FAST PHONES

PRACTICAL SOLUTIONS TO ADDRESS THE UK'S MOBILE PHONE E-WASTE CHALLENGE

WWF

Acknowledgments

This report has been produced by Resource Futures on behalf of WWF-UK, commissioned through the WWF Vodafone Partnership. The partnership aims to collect one million phones for the planet, use technology to help overcome sustainability and conservation challenges, and help people make more sustainable choices.

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Click here for more information about the WWF Vodafone partnership.

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WWF is one of the world's largest and most experienced independent conservation organizations, with over 5 million supporters and a global network active in more than 100 countries. WWF's mission is to stop the degradation of the planet's natural environment and to build a future in which people live in harmony with nature.

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FOREWORD

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KATE NORGROVE

EXECUTIVE DIRECTOR OF CONSERVATION, ADVOCACY AND POLICY AT WWF-UK

The world is facing a planetary crisis driven by climate change, biodiversity loss, pollution and waste.[1] From the food we eat to the products we buy and use, we urgently need to put production and consumption onto a sustainable footing, by bringing our use of natural resources into line with planetary boundaries.

Only by doing this can we protect and restore precious habitats all over the world, and slash greenhouse gas emissions in line with vital climate targets, helping to protect the planet and bring our world back to life.

Every sector has a part to play in addressing the triple planetary crisis, including the technology sector. Technology can be part of the solution, but currently it's a significant part of the problem.

Mobile phones are an example of how precious resources are extracted, used and discarded as waste on a large scale. And the increasing rate of mobile phone consumption continues to drive the need for the virgin raw materials required for smart devices. This cycle further fuels the climate crisis and results in biodiversity loss through emissions associated with mining, processing and manufacturing, also disrupting sensitive ecosystems and impacting the quality of life for local communities living in regions where mobile phone supply chain activities occur.

To address these impacts, this report focuses on mobile phones and includes research to show how circular economy approaches can support the UK to reduce its overall consumption of the precious materials vital for these technologies and help to deliver a zero-waste world, setting out some of the barriers, and identifying recommendations to support this shift.

This is a key focus of the WWF Vodafone partnership. We've joined forces to use technology to help overcome sustainability challenges, help people and businesses make more sustainable choices and – to directly encourage the shift towards a circular economy approach – collect one million phones for the planet, through trade-in and donations.

We must act with urgency to address unsustainable consumption, encouraging businesses to adopt more circular business models, urging governments to implement policies that drive the circular economy, and increasing awareness of the value of these resources, which are all too often discarded as waste. This is essential in order to accelerate the shift towards a model of consumption that better supports people and planet.

TECHNOLOGY CAN BE PART OF THE SOLUTION, BUT CURRENTLY IT'S A SIGNIFICANT PART OF THE PROBLEM.

As our society becomes increasingly digital the demand for devices is growing at a significant pace, creating an e-waste problem that will need both environmental and social solutions to solve it.

We firmly believe that everyone should have access to connectivity. It's not a luxury in our everyday lives anymore, it's an essential. People use it to access vital services like healthcare and education, contact loved ones and feel part of communities. But we cannot ignore the impact higher consumption rates of electronic equipment are having on our planet. We need to make this access as sustainable as possible.

We have a responsibility to help create a circular economy for devices in the UK, whilst providing customers with access to the devices they want, from phones and accessories to routers, fixed and IoT equipment that Vodafone commissions.

As part of our own efforts to reduce and ultimately eliminate waste, we already reuse, resell or recycle over 99% of our network waste.

However, we know larger changes beyond our own operations are needed to power the UK's circular mobile economy. This is why we are continuing to grow our refurbished device range for both consumers and businesses and have seen sales increase 83% in the last year. Our climate and waste targets are ambitious, and we take waste management seriously.

Whilst many of the solutions to the waste problem already exist, barriers to scaling these solutions across the UK persist. At the heart of the issue is a lack of public awareness and infrastructure to enable consumers to conveniently recirculate good quality devices, and an absence of tax support to encourage businesses to promote new value propositions.

By partnering with WWF, it is our aim that the research in the Fast Phones report will not only highlight the scale of the issue of the waste but also showcase how we can work together across the tech industry, retailers, suppliers and consumers to foster a circular economy.

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NICKI LYONS

CHIEF CORPORATE AFFAIRS AND SUSTAINABILITY OFFICER AT VODAFONE UK

WE HAVE A RESPONSIBILITY TO HELP CREATE A CIRCULAR ECONOMY FOR DEVICES IN THE UK

EXECUTIVE SUMMARY

Mobile phones have become a critical tool in modern society. Providing connectivity at home, at work and on-the-go, they are now indispensable to many, and access to mobile technology is essential for multiple facets of daily life. Advances in digital technologies and the desire to keep up with the pace of technological advancement, is not only driving increases in mobile phone consumption but also the speed at which they are replaced. The result is an escalation in electronic waste (e-waste), and the emergence of a "Fast Phones" culture that has impacts on our natural environment and human health.

In response to the emergence of this fast phones phenomenon, WWF-UK, in partnership with Vodafone, commissioned research into consumer, business and industry behaviours across the lifecycle of a mobile phone.

This report outlines the results of that research, undertaken by environmental consultancy Resource Futures, and – looking across a mobile phone's lifecycle from design and production through to disposal – outlines the current context of mobile phone e-waste. It also highlights opportunities to address this growing challenge and sets out recommendations for the mobile sector and policymakers to act to help address this issue, as part of wider efforts to tackle the climate and nature emergency.

Findings show that – despite more than half of UK adults agreeing that electronic waste from mobile phones and related accessories is a problem in the UK (see Appendix - Q20) – there are an estimated 12 million unused mobile phones stored indefinitely in homes across the country, representing a significant wasted resource. Unless we all pull together to support circular economy approaches which will reduce our overall consumption of precious resources, such as reuse, refurbishment and recycling of mobiles devices, will continue to put pressure on finite natural resources required for phone manufacture.

It is clear that addressing the climate and nature impacts of mobile phones, both in terms of their production and disposal, will require a shift towards a circular economy, where products and materials are designed, used and reused to deliver the highest value and lowest environmental impact.

We need a circular economy for mobile phones that fully addresses issues related to e-waste whilst still supporting the need to stay connected and maximising the enjoyment of being a digital citizen.

12 MILLION UNUSED MOBILE PHONES STORED INDEFINITELY IN HOMES

KEY RECOMMENDATIONS

All actors can play a role in disrupting the status quo, including the mobile phone industry, users of mobile phones (individuals and businesses), and through policy action by UK Governments. Key recommendations are set out below, and full details are provided in Section 4.

1 **Establish safe and convenient opportunities for consumers to return phones for reuse, refurbishment or recycling.** For example, mobile network operators working with local authorities to teach residents about how to securely data wipe smart devices, including mobile phones, prior to placement in kerbside collections (where available) or in network retailer stores, alongside creating secure collection routes for smart devices with grassroots partners who provide usable tech resources that can be put towards tackling digital poverty.

2 **Introduce ratings, improved standardisation, and best-practice across the industry to ensure reliability and durability of phones.** For example, introduction of comparison tools like Eco Rating at point of sale; improved standards and warranties; introduction of accreditation for data wiping services.

3 **Improve access to repair services.** Introduction of 0% VAT on repair services and parts to help reduce prices and improve accessibility; ensuring repairs by non-accredited repairers are accepted under manufacturing warranties; mandating the provision of spare parts at reasonable prices; and inclusion of the cost of servicing and repair into mobile phone contracts and clear guidance from providers on how to access repair services.

4 **Network operator targets to drive use of refurbished phones.** Change can be driven through, for example: incentivising business customers to purchase refurbished devices; making refurbished phones the default choice on all contracts; and introducing targets to drive sales of refurbished phones as a percentage of overarching sales.

5 **Greater regulation of e-waste.** For example, banning e-waste exports to non-OECD countries (in line with powers in the Environment Act on plastic waste exports), requiring proof that exported e-waste has been responsibly handled by export markets, and accelerating reforms to Extended Producer Responsibility for Waste Electrical and Electronic Equipment (WEEE).

6 **Establish better systems to track and monitor mobile phone e-waste.** The UK must, as a minimum, match and ideally surpass international best practice in this area, with both businesses and policymakers seeking to ensure e-waste is regulated meaningfully and transparently. For example, mandating businesses to report on product waste at each stage of the supply chain. Additionally, businesses are required to report on the carbon impacts of the technology they use for Scope 3 GHG emissions reporting. This includes accounting for the impacts of end-of-life management of the technology they use. So efforts to minimise the amount of phone and other technology waste would contribute to decarbonisation efforts.

7 **Awareness-raising campaigns across the mobile phone industry.** Whilst UK consumers are aware of issues around the climate crisis, biodiversity loss, pollution and waste, many do not consider the impact of phone consumption as a contributor to this. Other actors must be the driving force for sustainability, particularly government policymakers, mobile phone network operators and mobile phone manufacturers and retailers.

ACRONYMS

AGEC Law	Anti-Gaspillage et Economie Circulaire / anti-waste law for a circular economy
CRMs	Critical raw materials
CSR	Corporate social responsibility
DMU	Digital Markets Unit
EEE	Electrical and Electronic Equipment
EPR	Extended Producer Responsibility
ESG	Environmental, Social, and Corporate Governance
HWRC	Household Waste Recycling Centre
LMICs	Low-and Middle-Income Countries
n=	Number of survey respondents to a given question (i.e. sample size)
OECD	Organisation for Economic Co-operation and Development[1]
OFCOM	Office of Communications, the UK's communications regulator[2]
NFP	Not-for-profit
PCS	Producer Compliance Scheme
POM	Placed on market
R&D	Research and Development
WEEE	Waste Electrical and Electronic Equipment

1 Organisation for Economic Co-operation and Development. Link. [Accessed 17/12/2024]
2 OFCOM Link. [Accessed 17/12/2024]

1 INTRODUCTION

Mobile phones are now widely established as a critical tool in our modern society. By enabling connectivity across all facets of daily life, including at home, at work and on-the-go, mobile phones are now considered indispensable to many.

Increased mobile phone consumption, driven by advances in digital technologies and the desire to keep up with the pace of technological advancement, is driving up volumes of electronic waste. The emergence of a throwaway "Fast Phones" culture is causing wider impacts on our environment and human health impacts arising from mismanaged e-waste, thereby contributing to the climate and nature emergency.

Electronic waste, commonly referred to as e-waste, is any waste deriving from products with electronic components including plugs and cords. Mobile phones are just one source of e-waste, alongside other items like televisions, computers and home appliances. E-waste is also commonly referred to in the waste sector as Waste Electrical and Electronic Equipment (WEEE). Usable electronic items are similarly referred to as Electrical and Electronic Equipment (EEE).

A "FAST PHONES" CULTURE IS CAUSING ENVIRONMENTAL AND HUMAN HEALTH IMPACTS

OPPORTUNITIES TO ADDRESS THE ISSUES OF FAST PHONES AND E-WASTE

A circular economy is one where products and materials are designed, used and reused to deliver the highest value and lowest environmental impact.[3] We need a circular economy for mobile phones that fully addresses issues related to e-waste whilst still supporting the need to stay connected and maximising the enjoyment of being a digital citizen.

Transitioning to a circular economy is achieved through measures such as eco-design, prolonging product lifespans, maintenance, reuse, remanufacturing and more. The adoption of a circular economy approach also brings other benefits such as high skilled jobs in innovation, design, and repair; improved resource security,[4] and reduced reliance on goods that can be affected by supply chain disruption and potential geopolitical instability. Circular economy principles apply well to high-value goods and can also support affordable access to higher-quality products that last longer and retain a higher resale value.[5]

Sustainable business models that address excessive consumption patterns contributing to e-waste issues already exist and these business models are primed for greater adoption. These models include the sale of refurbished phones, modular phone manufacturing, and repair/leasing options. These models not only provide a route to boost brand reputation but also to generate new revenue streams, setting responsible companies apart from the competition. Successful adoption of circular models by business will bolster corporate social responsibility (CSR) and environmental, social, and corporate governance (ESG) goals. There are also significant financial opportunities, for example a recent study estimates that high street retailers are missing out on up to £850 million by not selling refurbished and repaired electronics.[6]

These business models can also support those affected by the cost-of-living crisis and help bridge the digital divide.[7] Research for this report has indicated that improving access to repair services will extend the lifespan of phones and avoid the need for consumers to spend money on new devices. Phones that last longer and a system that encourages and enables reuse will mean that second-hand phones donated through charities or business charity partnerships can go even further to support those experiencing poverty and help reduce the digital divide in the UK. This is crucial when 7% of UK adults have limited to no access to the internet due to not owning a smartphone or other IT equipment at a time when vital services and support networks are increasingly moving online.[8] The current partnership between Vodafone and Good Things Foundation that encourages the donation of devices for reuse is an example of such a model[9]

3 Ellen Macarthur Foundation. Link. [Accessed 17/12/2024]

4 For example, of critical minerals. [Accessed 17/12/2024]

5 Ellen McCarthur Foundation (undated). The circular economy in detail. Link. [Accessed 17/12/2024]

6 Circular (2023). Physical retailers could raise £850m in refurbished goods sales Link [Accessed 17/12/2024]

7 Digital Poverty Alliance. Link. [Accessed 17/12/2024]

8 Ofcom (2022). Digital exclusion: A review of Ofcom's research on digital exclusion among adults in the UK Link [Accessed 17/12/2024]

9 Good Things Foundation (2024). Highlighting the 'connectivity gap' with Vodaphone Link [Accessed 13/03/2025]

HIGH STREET RETAILERS ARE MISSING OUT ON UP TO £850 MILLION BY NOT SELLING REFURBISHED AND REPAIRED ELECTRONICS

2 THE SCALE OF THE UK'S E-WASTE PROBLEM

Available data shows the UK to be among the top e-waste producers in the world.
According to the Global E-Waste Monitor 2022, the UK generated the third highest amount of e-waste per capita in the world in 2022 (24kg)[10]. This is significantly higher than the global average of 7.8kg per capita and also higher than the average per capita in Europe (17.6kg), the region with the highest levels of e-waste generation.[11] This resulted in a total of 1.7 million tonnes (MT) of e-waste generated, placing the UK third behind Germany (1.8MT) and Russia (1.9MT) in Europe.[12] This makes the country a significant contributor to the problems associated with e-waste.

The amount of e-waste collected for recycling in the UK has decreased over time.
Household WEEE recycling tonnages peaked in 2016, and all other non-household WEEE recycling (i.e. anything not collected from kerbside or multiple unit blocks (flats)) decreased by 57% between 2013 and 2022.[13] This decline has likely been impacted by the COVID-19 lockdowns, rising inflation, and the cost-of-living crisis, although some experts argue comparing recent recycling rates is an inadequate view as it fails to take into account changes in repair and reuse.[14] Further, because e-waste is measured as a weight-based assessment, the decrease may also be linked to product lightweighting (particularly on smartphones and laptops[15]), which itself could lead to reduced waste tonnages. The lack of empirical data on the reasons behind this decline in WEEE recycling is problematic as it limits our ability to take informed action.

The proportion of e-waste that comprises mobile phones is unknown.
The Environment Agency's IT and Telecoms Equipment data category shows that IT and telecoms equipment amounted to just 8% of separately collected household WEEE in 2022.[16] Due to the lack of granular detail, it is not possible to say what proportion of this is made up of mobile phones as parties are not currently required to publish this data under the WEEE regulations. Although phones make up a relatively small proportion compared to other electronic devices, they are typically replaced more frequently.[17] Also, unlike larger WEEE items, waste from mobile phones and accessories is more likely to be disposed of in the residual or metal waste streams.[18] This is problematic as, if disposed of inappropriately, they risk causing fires,[19] plus the opportunity to refurbish them, and retain the critical raw materials within them, is lost.

THE UK GENERATED THE THIRD HIGHEST AMOUNT OF E-WASTE PER CAPITA IN THE WORLD IN 2022 (24KG)

10 Global E-Waste Statistics Partnership (2022). The Global E-waste Monitor 2022. Link. [Accessed 16/10/2024]
11 Global E-Waste Statistics Partnership (2022). The Global E-waste Monitor 2022. Link. [Accessed 16/10/2024]
12 Global E-Waste Statistics Partnership (2022). The Global E-waste Monitor 2022. Link. [Accessed 16/10/2024]
13 Environment Agency (2023). WEEE collected in the UK. Link. [Accessed 17/12/2024]
14 Materials Recycling World (2022). WEEE tonnage data 'less relevant' as reuse increases. Link. [Accessed 17/12/2024]
15 Interview with Beyondly Compliance Scheme, May 2023
16 Environment Agency (2023). WEEE collected in the UK. Link. [Accessed 17/12/2024]
17 Interview with Green Alliance, June 2023
18 Repic (2022). WEEE and battery kerbside collection service sees significant uplift. Link. [Accessed 17/12/2024]
19 LetsRecycle (2022). Batteries cause 'three times more' waste fires than thought. Link. [Accessed 17/12/2024]

THE UK IS ONE OF THE LARGEST EXPORTERS OF E-WASTE IN THE WORLD

Available data relating to volumes of mobile phone e-waste in the UK are sparse and incomplete. Mobile phones can be recycled or disposed of via multiple channels, but they may also be stored indefinitely (alongside other electricals) or passed on to other users by the owner.[20] Sparse data is available on a few recycling and disposal channels, thereby making it hard to see the full picture of mobile phone e-waste in the UK. For example:

- A review of waste composition analyses conducted by Resource Futures,[21] where the standard research protocol includes a separate category for mobile phones, suggests that 810 tonnes of mobile phone e-waste, equivalent to approximately 11.1 million phones, entered the UK's municipal solid waste stream[22] in 2020.[23]
- Analysis of WEEE flows in the UK from 2017 suggests a higher quantity of mobile phone e-waste when including other channels, with 1,035 tonnes sent to recycling and 871 tonnes of mobile phones stored indefinitely at home.[24] This is equivalent to 14.2 million and 12 million phones, respectively.

This lack of granular reporting limits the ability to tackle the problem as, without a better understanding of the volume of mobile phone waste entering the system, it is difficult to understand what happens to phones once the final owner is finished with them (i.e. when they reach the end of their "use life"). It also restricts understanding of what level of infrastructure is needed to better manage the waste, and, importantly, how to support consumers to adopt more circular and sustainable behaviours.

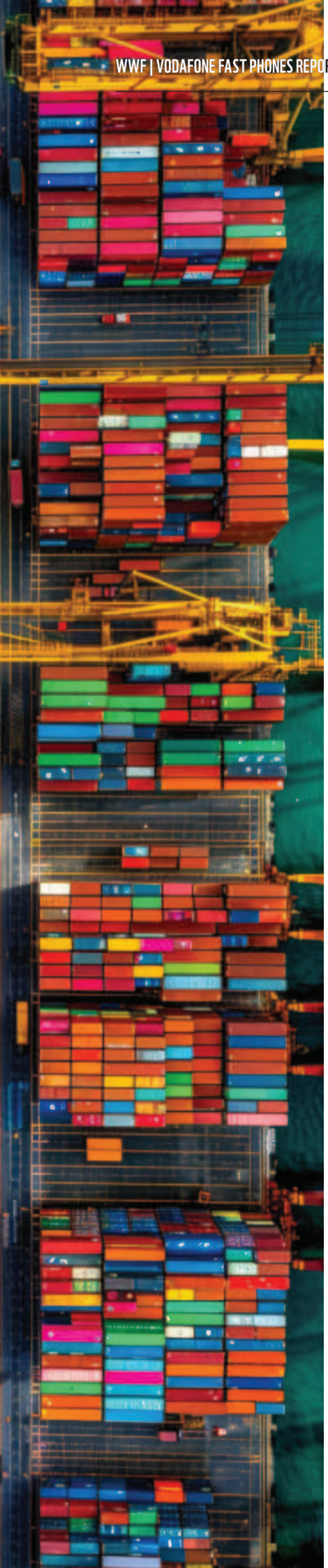
20 Material Focus (2022). 39 million tech items are hoarded in UK homes including £1.5 billion worth of working laptops that could be resold. Link. [Accessed 17/12/2024]

21 New analysis for this study using granular data from municipal solid waste composition studies conducted in the UK by Resource Futures.

22 Municipal solid waste streams refer to the total collected from kerbside residual waste, mixed dry recycling, food waste, and residual waste and recycling collected at household waste recycling centres (HWRC).

