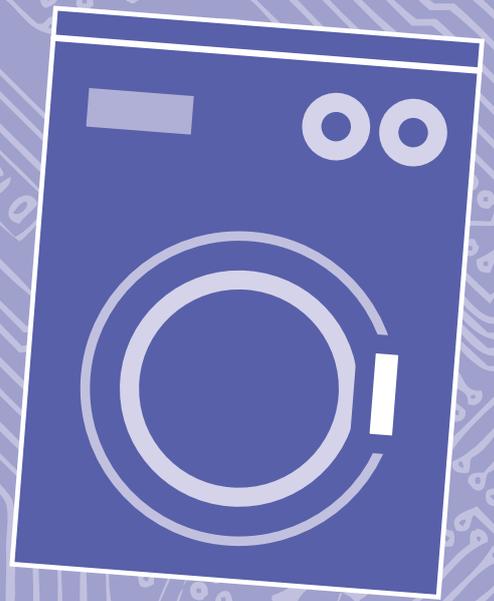
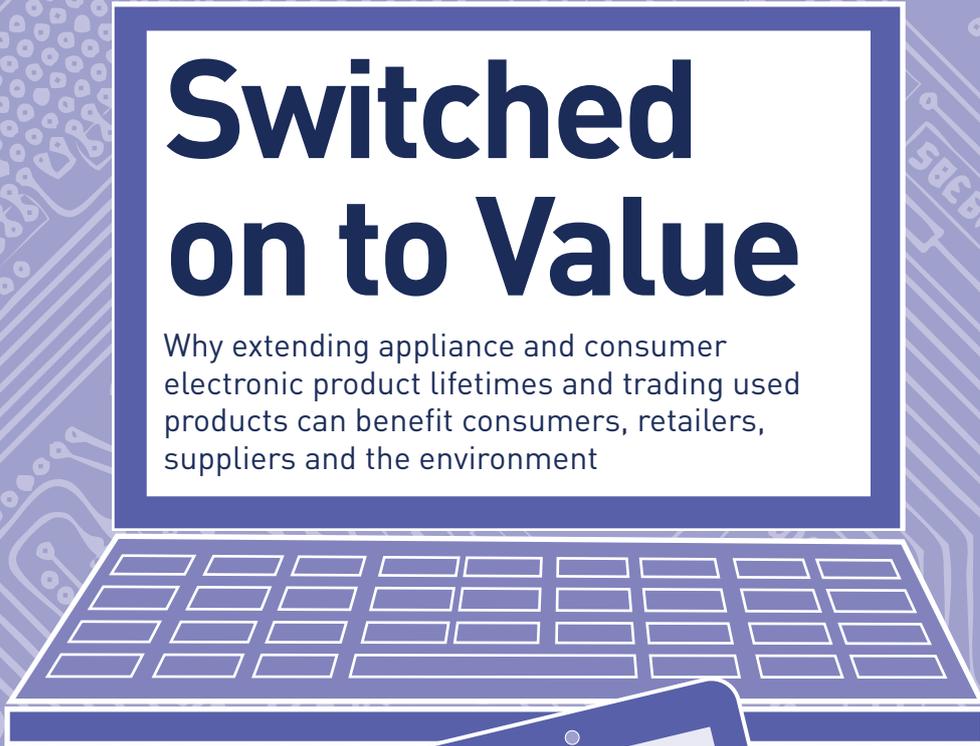


# Switched on to Value

Why extending appliance and consumer electronic product lifetimes and trading used products can benefit consumers, retailers, suppliers and the environment



This report provides new evidence from consumer research, product design reviews and a study of the asset management market, quantifying the value associated with product re-sale and longer-life appliances.

## Key findings

**Every year, the average household in the UK spends around £800 on new electrical and electronic goods. By weight, the UK purchases about 1.4 million tonnes per year. We dispose of a similar amount. Nearly 40% of this goes to landfill and less than 10% is re-used despite the fact that much of it either works or could be repaired.**

This waste is a missed opportunity for businesses and consumers. Changing how we design, make, buy and dispose of electrical and electronic equipment could reduce our carbon footprint by up to 15% and add £800 million in GDP to the UK economy.

This report sets out the key opportunities to do this and introduces WRAP's *Sustainable Electricals Action Plan* which will help businesses to take advantage of them.

### Key findings from WRAP's new research include:

- around a third of all washing machines and fridges, and a quarter of all the vacuum cleaners replaced in the UK each year failed to meet the average customer's expectation for each product's lifetime;
- extending the average life of lower-end appliances to match the current market average for all appliances would save around 750,000 tonnes of carbon emissions associated with production, roughly equivalent to one week's CO<sub>2</sub> eq emissions from all the cars in the UK;
- the average home contains around £1,200 worth of electrical and electronic equipment but many householders don't realise their used products still have significant value – this value amounts to around £3 billion across the UK;
- when asked, two-thirds of UK consumers expressed a willingness to trade-in consumer electronic products and would prefer to do so with reputable high-street retailers.

# What are the opportunities for consumers and businesses?

Our research provides new evidence of the value placed on longer-lasting appliances and pre-owned consumer electronics.



## Longer-lasting appliances

In our survey, reliability, quality and durability were rated as the most important buying criteria. **Over 80% of survey respondents** said they want a **minimum two-year guarantee** as standard on new appliances.



Longer product life does not always mean higher product cost. Expert reviews<sup>1</sup> identified cost savings from design changes on 15 out of 16 products that we stripped down. Greater reliability will reduce product returns due to failure, which currently cost UK retailers and brands up to £400 million every year.



