

Waste Electronic and Electrical Equipment (WEEE) Recycling

Research Report

September 2003





Foreword

This guide has been researched and written by the REALISE IT Network.

This guide is intended as a source of information on WEEE recycling activity in the United Kingdom (UK). In light of the EU WEEE Directive, it addresses key issues such as changes to the supply of WEEE versus the UK's current capacity to recycle WEEE. It also identifies market opportunities for those involved in recycling WEEE.

REALISE accepts no legal responsibility for any errors or misleading statements.

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Executive Summary

This research study has been undertaken by the REALISE Project. The project is a partnership between the London boroughs of Lambeth, Southwark, Westminster and the Corporation of London, with financial support from the European Union's LIFE Environment Fund and the UK Government's Single Regeneration Budget. REALISE has both environmental and social objectives. It is hoped that the project will significantly reduce the amount of electronic waste currently being sent to landfill and at the same time provide serviceable inexpensive equipment to those in greatest need. This report aims to provide a status update on WEEE recycling activity in the UK. Information gained will also be used to assist in the development of our referral service.

Introduction

This report surveys WEEE recyclers throughout the UK through a questionnaire study. The report shows evidence of current supply of WEEE and capacity to recycle as well as predicted changes to supply and demand due to factors such as the WEEE Directive.

The WEEE Directive

The WEEE Directive, which has to become law in the UK by August 2004, calls for the separate collection and recycling of electrical equipment. It requires producers / manufacturers to take responsibility for the take back and environmentally-friendly disposal of electrical and electronic equipment.

The WEEE Directive may increase supply of WEEE to recyclers. This depends on the intentions of manufacturers, as was suggested in the survey.

Methodologies

A questionnaire study was undertaken with a range of recyclers throughout the UK. This provided information about demographics, recycling activity, methods of obtaining and disposing of equipment, perceptions on the WEEE Directive, predictions of change in the market and future supply and demand, quality standards, barriers and support required and business relationships.

Results

The questionnaire was distributed to recyclers who varied from start-ups to multinationals. The questionnaire had a response rate of 32.7%. The majority of the responses were from private, often large-scale recycling companies.

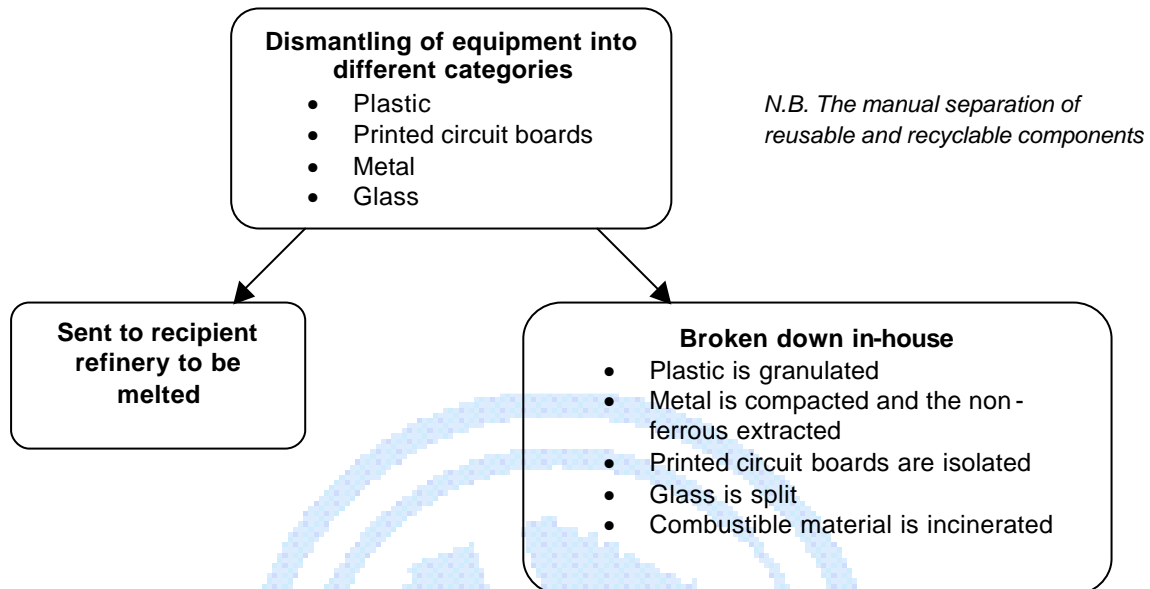
The results indicate that the bulk of WEEE processed is handled by only a few key players. However, only a small proportion of companies provided tonnage figures and reasons for the low response rate were not explored.

Perceptions on how the WEEE Directive is likely to affect the industry vary considerably among recyclers. There was an element of uncertainty in the responses, however the majority agreed that the supply of WEEE is likely to increase over the next twelve months.

Types of equipment recycled were broken down into nine categories of WEEE (Printers, peripherals, PCs, Networking Equipment, Laptops, Faxes, Mobile phones, Brown goods and White goods). Quantities of equipment recycled were hard to estimate from this survey, as most of the recyclers gave no weight data. However, of the recyclers who responded the total amount

of WEEE processed last year was approximately 27,552,780 KGs . The majority of organisations said that all components could either be recycled or reused.

Recycling processes were generally consistent and included;



Methods of obtaining equipment varied between private sector recyclers and not-for-profit. Sale by organisation was the most common method for private companies, and donation by organisation for non-profit making companies. Lack of capital was a major issue for both business types. Many would like more money to market their services better or rent more storage space.

It emerged that the small business, home office and home user section of the market is possibly not being tapped at present. This is supported with the knowledge that the majority of private companies receive their equipment from organisations, and also that transportation was a problem for not-for-profit companies.

The majority are not accredited by industry specific standards like ICER.

Conclusions

Evidence from the demographics suggests that the WEEE recycling industry is still in the early growth stages, as a large proportion of WEEE that is being processed is being handled by only a few key players.

In order to increase recycling rates, awareness needs to be raised amongst businesses and the general public about recycling services available and forthcoming legislation. Recyclers also need to extend their services to cover the small business, home office and home sector section of the market, which is at present not being reached. Improved relations with Local Authorities could possibly assist in the development of this service through facilities like local collection centres.

Relationships with refurbishment companies is an area that is underdeveloped. It is often not financially viable for a refurbisher to reuse low-end equipment, so unless the refurbisher recycles themselves, the precious metal products that can be recovered from this equipment goes to

waste. An area of suggestion would be for recycling companies to form relationships with refurbishers for the purchase and / or collection of this low-end equipment.