23 Calculation based on the average total weight of a smartphone as 72.82g, Singh et al. (2018). Characterizing the Materials Composition and Recovery Potential from Waste Mobile Phones: A Comparative Evaluation of Cellular and Smart Phones. Link. [Accessed 17/12/2024]

24 Anthesis (2020). An independent study on Waste Electrical and Electronic Equipment (WEEE) flows in the UK. Link. [Accessed 17/12/2024]



E-waste exports of mobile phones from the UK are not well understood or quantified. Whilst literature is available on the transboundary movement of e-waste, granular details are unavailable for mobile phone e-waste specifically. None of the stakeholders interviewed could give a definitive answer as to where mobile phones are exported. This inability to estimate export figures accurately was highlighted in a recent article by the United National Institute for Training and Research, where misaligned export data, incomplete reporting and incorrect e-waste categorisations were stated as reasons why there is limited knowledge in this area.[25] Lack of available data and the fragmented nature of it has also been attributed to the large number of players operating in the export chain.[26] Therefore, increased visibility of all players operating in this area, along with a requirement for transparency in data reporting, are necessary to enable a greater understanding of the situation and increase the ability to reduce the resulting environmental and social impacts associated with e-waste exports.

Export of non-functional e-waste from the UK to Low-and Middle-Income Countries (LMICs) is illegal under the WEEE Regulations,[27] but this practice still occurs. Waste management infrastructure in these regions is often limited, thus resulting in waste not being managed effectively and leading to negative impacts on the environment and local communities. The UK is one of the largest exporters of e-waste in the world[28] and has been identified as the worst offender in Europe for illegal e-waste exports to developing countries.[29] Whilst it remains legal to export used e-waste to LMICs if the item can be reused or refurbished,[30] this can enable illegal exports of non-functional waste exports through misclassification of that waste.[31] Given the scale of monitoring and enforcement activities of all shipments, the Environment Agency is very stretched in this area,[32] [33] and there are not enough resources to thoroughly check what is being exported and what condition it is in.[34] These practices can cause significant social and environmental harm in developing countries often due to lack of adequate facilities to manage the waste upon receipt. The Environment Agency is responsible for auditing waste exports, and since 2013-14, between 200 and 500 containers have not been exported following inspections.[35]

25 United National Institute for Training and Research (2022), Transboundary E-waste Flows. Link. [Accessed 17/12/2024]

26 Interview with a Beyondly, May 2023

27 The Waste Electrical and Electronic Equipment Regulations 2013 (WEEE) Link. [Accessed 17/12/2024]

28 House of Commons Environmental Audit Committee 2021, Electronic Waste and the Circular Economy. Link. [Accessed 17/12/2024]

29 House of Commons Environmental Audit Committee 2021, Electronic Waste and the Circular Economy. Link. [Accessed 17/12/2024]

30 Interview with Valpack and ByteBack, May 2023

31 United Nations University (2013). Toxic E-Waste Dumped in Poor Nations, Says United Nations. Link. [Accessed 17/12/2024]

32 UK Government (2021). Environment Agency 2020 data on regulated businesses in England. Link. [Accessed 17/12/2024]

33 UK Government (2021). Policy Paper: Waste Management Plan for England 2021. Link. [Accessed 17/12/2024]

34 Interview with ByteBack, May 2023

35 NAO (2022). Investigation into government's actions to combat waste crime in England. Link. [Accessed 17/12/2024]

SOCIETY ALSO NOW RELIES ON PORTABLE DEVICES TO KEEP UP WITH THE PACE OF TECHNOLOGICAL ADVANCEMENTS ACROSS ALL TOUCHPOINTS OF PEOPLE'S DAILY LIVES

Trading phones for reuse from developed to emerging markets.
The impact of this practice is not well understood as many trading activities occur within the informal waste sector value chain.[36] The real figures for functional second-hand e-waste being exported are not known.[37] The positive and negative impacts of exports from countries such as the UK must be carefully weighed up, factoring in both environmental and social impacts, to mitigate the risk of exported used goods undermining domestic markets in the receiving countries. For example, it is thought that second-hand, high-end mobile phones from high-income countries could compete with mid-tier and budget devices in India where market penetration of smartphones remains low.[38] Furthermore, exported phones will eventually become e-waste in those countries where waste management systems are less able to deal with the waste effectively. Whilst the e-waste sector is an important income source for hundreds of thousands of informal workers in developing countries, such e-waste work often carries a higher risk to human health, the environment, and can involve child labour.[39]

Mobile phones have become an indispensable feature of modern life but there is increasing digital poverty.
The diverse functionality provided by smartphones increases their role in everyday activities, making them indispensable for many and increasing the strength of personal connection beyond typical electronics ownership[40]. Society also now relies on these portable devices to keep up with the pace of technological advancements across all touchpoints of people's daily lives.

Barriers to mobile phone ownership can result in digital poverty, resulting in inequity in accessing services. For example, the shift to virtual consultations at some doctors' surgeries has been shown to shut out vulnerable groups, including homeless populations;[41] and online-only discounts disadvantages those without internet access.

As modern life increasingly requires people to have access to mobile devices, any attempts to shift mobile phone behaviours with a view to achieving improved environmental and social benefits must support a beneficial relationship between owner and phone.

In the context of growing digital poverty, it is even more important to reduce the number of functional mobile phones going to waste when they could be passed on to support those who need them.

36 Abalansa, S. et al. (2021). Electronic Waste, an Environmental Problem Exported to Developing Countries: The GOOD, the BAD and the UGLY, Sustainability. Link. [Accessed 17/12/2024]]

37 United National Institute for Training and Research, 2022, Transboundary E-waste Flows. Link. [Accessed 17/12/2024]]

38 Green Alliance (2015). A circular economy for smart devices opportunities in the US, UK and India. Link. [Accessed 17/12/2024]]

39 Abalansa, S. et al. (2021). Electronic Waste, an Environmental Problem Exported to Developing Countries: The GOOD, the BAD and the UGLY, Sustainability. Link. [Accessed 12/08/2023]

40 BBC (2023). The surprising ways cellphones have changed our lives Link. [Accessed 17/12/2024]]

41 BMA (2021). Access to care: bridging the digital divide. Link. [Accessed 17/12/2024]

3 CONSUMER INSIGHTS

3.1 CONSUMER BEHAVIOUR

A better understanding of the current mobile phone economy and consumer priorities can inform the design of more effective circular economy solutions and help build on existing opportunities. This section explores consumer related barriers and enablers. Some of the findings below are drawn from a consumer survey conducted specifically to inform this research. Full survey results can be found in the Appendix.

3.1.1 DISPOSAL BEHAVIOURS AND MOTIVATIONS

Over 60% of respondents either keep or donate their mobile.

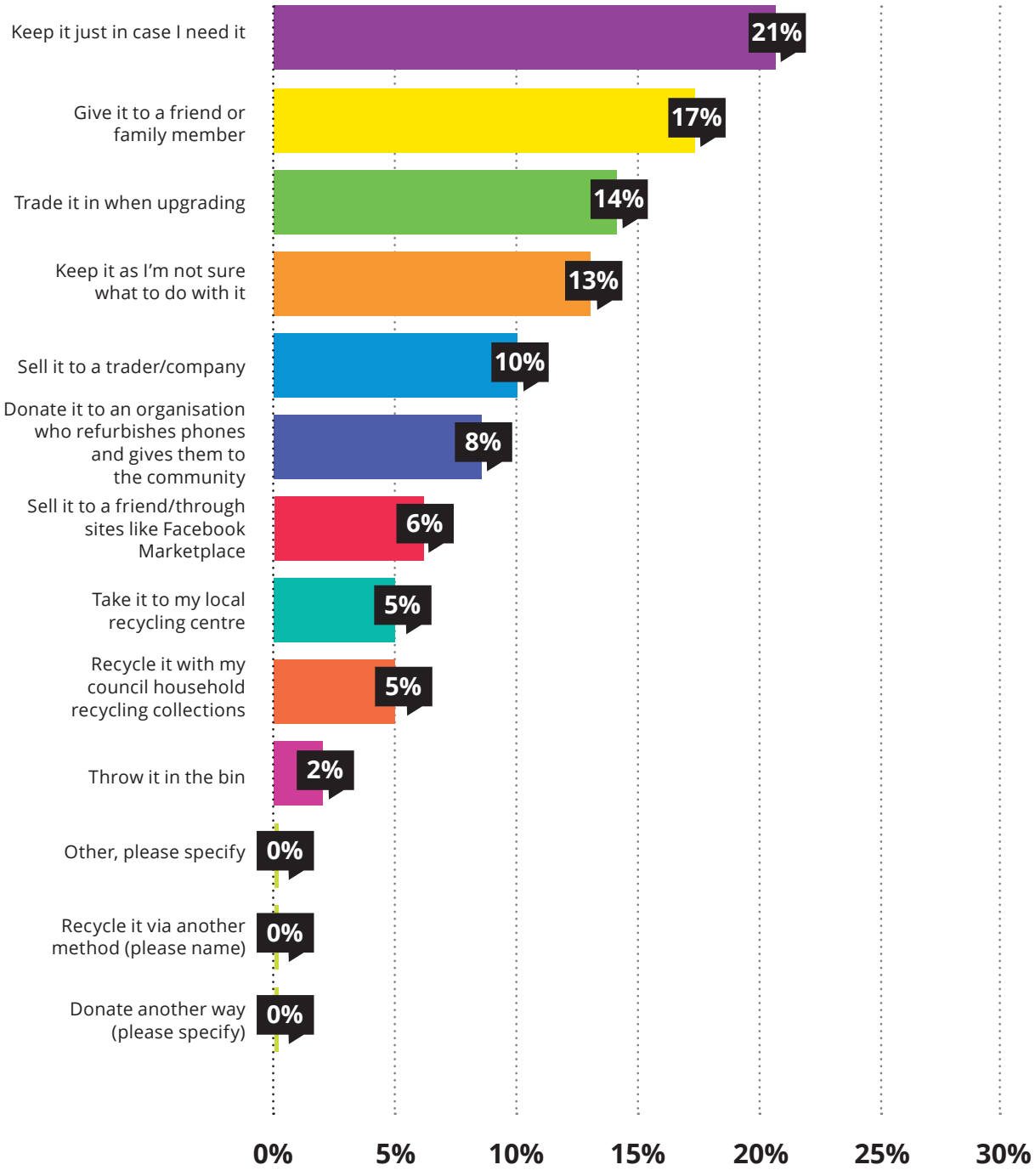
Our consumer survey asked what people were most likely to do with their mobile phone when they no longer need it. Of 1,882 respondents, only 10% said they would recycle it (Figure 1). This result does not tally with estimated mobile phone recycling rates as outlined in section 2, indicating there is limited understanding of consumer disposal behaviours.

By comparison, our survey results back up findings outlined in section 2 where estimates indicate a comparatively high volume of mobile phones are being stored indefinitely by consumers. The top three responses of what people do with phones they no longer require (Figure 1) were to “keep it just in case I need it” (21%), to “give it to a friend or family member” (17%) and to “trade it in when upgrading” (14%). This highlights an opportunity to influence consumer behaviour shifts to be more in line with circular economy principles.

21% OF PEOPLE KEEP THEIR OLD PHONE JUST IN CASE THEY NEED IT

F1 WHEN THEY NO LONGER WANT THEIR MOBILE PHONE, THOSE WHO SAID THEY REPLACE IT ARE MOST LIKELY TO...?

Consumer survey Q11, n=1882, single response



See Appendix for all consumer insights.

The survey also provides insights into the various drivers of consumer behaviour when they no longer want their mobile phone (Figure 2). Selecting up to 3 answers, the most common drivers for the survey respondents were "convenience" (35%), "financial incentive" (31%) and a "sense that the phone might be needed in the future" (30%). Also of note are the data security concerns (selected by 28% of those surveyed.) This demonstrates the main barriers currently preventing consumers from engaging with reuse and other circular economy options, and the levers such schemes will need to pull on (convenience, financial incentives etc.) to deliver high consumer participation.

Cost and convenience were found to be particularly strong factors in the survey responses. Survey respondents who reported having made certain choices (phone repair, trade-in, etc.) were asked the main motivation behind their actions, with "financial reasons" or "convenience reasons" being selected by:

64% of people who had their phone repaired (n=583).[42]

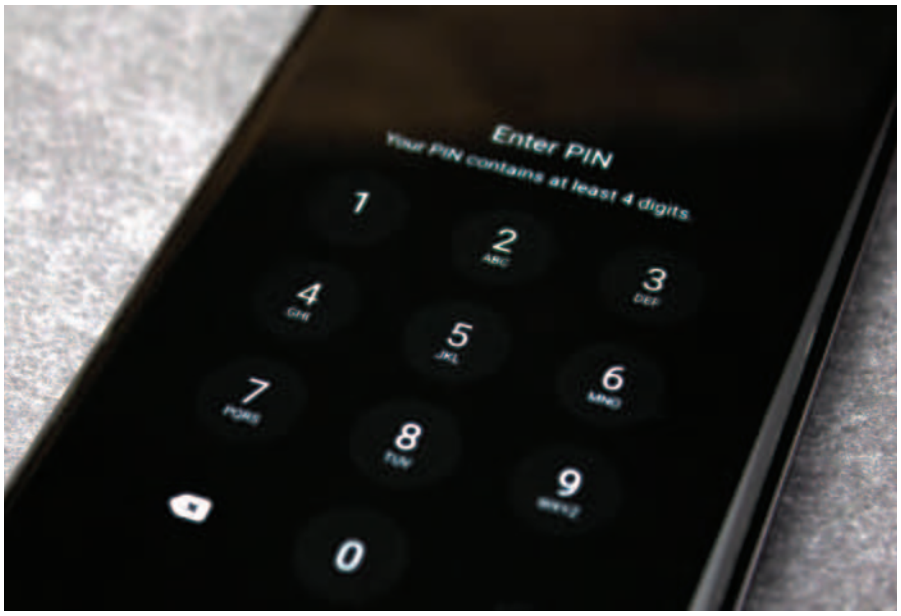
74% of people who bought a second-hand phone (n=524).[43]

75% of people who sold their phone to another user (n=501).[44]

72% of people who traded in their phone with their network or phone manufacturer (n=464).[45]

66% of people when determining what they will do with their phone once they no longer want it (n=1882).[46]

This suggests that to encourage more sustainable purchasing and disposal behaviours, financial incentives, including affordability and convenience, must be prioritised. The only behavioural option which was not predominantly influenced by cost or convenience was donating a phone, which was motivated by environmental (29%) or social responsibility (35%) drivers (n=421).[47]



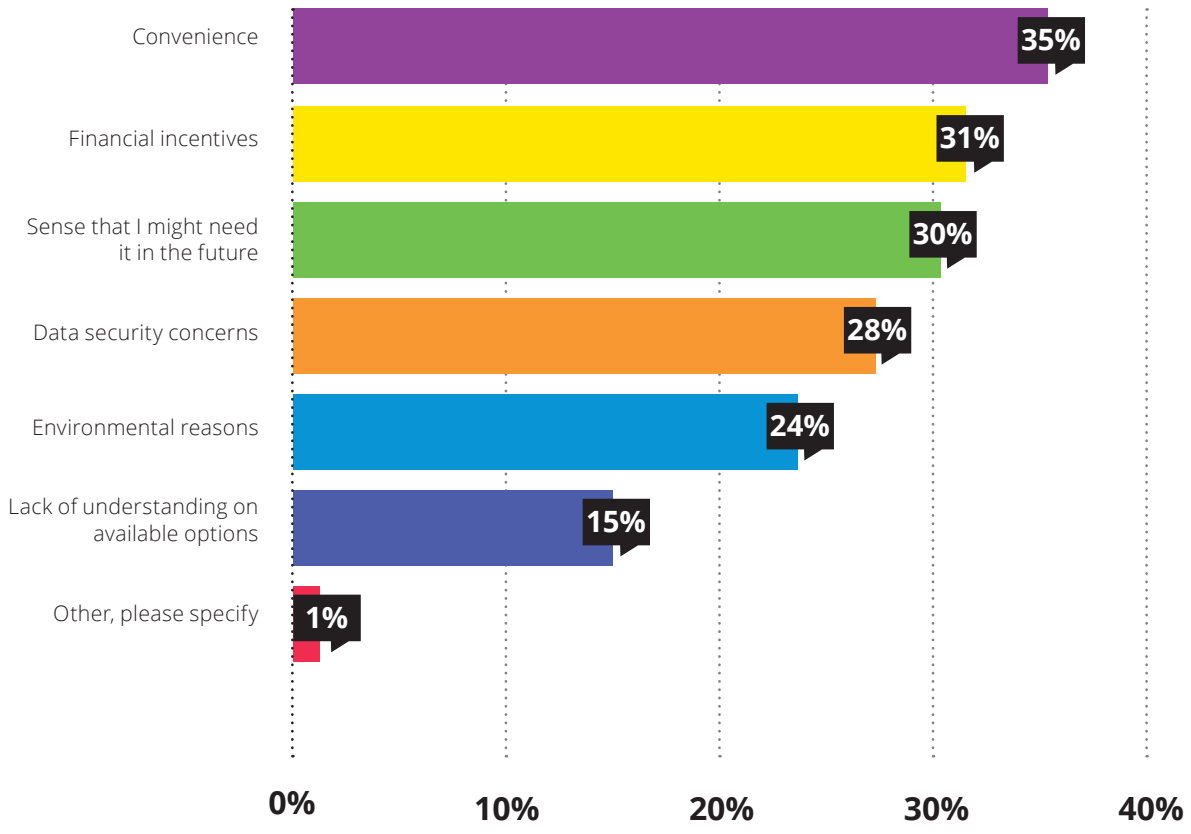
#8 28% OF PEOPLE KEEP THEIR OLD PHONE DUE TO DATA SECURITY CONCERNS

42 Resource Futures consumer survey results, Q4
43 Resource Futures consumer survey results, Q4
44 Resource Futures consumer survey results, Q4
45 Resource Futures consumer survey results, Q4
46 Resource Futures consumer survey results, Q12

F2

KEY FACTORS IN DETERMINING WHAT PEOPLE WHO REPLACE THEIR PHONES DO WHEN THEY NO LONGER WANT THEM

Consumer survey Q12, n=1882, up to three responses



See Appendix for all consumer insights.

3.1.2 LOW AWARENESS OF ENVIRONMENTAL AND SOCIAL IMPACTS OF MOBILE PHONES

Over 80% of respondents were unaware of a mobile phone's supply chain.

There is currently low awareness amongst consumers of the impacts of mobile phones, including both social and environmental issues. The consumer survey results shown in Figure 3 demonstrates this lack of awareness. When individuals were asked which factors they had considered in relation to their mobile phones, 65% of those surveyed had never considered any impacts, around 80% had never made the link between their mobile phone consumption (either purchase or use) and the climate and nature crisis, and 83% had never considered the impact of mining activities on local mining communities. This lack of awareness presents a challenge for trying to motivate more sustainable behaviour. But it also presents an opportunity for the sector to highlight these impacts in a sensitive way and positively shift consumption behaviours.

3.1.3 DATA SECURITY

35% of those surveyed would donate their old phones if they had reassurances on data security

The consumer survey results indicate that data security is a key issue for consumers when they finish using a mobile phone. Over a third of those surveyed cited data security as a key concern when deciding what to do with their phone when they no longer want it (n=1882)[48] Respondents expressed a hesitancy to donate their devices for reuse due to a fear their data will not be wiped adequately,[49] but also that reassurance their data would be wiped before the phone was passed on is a factor that could persuade them to donate their phone (15%).[50]

As phones are much easier and quicker to wipe than computers and laptops[51] these results imply a knowledge gap on how to properly manage technology, which once addressed, could lead to increased donations.