## Pre-owned consumer electronics

Consumers and businesses can benefit from a large potential market for trading-in and reselling used products. In a WRAP survey, **over 70% of customers said they were likely or very likely to trade in high-tech products** such as TVs and laptops if they were offered the right price by an electrical retailer, and **over 55% said they were likely or very likely to buy second-hand from the same source**. Market data<sup>2</sup> indicate that 1-3 year old products are worth substantially more than the cost of collecting, refurbishing and reselling them.



For retailers and manufacturers, this provides the opportunity to help their customers to trade-up to new technology by trading-in the products they own, which can then be sold or leased into new market segments. From econometric modelling<sup>3</sup>, WRAP estimates the **UK economy could benefit to the tune of £800 million GDP growth or more**. Businesses could see greater footfall and earlier sales of new technology, and reduce their dependence on overseas supply chains.

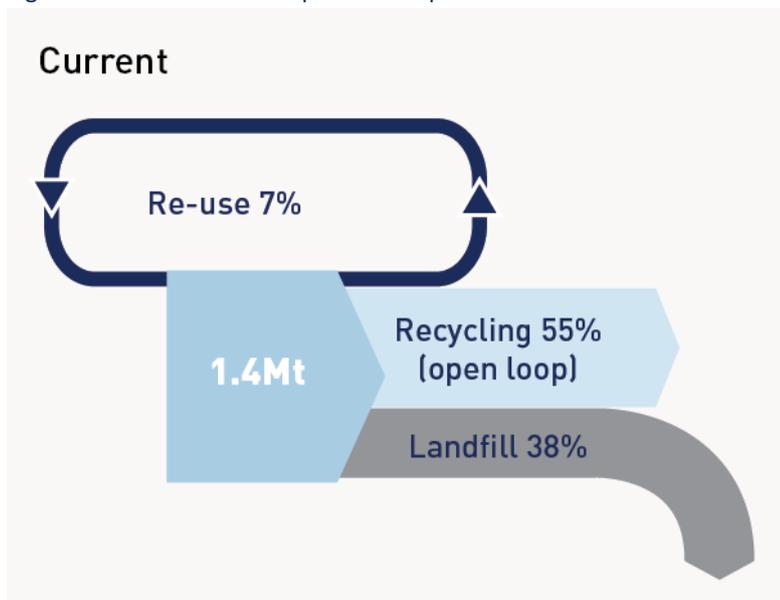
# Chapter 1

## Environmental benefits of valuing longer-life electrical products

Each year the UK buys 1.4 million tonnes of electrical and electronic products. The lifetime greenhouse gas (GHG) impacts of these products total around 160 million tonnes CO<sub>2</sub> eq<sup>4</sup>. In-use energy is the largest part of this impact, which is why government policy is driving energy efficiency in these products. However, the supply chain (or “embodied”) impacts are significant, roughly 11 million tonnes CO<sub>2</sub> eq, and these material consumption impacts link directly to business resilience and resource security<sup>5</sup>.

WRAP estimates that each year the UK discards a similar weight of products - around 1.4 million tonnes. We landfill around a third of this waste and just over half is recycled. Only around 7% is re-used as whole product.

Figure 1: Current electrical product loop



This waste represents a significant environmental *and* business loss. At the point of sale, a tonne of product has an average value of £15,000. By the time this product is landfilled or recycled the value is only in the material, which is notionally around £800 per tonne on average. Together, products purchased in the UK each year contain around 60 tonnes of silver, 3 tonnes of gold, and 500 kgs of other precious, rare and “critical” materials. In total, these materials are worth £220 million but we throw away £40 million of this value in the bin (including a tonne of gold) and lose another £50 million-worth of materials in recycling processes that focus on steel, copper and aluminium recovery.

### **Which products to focus on?**

WRAP has identified<sup>6</sup> the priority products that contribute the greatest resource impact on the UK market, based on the volume sold and resources required to make them. The priority product groups for action are:

- televisions;
- vacuum cleaners;
- washing machines;
- laptop computers; and
- refrigeration products (fridges and freezers).

These five product groups have 40% of the embodied impact of all electrical and electronic products sold in the UK. The most significant benefits that we can deliver are:

1. extend the lifetime of household appliances that householders consider to be “*workhorse products*”; and
2. maximise the useful life of consumer electronic products, when original owners no longer wish to use them.

### **What environmental benefits can change deliver?**

WRAP estimates that modest changes in the manufacturing and retail sector, which increase re-use by 10%, could deliver 30,000 tonnes of resource saving per year with a GHG benefit of 220,000 tonnes CO<sub>2</sub> eq.

Previous WRAP research<sup>7</sup> showed that almost a quarter of electrical and electronic products discarded by householders at recycling centres were suitable for re-use. If we are able to successfully extend the lifetime of shorter-life major appliances and re-use 25% of the products we purchase, the benefits are substantial: the UK could save 170,000 tonnes of resources per year with a GHG benefit of around 1.1 million tonnes CO<sub>2</sub> eq per year.

### **Business benefits**

These changes can also deliver business benefits. This report identifies the financial and wider commercial benefits that business can achieve, with information that shows the clear market pull for change.

## Chapter 2

# The science of appliances: product design for longer life



### Why take action?

- New consumer data and design reviews<sup>8</sup> show that product design changes can deliver multiple benefits, both commercial and environmental, which outweigh the costs of implementing longer product life.
- Increasing the lifetime of lower-end products to match the current market average would save 150,000 tonnes of resources and almost 750,000 tonnes of CO<sub>2</sub> eq per year.



