
Summary Report

Realising the Reuse Value of Household WEEE



A summary of a study investigating WEEE being disposed of via Household Waste Recycling Centres and local authority bulky waste collections, the reasons for disposal, its state of repair, and its potential value.

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Executive summary

This report sets out the amount of Waste Electrical and Electronic Equipment (WEEE) being disposed of via Household Waste Recycling Centres (HWRCs) and bulky waste collections, the reasons for the disposal of these items by residents, and their state of repair. The findings have been used to generate estimates of the theoretical monetary value of the discarded equipment.

Five local authorities were selected to take part in the project, and in each area a sample of residents using HWRCs and bulky waste collections were interviewed about the items they were disposing of. Over 590 interviews were carried out with residents using the five HWRCs to dispose of WEEE in March 2011, and 114 telephone interviews were conducted with residents who had booked a bulky waste collection for their WEEE. In addition, 100 items of WEEE were diverted from the HWRCs to an electrical testing outlet to be assessed in terms of their reusability, repair requirements and potential value.

Smaller items of consumer equipment (televisions, DVD recorders) and small domestic appliances are commonly found at HWRCs (34% and 22% of all HWRC WEEE), while large domestic appliances such as fridges and freezers are commonly found in bulky collections (36% of all bulky collected WEEE). Overall, though, just 16% of bulky items are WEEE.

The main reason given by people for disposing of WEEE was that the item was broken; 51% of respondents at HWRCs and 38% of respondents using a bulky collection said this. The next most commonly stated reason for disposing of WEEE was that it was no longer wanted. When asked why they did not consider repairing the item, for items being disposed of via HWRCs the most common response was that they were thought to be cheaper to replace than repair (47% of people disposing of WEEE said this). For items being disposed of via bulky collections, the most common response was that they were thought to be broken beyond repair (33%). This reflects the fact that consumer equipment is more likely to be disposed via HWRCs and large WEEE through bulky waste collections.

When asked to evaluate the condition of the item, just less than one third of people thought that the WEEE they had taken to HWRCs was fully reusable in its current condition, and over half (56%) thought the item was reusable either in its current condition or with some economical repairs. The condition of WEEE collected through the bulky waste collection service was thought to be in a poorer condition, with just 22% of people saying it would be fully reusable in its current condition. The condition of the item varied considerably according to the reason for disposal, with items being disposed of because they are not wanted anymore much more likely to be considered in a reusable state and therefore worthy of resale and reuse. However, awareness of more resource efficient methods for 'disposal' was low, and even when people were aware of other options they still tended to opt for the most convenient option of taking it to the HWRC or arranging for the council to collect it.

A sub sample of WEEE from HWRCs was diverted for testing by an independent electrical contractor. Whilst the proportion of WEEE which was viable for resale was independently assessed to be less than respondents thought, there is still enormous value attached to this WEEE which is currently disposed of rather than reused. In fact, top end estimates suggest around £220 million in resale value could be obtained from the repair, refurbishment and open market resale of WEEE from HWRCs alone. Nearly three quarters of this value is from small WEEE, in part because this is most commonly disposed at HWRCs, and this has the greatest potential economic recovery value. This figure does not take account of the acquisition of the WEEE and repair costs, which if taken into consideration have been estimated to be around £114 million, leaving a gross margin of around £106 million for HWRC WEEE. Whilst a smaller quantity of WEEE is currently collected by bulky waste collections, the estimated resale value of this bulky collected WEEE is around £77 million, of which 61% arises from large domestic appliances such as fridges and freezers.

This research has demonstrated the crucial importance of promoting reuse of WEEE. In many instances products are being thrown away when they are in full working order and could be diverted for reuse and resale. Although the most common reason for getting rid of WEEE is that it was broken, in many cases it seems that the item only needed a slight repair. Repair is not being considered, though, often because it is considered cheaper to replace the item; this is particularly the case for small WEEE. The value of the discarded products and materials is estimated to run into millions of pounds each year, and whilst the accuracy of these estimates is difficult to assess with any degree of certainty, they are reliable as 'order of magnitude' estimates.

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1.0 Introduction, aims and objectives

1.1 Background

Since April 2011, WRAP has initiated new streams of work with the aim of diverting more potentially reusable and recyclable waste away from disposal. Projects include designing out waste and incentivising waste prevention, and WEEE (Waste Electrical and Electronic Equipment) is one of WRAP's prioritised material streams. This project has investigated the nature of WEEE being brought to Household Waste Recycling Centres (HWRCs) and collected by local authority bulky waste services. Specifically it examines the potential for this WEEE to be reused, and estimates its monetary value. It also seeks to understand the reasons why householders are choosing to dispose of their WEEE, and their assessment of its worth.

Combined with existing WEEE data, this information can be used to establish how to realise more of the value of unwanted WEEE, and how current systems could be adapted to facilitate and promote WEEE reuse. This project excluded business and public sector waste. The original research conducted for this project also covered textiles, furniture and floor coverings.

1.2 Objectives

The objectives of the research were:

- To generate estimates based on fieldwork of the types of WEEE taken to HWRCs and collected by local authority bulky waste collections, divided into reason for disposal, and state of repair (reusability).
- To arrange for a sub-sample of WEEE items to be assessed as to whether they could be cost effectively repaired, their current value, and their potential value once repaired.
- To apply these proportions and values to data provided by WRAP on quantities to generate national estimates of WEEE available for reuse, and estimates of the theoretical reuse value of discarded WEEE.

2.0 Survey methods

A number of local authorities were invited to take part in the project. Those who responded positively were evaluated to ensure a mix of authorities were selected with different HWRC types, different facilities for bulky waste collection (e.g. paid for or free collections) and different arrangements for residual collections. These parameters were chosen because they were thought to influence how residents dispose of bulky items. Table 1 below shows the five local authorities selected to take part in the project, and the parameters used to select them.

Table 1 Sample Selection

Local Authority	Type of authority	HWRC with or without reuse shop	Bulky waste paid for or free	Rural or urban	Frequency of residual collection
Birmingham	Metropolitan Unitary	Without	Free (up to 6 items)	Urban	Weekly sacks
Warwickshire County Council (HWRC) and Stratford upon Avon District Council (bulky waste)	Two-tier County and District	With	Paid	Rural	Fortnightly bin
North Lincolnshire	Unitary	Without	Free	Rural	Fortnightly bin
Barnsley	Metropolitan Unitary	Without	Paid	Urban	Fortnightly bin
Hounslow	London Borough	With	Paid £32.50 for 5 items	Urban	Weekly sacks

2.1 Categories

Standard categories have been used throughout this report for both nature of the WEEE surveyed and the condition of the WEEE where it is assessed.

2.1.1 WEEE Categories

This report uses standard WEEE categories throughout, as show in Table 2 below.

Table 2 Categories of WEEE

1. Large household appliances e.g. refrigerator, freezers, washing machines
2. Small household appliances e.g. toasters, vacuum cleaners, hair dryers
3. IT and telecommunications equipment e.g. laptops, printers, telephones
4. Consumer equipment e.g. television sets, radios, DVD players
5. Lighting and light equipment
6. Electrical and electronic tools e.g. drills, saws, sewing machines
7. Toys, leisure & sports equipment e.g. video game consoles, rowing machines
8. Other WEEE items

Please note that this report also divides WEEE into two categories based on Table 2 above: Large WEEE, comprising category 1; and Small WEEE, comprising categories 2 to 8.

2.1.2 Condition Categories

Consistent condition categories have been applied to WEEE at the various stages of handling, from the point the resident decides the item is no longer wanted, to the point of independent assessment of reusability. These categories are shown in Table 3 below.

Table 3 Standard WEEE condition categories

Category	Description
1. Item fully reusable in current condition	The item could be taken home and used immediately, though it may need to be cleaned.
2. Slight repair required, but in general good condition	The item is slightly damaged, chipped, scratched or casing cracked and would benefit from minor repair work, but is complete and capable of fulfilling the function it was designed for.
3. Parts missing, but item is reusable with slight/moderate repair	Parts will be required to repair the item as not fully functional, but repair would not be prohibitively expensive.
4. Item requires major repair work	The item is damaged beyond repair, or repair would be prohibitively expensive. Parts of the item may be salvageable for recycling.
5. Total waste	Materials on item are very dirty/not economically viable to salvage materials for recycling. Separating recyclable materials from item will be prohibitively expensive.

2.2 Household Waste Recycling Centres (HWRCs)

Within the selected local authority areas, residents bringing WEEE, furniture, floor coverings and/or textiles to the selected HWRCs were approached to take part in a short survey. Those who agreed were interviewed.

