



# **Arisings, Collection and Handling of Waste Electrical and Electronic Equipment in Peterborough**

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# Contents

1.	SUMMARY	1
2.	INTRODUCTION	3
2.1.	Abstract	3
2.2.	Background	3
2.3.	Objectives	3
2.4.	Outline of key activities	4
3.	METHODOLOGY	4
3.1.	WEEE Arisings in the Peterborough Area	4
3.2.	Processing of WEEE Items	5
3.3.	Materials/Components Reprocessing and Remanufacturing	5
3.4.	Reuse and Recoding	5
3.5.	Public Attitudes	5
4.	RESULTS	5
4.1.	WEEE Arisings in Greater Peterborough	6
4.1.1.	Data Summary – Number of Items	6
4.1.2.	Data Summary - Weights	6
4.1.3.	Data Summary – Brands	7
4.1.4.	Reuse of WEEE items	8
4.1.5.	Seasonality	9
4.1.6.	Distribution	11
4.2.	Processing of WEEE Items	11
4.3.	Materials/Components Reprocessing and Remanufacturing	11
4.4.	Reuse and Recoding	11
4.5.	Public Attitudes	11
5.	CONCLUSIONS	12
5.1.	Article 1: Environmental Objectives	12
5.1.1.	Peterborough Findings	12
5.2.	Article 2: Scope	13
5.2.1.	Peterborough Findings	13
5.3.	Article 3: Definitions	13
5.4.	Product Design	13
5.5.	Article 5: Separate Collection	13
5.5.1.	Peterborough Findings (Local Authorities)	13
5.5.2.	Peterborough Findings (Retailers)	16
5.5.3.	Peterborough Findings (Producers)	17
5.6.	Article 6 – Treatment	18
5.7.	Article 7 – Recovery	18
5.8.	Article 8 – Financing in respect of WEEE from private households	18
5.9.	Article 9 – Financing in respect of WEEE from users other than private households	18
5.10.	Article 10 – Information for Users	18

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5.10.1. The Peterborough Context	18
5.11. Information for Treatment Facilities	18
5.12. Information and Reporting	18
5.12.1. The Peterborough Context	19
5.12.2. Further Work	19

## Appendices

1. WEEE Group Members and Roles
  2. Detailed Methodology
  3. Data collection sheets
  4. Public Survey – Questions/Method
  5. WEEE Items recorded from 25 July 2003 – 7 March 2004
  6. Destination of Electrical Goods
  7. Weight of Electrical Items at the CA site
  8. All Brands by ERP Categories
  9. Compass IT Review
  10. Data from Compass IT
  11. Public Opinion Survey – Detailed Results
  12. Amnesty Data
  13. Collections Service Leaflet
  14. Processing of WEEE
  15. Bibliography
-

## 1. Summary

In advance of implementation of the Waste Electrical & Electronic Equipment (WEEE) Directive in 2004, this pilot project undertaken by UK CEED sought to identify best practice options for setting up and operating an effective system for dealing with household WEEE in accordance with the Directive, and identifying corresponding opportunities and solutions.

The research focused on the emerging WEEE collection system being established in the Greater Peterborough area and covered the period July to December 2003. The findings were then placed in the context of the DTI consultation document, December 2003-March 2004.

The main research focused on recording household WEEE arisings by a range of characteristics. The systems and services of the local authority, Peterborough City Council, provided the main data, but the work of a social enterprise, Compass IT, was also studied. Average weights were obtained from samples of several WEEE types. Test kerbside collections and a public attitude survey were also carried out, and discussions and interviews with stakeholders were undertaken.

The main findings<sup>2</sup> were:

- 11,416 WEEE items were collected in a year totalling 240,337 kg by weight<sup>3</sup>.
- Within the area under study this equated to 3.68 kg per household per year<sup>4</sup>. This compares to a Directive target requiring collection of 4 kg per household per year.
- There were 124 different types of WEEE item collected and 620 brands. The latter figure illustrates the complexity of allocating responsibility fairly for cost recovery (particularly for historic waste) along the supply chain.
- White goods and products containing cathode ray tubes (CRTs)<sup>5</sup> were the largest categories at just over a quarter of arisings each by number.
- Small household items accounted for 14% of the total by number.
- White goods (62%) and items containing CRT (24%) contributed even more by weight to the total collected.
- Of these, the biggest contributors were fridges (74 tonnes, or 30% of total collected), washing machines (48 tonnes, 20%) and TVs (48 tonnes, 20%)<sup>6</sup>.
- Arisings of these items occurred without any significant promotional activity being undertaken. Survey work suggests that significantly more could be collected with targeted promotion, making the Directive target of 4 kg per household easily achievable by similar local authority schemes.

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<sup>2</sup> The results do not include retailer take-back on delivery collections, other private sector collections of household WEEE or collections from business premises.

<sup>3</sup> Extrapolated from the 7 months of project records.

<sup>4</sup> Based on a figure of 65,375 households being resident in Peterborough. These figures should be used cautiously, since the average standard deviation from average weights was 24%.

<sup>5</sup> Televisions and computer monitors

<sup>6</sup> All figures extrapolated to one year and approximate due to a significant range of unit weights within these categories.

