, so we welcome the Government requirement for large physical retailers to offer this service. However, this further tilts an unequal playing fields away from physical stores towards online retailers and marketplaces who do not have this obligation.** *Our high streets are under severe pressure and current regulations, coming into force from 2021, could unfairly entrench the competitive advantage of online retailers and marketplaces like Amazon. As a matter of urgency and at the latest by the end of 2021 online retailers and marketplaces must have an equal obligation to collect electronic waste from customers.*

69. *To prevent a potential loophole with take-back being offered only at remote, inconvenient warehouses, the regulations should follow the exemplary innovation shown by AO.com and DixonsCarphone. Online retailers and marketplaces for electrical and electronic equipment must arrange and pay for the collection of like-for-like electronics from customer's homes on delivery of new electronics. They must also offer to collect any electronic waste defined as "small" at the same time.*

70. **A mixture of collection types is needed to tackle the significant E-waste collection challenges. As well as Retailer Take-back, kerbside collection has been shown to be very effective and easy for the public to hand-over their electronics cost-effectively and**

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174   Tech UK, (ELE0044).
175   Tech UK, (ELE0044).
176   Q125.
177   Q63.
178   Department for Environment, Food and Rural Affairs, (EWa0025).

with limited damage to the environment. *The Government must make this mandatory for local authorities, with the cost paid for by producers and those smaller retailers or online marketplaces still exempt from collecting E-waste directly from the public.*

71.   **An Extended Producer Responsibility scheme could be used to incentivise the very best practice in circular low-carbon product design. However, care must be taken to put circular economy principles at the heart of the policy and efforts made to harmonise it with wider efforts internationally.** *In any future producer responsibility system online marketplaces like Amazon should be responsible for ensuring that all EEE that is sold on their platforms is fully compliant with the law. Furthermore, producers should be required to pay exactly the same fees and follow the same rules selling online as they do offline. The Government should explain how it will address all of these concerns when it publishes its consultation on new E-waste regulations in 2021.*

72.   In the following sections we will be making recommendations about areas that should be included in an EPR system to incentivise good practice.

2   Preventing E-waste and Using Resources Better

73.   The Circular Economy and Waste Hierarchy are clear that preventing waste is the first, most important step to reducing the environmental impact of products. The current system, often called a linear economy, is characterised by a high throughput of new products and waste, which demands significant resources. In August 2020, DEFRA published its monitoring plans for the Resources and Waste strategy and the targets supporting the Environment Bill. This contained a commitment to double resource productivity by 2050 measured by GDP over raw material consumption. Theoretically this means that GDP should increase at double the rate of material use.[179] The monitoring plans also included measuring the per capita resource consumption in this country which is currently at 14.7 tonnes of material per year.[180] Various studies have suggested that a sustainable level of resource consumption could be between six and eight tonnes per person per year.[181] [182] Other than improving resource consumption as a proportion of GDP, DEFRA currently has no targets to reduce the raw material consumption per person in this country to sustainable levels.

74.   Researchers have found there to be a direct link between GDP purchasing power of a country and the amount of E-waste that a country generates.[183] In evidence to this inquiry the organisation Resource Recovery from Waste were clear that:

> In order to realise the aspirations on environmental net-gains set out in the 25 Year Environment Plan and to be enforced via the forthcoming Environment Bill, it is of critical importance that the Government sets ambitious targets for a reduction of per capita resource consumption and/ or increased resource productivity (based on material stocks and flows in the UK and not on GDP) via electric and electronic goods as well as all other goods in the UK.[184]

75.   We have heard that better resource efficiency, using resources more effectively, and generally reducing our resource use are important parts of a circular economy and could save considerable carbon emissions, reduce the impact of extraction and manufacturing on biodiversity, water-use and quality and health hazards—all ambitions within the Government strategies.[185] A target designed to reduce resource and material consumption would underpin the circular economy by both driving action to reduce resource use in the design and manufacture phase (putting less in) and using resources better (getting

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179   Department for Environment, Food and Rural Affairs, Resources and Waste Strategy – Evaluation Plan, (August 2020), p 20. – footnote 17.

180   Department for Environment, Food and Rural Affairs, Resources and Waste Strategy – Monitoring progress, (August 2020), p 18.

181   International Resource Panel, Managing and Conserving the Natural Resource Base for sustained economic and social development, (February 2014), p 9.

182   University of Leeds, A Good life for all within planetary boundaries, Supplementary information, (2017), p 8.

183   Kusch, Hills, The Link between e-Waste and GDP—New Insights from Data from the Pan-European Region, (2017).

184   Resource Recovery from Waste, (ELE0046).

185   Green Alliance, Less in, more out: using resource efficiency to cut carbon and benefit the economy, (2018).

more out) and, if met, could help the UK achieve some of its climate reduction ambitions.[186] Resource efficiency and a reduction in product consumption are all recommended by the UK Climate Change Committee.[187]

76. **It is welcome that Government plans to monitor progress against the Resource and Waste Strategy, including both a measure of per capita material and resource consumption and measures of resource productivity with the goal being to double resource productivity by 2050.** *As a complement to monitoring per capita material consumption, there must also be a target in place to reduce consumption to a sustainable level in line with the research highlighted in this report. Due to the increasing number of electronics and the materials contained within them there should be a sub-target for per capita resource-use in electronics that is in line with this wider target.*

77. Libby Peake from Green Alliance told us that the existing mandatory eco-design product standards have focused on energy use. These have delivered massive carbon savings that according to BEIS' estimates for 2020 have saved the average household in the UK £100 on their energy bills. At the EU level these energy efficiency standards have saved the equivalent of five per cent of EU electricity consumption and €20 billion in total on household and business energy bills.[188] The success of energy efficiency standards could be replicated through minimum eco-design standards for resource efficiency. Ways of improving our efficient use of resources include more durable products that can be more easily repaired and more re-use of products by other individuals. This chapter now turns to that.

Durability: making electronics last longer again

78. Research undertaken by Professor Tim Cooper has found that a product's lifetime should, in most cases, be extended for as long as possible since roughly speaking, doubling a lifespan will halve the product's environmental impact.[189] [190] Green Alliance has put some figures on specific electronic products that show how lengthening a lifespan can save carbon, energy and water consumption.[191] According to a European Environmental Bureau (EEB) study (2019), extending the lifetime of all washing machines, smartphones, laptops and vacuum cleaners in the EU by one year would lead to annual savings of around four million tonnes of carbon dioxide by 2030, which is equivalent to taking over two million cars off the roads for a year.[192]

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186   University of Leeds, Centre for Industrial Energy, Materials and Products, Saving Energy through Resource Efficiency, (2018).

187   The Committee on Climate Change, Reducing UK emissions: 2020 Progress Report to Parliament, (June 2020).

188   Q89.

189   European Environment Agency, Electronics and obsolescence in a circular economy, (18 June 2020).

190   Cooper, T., Longer lasting products alternatives to the throwaway society. (2016). [accessed 24.03.2020].

191   Green Alliance, A circular economy for smart devices, (2015) - see also Deloitte, Study on Socioeconomic impacts of increased reparability – Final Report Prepared for the European Commission, DG ENV., (2016).

192   European Environmental Bureau, Coolproducts don't cost the Earth. Full report, (2019) [accessed 10 October 2020].

Shortening product lifetimes

79. Research shows that the durability of products has been changing.[193] For white goods there has been a clear decrease in lifetimes,[194] for example, the average lifetime of a washing machine fell from an average life of 10 years to seven years between 2000 and 2010.[195] An increasing number of appliances also fail within the first five years of their life—for example, the number of large household appliances being replaced within the first five years of their service life due to a defect increased from 3.5 per cent in 2004 to 8.3 per cent in 2013.[196] For other Large Domestic Appliances (LDAs), a 2012 study, found that 50 per cent of UK customers were replacing a product less than eight years old[197] and for fridges, the UK had the lowest average replacement age (5.1 years) and Sweden/Finland the highest at 6.8 years.[198] For smartphones the change hasn't always been towards a shorter life. In 2013, the average smartphone lifetimes in France, Germany, Italy, Spain and the UK were around 18.3 months, rising to 21.6 months in 2016, potentially due to the decreasing rate of innovation. This is still, however, far lower than the potential lifetime of a smartphone because they tend to be replaced for behavioural or technical reasons like the launch of new improved models and social expectations.[199]

80. Most studies show that consumers want more durable products. Green Alliance research found that 65 per cent of people feel frustrated about how long products last, and 62 per cent at the difficulty of repair. 75 per cent said that Government should ensure businesses produce repairable and recyclable products.[200] Low-income groups are most affected by short product lifetimes and are often afraid of taking the risks associated with buying high-priced products as there is a concern among some of the consumers that planned obsolescence (see below) is a widespread phenomenon.[201]

Planned or programmed obsolescence

81. If premature obsolescence is intentional, (when a product is designed to have a shorter life so that consumers are required to repeat purchases), it is referred to as planned or programmed obsolescence. For example, in December 2017 it was found that an update to Apple iOS software led to a slowing down of its devices. This led to a €25 million fine in March 2020 from French regulators. Apple also recently agree to settle a case in California on this.[202] In 2018 Samsung and Apple were fined €5 million and €10 million respectively

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193   Eunomia report for Defra, Electrical and Electronic Equipment: Ingredients for Successful Extended Producer Responsibility, (January 2020), p 36.

194   Prakash, S et al., (in English: The influence of products' service time on their environmental impact) (2016).

195   Green Alliance, Better Products by Design, [accessed 07 July 2020].

196   Follow-up of the preparatory study for Eco-design and Energy Label for household washing machines and household washer dryers, JRC (2017).

197   WRAP (2013) Switched on to Value, page 6, [accessed 18 June 2020].

198   Preparatory Studies for Eco-design Requirements for EuPs Lot 13: Household refrigeration, Final report; BIO Intelligence Services Preparatory Studies for Eco-design, (December 2007).

199   European Environment Agency, Electronics and obsolescence in a circular economy, (18 June 2020).

200   Green Alliance, By Popular Demand, (2018).

201   European Environment Agency, Electronics and obsolescence in a circular economy, (18 June 2020).

202   Tom Jowitt, Apple To Settle US iPhone Slowdown Lawsuit, www.silicon.co.uk, (3 March 2020), [accessed 06 July 2020].

by the Italian authorities for software updates that slowed down phones.[203] Apple made no public comment, but Samsung expressed disappointment with the decision, which it plans to appeal.[204]

82. The European Environment Agency states that although there have been numerous documented cases of products designed to make repair not viable—for example sealed drums in washing machines or mobile phones with non-removable batteries or inkjet cartridges with a chip that prevents them being re-used[205] —it is difficult to prove that the obsolescence is planned or that products are designed to break.[206] Despite this lack of evidence, many contributors to our inquiry do believe it is taking place. For example, Jim Puckett from Basel Action Network stated that:

> Sadly, planned obsolescence is real. More and more manufacturers… are intentionally making things not repairable and not long-lived. We have to reverse that.[207]

83. This is not just done through 'mechanical obsolescence' but also incompatibility. Libby Peake from Green Alliance, echoed by the Restart Project,[208] stated that new software updates are often not supported on older hardware meaning it becomes necessary to replace the hardware despite the physical product still working. For example, 40 per cent of Smartphones running the Android operating system are no longer receiving security updates.[209] IPhones, up to iPhone 6 released in 2015, are now considered obsolete, due to lack of software updates.[210] Green Alliance and the Restart Project said that mandating, through legislation that products can have their software upgraded is a way around this.[211]

84. The EU is attempting to address some of these concerns with (1) the introduction of resource efficiency requirements through changes to the Eco-design Directive agreed in October 2019, which will come into force in April 2021 and (2) through its Circular Economy Action Plan (CEAP), announced in March 2020.[212] France and Italy, amongst others, have introduced a ban on 'planned obsolescence' where it is illegal intentionally to shorten the lifespan of a product with the aim of making customers replace it, whilst they are also legally required to inform customers up-front about the lifespan of their products.[213] The EU Circular Economy Action Plan has promised to ban planned or in-built obsolescence.[214]

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203   The Guardian, Apple and Samsung fined for deliberately slowing down phones, (24 October 2018) [accessed 08 July 2020].