The questionnaire aimed to find out what item(s) people were disposing of and why. Having recorded all of the relevant items being brought to the site, interviewers selected one item to ask the respondent to think about during the rest of the interview, ensuring a range of items were included in the sample. The questionnaire asked respondents why they were disposing of the item, whether it was broken (and if so if they had considered repairing it), the overall state of the item rating it on a scale from 'fully functioning' to 'total waste', and other disposal, recycling or reuse methods they were aware of and/or had used.

The total numbers of interviews, 1,173, were spread equally across the five sites in order to provide a sample of responses in each geographical area. Interviewing took place over two days at each site, on a Saturday and Sunday (the busiest days) during March and April 2011. A total of 594 interviews were conducted where the focus was an item of WEEE. The total number of WEEE items brought by interviewees was 781.

2.3 Bulky Waste Collections

In the same five local authority areas, residents who telephoned their local authority to book a bulky waste collection for WEEE, furniture and floor coverings were asked whether they would be willing to take part in a short survey. Residents who agreed were told their contact details would be passed to M·E·L Research for follow up.

A questionnaire was administered asking residents to explain why they were throwing items away, if they had considered repairing broken items, how long it took for the item to be collected, storage of the item whilst it was awaiting collection, and other disposal, recycling or reuse methods they were aware of and/or had used.

Interviewing took place in March and April 2011. Table 4 below indicates the number of contacts supplied by each local authority, and the number of interviews completed. The total achieved sample was 602. Of these, 114 interviews were in relation to an item of WEEE, and these interviewees were responsible for 150 WEEE items. When completing the questionnaire, interviewers asked respondents to think about just one of the items they had arranged to be collected; the item was selected by the interviewer to ensure a spread of items from each category.

Table 4 Number of interviews completed – Bulky Waste

Local Authority	Number of contacts supplied	Number of interviews completed	% of sample
Birmingham	1,000 +	466	77.4
Warwickshire (Stratford upon Avon)	3	1	0.2
North Lincolnshire	127	80	13.3
Barnsley	4	3	0.5
Hounslow	73	52	8.6
Total		602	100.0

As shown in Table 4 above, the number of interviews completed in each local authority area varied according to the number of contacts supplied. The implication of this is that the overall representativeness of the sample is questionable, especially as Birmingham dominates the sample, offers a free collection, and is a large urban area. An analysis by ACORN suggests that the sample under-represents ACORNs 4 and 5, areas which tend to be less affluent, and tends to over-represent ACORNs 1 and 2, areas which tend to be more affluent. For this reason the results of the bulky waste survey should be treated with caution.

2.4 Independent testing of WEEE items

To allow analysis of the current working condition of WEEE items, an independent testing company was contracted to carry out individual item assessments¹. All items tested originated from the HWRCs included in the research in Birmingham, Warwickshire and North Lincolnshire. Once all questionnaires had been completed, appropriate WEEE items were stored at the HWRC and transported to the testing facility the next working day. A cross section of items was selected according to national WEEE categories. By giving each item a unique identifier number whilst at the HWRC, direct comparison with the questionnaire responses for each item tested was possible.

Information recorded for each item tested included:

- Item type
- PAT pass/fail
- Does it work?
- State of repair
- Description of any fault
- Value in current state
- Repair cost
- Resale value.

Each item was placed into one of five category types, from 1 (fully reusable in current condition) to 5 (total waste). In total 112 WEEE items were tested. These were split into standard WEEE categories.

The main assessment criterion for the independent testing was to understand the state of repair for each item. This enabled tonnage and financial data to be generated on the amount of potential WEEE that could be diverted for reuse, and the percentage of items that were in good working condition or required cost effective minor or moderate repair.

¹ Brown and Fincher www.brownanffincher.co.uk carried out all testing and reported findings for all WEEE items

2.5 Method for calculating theoretical monetary values

A key objective of the project was to calculate the potential monetary value of the items found in the selected waste streams. The principle was to consider whether the price a purchaser would be willing to pay for an item exceeds the cost of getting the item to the point of sale. Where this is the case, the item has net positive monetary value and is therefore not 'waste' from an economic point of view.

For WEEE, net value can be calculated in various ways. A typology was developed based on assessing net recovery value using the same categories as shown in Table 3 above.

It is recognised that individual retail prices for second hand or restored items depend on a number of variables, including the individual item's condition, the geographical location of a shop in the UK and how the shop is marketing its merchandise. The priorities of different charitable organisations also affect the prices of items. Transport and distribution costs of these waste materials also need to be taken into account when evaluating financial value. Therefore providing financial data on the amount of potentially divertible material type is a difficult task.

It is assumed that WEEE collected at HWRC and by bulky waste collections would currently be disposed of via an authorised WEEE disposal route. The costs for disposal of WEEE can be complex and vary depending on several contractual arrangements including collection, disposal and transport costs of loads between the local authority, third party waste handlers and the WEEE disposal company.

For simplicity WEEE baseline costs are taken to be zero, so far as the 'public purse' is concerned, and therefore calculate the additional monetary value gained through repair and resale as equating to the overall net monetary gain. However, in the real world we know it is more complicated than this because certain WEEE items contain hazardous materials that need removing and specialist disposal, but may also have a positive scrap value.

3.0 HWRC Results

In total 781 WEEE items were being disposed of at HWRCs by interviewees. The proportion of each type of WEEE as a percentage of all items brought to the HWRCs covered in this study, and as a percentage of all WEEE, is shown in Table 5. As respondents may have been disposing of more than one item at a time, the total number of WEEE items is greater than the total number of people interviewed.

Consumer equipment was the category of WEEE most commonly brought to the sites; one third (33%) of WEEE was consumer equipment such as DVD recorders, video recorders and televisions.

Small household appliances were the second most commonly brought items, at 22%, while large household appliances and IT and telecommunications equipment each comprised 14% of the WEEE brought to sites.

Table 5 Items of WEEE being disposed of at the four HWRCs studied

WEEE	No. of items	%
1. Large household appliances	111	14.2%
2. Small household appliances	170	21.8%
3. IT and telecommunications equipment	109	14.0%
4. Consumer equipment	264	33.8%
5. Lighting and light equipment	51	6.5%
6. Electrical and electronic tools	55	7.0%
7. Toys, leisure & sports equipment	13	1.7%
8. Other WEEE items	8	1.0%
Total	781	100.0%

Interviewers then asked respondents to focus on one item during the rest of the interview. WEEE items were the focus of 594 interviews.

3.1 Reasons for disposing of WEEE at HWRCs

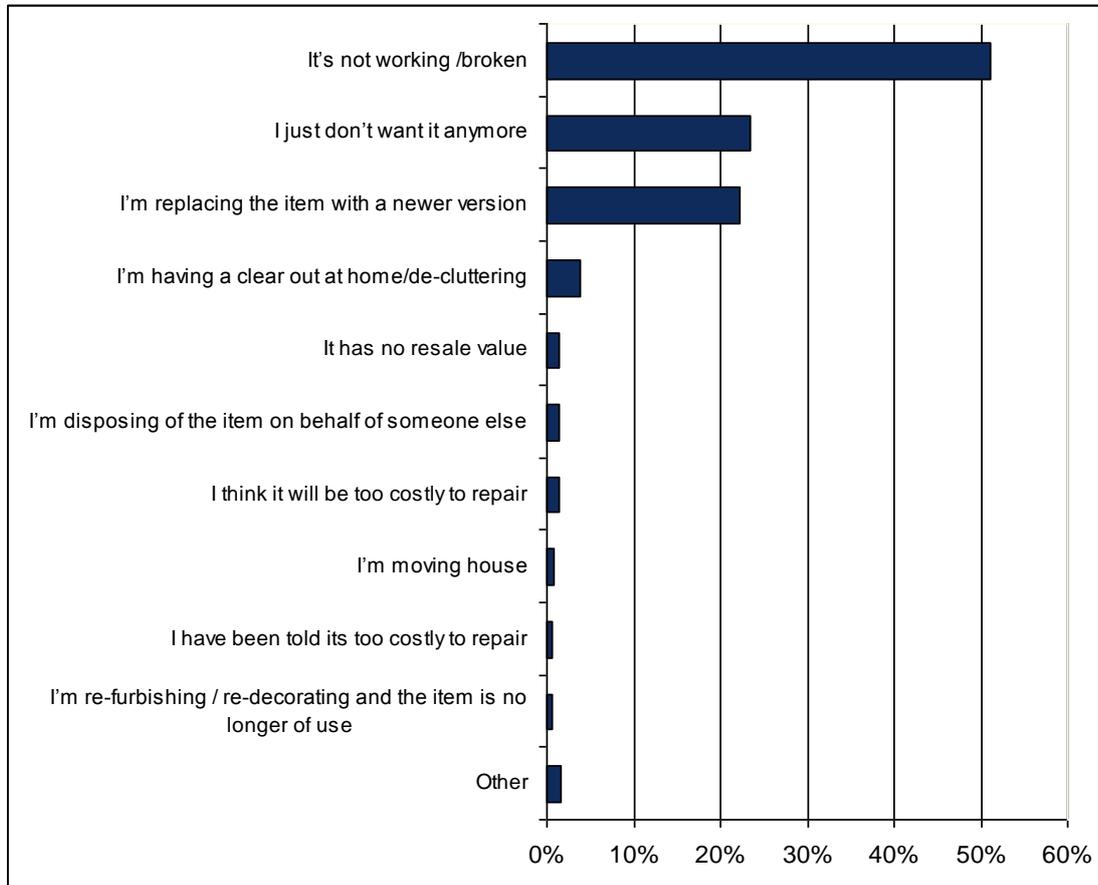
Respondents were asked why they were bringing WEEE to the HWRC. This was a multiple-choice question so respondents could select more than one response to this question and therefore totals do not add up to 100%.