- A separate trial collection scheme was also set up in five streets chosen to represent a socio-demographic cross section of the area. A before and after study in these streets suggested that whilst there is limited disposal of WEEE items through general household waste (7 items from 520 households or 1% by weight), targeted promotion of a subsequent local authority collection scheme generated 40 WEEE items from the same households.
- This suggests that promotion of kerbside collection results in a significant *increase* in participation although participation still remains relatively small in absolute terms. However, in terms of percentage participation it is not far off the 10.5% of households which take WEEE products to the CA site/collection service over the course of a year. This suggests there could be significant scope for use of kerbside collections for WEEE if the prime objective was to remove WEEE from the general waste stream.
- As part of the research, it was intended to set up one or more trial retailer take-back scheme(s). However, this proved extremely problematic due to the diverse nature of existing schemes in operation, limited space at retail sites, and lack of standard designs for take back containers.
- The CA site is self-resourced through the sale of items to third parties for re-use, either as a whole or for their components. There is a reluctance of such parties to disclose information on the end destination of items and therefore it was not possible to establish disposal routes as part of this report. This is an area requiring further research.
- Arisings from the 'bring' system at the CA site vary by month, with August the busiest time. Daily arisings at the beginning and end of the week are also quite close to the weekend figures. There could be several reasons for this, but the most likely is that people are more often not at work in August and the long weekend periods, so they have more time to sort their waste and deal with it.
- A public attitude survey was also undertaken as part of the project research. The main findings arising from this included:
  - 83% of those surveyed did not have any items in storage
  - 63% dispose of small WEEE items in household waste
  - 41% consider energy labelling when purchasing new products
  - 69% only buy new items (as opposed to second hand)
  - 15% try to get electrical items repaired
  - 53% say they dispose of large items through the City Council's collection service, and 28% at the CA site.

The report also mapped the experience in Peterborough onto the key challenges of implementing the Directive, suggesting routes to solutions where appropriate. The points covered include category definitions, social enterprises and reuse, local authority collection and processing services/facilities, retailer and producer responsibilities, identifying historical WEEE and determining average weights of types of WEEE item.

## **2. Introduction**

### **2.1. Abstract**

In advance of implementation of the Waste Electrical & Electronic Equipment (WEEE) Directive in 2004, this project was designed to identify best practice options for collecting, processing and remanufacturing/recycling these items in Greater Peterborough and its rural hinterland. To achieve this aim the project set out to analyse data on WEEE arising in the Peterborough area and how the costs of processing and remanufacturing/recycling activities may be most effectively allocated between different elements in the supply chain. The project also aimed to assess the role of social enterprise in such markets.

### **2.2. Background**

The UK Centre for Economic and Environmental Development (UK CEED) assisted Peterborough City Council (PCC) and the WEEE Group (a diverse consortium of local and national stakeholders - see Appendix 1), to obtain funding from the UK government and other sources to set up a waste electrical and electronics goods (WEEE) collection scheme and processing facility in the city. This is intended to be a resource for all seven local authorities in the Peterborough 'Recycling Cell'. The facility is to be the first local authority-run scheme in the UK and would build on the success of the Materials Recycling Facility (MRF) in the city, one of the first in the UK.

It is envisaged that the facility will initially take IT equipment, fridges, freezers, washers and TVs and will cater for approximately 20,000 units per year. Over three years the project will expand to be self-financing (gate fees, sale of recycling materials, any type of WEEE recovery note if introduced, Recycling Credits) and include all other WEEE items and materials – radios, CD players, videos etc.

Peterborough is one of the UK's four 'Environment Cities'. Peterborough Environment City Trust promotes environmental management in the city (the 'demand side') and has been instrumental in helping the city council develop its nationally recognised waste policies. Encluster, a UK CEED initiative, supports the growth of environmental goods and services industries – the 'supply side'. There is therefore considerable support in the city for the WEEE facility to succeed

UK CEED is keen to use the Peterborough facility to research key options for implementing the Directive to influence national policy.

### **2.3. Objectives**

The WEEE Directive has laid down major challenges for both public bodies with responsibility for waste collection and treatment options, producers and suppliers with waste responsibilities, and eventually the public in its attitude to waste treatment options.

The initial objectives of the project were to:

- Meet the expressed needs of manufacturers and retailers to understand the effects of the WEEE Directive, in advance of it being implemented
- Establish best practice in cost-effective collection systems which meet the needs of consumer and business interests and fairly allocate costs within the supply chain

- Identify and analyse the value of the data being generated by the collection and processing operation
- Establish the potential to grow social enterprise in new aspects of waste processing
- Determine the type of information which customers would find useful and act upon with respect to the collection and sorting system
- Provide results to central government to feed into policy development in the implementation of the Directive.

This report builds on previous studies and field trials, such as the HP pilot in France (1), a Bosch study on the feasibility of civic amenity sites, and work by ICER and P&O Logistics in the UK.

The Peterborough area was chosen for its heterogeneity, the main advantages being:

- The large administrative area of Peterborough covers urban, suburban and rural areas, including villages.
- The Recycling Cell of seven authorities is largely rural, but includes several market towns of varying sizes.

## **2.4. Outline of key activities**

UK CEED undertook the project on behalf of the ERP group (Hewlett Packard, Sony, Electrolux and Gillette) and in conjunction with retailers, including national chains, and Peterborough City Council. The main project activities were to:

- Research types (including brands), quantities and weights of domestic WEEE arisings in Peterborough and current treatment.
- Assess the costs and relative merits (including public attitudes) of different potential WEEE collection systems in the Peterborough area: civic amenity sites; collection on demand by local authorities; retailer take-back.
- Compare potential recovery and recycling volumes with WEEE requirements.
- Establish the effect of the Directive on social enterprises such as the city's Compass IT (which offers employment, career and life skills development for people from disadvantaged backgrounds through refurbishing computers).