204   Forbes, Italy Fines Apple, Samsung A Few Mil For 'Planned Obsolescence' In Phones, (24 October 2018), [accessed 08 July 2020].

205   Aladeojebi, T. 'Planned Obsolescence'. International Journal of Scientific & Engineering Research, (2013), pp 1504–1508.

206   EPRS, Planned obsolescence: Exploring the issue. Briefing, European Union, (2016) [accessed 20 March 2020].

207   Q84.

208   The Restart Project, (EWa0017).

209   See BBC, One Billion Android devices at risk of hacking, (6 March 2020) [accessed 09 September 2020].

210   The Sun, APPLE CRUMBLE Which iPhones are 'obsolete' and 'dangerous' in 2020? The full list, (27 January 2020), [accessed 10 November 2020].

211   Q77.

212   European Commissions, Circular Economy Action Plan, [accessed 10 October 2020].

213   BBC News, Apple investigated by France for 'planned obsolescence', (2018), [accessed 8th July 2019].

214   Resource, EU Unveils circular economy action plan, (11 March 2020).

85.   *The UK Government must confirm that it intends to follow the approach taken by other countries to ban the practice of intentionally shortening the lifespan of products through planned obsolescence.*

Actions to improve durability

86.   Professor Tim Cooper argued that consumers need to be better informed about the anticipated lifetime and repairability of electrical and electronic goods. In evidence to our inquiry he states that "labelling and differentiated warranties could be used to indicate durability and reliability".[215] In a study by the European Economic and Social Committee, it was noted that products with a lifespan label saw increased sales of 13.8 per cent.[216] This is the approach taken in Austria, which issues guidelines on reuse and has issued standards for a 'label of excellence' to indicate that the electronic equipment has been designed to be durable and repair-friendly.[217] [218] Minister Pow indicated that the Government is looking into labelling and warranties in these areas.[219]

87.   The Restart Project also suggested expanding on legislation being proposed by the Department for Digital, Culture, Media & Sport to include all internet-connect devices, including for example smartphones. The current proposal requires manufacturers of "internet of things" devices to state, at the point of sale, how long the device will receive security updates.[220] [221] [222]

88.   To popularise strategies to extend product lifetimes and encourage sharing, Green Alliance argued that policymakers should address concerns around trust by improving consumer rights.[223] It says that consumer rights legislation and access to justice need to be modernised to cover new business models.[224] The importance of consumer rights legislation has been echoed by researchers, consumer rights groups[225] and contributors to the inquiry. Professor Tim Cooper told us that:

> Options such as a minimum five-year guarantee on a product might increase product quality and remove products with unduly short lifetimes from the market.[226]

89.   In writing to us DEFRA has signalled potential support for this approach saying that the Resources and Waste Strategy commits to exploring the role of guarantees and warranties for product durability:

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215   Professor Tim Cooper, (ELE0022).

216   EESC, The Influence of Lifespan Labelling on Consumers. Final report. European Economic and Social Committee, (2016).

217   Eunomia report for Defra, Electrical and Electronic Equipment: Ingredients for Successful Extended Producer Responsibility, (January 2020), p 47.

218   Núria Cases i Sampere for the European Environmental Bureau, making more durable and reparable products, (February 2015), pp 7–8.

219   Qq256–258.

220   DCMS, Proposals for regulating consumer smart product cyber security - call for views, (16 July 2020) [accessed 10.09.2020].

221   The National Law Review, Internet of Things: How the U.K.'s Regulatory Plans Could Raise Compliance Standards, (10 September 2020), [accessed 10.09.20].

222   The Restart Project, (Ewa0017), p 2.

223   Green Alliance, By popular demand What people want from a resource efficient economy, (November 2018).

224   Green Alliance (EWa0006).

225   Maurer, S. & Pachl, U. BEUC. Durable goods: More sustainable products, better consumer rights. (2015).

226   PQ18.

> We will consider options including mandatory disclosure of expected product lifetimes, mandatory extended warranties, and incorporating warranties into labelling, for example a five-year warranty label. In conjunction with industry and other stakeholders, we will explore reform to consumer rights law and eco-design legislation to make use of these systems where the market is not delivering the necessary outcomes.[227]

90. DEFRA also told us that Eco-design for Energy-related products powers allow Government to mandate resource efficiency eco-design to drive the market to more durable and repairable products.[228] [229] Different products such as washing machines can be expected to last much longer than others.[230] A report by the European Parliamentary Research Service found that the optimal way to enhance sustainable consumption and durability of products is for a mandatory guarantee equal to a product's expected lifetime, with that lifetime calculated according to pre-defined technical standards.[231] Though the report acknowledged the difficulties in implementing this and the cost to businesses, the approach taken in Finland of linking guarantee periods to expected product lifetimes (without making them the same) is supported by a number of researchers.[232] It is also a specific recommendation of the European Parliament Policy Department for extension over the whole EU.[233] They show how this would make products more durable, provide more protection and information to consumers, and build consumer trust about the products they are buying.[234]

91. The 'burden of proof' when it comes to claiming guarantee is also important. In the UK, there is a 'reversal of the burden of proof' within the first six months i.e. that the seller must prove that an item was not defective before a guarantee is claimed. After this the evidence burden falls on consumers to prove a product was defective. Research has shown that:

> In practice, this six-month period often means that the product is presumed to be faulty only within the first 6 months after purchase; after this, the consumer must prove the pre-existing defect, which is often complicated and requiring expert advice.[235]

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227   Department for Environment, Food and Rural Affairs (EWa0025).

228   Department for Environment, Food and Rural Affairs, (EWa0025).

229   UK Statutory Instruments, The Ecodiesgn for Energy-Related Products Regulations (2010).

230   PQ18.

231   E.g. Keirsbilck et al, How can sustainable consumption and longer lifetime of products be promoted through consumer protection legislation?, (April 2020).

232   E.g. BEUC – The European Consumer Organisation, FACTSHEET Premature obsolescence when products fail too quickly, (2018) [accessed 21 October 2020] & K. Tonner & R Malcolm, How an EU Lifespan Guarantee Model Could be Implement Across the European Union, (January 2017).

233   BEUC – The European Consumer Organisation, FACTSHEET Premature obsolescence when products fail too quickly, (2018) [Accessed 21 October 20] & K. Tonner & R Malcolm, How an EU Lifespan Guarantee Model Could be Implement Across the European Union, (January 2017).

234   European Union, Consumer policy – the EU's new 'consumer agenda', (30 June 2020–06 October 2020) [accessed 21 Oct 2020].

235   S Svensson et al, The emerging 'right to repair' legislation in the EU and the US, (2019).

92.   Portugal and France have extended this reversal of the burden of proof to two years meaning within this period the burden of proof falls on the producers or manufacturers.[236] Finland again links the burden of proof to the expected product lifetime. The EU minimum will be increased from six months to one year from 2020.[237]

93.   **Consumers have a low trust in the electronic market and the longevity of products, both new, and repaired. They lack the information to make informed choices about the balance between cost, quality and the lifetime of the products they are buying.** *To overcome this issue, we recommend that the Government require producers to label their electrical and electronic products outlining the product's expected lifetime, including how long a device will receive software security upgrades. To enhance the label to be more informative, products that are particularly durable when compared to similar products in their categories should include a "durable" accreditation. This is a method undertaken in Austria.*

94.   **Minister Pow indicated that the Government is looking into enhancing and extending the minimum guarantees on electronic products, including software.** *We support this proposal and urge the Government to bring this forward with the aim of removing electronics with unduly short lives from the market. The expected lifetime label must be linked to the minimum lifespan guarantee. Particular attention must be paid to where the burden of proof lies between consumers and producers.*

Repairing our electronics

95.   As Ugo Vallauri of the charity The Restart project told us:

> We have been progressively losing our right to tinker and repair the products that we already own and this has happened, in a way, silently. We have not really been fully aware that we were progressively losing all of this … This country has a wonderful tradition of engineering, and repair was at the heart of the UK but that was not the case anymore. We were losing our skills and true ownership of the things that we own… Repair links people, it creates value and it is an essential part of being human. Polling in the UK and in Europe and the United States shows that people overwhelmingly want to repair and they want the barriers to repair to be removed. That is a wildly popular agenda that unites people across the whole political spectrum. Repair jobs that can be created through repair are excellent, but the skills in the future for repair jobs are under serious threat.[238]

96.   Contributors to our inquiry have argued that making repair of electrical and electronic products easier is vital to reaching a circular economy and is intrinsically linked to making more durable products. For example, the Restart Project has estimated that over 1,000 community repair events logged in its online system have saved an estimated 17,864kg of electronic waste and an estimated 280,894kg CO_2 emissions.[239] The Government's

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236   S Svensson et al, The emerging 'right to repair' legislation in the EU and the US, (2019).

237   Thomson Reuters, Product liability and safety in the EU: overview, Q9. (01August 2020) [accessed 26 October 2020].

238   Q100.

239   The Restart Project (ELE0043).

Resources and Waste Strategy commits to "taking on board consumer interest in the right to repair" including mandating the provision of spare parts and design for easy dis-assembly.[240]

Barriers to repair

97. A number of barriers exist to the repair of electronics becoming mainstream including: the design of products, availability of spare parts and information; access to trusted professional repairers; and the cost and convenience of replacing smaller items of EEE compared to getting an item repaired and consumer preferences and attitudes not favouring repair.[241] A balance needs striking between making it easier and cheaper for consumers to get their Electrical and Electronic products repaired, while ensuring health and safety, and balancing the interests of manufacturers.[242]

Box 4: Universal Right to Repair

'Right to Repair' is a term used to denote a legal right for individuals to be able to repair the products they own. There are three pillars to the universal right to repair that will allow individuals ease of repair: (1) Products designed to be repairable (e.g. without need specialised tools, and not gluing or soldering parts together); (2) Access to repair guides and manuals; and (3) Access to spare parts.

Many US states have considered legislation for a 'Right to Repair'[244] and the EU's Circularly Economy Action plan includes it. However the EU's proposals have been criticised for allowing manufacturers to restrict access to manuals and spares. [245]

Intentional prevention of repair

98. As part of our inquiry we undertook an informal survey of repair groups and organisations. Over 500 organisations responded to our survey. They highlighted how often they are faced with products that are intentionally designed and manufactured to prevent repair, and the lack of access to spare parts and manuals.

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240   Department for Environment, Food and Rural Affairs) (EWa0010).

241   Svensson et al, The emerging 'right to repair' legislation in the EU and the US, (2019).

242   Svensson et al, The emerging 'right to repair' legislation in the EU and the US, (2019).

243   US PRIG, Right to Repair wraps up a big year, (26 December 2019) [Accessed 10 October 2020].

244   Q103, and Restart Project (ELE0043), & S Svensson et al, The emerging 'right to repair' legislation in the EU and the US, (2018).