### Opportunities for business

- Strengthen brand loyalty by delivering against unmet customer expectations on product lifetime and guarantees.
- Over 80% of customers said they would be prepared to pay more for a washing machine that had a longer guarantee. WRAP research observed consumers shopping around for the longest guarantee available at a given price.



### Opportunities for consumers

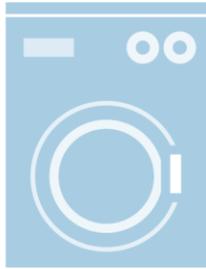
- Longer guarantees and information on product reliability make it easier to assess value for money when buying new products, and can also inform decisions on whether to get appliances serviced or repaired.

### Why extend product lifetime?

**Our consumer research<sup>8</sup>** shows that householders attach a sizeable financial value to longer life on “workhorse” appliance products such as washing machines, fridges, freezers and vacuum cleaners. Many people assess product lifetime through the length of the manufacturer’s guarantee. Therefore selling longer-life products can still make commercial sense, where backed by a longer guarantee.

**Longer-life, more reliable products will also reduce product returns**, which cost UK producers and retailers of household electricals an estimated £400 million a year<sup>9</sup>. In addition, our evidence shows that reviewing product design can deliver cost savings in manufacturing.

Figure 3: Consumer research findings - what consumers told us<sup>10</sup>



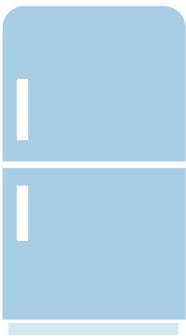
**Consumers expect ...**

Washing machines to last for **6 years** on average.

**41%** of washing machines purchased in 2012 were replacing an existing product under 6 years old.

**82%** of customers surveyed stated the reason for replacement was that their previous product had **broken down** or was **unreliable**.

So **33%** of purchases replaced a product that failed to meet the median customer's expectation.



**Consumers expect ...**

Refrigerators to last for **8 years** on average.

Around **50%** of refrigerators purchased in 2012 were replacing an existing product under 8 years old.

**77%** of customers surveyed stated the reason for replacement was that their previous product had **broken down** or was **unreliable**.

So **38%** of purchases replaced a product that failed to meet the median customer's expectation.



**Consumers expect ...**

Vacuum cleaners to last for **5 years** on average.

Around **50%** of vacuum cleaners purchased in 2012 were replacing an existing product under 5 years old.

**55%** of customers surveyed stated the reason for replacement was that their previous product had **broken down** or was **unreliable**.

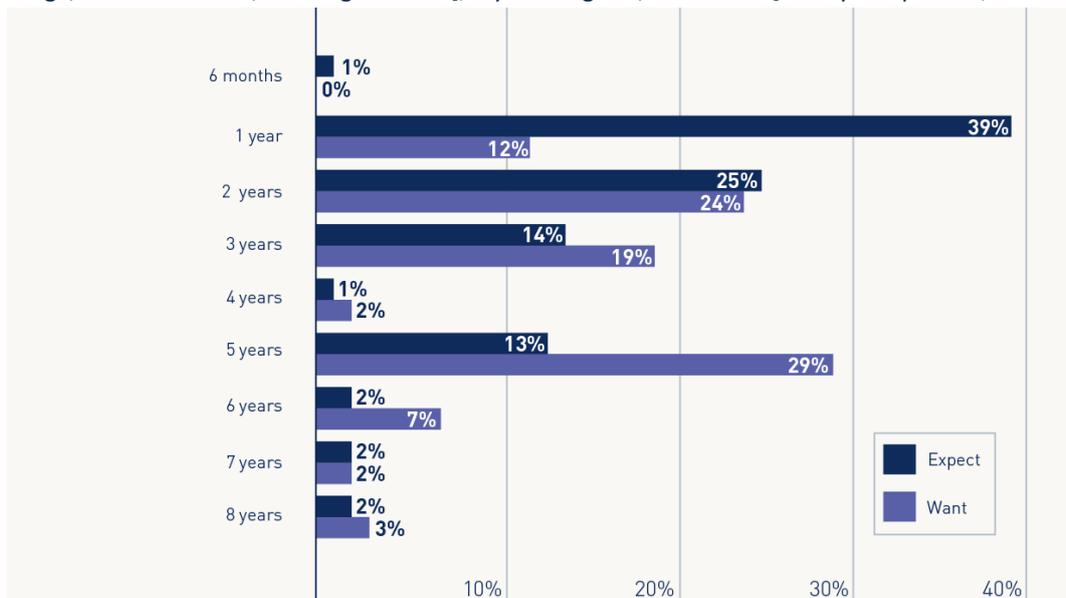
So **28%** of purchases replaced a product that failed to meet the median customer's expectation.

## Longer guarantees

Our research<sup>11</sup> shows that customers clearly want longer guarantees on “workhorse” products. The following chart illustrates the mismatch between what they expect to be offered and what they want to be offered.