Responses suggest that the supply of WEEE and the capacity to recycle WEEE is likely to increase over the next twelve months, mainly due to increased awareness through the WEEE Directive. However, opinions on how the Directive will affect the industry varied. There was an element of uncertainty in the responses, with one organisation saying that it is difficult to predict even for experts.

Recommendations for Further Research

1. Location studies

A study into the collection infrastructure of the industry could be used to help prepare for the collection challenges of the WEEE Directive.

2. Industry impact of WEEE Directive

Clear supply chain audit trails of the amounts collected and amounts recycled will be needed to monitor the value of recovery. Research is needed to determine appropriate data collection methods. Research could also be used to gain an understanding of producer / retailer intentions to date.

3. Changing barriers and support needs

As the industry grows, barriers to increasing recycling and the support needs of recycling companies are likely to change. Research to determine how support needs and barriers differ between different sized recyclers will help prepare the industry in meeting these needs.

4. Relevance of accreditation

There needs to be a greater understanding of the importance of licensing and performance standards and of meeting accreditation standards such as ICER. Do accredited recyclers do more business? If so, why aren't more recyclers applying for accreditation?

Implications for REALISE

There is much scope to link the results of this research study into the REALISE project. It is hoped that the project will significantly reduce the amount of electronic waste currently being sent to landfill, hence the implications for REALISE from this research range from the role for marketing available recycling services to the provision of data on WEEE to relevant parties.

Section 1 Introduction

REALISE IT Network

The REALISE IT Network aims to minimise the environmental impacts of IT waste, and maximise access to IT resources. The project is a partnership between the London boroughs of Lambeth, Southwark, Westminster and the Corporation of London, with financial support from the European Union's LIFE Environment Fund and the UK Government's Single Regeneration Budget. REALISE has both environmental and social objectives. It is hoped that the project will significantly reduce the amount of electronic waste currently being sent to landfill and at the same time provide serviceable inexpensive equipment to those in greatest need. In addition to this, REALISE aims to be an information provider on industry activity; information gained through research and / or data collection (<http://www.realise-it.org.uk>).

London Community Recycling Network (London CRN)

Thanks goes to London CRN for their assistance in questionnaire design and technical advice.

The London CRN acts as a consultant on sustainable waste management issues (specifically community-based) and aims to provide information on London's community recycling activities (<http://www.lcrn.org.uk>).

Research Background

According to Waste Watch, "Every year an estimated 1 million tonnes of waste electronic and electrical equipment are discarded by householders and commercial groups in the UK. Dealing with this waste is becoming an important issue as electronic goods are becoming increasingly short lived, and so ever increasing quantities of obsolete and broken equipment are thrown away. Electronic and electrical equipment makes up on average 4% of European municipal waste, and is growing three times faster than any other municipal waste category."

The EU WEEE Directive is designed to tackle this fast increasing waste stream. Increased recycling of electrical and electronic equipment will limit the total quantity of waste ending up in landfill sites.

The WEEE Directive

The major new legislation affecting WEEE is the draft EU Directive. This will have a large influence on how this waste stream is managed. This Directive sets out measures that aim, firstly, at the prevention of waste electrical and electronic equipment, secondly at the re-use, recycling and other forms of recovery and thirdly at minimising the risks and impacts to the environment associated with the treatment and disposal of WEEE. It requires Member States to recover an equivalent of 4kg of WEEE per inhabitant, and to recycle 75% of the weight of these products. Manufacturers are expected to fund a large part of this activity.

Key aspects of the Directive are:

- Prevention of waste
- Collection and treatment
- Recovery
- Aiding the process
- Designing for the environment.

The WEEE Directive requires producers and importers of electrical and electronic goods to treat, recover and recycle a proportion of these goods when they become waste. This will have significant administrative and attendant cost implications for all producers, importers and retailers of EEE.

Member states must implement the Directives into national law by 13 August 2004. Following implementation, the requirements of the Directives, for example, recycling targets and financing, will come into force at prescribed dates.

See http://europa.eu.int/comm/environment/docum/00347_en.htm

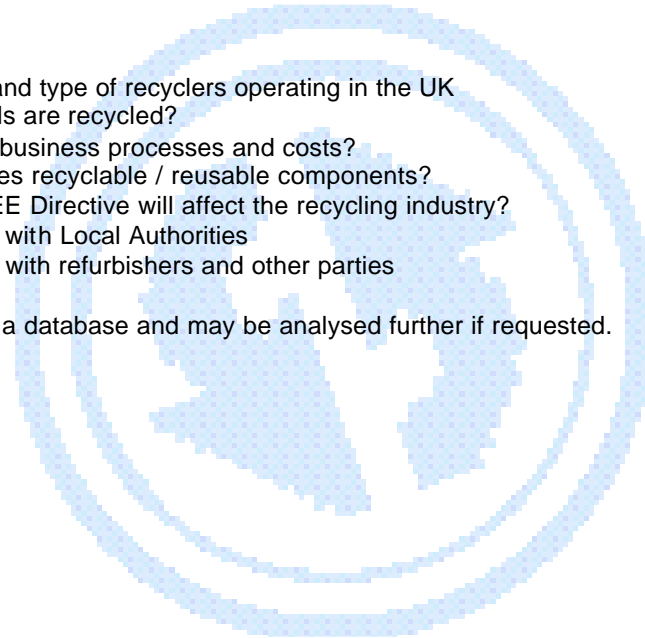
In order to determine the effects of the increasing rates of WEEE and the proposed Directive, it is necessary to develop an understanding of the existing provision of WEEE recycling activities. To do this it is essential to find out the current practices, perceptions and concerns of potential supplier and buyers. This will also help to develop forecasts for future supply and demand.

Aims and objectives

To determine:

1. The number and type of recyclers operating in the UK
2. What materials are recycled?
3. What are the business processes and costs?
4. Who purchases recyclable / reusable components?
5. How the WEEE Directive will affect the recycling industry?
6. Relationships with Local Authorities
7. Relationships with refurbishers and other parties

All data is held in a database and may be analysed further if requested.



Section 2 Methodologies

Methodologies and research tools

The questionnaire was designed to procure information on all aspects of their business such as;

- The status of the business e.g. private company, public company, registered charity
- Number of operating sites, turnover figures, staff numbers etc.
- Methods of obtaining equipment, recycling processes and what types and quantities of equipment they received and recycled
- Collection procedures
- Existing market
- Predictions of change in the market and future supply and demand
- Service standards and data protection standards
- Barriers to recycling e.g. lack of capital for investment and lack of trained staff
- Factors that could improve the business
- Effects of legislation.

Recycler questionnaire

55 recycling organisations throughout the UK were sent the questionnaire.

See Appendix 1 for a copy of the questionnaire.