## **3. Methodology**

### **3.1. WEEE Arisings in the Peterborough Area**

The main aim of the project was to collect data on WEEE items arising from three different areas:

1. Peterborough Civic Amenity (CA) site (since renamed the Household Waste Recycling Centre)
2. Local authority collections run by Peterborough City Council
3. Retailer take-back – items recovered by local retailers.

Peterborough City Council also conducted a detailed waste analysis of five streets in the Peterborough area and data was collected from the Farthinghoe Recycling Centre, based in a market town in Nottinghamshire.

A more detailed methodology can be found at Appendix 2, and a Data Collection Sheet at Appendix 3.

### **3.2. Processing of WEEE Items**

The aim of this section of the project was to analyse the effectiveness, efficiency and economics of approaches to processing at the WEEE facility. The City Council and Compass IT would provide data arising from the facility alongside information on capital and operating costs, using software developed in association with the Furniture Recycling Network (FRN, a national organisation for social enterprises which also has WEEE within its remit). These would be benchmarked as far as possible against other processing facilities in the UK and abroad, through desk research and interviews.

Throughout 2003, the facility faced an intractable legal dispute over access to the site, strategically well situated opposite the city's CA site. The issue arose after the Council had obtained funding for the facility. Towards the end of the year the Council improved the potential of the site by agreeing to purchase more land than originally planned, including the access. Unfortunately, just before completion the authority was gazumped by an offer from another party, so lost the site. Since then another site has been found and the facility began operating in mid April 2004. The alternative site has limitations and is not co-located with the household waste recycling site, so is likely to be a temporary site for a year or two.

This unforeseen problem has meant that the planned research into WEEE processing has not been possible. The FRN software could not be used until the facility was running. The experience has highlighted the kind of issues which organisations and businesses setting up processing facilities need to plan for and deal with in order to be successful.

### **3.3. Materials/Components Reprocessing and Remanufacturing**

See Section 3.2

### **3.4. Reuse and Recoding**

A review was conducted of a local social enterprise, Compass IT, including sample data from their IT refurbishment business and analysis of the recoding and reuse.

### **3.5. Public Attitudes**

The services of a market research company, Community Consultants, were engaged to conduct a survey of public attitudes and behaviour with regard to:

- disposal of WEEE items
- storage of WEEE items, including those not in use
- replacement of electrical items.

The survey was conducted on 200 people in the Peterborough area. Interviewers were given quotas to ensure that the sample was representative of the population of Peterborough in terms of gender, age and social class/income.

The questionnaire can be found at Appendix 4.

## **4. Results**

As explained above, the delay in setting up the WEEE processing facility has had an impact on the collection of data for this project. The data from the facility was to provide input into sections 3.2 and 3.3 described in the method.

#### 4.1. WEEE Arisings in Greater Peterborough

From 25 July 2003 to 7 March 2004 (32 weeks) over 7100 WEEE items were brought to the CA site by householders and by Peterborough City Council's collection service. This does not include any items taken at the Farthinghoe site or those collected on the WEEE Amnesty (as described in Appendix 2).

For information on retailer involvement see section 5.5.2.

##### 4.1.1. Data Summary – Number of Items

The table below summarises the collection of items by number.

(Categories agreed with the ERP. All are exclusive. They follow the categories and lists of products in Annexes 1A and 1B of the WEEE Directive (2002/96 dated 27 January 2003).

Category	No. (Data collected)	No. (~year)*	% of Total	No items / unitary area h'holds**
Fridges and freezers	1086	1746	15.30	0.03
Other white goods	799	1285	11.25	0.02
CRT-containing items	1935	3111	27.25	0.05
Small household items	973	1565	13.70	0.02
Consumer electronics	1022	1643	14.39	0.02
IT equipment	478	769	6.73	0.01
Tools (including mowers)	257	413	3.62	0.01
<b>Sub Total</b>	<b>6550</b>	<b>10532</b>	<b>92.25</b>	<b>0.16</b>
Large Household	511	822	7.20	0.01
Lighting	24	39	0.34	0.00
Other	15	24	0.21	0.00
<b>TOTAL</b>	<b>7100</b>	<b>11416</b>	<b>100.00</b>	<b>0.17</b>

\* 12 month data is extrapolated from approximately 7 months of collection.

\*\* Number of households is 66,526 (March 2003).

A more detailed breakdown of items coming into the site can be found at Appendix 5.

##### 4.1.2. Data Summary - Weights

Almost 300 items were weighed so as to obtain averages and compare with previously published averages. The graphs at Appendix 7.1 show the weights of selected items with the Standard Deviation expressed as error bars on the graph. They show that several of the items vary in weight a great deal from the average

calculated. With further weight data the accuracy of the averages may improve but this error should be taken into account when using weight data to express volumes of WEEE coming into the CA site by weight. There is also variation between studies – see Appendix 7.4 for previous weight data by item.

The table below summarises the collection of items by weight. It accounts for the 15 most numerous types of item collected, or 88% of the total number.

Item Type	Weight 1 yr (kg)	% of total	Weight / h'hold (kg)
Fridge	73882.61	30.7	1.11
Freezer	1964.59	0.8	0.03
Other white goods	72637.13	30.2	1.09
CRT-containing items	57435.42	23.9	0.86
Small household items	8275.69	3.4	0.12
Consumer electronics	6611.25	2.8	0.10
IT equipment	3589.81	1.5	0.05
Tools	2799.47	1.2	0.04
Large Household	13141.25	5.5	0.20
Lighting	N/A	N/A	N/A
Other	N/A	N/A	N/A
<b>Total</b>	<b>240,337.22</b>	<b>100.0</b>	<b>3.61</b>

Further information contained in the Appendices:

1. Main items coming into the site by weight - Appendix 7.2
2. Local authority collections by weight - Appendix 7.3
3. Other item and materials weight data - Appendix 7.4
4. Breakdown of CRT items by weight - Appendix 7.5

#### 4.1.3. Data Summary – Brands

Appendix 8 breaks the data down by ERP category and brand. As the information is very varied, with each category having a different pattern of brands, the best summary information is contained in the tables below.