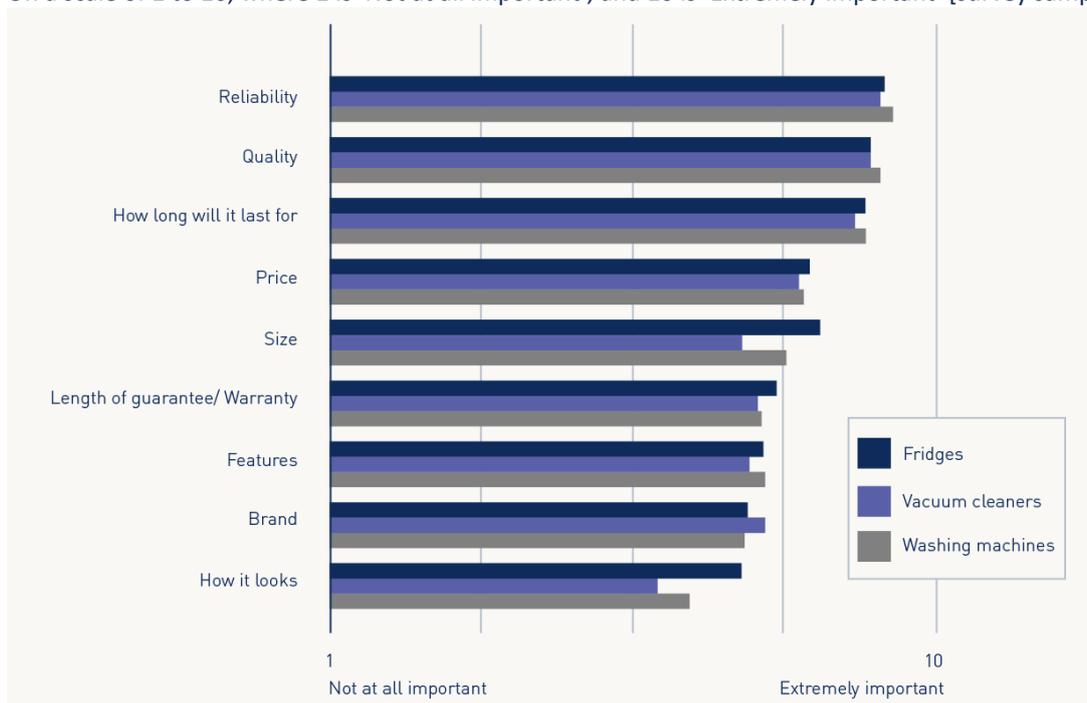
Over 80% of respondents said they wanted a **minimum two-year guarantee** on new appliances to be offered as standard.

Figure 4: “What is the minimum length of the standard warranty that you would expect/want to be included [on your fridge/vacuum cleaner/washing machine], if you bought it/this new?” [survey sample size, n = 607]



When asked to rank product attributes, customers rated reliability, quality and how long a product will last above all other attributes - including price, brand and features.

Figure 5: “How important are the following when you are buying a fridge/ vacuum cleaner/ washing machine?” On a scale of 1 to 10, where 1 is ‘Not at all important’, and 10 is ‘Extremely important’ [survey sample size, n = 607]



Our researchers also tracked customers on their purchasing journey to understand their decisions. These journeys were found to be complex and often involved each customer reviewing previous options several times, and using various sources of information to reach a decision. This means that retailers have the opportunity to influence purchase decisions if they provide online information and shop-floor sales advice on lifetime, guarantees and reliability.

#### Currently, how do customers most commonly gauge product lifetime?

- **25%** of potential customers stated they would use their perception of the brand to estimate how long the product would last.
- **23%** said they would judge lifetime based on online product reviews.

When comparing two products from the same category.

#### What information would consumers like to see?

Popular options for evaluating product lifetime among our survey respondents included:

- **Evidence of product testing:** the consumer focus groups highlighted the IKEA chair test adverts and in-store demonstrations as being particularly effective at communicating reliability;
- **Third party seals of approval:** reputable and independent sources of information were identified as useful references e.g. Which? reviews and reliable online product reviews; and
- **Product guarantees or warranties.**

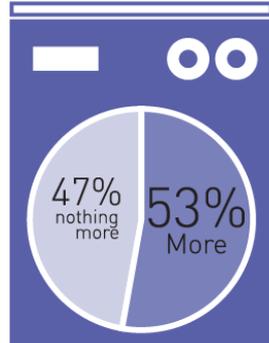
Respondents said that they would trust a manufacturer's guarantee, inferring that a manufacturer's guarantee is a show of faith in their product's reliability.

So the evidence indicates there is a commercial opportunity for all producers of washing machines, vacuum cleaners and fridges in clearly demonstrating longer product lifetime through longer guarantees and improved design – for both low-end and high-end appliances.

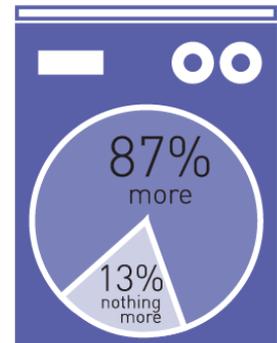
## Willingness to pay

Importantly, in our research, respondents consistently indicated that they value longer-life products and are willing to pay a higher price for products that have a longer lifetime, **especially if the manufacturer provides a long product guarantee:**

**53%** of customers said they would be prepared to pay more for a washing machine that had a **longer lifetime**.



**87%** of customers said they would be prepared to pay more for a washing machine that had a **longer guarantee**.



Younger consumers and families with children showed above-average willingness to pay more, and had low expectations about how long products currently last.

**We recognise that customers' behaviour at the till or website checkout may differ from stating a willingness to pay in a survey. However, we think the trends observed in this research are so significant that it's worth retailers and manufacturers assessing this finding in more detail for their own products.**

In comparison, the research found that longer product lifetime attracted lower consumer interest for electronic products such as laptops and televisions. For these products where rapid changes in technology or aesthetics drive the market, a different approach to product lifetime is required as the opportunities lie in upgradeability or re-sale to secondary markets. This is addressed in *Chapter 3: Trading technology products for re-use*.