LOW AWARENESS OF ENVIRONMENTAL AND SOCIAL IMPACTS OF MOBILE PHONES PRESENTS A CHALLENGE FOR TRYING TO MOTIVATE MORE SUSTAINABLE BEHAVIOURS

48 Resource Futures consumer survey, Q12. Figure 20

49 Interview with ByteBack and The Good Things Foundation, May 2023

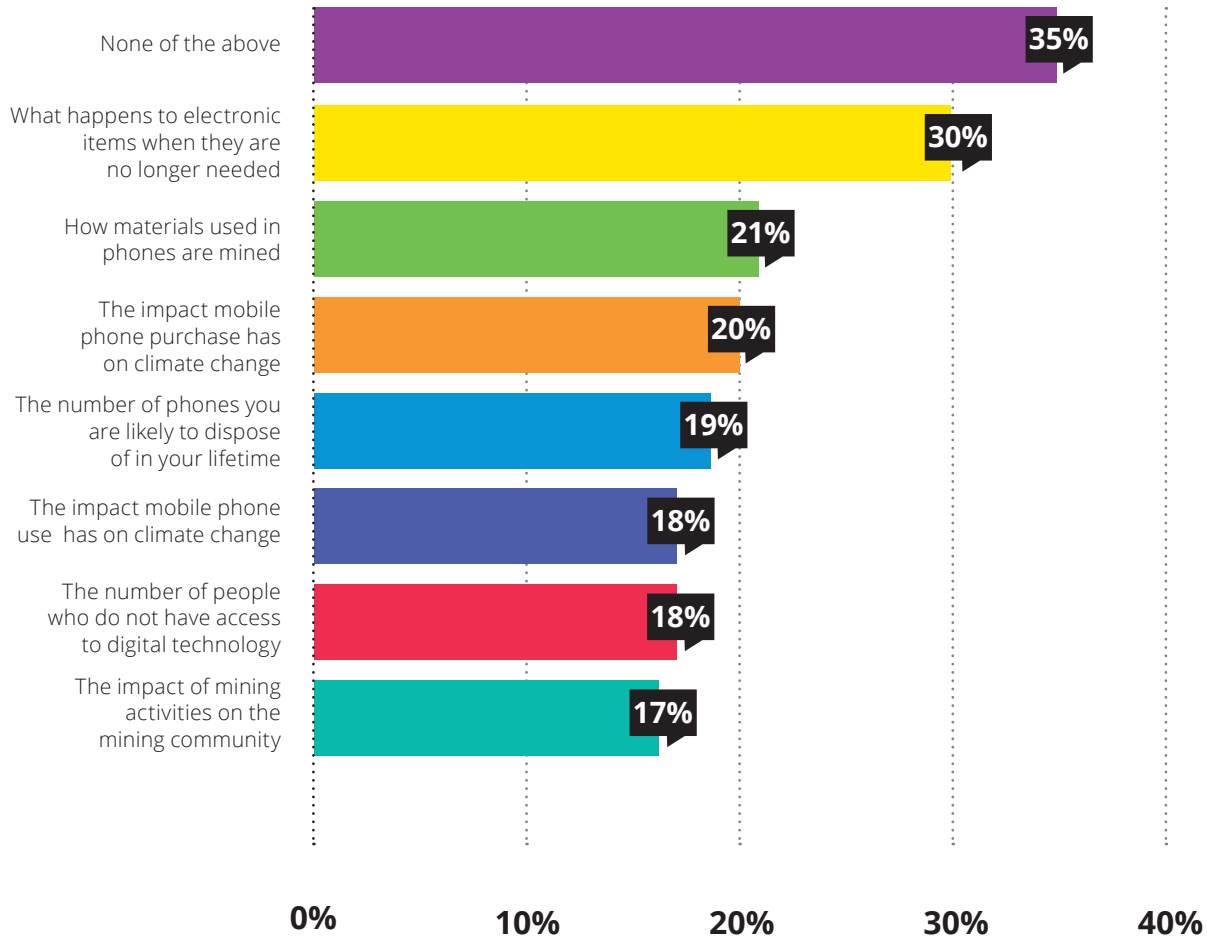
50 Resource Futures consumer survey, Q16. Figure 24

51 Personal communications, The Restart Project, June 2023

F3 FACTORS WHICH INDIVIDUALS HAD CONSIDERED IN RELATION TO MOBILE PHONES.

Q18, n=2001, multiple responses allowed.

Results do not total 100% as more than one option could be selected.



ALMOST HALF OF THE ELECTRICALS SENT FOR RECYCLING COULD BE REUSED, 2.9% OF WHICH WERE MOBILE PHONES

3.2 BARRIERS AND ENABLERS FOR GREATER CIRCULARITY

3.2.1 FINANCIAL AND POLICY INCENTIVES ARE MISALIGNED WITH SUSTAINABLE BEHAVIOURS

Financial and policy incentives in the UK could do more to support and motivate sustainable consumption behaviours and therefore a significant policy shift will be required to drive adoption of circular business practices for e-waste and EEE.

For example:

- There is currently a lack of strong policy signals to incentivise reuse, repair and recycling of mobile phones, and indeed, electronic products overall.[52]
- While there are legal ramifications for failing to comply with WEEE regulations,[53] there is a lack of proper monitoring due to time and resource constraints.[54] Indeed, Northern Compliance Ltd was fined £54,365 in 2019 for their failure to "finance the cost of waste electrical and electronic equipment (WEEE) collection, treatment, recovery and disposal".[55] However, these cases are rare due to the underfunding of government agencies such as the Environment Agency.
- The WEEE regulations have been shown to distract from waste prevention and reuse measures in favour of recycling, which is also limited to easily recoverable materials that represent the greatest mass of the product, such as ferrous metals and polyethylene plastic,[56] and neglects recovery of the critical raw materials.[57] In doing so, the actions with the greatest environmental and social benefit have not been prioritised. Measures proposed in the Government's 2024 consultation on reforming the producer responsibility system for waste electricals and electronic equipment continue to focus on recycling, while the accompanying Call For Evidence introduces measures related to enabling repair and reuse. However, the proposals in the latter will be phased in over a longer period of time [58]
- Financial incentives for replacing mobile phones, such as offers and promotions, encourage the purchase of new devices or the upgrading of old ones for new.[59]
- A recent study from The Restart Project showed that almost half of the electricals sent for recycling could be reused, 2.9% of which were mobile phones.[60]

52 House of Commons Environmental Audit Committee. Electronic waste and the circular economy. First Report of Session 2019-21. Link. [Accessed 17/12/2024]

53 UK Government (undated). Electrical waste: retailer and distributor responsibilities. Link [Accessed 17/12/2024]

54 Interview with Beyondly, June 2023

55 Resource Co. (2019). Recycling business ordered to pay £50K for breaching WEEE regulations. Link [Accessed 17/12/2024]

56 WRAP (2012). Electrical product material composition. Link. [Accessed 17/12/2024]

57 Cole, C. et al. (2019). An assessment of achievements of the WEEE Directive in promoting movement up the waste hierarchy: experiences in the UK. Waste Management (87). Link [Accessed 17/12/2024]

58 Defra (2023). Consultation on reforming the producer responsibility system for waste electrical and electronic equipment 2023. Link [Accessed 06/01/2025]

59 For example, O2's 'Switch Up' campaign: Link. [Accessed 17/12/2024]

60 The Restart Project (2023). What a waste: our study shows almost half of electrical sent for recycling could be reused. Link. [Accessed 17/12/2024]

3.2.2 PHONES DO NOT TYPICALLY HAVE LONG LIFESPANS

Modern mobile phones do not have long lifespans nor, in general, are they designed for repair, reuse nor recycling.[61] Further, the manufacturing process of mobile phones has a pronounced environmental impact, with 79% of the full lifecycle carbon emissions being generated during this phase due to the impact of resource mining and device assembly.[62] A range of barriers currently exist that inhibit consumer adoption of more circular models. For example:

Where manufacturers serialise device parts, this creates a barrier to use of more affordable third-party or reused/refurbished parts. Whilst this protects consumers against the use of low-quality substitutes by third party repairers which could lead to compromised functionality, it also impacts use of high-quality parts which could increase financial accessibility of repair services.

Consumers can be reluctant to approach wider and more affordable repair opportunities due to concerns on how this will impact device warranties.[63]

Consumers can distrust the quality or reliability of third-party repairers as there is no accreditation to legitimise them, despite them often offering much needed accessibility and affordability to repair.[64]

A number of stakeholders interviewed for this research also raised that recycling potential is further limited by the various adhesives used to solder parts together, and the inaccessibility of batteries which make it harder to recover the most valuable materials.[65]

Changes in mobile phone design and manufacturing will therefore be required to open up key downstream circular economy options for mobile phones.

ACCESS TO AFFORDABLE SPARE PARTS COULD BE A KEY MOTIVATOR TO ENCOURAGE PHONE REPAIR

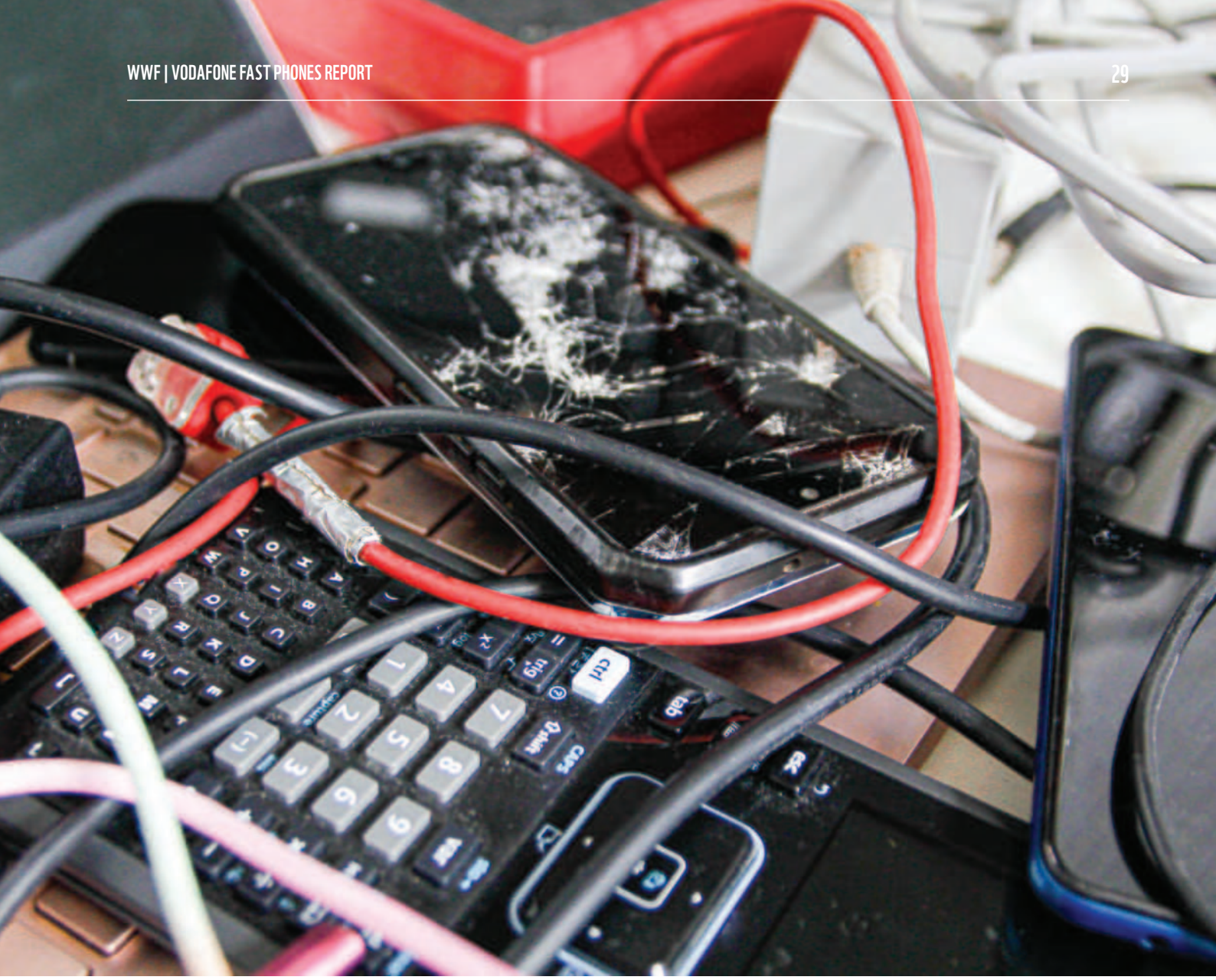
61 Statista. (2023). Average lifespan (replacement cycle length) of smartphones in the United States from 2013 to 2027. Link. [Accessed 17/12/2024]

62 The Restart Project (2021). The environmental impact of our devices: revealing what many companies hide. Link. [Accessed 17/12/2024]

63 Interview with iParts4u, May 2023

64 Interview with SarasFix, May 2023

65 Interviews with SarasFix, iParts4u, Replace Base, Valpak, and research/academic, May and June 2023



3.2.3 REPAIR LACKS CONVENIENCE AND ACCESSIBILITY

Lack of convenience and high repair costs (inaccessibility) are key barriers to consumers prolonging the life of their existing phones. It is increasingly common that devices will be deemed 'beyond economic repair' as the cost of repair exceeds the market value of the product.[66] However, our consumer survey showed that 89% of respondents could be encouraged to repair their mobile phones (n=2001), with the greatest motivator being affordability (38%) followed by knowing the repair would be completed quickly (21%).[67] While some manufacturers are starting to make official spare parts for phone repairs available, they are often priced to discourage repair[68].

Access to affordable spare parts could therefore be a key motivator to encourage phone repair. Vodafone's existing lifetime service promise is a good example of an offer to customers to help extend the lifecycle of a device.[69]

66 Interview with Replace Base, June 2023

67 Resource Futures consumer survey, Q14

68 Personal communications, The Restart Project, May 2023

69 Vodafone (2023). Vodafone launches UK's only Lifetime Service Promise. Link [Accessed 17/03/2025]

3.3 CIRCULAR ECONOMY BUSINESS MODELS

A number of examples of good practice and circular economy business models already operate in the UK. These are explored below and provide a basis upon which to build.

3.3.1 WEEE REGULATIONS

The UK's WEEE regulations designate responsibilities to key stakeholders with the aim of reducing e-waste disposal in landfill.[70] Stakeholder requirements include:

- Producers that place more than five tonnes of EEE on the market annually are required to join a Producer Compliance Scheme (PCS)[71] which ensures they meet WEEE regulatory obligations.[72]
- All businesses are required to recycle and safely dispose of WEEE.[73]
- Distributors of EEE over a certain size (excluding online distributors) have take-back obligations for WEEE.[74] This sits alongside obligations to provide customers with information on these services,[75] the importance of reuse and recycling of WEEE, and the potential harmful impacts of hazardous substances in EEE on human health and the environment.[76]
- Local authorities are not obligated under the WEEE regulation but can voluntarily establish WEEE recycling points at their HWRCs as Designated Collection Facilities in order to receive funding and have the WEEE waste collected and treated free of charge by a PCS.[77]

The Government consultation and call for evidence, which concluded in March 2024, on reforming the producer responsibility system for WEEE includes enhanced obligations, including proposals that require online retailers to comply.

3.3.2 HOUSEHOLD WASTE COLLECTIONS

According to a December 2023 Government impact assessment, 86 local authorities offer kerbside WEEE collections,[78] with the intention of collected items subsequently being processed for recycling. The UK Government has also proposed new measures to extend kerbside collections of small WEEE across all local authorities. While this is a valuable service for much e-waste, uptake of this service in terms of mobile phone recycling currently remains low with only 3% of people recycling phones in this way (Figure 1). Of our consumer survey respondents, 28% felt that concerns around data security was a key factor when deciding what to do with their phones when they no longer want them (n=1882)[79]. Household waste is generally left outside overnight which introduces a risk of theft, and kerbside collections do not provide the secure chain of custody that other channels such as take-back, trade-in or refurbishment schemes provide. Given there are now plans to roll-out household WEEE collections across all local authorities, it will be imperative to build greater consumer confidence in at-home data wiping for this to have a significant impact on the collection of mobile phones and other smart tech items coming through this channel. Funding via a WEEE extended producer responsibility scheme could also support kerbside collections as local authorities currently lack the budget to invest in additional services, particularly those with low rates of uptake.[80]

70 UK Government (2021). Regulations: Waste Electrical and Electronic Equipment (WEEE) Link [Accessed 17/12/2024]
71 UK Government (2021). Regulations: Waste Electrical and Electronic Equipment (WEEE) Link [Accessed 17/12/2024]
72 UK Government (2019). WEEE: apply for approval as a producer compliance scheme Link Accessed 17/12/2024]
73 WRAP (2021). Waste Electrical and Electronic Equipment Collection Guide Link [Accessed 17/12/2024]
74 UK Government (2021). Regulations: Waste Electrical and Electronic Equipment (WEEE) Link [Accessed 17/12/2024]
75 UK Government (2021). Regulations: Waste Electrical and Electronic Equipment (WEEE) Link [Accessed 17/12/2024]
76 WRAP (2021). Waste Electrical and Electronic Equipment Collection Guide Link [Accessed 17/12/2024]
77 SEPA (undated). Waste Electrical and Electronic Equipment (WEEE) Link [Accessed 17/12/2024]
78 Reforming the UK producer responsibility system for waste electricals Link – Impact [Assessment (IA) 17/12/2024]
79 Resource Futures, consumer survey results, Q12
80 Interview with Local Government Association, June 2023

3.3.3 TAKE-BACK SCHEMES

"Take-back" is the service where consumers can return unwanted electrical and electronic items to retail stores for recycling, refurbishing, onward donation or safe disposal. Take-back is a requirement of the WEEE regulations for certain product categories, but there is a lack of transparency and no obligation to report on the end destination of phones collected through these schemes. While some mobile network operators explicitly state the proportion of phones that are resold and recycled through their schemes (e.g., Vodafone trade-in data: 97% resold, 3% recycled[81]), others do not.[82] Most of our survey respondents were motivated to trade-in their old phone with their network for financial reasons (47%, n=464),[83] suggesting current trade-in messaging focuses primarily on financial rather than social or environmental motivators. While financial incentives are the main driver for consumers to act, there remains a valuable opportunity to educate customers on the environmental and social impact of their behaviours as further motivation.

3.3.4 MOBILE PHONE REUSE AND REPAIR

The enabling of mobile phone reuse is being supported by an increasing number of organisations, typically charities, non-profits and not-for-profit (NFP) organisations. Several of these organisations work to keep phones in use for longer by facilitating reuse and repair, while also tackling social issues such as digital poverty. These organisations often work in partnership with commercial businesses to achieve shared aims.[84] However, repair activity is currently limited. While some people get their phones repaired by such organisations, this is not yet common as people are generally hesitant to have their phone fixed at a repair event due to the perceived risk associated with a community fix and the impact on phone warranties.[85] Lack of skills and expertise, and access to and pricing of spare parts also limits the ability of non-profits and charities to conduct repairs.[86] However, opportunities exist to build repair skills in local communities which could translate to green jobs if an increased public demand for repair can be incentivised.[87] According to our consumer research (n=2001), public demand for mobile phone reuse could be encouraged through the introduction of affordable repair costs (38% of respondents), quick repair turnaround (21%), guarantees of repair quality (20%), an increased ease in carrying out repairs independently (15%) and financial incentives (15%).[88]

BUSINESSES HAVE AN OPPORTUNITY TO EDUCATE CONSUMERS ON WHY CAPTURING MORE E-WASTE IS ESSENTIAL

81 Vodafone (undated). Trade-in Link [Accessed 17/12/2024]

82 Google (undated). Google store trade-in program Link [Accessed 17/12/2024]

83 Resource Futures consumer survey results, Q4E

84 Interviews with iParts4u, Sarasfix, Material Focus, and Beyondly Compliance Scheme, May 2023

85 Vodafone (undated). The Great British Tech Appeal. Link. [Accessed 17/12/2024]

86 Interview with Repair Café Wales, May 2023

87 Interviews with Repair Café Wales and Community Tech Aid, May 2023

88 Resource Futures consumer survey results, Q14

3.3.5 MOBILE PHONE TRADE-IN

Trade-in business models foster a circular economy for smartphones. The trade-in business model, adopted by websites such as Mazuma Mobile and incorporated into wider business models by several leading mobile phone retailers, allows individuals to trade in their old devices for cash, after which the company either refurbishes or repairs these for reuse, or sends them for recycling. However, as explored further in Section 3.3.3, the trade-in sector often lacks transparency regarding the exact processes the phones go through and what actors are involved. Green Alliance identified that 70% of smartphones collected through trade-in programmes in developed countries are subsequently traded through emerging LMIC markets due to cheap export costs and a local demand for branded mobile phones.[89] This practice is not sustainable. For example, one manufacturer is understood to be re-selling refurbished phones in India, but ever-increasing phone exports could worsen India's e-waste issues and introduce risk that the country becomes a dumping ground for e-waste exported from developed countries like the UK.[90] There is a need to for tighter regulations around end of life outcomes for phones, including those exported, to improve transparency.

