

Environmental RTDI Programme 2000–2006

**Waste Electrical and Electronic Equipment
(WEEE) Collection Trials in Ireland
(2001-WM/MS1-M1)**

Synthesis Report

Prepared for the Environmental Protection Agency

by

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Executive Summary

The European Directive on Waste from Electrical and Electronic Equipment (WEEE)¹ entered into force on 13 February 2003. By 13 August 2005, Ireland must have a system in place for the collection of all types of WEEE free of charge from private households. By the end of 2006 (or 2008 if an optional derogation is taken), a collection rate of 4 kg/inhabitant/year must be achieved. This equates to 15,200 tonnes of WEEE being collected from Irish householders every year. This project follows two previous studies by the authors on the calculation of theoretical WEEE arisings, and an assessment of ecodesign practices in Ireland (Wilkinson *et al.*, 2001, 2002). The project has established collection trials in five different locations throughout Ireland in order to characterise and quantify WEEE arisings, and to examine outlets for collected WEEE.

National collection systems are currently in place in six countries in mainland Europe. Current results from these take-back systems vary from 4.7 to 9.4 kg of WEEE collected per inhabitant per year. This means that all national collection systems currently in place in Europe exceed the target of 4 kg/person/year set by the EU WEEE Directive. These national WEEE collection systems are operating at cost levels of between €350 and €500 per tonne of WEEE collected and processed. Based on these costs, it is estimated that meeting the 4 kg/person/year target of the WEEE Directive would cost Ireland between €5.5 million and €7.8 million per year to operate a national collection system.

Overall, during the 12 months of collection at the project locations, more than 450 tonnes of WEEE were collected from the public and recycled. **Within the catchments of each facility**, collection rates of between 2.1 and 3.5 kg/person/year were achieved during the 12-month trial

period. With the raising of further public awareness and the removal of recycling fees this suggests that, **on a local basis, the 4 kg/person/year target of the Directive is achievable**. It was shown that removal of a disposal fee resulted in a significant increase in collection rate, possibly due to a “clear-out” effect. Raising existing fees was shown to reduce the collection rate, though with some recovery after a period of time. A one-day collection event in Kildare was very effective in collecting WEEE, and in achieving a higher than normal proportion of information and communications technology (ICT) and small brown goods collection. However, **on a national basis, the target becomes more problematic**. There is a need to increase the access to the existing civic amenity sites, to expand the number of amenity sites, to trial alternative collection routes such as kerbside collection and one-day events, and particularly to integrate retail take-back, to enhance an underdeveloped collection infrastructure. The recycling and refurbishment infrastructure is also underdeveloped, with a need to expand facilities and to adapt existing practices to satisfy the pre-treatment requirements of the Directive, and to develop refurbishment and reuse systems, probably via social economy enterprises. It is likely that the current reliance on the export of recovered materials and of equipment for specialised recycling will continue.

Experiences from these collection trials have been used to establish best-practice guidelines for the collection and monitoring of WEEE by local authorities. Based on the findings of this project and a review of current European practices, a set of 38 recommendations can be made. These are variously applicable to local authorities, retailers, recyclers, treatment facilities, refurbishers, manufacturers, importers, Government departments, agencies and representative organisations. These will assist in the development of WEEE management and in the implementation of the WEEE Directive in Ireland.

1. CEC (Commission of the European Communities), 2003. *Directive 2002/96/EC on Waste Electrical and Electronic Equipment (WEEE)*. Official Journal L 037. Vol. 46, 13 February 2003, pp. 24–39.

1 Introduction

Waste from electrical and electronic equipment (WEEE) has become an increasingly important waste stream in Ireland and worldwide. In a post-industrial era, electrical and electronic equipment has permeated almost every aspect of our lives. Consider the number of items within an average Irish household requiring electricity or batteries to operate. At the end of their useful life every one of these products becomes waste, forming the complex mix of equipment and materials that makes up the EEE waste stream.

In Ireland, as with the rest of the western world, there has been a remarkable rise in the consumption of electrical and electronic equipment (Fig. 1.1). With increasing affluence and increasingly hectic lives, people have sought more convenient ways to undertake household tasks. The ownership of items such as microwaves, dishwashers and clothes dryers has risen dramatically

over the last 10–15 years. New technology has become, and continues to become, available, changing the way that we work and the way that we play. Items such as computers, televisions, videos and stereos have become more commonplace in Irish society.