The biggest barrier facing repairers is…

- Products glued together — 45%
- Lack of available parts — 23%
- Lack of available repair manuals — 20%
- Warranty concerns — 4%
- Safety concerns — 8%
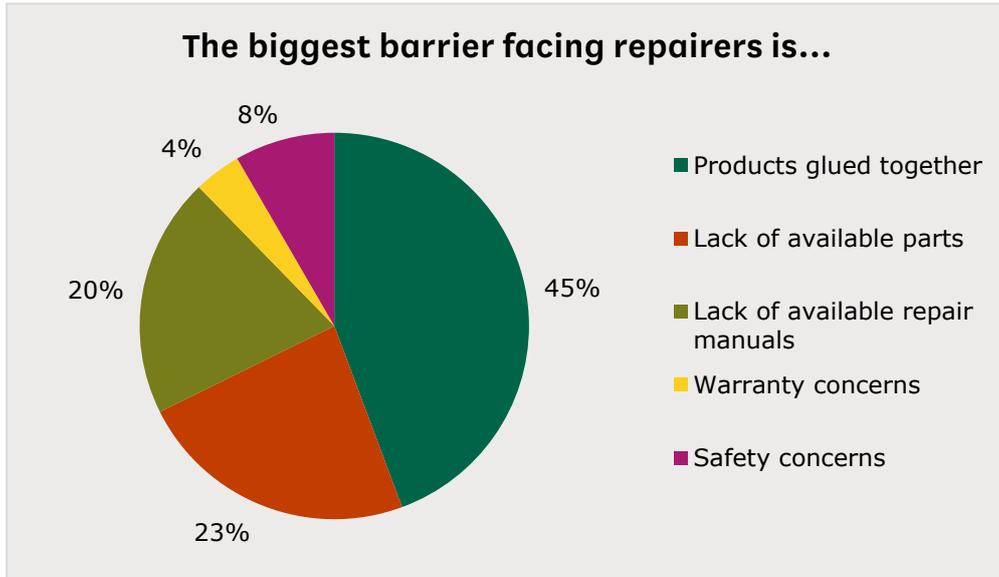
99. The European Environment Agency states that there have been numerous documented cases of products designed to make repair not viable—for example sealed drums in washing machines or mobile phones with non-removable batteries or inkjet cartridges with a chip that prevents them being re-used.[245] Concerns have been raised about repair being prevented or disincentivised by monopolistic practices in the tech industry[246] that undercut the ability for third party businesses to undertake repairs. Ifixit highlighted products where parts are soldered and glued together and the use of unique "pentalobe screws" to prevent wide access for repair, with Apple laptops in particular ranking lower than those of most other companies. For example, the 2019 MacBookPro 16" is ranked one out of ten for repairability.[247] Ugo Vallauri from the Restart Project argued that Apple was creating a monopoly over repair of its products, which allowed it to control the market. He suggested that the seemingly impressive progress that Apple was making in its sustainability initiatives did not balance the overall carbon and material footprint involved in manufacturing so many new products with limited repairability.[248] He highlighted a number of allegations against Apple including:

> Apple and Nokia's refusal to supply original parts to independent workshops…caus[ing] products to fail or work less optimally following third party repair, examples include Apple's 'bricking' of iPhones that had their home buttons replaced by third party technicians and Apple's battery warning message that appears upon third party battery replacement.[249]

100. To improve the ability of individuals to repair their products Ugo Vallauri said that there were:

> …three pillars of a true right to repair that we would like to happen in legislation in the UK, as well as the rest of the world. They are, first…

245   Aladeojebi, T. 'Planned Obsolescence'. International Journal of Scientific & Engineering Research, (2013), pp 1504–1508.

246   Steven Domb, (EWa0031).

247   E.g. IFIXIT, Laptop Repairability Scores, [accessed 10 October 2020].

248   Q108.

249   Restart Project (ELE0043), BBC 'iPhones 'disabled' if Apple detects third-party repairs,' BBC News, 5 February 2016; [accessed 29 October 2020) Goode, L. 'Apple's battery service alerts are a blow to right to repair' Wired, (2019), [Access 29 October 2020).

requiring in legislation that all manufacturers provide…access to spare parts…The second thing that ensures safe repairs can be done by everyone is access to the official repair manuals, so that products can be repaired using the best knowledge available, which will obviously be the one provided by the manufacturer. The third point that is a crucial pillar is that products should be designed to be repairable to begin with.[250]

101. Though respondents to our survey highlighted that design issues (e.g. glued parts) were the biggest barrier to repair they said the thing that would most help overcome repair issues was access to repair manuals—perhaps reflecting a pragmatic approach:

How could producers make repair easier?

- Make repair manuals available online
- Sell product parts and components
- Design to be repaired
- Free software
- Other
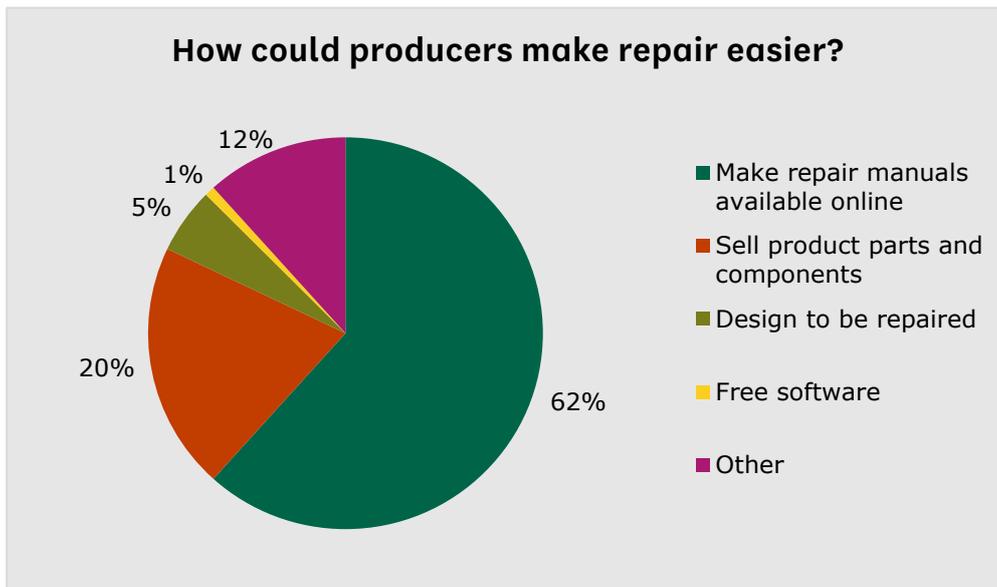
Contributors were able to submit any suggestion. Our analysis of these highlighted some other common themes for actions that producers could take to make repair easier:

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102. Professor Cooper argued that the UK Government should work with industry to encourage better maintenance of products through, for example, ensuring access to repair manuals for independent repairers and owners, and the availability of spare parts at reasonable cost.[251] Another important factor within the design of products is that easily accessible tools can be used in repair.

103. The Restart Project argued that to help consumers choose more repairable products manufacturers could be required to state the repairability of a product in much the same way as they are currently required to state its energy efficiency. It said that France has adopted its own initial repairability score index, as part of its new waste-prevention law adopted in January 2020. From 2021 consumers in stores and online will be able to compare the repairability score of five categories of products: smartphones, washing machines, TVs, computers and lawn mowers—calculated by factoring in the availability and pricing of spare parts, as well as the ease of disassembly of a product. The Restart Project recommended that the UK Government should consider adopting a similar approach but be extended to other product categories relevant to the UK context.[252]

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251   Professor Tim Cooper, (ELE0022).
252   Restart Project, (EWa0017).

The cost of repair

104. Repairing a product tends to be the more costly option both for the users of electronics (compared to buying a new product) and for the E-waste collection industry (compared to recycling the materials). This is partly explained by manufacturers controlling the repair of their products and charging high prices, as well as the high labour and operational costs of repair.[253] Many of those campaigning for a circular economy argued that repair activities need to be made cheaper and more competitive[254] to prevent faulty goods being discarded because buying a new one is easier and cheaper than repair.[255] The consumer group Which? has highlighted how the cost of fixing Apple phones can sometimes be as costly as buying a new alternative smart phone:

> Smash the display on Apple's iPhone 11 Pro Max, for example, and you can expect to pay £326 to get it fixed by the tech giant if it's out of warranty. If the damage sustained by the iPhone comes under 'other damage' (faults not related to the display), that number could rise to a whopping £596.44. For the same price, you could buy a brand new Which? Best Buy smartphone and a Best Buy smartwatch.[256]

105. Despite being a market leader in the UK,[257] Apple were unwilling to appear before us to discuss issues related to product obsolescence, and practices that might make repair more difficult.[258] They did respond in writing to our requests for evidence on their approach to sustainability and the challenges of repairing their products, but only after public pressure[259] from us on the day of a product launch.[260] Given the stated commitment of the company to sustainability, we were disappointed with the limited level of engagement with our inquiry.

VAT reduction on repair services

106. In 2014, our predecessor Committee's report on *Growing a circular economy: Ending the throwaway society* called for differential VAT rates based on life-cycle analysis of the environmental impact or recycled content of products, and tax allowances for businesses that repair goods or promote re-use.[261] [262] Many EU countries, such as Greece, Ireland, Netherlands and Poland have a reduced charge on repair activities at six per cent.[263] Reductions in rates of VAT on repairs could make it more economically attractive to opt for repair over buying a new replacement product. For example, along with many contributors to our inquiry,[264] TechUK—the UK technology Industry trade bodies, has joined calls by circular economy campaigners for a reduction in VAT on repairs to counter

253   Dr Alison Stowell, (EWa0011).

254   Rreuse, Reduced taxation to support re-use and repair, (March 2017).

255   Professor Tim Cooper, (ELE0022).

256   Which.co.uk, How to repair your smartphone [accessed 12 September 2020].

257   E.g. see Statista, Market share of leading mobile device vendors in the United Kingdom (UK) from 2010 to 2019, (April 2020) [accessed 10 November 2020].

258   EAC, Apple refusal to respond to EAC on environmental sustainability and repairability of its products, (15 September 2020) [accessed 10 November 2020].

259   E.g. Bloomberg, Apple Snubs U.K. Sustainability Inquiry, (15 September 2020). [accessed 10 November 2020].

260   EAC, Apple to Chair on environmental impact of the electronics industry, (17 September 2020)

261   EAC, Growing a circular economy: Ending the throwaway society, (July 2014).

262   EAC, Growing a circular economy: Ending the throwaway society: Government response, (November 2014)

263   Green Alliance, (EWa0032).

264   E.g. Dr Lara Houston, City University (ELE0036).

the "perception that repair is expensive compared to the price of a new product." It says that "a reduction in VAT on the labour for repair activities, as introduced by Sweden, could make it more economical to repair products out of warranty."[265] Some European countries are attempting to incentivise repair through other forms of tax reductions such as Sweden where 50 per cent of labour costs in repair are tax deductible and in Austria where labour costs of repair may become reimbursable.[266] Green Alliance's research has shown that the lost tax could be counteracted by the increased jobs, but also by raising taxes on other harmful activities. Sweden has done this with hazardous chemicals.[267]

Requirements related to strengthening the right to repair

107. TechUK also argued that safety and intellectual property rights must be protected in policy action taken to promote repair. Its policy recommendations call on Government to:

a)   Recognise the trusted status of the UK's network of authorised repair networks and refurbishment / remanufacturing facilities.

b)   Protect the intellectual property rights in the after-sales, maintenance and repair market, in particular with respect to license agreements and access to proprietary information.

c)   Promote the safety risks of unauthorised repairs carried out without the necessary training.[268]

d)   Recognise that there is sometimes a trade-off between durability and repairability.[269]

108. Some categories of products should only be repaired by a qualified repairer.[270] The community safety organisation EEESafe submitted evidence on safety issues and said that a professional standard similar to Gas Safe needs to be established for the repairs of white goods such as washing machines, fridges and cookers.[271] EEESafe say that the depth of knowledge needed to help prevent and identify faults in white goods is not independently verified by anyone at present.[272] Martyn Allen from Electrical Safety First told us that:

> We need a regulated system for repairers. At the moment it is the wild west in many cases. There are certain jobs that need lower-level skills, but there are certain complex examples that we mentioned at the very start that need special skills. We need to find a way of having an extended process where things can be repaired, but the people carrying out those repairs need to be competent for the task in hand, and also have accessible access to the components so that the repairs are done safely.[273]

109. **The UK has a long history of engineering, and the public wants to be able repair their products. When products are designed, durability and repairability should be**

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265   TechUK, (ELE0044).