Interviews with Sarasfix, iParts4u and ByteBack conducted as part of this research all indicated that some businesses are choosing to specialise in both selling and improving access to spare parts as a core financial model in terms of repair.[91] Unfortunately, they also reported that smartphone design continues to increase in complexity, making devices more difficult to repair, and that obtaining spare parts is also difficult, particularly for older devices. Successful trade-in business models will require exports for reuse to be more closely monitored, and enabling repairability needs to be considered when designing new phones.

89 Green Alliance (2015). A circular economy for smart devices opportunities in the US, UK and India. Link. [Accessed 17/12/2024]

90 Green Alliance (2015). A circular economy for smart devices opportunities in the US, UK and India. Link. [Accessed 17/12/2024]

91 Interviews with Sarasfix, iParts4u and ByteBack, May 2023

3.3.6 LEASING MODELS

Mobile phone leasing is the focus for some businesses such as Ooodles[92] and Music Magpie.[93] Users can choose to upgrade, continue leasing, or return their device free of charge when the lease period ends. Leasing mobile phones rather than encouraging outright purchase and ownership of devices is a strategy that provides commercial opportunities while also encouraging greater device reuse. However, our consumer survey results indicate that appetite for this is currently limited, with almost half of our survey respondents (44%, n=2001) saying nothing would encourage them to rent or lease a mobile phone.[94] However, aspects such as affordability (24% of respondents), flexibility to cancel (18%), a trusted network running the service (18%) and reassurance that data would be wiped securely (14%) were all cited as factors that would encourage greater consideration of this as an option[95]

3.3.7 SUSTAINABILITY LEGISLATION

In some countries, sustainable consumption and repair are facilitated through legislation. For example, the French Anti-Waste for a Circular Economy law (AGEC Law[96]) mandates that a repairability index must be displayed for consumers on all electrical and electronic equipment. The index is calculated according to different elements of repairability defined by the French Ministry of Environment[97] such as documentation, disassembly, the availability and price of spare parts and product specific aspects like software.[98] The repairability index has already positively impacted manufacturers such as Samsung, who have since made disassembly manuals available in France in order to improve their score.[99]

Other proposed EU measures linked to Right to Repair have been criticised as they will not prevent manufacturers using software practices that limit independent repair. For example, part pairing - the use of serial numbers on spare parts, paired to an individual device that restricts independent repair activities.[100] Furthermore, price caps or control over the cost of spare parts, not only for professional repairers but also for individuals and community repair organisations, are not included in these measures.[101]

There is a need for policymakers to strengthen UK regulations to drive sustainable practices, with international best practice providing a useful case source.

92 Ooodles (undated). How Ooodles Works. Link. [Accessed 17/12/2024]

93 Music Magpie (undated). Rental at MusicMagpie. Link. [Accessed 17/12/2024]

94 Resource Futures consumer survey results, Q16.

95 Resource Futures consumer survey results, Q16.

96 Legifrance (2020). Law n 2020-105 of February 10, 2020 relating to the fight against waste and the circular economy Link [Accessed 17/12/2024]

97 Barros & Dimla (2021). From planned product obsolescence to the circular economy in the smartphone industry: An evolution of strategies embodied in product features. Link. [Accessed 17/12/2024]

98 Right to Repair (2021). The French repair index: challenges and opportunities. Link. [Accessed 17/12/2024]

99 iFixit (2022). French Repair Index: One Year Later. Link. [Accessed 17/12/2024]

100 iFixit (2023). How Parts Pairing Kills Independent Repair. Link. [Accessed 17/12/2024]

101 Right to Repair (2022). New EU rules for smartphones and tablets: still far from a true Right to repair. Link. [Accessed 17/12/2024]

THERE IS A NEED FOR POLICYMAKERS TO STRENGTHEN UK REGULATIONS TO DRIVE SUSTAINABLE PRACTICES

#8 CONSUMERS HAVE CONCERNS AROUND DATA SECURITY WHEN THEY FINISH USING A MOBILE PHONE

4 KEY FINDINGS AND RECOMMENDATIONS

Section 3.3 sets out where progress is already being made to drive a shift towards a more circular economy approach to mobile phone technology, however, more can be done to support this shift. This section sets out key findings and recommendations to help address issues of e-waste and support a shift to a circular economy approach in this sector.

Finding: Consumers have concerns around data security when they finish using a mobile phone, resulting in hesitancy to hand in devices for reuse.

Whilst a range of circular models already exist to collect unwanted mobile devices, such as kerbside recycling, trade-in, take-back, repair for reuse, and donation for reuse, data security remains a key issue for many consumers (as outlined in section 3.1.3). As phones are much easier and quicker to data cleanse than computers and laptops[102] this hesitancy indicates a knowledge gap exists on how to properly manage technology, which once alleviated could induce increased donations.

Recommendation 1: Establish safe and convenient opportunities for consumers to return phones for recycling, reuse or refurbishment.

- **All:** mobile phone return schemes need secure device handling chains that demonstrate proper data security protocols to reassure consumers.
- **Network operators and local authorities:** have a role to play in teaching consumers how to securely data wipe smart devices including mobile phones prior to improve trust.
- **Local authorities:** Some local authorities already collect e-waste through household waste collections or at household recycling centres and should be supported in finding the best options for ensuring items are reused and recycled.
- **Local authorities:** Report on how phones are managed once they enter household waste streams via kerbside collections and household recycling centres.
- **Charities and grassroots partners:** create secure collection routes for smart devices to increase availability of usable digital resources to tackle the digital divide.

102 Personal communications, The Restart Project, June 2023

Finding: Phones are built with short lifespans, and the production phase is a key contributor to environmental impact

Mobile phones typically do not have long lifespans.[103] Yet phone production is the key contributor to environmental impact.[104] The increasing complexity of mobile phone design is making refurbishment and repair of devices more difficult,[105] and access to spare parts remains a hinderance.[106] Consumers are highly driven by cost and convenience (as outlined in section 3.1.1), but few processes are in place to support consumer purchasing decisions and aid sustainable let alone cost-efficient choices.

Recommendation 2: Introduce ratings, improved standardisation and best-practice across the industry to ensure reliability and durability of phones

- **Policymakers:** mandate introduction of a durability and repairability index for phones to require producers to publish obsolescence dates (i.e., how long new phones are expected to function with software updates).
- **Policymakers:** mandate presentation of a 'purchasing decision hierarchy' to customers as a quick and easy tool to guide more sustainable choices.
- **Policymakers:** expand take back obligations to include online retailers to level the playing field and act to build trust by making this an expected standard practice.
- **Phone retailers and network operators:** help educate consumers in choosing sustainable handsets by incorporating comparison tools such as Eco Rating[107] at point of sale. At present, Eco Ratings are not available for all brands,[108] which risks steering consumers away from phones with an Eco Rating in order to ignore the environmental impact of their phone.
- **Policymakers:** formalise and verify Eco Ratings to ensure industry data and categorisations are comparable and evidence-based.
- **Phone retailers and network operators:** help customers choose products that are longer lasting by either publishing the expected functional life left for each listed model and immediately stopping sale of any phone model with less than two years of functional life left (software and security updates) to support customers to make informed choices favouring longer-lasting devices.
- **Phone retailers and network operators:** remove incentives to upgrade too frequently (yearly) and increasing incentives for refurbished phones purchases.
- **Manufacturers:** ensure products are designed for repair, considering ease of repairability, product manuals and spare parts.
- **Each stakeholder group:** lead with policies that drive a more circular economy for mobile phones and accessories, thereby prolonging the working life of phones, reducing the consumption of new resources, and finding secondary uses for serviceable phones and their materials.
- **All:** work to encourage sustainable practices in line with the waste hierarchy, including refurbishment and repair.

103 Statista. (2023). Average lifespan (replacement cycle length) of smartphones in the United States from 2013 to 2027. Link. [Accessed 17/12/2024]

104 World Economic Forum [2021]. Repairing – not recycling – is the first step to tackling e-waste from smartphones. Here's why. Link. [Accessed 17/12/2024]

105 Interviews with Repair Café Wales and Community Tech Aid, May 2023

106 Interviews with Sarasfix, iParts4u and ByteBac, May 2023

107 Eco Rating. What is Eco rating? Link. [Accessed 17/12/2024]

108 Compare and Recycle (2023). What is 'Mobile phone eco rating' and where to find it? Link. [Accessed 17/12/2024]

Finding: High pricing of repair services acts as a barrier to consumers extending the lifespan of their mobile phones.

It is increasingly common that devices will be deemed 'beyond economic repair' as the cost of repair supersedes the current market value of the product.[109] While some manufacturers are starting to make official spare parts for phone repairs available, the price of these parts can discourage consumers from pursuing repair options.[110] Whilst companies providing repair, resale and recycling services exist, this sector needs to be scaled up to fundamentally shift purchase and disposal behaviours for all mobile phones.

Recommendation 3: Improve access to repair services.

- **Policymakers:** stimulate circular economy growth by introducing a 0% VAT rate for repair services and mandate that manufacturers' warranties permit repairs by non-accredited repairers.
- **Network operators:** prolong the lifespan of phones by incorporating the cost of servicing and repair into contracts or move to a leasing model with this built in.
- **Network operators:** support repair by incentivising customers to send in old phones, providing device recycling boxes in stores, offering servicing and repairs and facilitating repair and recycling through strategic partnerships.
- **Manufacturers:** support repair by providing spare parts at affordable prices for at least five years. Providing parts at wholesale prices to network operators and others enabling repair would help scale these efforts.
- **Manufacturers:** provide accessible information to consumers on how to self-repair their phones potentially through online materials. For example, information on how to replace the battery, a common reason for people to upgrade their phones.
- **Policymakers:** include measurement and reporting requirements as part of circular economy policies, setting national circularity targets with strategic action plans, and training every civil servant and public sector employee in circular economy principles.[111] This ensures a comprehensive understanding of what systems changes are needed, why they are needed within the context of the climate and biodiversity crises and enabling a just transition, and how these principles can be applied cross-departmentally in all policy areas.

109 Interview with Replace Base, June 2023

110 Personal communications, The Restart Project, May 2023

111 Monbiot, G. (2023). When it comes to rich countries taking the environment seriously, I say: vive la France. Link. [Accessed 17/12/2024]

Finding: There is an opportunity to expand use of refurbished phones, but limited incentives or motivations exist to grow this sector.

Routes that enable access to refurbished phones already exist, as outlined under circular economy business models in section 3.3. For example, business customers who have the autonomy, corporate responsibility and purchasing power to catalyse growth in the refurbished and reuse markets, could be incentivised to be early adopters of more sustainable technology practices. Further, the concept of refurbishing phones prior to donating them to those living in digital poverty is a growth sector and could provide opportunity for upskilling and green job opportunities in the community.

Recommendation 4: Network operators should set targets to drive the use of refurbished phones. This will drive action to deliver this, such as through the recommendations below.

- **Network operators:** introduce offers for customers who commonly pass their old phones to friends and family members to encourage this form of reuse, while also reminding individuals to return the phone for recycling when it is no longer suitable to be reused in this way.
- **Network operators:** actively promote refurbished devices and trade-in programs to business customers to encourage them to purchase refurbished phones, trade-in old devices, hand-in phones for refurbishment and recycling as well as donate their old mobile phones to charities.
- **Network operators:** promote refurbished range and encourage customers to consider them as good options from an environmental and financial perspective. Match servicing options and warranties to those of new phones.
- **Policymakers:** consider reforms to the WEEE producer responsibility scheme that prioritise a focus on waste prevention, repair and reuse over recycling to incentivise greater emphasis on refurbished phone use.
- **Policymakers:** require businesses to include scope 3 impacts of the technology they use (including mobile phones) to incentivise consideration of refurbished options.
- **Network operators:** consider how trade-in and phone refurbishment can be made accessible for all consumers, especially with a view to supporting low-income households and/or those experiencing digital poverty, for example linking with charity partners to facilitate donation to those in need, Such as Vodafone's Great British Tech Appeal run in partnership with the Good Things Foundation.

MAKE REFURBISHED PHONES THE DEFAULT CHOICE FOR INDIVIDUAL AND BUSINESS CLIENTS AND PROMOTE THEM AS THE MOST BENEFICIAL CHOICE FROM BOTH AN ENVIRONMENTAL AND FINANCIAL PERSPECTIVE

Finding: Limited transparency of product and waste flows within and outside of the UK is a barrier to tackling illegal e-waste exports, making existing legislation difficult to enforce

To ensure actions are targeted most effectively, and are having the intended impacts, improved data reporting is needed on production and waste, along with improved regulation. For example, the UK is one of the largest exporters of e-waste in the world and additionally the Basel Action Network identified the UK as the worst in Europe for illegal e-waste exports to developing countries.[112] Illegal exporters currently use tactics such as mislabelling phones and other e-waste exports as 'used goods' to bypass legislation.[113] Further, supply chains in countries receiving the waste can be complicated and opaque, and items can result in unsafe and irresponsible treatment of further down the chain.

Recommendation 5: Greater regulation of e-waste.

- **Policymakers:** require greater transparency of waste flows and clamp down on harmful and illegal e-waste exports through mandatory waste tracking to the final destination.
- **Policymakers:** ban e-waste exports to non-OECD countries until exporters can trace the final destination of the waste and provide evidence of safe treatment. With the right support, such a ban could stimulate investment in high-quality e-waste treatment in the UK.
- **Policymakers:** include requirement for proof of recycling at end destinations (in line with packaging EPR requirements) within the upcoming reforms to WEEE producer responsibility regulations.
- **Policymakers:** introduce further regulatory levers to drive circular economy practices. For example, mandate businesses to donate unsold items (and thereby disincentivise overproduction), legislate against planned obsolescence, channel industry funds (via the upcoming WEEE Extended Producer Responsibility reforms) into the repair sector, and require manufacturers to publish eco-design plans with updates every five years.
- **Policymakers:** seek to match and then surpass policies in other countries, such as the Anti-Waste for a Circular Economy or 'AGEC Law'[114] which seeks to "fundamentally change the production methods of companies and the consumption patterns of our citizens".[115]
- **Policymakers:** Ensure the Environment Agency has sufficient resources for for monitoring and enforcement activities.
- **Industry:** lead the way and show support for action on e-waste exports by tracking their current waste supply chains, sharing the findings, and ensuring safe treatment of the waste.

Recommendation 6: Establish better systems to track and monitor mobile phone e-waste.

- **Policymakers:** modify the current Waste Electrical and Electronic Equipment (WEEE) reporting categories[116] to make them more specific, including creating a separate category for smartphones.
- **Policymakers:** require reporting on mobile phone waste in units, in addition to tonnages, to assist in creating more robust and accurate WEEE reporting.
- **Policymakers:** Prioritise the inclusion of mobile phones and wider e-waste items in upcoming mandatory digital waste tracking measures from 2025[117] to facilitate better, centralised data and impede criminal waste activity.
- **Policymakers:** require that phones are tracked from point of waste collection to final destination.[118]
- **Policymakers:** mandate businesses to report on product waste at each stage of the supply chain.

112 House of Commons Environmental Audit Committee (2021). Electronic Waste and the Circular Economy. Link. [Accessed 17/12/2024]

113 United Nations University (2013). Toxic E-Waste Dumped in Poor Nations, Says United Nations. Link. [Accessed 17/12/2024]

114 Legifrance (2020) Law n 2020-105 of February 10, (2020) relating to the fight against waste and the circular economy. Link. [Accessed 17/12/2024]

115 Ministère de la Transition Ècologique et Solidaire (2020). The Anti-Waste law in the daily lives of the French people, what does that mean in practice. Link. [Accessed 25/02/2025]

116 UK Government (2013). The Waste Electrical and Electronic Equipment Regulations 2013. Link. [Accessed 06/01/2025]

117 Defra, Mandatory digital waste tracking. Link. [Accessed 17/12/2024]

118 UK Government (2022). Introduction of Mandatory Digital Waste Tracking. Link. [Accessed 17/12/2024]

Finding: UK consumers lack awareness of environmental and social issues linked to their mobile phones.

Whilst UK consumers are aware of issues around the climate crisis, biodiversity loss, pollution and waste, many do not consider the impact of phone consumption as a contributor to this (section 3.1.2). This knowledge gap on issues specific to mobile phones presents a communications opportunity. However, any communication to educate consumers on this topic must be managed sensitively, and should include actions to support customers to adopt more sustainable ways to deal with their e-waste. Phones are increasingly critical for enabling access to essential, day to day services for many. Therefore, it is vital that other stakeholders must be the driving force for sustainability, particularly government policymakers, mobile phone network operators and mobile phone manufacturers and retailers

Recommendation 7: Awareness-raising campaigns across the mobile phone industry

- **Industry:** raise customer awareness by collaborating to develop a communications campaign, being transparent on sustainability issues but highlighting the positive actions planned to tackle it and the choices available to customers to support them to change their behaviour.
- **Policymakers:** ensure there is a robust a mechanism to ensure any sustainability claims are true to avoid risks of greenwashing. This could be called out under the Green Claims Code or through OFCOM.

CONCLUSION

There is no silver bullet solution or individual actor that can drive the systems shift that is urgently needed in order to address the environmental and human impacts of e-waste. However, if all actors - policymakers, network operators and the wider industry - work together to adopt the recommendations set out in this report, this would have a potentially transformative impact on how consumers engage with their phones, especially when they are no longer needed. Ultimately, all this will support the move away from a fast phones culture, reducing the impacts that occur both throughout the supply chain and when phones become e-waste.

? MOST UK CONSUMERS ARE NOT AWARE OF ENVIRONMENTAL AND SOCIAL ISSUES LINKED TO THEIR MOBILE PHONES

THE SURVEY PROVIDES RESULTS FROM A ROBUST SAMPLE OF MOBILE PHONE USERS IN THE UK POPULATION, REPRESENTING A RANGE OF AGES AND DEMOGRAPHICS

5 METHODOLOGY

The findings in this work were informed by primary and secondary data collection, as described below.

A survey of 2,001 individuals was conducted by Censuswide between 15-18 November 2024. to understand consumer behaviours. Individuals answered 20 questions designed to draw out understanding of consumer behaviours, motivations and understanding of the e-waste issue. The survey provides results from a robust sample of mobile phone users in the UK population, representing a range of ages and demographics.

In-depth interviews were conducted by Resource Futures with 16 stakeholders. A broad range of industry stakeholders were approached for interview, including charities, commercial operators in the mobile phone industry, compliance schemes, recycling companies, reuse and repair organisations and researchers.

Interviews were conducted using an interview template tailored to each stakeholders' areas of expertise in order to gain the most value from each conversation.

Waste composition analysis results were analysed to determine the quantity of mobile phones in household waste streams. Existing WEEE datasets do not present mobile phones separately. UK-based household waste composition analyses conducted by Resource Futures across two seasons in 2022 which separated household waste into over 70 categories, one of which was mobile phones, were reviewed. This allowed identification of phones in general waste based on 210 tonnes of general waste from kerbside collections and HWRCs. Households were selected to be demographically representative.

A review of existing literature was conducted to understand current data availability, understanding and best practice. This included both peer reviewed papers and grey literature and prioritised the most recent publications.

GLOSSARY

Circular economy	A system where materials never become waste and nature is regenerated. In a circular economy, products and materials are kept in circulation through processes like maintenance, reuse, refurbishment, remanufacture, recycling, and composting. The circular economy tackles climate change and other global challenges, like biodiversity loss, waste, and pollution, by decoupling economic activity from the consumption of finite resources.
Critical raw materials	Materials that are essential for manufacturing technology where supply is limited or at risk and there are no easy substitutes.[119]
Data wiping	Process of logically removing data from a read/write medium so that it can no longer be read.[120]
Digital divide	Inability to interact with the online world fully, when, where and how an individual needs to.[121]
Electronic waste	Any waste deriving from products with electronic components including plugs and/or cords. Mobile phones are one source of e-waste, with wider items including televisions, computers and home appliances. E-waste is also commonly referred to in the waste sector as Waste Electrical and Electronic Equipment (WEEE), and usable electronic items as Electrical and Electronic Equipment (EEE).
E-waste	See electronic waste above.
Extended Producer Responsibility	Environmental policy approach in which a producer's responsibility for a product is extended to the post-consumer stage of a product's life cycle[122]
Fast phones	High consumption and turnover levels relating to mobile phones.
Lightweighting	The process of reducing the weight of a product to reduce resource use and energy consumption.[123]
Municipal solid waste	Total collected from kerbside residual waste, mixed dry recycling, food waste, and residual waste and recycling collected at household waste recycling centres (HWRC).
Non household waste	In the context of this report, non-household waste refers to anything that is not collected from kerbside or flatted properties.

