



postnote

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ELECTRONIC WASTE

The UK produces around 15% of the EU's total waste electronic and electrical equipment (WEEE). The disposal and low rates of recycling of electronic and electrical appliances, many containing toxic components, may pose an environmental hazard. The UK introduced new legislation in January 2007, to minimise WEEE, to support greater recycling and re-use, and to improve the monitoring of final disposal of materials. This POSTnote outlines the types of WEEE and examines the implementation and potential impacts of the legislation.

Background

Of the UK's total of 300 million tonnes of waste a year, approximately 940,000 tonnes is WEEE from domestic sources.¹ On average, each UK householder disposes of approximately four pieces of WEEE a year. This type of waste is growing three times faster than any other municipal waste stream (see POSTnote 252, Recycling Household Waste for details on other types of waste). The routes for WEEE following disposal are landfill; incineration; reuse; recycling or export (where any of the previous processes may follow).

Volumes of WEEE in the UK

There is no official, central source of data on the amount of WEEE discarded in the UK. The most comprehensive estimates come from research by the Industry Council for Equipment Recycling (ICER), a UK industry membership association. ICER estimated amounts of UK WEEE in 2003 (see Table 1) based on equivalent units sold, assuming that for each one bought, one will be discarded. However, this does not account for the large amount of WEEE thought to enter second-hand markets. There is also a lack of data on projected future volumes of discarded electrical equipment, making it difficult to establish an appropriate system to process the waste.

While large household appliances (like washing machines) make up the largest proportion of WEEE by weight, small household appliances (such as toasters and hi-fis),

alongside IT and telecommunications equipment make up the majority of units discarded.

Table 1. Tonnages and units of WEEE discarded in the UK in 2003

Type	Tonnage discarded (thousands of tonnes)	Units discarded (millions)
Large household appliances	644	14
Consumer equipment	120	12
Small household appliances	80	30
IT & telecomms equipment	68	21
Other	28	17
TOTAL	940	93

source: Industry Council for Electronic Equipment Recycling, 2005

Disposal of WEEE

For some types of WEEE, there are established markets for recycling and/or reuse. For example, some large household appliances ('white goods') such as refrigerators and washing machines are recycled on a large scale due to:

- regulations enforced in 2002 requiring that waste fridges and freezers are processed to remove ozone depleting substances before scrapping;
- their valuable scrap metal content.

For other small consumer items such as small household appliances, power tools or electronic toys, the market for re-use, or for their constituent materials to be recycled in the UK, is not well developed. Also the economic benefits of doing so are limited. This means they enter the domestic waste stream untreated, usually in landfill.

The European Directive for WEEE

The EU introduced new producer responsibility legislation in 2002, an EU Directive for WEEE (2002/96/EC). Under this, producers are responsible for their products at the end of their useful life. Its overarching aim is to minimise the environmental impact of an electronic product's entire life, not just at the point where it becomes waste. It is hoped that placing an end-of-life cost on producers will

act as an incentive for them to design longer-lived products, that use fewer resources and hazardous materials, generate less waste, and are safer and easier to recycle. It outlines mechanisms by which household and commercial WEEE should be classified (Box 1), collected, treated and recorded. Two other recent EU Directives related to electrical and electronic goods include:

- The **Energy Using Products Directive** (2005), due to be implemented in the UK in August 2007. It is not aimed at waste but rather at improving the environmental performance of energy-using products during their entire life, by considering environmental performance at the design stage.
- The **Restriction on the Use of Hazardous Substances Directive** was enforced in the UK in July 2006. It restricts the use of certain hazardous materials that are often used in electrical products, such as lead, mercury and some types of flame retardants.

Box 1. What kind of goods are WEEE?

There is a diverse range of WEEE outlined in the legislation. Many items comprise mixtures of various materials, with different amounts and types of plastic, glass and metals. This makes them more difficult to separate for recycling.

- 'White goods' including small and large household appliances such as refrigerators, washing machines, microwaves and cookers.
- 'Brown goods' such as coffee makers, toasters and irons.
- Information and Communication Technologies (ICT) equipment such as computers, printers and telephones.
- 'Consumer goods' such as TVs, digital TV receiving equipment, video cassette recorders and music players.
- Fluorescent lighting, automatic dispensing machines and control instruments such as thermostats.
- Some medical devices such as dialysis machines and laboratory equipment.
- Miscellaneous consumer electrical equipment including power tools, electronic toys and smoke detectors.