#### Top 5 Brands in Key ERP Categories – Numbers Arising

Consumer Equipment		%
JVC	59	5.8
Hitachi	58	5.7
Philips	56	5.5
Ferguson	53	5.2
Sony	49	4.8

CRT-containing Items		%
Hitachi	183	9.5
Ferguson	142	7.3
Philips	111	5.7
Sony	94	4.9
Panasonic	76	3.9

<b>Fridges &amp; Freezers</b>		<b>%</b>
Hotpoint	242	22.3
LEC	167	15.4
Zanussi	86	7.9
None	60	5.5
Electrolux	58	5.3

<b>IT (&amp; Telecoms Equipment)</b>		<b>%</b>
Hewlett Packard	57	12.6
Epson	39	8.6
Compaq	23	5.1
Canon	22	4.8
Lexmark	20	4.4

<b>Other White Goods</b>		<b>%</b>
Hotpoint	219	27.4
Zanussi	69	8.6
Creda	64	8.0
Hoover	64	8.0
Indesit	58	7.3

<b>Small Household Items</b>		<b>%</b>
Electrolux	231	23.7
Hoover	175	17.9
Dyson	77	7.9
Panasonic	62	6.4
VAX	49	5.0

<b>Tools</b>		<b>%</b>
Flymo	96	36.8
Black & Decker	72	27.6
Qualcast	55	21.1
None	7	2.7
Power Devil	6	2.3

Deciding on the allocation of items to the ERP categories did not present difficulties, also using the Directive Annex 1B as a guide, but items would need to be specifically allocated in guidance notes for widespread use. The most difficult example was kettles, which is not mentioned in Annex 1B and went into *Small Household Items*, although most cooking items are in *Large Household Items*. The main difference between the ERP categories and the Directive, adding *Fridges and Freezers* and *Other White Goods* as additional categories within the *Large Household Items* list, was not difficult.

It has not been possible to analyse brands by weight because the difficulties with the WEEE facility prevented use of the FRN software.

#### 4.1.4. Reuse of WEEE items

All the WEEE items on the site are either:

1. **sold as a whole product** - to local intermediate traders or exporters; or
2. **sold for materials** – for example, items with high metal content are taken by metal merchants for reprocessing; or
3. **scrapped** - sent to landfill; or
4. **stored** - fridges and freezers are stored before being removed for processing.

Interviews were conducted with staff at the CA site to obtain more information on the path of items after they were sold. Although they could provide basic information, details were not forthcoming for reasons of commercial confidentiality. However, the following verbal observations were made by the staff:

1. Electrical goods are assessed on site and divided up according to quality and age. For example, TVs with wooden cases are sent directly to landfill whereas those with black plastic cases are sold on if in reasonable condition.
2. Items in good condition are often sold to local intermediate traders and appear in local second hand shops.

3. Most other items are sold to third parties at a fixed price. For example, standard TVs are sold for approximately £5 per unit. Prices only change when high specification items are on offer.
4. The third parties generally take: TVs, videos, hi-fis, toasters, kettles and irons. There would appear to be no demand for used vacuum cleaners.
5. Many third parties only take the recent and high specification computers which suggests that they intend to sell them rather than break them up for parts and scrap.
6. In conversations with CA staff it was suggested that a large proportion of WEEE items were eventually exported to other countries via traders although it was not possible to validate this claim.
7. Most CA sites are self-financing and selling the items provides an income to pay for insurance etc. There is concern that the WEEE Directive may affect this income.

The actual path data recorded at the site supports some of these points made by CA staff and managers. However, it is worth noting that:

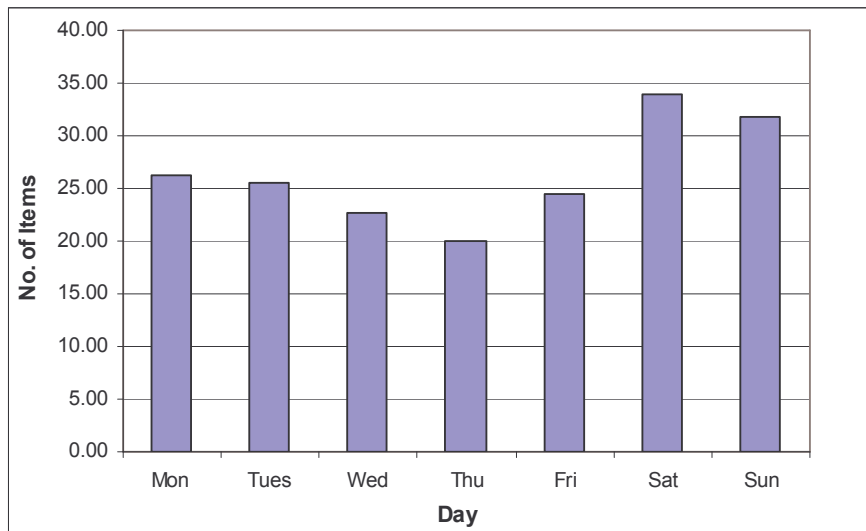
- The items sold are not limited to those suggested above
- Just over 50% of the items were sold in total from the site
- Over 50% of microwaves were sold
- Over 50% of vacuum cleaners were sold

Further information on the destination of items, including analysis of brands, can be found at Appendix 6.