As shown in Figure 1 below, the main reasons for disposing of WEEE were:

- "It's not working/it's broken" (51%);
- "I just don't want it anymore" (24%); and
- "I'm replacing the item with a newer version" (22%).

Figure 1 Reason for bringing WEEE to HWRC

Base: 587 respondents



The reasons for disposal vary according to the type of WEEE.

Consumer items are less likely to be disposed of because they are broken (43%) compared to other types of WEEE, particularly small household appliances (57%) and electrical tools (74%, but note small sample).

Consumer equipment is more likely to be disposed of because it is being replaced with a newer item (28%) and because it is no longer wanted (28%).

3.2 Repairing broken WEEE

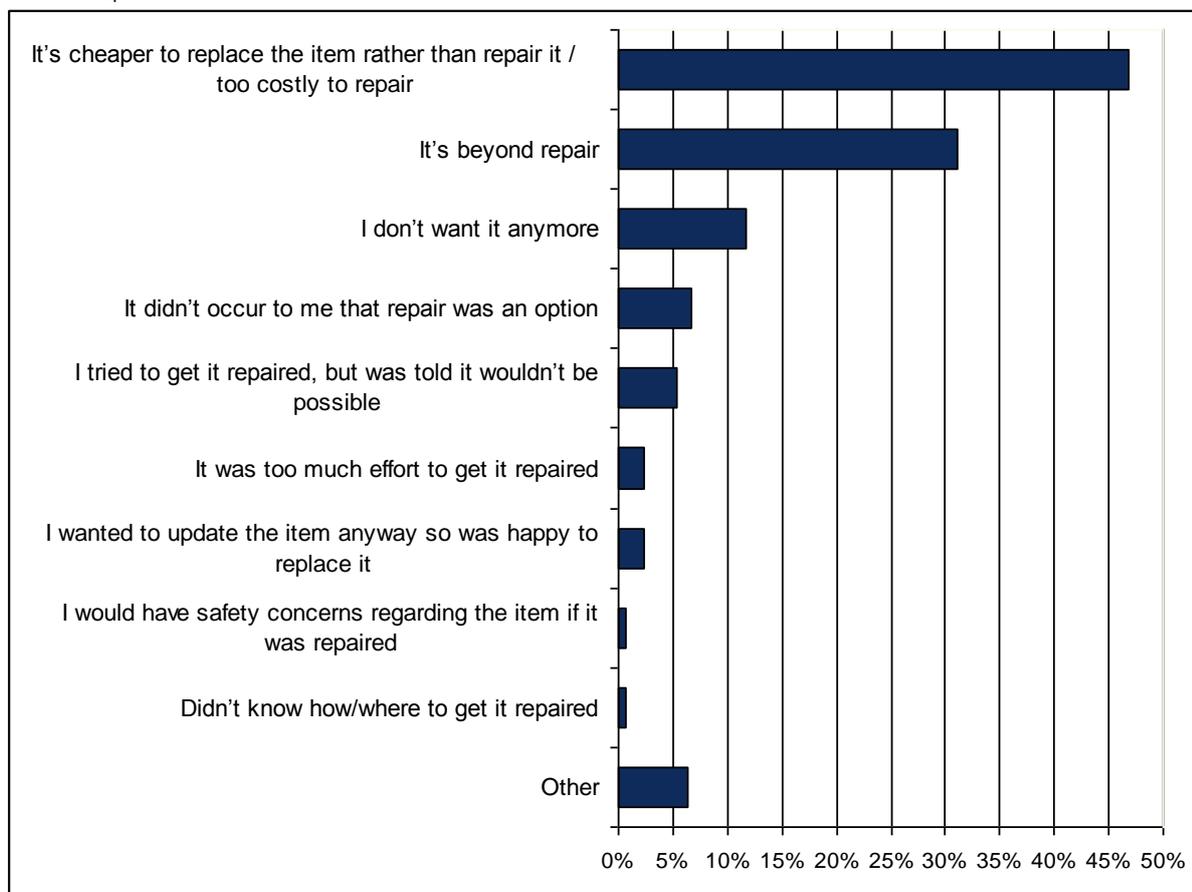
If an item was broken or no longer working, respondents were asked if there was a reason why they did not repair the item, or take it somewhere to be repaired. This was a multiple-choice question so respondents could select more than one response, therefore results do not total 100%. Results are presented in Figure 2 below.

The main reasons cited for not repairing broken WEEE were:

- 'because it's cheaper to replace rather than repair the item (or it's too costly to repair)' (47%);
- 'the item is beyond repair' (31%);
- 'just don't want it anymore' (12%); and
- 'it didn't occur to me that repair was an option' (7%).

Figure 2 Reason for not repairing broken WEEE

Base: 299 respondents



3.3 Condition of WEEE

All respondents were asked about the condition of the item at the point of making a decision to dispose of it. Specifically, they were asked to rate the item on a scale from 1 to 5. The results are presented in Table 6 below.

Table 6 Condition of WEEE

Condition of the item	Number of people saying this	%
1. Item fully reusable in current condition	177	30.3%
2. Slight repair required, but in general good condition	69	11.8%
3. Parts missing, but item is reusable with slight/moderate repair	80	13.7%
4. Item requires major repair work	195	33.3%
5. Total waste	64	10.9%
Total	585	100.0%

Analysis shows that items which are being thrown away because they are not wanted anymore, or because they are being replaced with a newer one, are much more likely to be considered as fully functioning (69% and 59% respectively) compared to items that are not working (2%). **Nearly 30% of respondents are disposing of an item because it is broken when by their own assessment it could be viably repaired and reused.**

The findings above are based on the condition of the WEEE at the point of deciding to take it to the HWRC, so respondents were also asked if the item was in the same condition on arrival at the HWRC. Nearly all respondents (94%) said the WEEE was in the same condition on arrival at the HWRC as it was when they decided to dispose of the item. Just 6% of respondents said the item was not in the same condition.

The place where the item of WEEE was stored between deciding to dispose of it and taking it to the HWRC may have affected its condition. The respondents who said the item was no longer in the same condition were asked where the item was kept²:

- over half (55%) said the item was kept outside and was uncovered;
- over one quarter (26%) said the item was kept outside in a covered area; and
- just less than one fifth (18%) said the item was kept inside.

Respondents were asked why the item was no longer in the same condition as it was when they decided to dispose of it. Reasons included:

- 'broke it up before coming [to the HWRC]';
- '[my] garage is damp'; and
- '[the item got] wet and rusty'.

3.4 Other ways to dispose of WEEE

Respondents were asked if they were aware of any other options for getting rid of WEEE, and of those they were aware of, if they had used them for disposing of WEEE in the past. Results are presented in Figure 3 below.

Unprompted awareness of alternatives to HWRCs was low – 82% said they were not aware of any other disposal routes.

However 8% of respondents were aware items could be donated to charity, 4% of respondents thought items could be given to friends/family and 4% thought they could contact the council to collect the item (bulky waste collection). Perhaps surprisingly, no respondents mentioned putting the WEEE in a residual bin.

Secondly, interviewers read out a number of different options for disposing of WEEE and asked respondents which ones they had heard of. The options respondents were most commonly aware of were:

- giving it to charity (63%);
- contacting the council to collect the item (43%);
- giving it to friends/family (37%); and
- selling it, for example on ebay or in the local paper (21%).