UK Implementation of the WEEE Directive

Transposition of the Directive fell to the Department of Business, Enterprise and Regulatory Reform (DBERR, formerly the Department for Trade and Industry or DTI), while the Department for the Environment, Food and Rural Affairs (Defra) is responsible for licensing WEEE treatment facilities. The Environment Agency (EA) is the enforcement agency in England and Wales, the Scottish Environment Protection Agency in Scotland and the Environment and Heritage Service in Northern Ireland.

The UK must collect a minimum level of WEEE, amounting to 4kg/person/year, and meet several other recovery, recycling, reuse and treatment targets. The legislation requires separation of WEEE from other waste streams, so that hazardous substances can be removed, while increasing recycling rates. WEEE treatment need not take place in the UK provided it is carried out to EU standards and complies with waste export rules.

Europe-wide implementation of the legislation

The WEEE Directive came into force in 2003 and required Member States to transpose provisions into national law

by August 2004. The UK was one of the last EU countries to implement it, leading to the EC beginning infringement proceedings for the delay which could lead to a fine. There are two approaches that can be taken to collect and process WEEE: a single non-competing system (as in Belgium and Sweden) or multiple collection schemes (there are more than 20 operating in Germany).

The UK timetable for WEEE Directive implementation

Delays in implementing the regulations in the UK meant that the Directive came into force on 2 January 2007, two years after the deadline set by the EU.² Producers of WEEE were obliged to join a registered collection scheme called a Producer Compliance Scheme (PCS) by 15 March 2007. Through these PCS schemes, operated by the private sector, producers now pay for WEEE collection, treatment and recycling.

New responsibilities for WEEE management

The legislation affects all those involved in manufacturing, selling, distributing, recycling, exporting or treating electrical and electronic equipment, as well as end-users. The main obligations are on producers and retailers who can be fined for non-compliance. The legislation does not apply to new products only. Producers are also responsible for goods manufactured before August 2005, "historic (*sic*) WEEE". This date was that set by the EU for member states to have established WEEE collection facilities. The funding for processing historical WEEE will be based on producers' market share.

Producers (manufacturers, brand owners or importers)

The cost to producers for financing WEEE collection and treatment is based on their market share of new products (the more they produce the more they will pay). In practice producers must be registered with an approved PCS (of which there are 37 in the UK) who will operate schemes on their behalf (overseen by the Environment Agency and their devolved partners) and to:

- report quarterly on UK sales of EEE, including total weights for each category of WEEE;
- maintain records and make them available for six years;
- mark new products with a producer identifier and a crossed out wheellie bin symbol.

Retailers and distributors

Retailers and distributors of electronic equipment have two choices. They can provide a free in store take-back scheme for customers and then forward WEEE for approved processing or disposal. The second option is to join an approved 'Distributor Take Back Scheme'. Contributions to the scheme go towards a national network of Designated Collection Facilities (DCFs). A compliance consultancy (Valpak) operates this scheme. Costs to large retailers are also based on market share of EEE, while smaller retailers pay a fixed fee based on their EEE turnover.

Local authorities

Local Authorities' (LAs) waste collection and processing sites are the primary locus of the collection facilities for WEEE. Under the new scheme LAs are registered as one

of the network of DCFs, which consumers can also use to dispose of WEEE directly. Money raised from retailers (£~10 million) is available to waste collection sites who have opted to become DCFs, to upgrade their WEEE collection infrastructure to meet the new obligations.

Waste processing sector

Waste companies must register processing facilities to become Authorised Treatment Facilities (ATFs) or Approved Exporters (AEs) for WEEE. They must be licensed by the Environment Agency and collect WEEE from civic amenity sites for processing. As well as the commercial sector, a UK-wide social reuse network exists for goods including WEEE. There are few official data on the percentage of WEEE that enters the reuse network, facilitated by the market for second-hand goods or charitable donations. The Furniture Reuse Network is an umbrella body for several community projects that collect and refurbish or recycle unwanted goods and sell them to low-income households (see Box 2). It has published guidelines for reuse of WEEE, given the safety implications of second-hand electrical goods.⁴

Box 2. WEEE collection and reuse schemes

There are several existing schemes in the charitable sector to encourage the collection, reuse and recycling of WEEE.