Methods of determining circulation numbers

The methods used to obtain the original sample number of 55 recyclers include:

- REALISE contact list
- ICER 2003 Directory of Recyclers
- Materials Recycling Handbook 2002
- Internet
- Referrals from REALISE Network refurbishers

It is therefore safe to assume that the sample was representative of the UK's current recycling activity.

Sample size confidence level

For the purpose of this research, we are using a confidence interval of 19 and a 95% confidence level, and we assume that the true population is represented by the 55 recycling companies that were sent the questionnaire.

Section 3 Results

Participants

- 18 recyclers returned the questionnaire indicating a 32.7% response rate
- 3 (16.7%) were not-for-profit organisations
- 13 (72.2%) were private companies
- 1 (0.05%) was a registered charity
- 1 recycler did not specify their legal status.
- 2 of the organisations that replied subcontracted their recycling to organisations that did not take part in the survey.

Organisational Demographics

Full Time Staff

- 17 out of 18 provided responses
- Full-time staff number range between 1 and 120
- The average number was 27
- 76.5% of organisations had less than 20 staff
- 23.5% had over 20 staff members.

Part Time Staff

- 11 out of 18 provided responses
- Part-time staff number range between 1 and 30
- The majority of organisations (81.8%) had 6 part-time staff or less.

Volunteers

- 7 out of 18 provided responses
- Numbers range between 1 and 45
- 6 out of the 7 organisations who responded had 4 volunteers or less
- 64.7% of organisations had no volunteers at all.

Average Full Time Staff Number by Business Type

Legal Status	Number of Recyclers	Average Number of Full Time Staff
Private Company	13	31.8
Not For Profit Company	3	4.7
Registered Charity	1	45
Not Replied	1	

Full Time Staff Ratio

Not For Profit : Private Company (Number of employees) 1 : 6.8

Operating Sites

- 18 out of 18 provided responses
- Operating site numbers ranged between 1 and 15
- The average was 2.83 per recycler.

The number of operating sites varied across business types and is shown in the table below.

Legal Status	Number of Recyclers	Number of Operating Sites	Average by Business Type
Private Company	13	43	3.3
Not For Profit Company	3	3	1
Registered Charity	1	4	4
Not Replied	1	1	1

Annual Turnover

- 66.7% of organisations responded to this question
- Turnover figures ranged between £40,000 and £12,000,000
- The average annual turnover for a private company was £3,998,888
- The average for a Not For Profit was £253,000.

Annual Turnover Ratio

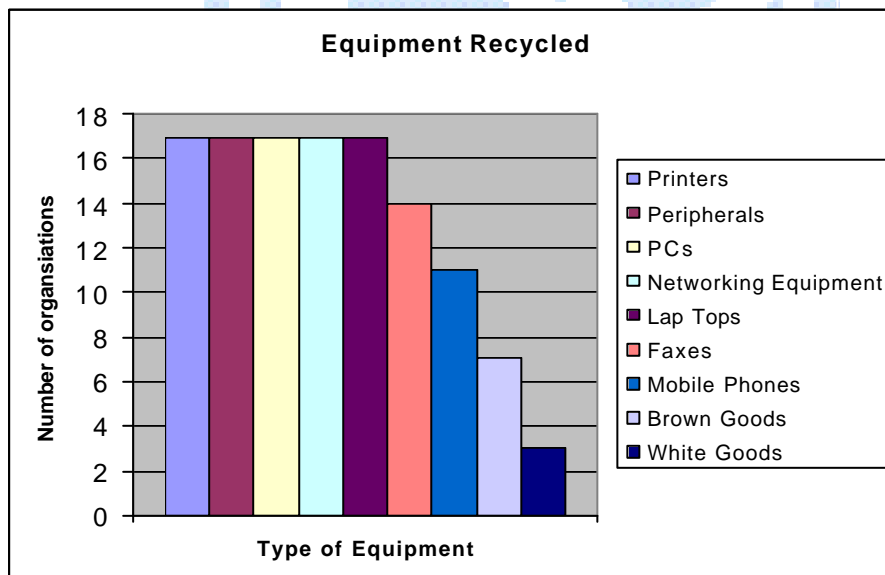
Not For Profit : Private Company (£s) 1 : 17

Recycling Activity

When analysing this data, it should be noted that the definition of 'WEEE' may vary between recyclers. There may also be variation of the term 'recycled'. A definition was not given in the questionnaire, however this may be an area for future research.

What materials are recycled?

17 out of 18 organisations responded to this question. All of the organisations that replied recycle PCs while only 18% recycle white goods. A further break-down is provided below.



Quantities of WEEE Received / Recycled

50% of the organisations could not provide reliable figures as to the number of units recycled, 61.1% of organisations provided no weight data, and 1 organisation provided no data at all. Quantities of equipment received and recycled last year varied from a few hundred PCs to

100,000. It is difficult to determine a conversion rate of WEEE received to WEEE recycled from this research, however, the majority claimed high levels of recycling; generally indicating that 90% of WEEE received is recycled.

From the available data, an overview of quantities of WEEE recycled last year is given below.

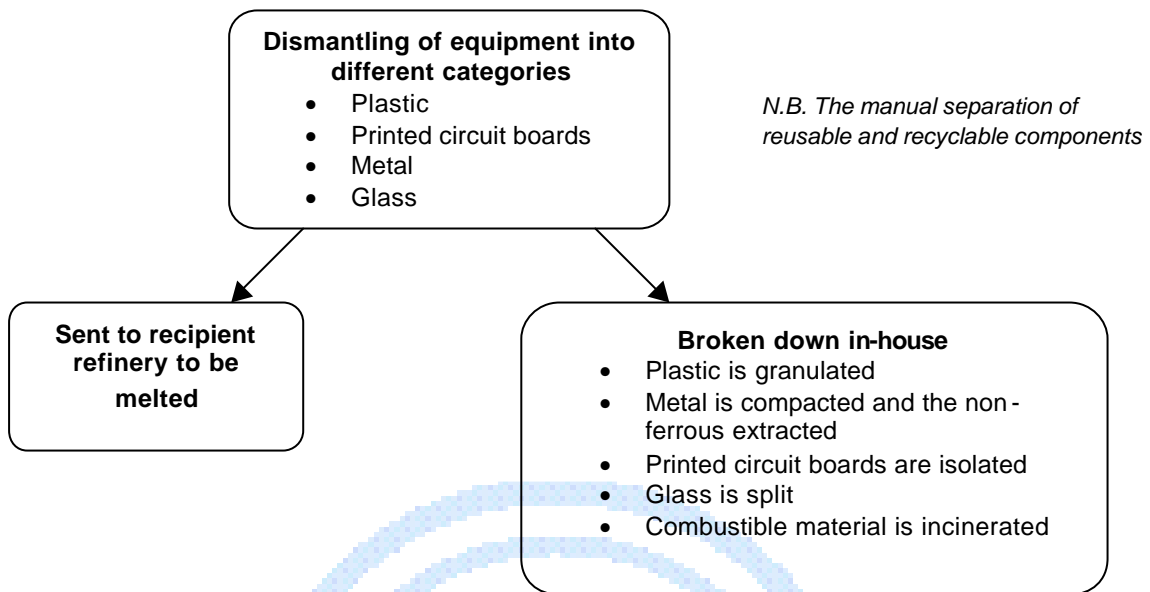
Equipment	Number of respondents	Lowest no. recycled	Highest no. recycled	Total units recycled	Average
White Goods	2	100	500000	500100	250050
PCs	6	200	100000	135433	16929.1
Peripherals	3	20	20000	52337	8722.8
Printers	5	150	20000	43861	6265.9
Networking Equipment	4	50	20000	30421	5070.2
Laptops	4	2	5000	10838	1354.8
Faxes	4	50	5000	6794	1358.8
Mobile Phones	4	400	3000	4123	1374.3
Brown Goods	3	72	400	772	257.3