The increased consumption of electrical and electronic equipment, together with a decrease in the average lifespan of products, has resulted in a growing waste stream. A 2001 EPA study (Wilkinson *et al.*, 2001) predicted that in 2003 up to 102,028 tonnes of WEEE would arise in Ireland, representing approximately 3.5% of all household waste arisings. This growth, together with the presence of several hazardous substances (e.g. lead, mercury, brominated flame retardants) in many products, has led to the development of European legislation on WEEE.

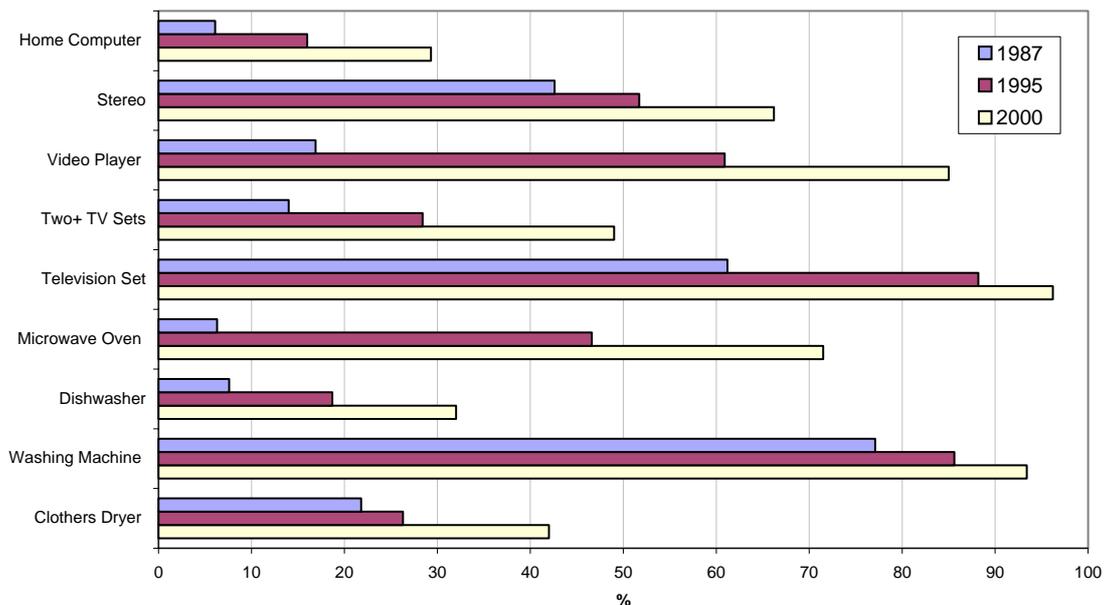


Figure 1.1. Comparison of Irish household facilities 1987, 1995 and 2000 (CSO, 2003).

2 Project Background

The European Directive on Waste from Electrical and Electronic Equipment (WEEE) entered into force on 13 February 2003 (CEC, 2003a). By 13 August 2005, Ireland must have a system in place for the collection of all types of WEEE free of charge from private households. By the end of 2006 (or 2008 if an optional derogation is taken), a collection rate of 4 kg/inhabitant/year must be achieved. This equates to 15,200 tonnes of WEEE being collected from Irish householders every year.

There is a relatively underdeveloped WEEE collection infrastructure and it is therefore imperative that models for the collection of WEEE are developed in order to establish a background within which a nationwide system can be developed. This project, run over a 12-month period, established collection trials in five different locations throughout Ireland in order to characterise and

quantify WEEE arisings, and to examine outlets for collected WEEE. It has also assessed current WEEE management practices amongst local authorities and private-sector recycling companies.

The project follows two previous studies by the authors on the calculation of theoretical WEEE arisings, and an assessment of ecodesign practices in Ireland (Wilkinson *et al.*, 2001, 2002).

This is the first time that data have been gathered and analysed on actual WEEE collection, and the project has provided the only source of information in Ireland on domestic and international WEEE management practices. The project provides valuable background information for all parties involved in developing Irish legislation to implement the measures contained in the WEEE Directive.