266   RReuse, Reduced taxation to support re-use and repair, (March 2017).

267   Green Alliance, Improving the environmental and social impact of UK VAT, (2020).

268   TechUK, Reuse | Repair | Remanufacture in the ICT Sector, (June 2018).

269   Q105.

270   CILA, White Goods and Fire Risks: Home Laundry, (January 2018).

271   EEESafe, (ELE0050).

272   EEESafe, (ELE0050).

273   Q117.

key considerations. *The Government must enshrine the right to repair in law, enforcing access to (1) repair manuals; (2) access to affordable spare parts for products; and (3) ability to repair products without repairers needing access to physical or software tools specifically designed to be a barrier to independent servicing or repair.*

110. *Technology companies, repair organisations and the UK Government should collaborate to ensure safety is ensured during the repair of electronics. This could be through creating professional standards, that will in turn drive more consumer trust. This collaboration should also look at the protection of intellectual property.*

111. *The Government should mandate that products be labelled with a repairability score, based on the products design, the availability and cost of spare parts, access and ease of use of repair manuals. This will incentivise companies to go beyond the minimum requirements already established. Companies with better repairability scores should be rewarded with a reduction in modulated fees for their extended producer responsibility scheme contributions.*

112. **Another proposal supported by industry is a reduction in VAT on repair services from the current standard rate. This is also supported by Professor Tim Cooper and is in place in a number of countries across the EU.** *The UK Government should encourage repairability through reducing VAT charged on the repair of electrical and electronic products.*

Promoting the re-use of electronics

113. Under the WEEE Regulations, Producer Compliance Schemes (PCs) are required to prioritise re-use of products that are no longer wanted by their original purchasers. However, rates of re-use have been low, estimated at 2.5 per cent in 2018.[274] In other countries targets are increasingly being used as a method of increasing the re-use of EEE. The Flanders region of Belgium has instigated financial incentives for local municipalities meeting re-use targets. It reached a target of re-use of EEE of 5kg per inhabitant and has set a further target of 7kg to be achieved by 2022.[275] Spain is the first EU country to introduce mandatory re-use targets. These range from three per cent of large appliances to four per cent of IT equipment in 2018.[276] Wales has a 'preparing for reuse' target for municipal waste, however, this excludes WEEE. London set a policy objective in 2011 to increase repair and reuse capacity from 6,000 tonnes per year to 20,000 tonnes by 2015 and 30,000 by 2031.[277]

114. The WEEE Scheme Forum said the Government could "implement mechanisms to encourage PCSs to favour re-use over recycling."[278] It suggested that could include applying a premium to re-use evidence so that a PCS could use evidence of re-use to offset part of its collection target evidence.[279] The AATF forum in evidence to us said:

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274   WEEE Scheme Forum, (ELE0025), p 10.
275   City University, (ELE0036), p 3.
276   City University, (ELE0036), p 3.
277   Reeve, S. and Eduljee, G., An Overview of Electronic Waste Management in the UK in Eduljee, G.H. and Harrison, R.M., eds., Electronic Waste Management, 2nd edition, (2019), p 128.
278   WEEE Scheme Forum, (ELE0025), p 10.
279   WEEE Scheme Forum, (ELE0025), p 10.

> There must also be clearer incentives for reuse, both of parts and whole items. The need for WEEE evidence to meet regulatory targets has seen a decline in reuse as the ability to generate evidence from recycling is easier. This suggests that there is a strong need for a much clearer and more environmentally orientated guidance on the definition of waste from the point at which the first user seeks to replace or discard it.[280]

115. There is a need for incentives at Local Authority Household Waste recycling centres (HWRC) that will help them to promote re-use and proper recycling:

> The biggest barrier to realising the value in discarded electronics is the current system's inability to organise careful collection and delivery to a facility that can effectively separate high value reusable or repairable products from those that must be recycled. Indeed, current systems render most electronics only suitable for recycling: the three foot fall onto the steel floor of a recycling bank destroys the reuse value of all but the most robust electricals, as does the practice of leaving them outside for collection exposed to damp and dirt.[281]

116. **Producers, local authorities and recyclers have little or no incentive to re-use products over recycling them.** *The Government must increase the incentives for re-use so that all parties benefit from further re-use, in particularly making re-use evidence worth more than recycling evidence.*

117. **Some countries set re-use targets for electronics, such as Spain and Belgium.** *The UK Government should set similar re-use targets for producer compliance schemes, with penalties levied when targets are missed. These targets must be set long term and ratchet over time to give the industry clarity and time to prepare.*

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280   AATF Forum, (ELE0051), p 3.
281   Green Alliance, Waste Opportunities, (2014).

3   Recycling

118. When electrical and electronic products reach the end of their life and can no longer be repaired or re-used, recovery of the materials for use in new products can reduce the damaging extraction of new materials and will help the UK secure more precious and rare materials for use in vital sectors like healthcare, low-carbon energy and defence systems.[282] [283] It has the potential to retain significant value in the country,[284] [285] create job opportunities, lower council tax[286] and prevent the toxic impact of electronic waste on humans and the environment.

Box 5: Cobalt and Helium – two case studies from the BBC and The Parliamentary Office of Science and Technology.

> Cobalt prices rose over 300% in the period from 2016–2018. Over 60% of the world's cobalt supply comes from the Democratic Republic of the Congo, where it has been strongly linked with child labour and environmental degradation. Recycling existing batteries could therefore play an essential part in the sourcing of sustainable cobalt. Recovering all the end-of-life portable devices collected by EU citizens over the past 20 years could "generate enough cobalt to [produce] at least 10 million electric vehicles".[288]
>
> Helium has the lowest boiling point (-269°C) of all the elements and is often used as a cryogenic liquid coolant for MRI scanners. It is primarily used for welding, semiconductor manufacturing, filling balloons, and creating inert atmospheres, but also has a range of research applications, such as microscopy. Helium has a very low density and can therefore be permanently lost from the atmosphere into space. It can be reused to avoid loss, but this is technically difficult. The price of helium has risen by 500% in the last 15 years, and there have been three supply shortages. Despite the discovery of a sizeable deposit in Tanzania in 2016, enough to fill 1.2 million MRI scanners, another global shortage occurred in 2019.[289]

119. However current methods of disposing of WEEE rely heavily on shredding the material—up to 80 per cent of recycled electronics go to this form of low value recycling.[289] Lithium batteries are now the main cause of fires at waste sites because they are shredded and crushed without prior separation.[290] After shredding there is some separation of different types of products. The resulting shredding mix is mostly exported or incinerated as energy from waste. Green Alliance told us that the lack of appropriate resource recovery infrastructure in the UK perpetuates the linear economy because our current system is heavily focused on energy recovery (e.g. creating energy from waste through incineration).[291] Manual processes can result in far more extraction of materials, but are often far more costly.[292]

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282   Parliamentary Office for Science and Technology, Access to critical materials, (13 September 2019).
283   Libby Peake, Green Alliance, (EWA0006), p 1.
284   Green Alliance, Waste Opportunities, (2014).
285   Green Alliance, (ELE0023), p 5.
286   Green Alliance, Waste Opportunities, (2014).
287   BBC, How to mine precious metals in your home, (8 April 2020).
288   Parliamentary Office for Science and Technology, Access to critical materials, (13 September 2019).
289   Green Alliance, (EWA0006), p 2.
290   Viridor, (ELE0018), p 2.
291   Green Alliance, (EWa0006), p 2.
292   WRAP, Techniques for Recovering Printed Circuit Boards (PCBs), (March 2014).

120. Shredding does allow for reuse of some raw materials (mostly base metals and increasingly plastics), but yields are often low, and valuable metals, used in small quantities, are often lost completely in the process.[293] [294] The resulting shredding mix, considered toxic, is mostly sent overseas to refineries based in Belgium and Sweden, with some sites also in Japan and Canada, where the waste is heated to high temperatures to extract the base metals with the rest of the waste incinerated as part of the extraction process. There are companies in the UK who conduct some form of smelting or refining of E-waste - particularly focusing on ferrous metals, aluminium, lead and stainless steel,[295] however these companies have limited capacity to recycle complex components like Printed Circuit Boards (PCBs) and extract materials like gold and silver, or other critical raw materials.[296] [297]

121. The precious metals contained in a tonne of E-waste (in particular in PCBs) can often be far higher than the equivalent in a tonne of directly mined ore which means that 'urban mining' of E-waste is quickly becoming more cost-effective than virgin mining at those sites outside the UK that have the size and technology to extract them.[298] In fact, because old E-waste contains more materials than lighter modern electronics, Europe could theoretically source most of the materials it needs for new electronics from old E-waste.[299] The UK is therefore sending valuable and precious materials overseas for recycling and missing an economic opportunity from the high amount of electronic waste this country creates compared to others.

122. However, this is only true of some materials, and those critical raw materials (CRMs), found in small quantities, are still mostly lost, with only around one per cent being recovered worldwide. The European WEEE Directive (article 15) states that information about the usage of CRMs must be provided free of charge to recyclers from producers of electronics placed on the market. However we have heard that recyclers often have difficulty accessing information about the materials in products and where those materials are located, which can cause difficulties in recycling.[300] LG Electronics told us it is trying to respond to a recycler's request for information about the presence of materials and components in electronic waste that require separate treatment—essential to proper treatment—through working with the EU wide platform "Information for Recycler (i4R)".[301]

123. This reflects wider problems with the flow of materials throughout the UK, including export. The design of products at the start of their life has a serious impact. As Green Alliance told us:

> Recovering materials is such a challenge largely because products are not designed for longevity or to allow for material and parts recovery.[302]

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293   WRAP, Techniques for Recovering Printed Circuit Boards (PCBs), (March 2014), p 23.

294   Veolio, Preventing Battery Fires, (15 January 2020).

295   Phil Conran, (EWa0030).

296   WRAP, Techniques for Recovering Printed Circuit Boards (PCBs), (March 2014).

297   The Guardian, Britain to get first commercial refinery for extracting precious metals from e-waste, (22 August 2020).

298   Zeng et al. Urban Mining of E-Waste is Becoming More Cost-Effective Than Virgin Mining, (4 April 2018).

299   Huisman et al., ProSum, Prospecting Secondary raw materials in the Urban mine and Mining wastes, (2017), pp 25–32.

300   S. Takhar, University of Derby, (ELE0017); Green Alliance, Design for a circular economy: reducing the impacts of the products we use, (November 2020).

301   LG Electronics, (EWa0020).

302   Green Alliance, (EWa0006).

Box 6: National Materials Datahub

According to the Office of National Statistics (ONS) the long-term vision of the National Material Datahub (NMD) is a single version of truth for materials information in the UK, open for public good. It would enable the measurement of a resource economy and reflect our evolving and complex relationship to materials. It would support policy decisions and the industrial strategy. The Resources and Waste Strategy highlights the National Materials Datahub as a way of providing comprehensive data on the availability of raw and secondary materials and chemicals. It identifies the electronic tracking of waste as part of this.

Source: ONS, DSC-69 National Materials Datahub, [Accessed 29.10.20] & HM Government, RWS, (2018) p 43.

124. Evidence to our inquiry has highlighted how advancing the ONS work on a National Materials Datahub, which tracks the flow of materials through society, including in products, could make a big difference. This would include requirements for producers to provide information on the materials in their products to help waste treatment companies in future years. It could eventually contain information about products such as the durability, repairability and eco-design of products. The information contained in the hub is considered a critical and necessary step to reaching a circular economy, as it will allow industry and the public sector to become more resource efficient and use secondary materials. Contributors believe that, due to the growing problem of E-waste and the importance of critical raw materials there is therefore some urgency to set the datahub up.[303]

125. The Royal Society of Chemistry noted that the Environment Bill, unlike the Resources and Waste Strategy, does not include the tracking of electronic waste or critical raw materials specifically. It says, in common with other contributors, that electronic tracking of E-waste and CRMs could inhibit illegal waste export[304] and ensure CRMs are being recovered and recycled properly.[305] Fidra, a UK-based NGO, told us that transparency and accessibility of chemical information for all users and handlers of electronics would enable decision making and safe use, re-use and recycling.[306] In light of the importance of information to this sector the Resource Recovery from Waste Programme at the University of Leeds suggested that electric and electronic products and waste should be an initial case study within the datahub.

126. *Manufacturers of electronics must ensure that their products are recyclable and dismantlable by waste treatment operators. The Government must apply incentives, potentially through the extended producer responsibility scheme, for the design of products that are easy to recycle.*

127. *Producers, via producer compliance schemes, should provide information to recyclers about the materials, including quantities, in their products. A clear date should be set for this to be mandatory. Once the national material datahub is operational then manufacturers' information should be linked to this.*

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303   Green Alliance, EWa0006).