Equipment	Number of respondents	Total Weight (In Kilograms)	Average Weight (In Kilograms)	Maximum Weight (In Kilograms)	Minimum Weight (In Kilograms)
White Goods	2	24,803,000	12,401,500	24,303,000	500,000
PCs	6	1,343,525	205,250	800,000	6,500
Brown Goods	3	638,000	212,666.67	625,000	5,000
Printers	5	315,250	63,050	200,000	2,250
Peripherals	4	214,250	53,562.50	200,000	250
Networking Equipment	4	161,900	40,475	100,000	1,900
Laptops	4	36,105	9,026.25	25,000	105
Faxes	4	31,750	7,937.50	20,000	750
Mobile Phones	3	9,000	3,000	5,000	1,000

Only 3 organisations stated that a percentage of the WEEE received was sent to landfill. The majority of organisations said that all components could either be recycled or reused.

Recycling Processes

With the exception of 2 organisations, which outsource their recycling to a third party, responses to this question were generally consistent. A number of organisations refurbish the majority of equipment and send the remaining parts to recipient refineries but the majority recycle in-house and processes typically included:



Associated Costs

66.6% of organisations responded to this question and the main determinant of cost was transport (41.6%). The other main determinants of cost included labour and handling. A number of organisations stated that costs are dependent upon items received and geographical location.

Clients

Methods of Obtaining Equipment

Recyclers procure equipment from a number of different sources, but the most common method of obtaining WEEE was from Local Authorities (82%). A further break-down is given in the table below.

Procurement	Number of recyclers
Local Authorities	14
By contract	12
Sale by organisations	11
Donation by organisations	10
Donation by individuals	7
Sale by individuals	3
Other	3
Household Waste via Public Sector	2
No info given	0

However, the majority of organisations who responded to the questionnaire were private companies and methods of obtaining equipment do vary between business type.

Private Companies

Sale by organisation was the most common method of obtaining equipment for private companies (100%). This was followed by Local Authorities and by contract. The least common method of obtaining equipment was from sale by individual.

Not-for-profit Companies

Donation by organisation was the most common method of obtaining equipment for not-for-profit companies (100%). Donation by individual was the next most common and by contract was the least common.

Attracting Clients

There was no obvious split between methods of attracting clients and business type, as the 3 most common methods were consistent for both private companies and not-for-profits. 89% of organisations cited marketing as a method of attracting clients. 83% cited word of mouth and referral from other organisations. Marketing activities ranged from direct mail to advertising as well as their own websites.

Collection

All of the organisations that replied to the questionnaire offer collection. The majority (83.3%) charge for collection and cost is usually dependent upon type and volume of equipment and geographical location. A number of organisations stated that they collect reusable equipment free of charge. Costs are charged either per item collected, per pallet or per van load.

15 out of 18 organisations gave details of minimum and maximum collection requirements. Minimum collection amounts varied across recyclers. Collection amounts were stated in units and / or weight. Minimum units collected ranged from 1 to 50 units and minimum weight ranged from 100 kg to 1 tonne. The majority of organisations had no maximum collection limit.

17 organisations provided a break-down of the collection areas covered. 47% of those who responded provide collection UK-wide, 23.5% internationally and 23.5% solely in London. 16 out of the 17 organisations who responded provide collection services in London. The next most common collection area was the South, followed by the Midlands. Northern Ireland was the least common collection area in the UK, with 8 organisations servicing this area.

Area	Number of organisations
All London boroughs	16
South	12
West Midlands	11
East Midlands	11
Yorks	10
Wales	10
North West	10
North	10
Scotland	9
Other	8
Northern Ireland	8
Some London boroughs	1

Buyers

According to WRAP (the Waste & Resources Action Programme), there are two main target markets for recycled material; reprocessors and major glass, plastic and paper manufacturers. "If you are a local authority or waste management company with recycled material to sell a target market your recyclate could be reprocessors. Additionally, some manufacturing processes can use recycled materials as a direct substitute for virgin materials. Your target market could be the major glass, plastic and paper manufacturers."

The markets identified by the sample differed quite substantially. 23% of organisations export recyclable components to third world countries and a number of organisations resell components, although it was not identified whom they resell to. Other markets included brokers, traders and low-income users.

Similar markets were identified for re-useable components with the exception of community and charity organisations. Community and charity organisations were identified by a number of organisations as markets for refurbished PCs. Other categories of WEEE were not mentioned.

One organisation believed that the re-useable markets for IT equipment has collapsed.

Attracting Buyers

88% of organisations cited word of mouth as a method of attracting buyers. This was practically evident in the not-for-profit organisations (100%). However, 14 out of the 16 who responded to this question, including non-profit-making organisations, undertake some sort of marketing activity. Activities range from advertising to mailshots, with the most common activity being their own websites. Marketing was the most common method of attracting buyers for private companies.

Referral from other organisations was also a common method of attracting buyers. This was more prominent in the non-profit making organisations, where 100% cited this as a method while only 54.5% of private companies did.

Pricing

Pricing of components is difficult to quantify, as many of the organisations pointed out that prices vary constantly. Additionally, PCs are often custom-built, so the price is dependent on the technical specification.

Quality Standards

Standard	Number of recyclers
ISO 9000	9
Data Protection Standards	7
EMAS/ISO 14000	7
Waste Management Licence	6
ICER Code of Best Practice	4
Other	4
Waste Management Licence Exemption	4
Treatment Standards	3

The ISO standards and EMAS are a general management standard. The ICER accreditation scheme is designed specifically for the industry, however only 4 respondents operate to the ICER Code of Best Practice. 60% of participating organisations adhere to ISO 9000; 47% adhere to

EMAS/ISO 14000; 16.6% do not have any formal standards and 16.6% of those were working towards or considering ISO or ICER accreditation.