## Designing for longer life and lower costs

We have presented evidence that customers want longer-life appliances and could be willing to pay for the benefit, especially where a guarantee provides extra peace of mind. But how would this make commercial sense for the sector?

Better product design can deliver longer life, lower production costs and reduced product returns. WRAP product design reviews have revealed simple, cost-effective design changes to improve reliability and durability for a number of household electrical and electronic products across the price spectrum. In fact, these reviews also found ways of reducing production and transport costs too.

Even better, these changes would reduce the environmental impact of production.

For more information, see [www.wrap.org.uk/content/electrical-product-design-reviews](http://www.wrap.org.uk/content/electrical-product-design-reviews)

WRAP's expert product design reviews revealed that **15 out of 16** products reviewed could be improved to deliver **significant cost savings** and **reduced returns** through simple changes in the design and production process.

## Design review case studies

### Retailer own-brand microwave oven

Possible cost savings of ~£320,000 and carbon reduction of ~300 tonnes of CO<sub>2</sub> eq (per 100,000 units). Changes included:

- lightweighting the steel in the door by ~1.5kg per unit without impacting on quality or performance; and
- simplifying and strengthening the push-button door closure mechanism.

### Premium-brand washing machine

Possible cost savings of ~£550,000 and carbon reduction of ~740 tonnes of CO<sub>2</sub> eq (per 100,000 units). Changes included:

- improving location and durability of screw fixings; and
- redesigning inlet and wastewater pipes to prevent movement during use, provide damping, and reduce vibration noise.

### Retailer own-brand LCD television (32") with CCFL backlight

Possible cost savings of ~£215,000 and carbon reduction of ~780 tonnes of CO<sub>2</sub> eq (per 100,000 units). Changes included:

- strengthening the TV stand and mount to reduce the risk of failure and damage;
- improving speaker mounts to avoid vibration and reduce returns; and
- simplifying fixing design and layout, which could lead to a 30 second saving in assembly time per unit at no additional cost.

## Chapter 3

### Trading technology products for re-use



#### Why take action?

- 38% of consumer electronic products go to landfill when no longer wanted. Only 7% are re-used. One quarter of products taken to household waste reception centres are still in working order.



#### Opportunities for business

- More than six in ten consumers said they would welcome the opportunity to trade in older products. The UK market value for trading pre-owned electrical and electronic products could be worth up to £3 billion.
- Selling quality used products to new customer segments could offer business growth, reduce the demand for raw materials and improve supply chain resilience.



#### Opportunities for consumers

- Easy access to trade-in services and pre-owned products would benefit those customers who want the latest technology as well as consumers seeking a value-for-money purchase.

Market data show that there is clear consumer interest in buying the latest electronic products. In our research, 64-74% of customers said they are willing to trade in working high-tech products such as TVs, laptops and tablets, if they get the right price offer from their retailer. Inevitably, different customers will have different expectations for the value to be offered.

28% of customers surveyed had technology products lying round the house unused, and half said they were unsure or didn't know where they could trade them in. 57% of consumers stated they would be likely to buy second-hand products from major retailers.

Therefore a new option for retailers (including charity retailers) and manufacturers, alongside current sales, is to buy back and re-sell their original products, possibly in partnership with a specialist IT asset management company. A recent WRAP study of the asset management market shows a significant margin is available between the re-sale value of pre-owned products and the cost of putting them back on the market. This margin creates the scope to offer consumers a significant financial value for their traded-in products.

## Market size

By only selling products once, brands and retailers are missing out on the opportunity to serve additional customer segments. WRAP estimates that the second-hand value of 1-3 year old products in a typical household (which cost £2,400 to purchase) is roughly £400.

Based on this, WRAP estimates the UK market value for trading in pre-owned products could be worth up to £3 billion per annum<sup>12</sup>. Modelling the potential impact of TV trade-in on the UK economy indicates that the UK could benefit from £1bn+ growth in GDP and a reduction in imports if consumer electronics were traded as a norm.