Finally, respondents who had heard of the options above were asked if they had used them to dispose of similar items in the past. Nearly half (49%) of respondents had not used any of the options to dispose of WEEE in the past. The other respondents had used a variety of different methods to dispose of similar items, including:

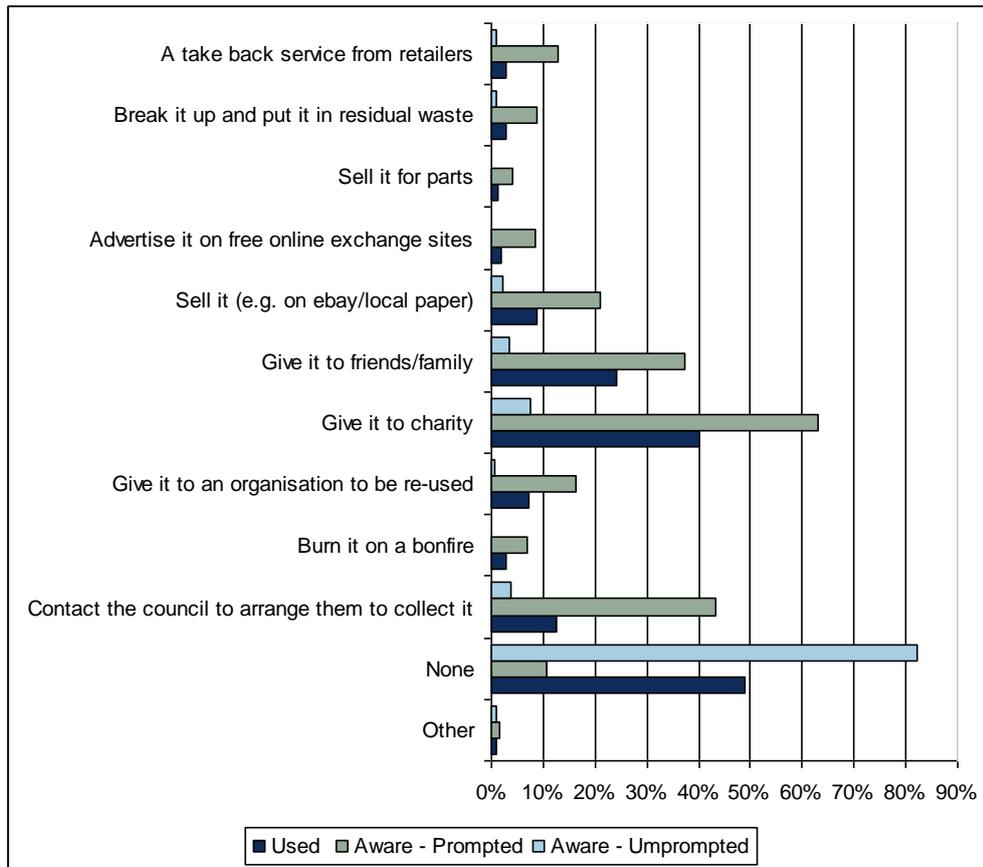
- giving it to charity (40%);
- giving it to friends/family (24%); and
- contacting the council to collect the item (13%).

The main reasons for not using these other disposal routes for the WEEE were:

- using the HWRC is the most convenient option (45%);
- the item couldn't be repaired/I couldn't repair it (37%); and
- I was coming to the HWRC anyway (19%).

² The small sample size should be noted when interpreting these results.

Figure 3 Awareness of options for disposing of WEEE items, and previous use of those options.



4.0 Bulky Waste Collection Results

As noted, the sample for this survey is potentially unrepresentative, with the majority of respondents coming from Birmingham, which offers a free collection service. Respondents were asked to describe the WEEE item to be collected through the bulky waste service. A total of 114 interviews were conducted on WEEE items, as shown in Table 7. This research identified 150 items of WEEE as some respondents were disposing of more than one item. Interviewers then asked respondents to focus on one item during the rest of the interview.

The most common types of WEEE collected through a bulky waste service were large household appliances and consumer equipment at 36% each. Small household appliances comprised 19%.

Table 7 Items of WEEE being disposed of via bulky waste collections (percentages rounded)

Bulky Waste WEEE	No. of items disposed of	%	No. of items subject of interview	%
1. Large household appliances	54	36%	51	45%
2. Small household appliances	29	19%	13	11%
3. IT and telecommunications equipment	6	4%	3	3%
4. Consumer equipment	54	36%	44	39%
5. Lighting and light equipment	1	1%	0	0%
6. Electrical and electronic tools	3	2%	3	3%
7. Toys, leisure & sports equipment	2	1%	0	0%
8. Other WEEE items	1	1%	0	0%
Total	150	100%	114	100%

4.1 Reasons for disposing of WEEE via bulky waste collections

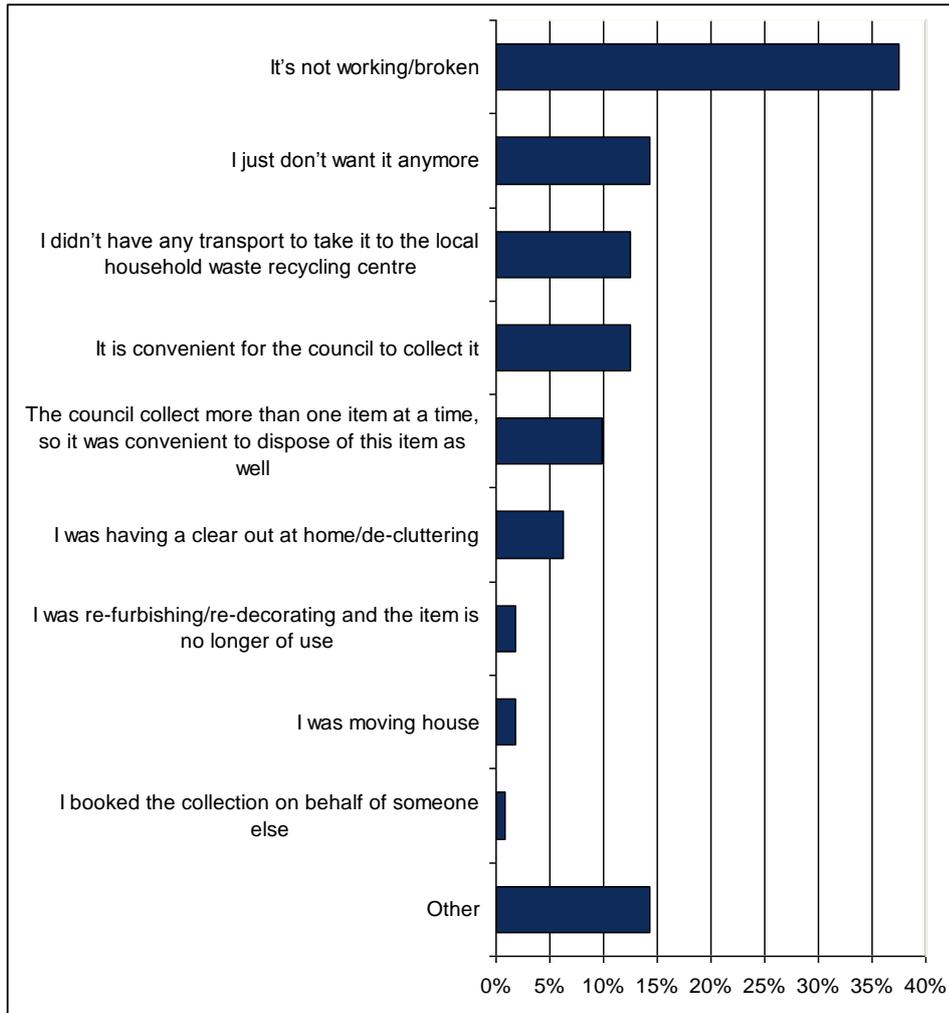
Respondents were asked why they had arranged for the council to collect the item of WEEE. This was a multiple-choice question; respondents could select more than one response therefore results do not total 100%. The main reasons for disposing of WEEE via a bulky waste collection were:

- it's not working/it's broken (38%, 42 respondents);
- I just don't want it anymore (14%, 16 respondents); and
- I don't have any transport to take it to a HWRC (13%, 14 people).

The results are presented in Figure 4 below.