Waste Management

Waste management licences are issued by the Environment Agency to ensure that the authorised activities do not cause pollution of the environment, harm to human health or serious detriment to local amenities. Only 40% of those who responded operate with this licence.

Data Protection

47% of those surveyed worked to specific data security standards. While this may seem like a small percentage for an activity that is taken very seriously by organisations that pass on equipment, the amount of wiped equipment received was not taken into account.

The majority of respondents did not identify the type of standards they work to, but the ones that were identified include US Department of Defence or Ministry of Defence.

See Appendix 2 for full details on licencing and the ICER Accreditation Scheme.

Barriers and Support Needs

Barriers to increasing recycling rates

56% of organisations cited lack of capital as a barrier to increasing recycling. This was the most common barrier for both private and non-profit-making companies.

Private Companies

36.4% said that lack of access to suppliers was a barrier and 27.3% said that lack of marketing resources was a barrier. Only a small percentage of private companies said that a lack of trained staff and a lack of storage space was a problem. One organisation cited the limited market for recyclable components was a barrier and another said that lack of support from Local Authorities was a main barrier.

Not-for-profit Organisations

Lack of storage space and lack of marketing resources were the other barriers that were identified by non-profit-making organisations.

Support

60% of those who responded cited greater provision of storage as the most common support need. This was evident in both business types but more so in private companies, with 54.5% stating it as a support need. Marketing was the next most common support need, equally evident in private and not-for-profit organisations. This was followed by links to other organisations, e.g. to clients and end users as well as other similar organisations.

27% of organisations said that technology or equipment would benefit their business. Examples include large-scale granulating machines and large-scale separators.

20% said that training would benefit their business. Types of training identified varied widely. One organisation stated training UK business and government on cost of landfill and lost opportunities from reuse would benefit their business.

All non-profit-making organisations said that they need help with transport, either for picking up quantities of equipment from long distances or because they do not have adequate transportation generally. However, this was one of the least common support needs for private companies.

WEEE Directive

The WEEE Directive aims to reduce the amount of electrical and electronic equipment sent to landfill. Europa stated the objective as, "To promote re-use, recycling and other forms of recovery of electrical and electronic waste in order to reduce the quantity of such waste to be eliminated and to improve the environmental performance of the economic operators involved in the treatment of such waste."

How will the new legislation affect business?

16 out of 18 recyclers responded to this question. 77.7% of respondents believe that the WEEE Directive will have a positive impact on their business. The majority of these say that business will increase substantially, with one organisation stating that it will increase by 1000%. Reasoning for how and why business will increase varied slightly. One organisation said business will increase through greater awareness, another said it will increase if emphasis is on reuse and another saying it will make recycling services more in demand. One organisation said that it would only improve business if 'we can work closer to manufacturers' and another saying it will benefit if one obtains the licence, although the type of licence was not mentioned.

Only 2 organisations believe that the WEEE Directive will adversely affect their business. Both of these organisations are non-profit-making organisations. One organisation said that they would lose sources if PC manufacturers conduct recall.

How will the new legislation affect the industry?

12 out of 16 recyclers responded to this question. Opinions on how the Directive will affect the industry varied, with one organisation saying that it is difficult to predict even for experts. There was generally a positive response to this question, with the majority of organisations saying the industry will grow, but the rate of growth is dependent on the amounts of re-education conducted.

Negative responses varied. One organisation said that materials will be generated for which there is no market, while another said that ad-hoc demand from Local Authorities will prevent regional specialists developing, leaving the UK vulnerable to European infiltration. Another said it will create new jobs but greater cooperation and coordination is needed.

One organisation said that dumping and associated costs will increase and revenues will be created for disposal of all items, most of which are not commercially viable.

Supply of WEEE

There were similar responses as to how the supply of WEEE is likely to change over the next 12 months. 29% of those surveyed believe that supply will increase by an amount greater than 30% in the next year; 47% believe that supply will increase by up to 30% and 18% said that supply will decrease by up to 30%. There was no obvious split between perceptions on supply and business type or perceptions on supply and turnover.

The WEEE Directive is certain to be a significant factor in determining the supply of WEEE to recyclers. Responses to the changes in supply reflect opinions on how the Directive will affect business, with the majority predicting an increase in supply and a small number predicting a decrease.

One organisation suggested that the upsurge would be due to the fact that, in light of the WEEE Directive, manufacturers will no longer 'landfill' their returned equipment, leaving recyclers to deal with it.

Capacity to recycle WEEE

53% of organisations believe that their capacity to recycle will increase by an amount greater than 30% in the next year and 35% believe it will increase by an amount up to 30%. Only one organisation believed their capacity will stay the same and one stated that their capacity would decrease by an amount up to 30%. Again there was no obvious split between perceptions on capacity and business type or perceptions on capacity and turnover.

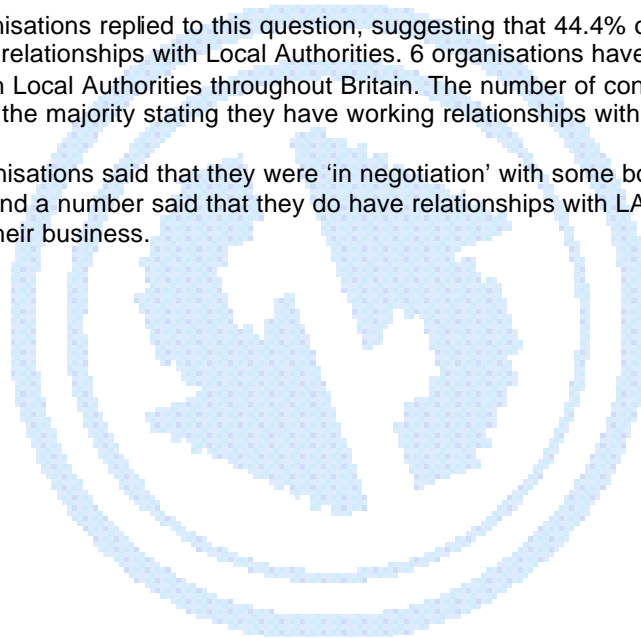
Relationships with refurbishers

72.2% of organisations did not identify any working relationships with refurbishers. A number of organisations provide refurbishment activities themselves and one organisation works with refurbishers mainly on purchasing precious metal products that are removed from machines that are not viable, or are under contract to dismantle.