304   E.g. Sussex Energy Group, University of Sussex, (ELE0013).

305   Royal Society of Chemistry (EWa0005).

306   FIDRA, Written evidence to the EAC, (ELE0052).

128. *We recommend that the Government fast-tracks the national materials datahub to track critical raw materials in the UK. The aspects that focus on critical raw materials, E-waste and toxic chemicals should be operational by 2023.*

Recycling targets

129. We have been told that, alongside lack of information, recycling standards and targets are driving low-quality recycling practices. Treatment of waste electronics is based on Best Available Treatment Recovery and Recycling Techniques (BATRRT).[307] Many contributors to our inquiry have said that BATRRT needs updating to include for example, material efficiency standards,[308] as it has not changed since 2006 and "no longer reflects developing international standards of treatment."[309]

130. As well as BATRRT, the Waste Electrical and Electronic Equipment Regulations 2013 also mandate the percentage of electronic waste, by weight, that must be recycled and/or recovered once it has been officially collected. Recovery of materials can be done either by recycling or capturing energy from the incineration of materials. However even then it does not reach 100 per cent of waste collected, (see Appendix 2 below). It is not clear what BATRRT expects will happen to the remaining amount however, if it is disposed to landfill, the Government must find a solution in order to meet its targets.[310] [311] We have also received evidence that collection, recycling and recovery targets based solely on weight could drive a linear economy pushing up collection of waste over re-use, and quantity of recycling rather than quality.[312] [313] The weight of many electronics is dominated by plastic and metals and so there is little incentive to capture more valuable products that are lightweight such as critical raw materials.[314] This means that the targets do not necessarily drive environmental benefits such as CO_2 savings. The recycling company, Circular Resources UK, told us that:

> Focussing on a percentage recycled by volume is a useful indicator of the efficiency of bulk recovery but there is a danger that the recovery of precious metals and CRM's is lost in this statistic as a minor constituent in volume terms. These materials are however significant in terms of resource scarcity and have financial and strategic value.[315]

131. It is not clear how much recycling of critical raw materials is taking place in the UK. Libby Peake told the inquiry that worldwide the figure is below one per cent. In August 2020 DEFRA opened a consultation on new metrics to monitor resources policy which may include moving away from weight-based approach.[316]

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307   Department for Environment, Food and Rural Affairs, Guidance on Best Available Treatment Recovery and Recycling Techniques (BATRRT) and treatment of WEEE (November 2006), pp 8–9.

308   WEEE Scheme Forum (ELE0025)

309   E.g. Samsung Electronics UK (EWa0021),

310   Environment Agency, Waste electrical and electronic equipment (WEEE): evidence and national protocols guidance, (22 May 2020) [accessed 13 October 2020].

311   Q67.

312   Eurostat, Waste electrical and electronic equipment (WEEE) by waste management operations [env_waselee]. 26.08.20 [accessed 08 October 2020].

313   Samsung Electronics UK (EWa0021).

314   Royal Society of Chemistry (EWa0005).

315   Circular Resources UK, Written evidence to the EAC, (EWa0015).

316   Resource.co, DEFRA OUTLINES PLANS FOR MONITORING RESOURCES POLICY, (12 August 2020) [accessed 08.09.2020].

132. Piecemeal and rapid changes to standards can cause serious problems for recyclers and harm investment. For example, Environment Agency changes to regulations regarding Persistent Organic Pollutants (PoPs), though welcome and overdue, have had a serious impact on recyclers' ability to operate and treat E-waste. This is because all E-waste that contains any PoPs is now considered hazardous, can no longer be recycled and must be incinerated at high temperatures. At a stroke AATF's have lost a significant income stream from the selling of recyclable materials.[317] As the WEEE Scheme forum stated: "when such regulatory issues [as PoPs] arise, impacting downstream markets, we need clear and timely guidance well in advance of any implementation deadlines."[318]

133. **Current recycling and recovery targets and metrics, based on weight, are not sufficient to incentivise the capture of valuable materials.** *Clear targets for E-waste treatment facilities that are based on capturing value, including critical raw materials, and their environmental impact must be set.*

134. *Recycling methods covered by Best Available Treatment Recovery and Recycling Techniques, and recycling and recovery targets must be ambitious with a shift away from recovery towards high-quality recycling. There must be a clearly defined and communicated long-term pathway, with milestones, showing when and how E-waste treatment centres must improve their recycling of E-waste to capture as many materials as possible and remove toxic chemicals. This clear pathway will allow businesses to raise finance and invest in advance to reach these mandatory targets.*

Investment

135. As well as lack of information, evidence to our inquiry has highlighted a lack of investment in the sorting, recycling and treatment of electronic waste. Investment in electronic waste processing infrastructure is vital to help facilities "operate to the highest standards of treatment to maximise recovery and minimise the impact of their treatment processes on the environment", according to the AATF Forum.[319] The industry also needs significant investment to allow it to keep pace with the increasing amount of electronic waste and the fast rate of change and innovation in electronics.[320] The Royal Society of Chemistry told us that the extraction processes for a broad range of CRMs have been developed at laboratory scale, but further work and investment is needed for commercialisation.[321] [322] [323] Investment will also reduce the costs of recycling and so disincentivise cheaper but more harmful waste processing practices and even the exportation of waste.[324] There are significant cost savings to society and local authorities to investing in better waste infrastructure, including capturing valuable products for re-sale or use in critical industries.[325] Green Alliance estimated the UK could support eight to

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317   Phil Conran, (EWa0030).

318   WEEE Scheme Forum, (ELE0025).

319   AATF Forum, (ELE0051), p 2.

320   AO.com, (ELE0021), p 6.

321   Royal Society of Chemistry, (EWa0005), p 1.

322   Parliamentary Office for Science and Technology, Access to critical materials, (13 September 2019).

323   Green Alliance, (EWa0006), p 1.

324   Environcom, (ELE0006), p 2.

325   Green Alliance, Waste Opportunities, (2014).

twelve WEEE recycling facilities and 50–200 more specialised waste reprocesses, creating over £500 million extra value and allowing for the extraction of critical raw materials such as lithium from batteries.[326]

136. The evidence we have received outlines possible reasons for the lack of investment in recycling or processing infrastructure.[327] Other than the lack of E-waste being collected for recycling, as previously discussed[328] several other areas have also been highlighted:

(1)   The Government's current investment strategy.

(2)   The market-system for producer compliance schemes alongside poor Environment Agency enforcement.

(3)   Fluctuations in the price of raw materials and lack of legislation on recyclable content.

The focus of government investment

137. The Resources and Waste Strategy commits the Government to investing £3 billion in waste infrastructure by 2042. In evidence, echoed by others, the Resource Recovery from Waste Programme at the University of Leeds reported that the Waste Infrastructure delivery programme is focused on thermal energy from waste or mechanical-biological treatment plants producing refuse-derived fuels. It found that 'no recycling or reprocessing facilities are listed' under the Programme of planned projects and called on Government to "stop presenting recycling and [thermal energy] recovery as being of equal value."[329] It said:

> Expecting to achieve a circular economy with an infrastructural monoculture dominated by EfW [Energy from Waste] is magical thinking of the first order … .[330] Planned investments will result in an overcapacity of energy-from-waste (EfW) and this constrains the viability of business models for WEEE reuse, repair, remanufacturing and recycling.[331]

138. In the Climate Assembly UK citizen's assembly report, participants recommended that Government provide "grants and incentives for businesses to improve recycling, develop new materials and make goods from recycled materials".[332]

139. *Government investment in low-quality Energy from Waste plants should at the least be matched by investment in higher quality recycling methods that mean materials, particularly rare and valuable ones can be re-used. Energy from Waste, though important to prevent items going to landfill, should be treated as a low priority in UK waste infrastructure investment strategies.*

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326   Green Alliance, (ELE0023), p 4.

327   Environmental Services Association, (ELE0026), p 2.

328   Veolia, (ELE0042), p 2.

329   Resource Recovery from Waste, (ELE0046), p 3.

330   Resource Recovery from Waste, (ELE0046), p 3.

331   Resource Recovery from Waste, (ELE0046), p 3.

332   Climate Assembly UK, The path to net zero: what we buy, (September 2020), p 307.

Short-term system

140. The current system for producers to fund waste collection and treatment is a market system, with producer compliance schemes searching for the cheapest companies to collect waste and treat it. This system has come under criticism by contributors to our inquiry. For example Green Alliance told us that the market mechanisms–explicitly promoted in the Resources and Waste Strategy–will deliver only limited recycling facilities and not enough for a move towards a circular economy.[333] Reflecting on this Cris Stephenson, CEO of Environcom, the largest privately-owned E-waste treatment and recycling business in the UK, told us:

> …the current system in place is simply not fit for purpose… and is predicated on the principle that competition drives not only the best cost prices but greater efficiency, however due to Governmental intervention in both supply and demand sides of this market the model is dysfunctional. Leaving E-waste to 'the market' has led to the current position where the UK is the European 'serial dumper' of its E-waste abroad.[334]

141. As mentioned in the section on collection targets above, one aspect of this is the short-term nature of the system, with local authorities, PCSs and recycling plants often only having one-year contracts.[335] REPIC Ltd said that producers can currently move between PCSs annually, which prevents PCSs from offering longer-term contracts to treatment facilities to underwrite investments.[336] [337] TechUK highlighted the lack of a deep and long-term relationship between PCSs and Local Authorities.[338] Reflecting on this short-termism Mr. Stephenson, amongst others,[339] also outlined what he sees as three fundamental flaws in the current UK System of electronic waste processing:

- It is transactional in form, in an industry that needs large capital infrastructure to function efficiently;

- It fails to tackle the first Law of Waste Dynamics that is 'waste goes down the cheapest hole' [which incentivises E-waste to be incorrectly treated and processed, or illegally exported]; and

- It fails to define WEEE correctly leaving huge loop-holes to allow export of E-waste by seemingly legitimate routes.[340]

142. One UK solution to the short-termism is requiring longer term contracts between all parts of the system. Mr. Stephenson recommends that producers should join a PCS for three or five years, PCSs should contract with local authorities for three or five years and that PCSs should contract to AATFs for a minimum of three years.[341]

143. Other EU countries have chosen not to implement a market-based system for producer compliance schemes under the WEEE directive. In France, Italy and Finland PCSs are

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333   Green Alliance, (EWa0006) p 2.
334   Environcom, (ELE0006), p 1.
335   Q22.
336   Repic LTD, (ELE0027).
337   Q43.
338   Susanne Baker, (EWa0022).
339   Q22.
340   Environcom, (ELE0006), p 1.
341   Cris Stephenson, (EWa0029).

required to be not-for-profit. Most countries also have far fewer PCSs then the UK. For example, Sweden, the only country to have met the 65 per cent E-waste collection target, only has two PCSs, one of which represents 99 per cent of producers and collections. Switzerland, the country with the second highest percentages of collections covered by the directive, has three PCSs. Germany does not have any and uses a clearing house system. The UK has between 28 and 31 PCSs.[342]

144. In written evidence it is alleged that in England poor quality recycling has resulted from poor enforcement and poor understanding of regulations by the Environment Agency.[343] This is particularly important in a market system where cost rather than high quality is the focus. This has allowed producer compliance schemes (PCSs) to direct waste (and purchase proof of recycling certificates) from electronic waste processing facilities that may not be following regulations or that, due to limited investments, have lower costs. REPIC and the AATF forum agree that this lack of enforcement is concerning as there is potentially significant environmental impact from illegal WEEE 'treatment' in the UK.[344] Of particular concern is the trade in fridge compressors with an estimate that close to 20,000 litres of compressor oil a year is drained into the earth or surface water system by unscrupulous removal of compressors from dumped items, to say nothing of CFCs that escape through crushing of fridges by low quality scrap metal operators.[345]

145. The WEEE Scheme forum have outlined how independent audits of E-waste treatment centres are no longer required and highlight the fraud that has taken place both by AATFs and PCSs, and that lack of enforcement power that the Environment Agency has, as exemplified by the fine to a PCS of £50,000 for a fraud worth more than £1million.[346]

146. The Environment Agency told us it is taking steps to improve its enforcement and outlined the resources and audits it is undertaking in this area to improve this. For example, last year, the EA increased the number of unannounced visits from seven in 2018 to 24 in 2019. In total they increased the percentage of inspections at E-waste treatment sites to 56 per cent in 2019 from 44 per cent in 2018. However, this still does not reach the height of 2015 where 86 per cent were audited and follows a sustained fall in the total number of AATFs from 173 in 2015 to 120. The number of prosecutions under the WEEE regulations has also increased in recent years (after no prosecutions between 2015 and 2018). The evidence provided by the Environment Agency in relation to its budgets suggests that, though lower than 2011/12, budgets have increased in recent years.[347]

147. **The current short-term and transactional nature of the electronic waste system is not delivering the high-quality and high-capacity recycling this country needs if it is to reach a circular economy and extract the full benefits to jobs and the economy of the precious and valuable materials currently being lost.** *The Government must take strong steps to overcome the problems besetting the system by mandating that producers,*

342   Eunomia report for Defra, Electrical and Electronic Equipment: Ingredients for Successful Extended Producer Responsibility, (January 2020).