119 Green Alliance. Link. [Accessed 17/12/2024]

120 Gartner. Link. [Accessed 17/12/2024]

121 Digital Poverty Alliance. Link. [Accessed 17/12/2024]

122 OECD. Link. [Accessed 17/12/2024]

123 3M website (undated). An Introduction to Lightweighting. Link.[Accessed 8/1/2025]

Part pairing	Use of unique serial numbers on spare parts that are paired to an individual device through software, restricting independent repair activities.[124]
Product use life	Period in which a phone remains in use, which could include multiple owners.
Smart devices	An electronic device that, to some extent, can operate interactively and autonomously and one that is typically connected to other devices or networks via wireless protocols such as Bluetooth, Wi-Fi, or 5G).[125]
Take-back	Business model that facilitates return of unwanted electrical and electronic items to retail stores for recycling, refurbishing, onward donation or safe disposal.
Trade-in	Business model that facilitates the trade of old electrical and electronic devices for cash after which the company either refurbishes or repairs these for reuse or sends them for recycling.
Transboundary	The movement of waste across different countries and regions.

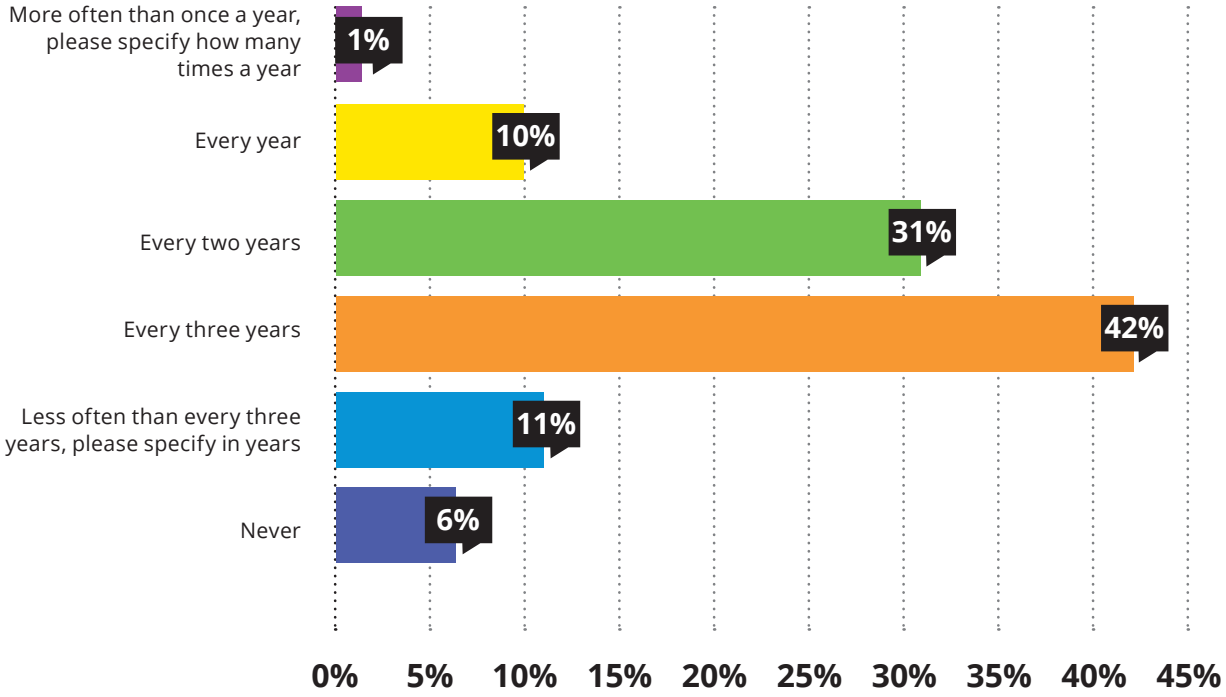
124 Right to Repair (2021). Part pairing: a major threat to independent repair. Link. [Accessed 17/12/2024]
125 Wikipedia. Link. [Accessed 17/12/2024]

APPENDIX: CONSUMER SURVEY RESULTS

As set out in Section 5 [Methodology] a survey of 2,003 individuals was conducted by Censuswide between 15-18 November 2024, to understand consumer behaviours. Individuals answered 20 questions designed to draw out understanding of consumer behaviours, motivations and understanding of the e-waste issue. The responses to the survey are set out below.

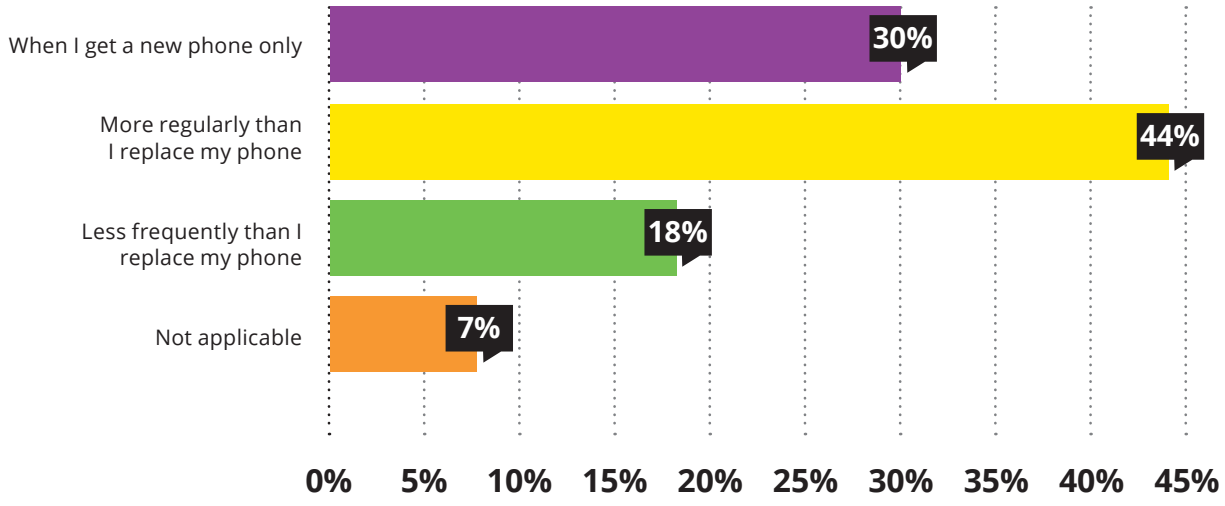
Q1 HOW OFTEN, IF AT ALL, DO YOU REPLACE YOUR MOBILE PHONE?

Consumer survey Q1, n=2001, single response



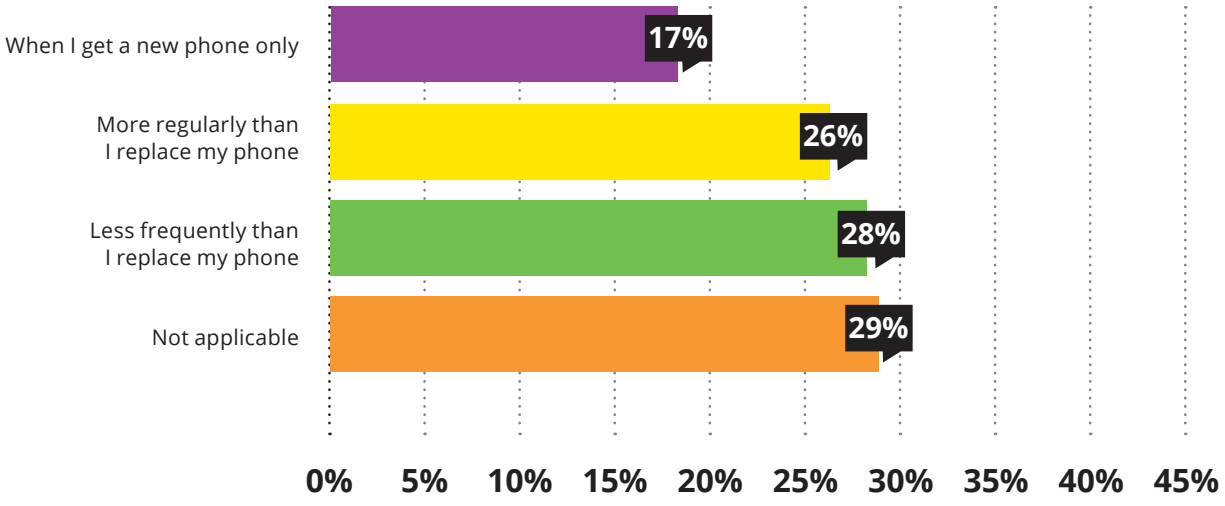
Q2A HOW OFTEN, IF AT ALL, DO YOU REPLACE CHARGING CABLES?

Consumer survey Q2a, n=2001, single response



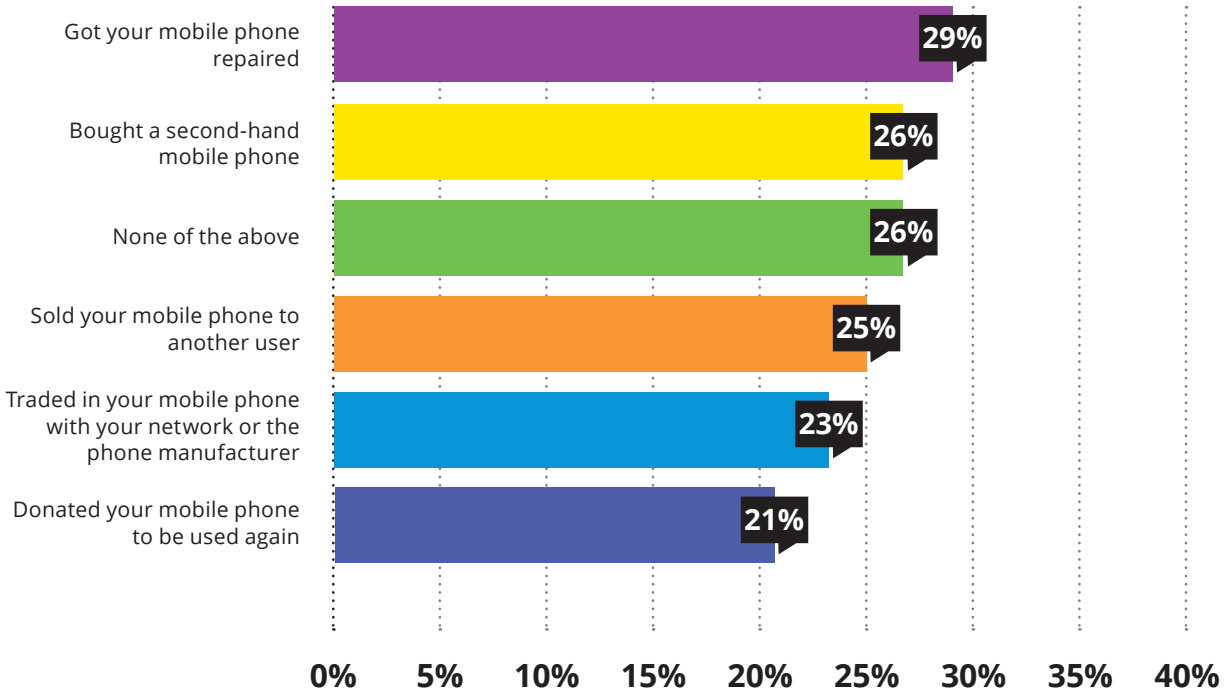
Q2B HOW OFTEN, IF AT ALL, DO YOU REPLACE THE HEADPHONES?

Consumer survey Q2b, n=2001, single response



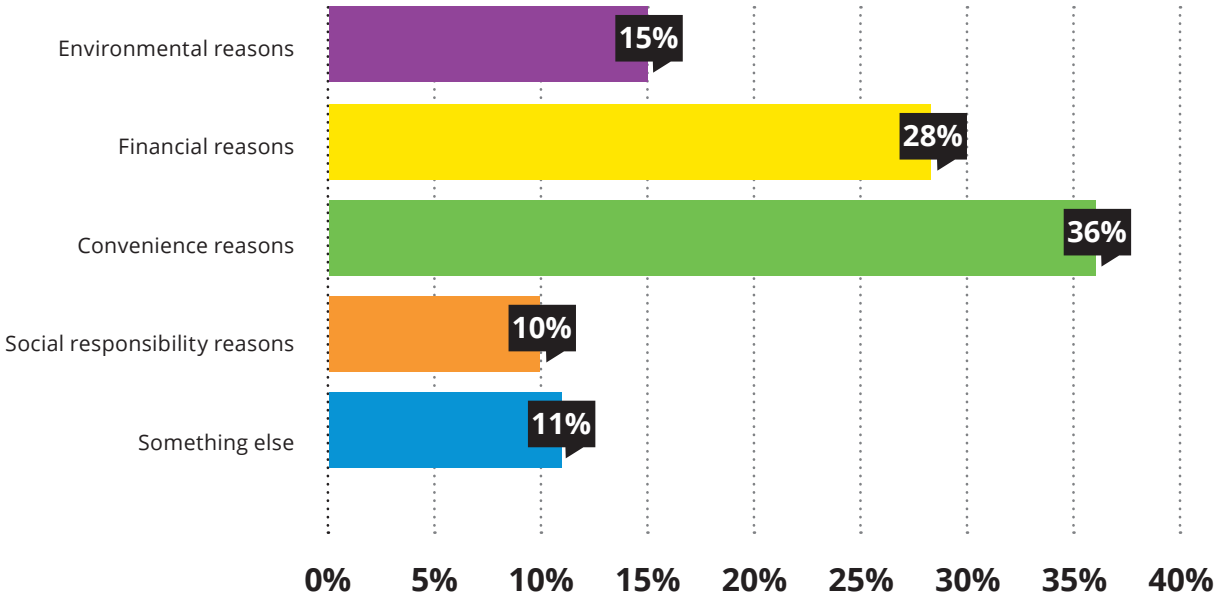
Q3 HAVE YOU EVER DONE ANY OF THE BELOW?

Consumer survey Q3, n=2003, select all that apply



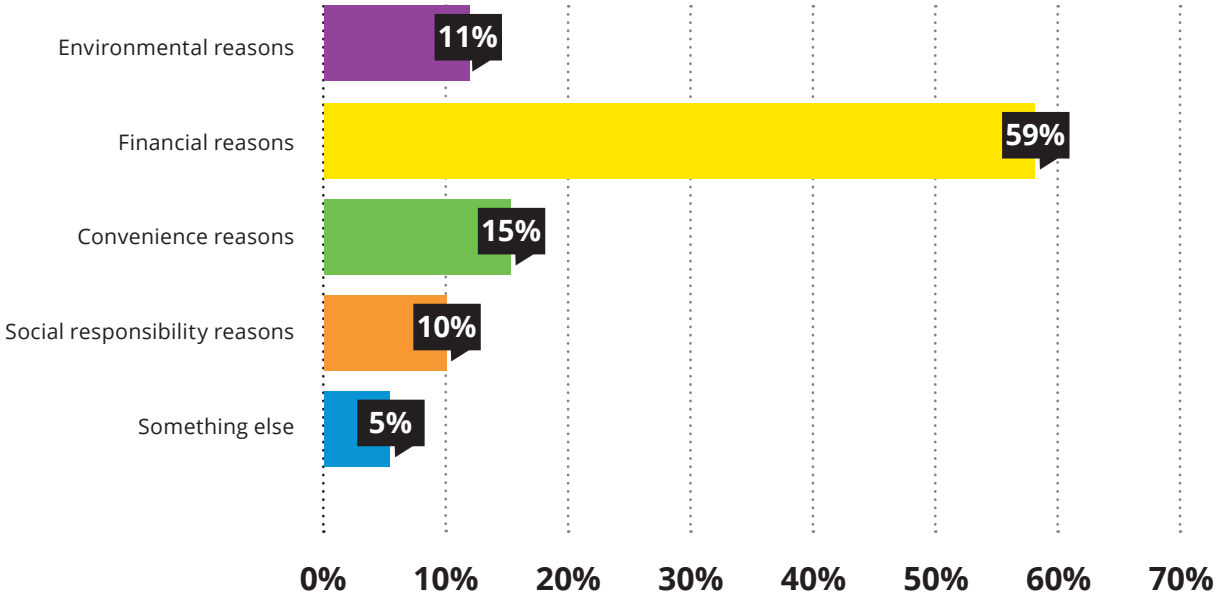
Q4A OF THOSE WHO HAVE HAD THEIR MOBILE REPAIRED, WHAT MOTIVATED THIS?

Consumer survey Q4A, n=524



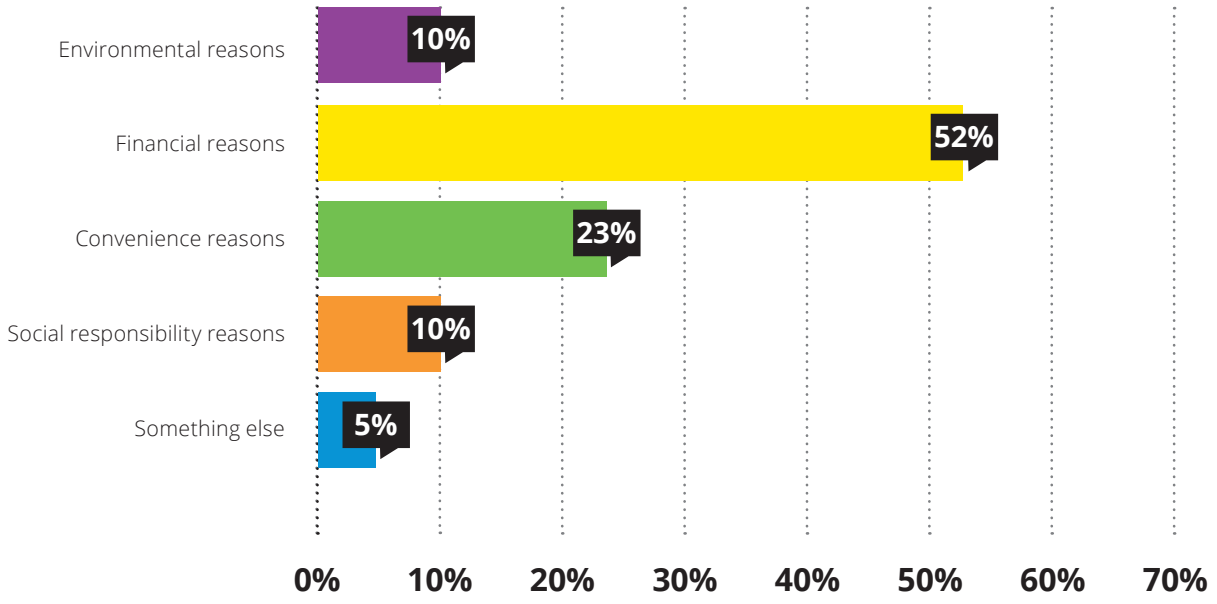
Q4B OF THOSE WHO HAVE BOUGHT A SECOND-HAND MOBILE PHONE, WHAT MOTIVATED THIS?

Consumer survey Q4B, n=524, single response



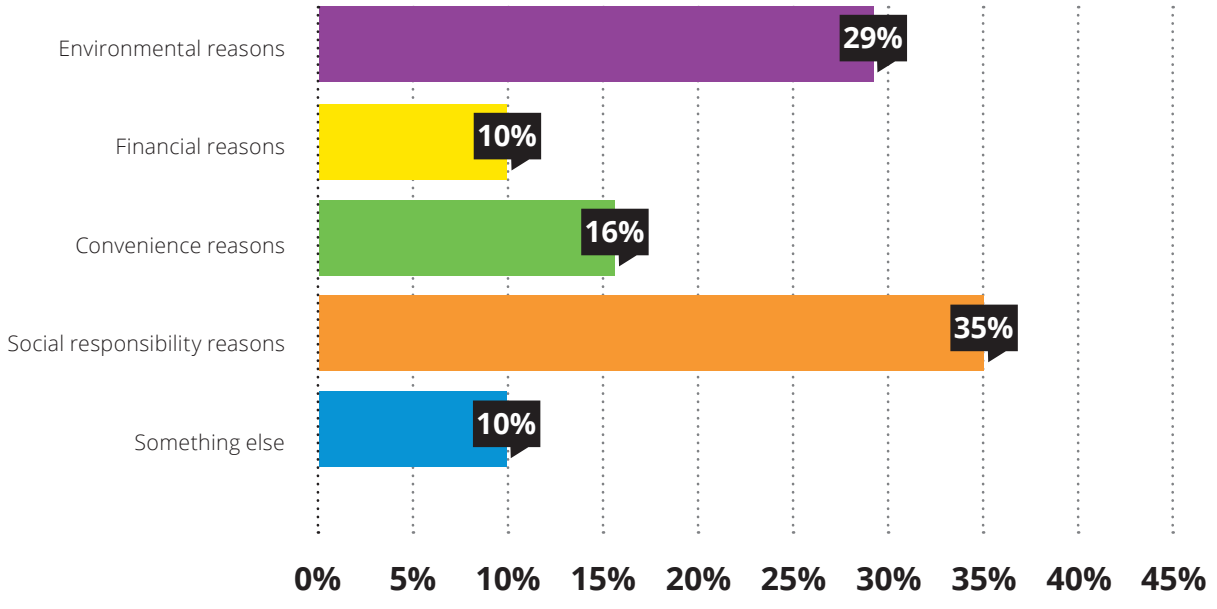
Q4C OF THOSE WHO HAVE SOLD THEIR MOBILE PHONE TO ANOTHER USER, WHAT MOTIVATED THIS?