Relationships with Local Authorities

10 out of 18 organisations replied to this question, suggesting that 44.4% of respondents do not have any working relationships with Local Authorities. 6 organisations have contracts or existing arrangements with Local Authorities throughout Britain. The number of contracts varied with each organisation, with the majority stating they have working relationships with 'a number' of LAs.

A number of organisations said that they were 'in negotiation' with some boroughs for collecting electronic waste and a number said that they do have relationships with LAs but it is only a very small percent of their business.



Section 4 Conclusions

The majority of the responses were from the private, often large-scale recycling companies. The private companies in this research study recycle a higher proportion of WEEE and have a higher employee and turnover ratio than the not-for-profits.

Evidence from the demographics suggest that the WEEE recycling industry is still in the early growth stages as a large proportion of WEEE that is being processed is being handled by only a few key players. However, only a small proportion of companies provided tonnage figures and reasons for the low response rate were not explored.

From the results it is evident that the not-for-profit companies and private companies operate quite differently. The majority of private recycling companies work in contracts and obtain their equipment mainly from sale by organisation and from Local Authorities, with a smaller proportion from donations. Non-profit-making companies on the other hand obtain most of their equipment from donations. While both business types undertake some sort of marketing activity, it could be concluded that the private companies are selling themselves more effectively and can attract attention from both sides.

Recyclers cited a number of barriers to increasing recycling quantities. Lack of capital was a major issue for both business types. Many would like more money to market their services better or rent more storage space.

It emerged that the small business, home office and home user section of the market is possibly not being tapped at present. This is supported with the knowledge that the majority of private companies receive their equipment from organisations, and also that transportation was a problem for not-for-profit companies.

On the support side, recyclers would like to have better links to other organisations e.g. to clients, namely Government and manufacturers of IT equipment as well as other similar organisations that may be able to provide equipment. However, while this was cited as a common support need, only a very small number of respondents identified links to refurbishment companies. It is often not financially viable for a refurbisher to reuse low-end equipment, so unless the refurbisher recycles themselves, the precious metal products that can be recovered from this equipment goes to waste. An area of suggestion would be for recycling companies to form relationships with refurbishers for the purchase and / or collection of this low-end equipment.

Recyclers generally agree that businesses and the public in general, need to be given more information about recycling services, i.e. greater marketing support. This could be partially achieved by building links between government, the public and existing recycling schemes to raise awareness and to train on opportunities through recycling and reuse, as was suggested in the survey.

According to the Department of Trade and Industry, "The total annual waste arisings of electrical and electronic equipment in the UK have been estimated to be in excess of 900,000 tonnes. Computers, workstations and systems account for nearly 14% of this waste arising (126,000 tonnes)."

The quantity of equipment being recycled is very hard to estimate, as the majority of organisations provided no weight data. However, of the recyclers who responded the total amount of WEEE processed last year was approximately 27,552,780 KGs. 7.63% of this WEEE is IT equipment (2,102,780 KGs).

From this result we can give a rough estimate of the amount of IT equipment that was recycled last year UK-wide. Assuming the following:

- The 55 recycling companies that were distributed the questionnaire represents the total capacity
- The entire sample undertakes some sort of IT equipment recycling
- The 2001 DTi figure of 126 000 tonnes is still an approximate figure
- An unknown proportion of the DTi figure goes to reuse.

If we calculate;

2,102,780 KGs / Number of responses (18) * Number of UK recyclers (55)

= Total IT equipment recycled last year = 6,425,161 KGs (6,425.16 tonnes)

If approximately 126,000 tonnes of IT equipment is disposed of, and only 6,425.16 tonnes is being recycled, **119,574.84 tonnes** of IT equipment is potentially landfilled annually. These figures indicate that less than 10% of the potential equipment that could be made available for recycling is currently being utilised.

The majority of organisations said that all components could either be recycled or reused, suggesting that potentially high levels of recycling can be achieved. Thus, in order to reduce the amount of equipment that ends up in landfill sites, recycling companies need extra support in marketing their services, as was suggested in the results.

Perceptions on the supply of WEEE and capacity to recycle WEEE were generally consistent. The majority believes that supply will increase in the next year as a result of increased awareness through the WEEE Directive. Recyclers stated that they have the capacity to deal with this extra volume.

Perhaps the most striking thing to emerge from the questionnaire was the variation in opinions on the impact of the WEEE Directive on the recycling industry. Opinions as to how the Directive will affect the industry varied quite dramatically. There was an element of uncertainty in the responses, with one organisation saying that it is difficult to predict even for experts. A number of organisations commented that the impact of the Directive is dependent upon the actions of the manufacturers.

The Directive will drive some significant changes in the current management of WEEE. On the collection side, recycling companies will need to maintain and develop existing collection infrastructure. There is also likely to be a greater need to keep detailed records of equipment. The uncertainty in the questionnaire responses implies that large proportions of UK WEEE recycling companies may still be in the early stages of preparation for the Directive.

This uncertainty is spread across business as well. According to an environmental survey by Mirec Asset Management, released May 2003, "The vast majority of UK businesses (89%) are unaware of forthcoming legislation that will effect how they dispose of redundant electronic and electrical equipment.

- 89% know nothing about the WEEE (Waste Electronic and Electrical Equipment) Directive
- Only 4% claim to 'know basics'".

The majority of recyclers gave details of minimum collection requirements. These minimum collection amounts did vary but included amounts as large as 1 tonne. However, in order to reduce landfill rates and assist in meeting the requirements of the new Directive, collection will need to be extended to include recovery from individual consumers and small businesses.

Additionally, only a small number of organisations cited existing relationships with Local Authorities; hence this is an area that has the potential to be developed in response to the collection requirement of the Directive. Although there are no specific obligations placed upon

Local Authorities in the Directive, they represent one option which could prove to be more cost effective than other options under consideration. For example, recycling companies could possibly develop local collection centres with Local Authorities to deal with the smaller amounts of WEEE, particularly household WEEE, that is currently not being collected.

Success of Methodologies

The questionnaire elicited a great deal of useful information. Many of the questions were qualitative but it was still possible to draw off some quantitative results.

Some questions proved difficult for the recyclers to answer, such as quantities of equipment received and recycled. This was more evident in the smaller, often non-profit-making recycling companies.

Implications for REALISE

There is much scope to link the results of this research study into the REALISE project. It is hoped that the project will significantly reduce the amount of electronic waste currently being sent to landfill, hence the implications for REALISE from this research include:

- Role for marketing available recycling services
- Role for awareness raising in different sectors
- Role for building partnerships
- Role for establishing a referral system to recyclers
- Investigate a small office / home sector collection service for recyclers
- Assist recyclers in getting accreditation
- Provision of data on WEEE to relevant parties.