343   See for example, Veolia, (ELE0042), p 2.

344   REPIC Ltd, (ELE0027), p 5., See also: Veolia, (ELE0042), p 2.

345   AATF Forum, (ELE0051), p 5 & 6.

346   E.g. LetsRecycle.com, Northern Compliance to pay out over WEEE regs breach, (1 October 2019) & Northern Compliance 'disappointed' with WEEE approval decision, (1 February 2019).

347   Environment Agency, (EWa0026), Qq238–249.

compliance schemes, local authorities and AATF enter longer term contracts to create partnerships and longer-term certainty. It must also ensure that the market is regulated to a high-enough standard to prevent unscrupulous operators.

Raw material prices

148. The price of raw materials and their price variability has a big impact on the viability of investment in recycling technology and capacity, because recyclers rely on selling the recycled materials. For example, aluminium is extensively recycled because of the high costs of extracting it from minerals.[348] Solutions that could help recycled materials be cost competitive and help improve the lack of investment in recycling include: (1) VAT and other tax breaks on recycled components and companies meeting recycling targets,[349] (2) legislation on the amount of recycled content in new products[350] and (3) taxes on raw and virgin materials or non-recycled products.[351] In evidence to us commentators have argued that the approach to single use plastic could be replicated for electronics.[352] [353] For example Alison Stowell suggested that:

> In a similar way to encourage a percentage of recycled plastics to be present in the production of new single use plastics, the same policy could be adopted for the electrical and electronic manufacture–given than on average 20% of the products are made up of plastics.[354] [This would] incentivise the use of secondary materials, bio-based resources and rare earth metal substitutions because some virgin materials are still cheaper than alternatives. [There are] e.g. taxation opportunities to encourage the use of x% of secondary materials/recycled materials as has been discussed for plastics.

149. We have been told that this would also create a market for secondary materials and hold up prices which could go some way to overcoming a lack of investing in new recycling capacity and innovative approaches due to the fluctuating prices of raw materials in electronics,[355] often caused by market 'dumping' from countries with developed raw-material mining infrastructure.[356] [357] [358]

150. **Increasing resource productivity by reducing the amount of resource that is extracted to make new products will be crucial to reducing the damaging impact of extractive industries on the environment and safeguarding scarce resources that are vital to a low-carbon economy. Improving the long-term price certainty of recycled materials will help recyclers invest in more capacity and improved process. *The Government should find ways of driving the use of more recycled materials in new products. This could be done through taxes on virgin materials, or through rewarding producers that use recycled products through eco-modulated fees.***

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348   The Geological Society, (ELE0038), p 1.

349   In2tec Limited, (EWa0014), p 2.

350   Dr Alison Stowell, (EWa0012), PQ7.

351   Environmental Services Association, (ELE0026), p 1.

352   In2tec Limited, (EWa0014), p 2.

353   Environmental Services Association, (ELE0026), p 1.

354   Dr Alison Stowell, (EWa0012).

355   Environcom, (EWa0028).

356   HMRC, Tungsten electrodes from Laos and Thailand (anti-dumping duty 2424), 15 September 2020.

357   Financial Times, The world must counter China's dominance of rare earths, 20 October 2020 [Accessed 11 November 2020].

358   Critical Minerals Association, (EWa0034).

Exporting E-waste

151. Another issue with the current framework for treatment of E-waste is the exportation of E-waste to countries with sub-standard methods of treatment, causing serious harm to humans and the environment. Under the Basel Convention, to which the UK is a signatory, export of E-waste is illegal except in the case of re-use and repair. In the UK this is codified in the Trans-frontier Shipment of Waste Regulations. What's more many countries that have previously accepted waste from the UK are no longer accepting it, and so returning it when it is shipped there (e.g. China,[359] Vietnam[360]).

152. Despite this exportation is still the cheapest way of dealing with E-waste[361] and the 'repairability loophole' allows products to be exported for re-use if they are not yet classified as waste. We have been told that in practice this means a large number of waste electronics can be exported.[362] [363] The impact is that prices for E-waste treatment in this country are driven down, and that there is not enough potential E-waste for treatment. This prevents recyclers investing in better and higher quality treatment[364]and can also drive recyclers to cut corners when trying to be cost competitive with illegal routes. As Jim Puckett of the Basel Action Network told us:

> you can never have a truly circular economy if waste is exported overseas, because the externalities [i.e. the cost of recycling and treating E-waste and the hazardous material in it] are not being internalised into the cost of the product or the producers' profits.[365]

153. Jim Puckett told the committee that estimates put the UK figure of E-waste leaving the UK for developing countries at 209,000 tonnes.[366] This can be compared to the official amounts of E-waste collected in 2019 at 494,000 tonnes. Some of the exported E-waste is part of the officially collected amount and some is not. Research by BAN,[367] and re-iterated by the UN, has found that the UK is one of the worst offenders for the exportation of E-waste.[368]

154. The Environment Agency do not automatically classify all used or returned EEE as WEEE (i.e. as waste).[369] Jim Puckett told us that allowing repairable and reusable electronics to be exported should be considered a loophole because "the problem is that anybody can declare something is repairable".[370] This can lead to the exporting of items that are 'in essence' waste (WEEE) but are only classified as 'used EEE' which is not subject

359   China.org.cn, 70% of annual global e-waste dumped in China, (24 May 2012), [Accessed 10 November 2020].

360   Resource.co, Malaysia and Vietnam follow China's lead with waste import restrictions, (6 August 2018), [accessed 10 November 2020].

361   Baldé et al., The Global E-waste Monitor 2017: Quantities, Flows and Resources (2017), p 34.

362   Geeraerts et al., Illegal shipment of e-waste from the EU: A case study on illegal e-waste export from the EU to China. (2015). A study compiled as part of the EFFACE project. London: IEEP.

363   Q72.

364   WEEE Scheme Forum, (ELE0025).

365   Q74.

366   Q74.

367   Puckett et al. Holes in the Circular Economy: WEEE Leakage from Europe, Basel Action Network, (2019).

368   Odeyingbo, Olusegun, Nnorom, Innocent and Deubzer, Otmar, Person in the Port Project: Assessing Import of Used Electrical and Electronic Equipment into Nigeria. UNU-ViE SCYCLE and BCCC Africa. (2017), p 35.

369   Environcom, (ELE0006).

370   Q72

to the same WEEE export regulations. The classification of used EEE differs in Scotland where the Scottish Environmental Protection Agency deem all used equipment as waste until it has been tested.[371] The Environment Agency told us that:

> Our stance has always been that for items to be exported for re-use they must have been through an assessment process and be packaged and ready for direct re-use. If they haven't been through an assessment process the items are classified as waste, and must be notified before export.[372]

It told us that some companies mis-describing products that have not been tested or assessed, are undertaken illegal activity which is subject to enforcement.[373]

155. The WEEE recycling company Environcom suggested that "the UK Government should deem all returned / disposed of sold EEE as WEEE unless otherwise proven."[374] The AATF Forum called for clarity in the UK's waste export system which varies across countries:

> For instance, green list waste exports[375] do not have to even be notified to the Environment Agency prior to export and must simply carry a form with the waste. This varies around the UK with pre-notification required in Northern Ireland and post notification in Scotland. Defra are known to be reviewing the current system with a view to a consultation in 2020.[376]

156. Green list waste is waste that considered low risk to the environment under the Shipments of Waste Regulations. You can usually import and export these wastes for recovery without the need for prior authorisation. For example, you do not have to notify anyone before you import or export uncontaminated waste-paper for recycling. Red-list waste is the opposite and requires prior notification to regulators for export.[377]

157. In England where exportation for re-use is allowed without notification the regulation of electronics being shipped out of the country is all the more important to ensure items are not actually waste. However, there has been wide agreement from contributors to our inquiry that the Environment Agency in England is not undertaking effective regulation[378] and that:

> the chances of getting caught are vanishingly small. It is quite easy for waste cowboys to avoid the cost of legitimately dealing with waste, and it is far too easy for them to misdescribe waste and send it abroad.[379]

158. The Environment Agency told us it is developing better and systems and improving their audit process to prevent the exportation of E-waste. Malcolm Lythgo, the Deputy

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371   Environment Agency, (EWa0026), Qq238–249; SEPA, SEPA Regulatory Position Statement – Repair and Refurbishment of Waste Electronic and Electrical Equipment (WEEE) [accessed 30 October 20].

372   Environment Agency, (EWa0026), Qq238–249.

373   Environment Agency, (EWa0026), Qq238–249.

374   Environcom, (ELE0006).

375   This is a list of products under 'article 18' of the EU Waste Shipment regulations that are allowed for export under a lower form of control and mainly applies to the shipment of non-hazardous waste. This means that the export of used electronics (rather than waste electronics) does not require a notification to the 'competent authorities' (in England this is the Environment Agency).

376   AATF Forum, (ELE0051).

377   NetRegs, Importing or exporting green list waste [Date accessed 19 June 2020].

378   E.g. AATF Forum, (ELE0051), p 5 & 6., REPIC Ltd, (ELE0027), p 5., Veolia, (ELE0042), p 2.

379   Q76.

Director of Waste Enforcement and Regulation at the Environment Agency, told us that they are increasing the number of audits and unannounced visits. The Agency is increasingly taking an intelligence-based approach to make sure that they are targeting their activity based on the highest risk. It also told us that they are working closely with HMRC and port-authorities and getting evidence from shipping companies. It also told us that:

> last year we stopped and prevented over 22,000 tonnes of waste being illegally exported. Of that, only 1,765 tonnes were WEEE. Therefore, the general proportion of illegal activity that we are finding at ports is a relatively small proportion of WEEE. That is also backed up by the repatriation requests that we get when something has been illegally exported and an overseas authority asks us to bring it back. Again, it is a relatively low proportion, in the order of 10% to 15%, which is waste electrical.[380]

Prosecutions for illegal exportation of WEEE have fallen considerably. Between 2010 and 2015 there were 22 prosecutions, yet between 2016 and 2020 there have only been three. The number of port inspections undertaken by the EA, was around 1,400 per year in 2014 and 2015 but have since fallen to between 900 and 1000 inspection per year.[381]

159. **There are in some cases legitimate reasons to export overseas old electronics that can have a second life.** *However, due to the serious impact of E-waste on human health and the environment, both here and overseas, and the sheer quantity potentially being exported illegally, the Environment Agency should deem all electrical and electronic exports as risky and in need of more stringent requirements before exportation is allowed.*

160. *The presumption, unless proved otherwise, should be that electronics are not usable. All electronics should be tested and proved to work before exportation. No good should be exported that needs repair to be workable. There should be harmonisation of this across the UK to prevent goods being moved from one nation to another for exportation purposes.*

161. *The Environment Agency in England should be undertaking stronger enforcement activity and should be actively collecting data and information to estimate the actual quantities of E-waste being exported illegally.*

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380   Qq236–238.
381   Environment Agency, (EWa0026); Qq238–249.