Consumer survey Q4C, n=501



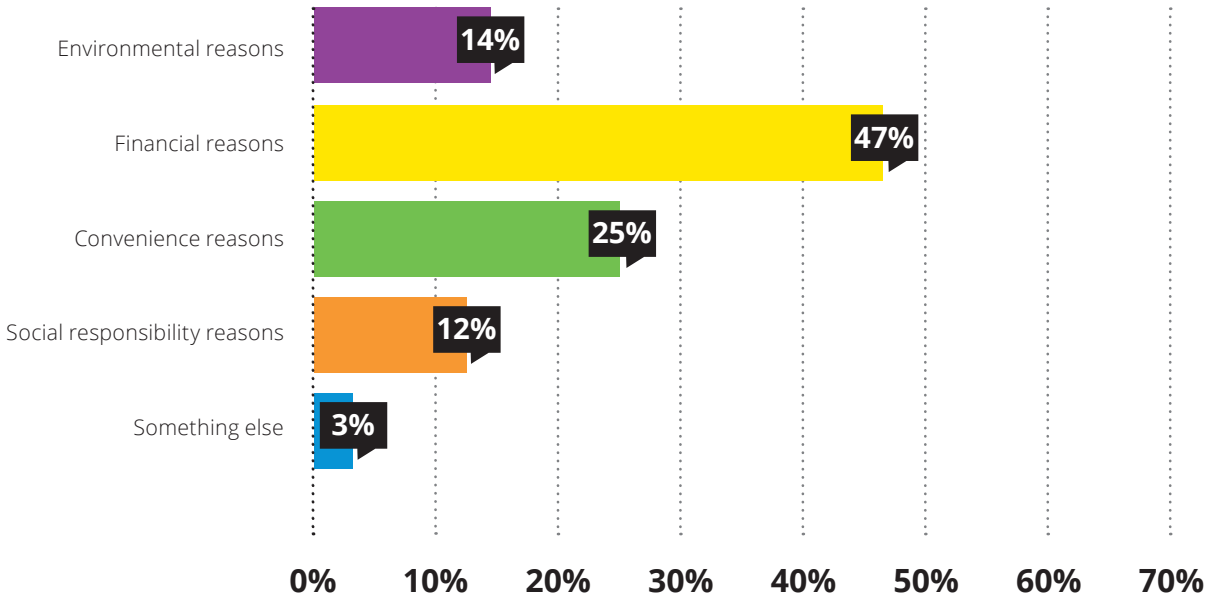
Q4D OF THOSE WHO HAVE DONATED THEIR MOBILE PHONE TO BE USED AGAIN, WHAT MOTIVATED THIS?

Consumer survey Q4D, n=421



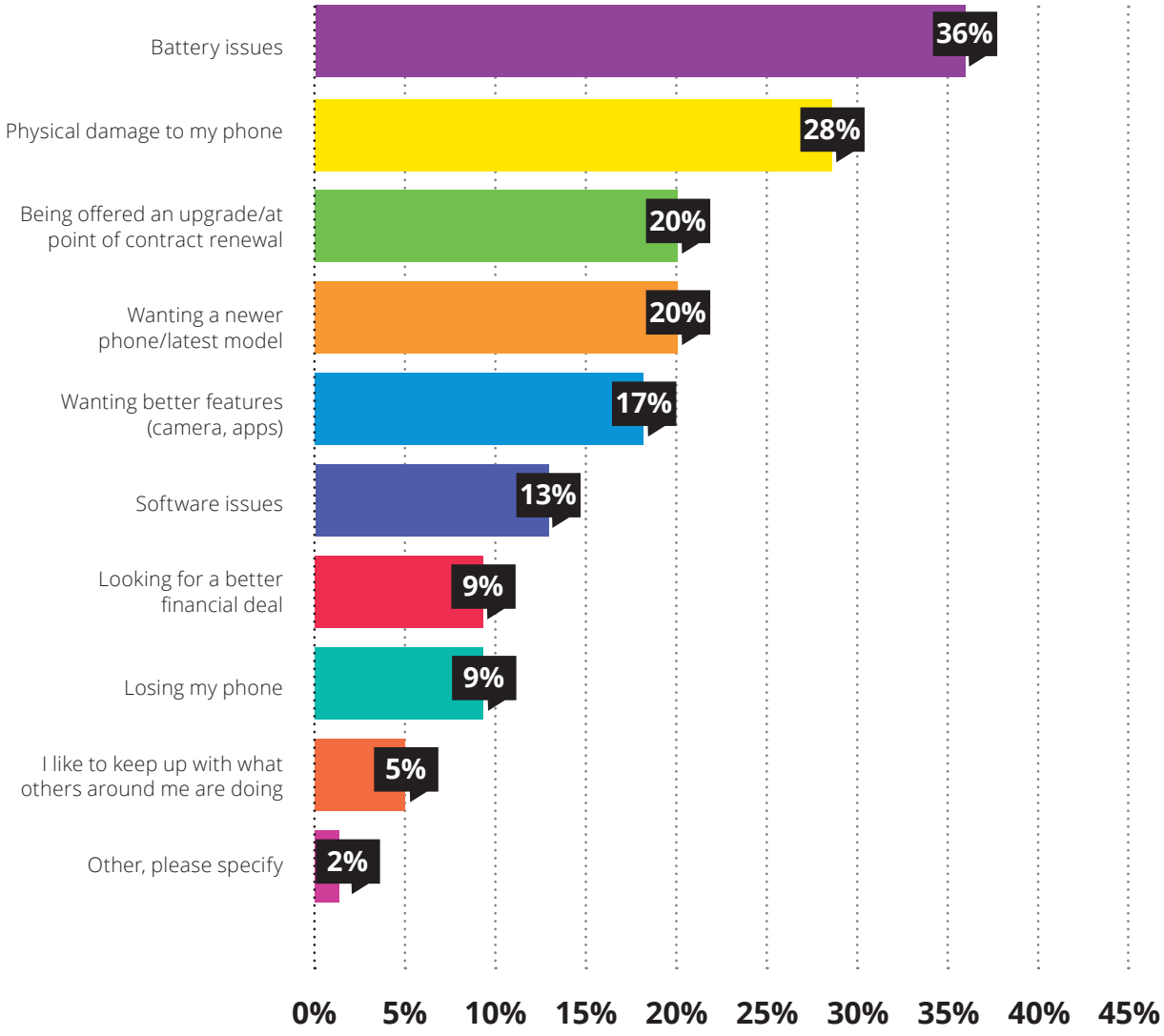
Q4E OF THOSE WHO HAVE TRADED IN THEIR MOBILE PHONE WITH A NETWORK OR PHONE MANUFACTURER, WHAT MOTIVATED THIS?

Consumer survey Q4e, n=464, single response



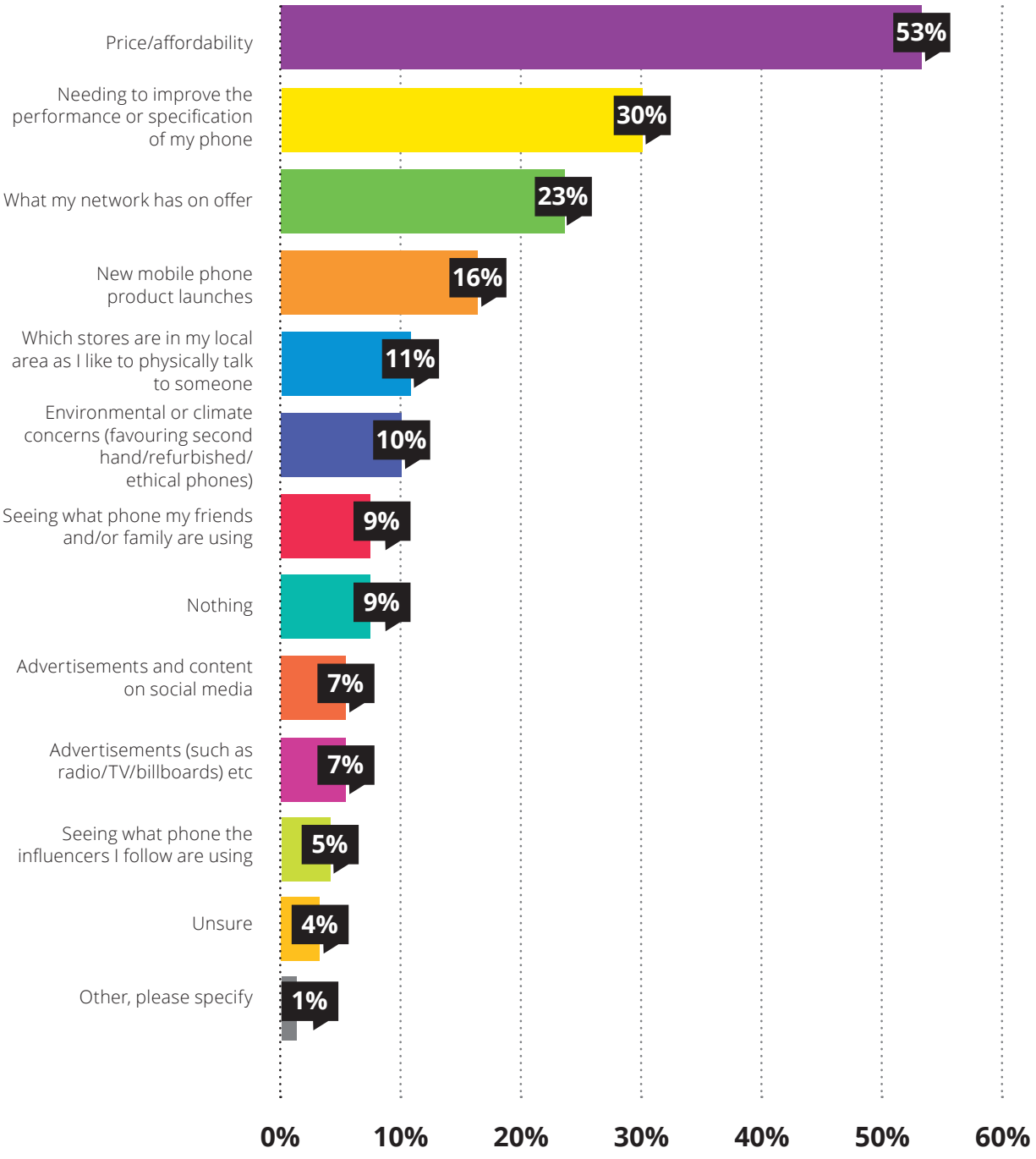
Q5 WHAT ARE THE MOST COMMON REASON(S) YOU REPLACE YOUR MOBILE PHONE?

Consumer survey Q5, n=1882, select up to 2



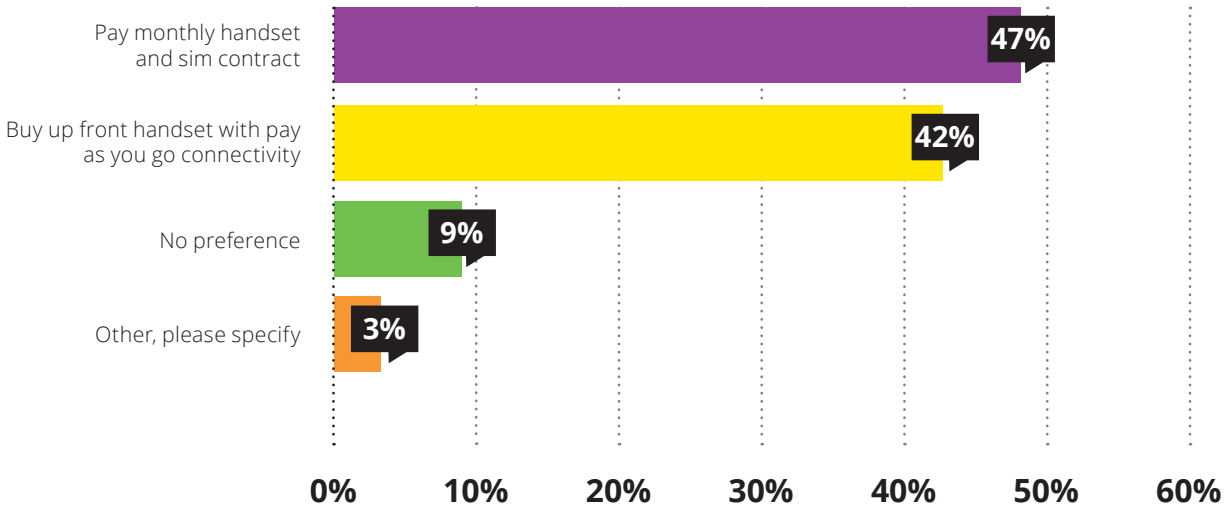
Q6 WHAT, IF ANYTHING, INFLUENCES YOUR PHONE PURCHASING HABITS THE MOST? (SELECT UP TO 3)

Consumer survey Q6, n=2001, multiple responses



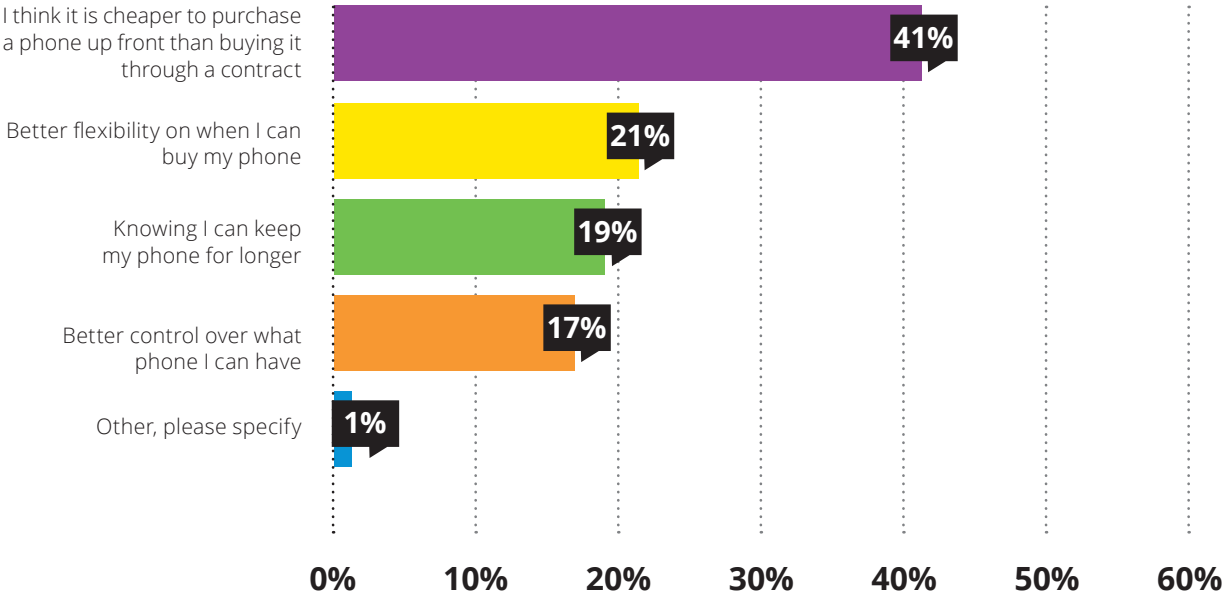
Q7 WHAT IS YOUR PREFERRED SET UP FOR MOBILE OWNERSHIP, IF ANY?

Consumer survey Q7, n=2001, single response



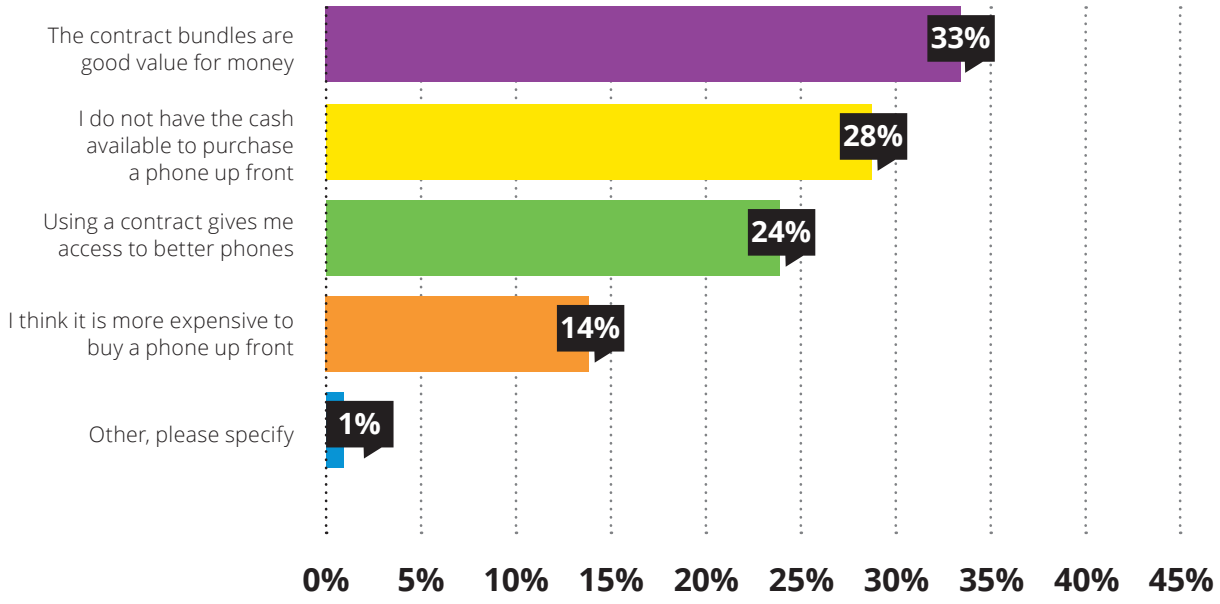
Q8 OF THOSE WHO SAID THEY PURCHASE THEIR OWN PHONE, WHAT MOTIVATES YOU THE MOST TO DO SO RATHER THAN BUY IT AS PART OF A PHONE/SIM CONTACT? (SELECT ONE)

Consumer survey Q8, n=838, single response



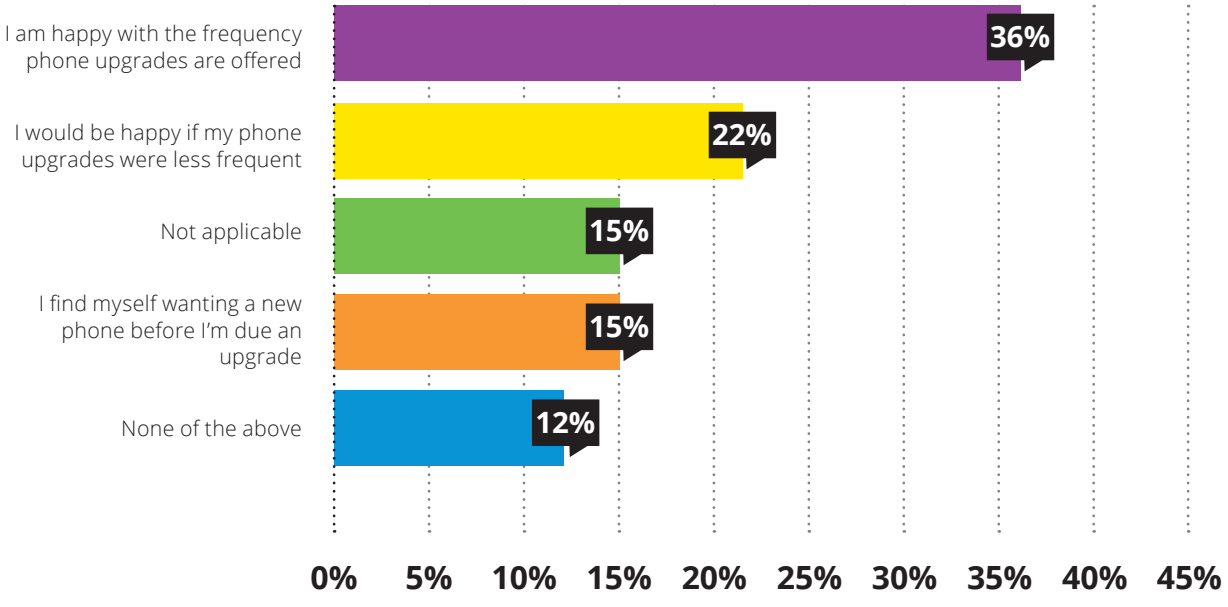
Q9 OF THOSE WHO SAID THEY PURCHASE THEIR PHONE THROUGH A MOBILE PHONE CONTRACT, WHAT MOTIVATES YOU THE MOST TO BUY YOUR PHONE THROUGH A MOBILE PHONE CONTRACT?