3 European WEEE Collection Systems

There are systems currently in place in six countries in Europe for the collection of WEEE from private households, with a seventh in Austria presently confined to the collection of refrigerators. Most countries have formed two parallel systems, one for information technology and communications equipment and the other for all other items. These systems have largely been established by manufacturer associations in response to national WEEE legislation. In all cases, existing local authority waste management infrastructure has been used as the primary route for collecting WEEE from consumers (Fig. 3.1). Free retail take-back, usually on an old-for-new basis, is also an important collection route in most of the systems, and forms a significant portion of the

WEEE collected in Norway and Switzerland.

Current results from the national take-back systems vary from 4.7 to 9.4 kg of WEEE collected per inhabitant per year (Table 3.1). This means that all national collection systems currently in place in Europe exceed the target of 4 kg/person/year set by the EU WEEE Directive. These national WEEE collection systems are operating at cost levels of between €350 and €500 per tonne of WEEE collected and processed. Based on these costs, it is estimated that meeting the 4 kg/person/year target of the WEEE Directive would cost Ireland between €5.5 million and €7.8 million per year to operate a national collection system.

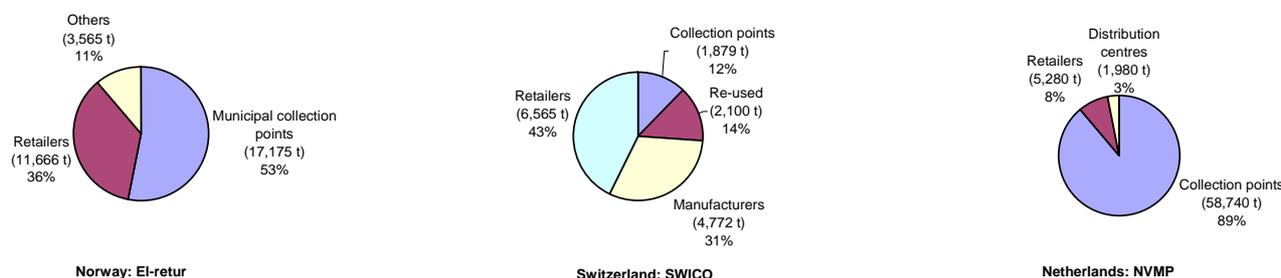


Figure 3.1. Comparison of collection routes for Norway, Switzerland and Netherlands WEEE collection systems.

Table 3.1. Comparison of results from European WEEE collection systems, using publicly available data.

Country	System	Quantity ^a	
		tonnes	kg/inhabitant/year
Sweden	El-Kretsen	64,000	7.27
	Refrigerators	18,650	2.1
	Combined	82,650	9.4
Netherlands	NVMP	66,000	4.13
	ICT Milieu	8,500	0.53
	Combined	74,500	4.7
Switzerland	SWICO	15,316	1.96
	SENS	38,100	5.32
	Combined	53,416	7.3
Norway ^b	El-retur	32,446	7.2
	EuroVironment	3,250	0.7
	Combined	35,696	7.9

^aQuantity in most recent year available.

^bDoes not include refrigerators/freezers containing CFCs.

4 Local Authority WEEE Management in Ireland

There is a relatively poor WEEE collection infrastructure, with only 45 local authority collection facilities available throughout the country (Figs 4.1 and 4.2), and only 19 of these collect **all** types of WEEE. Three counties and one city have no permanent facility for collecting household WEEE for recycling. The problem is particularly acute in Dublin, where just four

civic amenity sites currently serve 1 million inhabitants. Dublin will be important in achieving the WEEE Directive collection target on a national basis. Its high density and relatively affluent population has the potential to be a large source of WEEE. It is therefore imperative that access to existing facilities be extended, that further collection facilities be established, or that