Figure 4 Reason for arranging for the council to collect WEEE

Base: 112 respondents



4.2 Repairing broken WEEE

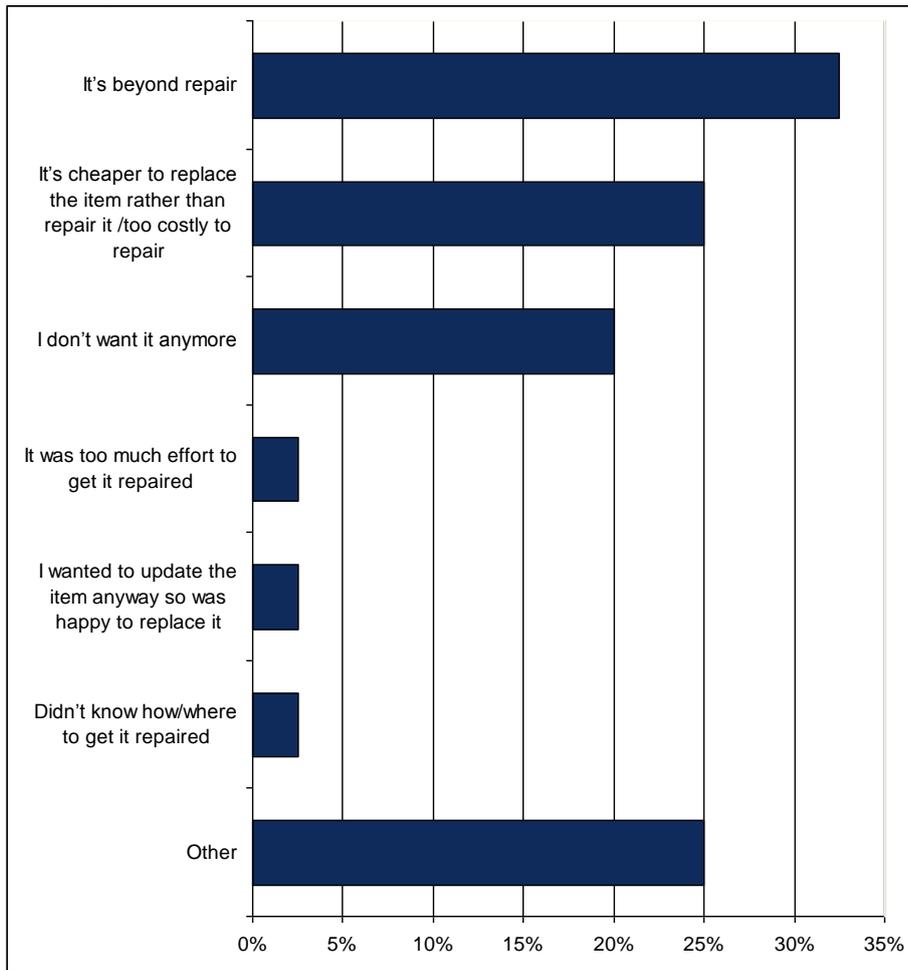
If an item was broken or no longer working, respondents were asked if there was a reason why they did not repair the item, or take it somewhere to be repaired. This was a multiple-choice question so results do not total 100%. Results are presented in Figure 5 below.

The main reasons for not repairing WEEE that was broken were:

- it was broken beyond repair (33%, 13 people);
- it was cheaper to replace the item rather than repair it (25%, 10 people); and
- just didn't want the item anymore (20%, 8 people).

Figure 5 Reason for not repairing broken WEEE

Base: 40 respondents



4.3 Condition of WEEE

Respondents were asked to think about the condition of the item when they booked the collection, and rate it on a scale from 'fully functioning and reusable in its current condition' to 'total waste.' The results are presented in Table 8 below.

Table 8 Respondent's view of the condition of WEEE when the collection was booked

Condition of the item at point of booking collection	Number of respondents	%
1. Item fully reusable in current condition	25	22.3%
2. Slight repair required, but in general good	12	10.7%
3. Parts missing, but item is reusable with slight/moderate repair	22	19.6%
4. Item requires major repair work	33	29.5%
5. Total waste	20	17.9%
Total	112	100.0%

Further analysis suggests the condition of the item varies with the reason for disposing of the item in the first place. Although the sample size is small and results should be used with caution, they indicate that nearly 40% of respondents who said they just did not want the WEEE item anymore also said the item was fully reusable in its

current condition. The majority of those respondents who said the WEEE was broken said the item needed major repair work, indicating that some of the parts may have been salvageable for recycling or reuse.

At the time of booking collections, many local authorities ask residents what condition the item is in, in order to help divert items in full working condition for reuse. In this survey 14% said they were asked about the condition of the item when booking the collection compared to 81% who were not.

When asked how long it took for the item to be collected after they arranged the collection with the council:

- More than two fifths (45%) said over a week.
- Half of all respondents (50%) said the item was collected within a week.
- 9% of respondents had the item collected within a day.

Respondents were also asked where the item was kept while it was awaiting collection.

- The majority (62%) said the item was kept outside and was uncovered.
- More than one quarter (26%) said the item was kept inside.
- One tenth (10%) said the item was kept outside but was covered up.

Despite items being stored outside whilst awaiting collection, and in some cases taking more than a week to be collected, only 8% of respondents said the condition of the WEEE deteriorated while it was awaiting collection. These respondents all said they had stored the item outside and the weather had affected its condition. Respondents were asked who had collected the item as some authorities use a third party, sometimes a charity, to make the collections. The majority said the council had collected the item (75%) and 21% said they were not sure who collected the item. Reference was also made to items being stolen whilst awaiting collection.

4.4 Other ways to dispose of WEEE

Respondents were asked unprompted if they were aware of any other ways to dispose of the item they had arranged to be collected. Over half (57%) said they could have taken the item to an HWRC and 22% said they could give it to a charity. Generally, though, awareness was relatively low with regards to other disposal routes. Results are presented in Figure 6 below.

Then interviewers read out a number of different options for disposing of WEEE and asked respondents which ones they had heard of. The options respondents were most commonly aware of were:

- give it to friends/family (56%);
- take it to a HWRC (51%);
- sell it on ebay or in the local paper (49%); and
- give it to a charity (47%).

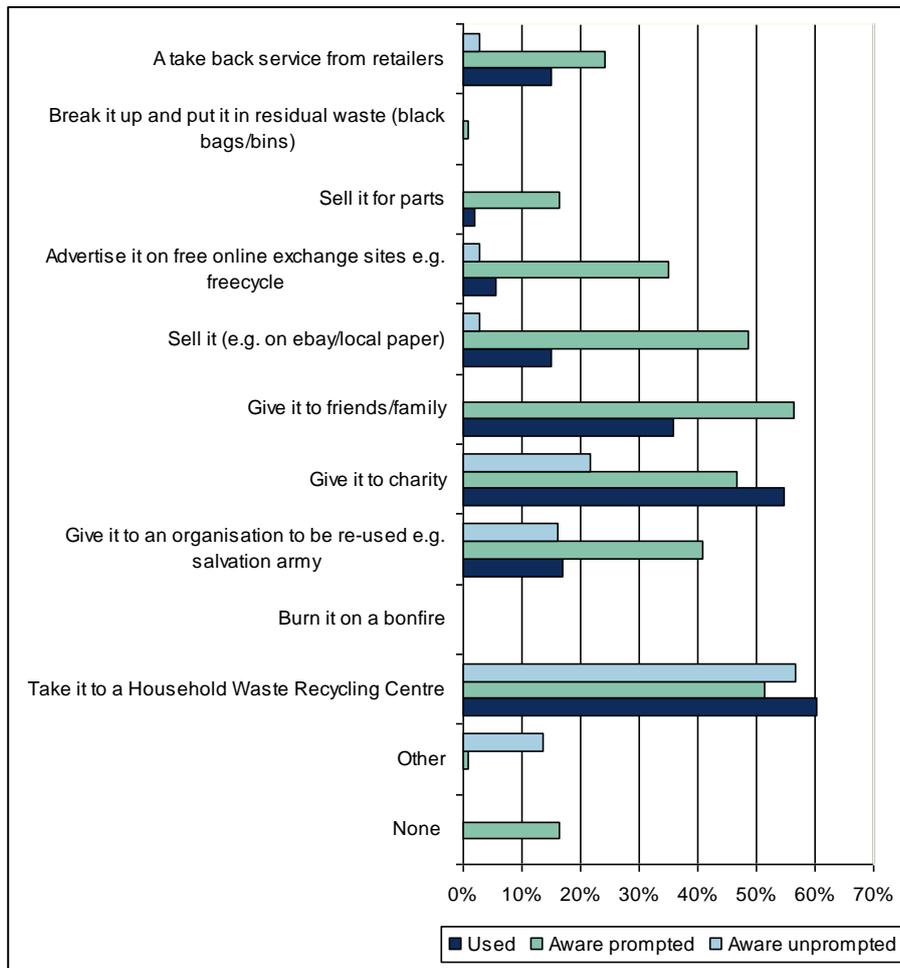
Finally, respondents were asked whether they had used any of the options they had heard of to dispose of similar items in the past. The top three alternative disposal methods that people had actually used were:

- take it to a HWRC (60%);
- give it to charity (55%); and
- give it to friends/family (36%).

The main reasons for not using the options above and contacting the council to collect the item instead were:

- the council collection is more convenient (34%, 12 people); and
- no transport to take it to HWRC (31%, 11 people).

Figure 6 Awareness of options for disposing of WEEE items, and previous use of those options



5.0 Technical Electrical Assessments

A total of 112 items of WEEE brought to HWRCs were selected for testing; a third of these were classified as large WEEE and two thirds classified as small WEEE. Large WEEE consisted mostly of household appliances and white goods. A range of different categories of small WEEE were surveyed to give a good representation of the items. Table 9 gives a breakdown of the WEEE materials that underwent electrical testing.