Consumer survey Q9, n=935, single response



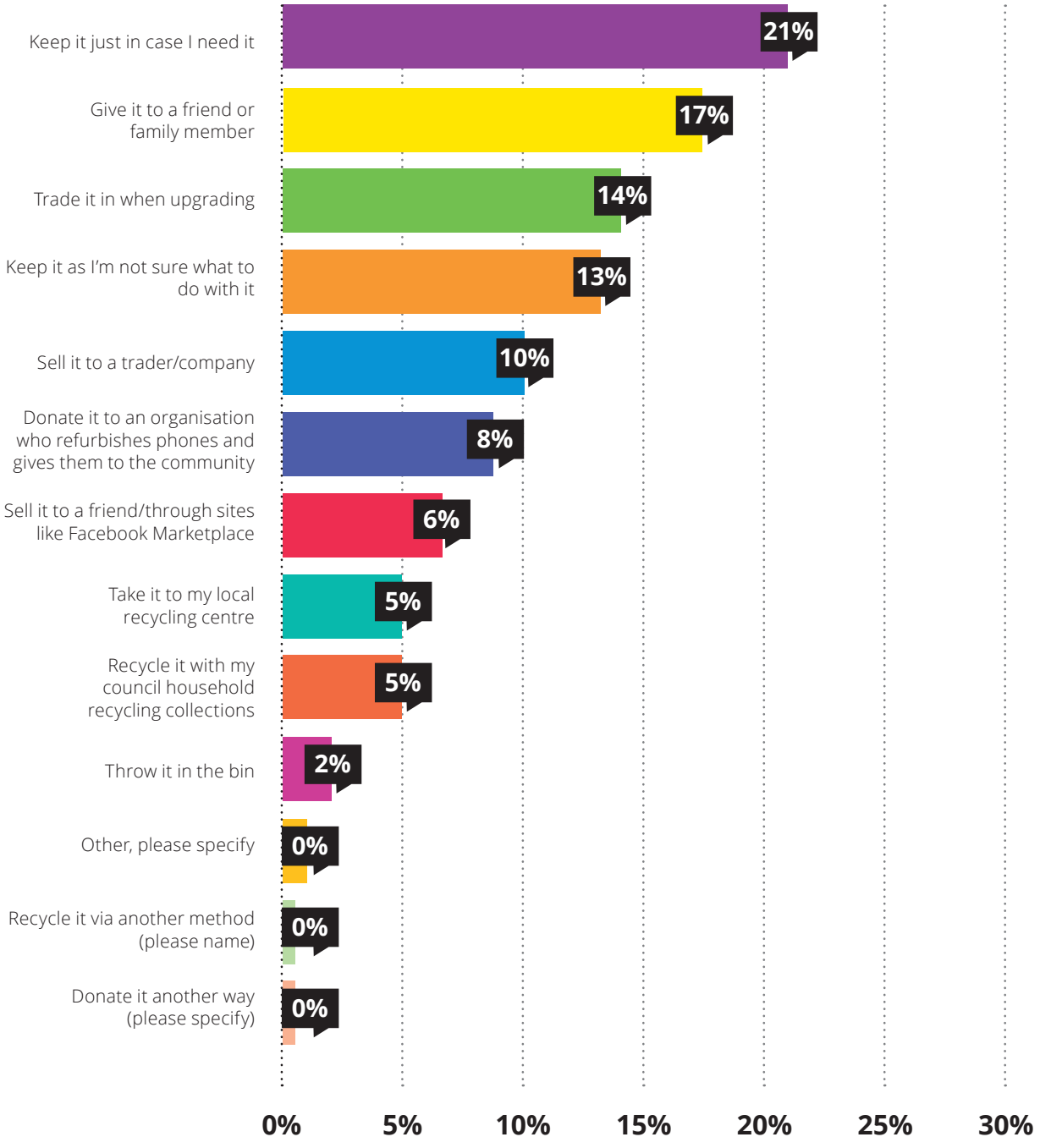
Q10 IF YOU HAVE EVER HAD A MOBILE PHONE CONTRACT - WHICH OF THE FOLLOWING APPLIES TO YOU THE MOST? (SELECT ONE)

Consumer survey Q10, n=2001, single response



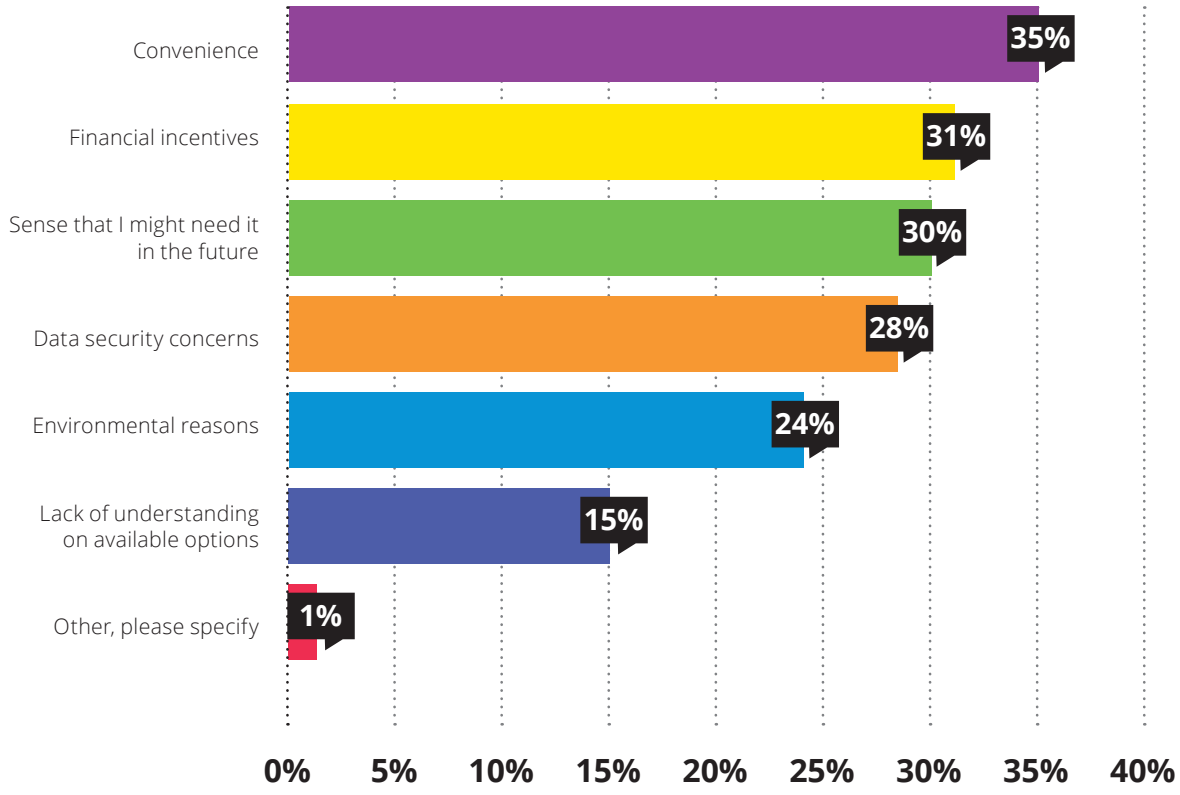
Q11 OF THOSE WHO DO REPLACE THEIR MOBILE PHONE, WHAT ARE YOU MOST LIKELY TO DO WITH YOUR MOBILE PHONE ONCE YOU NO LONGER WANT IT?

Consumer survey Q11, n=1882, single response



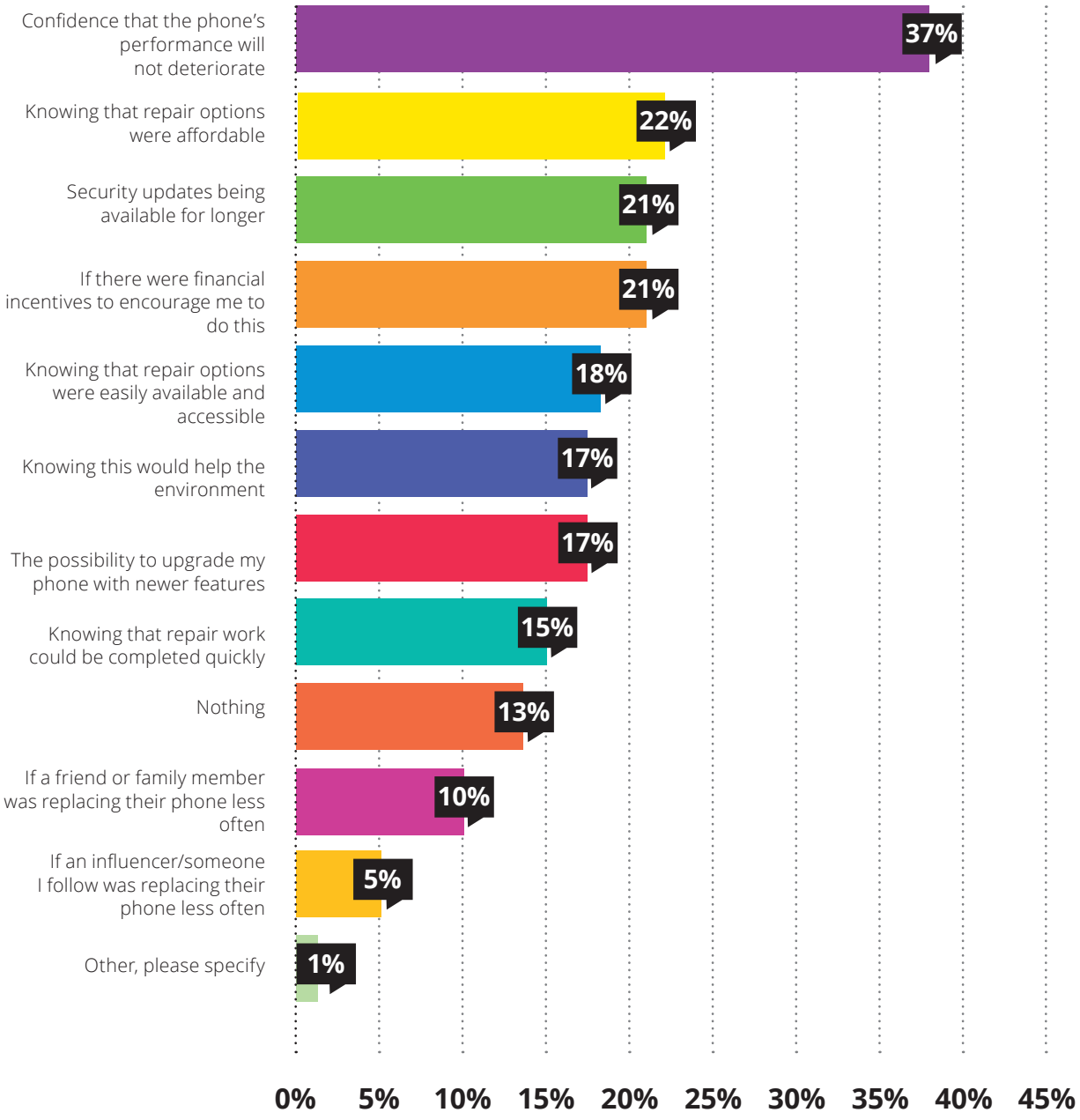
Q12 OF THOSE WHO DO REPLACE THEIR MOBILE PHONE, WHAT ARE THE MAIN FACTORS IN DETERMINING WHAT YOU DO WITH YOUR MOBILE PHONE ONCE YOU NO LONGER WANT IT? (SELECT UP TO 3)

Consumer survey Q12, n=1882, multiple responses



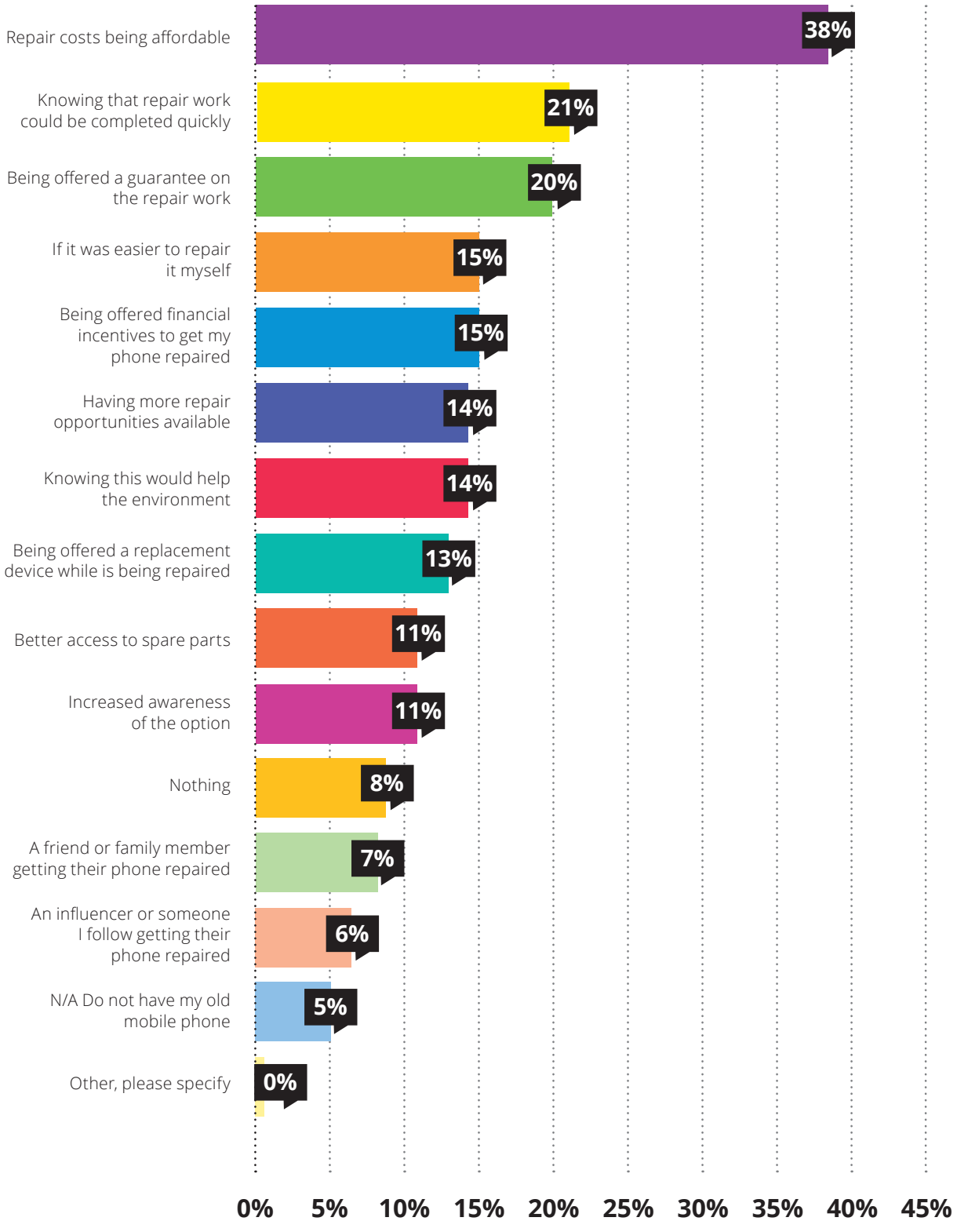
Q13 WHAT, IF ANYTHING, WOULD ENCOURAGE YOU THE MOST TO KEEP AND USE YOUR MOBILE PHONE FOR LONGER? (SELECT UP TO 3)

Consumer survey Q13, n=2001, multiple responses



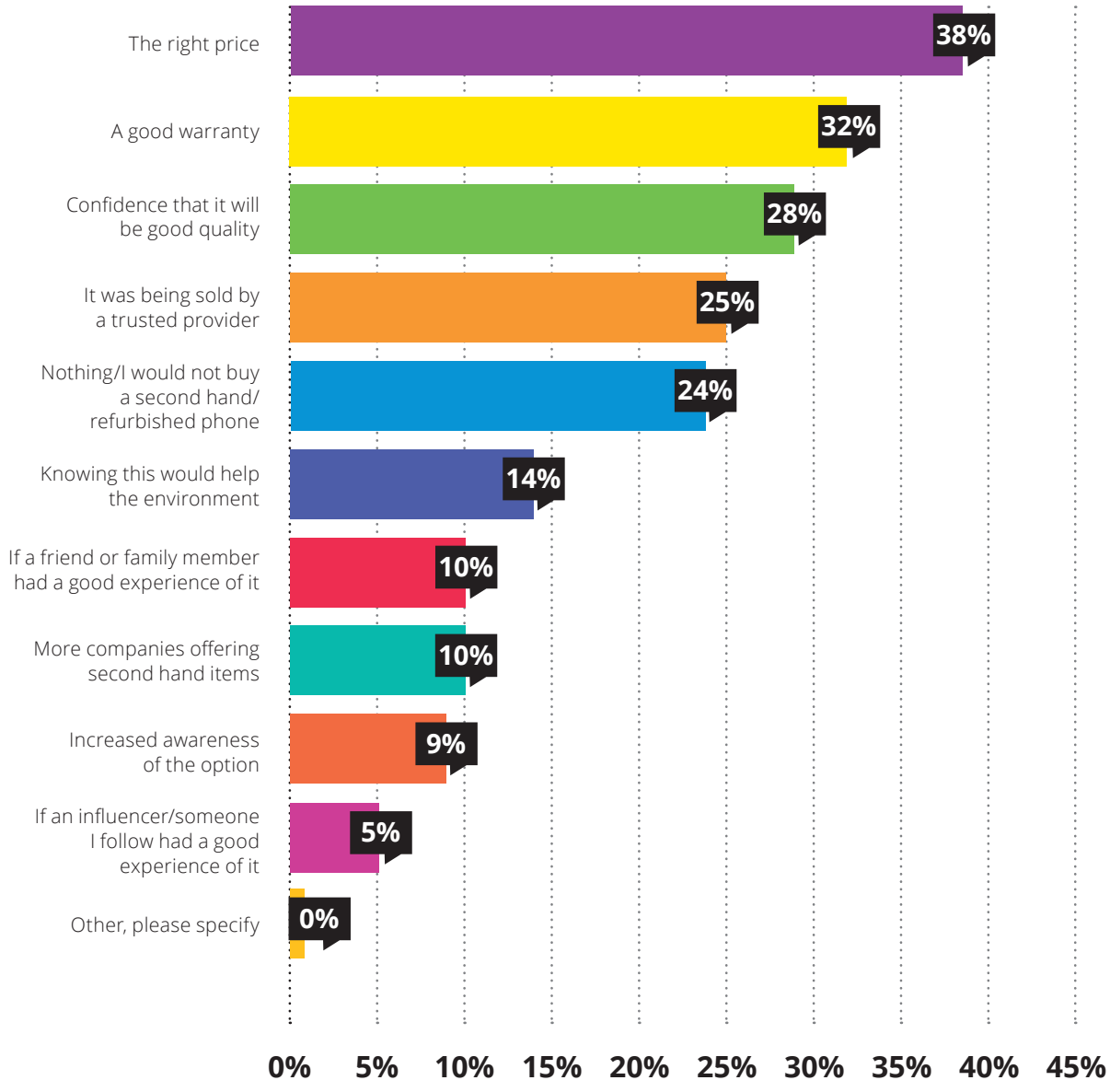
Q14 WHAT, IF ANYTHING, WOULD ENCOURAGE YOU THE MOST TO REPAIR YOUR OLD MOBILE PHONE? (SELECT UP TO 3)