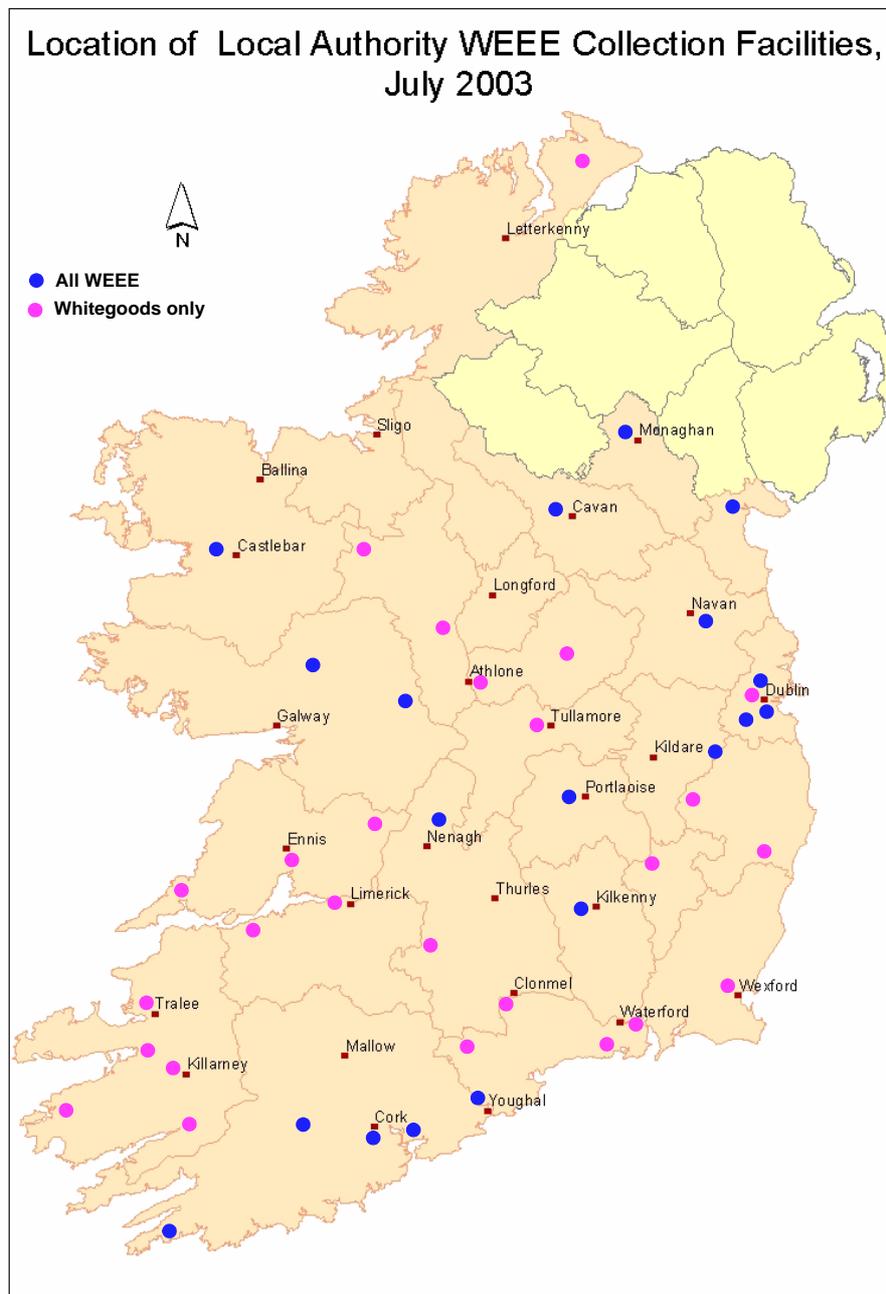


Figure 4.1. Location of Local Authority WEEE Collection Facilities, July 2003.



Figure 4.2. Some WEEE collection facilities exist in Ireland, for example Navan civic amenity site: (a) brown goods and consumer electronics bins; (b) example of equipment received; (c) shipping container for fridge/freezers; and (d) skip for white goods (April, 2002).

alternatives such as kerbside collection or on-demand collection be set up in the local authority areas of Dublin.

In addition to the lack of permanent facilities, no bulky waste collection systems exist and annual ‘spring-clean’ weeks have almost all stopped collecting WEEE, due to increasing costs of treating equipment such as refrigerators.

Where collection facilities do exist, there are poor and inconsistent records of collected equipment preventing an accurate assessment of current collection rates. This highlights the need for a standardised national monitoring method to be developed.

A further 35 civic amenity sites are being constructed or are in the planning stage. This means that by the time a national collection system must be in place by August

2005, there may be up to 79 facilities for collecting WEEE from private households in the Republic of Ireland.