Table 9 WEEE items undergoing technical assessment

WEEE Type	WEEE Category	Number of items	%
Large WEEE	Large household appliances	38	34
Small WEEE	Small household appliances	24	21
	Consumer equipment	26	23
	Electrical and electric tools	3	3
	IT and telecommunications	19	17
	Lighting	2	2
Total		112	100

Items sent for testing were given a unique reference number in order to be able to compare the electrical testing results against what people said about the item and classified as to their WEEE type and category. Each item was then individually tested and classified into the five condition categories.

An item in condition 1 (fully reusable in current condition) was given an estimated 'current state' value and a projected retail resale price.

WEEE items that either failed the PAT test or passed the PAT test but failed to work properly were deemed to require further repairs. Where applicable, each item was given a 'current state' value and the level of remedial repair was assessed and priced, calculated based on the cost of labour and parts. The item was then assigned a potential post-repair resale value. Items requiring minor or moderate repairs where the resale price exceeded the cost of the repairs were classed as being in category 2 or 3. Therefore WEEE materials in categories 1, 2 and 3 have some intrinsic potential for resale.

WEEE that was deemed to be in condition 4 or 5 was not viable for repair with a view for resale in the retail sector.

Initial testing results showed that, after cleaning, 26% of large WEEE and 4% of small WEEE was suitable for immediate reuse, representing 12% of all WEEE tested. All the results are shown in Table 10 below.

By looking at the reuse condition of the WEEE it was possible to determine what proportion of the items that require repair could have this carried out economically. Of the large WEEE it was observed that 74% of items needed some sort of repair. Of these just under a third would generate a final WEEE product that would be resalable economically. Of the small WEEE it was observed that 96% of items needed some sort of repair. However only 6% of faulty small WEEE would generate a final product that would be resalable economically (i.e. the resale value would exceed the cost of repair).

In summary, 88% of all WEEE items were unsuitable for immediate resale and required further repair or servicing. Of the items not immediately resalable, 87% were either pure waste materials or prohibitively expensive to repair; at best they were suitable only for scrap and parts salvage. **From all the assessed WEEE, 23% of items were economically viable for resale, with half of these requiring minor repairs and half in full working order.**

Larger WEEE items were more likely than smaller WEEE to show potential for cost-effective resale³; with 26% immediately resalable and 23% economically repairable this represents a viable reuse potential of 49% of items. In contrast, small WEEE items tended to have reduced potential for cost effective resale, with just 4% immediately resalable and 5% economically repairable; **small WEEE therefore had a viable reuse potential of less than 10% of items.**

Table 10 WEEE resale potential and reuse condition (% of items)

Type of WEEE	Economic for resale			No resale value	
	Condition 1	Condition 2	Condition 3	Condition 4	Condition 5
Large WEEE	26%	5%	18%	26%	26%
Small WEEE	4%	5%	0%	68%	22%
All WEEE	12%	5%	6%	54%	23%

5.1 Comparison of respondent assessed condition of WEEE and technically assessed condition

This section compares how the condition of the WEEE item was assessed by the respondent (respondent assessment) and by the qualified electrical assessor (technical assessment). Note that this is not a direct comparison because an item may have suffered damaged between the respondent assessing the condition at the point of disposal and the point of technical assessment. This should be taken into account when reviewing the data in Table 11 below.

The technical assessments showed that a higher proportion of the items required major repair work or were total waste compared with the respondents' assessment of the same items. Had respondents known that their item could be reused at the point of disposal, they may have been more careful about where they stored it or how they transported it to the HWRC. This may have resulted in more items being graded as reusable by the technical assessors.

³ Although as seen in the following section, repaired small WEEE generates a higher 'per tonne' resale value than large WEEE

Table 11 Comparison of the assessment of item condition between respondents and the technical assessor

Condition of the item	Respondent assessment	Technical assessment
1. Item fully reusable in current condition	29	12
2. Slight repair required, but in general good condition	15	5
3. Parts missing, but item is reusable with moderate repair	15	6
4. Item requires major repair work	35	54
5. Total waste	6	23
Total	100	100

This shows that it would be unwise to rely on householders' assessment of the condition of an item as the basis for judging how much WEEE is reusable.

6.0 Derivation of theoretical monetary value of discarded WEEE

This section uses data for annual national WEEE arisings to estimate the potential monetary value of discarded WEEE across the UK. It uses data from WasteDataFlow (WDF), as presented in Table 12 below.

Table 12 Estimated annual quantities of WEEE in major Local Authority Collected Waste streams

Waste stream	England	Scotland	Wales	Northern Ireland	UK
Segregated WEEE excluding BWC	289,000	85,000			375,000
Bulky Waste Collections	113,000	29,000	3,000	4,000*	149,000
Household residual kerbside	Not calculated				160,000
HWRC residual	69,000	10,000	7,000	3,000*	89,000

*Estimated assuming same arisings per capita as GB
(Based on years 2006/7 to 2009/10)

6.1 National estimates of monetary value for HWRC WEEE

The methodology for estimating the value of household WEEE items taken to HWRCs at a national level involved the following steps:

- determine the economic value of WEEE items in the five recovery conditions, for each of the four principal categories of household WEEE;
- convert the item values to a typical value per tonne of each of the four principal WEEE categories; and
- multiply the value-per-tonne coefficients by the best available national estimate of the total tonnes of WEEE arising at HWRCs in the UK, to generate a national estimate of economic value.

A similar approximation was applied to WEEE items collected through bulky waste collections; see Section 6.3.

6.1.1 Assessing the repair and resale potential of WEEE items

The 112 household WEEE items, weighing an estimated 2.1 tonnes in total, had their individual recovery values assessed by Brown & Fincher's analysts at their electronic product repair works. The results are shown in Table 13 below, showing the overall item count and notional weights. Weights have been ascribed to each WEEE item analysed, by reference to notional weights for this kind of item from FRN and WRAP look-up tables⁴.

⁴ http://www.frn.org.uk/images/stories/FRN_2009_Average_Weights_List.pdf

In total 12% of items, and 19% by weight, were fully functional and reusable after testing and re-presentation. **Altogether the recoverable categories 1 to 3 amounted to 23% of items and 31% of the total by weight.** About a quarter (23% by both item count and weight) had no recoverable resale or recyclable value at all.

Table 13 Distribution of WEEE items according to assessed reuse potential

Reusability condition	Tested item data			
	Count	%	Weight (Kg)	%
1. Fully functioning and reusable in its current condition	13	12	405	19
2. Needs slight repair, but is in general good condition	6	5	152	7
3. Needs major repair work	7	6	100	5
4. Is broken beyond repair but parts may be salvageable for recycling	60	54	975	46
5. Total waste	26	23	489	23
Total	112	100	2,120	100

Table 14 below shows the materials classified according to the four principal WEEE categories and analysed by weight. (Note that fluorescent tubes and bulbs have not been included as their weight and value is negligible). This shows that the main WEEE types falling into recoverability category 1 (fully functioning) were fridges and freezers and large domestic appliances such as washing machines. These two categories accounted for 89% of the weight of the fully functioning category. By contrast, none of the CRT items (TV and screen monitors) had any recoverable value.

When analysed by WEEE category in this way, it is possible to make some broad generalisations about their reusability potential:

- CRT items are essentially without repair or resale value but have relatively high disposal costs due to the hazardous nature of some of their materials and components.
- Fridges and freezers have significant resale value if broadly fully functioning (category 1); otherwise they are not likely to be economically repairable but can have scrap or component value (category 4).
- Large and small domestic appliances offer the greatest potential for repair and restoration (categories 2 and 3) but still derive most value as recyclable components or scrap (category 4).

Table 14 Distribution of notional weights of WEEE items analysed by WEEE category (kg)

Reusability condition	Cathode Ray Tubes	Fridges & Freezers	Large Domestic Appliances	Small Domestic Appliances	All	
					Count	%
1. Fully functioning and reusable in its current condition	0	186	174	45	405	19%
2. Needs slight repair, but is in general good condition	0	0	84	68	152	7%
3. Needs major repair work	0	0	39	61	100	5%
4. Is broken beyond repair but parts may be salvageable for recycling	0	182	495	298	975	46%
5. Total waste	63	186	165	75	489	23%
Total	63	554	956	547	2120	100%
Proportions	3%	26%	45%	26%	100%	

6.1.2 Estimation of theoretical resale value of sampled items

The next step assigned a likely monetary value to the WEEE items analysed. For each item with resale value (condition categories 1 to 3) the technicians determined three parameters:

- item value as seen (this was equated to the value or 'trade price' the company might expect to pay to acquire the item for repair if sourced from a supplier of these items);

- parts and materials costs of repair; and
- resale value, i.e. price obtainable through selling on the open market once repaired.⁵

To illustrate, the item was deemed profitable to repair if the resale price achievable was greater than the acquisition cost plus the costs of repair; if the resale value was less than this, the item was deemed beyond economic repair. Note that other costs e.g. distribution costs, were not considered in this analysis.