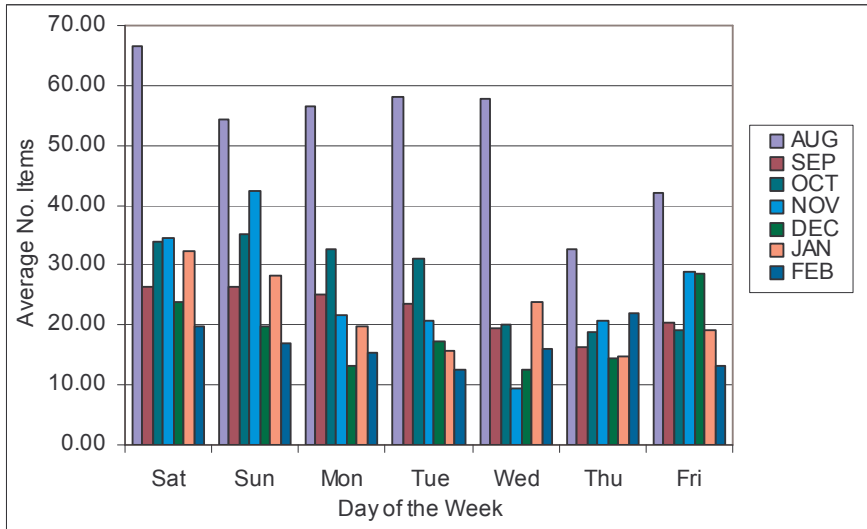
#### 4.1.5. Seasonality

The items brought to the CA site were logged by day to allow analysis of seasonality and determine if any patterns emerged.

**Average No. items by day (25 July 03 - 7 March 04)**



**Average No. items by day and month (25 July 03 – 7 March 04)**

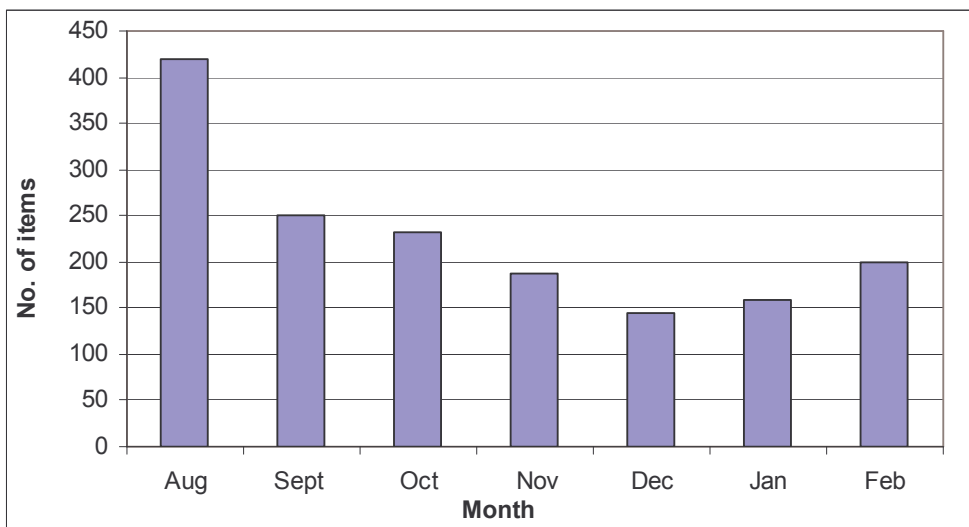


It should be noted that the number of days of data collection per month decreased from August to December. This was largely due to the change in weather which often made data collection impossible. Where possible, items from days with no data collection were kept separate and then recorded later, backdated to minimise disruption. The graphs above eliminate the seasonal error introduced by the levels of data collection by averaging the number of items per day; there was sufficient data for averages to be meaningful.

The local authority collections did not occur daily so data is only available on a monthly basis.

**Monthly variations in local authority collections**

These showed the same pattern of seasonal variation as the CA collections.



There could be several reasons for this, but the most likely is that people are more often not at work in August and the long weekend periods, so they have more time to sort their waste and deal with it.

#### **4.1.6. Distribution**

The CA site also recorded sample data on the origin of people bringing items to the CA site. The sample size (47) was small as it was thought that a significant number of people were perhaps not entirely truthful about their origin due to concern about whether they were eligible to use a PCC site. Although the small sample size is not large enough to make robust conclusions, it is worth noting that all the people recorded so far have come from PE1 to PE6. PE1-PE4 are within the urban area, while PE5 and PE6 cover villages to the north-west, north and north-east of the city.

#### **4.2. Processing of WEEE Items**

As discussed, due to the delay in opening the WEEE facility there is no data on the processing of WEEE items.

#### **4.3. Materials/Components Reprocessing and Remanufacturing**

As 4.2.

#### **4.4. Reuse and Recoding**

Compass IT do not recode any of the equipment they resell. Appendix 8 contains more information on their refurbishment process.

#### **4.5. Public Attitudes**

The public opinion survey was carried out in January 2004. Some of the major findings are given below. The figures are percentages of respondents, who represented households:

- 83% did not have any items in storage
- 63% dispose of small WEEE items in household waste
- 41% consider energy labelling when purchasing new products
- 69% only buy new items (as opposed to second hand)
- 15% try to get electrical items repaired
- 53% say they dispose of large items through the Council's collection service, and 28% at the CA site.