Section 5 Recommendations for further research

1. Location studies

In light of the WEEE Directive and the collection challenges that seem to face recyclers, a study into the collection infrastructure could be used to determine:

- Geographical split of recyclers, i.e. coverage
- Transport routes
- CA site capacity
- Retailer collection / take back opportunities
- Local Authority collection opportunities

2. Industry impact of WEEE Directive

Clear supply chain audit trails of the amounts collected and amounts recycled will be needed to monitor the value of recovery.

Statistics will need to be collated for amounts collected and amounts recycled.

Research is needed to determine appropriate data collection methods. Should this be done by a central body or by the recyclers themselves?

Research could also be used to gain an understanding of producer / retailer intentions to date:

- Are they planning to get their own recycling plant?
- Will they use existing recyclers? I.e. market opportunities
- What will be the selection criteria for choosing a recycling organisation?
- Options open to producers / retailers.

3. Changing barriers and support needs

As the industry grows, barriers to increasing recycling and the support needs of recycling companies are likely to change. Research to determine how support needs and barriers differ between different sized recyclers will help prepare the industry in meeting these needs.

The first requirement is to conduct research into what factors contribute to profitability, i.e. do different categories of WEEE generate higher income?

4. Relevance of accreditation

There needs to be a greater understanding of the importance of licensing and performance standards and of meeting accreditation standards such as ICER. Do accredited recyclers do more business? If so, why aren't more recyclers applying for accreditation? Questions that need to be asked include;

- What is the relevance?
- Are they too hard to attain?
- What are the advantages of having accreditation? E.g. Profitability? Avoid prosecution?

Section 6 APPENDIX

Appendix 1 WEEE Recycling Questionnaire

Basic Information

Organisation Name:	
---------------------------	--

Address:	Tel: Fax: Email:
Contact person:	

Please provide a brief description of your organisation:

What is your organisation's legal status?
(e.g. Registered Charity, Private Limited Company etc.)

Please give details of your organisational demographics?

Annual turnover:		Number of paid staff:	F/T
Number of operating sites:			P/T
		Number of volunteers:	

Business activity

What materials do you recycle?

	<i>Tick all that apply</i>	<i>Number of each item recycled last year</i>	<i>Corresponding weight</i>
PCs	<input type="checkbox"/>		
Laptops	<input type="checkbox"/>		
Peripherals	<input type="checkbox"/>		
Networking Equipment	<input type="checkbox"/>		
Printers	<input type="checkbox"/>		
Faxes	<input type="checkbox"/>		

Brown Goods (including televisions, Hi fi's)	<input type="checkbox"/>		
White Goods	<input type="checkbox"/>		
Mobile Phones	<input type="checkbox"/>		
Other (please give details below)	<input type="checkbox"/>		

Please outline the processes that you employ to deal with waste.
(Alternatively, please attach corporate literature detailing this information)

What are the associated costs?

Please describe what happens to components that cannot be recycled or reused?

Clients

How do you obtain equipment for recycling?

	Tick all that apply	Approximate % breakdown of clients
By contract	<input type="checkbox"/>	
Sale by individuals	<input type="checkbox"/>	
Sale by organisations	<input type="checkbox"/>	
Donation by individuals	<input type="checkbox"/>	
Donation by organisations	<input type="checkbox"/>	
Household waste via public sector	<input type="checkbox"/>	
Local Authorities	<input type="checkbox"/>	
Other (please give details below)	<input type="checkbox"/>	

How do your clients usually hear about you?

	Tick all that apply	
Word of mouth	<input type="checkbox"/>	

Marketing	<input type="checkbox"/>	Please list marketing activity
Referral from other organisation	<input type="checkbox"/>	Please list organisations
Other	<input type="checkbox"/>	Please list

Do you collect Equipment?

Yes No

Do you charge for collection?

Yes No

If yes, please give further details:

What is the minimum and maximum amount of equipment you will collect?

What areas will you collect from?

	Tick all that apply	
All London Boroughs	<input type="checkbox"/>	
Some London Boroughs	<input type="checkbox"/>	<i>Please list</i>
North	<input type="checkbox"/>	
North West	<input type="checkbox"/>	
Yorks	<input type="checkbox"/>	
West Midlands	<input type="checkbox"/>	
East Midlands	<input type="checkbox"/>	

South	<input type="checkbox"/>	
Wales	<input type="checkbox"/>	
Scotland	<input type="checkbox"/>	
Northern Ireland	<input type="checkbox"/>	
Other	<input type="checkbox"/>	<i>Please list</i>

End Users / Buyers

What markets exist for the purchase of recyclable components?

What markets exist for the purchase of reusable components?

How do your end users usually hear about you?

	Tick all that apply	
Word of mouth	<input type="checkbox"/>	Please list marketing activity
Marketing	<input type="checkbox"/>	
Referral from other organisation	<input type="checkbox"/>	Please list organisations
Other	<input type="checkbox"/>	Please list

What are the market prices for reusable / recyclable components?

(write specification and then corresponding price)

<i>Specification</i>	<i>Price</i>

If you have a pricing list, please include on a separate sheet.

Current Business

If information is available, please give details of the quantities of WEEE received last year?
(In tonnage and / or number)

If information is available, please give details of the quantities of WEEE recycled last year?
(In tonnage and / or number)

What standards of performance do you adhere to?

	Tick all that apply	
Waste Management licence	<input type="checkbox"/>	
Waste Management licence exemption to standards	<input type="checkbox"/>	
EMAS / ISO 14000	<input type="checkbox"/>	
ISO 9000	<input type="checkbox"/>	
ICER Code of best practice for recyclers	<input type="checkbox"/>	
Data protection standards	<input type="checkbox"/>	Please list
Treatment standards	<input type="checkbox"/>	Please list
Other	<input type="checkbox"/>	Please list

What are the barriers that prevent you from increasing the amount of recycling you carry out?

	Tick all that apply	
Lack of capital	<input type="checkbox"/>	
Lack of trained staff	<input type="checkbox"/>	
Lack of storage space	<input type="checkbox"/>	
Lack of access to suppliers	<input type="checkbox"/>	
Lack of marketing resources	<input type="checkbox"/>	
Other	<input type="checkbox"/>	Please list

Would greater provision of the following benefit your business?

	Tick all that apply	
Storage	<input type="checkbox"/>	
Transport	<input type="checkbox"/>	
Marketing	<input type="checkbox"/>	
Technology / Equipment	<input type="checkbox"/>	Please specify what equipment is needed
Training	<input type="checkbox"/>	Please specify training needs
Links to other organisations	<input type="checkbox"/>	Which organisation?
Other	<input type="checkbox"/>	Please list

Legislation

Please detail how you think the new EU WEEE Directive is likely to affect your business operations?