Consumer survey Q14, n=2001, multiple responses



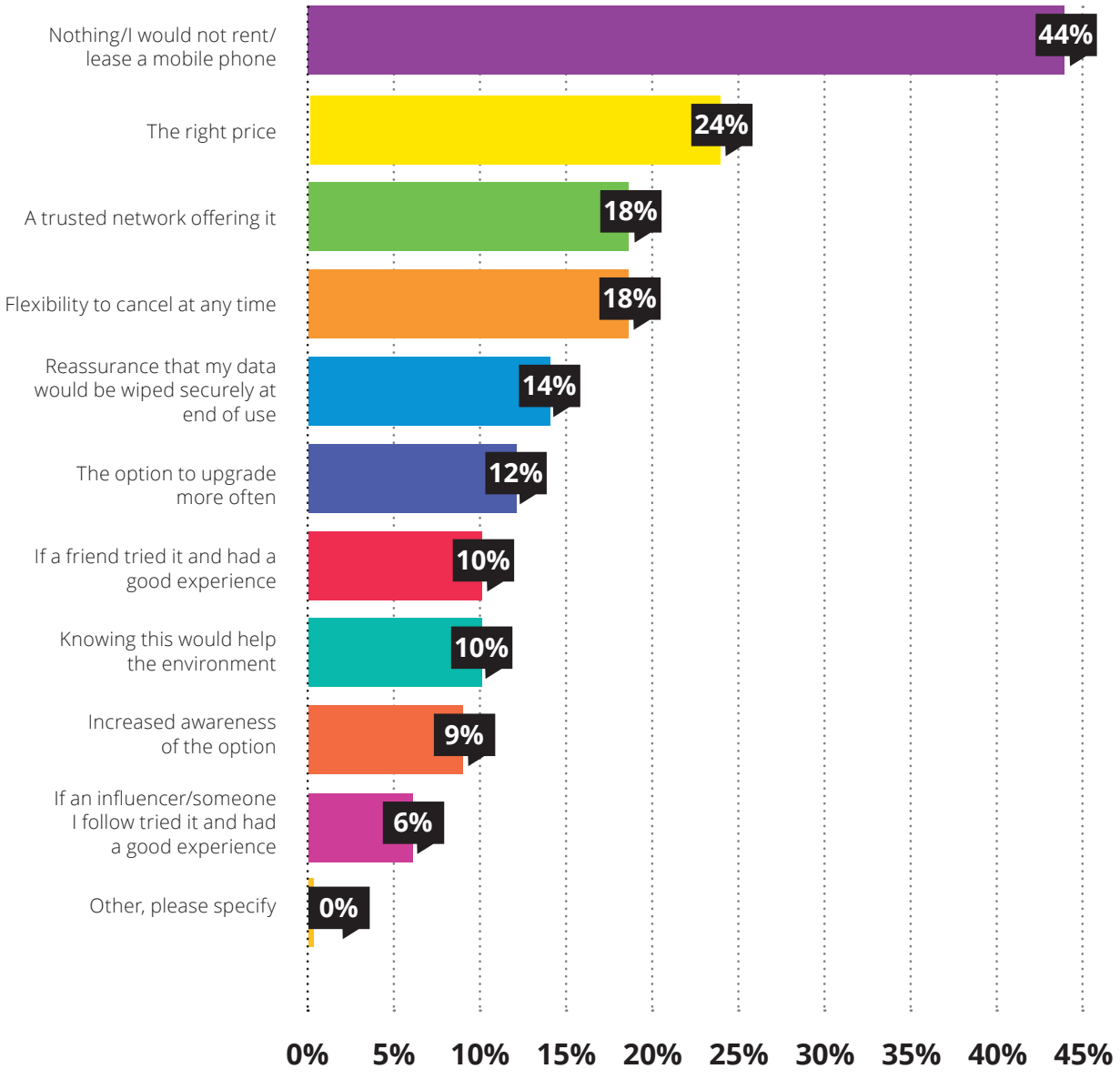
Q15 WHAT, IF ANYTHING, WOULD ENCOURAGE YOU TO BUY A SECOND HAND/REFURBISHED PHONE? (SELECT UP TO 3)

Consumer survey Q15, n=2001, multiple responses



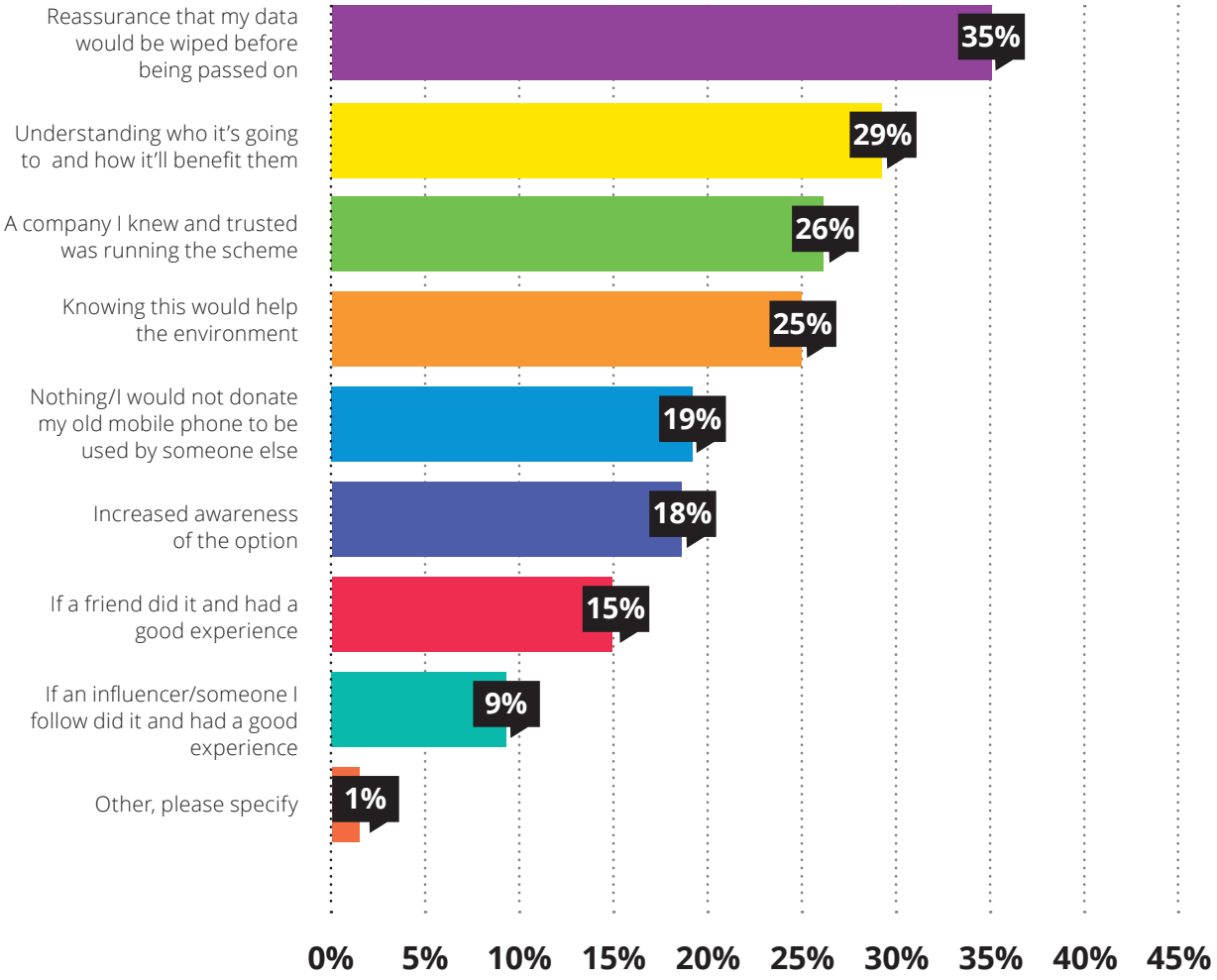
Q16 WHAT, IF ANYTHING, WOULD ENCOURAGE YOU TO RENT/LEASE A MOBILE PHONE? (SELECT UP TO 3)

Consumer survey Q16, n=2001, multiple responses



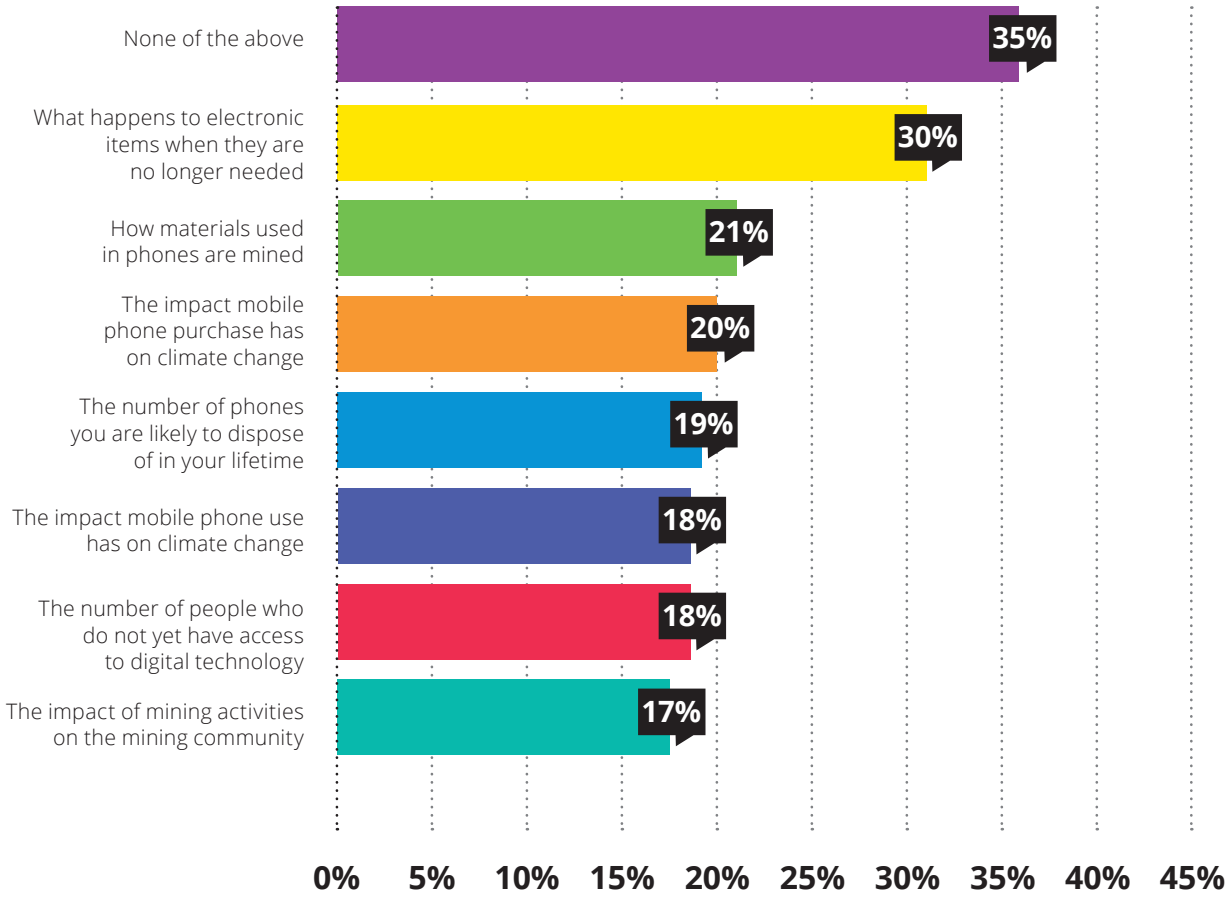
Q17 WHAT, IF ANYTHING, WOULD ENCOURAGE YOU TO DONATE YOUR OLD MOBILE PHONE TO BE USED BY SOMEONE ELSE? (SELECT UP TO 3)

Consumer survey Q17, n=2001, multiple responses



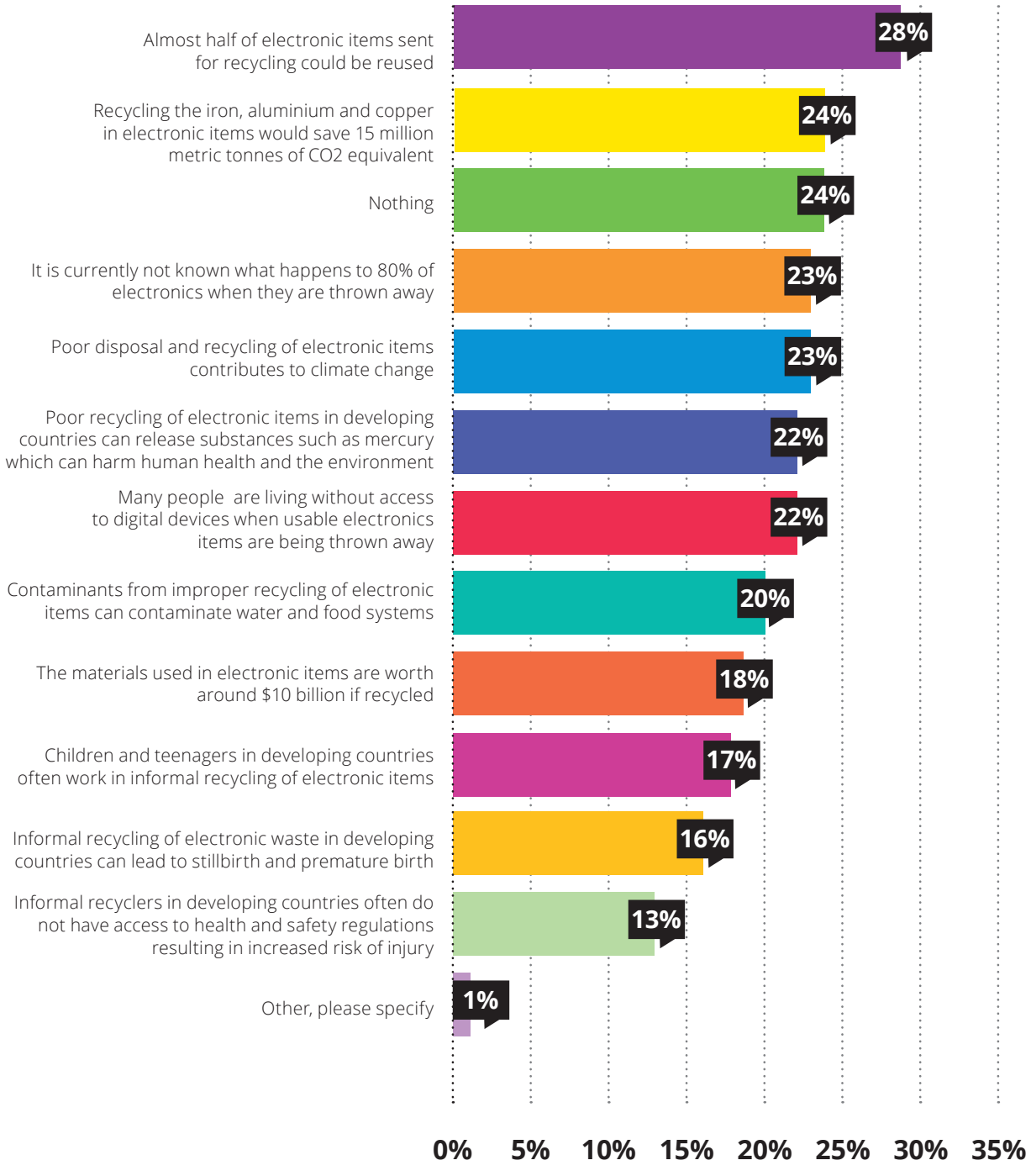
Q18 HAVE YOU EVER CONSIDERED ANY OF THE FOLLOWING IN RELATION TO MOBILE PHONES? (SELECT ALL THAT APPLY)

Consumer survey Q18, n=2001, multiple responses



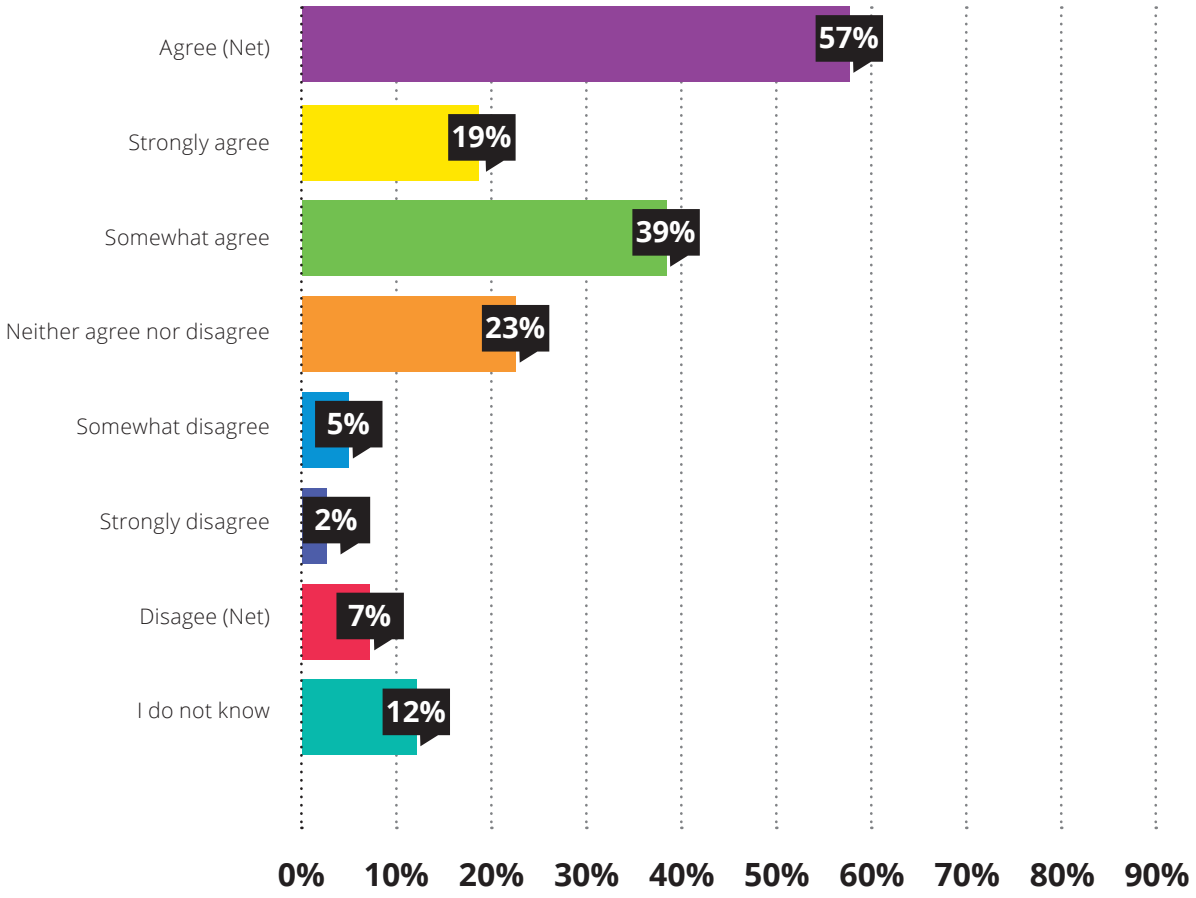
Q19 WHAT MIGHT MAKE YOU RETHINK YOUR PURCHASING HABITS AROUND YOUR MOBILE PHONE USE THE MOST? (SELECT UP TO 5)

Consumer survey Q1, n=2001, multiple responses



Q20 TO WHAT EXTENT DO YOU AGREE OR DISAGREE WITH THE FOLLOWING STATEMENT: I THINK ELECTRONIC WASTE FROM MOBILE PHONES AND RELATED ACCESSORIES IS A PROBLEM IN THE UK'?

Consumer survey Q20, n=2001, single response



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