Further analysis of this data is available at Appendix 11.

## 5. Conclusions

The conclusions below are titled according to the sub headings provided in the final DTI consultation on implementation of the WEEE Directive (December 2003-March 2004).

### 5.1. Article 1: Environmental Objectives

The Government wishes to encourage recovery, reuse and recycling of WEEE with particular consideration of reuse. Although there are no targets for reuse of whole items at present it is likely that they will be included in future revisions. The Government is aware that charities and social organisations are involved in the reuse and refurbishment of EEE and would like to see this expand.

#### 5.1.1. Peterborough Findings

##### CA Site

- Over 50% of the items brought into the site are sold on to intermediate traders and exporters for either local sale or use in the developing world.
- Unfortunately data on the final destination of these goods was not forthcoming from either exporters or intermediate traders. Therefore there is no guarantee that the items do not re-enter the waste stream if they do not meet their requirements.
- However, interviews with staff at the CA site suggest that traders and exporters will only accept items in a good condition.
- It should be noted that selling the items generates a valuable source of income for the staff at the site and there is concern that the Directive will remove/reduce this.
- Approximately 30% of items are scrapped. Wiring is removed from all products and stripped. Items with high metal content are sent to metal processors. The remainder of the material is sent to landfill.

During the period of the study the sorting is conducted at the CA site by one member of staff who is often overwhelmed by the volume of items arriving at the site.

A more comprehensive breakdown of items sold from the site can be found at Appendix 6.

##### Compass IT

- Compass IT (a local social enterprise – see Profile: Appendix 9) reprocesses electrical equipment (largely IT equipment) and sells this at outlets in Peterborough. However the equipment is largely provided by local companies. Data at Appendix 10.

##### Conclusions

- **Although many items are sold on from the site, the reuse rates are not known and information on the destination of items is scarce.**
- **It is reasonable to assume that the present system would not meet future reuse targets.**
- **There needs to be further research into the true destination of the items sold from the site.**

- **The Environment Agency is supposed to hold more detailed data on items leaving the country but enquiries did not reveal any information. At the time of asking the records in question were out of date.**

## **5.2. Article 2: Scope**

Even at this late stage there is confusion as to what items are covered by the directive. Although there are 10 broad categories listed, there are electrical items that do not fall into the lists provided. The Government has suggested developing generic criteria to assist in establishing the status of these “grey area” products.

### **5.2.1. Peterborough Findings**

The only relevant information that can be taken from the data collected at the CA site is the proportion of “grey area” products occurring.

- Out of over 7100 items logged so far there are only 5 that do not seem to fit into any categories provided in the directive. These are a fruit machine, a cash register and a shower. The other two could not be identified.

The data collected so far suggests that the frequency of these “grey area” products is quite low in the waste stream.

The Government has suggested a “decision tree” to assist in discerning the status of these items. This may prove too complex, unwieldy and laborious. If an example of the decision tree is released by the DTI it will be interesting to test it on the products above.

## **5.3. Article 3: Definitions**

It is unclear whether the definitions of reuse and recycling mean that the sale of refurbished items and components would be treated under the directive as new products with respect to being ‘put on the market’.

## **5.4. Product Design**

Unfortunately as operation of the WEEE facility was delayed it has not been possible to gather information on the ease of reuse, recycling or recovery of any products.

## **5.5. Article 5: Separate Collection**

Article 5 requires Member States, to have in place systems allowing final holders and distributors to return WEEE from private households free of charge. The UK consultation suggests that there should be no unfinanced burden placed on local authorities but they will be encouraged to upgrade CA sites for separate collection of WEEE. This could be achieved with funding from retailers.

### **Local Authorities**

#### **5.5.1. Peterborough Findings (Local Authorities)**

##### **Bring facilities**

Peterborough City Council arranged for separate collection of WEEE at the local CA site from the middle of July onwards. This involved the allocation of a separate closed container for storage, several smaller containers for initial collection and a dedicated member of staff to record, weigh and store the items.

### Collection Service

In July of 2003 Peterborough City Council altered its usual bulky collection service to include free collection of all electrical items covered by the directive. This is limited to one collection a year of five items (small items in a bag count as one item). Additional collections and items can be ordered for a charge. See promotional leaflet at Appendix 13.

The breakdown of the collection service data from the end of July to 29 December is as follows:

Item	No. (Data collected)	No. (~year)*	% of Total	Weight (kg)
Fridges and freezers	904	1454	55.36	63,077.4
Other white goods	620	997	37.97	56,994.2
CRT-containing items	45	72	2.76	1,272.9
Small household	11	18	0.67	115.7
Consumer electronics	10	16	0.61	
IT equipment	4	6	0.24	
Tools (includes mowing tools)	3	5	0.18	
<b>Sub total</b>	1597	2568	97.8	
Large Household	33	53	2.02	881.8
Lighting Equipment	1	2	0.06	
Toys Leisure	2	3	0.12	
<b>Total</b>	1633	2626	100	122,341.9

\* 12 month data is extrapolated from 7 months of collection.

Even though the collection of smaller items has been promoted through leaflets and when people ring the Peterborough Direct call centre, they still constitute a small percentage of the overall collection. The service was not promoted initially due to worries about volume of requests increasing beyond capacity. As this has not occurred there may be further promotion.

The public attitude survey results (section 4.5) included 53% of interviewees saying they dispose of large items through the Council's collection service, and 28% at the CA site. This reported disposal behaviour contrasts with actual behaviour.