Table 15 below shows the resale value estimated for the items analysed. The table shows the total weight of all items analysed in each category, the total resale value for all items in the category, and the average 'value per kg' of each WEEE waste category according to its state of repair (categories 1 to 3). Note the repair categories 4 and 5 generate no resale value in this analysis.

Table 15 Weights, resale value, and value per kg, for WEEE categories, according to reuse potential (sample)

Reusability condition	Cathode Ray Tube TVs	Fridges & Freezers	Large Domestic App	Small Domestic App	Grand Total	
	Weight (Kg)					%
1. Fully functioning and reusable in its current condition	0	186	174	45	405	19
2. Needs slight repair, but is in general good condition	0	0	83.5	68	152	7
3. Needs major repair work	0	0	39	61	100	5
4. Is broken beyond repair but parts may be salvageable for recycling	0	182	495	298	975	46
5. Total waste	63	186	164.5	75	489	23
Total	63	554	956	547	2120	100
Proportions	3%	26%	45%	26%	100%	n/a
Estimated market resale values after repair						
1. Fully functioning and reusable in its current condition	£0	£180	£220	£160	£560	37
2. Needs slight repair, but is in general good condition	£0	£0	£185	£290	£475	32
3. Needs major repair work	£0	£0	£60	£400	£460	31
4. Is broken beyond repair but parts may be salvageable for recycling	£0	£0	£0	£0	£0	0
5. Total waste	£0	£0	£0	£0	£0	0
Total	£0	£180	£465	£850	£1,495	100
Proportions	0%	12%	31%	57%	100%	n/a
Average open market resale value per Kg						
1. Fully functioning and reusable in its current condition	£0.00	£0.97	£1.26	£3.56	n/a	n/a
2. Needs slight repair, but is in general good condition	£0.00	£0.00	£2.22	£4.26	n/a	n/a
3. Needs major repair work	£0.00	£0.00	£1.54	£6.56	n/a	n/a
4. Is broken beyond repair but parts may be salvageable for recycling	£0.00	£0.00	£0.00	£0.00	n/a	n/a
5. Total waste	£0.00	£0.00	£0.00	£0.00	n/a	n/a
Average resale value per kg of waste	£0.00	£0.32	£0.49	£1.55	£0.71	n/a

As noted earlier, 23% of the items, and 31% of the total weight of the WEEE sample analysed, have a resale value once tested repaired and re-presented to the market. In total, of the 2.1 tonnes analysed, a resale value of £1,495 is estimated to be obtainable from this sample. This gives a 'headline value' of £71 per tonne of WEEE input, or £2,300 per tonne for the 31% of the input by weight that has resale value. The highest resale value per tonne of WEEE

⁵ Note this was taken to be the commercial retail value e.g. through selling the repaired product in a commercial retail outlet on the open market, such as a second hand appliance shop. This can be seen as the top end commercial price recoverable for the product. Resale through charity shops or through a notional price paid by a reuse network distributor such as a community support agency, are likely to be lower than open market value.

waste occurs for small domestic appliances (£1,550 per tonne of waste) followed by £490 per tonne for large domestic appliances and £320 per tonne for fridges and freezers. Note that the sample was not designed necessarily to consist of WEEE types in the same proportion as they arise nationally, and this adjustment is made below to generate nationally representative headline findings.

6.1.3 Estimation of theoretical resale value of HWRC WEEE items nationally

The basic principle of the method used for national estimation of WEEE resale value is to take national estimates for the total weight of WEEE material categories entering HWRCs, obtained from WDF, and apply the average resale value per tonne of waste determined for that category through the calibration exercise above. The data are derived from WDF for waste input tonnages for source-segregated WEEE classified by WDF as 'recycling' plus the additional element of source-segregated tonnage in national data already described as 'reuse'. The results are shown in Table 16.

Table 16 Annual UK source segregated WEEE inputs to HWRCs 2009/10, and theoretical resale values⁶

National estimates	Cathode Ray Tubes	Fridges & Freezers	Large Domestic App	Small Domestic App	Grand Total
National HWRC tonnage	100,169	64,322	79,993	103,006	347,490
WEEE tonnage share (%)	29%	19%	23%	30%	100%
Total resale value	£0	£20.8m	£38.9m	£160.0m	£219.9m
WEEE value share (%)	0%	10%	18%	73%	100%
WEEE resale value / tonne	£0	£325	£486	£1,554	£633

WRAP provided data on other streams of WEEE waste:

- WEEE items taken to HWRCs and deposited in the general residual waste containers: 89,000 tonnes (see next section for these results);
- WEEE collected at the kerbside through local authority bulky waste collections: 149,000 tonnes; and
- WEEE deposited by householders in their standard household residual waste container: 160,000 tonnes.

The calculation produces an estimate that £220 million in resale value could be obtained from the repair, refurbishment and open market resale of WEEE categories considered in this element of the study. Nearly three-quarters of this value (£160 million, 73%) is derived from small domestic appliances, which account for only 30% of the total HWRC WEEE tonnage. This would appear to be the material type with the greatest potential economic recovery value on a £/tonne basis. Fridges and freezers by contrast produce 10% of value (£20 million) but comprise 20% by weight. Some of these items will currently be recycled and a small proportion (1% by weight) reused. For this very reason, these 'reuse' items are likely to be in a more reusable state than the average item taken to the HWRC site. If it is assumed that this element of the total held twice the average value, the estimate of £220 million may be overstated on this basis by around 2% (£4.5 million).

This open market resale value is a 'top end' estimate, given that a range of financially sub-optimal outlets would be likely to operate in practice, trading financial value for social value in making the refurbished products available to communities.

These figures do not represent net additional economic value. The costs of acquisition and repair need to be considered and offset against the price obtained on open market sale. The repair costs were estimated by Brown & Fincher for each item analysed and, when applied to the same national calculation above, generates a total labour and materials repair cost of £77 million to offset against the open market retail value – representing 35% of the sale value, leaving a margin of £143 million for the WEEE repair and refurbishment industries. From this margin, transport and distribution costs would need to be met if required. A provision was also made by Brown & Fincher to reflect the potential acquisition cost of the products, amounting to £37 million (17% of resale value). This was the notional resource cost needed to pay a dealer or supplier for these items if they were sold into the repair industry as a feedstock resource⁷.

⁶ UK WEEE figures provided by WRAP - WEEE – quantities in municipal waste streams internal WRAP working note

⁷ Note that this cost this can equally be seen as an input to the value chain at the supply end (e.g. income to HWRC WEEE waste collection).

If the £37 million estimated resource feedstock cost is added to the £77 million labour and materials repair cost, giving a total direct cost of £114 million then the industry could gain a gross margin of £106 million (48% gross percentage margin). For the repair and resale process to be commercially viable this would need to be sufficient to cover distribution costs, overheads and a commercial rate of net profit.

6.1.4 WEEE in HWRC residual waste

We have also made an estimate of the approximate resale value of WEEE disposed of in residual HWRC containers, were they to be effectively segregated and potentially reused as for the segregated stream. The method used for calculating this amount of WEEE is the same as that used above for the source segregated HWRC WEEE, as no separate analysis or testing of residual deposited WEEE items was undertaken in this study. The WRAP UK estimates, based on WDF, are that 89,000 tonnes of WEEE is disposed of via the general residual containers at HWRCs annually⁸. This figure was used to determine the breakdown by tonnes and resale value of items disposed of via this method, based on assuming the same overall average resale value per tonne as for those analysed in more detail in the source segregated stream. The results are shown in Table 17.