Please detail how you think the new EU WEEE Directive will impact the WEEE recycling industry in the UK?

How do you think the supply of WEEE is likely to change in the next 12 months?

(tick one)

Major decrease (Greater than 30%)	<input type="checkbox"/>
Some decrease (1% - 30%)	<input type="checkbox"/>
Stay the same	<input type="checkbox"/>
Some increase (1% - 30%)	<input type="checkbox"/>
Major increase (Greater than 30%)	<input type="checkbox"/>
Specific figure	<input type="checkbox"/>

How do you think your capacity to recycle WEEE is likely to change in the next 12 months?

(tick one)

Major decrease (Greater than 30%)	<input type="checkbox"/>
Some decrease (1% - 30%)	<input type="checkbox"/>
Stay the same	<input type="checkbox"/>
Some increase (1% - 30%)	<input type="checkbox"/>
Major increase (Greater than 30%)	<input type="checkbox"/>
Specific figure	<input type="checkbox"/>

Business relationships

If relevant, please give details of the nature of the business relationship you hold with WEEE refurbishers (i.e. collection agreements / proportion or business etc.)?

If relevant, please give details of the nature of the business relationship you hold with Local Authorities (i.e. collection agreements / proportion or business through LA's etc.)?

Other comments

Information provided by:

Name:

Signature:

Position:

Date:

Please return in the Freepost envelope provided, or fax to Lara Meredith on:

020 7926 6201

Many thanks for your participation



Appendix 2 Licencing and ICER Accreditation Scheme

ICER Accreditation

The Industry Council for Electronic Recycling (ICER) has guidelines, a directory and a voluntary accreditation scheme to recognise responsible recyclers and computer refurbishers. The ICER Accreditation Scheme for WEEE Recyclers and Computer Refurbishers recognise companies that operate to the high standards of environmental performance set out in the ICER Code of Best Practice and are overseen by an independent board. Accredited companies are audited annually by independent auditors and are entitled to use the 'ICER Accredited Mark'.

The schemes are voluntary and open to all. They have been devised by recyclers, refurbishers and waste management companies working, through ICER (a cross industry association), with users of recycling services and manufacturers of equipment. The codes of best practice on which the schemes are based will continue to be developed and improved to take account of technological developments.

Why ICER has developed these accreditation schemes:

- To prepare for the WEEE Directive
- To recognise companies which are environmentally responsible
- To raise the profile of the WEEE recycling industry.

What the accreditation scheme for recyclers covers

The accreditation scheme for WEEE recyclers is aimed at all companies which operate recycling processes for waste electrical and electronic equipment. These processes include:

- Dismantling
- Mechanical processing, such as granulating, shredding, fragmenting
- CFC recovery
- Chemical processing (e.g. precious metal)
- Plastics processing
- Cable granulation
- CRT recycling.

The scheme covers all kinds of equipment.

ISO 9000

ISO 9000 a quality management standard that requires business to ensure the following:

Contract Review - ensuring that the customers' needs are correctly identified

Document Control - ensuring that staff are issued with the correct versions of documentation (including software) needed to perform the task; and removing obsolete documents

Purchasing - ensuring identity of preferred suppliers; and a system for advising them of what is expected to be supplied

Training - ensuring that training needs are identified; and records of who has been trained, in which topics

Non-conformance - documenting errors and ensuring that they are corrected

Corrective Action - preventing errors from recurring; processing customer complaints and improving.

It is a system that defines business quality management processes and allows you to manage them through audit.

ISO 14000

ISO 14000 a comprehensive set of standards for environmental management. This series of standards is designed to cover the whole area of environmental issues for organisations in the global marketplace.

The new series of ISO14000 standards are designed to cover:

Environmental management systems
Environmental auditing
Environmental performance evaluation
Environmental labelling
Life-cycle assesment
Environmental aspects in product standards.

EMAS - The European Eco Management & Audit Scheme

EMAS requires an Environmental Policy to be in existence within the organisation, fully supported by senior management, and outlining the policies of the company, not only to the staff but to the general public and other stake-holders. The policy needs to clarify compliance with Environmental Regulations that may affect the organisation and stress a commitment to continuous improvement.

As with ISO9000 the Environmental Management System requires a planned comprehensive periodic audit of the Environmental Management System to ensure that it is effective in operation, is meeting specified goals, and the system continues to perform in accordance with relevant regulations and standards.

Note: If used well, these standards could indicate good service, but some critics argue that this allows organisations to set simple, environmentally meaningless objectives and still receive accreditation.

Waste Carriers Licence

Waste carriers are people who are registered to transport controlled waste by road, rail, air, sea or inland waterways. Waste brokers are people who make arrangements on behalf of others to dispose of waste.

The registration scheme is implemented by the Controlled Waste (Registration of Carriers and Seizure of Vehicles) Regulations 1991. It is the responsibility of the Environment Agency in England and Wales and SEPA in Scotland to maintain registers of carriers and brokers and make them available to the public for inspection.

Waste Management Licence

Waste management licences are issued by the Environment Agency and work to ensure that the authorised activities do not cause pollution of the environment, harm to human health or serious detriment to local amenities. There are two types of waste management licence: a site licence (authorising the deposit, recovery or disposal of controlled waste in or on land), or a mobile plant licence (authorising the recovery or disposal of controlled waste using certain types of mobile plant).

Section 7 References

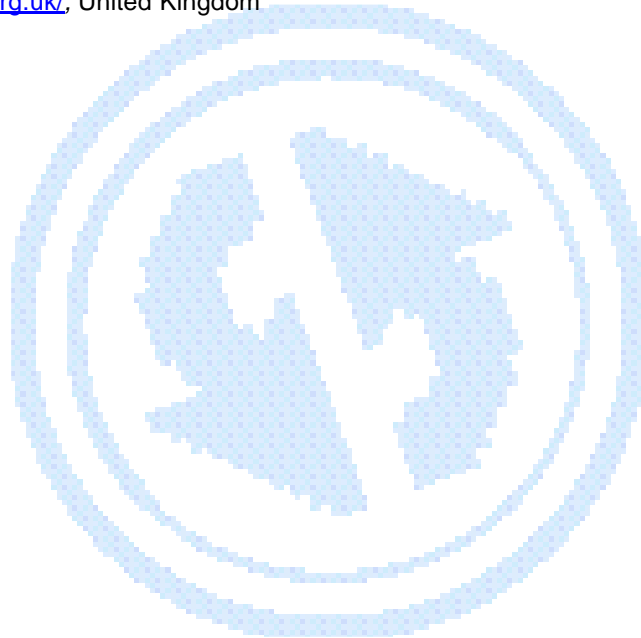
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