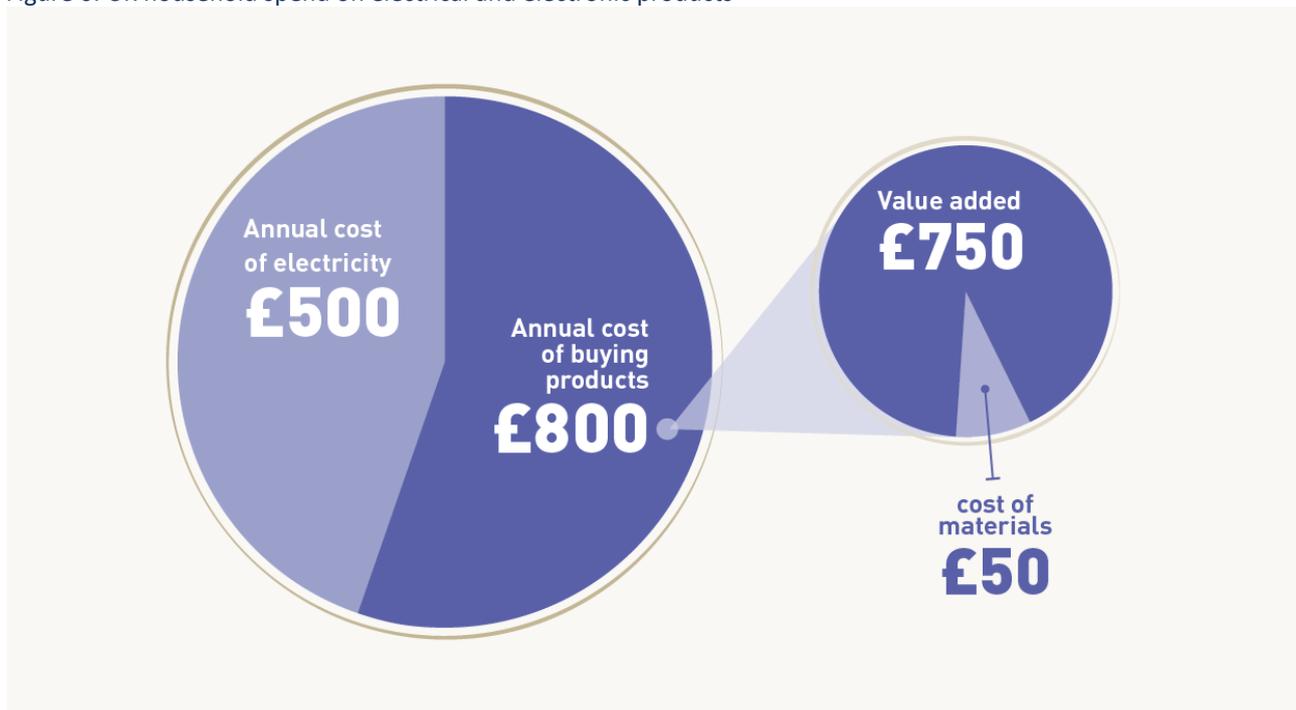
## Standard for re-use of products

Work is underway to increase confidence in the re-use of returned electrical and electronic products. In 2011, a Publicly Available Specification (PAS141) for the re-use of used and waste electrical and electronic equipment was published. This created formal and consistent quality tests for re-used equipment, providing confidence for purchasers.

As illustrated in Figure 6, the average UK household spends around 5% of its yearly spend on buying and running electrical and electronic products (~£1,300 including electricity but excluding broadband and media costs). Around £800 of this is product purchases, while the rest (~£500) is electricity costs.

WRAP estimates that the material value of these products when sold is around £50-70; the rest of the £800 value is “value added” (R&D, manufacturing, testing, distribution and retail, marketing and other costs). Trading used products could allow more value to be added in the UK.

Figure 6: UK household spend on electrical and electronic products



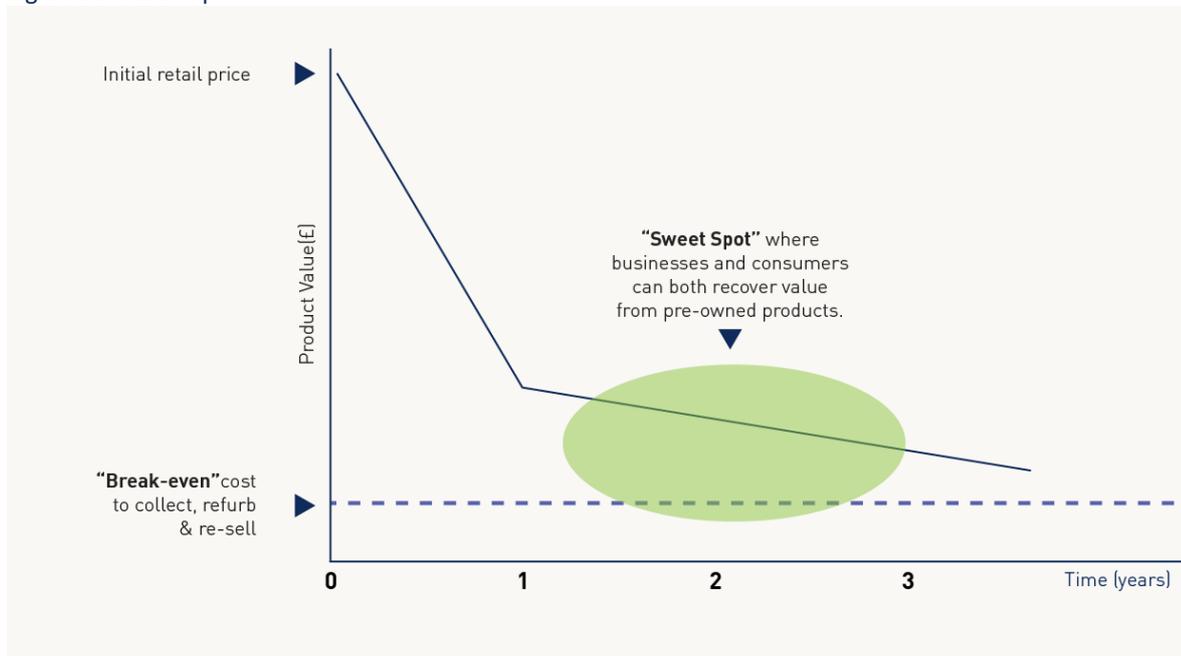
### Focus on 2-3 year-old products

Therefore opportunities for re-sale to additional customer segments are worth serious analysis, particularly for technology product categories where many consumers are eager to upgrade to new, more powerful products. For example, WRAP's research shows that customers believe their laptops to be reaching the end of their useful/desirable life at 2-3 years of age, and they don't realise that these items have a gross re-sale value of over £100 each (around one quarter of the retail price after two years, depending on the brand).

This compares to collection and refurbishment costs of £25-40. So there is ample scope for companies to offer an incentive for their return, while still achieving a commercial margin. Otherwise, many consumer electronics remain unused at home depreciating in value.

In fact, there is a "sweet spot" where retailers can offer their customers a good financial incentive to trade in their used products.