Conclusions and recommendations

Collecting E-waste

Conclusion

1. The system of collection targets in the UK is unclear. National figures on collection rates include a significant amount of estimation about electronics that have been collected in different ways, with no clear understanding as to whether those collected electronics are treated in a high-quality manner. This leads to a perception that all is well compared to other countries that do not use these estimates. (Paragraph 30)

Recommendation 1

2. *We recommend that the Government reconsiders the use of substantiated estimates in the E-waste system when evaluating performance.* (Paragraph 30)

Conclusion

3. Targets for producer compliance schemes have been missed over recent years. For 2020 the target has been brought down to match the actual amount collected in 2019 due to the impact of Covid-19. Targets are set annually, which prevents all parties in the system from investing in long term collection and treatment. (Paragraph 36)

Recommendation 2

4. *DEFRA must set long term targets that align with existing commitments like zero waste to landfill. The targets should have milestones at clear intervals, to allow certainty for businesses and investors. They must be set using independently verified data not self-reported data. It must be clear that these are collection targets for both re-use and recycling to prevent recycling being prioritised over keeping valuable EEE in circulation—an area we will return to later in this report.* (Paragraph 37)

Conclusion

5. Our inquiry has heard that making official collection routes for the public easy and consistent is key to ensuring products are correctly re-used, repaired and recycled. Retailer take-back is an effective method, so we welcome the Government requirement for large physical retailers to offer this service. However, this further tilts an unequal playing fields away from physical stores towards online retailers and marketplaces who do not have this obligation. (Paragraph 68)

Recommendation 3

6. *Our high streets are under severe pressure and current regulations, coming into force from 2021, could unfairly entrench the competitive advantage of online retailers and*

marketplaces like Amazon. As a matter of urgency and at the latest by the end of 2021 online retailers and marketplaces must have an equal obligation to collect electronic waste from customers. (Paragraph 68)

Recommendation 4

7. *To prevent a potential loophole with take-back being offered only at remote, inconvenient warehouses, the regulations should follow the exemplary innovation shown by AO.com and DixonsCarphone. Online retailers and marketplaces for electrical and electronic equipment must arrange and pay for the collection of like-for-like electronics from customer's homes on delivery of new electronics. They must also offer to collect any electronic waste defined as "small" at the same time.* (Paragraph 69)

Conclusion

8. A mixture of collection types is needed to tackle the significant E-waste collection challenges. As well as Retailer Take-back, kerbside collection has been shown to be very effective and easy for the public to hand-over their electronics cost-effectively and with limited damage to the environment. (Paragraph 70)

Recommendation 5

9. *The Government must make this mandatory for local authorities, with the cost paid for by producers and those smaller retailers or online marketplaces still exempt from collecting E-waste directly from the public.* (Paragraph 70)

Conclusion

10. An Extended Producer Responsibility scheme could be used to incentivise the very best practice in circular low-carbon product design. However, care must be taken to put circular economy principles at the heart of the policy and efforts made to harmonise it with wider efforts internationally. In any future producer responsibility system online marketplaces like Amazon should be responsible for ensuring that all EEE that is sold on their platforms is fully compliant with the law. Furthermore, producers should be required to pay exactly the same fees and follow the same rules selling online as they do offline. (Paragraph 71)

Recommendation 6

11. *In any future producer responsibility system online marketplaces like Amazon should be responsible for ensuring that all EEE that is sold on their platforms is fully compliant with the law. Furthermore, producers should be required to pay exactly the same fees and follow the same rules selling online as they do offline. The Government should explain how it will address all of these concerns when it publishes its consultation on new E-waste regulations in 2021.* (Paragraph 71)

Preventing E-waste and Using Resource Better

Conclusion

12.   It is welcome that Government plans to monitor progress against the Resource and Waste Strategy, including both a measure of per capita material and resource consumption and measures of resource productivity with the goal being to double resource productivity by 2050. (Paragraph 76)

Recommendation 7

13.   *As a complement to the monitoring per capita material consumption there must also be a target in place to reduce consumption to a sustainable level in line with the research highlighted in this report. Due to the increasing number of electronics and the materials contained within them there should be a sub-target for per capita resource-use in electronics that is in line with this wider target.* (Paragraph 76)

Recommendation 8

14.   *The UK Government must confirm that it intends to follow the approach taken by other countries to ban the practice of intentionally shortening the lifespan of products through planned obsolescence.* (Paragraph 85)

Conclusion

15.   Consumers have a low trust in the electronic market and the longevity of products, both new, and repaired. They lack the information to make informed choices about the balance between cost, quality and the lifetime of the products they are buying. (Paragraph 93)

Recommendation 9

16.   *To overcome this issue, we recommend that the Government require producers to label their electrical and electronic products outlining the product's expected lifetime, including how long a device will receive software security upgrades. To enhance the label to be more informative, products that are particularly durable when compared to similar products in their categories should include a "durable" accreditation. This is a method undertaken in Austria.* (Paragraph 93)

Conclusion

17.   Minister Pow MP indicated that the Government is looking into enhancing and extending the minimum guarantees on electronic products, including software. We support this proposal and urge the Government to bring this forward with the aim of removing electronics with unduly short lives from the market. The expected lifetime label must be linked to the minimum lifespan guarantee. Particular attention must be paid to where the burden of proof lies between consumers and producers. (Paragraph 94)

Recommendation 10

18. *We support this proposal and urge the Government to bring this forward with the aim of removing electronics with unduly short lives from the market. The expected lifetime label must be linked to the minimum lifespan guarantee. Particular attention must be paid to where the burden of proof lies between consumers and producers.* (Paragraph 94)

Conclusion

19. The UK has a long history of engineering, and the public wants to be able repair their products. When products are designed, durability and repairability should be key considerations. The Government must enshrine the right to repair in law, enforcing access to (1) repair manuals; (2) access to affordable spare parts for products; and (3) ability to repair products without repairers needing access to physical or software tools specifically designed to be a barrier to independent servicing or repair. (Paragraph 109)

Recommendation 11

20. *The Government must enshrine the right to repair in law, enforcing access to (1) repair manuals; (2) access to affordable spare parts for products; and (3) ability to repair products without repairers needing access to physical or software tools specifically designed to be a barrier to independent servicing or repair.* (Paragraph 109)

Recommendation 12

21. *Technology companies, repair organisations and the UK Government should collaborate to ensure safety is ensured during the repair of electronics. This could be through creating professional standards, that will in turn drive more consumer trust. This collaboration should also look at the protection of intellectual property.* (Paragraph 110)

Recommendation 13

22. *The Government should mandate that products be labelled with a repairability score, based on the products design, the availability and cost of spare parts, access and ease of use of repair manuals. This will incentivise companies to go beyond the minimum requirements already established. Companies with better repairability scores should be rewarded with a reduction in modulated fees for their extended producer responsibility scheme contributions.* (Paragraph 111)

Conclusion

23. Another proposal supported by industry is a reduction in VAT on repair services from the current standard rate. This is also supported by Professor Tim Cooper and is in place in a number of countries across the EU. (Paragraph 112)

Recommendation 14

24. *The UK Government should encourage repairability through reducing VAT charged on the repair of electrical and electronic products.* (Paragraph 112)

Conclusion

25. Producers, local authorities and recyclers have little or no incentive to re-use products over recycling them. (Paragraph 116)

Recommendation 15

26. *The Government must increase the incentives for re-use so that all parties benefit from further re-use, in particularly making re-use evidence worth more than recycling evidence.* (Paragraph 116)

Conclusion

27. Some countries set re-use targets for electronics, such as Spain and Belgium. (Paragraph 117)

Recommendation 16

28. *The UK Government should set similar re-use targets for producer compliance schemes, with penalties levied when targets are missed. These targets must be set long term and ratchet over time to give the industry clarity and time to prepare.* (Paragraph 117)

Recycling

Recommendation 17

29. *Manufacturers of electronics must ensure that their products are recyclable and dismantlable by waste treatment operators. The Government must apply incentives, potentially through the extended producer responsibility scheme, for the design of products that are easy to recycle.* (Paragraph 126)

Recommendation 18

30. *Producers, via producer compliance schemes, should provide information to recyclers about the materials, including quantities, in their products. A clear date should be set for this to be mandatory. Once the national material datahub is operational then manufacturers' information should be linked to this.* (Paragraph 127)

Recommendation 19

31. *We recommend that the Government fast-tracks the national materials datahub to track critical raw materials in the UK. The aspects that focus on critical raw materials, E-waste and toxic chemicals should be operational by 2023.* (Paragraph 128)

32.   Current recycling and recovery targets and metrics, based on weight, are not sufficient to incentivise the capture of valuable materials. (Paragraph 133)

Recommendation 20

33.   *Clear targets for E-waste treatment facilities that are based on capturing value, including critical raw materials, and their environmental impact must be set. (Paragraph 133)*

Recommendation 21

34.   *Recycling methods covered by Best Available Treatment Recovery and Recycling Techniques, and recycling and recovery targets must be ambitious with a shift away from recovery towards high-quality recycling. There must be a clearly defined and communicated long-term pathway, with milestones, showing when and how E-waste treatment centres must improve their recycling of E-waste to capture as many materials as possible and remove toxic chemicals. This clear pathway will allow businesses to raise finance and invest in advance to reach these mandatory targets. (Paragraph 134)*

Recommendation 22

35.   *Government investment in low-quality Energy from Waste plants should at the least be matched by investment in higher quality recycling methods that mean materials, particularly rare and valuable ones can be re-used. Energy from Waste, though important to prevent items going to landfill, should be treated as a low priority in UK waste infrastructure investment strategies. (Paragraph 139)*

Conclusion

36.   The current short-term and transactional nature of the electronic waste system is not delivering the high-quality and high-capacity recycling this country needs if it is to reach a circular economy and extract the full benefits to jobs and the economy of the precious and valuable materials currently being lost. (Paragraph 147)

Recommendation 23

37.   *The Government must take strong steps to overcome the problems besetting the system by mandating that producers, compliance schemes, local authorities and AATF enter longer term contracts to create partnerships and longer-term certainty. It must also ensure that the market is regulated to a high-enough standard to prevent unscrupulous operators. (Paragraph 147)*

Conclusion

38.   Increasing resource productivity by reducing the amount of resource that is extracted to make new products will be crucial to reducing the damaging impact of extractive industries on the environment and safeguarding scarce resources that are vital to a low-carbon economy. Improving the long-term price certainty of recycled materials will help recyclers invest in more capacity and improved process. (Paragraph 150)

Recommendation 24

39. *The Government should find ways of driving the use of more recycled materials in new products. This could be done through taxes on virgin materials, or through rewarding producers that use recycled products through eco-modulated fees.* (Paragraph 150)

Conclusion

40. *There are in some cases legitimate reasons to export overseas old electronics that can have a second life.* (Paragraph 159)

Recommendation 25

41. *However, due to the serious impact of E-waste on human health and the environment, both here and overseas, and the sheer quantity potentially being exported illegally, the Environment Agency should deem all electrical and electronic exports as risky and in need of more stringent requirements before exportation is allowed.* (Paragraph 159)

Recommendation 26

42. *The presumption, unless proved otherwise, should be that electronics are not usable. All electronics should be tested and proved to work before exportation. No good should be exported that needs repair to be workable. There should be harmonisation of this across the UK to prevent goods being moved from one nation to another for exportation purposes.* (Paragraph 160)

Recommendation 27

43. *The Environment Agency in England should be undertaking stronger enforcement activity and should be actively collecting data and information to estimate the actual quantities of E-waste being exported illegally.* (Paragraph 161)

Appendix 1: UK E-waste in numbers

Table 1: UK E-waste in numbers - data gaps mean that number do not add up

1,714,000 tonnes	Of electronics and electrical equipment (EEE) purchased in 2019 by households and businesses. This has fluctuated but was 1,743,505 tonnes in 2008 when items were generally heavier.
23.9 kg	Of E-waste generated per person in the UK.
505,445 tonnes	Of waste electronic and electrical equipment officially collected by the Waste Electrical sector in 2019. Down from a peak of 589,850 tonnes in 2016.
155,000 tonnes	Thrown away in domestic bins and being incinerated or landfilled in 2017
145,000 tonnes	Of commercial electrical waste thrown away in skips with no evidence that is recycled in 2017
190,000 tonnes equivalent to 527 million	Of small old unused electronical items hoarded by UK Households
32,000 – 209,000 tonnes	Of E-waste illegally exported from the UK to countries like Nigeria, Ghana and India. This includes items officially collected at local authority sites.
20	average old, unused small electronics hoarded by each UK household.
140 million, enough to go around the earth 5 times	Cables held in people's home across the UK
159,000 bikes, 12,000 playground swings, 5 million life-saving defibrillators	Could be made from the old laptops currently hoarded across the UK
2.5%[383] – 10%[384]	Estimated amount of Electronics that are re-used by others.