On the reasonable assumption that disposal via the CA site and via Council collections involves approximately the same number of items per disposing household, the proportion of households disposing of large items via collections is only a quarter of the total number of items disposed of. The *reported* figures are that just over two thirds of the total use the collections. This suggests a latent demand for the collection service.

As shown in Appendix 11, the disposal behaviour question allowed choice of more than one disposal route. The above analysis would apply equally strongly whether respondents chose only one route each, or both as routes they use. If all those saying they use the CA site also said they use Council collections, there would still be another 25% using Council collections.

### **Household Waste**

In November 2003 Peterborough City Council engaged the services of a waste analysis company to determine the level of WEEE occurring naturally in the waste stream. Five streets were chosen to represent the range of demographics occurring in the Peterborough area. Without any promotion the general household waste was separately collected from each street and items recorded according to several categories including electronic items.

- Electrical waste was less than 1% of the waste by weight and amounted to only 7 items from approximately 520 households.

One week after the completion of the waste analysis a leaflet was delivered to every house on each of the five streets announcing a date for a WEEE Amnesty. On the date given (in early December) any electrical item left outside was collected from outside the houses and each item was recorded.

- Out of 520 households, 40 electrical items were collected. Interestingly the majority of these items were small household and consumer items. Further breakdown of this data is at Appendix 12.

Three possible conclusions from this result are:

- households will make little use of kerbside collections as only a small proportion of households responded to the opportunity.
- promotion of kerbside collection results in a significant increase in participation (nearly 600%), and up to nearly half the participation rate at the CA site for 520 households ( $520 \times 0.17$  items = 88 items).
- There are a number of factors which contribute to people putting out their small WEEE and there is no certainty that a regular kerbside collection would produce the same results.

The number of items per household was not recorded, but it seems likely that most households would have left one item each. If so, 40 households, or a little fewer, is moving towards the 10.5% of households which the CA site/collection service collected from over 7 months. If this observation is valid, it suggests scope for significant use of kerbside collections for WEEE if the prime objective is to remove WEEE from the general waste stream. However, system constraints in terms of collection costs and the benefits and impacts of recycling and alternatives in environmental and social terms, both economically and environmentally, also require consideration, so further research is clearly needed on the benefits of kerbside collection of WEEE.

### **Retailers**

Retailers are expected to offer a take-back collection scheme on a like for like basis or another method for returning equipment. The collected equipment then has to be transported to authorised treatment facilities.

### **5.5.2. Peterborough Findings (Retailers)**

At present there are several retailers, e.g. Curry's, Argos and John Lewis that conduct take-back on delivery in the Peterborough area. At present we have been unable to obtain localised figures for collection.

UK CEED has engaged in a dialogue with individual retailers throughout the research project, including with the British Retail Consortium, which has been co-ordinating the sector's preparations for the WEEE Directive. Retailers have foreseen difficulties with the options for collection, such as potential damage from waste items taken back when delivering new items to households, consumer perception of this, particularly from department stores where, say, furniture might be seen in a vehicle alongside rusty white goods, take-back within stores (space and warranty issues) and collection containers outside stores and in retail parks (responsibility, need to employ people to receive items, and health, safety and security).

#### **Further Work (Retailers)**

The recent DTI consultation has outlined in more detail the involvement that retailers will have in meeting the WEEE directive. UK CEED, the City Council and Dixons Group have now been able to agree the purchase of "WEEE Banks" and this should yield some data on this collection method. The banks have been ordered by Peterborough City Council but unfortunately they were not delivered until mid-April as they had to be custom built.

The "WEEE Banks" will be placed in retail parks and other sites around the city. The different sites may experience different volumes of items deposited and this data can be used to refine the system. Dixons have also agreed to promote the "banks" in their local stores along with information on other disposal options for WEEE items.

The cost of the WEEE banks is approximately £1,000 each including design, construction and delivery. Peterborough City Council has agreed to collect from the banks and take the items to the CA site. Depending on the volumes collected this may require additional staff and resources.

The London Borough of Bexley has recently trialled a similar concept. In October 2003 they placed 6 "WEEE Banks" on the streets and increased this to 20 in December 2003. The response has been better than expected. The Council collects approximately once a month from each bank.

#### **Conclusion**

- **As the Directive does not define "in-store", bring banks could be a part of the solution to meeting retailers' obligations. It would certainly overcome the objections most retailers have with regards to taking items into stores and over the counter. However the following concerns will have to be addressed:**
  - **Health & Safety – the impacts of having unmanned containers with electrical items in public places such as retail parks.**
  - **Ownership for banks and their location – if the local authority's only involvement is collections then the retailers will have to be responsible for upkeep of the banks and the surrounding site.**

## **Producers**

Producers are expected to have responsibility for arranging collection from CA sites and designated retailer sites. The current proposal is for a “clearing house” that would allocate WEEE to treatment facilities. It would act on behalf of producers and be funded by them on a not-for-profit basis. Producers would have an obligation to arrange collection within a specified time frame. It has been suggested that the clearing house could establish producers’ share of the UK EEE market based on authorised data submission from them, and calculate their WEEE obligations (by tonnage) on an annual basis.

The producers would then be responsible for ensuring that WEEE is processed in authorised treatment facilities on a competitive market basis.

### **5.5.3. Peterborough Findings (Producers)**

The involvement of the ERP is currently limited to the sponsorship of the research project. The consultation has suggested that producers should have an obligation to collect within a set time frame (perhaps 48 hours). The data coming from the research that may be of relevance here is on seasonality (see section 4.1.3). Both local authority collections and items coming into the CA site are significantly higher in August. As part of the distribution data collection (4.1.5) people were asked whether they knew about the separate WEEE collection facility at the CA site and how they knew about it:

- 74% of people coming to the site did not know about separate collection
- Of the 12 people who had heard of the separate collection, only 1 had found out through the PCC leaflet. The majority had found out through word of mouth and previous visits.