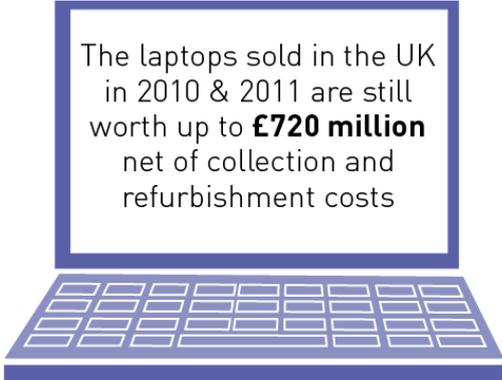
Figure 7: "Sweet spot"



Products between 2 and 3-years old have a residual value significantly higher than the cost of collecting, refurbishing and reselling them on the market. Also, consumer electronics in this age range are likely to have been superseded by newer, faster products with greater functionality, providing some customers with a reason to trade-up. Moreover, from a commercial perspective, the major value depreciation has ended, so used products will hold a more stable value on the global market while waiting to be sold.

## Business opportunities

With almost 10 million laptops sold in 2010 and 2011, WRAP estimates there could be over £700 million in value available to share between consumers, retailers and brands. In WRAP's research, respondents welcomed a retailer providing this service because they were less comfortable selling to unknown individuals on internet trading sites or through personal sales adverts.



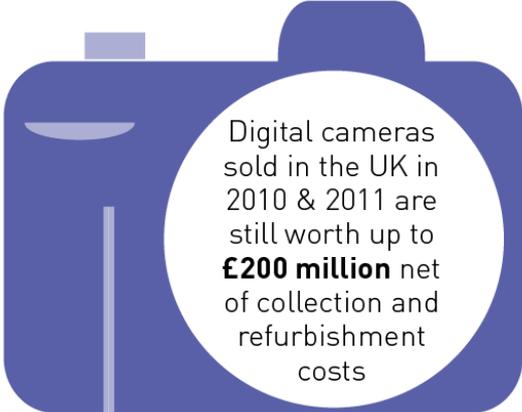
The laptops sold in the UK in 2010 & 2011 are still worth up to **£720 million** net of collection and refurbishment costs



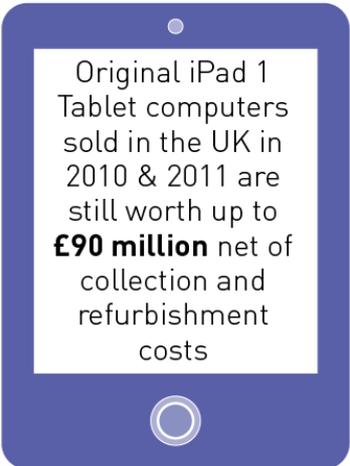
TVs sold in the UK in 2010 & 2011 are still worth up to **£350 million** net of collection and refurbishment costs

This opportunity is greatest for premium brands, whose products will hold their value for longer. For example, some customers may be keen to buy a quality used premium product rather than a low-end new product.

A good example of developing a new market within the electronics sector is the trade-in of used mobile phones. For example, Mazuma claims to trade around 1.8 million<sup>13</sup> mobile phones per year: that's equivalent to 10% of the UK smartphone market.



Digital cameras sold in the UK in 2010 & 2011 are still worth up to **£200 million** net of collection and refurbishment costs



Original iPad 1 Tablet computers sold in the UK in 2010 & 2011 are still worth up to **£90 million** net of collection and refurbishment costs

Many customers are becoming comfortable with trading-in their working products. Other companies offer service packages where products can be leased or upgraded. As a result, retailers and brands can reduce the environmental impact of their sales activity while still delivering the required business performance, by achieving higher turnover per tonne of raw material. This reduces the demand on global resources and increases business resilience.

## Chapter 4

### How to explore the opportunities

**This report provides evidence for market opportunities in the electrical and electronic products sector. What should companies that are willing to investigate further and act quickly do next?**

#### **Join WRAP's Electrical and Electronic Products Pathfinder Group**

This cross-industry working group provides retailers, brands and trade associations with the latest evidence on delivering less resource-intensive business growth. Members steer projects to provide the sector with the information it needs.

Pathfinder members include:

AMDEA	Dixons Retail	Next
Apple	Electrolux	Panasonic
Asda	Home Retail Group	Samsung
B&Q	John Lewis	Sainsbury's
Bosch Siemens	Travis Perkins	Tech UK
British Retail Consortium	LG Electronics	Tesco

The group is currently taking action on:

- **Developing specifications for longer-life appliances**  
WRAP is developing specifications to support retailers' buying teams in selecting longer-life appliances at their target price point. With European eco-design measures focusing more on resource impacts in future, this is an important consideration for brands and retailers. This work could potentially lead to a sector commitment on product lifetimes and guarantee periods.
- **Demonstrating trade-in and other business models in exemplar companies**  
WRAP's EU funded "REBus" project is kick-starting the development of resource efficient business models which "make more with less". Participating companies benefit from detailed research and funded resource to develop and evaluate the business case. This work has already helped exemplar companies understand the changes required, the potential profitability and wider business benefits. [www.rebus.eu.com](http://www.rebus.eu.com)

**Broadening the scope, increasing the impact**

The Pathfinder Group is evolving into a “Sustainable Electricals Action Plan”.

The Action Plan’s scope will be wider than that of the Pathfinder, taking action beyond the UK and including the whole product lifecycle - from design and specification through repair and re-use to end of life and recycling.

Collectors, re-use businesses and organisations, recyclers, enforcement bodies, consumer interest groups and international initiatives will all be included in the Action Plan.