Furniture Reuse Network

The FRN is a national umbrella body, established to provide low cost, second-hand furniture which would otherwise be discarded. The charitable re-use sector is estimated to divert 85,000 tonnes of mixed waste from landfill every year. It is also reusing WEEE, with an estimated 250,000 electrical items made fit for reuse annually. It recently announced a collaboration with the Recycling Electrical Producers' Industry Consortium (REPIC), a not-for-profit organisation, to operate a national, low-cost take-back scheme for retailers.

Network Worcestershire Appliance Re-use Centre

This charitable social enterprise is typical of similar UK community schemes. The scheme collects WEEE, predominantly white goods, donated by the public and via product takeback schemes via small local retailers. Electrical items are assessed for potential re-use, and if suitable, refurbished and sold 'as new' at low cost to the community. Approximately 30% of the goods collected can be re-used; most of these are white or brown goods. In addition, valuable materials such as precious metals (e.g. copper wire and stainless steel) can be recovered and re-used.

Oxfam's 'Bring Bring' Scheme and Fonebak

There are several charitable mobile phone recycling schemes. Oxfam and Fonebak collect unwanted mobile phones and process them for reuse or recycling. Refurbished handsets are sold to developing countries at low-cost while phones that are not refurbished are processed for recycling.

Consumers

The Directive does not place any obligations on consumers to recycle their WEEE. The increase in choice and affordability of consumer electronics is partly responsible for the increasing amount of WEEE in domestic waste. Consumers often renew items that are not faulty or buy multiple versions of the same item. The Fonebak mobile phone collection scheme (Box 2) estimates that 15 million handsets are replaced annually in the UK. The average

lifetime of a phone is seven years but most handsets collected are less than two years old.

Issues

There was broad consensus that legislation should pass responsibility for disposal of WEEE to the producers. However several aspects of the Directive's UK implementation have been criticised, including inadequate planning for operational aspects of the scheme and the lack of incentives for manufacturers to redesign products.

Operational implementation of the legislation

Despite a four-year consultation period by DBERR (DTI) with stakeholders on the Directive's implementation, some groups, including the waste services sector, feel that insufficient attention was given to practical aspects of the scheme. The DBERR points out that consultation was open to all stakeholders for this purpose.

UK collection and processing facilities

Although WEEE is classified into ten categories under the Directive, it is generally collected in five classes: large household appliances (except fridges); fridges; TVs and monitors; gas discharge lamps (such as fluorescent lights); and all other WEEE. A Code of Practice gives guidelines on best practice for how DCFs should facilitate these arrangements.

The lack of central data on projected volumes of WEEE in the waste stream means that LAs and the waste processing sector have been uncertain about the tonnages of material requiring collection and processing. This, alongside the delays in implementing the Directive meant that the waste management sector was reluctant to invest in the necessary resources. While compliance schemes must report WEEE volumes collected, critics argue that without a centralised database in place to enable this it will be difficult to assess whether obligations have been met. The DBERR appointed a private company to act as the 'WEEE Settlement Centre'. This body will administrate the records of WEEE recycling evidence to ensure that producers are meeting their obligations and allow PCSs to trade allowances with other schemes. It is expected that it will be operational by September 2007.

Designated Collection Facilities

The Local Authority Recycling Advisory Committee (LARAC) welcomed the implementation of the regulations but is concerned that the public sector will continue to pay the majority of costs for the collection infrastructure. Despite the fact that retailers estimated the costs of in-store take-back at £200-500 million, only £10 million was invested in civic amenity waste sites. LARAC view this as a lost opportunity for investment in the UK's recycling infrastructure. LARAC are concerned about local authorities' ability to provide adequate storage capacity on sites, since they will need to manage five different categories of WEEE. LAs have also asked for clear obligations relating to the frequency and timing of collection of WEEE on a site-by-site basis with the designated compliance scheme(s). The countries already operating multiple schemes like those proposed in the UK,

have encountered logistics problems and received criticism for unnecessary environmental impacts from transporting WEEE from collection points to processing facilities.