The seasonality data also shows that there is a consistent trend of a lower volume of items coming in during mid-week. As expected the volume was highest at weekends but relatively high volumes were also experienced at the beginning and end of the week (see graph in 4.1.4).

It is anticipated that once the WEEE facility is operational it will be used by the proposed clearing house as an authorised treatment facility. Peterborough City Council will divert the bulky collections directly to the facility. However, items brought in by the public will need to be transferred from the CA site to the facility. Presumably this will be dealt with by the clearing house directly or contracted to Peterborough City Council. From surveys (sections 4.5 and 5.5.3 above), there appears scope to significantly increase the awareness and use of the collection service to reduce the amount of transfer necessary.

## Conclusion

The local facility will have the following advantages:

- **Reduced transportation costs and impacts.**
- **Better perceived connections between disposal and recycling due to local promotion and profile for the facility.**
- **Opportunity to include WEEE in a recycling system encompassing disposal of items to remanufacturing of materials.**
- **Providing opportunities for local employment, development of expertise and social enterprise.**

### **5.6. Article 6 – Treatment**

Data not yet available

### **5.7. Article 7 – Recovery**

Data not yet available

### **5.8. Article 8 – Financing in respect of WEEE from private households**

Not within the scope of this project

### **5.9. Article 9 – Financing in respect of WEEE from users other than private households**

Not within the scope of this project

### **5.10. Article 10 – Information for Users**

Member states have to ensure that users of electrical and electronic equipment have sufficient information about collection schemes for WEEE.

#### **5.10.1. The Peterborough Context**

As establishment and operation of the WEEE facility has been prevented, Peterborough City Council have not implemented a marketing drive to highlight the separate collection of WEEE at the CA site or through their bulky collection. There was a concern that additional marketing would lead to an influx of items without the facilities to deal with them in the most responsible manner.

Leaflets (see Appendix 13) containing information on the separate collection were available at Council offices, and staff at Peterborough Direct (information call centre) were briefed on the options available, for passing on to callers.

### **5.11. Information for Treatment Facilities**

Not within the scope of this project

### **5.12. Information and Reporting**

Member states must establish and maintain a register of producers of electrical and electronic equipment and ensure they report data on products they put on the market. Financing responsibilities for 'historic' WEEE treatment would be initially based on market share calculated from sales revenue rather than weight or numbers.

### 5.12.1. The Peterborough Context

#### Brands

The data collection has revealed a wide range of brands many of which did not register when entered into internet search engines.

- So far approximately 620 brand names have been recorded at the site.

Obviously there is room for misinterpretation of names during the data recording process and a proportion of these may not be true brands. This is an important observation as there appears to be some confusion in determining the brand particularly if the item is in bad repair or the model name is particularly prominent. It should be noted that a large proportion of items coming into the site were from brands recognised by the researcher.

- Approximately 3% of items had no clear brand name at all.

Producers will wish to use the brand arisings to assess whether the brand arisings match the market share which will determine responsibility for recovery and recycling costs in the Directive. It is interesting that a brand such as Hotpoint, whose manufacturer in the UK operated a takeback system for recycling at its Peterborough factory, still had over a quarter of the arisings, by far the largest in the *Other White Goods* category. This suggests that it may not be worth manufacturers carrying out their own recycling operations.

#### Weights

By the end of February 2003, almost 410 items had been weighed at the CA site. For items that had a weighing sample size of more than 10 we could calculate an average weight and the standard deviation from this weight. (For further weight results see Appendix 7.)

Item Type	Av Weight (kg)	Standard Deviation (kg)	St Dev as % of Av Weight
Television	18.40	10.47	56.9
Fridge	43.64	13.83	31.7
Microwave	17.69	4.74	26.8
Vacuum Cleaner	6.54	1.07	16.3
Washing Machine	67.05	8.76	13.1
VCR	5.57	1.53	27.5
Dryer	27.42	5.26	19.2
Cooker	52.30	12.75	24.4
Printer	5.56	2.99	53.8
HIFI	7.62	5.31	69.8
Speakers	7.81	5.27	67.5

### 5.12.2. Further Work

The software developed by the FRN will also have a database of producers to log items coming into the site. Again this software can be used to monitor the 'historical' WEEE coming into the site and see if the volumes match the allocation of

responsibility by market sales. Further weight collection will provide more accurate average weights but the standard deviation is unlikely to change dramatically. Variations in average weight data are shown at Appendix 7.4, with the results of three other relevant studies.

#### **Conclusions:**

- **By the time the item enters the waste stream it is often not possible to determine who initially put it onto the market. Even if identification is possible the brand or even the producer may no longer exist so allocating responsibility from this data could have practical difficulties.**
- **The weight data shows there is a large variation in weight for some items - fridges and TVs, for example. Some companies produce lighter electrical items so allocation of responsibility derived from using average weights would produce a skewed allocation, and would not enable those who had invested in more resource efficient products to realise the benefit from lower end of life costs. IPR is therefore important for the future. Obtaining brand or model specific weights for all items would not be practicable.**

#### **Reference (Bibliography is at Appendix 15)**

1. SCRELEC (2003): *Initiative Recyclage - collection and treatment of waste electrical and electronic equipment discarded by households in the Nantes Metropolitan Area. Summary progress report on stage 1.* Paris.