To find out more about the Sustainable Electricals Action Plan, contact [eproducts@wrap.org.uk](mailto:eproducts@wrap.org.uk)

## Further information

WRAP makes its government-funded research findings available to support decision-making in companies, leading to improved resource efficiency and better outcomes for the UK economy. This includes:

- Product value project that quantifies the value hidden in customers' un-used products, [www.wrap.org.uk/node/18473](http://www.wrap.org.uk/node/18473)
- Basic buying guidance for specifying longer life, [www.wrap.org.uk/content/buying-guides-durability-and-repair](http://www.wrap.org.uk/content/buying-guides-durability-and-repair)
- Product design reviews that identify opportunities for reducing assembly time; material savings; and design improvements to improve durability, longevity and enable repair. These can inform your design checklists, [www.wrap.org.uk/content/electrical-product-design-reviews](http://www.wrap.org.uk/content/electrical-product-design-reviews)
- Electrical products: UK mapping of raw material consumption and waste <http://www.wrap.org.uk/material-recovery>
- Identification of 'hotspots': electrical & electronic products with the highest environmental impact and potential for reduction, taking into account cost considerations. This study quantifies the lifecycle environmental impacts of products placed on the UK market, according to five metrics: greenhouse gas (GHG) emissions; energy use; material use; waste production; and water use, [www.wrap.org.uk/content/reducing-environmental-and-cost-impacts-electrical-products](http://www.wrap.org.uk/content/reducing-environmental-and-cost-impacts-electrical-products)
- WEEE collection, re-use and recycling guidance for retailers, [www.wrap.org.uk/content/weee-good-practice-retailers-electrical-and-electronic-equipment](http://www.wrap.org.uk/content/weee-good-practice-retailers-electrical-and-electronic-equipment)
- Customer communication materials to help retailers meet their obligation on communicating about WEEE recycling with householders, [www.recyclenowpartners.org.uk](http://www.recyclenowpartners.org.uk)
- Product lifetime consumer research [www.wrap.org.uk/node/18468](http://www.wrap.org.uk/node/18468)
- Standard for re-use of products [www.wrap.org.uk/pas141](http://www.wrap.org.uk/pas141)
- Evidence of consumer demand for retailer services on electrical products that offer alternatives to new product purchase, [www.wrap.org.uk/content/resource-efficient-business-models-consumer-research](http://www.wrap.org.uk/content/resource-efficient-business-models-consumer-research)

For further information on any aspect of this report, contact [eproducts@wrap.org.uk](mailto:eproducts@wrap.org.uk)

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- <sup>1</sup> Design review case studies commissioned by WRAP 2012-2013, [www.wrap.org.uk/content/electrical-product-design-reviews](http://www.wrap.org.uk/content/electrical-product-design-reviews)
- <sup>2</sup> Data on values of used electrical and electronic products, commissioned by WRAP in 2012, [www.wrap.org.uk/node/18473](http://www.wrap.org.uk/node/18473)
- <sup>3</sup> Report on econometric modelling of alternative business models, commissioned by WRAP in 2012, [www.wrap.org.uk/node/18471](http://www.wrap.org.uk/node/18471)
- <sup>4</sup> [www.wrap.org.uk/content/reducing-environmental-and-cost-impacts-electrical-products](http://www.wrap.org.uk/content/reducing-environmental-and-cost-impacts-electrical-products)
- <sup>5</sup> [www.gov.uk/government/uploads/system/uploads/attachment\\_data/file/69511/pb13719-resource-security-action-plan.pdf](http://www.gov.uk/government/uploads/system/uploads/attachment_data/file/69511/pb13719-resource-security-action-plan.pdf)
- <sup>6</sup> [www.wrap.org.uk/content/reducing-environmental-and-cost-impacts-electrical-products](http://www.wrap.org.uk/content/reducing-environmental-and-cost-impacts-electrical-products)
- <sup>7</sup> <http://www.wrap.org.uk/content/value-re-using-household-waste-electrical-and-electronic-equipment>
- <sup>8</sup> New consumer research commissioned by WRAP (including 6 focus groups, 10 accompanied shopping trips and a telephone survey of 1,104 respondents) shows the importance of reliability and product lifetime within consumers' purchase decisions for "workhorse" products, compared to "technology" products such as laptops or televisions
- <sup>9</sup> Based on UK annual electrical sales of £21bn (Verdict data for 2012) and a product return rate of 2% (US average for appliances and consumer electronics based on data from [www.warrantyweek.com](http://www.warrantyweek.com))
- <sup>10</sup> Replacement cycle data obtained from GfK NOP, 2012
- <sup>11</sup> Consumer research commissioned by WRAP on appetite for new business models and carried out by Brook Lyndhurst between January and June 2013 [www.wrap.org.uk/node/17224](http://www.wrap.org.uk/node/17224)
- <sup>12</sup> Calculated based on 26.5m households (ONS 2011 UK census data)
- <sup>13</sup> [www.mazumamobile.com/about.php](http://www.mazumamobile.com/about.php)

**WRAP's vision is a world without waste, where resources are used sustainably.**

**We work with businesses, individuals and communities to help them reap the benefits of reducing waste, developing sustainable products and using resources in an efficient way.**

**Find out more at [www.wrap.org.uk](http://www.wrap.org.uk)**

**Data limitations: This report seeks to identify patterns of business benefit and environmental impact based on estimates of value and product impacts throughout their lifecycle. Due to the complexity of the supply chain, consumer use and disposal routes, and limited availability of data specific to the UK, values are approximate.**

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