Table 17 Annual UK WEEE inputs to residual waste at HWRCs in 2009/10 and theoretical resale values

Reuse condition	Cathode Ray Tubes		Fridges & Freezers		Large Domestic Appliances		Small Domestic Appliances		Grand Total	
	Weight (tonnes)	Estimated resale values	Weight (tonnes)	Estimated resale values (£m)	Weight (tonnes)	Estimated resale values (£m)	Weight (tonnes)	Estimated resale values (£m)	Weight (tonnes)	Estimated resale values (£m)
1. Fully functioning and reusable in its current condition	0	£0	5,531	£5.4	3,729	£4.7	2,170	£7.7	17,002	£17.8
2. Needs slight repair, but is in general good condition	0	£0	0	£0	1,789	£4.0	3,280	£14.0	6,360	£18.0
3. Needs major repair work	0	£0	0	£0	836	£1.3	2,942	£19.3	4,198	£20.6
4. Is broken beyond repair but parts may be salvageable for recycling	0	£0	5,412	£0	10,608	£0	14,373	£0	40,932	£0
5. Total waste	25,656	£0	5,531	£0	3,525	£0	3,617	£0	20,508	£0
Total	25,656	£0	16,474	£5.4	20,488	£10.0	26,382	£41.0	89,000	£56.3

The resale value per tonne is significantly increased compared to the source segregated average per tonne values, due to the relatively large proportion of small domestic appliances present relative to other WEEE categories that can be repaired. These have a higher average resale value per tonne than the other WEEE categories. In total, we estimate that over £56 million of re-sale value of WEEE is contained within HWRC residual waste containers, of which nearly 73% is derived from small WEEE appliances. This method assumes however that the WEEE materials that people put into the residual containers are in the same state of reusability as those they source segregated. In practice this is unlikely to be the case and residual WEEE is likely to be in a poorer condition. It would therefore be prudent to scale back the estimated value to reflect this; if a crude assumption of 50% lower value was taken, this would result in a UK annual residual WEEE resale value of about £28 million.

6.2 WEEE disposed of through household kerbside residual waste collections

Basic analysis of the potential value of WEEE disposed of via kerbside residual waste collections has been carried out using readily available data. WRAP⁹ provided an annual UK tonnage for WEEE disposed of via residual household

⁸ UK WEEE figures provided by WRAP - WEEE – quantities in municipal waste streams internal WRAP working note

⁹ UK WEEE figures provided by WRAP - WEEE – quantities in municipal waste streams internal WRAP working note

waste collection. The total annual amount of 160,000 tonnes for the UK was used as the primary figure to project tonnage and estimated resale values to the five 'reuse condition' categories.

The analysis has assumed the following:

- The only significant WEEE categories disposed of via household waste collections will be small domestic appliances due to physical size and weight restrictions for both wheelie bin and sack collections.
- Compared to WEEE taken to HWRC sites, disproportionately fewer items will be in repairability category 1: *Fully functioning and reusable in its current condition*.
- The proportion of items in category 1 is an eighth of the proportion in the HWRC stream, and that the proportions in categories 2 and 3 are a quarter of the proportions in the HWRC stream.
- The proportions in the 'beyond repair' categories 4 and 5 are adjusted upwards accordingly.

These assumptions result in the estimated tonnages of small domestic appliance WEEE in each reusability category, as shown in Table 18 below. When multiplied by the £/tonne resale value coefficients used in the HWRC calculations, an estimated total resale value of £56 million is disposed of through kerbside residual waste disposal.

Table 18 Weights and resale value for WEEE categories disposed of via household residual collections

Reuse condition	Small Domestic Appliances		
	Weight (tonnes)	Estimated resale values (£m)	% of resale values
1. Fully functioning and reusable in its current condition	1,645	5.8	10%
2. Needs slight repair, but is in general good condition	4,973	21.2	38%
3. Needs major repair work	4,461	29.3	52%
4. Is broken beyond repair but parts may be salvageable for recycling	118,977	0	0%
5. Total waste	29,944	0	0%
Total	160,000	£56.3	100%

6.3 National estimates for monetary value of Bulky Waste Collection WEEE

Providing an equivalent estimate for source segregated bulky household collection WEEE is more difficult as there is no comparable analysis undertaken for WEEE items collected this way. To produce an indicative estimate, it has been assumed that the resale value of WEEE items collected through bulky collection services are the same as those tested for HWRC items. Also, the profile of items collected through bulky waste collection was not observed directly, and the proportions were instead estimated from the answers given by respondents in the telephone survey of bulky waste collection users.

As Table 19 below shows, this gives a different distributional profile. For bulky household collections, it is estimated that 69% by weight is large WEEE, compared to only 43% at HWRCs. This is plausible in that residents are more likely to ask the council to collect these large, heavier items. Correspondingly, small domestic appliances account for only 8% of bulky WEEE waste by weight, compared to 30% of the waste taken to HWRCs.

The national estimate for the tonnages of these individual WEEE categories was made as for HWRCs, by applying the proportional percentages to the total national WEEE bulky household collection tonnage estimate of 149,000 tonnes, provided by WRAP and derived from WDF. Assuming the same proportions and resale values apply as for HWRCs, a theoretical resale value of £77m is estimated for bulky collected WEEE items. Of this, £47 million (61%) is calculated to arise from large domestic appliances, and £25 million (32%) from small domestic appliances. This proportion is in contrast to the 78% of value attributed earlier to small domestic appliances from the WEEE taken to HWRC sites.

One might assume that the £77 million from bulky collections can be added to the £220 million estimated for HWRC waste. Due to uncertainties in the source data on waste quantities however, there is a risk of double counting. This is because, some of the 149,000 tonnes of WEEE estimated to be collected by bulky household services may also then be recorded in WDF as WEEE waste 'arising' at HWRCs if these sites are used as depots or transfer stations for the onward consignment of bulky household collections. Because of these uncertainties in the source quantities, these two sets of figures are best viewed as separate, parallel estimates.

Table 19 Annual national WEEE bulky collections 2009/10, and theoretical resale values¹⁰

National estimates	Cathode Ray Tubes	Fridges & Freezers	Large Domestic App	Small Domestic App	Grand Total
National Bulky tonnage	34,453	45,771	56,801	11,975	149,000
WEEE tonnage share (%)	23%	31%	38%	8%	100%
Total resale value (£m)	£0	£5.2	£47.1	£24.9	£77.1
WEEE value share (%)	0%	7%	61%	32%	100%
WEEE resale value / tonne	£0	£113	£829	£2,075	£518

7.0 Conclusion

- The most common items being disposed of at HWRCs comprised consumer equipment, followed by small household appliances. Large household appliances were the most common WEEE items being collected by council bulky collections.
- The main reason for disposing of WEEE at both the HWRC and via bulky collections was because the item was broken (51% and 38% respectively), followed by those respondents who said they no longer wanted the item.
- When asked why they did not repair broken items, nearly half (47%) of respondents at the HWRC said it was cheaper to replace rather than repair the item, while for bulky collected WEEE the main reason for not repairing the item was that it was broken beyond repair (33%). These responses correlate with the type of WEEE being disposed of via each channel.
- Generally WEEE was not damaged whilst being stored to take to the HWRC or to be collected by bulky waste collection. Just 6% of WEEE brought to the HWRC was not in the same condition as it was when it was decided to dispose of it, and 8% of bulky collected WEEE was not in same condition on collection.
- Almost one third of respondents bringing WEEE to the HWRC assessed the item to be fully reusable in its current condition, and over half (56%) graded it as economically viable for reuse although it may need some slight or moderate repair. Just 11% thought it was total waste.
- Bulky collected WEEE was less likely to be considered fully reusable in current condition (22%). Just over half (53%) of bulky collected WEEE was, however, considered economically viable for reuse with some repair, while 18% was considered total waste.
- The technical assessments carried out on a sub sample of WEEE diverted from HWRCs evaluated the proportion available for immediate reuse to be less than respondents thought, although 23% were evaluated to be economically viable for resale - half of which required minor repairs and half major repairs. Around one quarter of WEEE which was technically assessed had no recoverable resale or recyclable value at all.
- The technical assessments found that CRT items are essentially without repair or resale value and also have high disposal costs. In addition, whilst fridges and freezers have significant resale value if they are functioning, they are otherwise not economically repairable – although they can have scrap value.
- Large and small domestic appliances offer the greatest potential for repair and restoration and also derive most value as recyclable parts. In terms of resale values, small domestic appliances generate the highest resale values (£1,550 per tonne).
- Top end estimates suggest £220 million in resale value could be obtained from the repair, refurbishment and open market resale of WEEE from HWRCs. Nearly three quarters of this value comes from small domestic appliances – this would appear to be the material type with greatest potential economic recovery value. Taking into consideration repair costs and acquisition costs, the gross margin could be around £106 million for HWRC WEEE.
- WDF estimates suggest 89,000 tonnes of WEEE are also disposed of in residual waste at the HWRC annually, and crude estimates suggest that the annual resale value of this WEEE (which has a greater percentage of small WEEE) may be in region of £28 million.
- The estimated resale value of WEEE collected via bulky waste collections is around £77 million, of which 61% (£47 million) arises from large domestic appliances and 32% (£25 million) from small appliances.
- The research has found that there is the potential to generate a large amount of resale value from the repair, refurbishment and open market resale of WEEE. At HWRCs the greatest resale value would be generated from small domestic WEEE, whereas large domestic appliances would contribute the greatest proportion of the potential resale value from bulky collected WEEE.

¹⁰ UK WEEE figures provided by WRAP - WEEE – quantities in municipal waste streams internal WRAP working note

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