Sources: Material Focus, Electrical waste–challenges and opportunities, 16 July 2020; Jim Puckett, Oral Evidence to EAC, 25 June 2020, Q74; Environment Agency, Statistical Data Set: Waste electrical and electronic equipment (WEEE) in the UK, June 2020

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382   WEEE Scheme Forum, Written evidence to EAC, (ELE0025), p 10.
383   Libby Peake, Green Alliance, Written evidence to EAC, (EWa0006)

Appendix 2: UK Electrical and Electronic Equipment categories

Table 2: Mandatory Recycling Targets for UK Treatment facilities in Tonnes

Category	Description	Recovery	Recycling
1	Large household appliances e.g. microwaves, washing machines	85%	80%
2	Small household appliances e.g toasters, hair dryers, coffee machines	75%	55%
3	IT and telecommunications equipment e.g Laptops, Printers	80%	70%
4	Consumer equipment e.g. Radios, Video cameras	80%	70%
5	Lighting equipment e.g. illuminated emergency exit sign	75%	55%
6	Electrical and electronic tools (with the exception of large-scale stationary industrial tools) e.g. Drills, Saws, Sewing machines	75%	55%
7	Toys, leisure and sports equipment e.g. Hand-held video games, electric trains	75%	55%
8	Medical devices (with the exception of all implanted and infected products) e.g. Dialysis, Radiotherapy equipment	75%	55%
9	Monitoring and control instruments e.g. Smoke detectors, Thermostats	75%	55%
10	Automatic dispensers e.g. Hot drink dispensers, money dispensers	85%	80%
11	Display screens e.g. TV screens and Computer screens only	80%	70%
12	Cooling appliances e.g. fridges	85%	80%
13	Gas discharge lamps and LED light sources e.g. LED filament lamps	no target	80%
14	Photovoltaic panels i.e. Solar panels	80%	70%

Source: Environment Agency, Waste electrical and electronic equipment (WEEE): evidence and national protocols guidance, (22 May 2020) [Accessed 13.10.20] Source: Environment Agency, Electrical and electronic equipment (EEE) covered by the WEEE Regulations, (26 October 2018) [Accessed 09.10.20]

Appendix 3: Critical Raw Materials

EU's 2020 list of Critical Raw Materials		
Antimony	Hafnium	Phosphorus
Baryte	Heavy Rare Earth Elements	Scandium
Beryllium	Light Rare Earth Elements	Silicon metal
Bismuth	Indium	Tantalum
Borate	Magnesium	Tungsten
Cobalt	Natural Graphite	Vanadium
Coking Coal	Natural Rubber	Bauxite
Fluorspar	Niobium	Lithium
Gallium	Platinum Group Metals	Titanium
Germanium	Phosphate rock	Strontium

Source: European Commission, Study on the EU's list of Critical Raw Materials, (2020)

Appendix 4: Why electronic products become waste

Box 8: Why electronic products become waste

> **Absolute obsolescence:** where a product breaks and stops functioning. This mainly influenced by the product nature determined by design. It can be further categorized as:
>
> **Mechanical obsolescence:** when the product no longer functions due to lack of performance of material or components.
>
> **Incompatibility obsolescence:** when the product no longer works properly due to lack of inter-operability of software and/or hardware.
>
> **Relative obsolescence:** which refers to the disuse of a functional product. In this case, the actual lifetime is less than the designed lifetime. This is a joint result of the product's nature and consumer's decision. This decision can be highly influenced by marketing, sometimes also referred to as marketing induced obsolescence. It includes further different types of obsolescence, including the following:
>
> **Psychological obsolescence, or style, cosmetic or aesthetic obsolescence:** when a product is replaced because the desire for a new item is strong although the old one is still functional.
>
> **Economic obsolescence:** when the old product is replaced as the cost of repair or upgrading is high compared to replacement.
>
> **Technological obsolescence:** when the old item is replaced as a new product offering better quality, functionality or effectiveness is available.

Source: European Environment Agency, Electronics and obsolescence in a circular economy, (18 Jun 2020), p 14.

162. The main reasons for obsolescence vary depending on the product. For example, for mobile phones relative obsolescence is the main driver for consumers to replace their devices in 59% of cases. Absolute obsolescence, or the replacement of a mobile phone due to mechanical defects at 31.4 per cent, is less dominant.[384]

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384 European Environment Agency, Electronics and obsolescence in a circular economy, (18 Jun 2020)

Formal minutes

Members Present:

Rt Hon Philip Dunne, in the Chair

Duncan Baker	Jerome Mayhew
Barry Gardiner	John McNally
Mr Robert Goodwill	Dr Matthew Offord
Ian Levy	Alex Sobel
Marco Longhi	Nadia Whittome
Caroline Lucas	

Draft report (*Electronic Waste and the Circular Economy*), proposed by the Chair, brought up and read.

Ordered, That the draft Report be read a second time, paragraph by paragraph.

Paragraph 1 to 161 read and agreed to.

Appendix agreed to.

Summary agreed to.

Resolved, That the Report by the First Report of the Committee to the House.

Ordered, That the Chair make the Report to the House.

Ordered, that embargoed copies of the Report be made available, in accordance with the provisions of Standing Order No. 134.

[Adjourned till Wednesday 18 November at 2.00pm

Witnesses

The following witnesses gave evidence. Transcripts can be viewed on the inquiry publications page of the Committee's website.

Tuesday 28 April 2020

Tanya Sheridan, Head of Policy and Evidence team, Royal Society of Chemistry; **Professor Tim Cooper**, Nottingham Trent University; **Dr Alison Stowell**, Associate Director for Lancaster University's Research Centre at the Pentland Centre for Sustainability in Business   PQ1–33

Thursday 11 June 2020

Gurbaksh Badhan, Chair, National Association of Waste Disposal Officers; **Phil Conran**, Chair, Approved Authorised Treatment Facilities Forum; **Lee Marshall**, CEO, The Local Authority Recycling Advisory Committee   Q1–32

Scott Butler, Executive Director, Material Change; **Louise Grantham**, Representative, Waste Electric and Electronic Equipment Scheme Forum; **Adrian Hawkes**, Representative, Distributor Take-back scheme   Q33–64

Thursday 25 June 2020

Heather McFarlane, Project Manager, Fidra; **Jim Puckett**, Executive Director and Founder, Basel Action Network; **Libby Peake**, Head of Resource Policy, Green Alliance   Q65–94

Martyn Allen, Technical Director, Electrical Safety First; **Susanne Baker**, Associate Director for climate, environment and sustainability, techUK; **Ugo Vallauri**, Co-founder and Policy Lead, The Restart Project   Q95–125

Thursday 16 July 2020

Kevin Consindine, Head of Sustainability, Samsung; **Eva Gouwens**, CEO, Fairphone; **Andrew Mullen**, Head of Quality and sustainability for the UK and Ireland, Beko   Q126–162

Robert ter Kuile, Worldwide Director of Environmental Affairs, Amazon; **Matthew Manning**, Compliance and Recycling Operations Manager, DixonsCarphone; **Astrid Wynne**, Sustainability Manager, TechBuyer   Q163–196

Thursday 17 September 2020

Rebecca Pow MP, Parliamentary Under-Secretary of State, Department for Environment, Food and Rural Affairs; **Chris Preston**, Deputy Director of Waste and Recycling, Department for Environment Food and Rural Affairs; **Malcolm Lythgo**, Deputy Director of Waste Enforcement and Regulation, Environment Agency   Q197–273

Published written evidence

The following written evidence was received and can be viewed on the inquiry publications page of the Committee's website.

EWa numbers are generated by the evidence processing system and so may not be complete.

1   AATF Forum (EWa0030)

2   Amazon (EWa0024)

3   Butler, Scott (EWa0019)

4   Circular Resources UK (EWa0015)

5   City of London Corporation (EWa0003)

6   Conran, Phil (EWa0018)

7   Critical Minerals Association (EWa0034)

8   Defra (EWa0025)

9   Department for Environment Food and Rural Affairs (EWa0010)

10   EEESafe (EWa0002)

11   Electrical Safety First (EWa0008)

12   Environcom (EWa0028)

13   Environcom (EWa0029)

14   Environment Agency (EWa0026)

15   Green Alliance (EWa0032)

16   Green Alliance (EWa0006)

17   In2tec Limited (EWa0014)

18   The Institute of Materials, Minerals and Mining (IOM3) (EWa0016)

19   Law Society of Scotland (EWa0007)

20   LG Electronics (EWa0020)

21   Megson, Colin (EWa0004)

22   Recolight ltd (EWa0027)

23   The Restart Project (EWa0017)

24   Royal Society of Chemistry (EWa0033)

25   Royal Society of Chemistry (EWa0005)

26   Samsung Electronics UK (EWa0021)

27   Stowell, Dr Alison (EWa0011)

28   SWEEEP Kuusakoski (EWa0001)

29   TechBuyer (EWa0023)

30   techUK (EWa0022)

31   Think Plan Win (EWa0031)

32   Valpak Limited (EWa0013)

This inquiry incorporates evidence from a similar inquiry launched but not concluded by the Environmental Audit Committee in the previous parliament: HC 87, Session 2019. This can be viewed on the inquiry publications page of the pre-2020 committee's website.

1   AATF Forum (ELE0051)

2   Aldersgate Group (ELE0033)

3   AO.com (ELE0021)

4   B2B Compliance (ELE0034)

5   BEAMA Ltd (ELE0041)

6   City University (ELE0036)

7   Comply Direct Ltd (ELE0039)

8   Professor Tim Cooper (ELE0022)

9   Cumbria Recycling Limited (ELE0031)

10   Defra (ELE0048)

11   Dixons Carphone plc (ELE0010)

12   Ecosurety (ELE0035)

13   EEESafe (ELE0050)

14   Electrical Safety First (ELE0037)

15   Mr Mark Else (ELE0029)

16   Environcom (ELE0006)

17   Environmental Services Association (ELE0026)

18   Fair Trade Recycling [WR3A] (ELE0004)

19   Fidra (ELE0052)

20   FKA Brands Ltd. (ELE0014)

21   Green Alliance (ELE0023)

22   Mr Laurence Green (ELE0001)

23   HP Inc (ELE0011)

24   JTA (ELE0045)

25   LARAC ELE0019

26   London Waste and Recycling Board (ELE0016)

27   Dr Sharali Malik (ELE0030)

28   National Association of Waste Disposal Officers (NAWDO) (ELE0009)

29   Portable Electric Tool Manufacturers Association (ELE0024)

30   REPIC LTD (ELE0027)

31   Resource Recovery from Waste (ELE0046)

32   Royal Society of Chemistry (ELE0047)

33   Edward Russell-Johnson (ELE0002)

34   Sussex Energy Group, University of Sussex (ELE0013)

35   Techbuyer (ELE0005)

36   techUK (ELE0044)

37   The Geological Society (ELE0038)

38   The Restart Project (ELE0043)

39   University of Derby (ELE0017)

40   UNTHA UK (ELE0020)

41   Valpak Retail WEEE Services (ELE0032)

42   Veolia (ELE0042)

43   Viridor (ELE0018)

44   WEEE Forum (ELE0040)

45   WEEE Fund (ELE0015)

46   WEEE Scheme Forum (ELE0025)

List of Reports from the Committee during the current Parliament

All publications from the Committee are available on the publications page of the Committee's website.

Session 2019–21

Number	Title	Reference
First Special Report	Invasive species: Government response to the Committee's First report of Session 2019	HC 332
Second Special Report	Our Planet, Our Health: Government Response to the Twenty-First Report of Session 2017–19	HC 467