Business to business compliance

Some in the waste processing sector have commented that the government paid too little attention to compliance schemes that will operate for WEEE passing from business to business (mostly IT and industrial equipment) compared with the consumer market. The main criticisms are that:

- No government-led UK system was proposed.
- Obligations can be passed down the supply chain.

One of the UK's 'business-to-business' Producer Compliance Schemes, B2B Compliance, comments that many companies may be leaving their decision to prepare for WEEE very late or not be aware of the new obligations. The EA estimates that 3200 producers are registered with a compliance scheme, but does not know how many remain unregistered.

Environmental impacts

Greenpeace are concerned about illegal shipping of hazardous waste (including WEEE) from the EU to developing countries, where environmental standards may be lower. The control of waste shipments is the EA's responsibility. It licenses waste exporters and monitors legal shipments of materials recovered from WEEE for reuse or recycling abroad.

Individual producer responsibility

Environmental groups including Greenpeace, Friends of the Earth and the Green Alliance comment that individual rather than collective producer responsibility legislation would have a more positive impact on managing WEEE. The UK legislation gives producers collective responsibility for WEEE. They argue that this has watered down the original intention of the Directive and may penalise environmentally responsible producers.

Sustainable product design

An aim of the Directive was to stimulate "sustainable design". This describes products designed to have greater longevity, that are easy to refurbish for reuse, or to disassemble or recycle, without affecting product performance. Envirowise, a government-funded programme, provides advice to businesses on reducing their environmental impact by examining product design and the manufacturing process. They point out that changes made to the design of products often give the greatest benefits, both environmentally and economically.

Environmental groups also comment that waste management targets set by weight (rather than by volume for example) are not always the most appropriate measure and are not conducive to the best environmental outcomes. They also argue that legislation should take account of the environmental impact of a product's entire life. This approach is at the centre of the Energy Using Products Directive. Environmental groups feel that this legislation may be a stronger driver for change in the design of electronic goods than the WEEE Directive.

Experts agree that, while legislative change may stimulate sustainable product design and innovation, other important drivers include consumer preferences and requirements, as well as economic factors. Research by Biffaward (a Landfill Communities Fund scheme) and the Green Alliance shows that few resources are recycled or reused, with most staying in the economy for less than six months before being discarded to landfill.^{5,6} They suggest that policies do not adequately address the problem of an 'extract-consume-discard' economy and that waste should be viewed as a resource.

Consumer awareness

The WEEE Directive enforces new labelling of equipment with a symbol of a crossed-out wheellie bin to indicate that the goods should not be discarded alongside municipal waste. Apart from this, there has been no other specific exercise in making the public aware of the changes to the way in which WEEE will be handled by either local retailers, or local authority waste facilities. The DBERR and the EA are running a series of awareness events in 2007, but these are aimed at improving compliance by businesses rather than informing householders. Greenpeace is trying to raise awareness among consumers about the use of hazardous chemicals in electronic goods.

Overview

- The UK has implemented new European legislation to manage WEEE, which requires action from equipment producers, retailers, the waste management sector and end-users of electrical and electronic goods.
- The delays in implementing the practical elements of the legislation in the UK mean that many WEEE producers are unaware of their new obligations.
- Some environmental groups regard the UK's implementation of the WEEE Directive as a missed opportunity to improve the design of electronic goods.
- Environmental groups are calling for policies to address the "extract-consume-discard" cycle, and argue that waste should be viewed as a resource.

Endnotes

- 1 *Status Report on Waste Electrical and Electronic Equipment*, January 2005, Industry Council for Electronic Equipment Recycling, www.icer.org.uk/
- 2 *WEEE Consultation Response*, December 2006, URN 06/2196, <http://www.berr.gov.uk/>
- 3 *Civic Amenity Site WEEE Capacity in the UK: An Assessment of the Capacity of Civic Amenity Sites in the UK to Separately Collect WEEE*, September 2003, Network Recycling and Furniture Recycling Network, www.defra.gov.uk/
- 4 *Fit for Reuse*, Furniture Reuse Network, www.frn.org.uk/
- 5 *The Mass Balance Movement*, Biffaward, February 2006
- 6 *A Zero Waste UK*, Institute for Public Policy Research and Green Alliance, October 2006, www.green-alliance.org.uk/

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