A comparison with facilities in other countries, as shown in Table 4.1, illustrates the lack of public recycling infrastructure in Ireland. While a comparison by population or land area alone is overly simplistic, this analysis does give an indication of the challenge that Ireland will face in meeting the collection target of the WEEE Directive, particularly in the sparsely populated, rural areas of the country. In the Netherlands, a country approximately the same size as Munster, more than 600 local authority civic amenity sites serve 16 million people. This large number of collection facilities, together with retail take-back in such a small, densely populated area, is only achieving a national collection rate of 4.7 kg/person/year.

Table 4.1. Comparison of local authority WEEE collection facilities.

Country	Population	Local Authority Collection Facilities	Ratio (facilities/person)	Ratio (facilities/km²)
The Netherlands	16.0 M	600	1:27,000	1:57
Sweden	8.8 M	600	1:15,000	1:685
Norway	4.5 M	400	1:11,000	1:770
Ireland	3.9 M	45	1:87,000	1:1,500
Ireland (future)	4.0 M	79	1:51,000	1:873

5 Recycling of WEEE in Ireland

There is also a relatively underdeveloped WEEE recycling infrastructure in Ireland and Northern Ireland. The small population and island nature of the country are factors that have limited the development of markets and outlets for materials from recovered WEEE, and this has restricted the country's recycling industry.

There are currently 46 recyclers that handle some or all types of WEEE in Ireland and Northern Ireland. The market is becoming increasingly dominated by companies that simply act as waste brokers, facilitating the collection and export of equipment to Europe for reprocessing. A number of companies disassemble collected equipment in order to segregate, or 'cherry-pick', valuable components and materials, which are exported for further processing and recycling. One company specialises in dismantling fluorescent lamps. In

addition to this, there is a well-established scrap metal recycling industry that processes white goods (excluding refrigerators and freezers) by cutting or shredding. A number of companies are examining the potential to install equipment for the processing of cathode ray tubes (CRTs).

The methods currently used for recycling WEEE in Ireland are likely to be impacted upon by the pre-treatment conditions of the WEEE Directive which require that certain components and materials be removed from items of equipment for selective treatment. These measures are likely to particularly impact on the metal shredding industry, which currently undertakes minimal removal of components prior to mechanical shredding.

6 Outlets for Recycled WEEE

The WEEE Directive requires that priority be given to the reuse of equipment. A very small number of companies in Ireland refurbish items of WEEE for resale and reuse, and those that do are currently operating on a small scale. Refurbishment is surprisingly underdeveloped when compared to other countries in Europe. In the UK, for example, a number of examples exist of direct links between local authority WEEE collection systems and refurbishment organisations. In some cases, up to 30% of white goods collected through the household bulky waste system is being refurbished and resold (Fig. 6.1).

Refurbishment elsewhere in Europe is often undertaken by social economy enterprises and this has the potential to provide a triple benefit: (i) the removal of items from the waste stream, (ii) a reduction in overall collection costs, and (iii) opportunities for social benefits through training and employment. One organisation, RREUSE (Re-use and Recycling European Union of Social Enterprises), estimates that the social sector accounts for 10,000 jobs processing 200,000 tonnes of WEEE in Europe. Much of this is in the refurbishment of equipment.

If Ireland meets the WEEE Directive target of 4 kg/inhabitant/year, this will mean that 15,200 tonnes of equipment will be made available for recycling each year. Recycling this WEEE would result in over 7,000 tonnes of ferrous metals, more than 3,000 tonnes of mixed plastics, and over 800 tonnes of glass (mostly leaded).

All materials, bar small quantities of mixed plastics, are currently exported for reprocessing, increasing the costs of recycling in Ireland. The most problematic materials from recycled WEEE are glass from CRTs and mixed plastics. Outlets for these materials recovered from WEEE are limited because of uncertainties over their chemical composition, contamination with other substances, and low demand for recycled material by manufacturers of new products. While the small population and island nature of Ireland will continue to restrict recycling outlets, and maintain reliance upon the export of equipment for specialised recycling, there is still a need to enhance recycling outlets in Ireland in order to create a more economically and environmentally sustainable domestic WEEE recycling industry.



Figure 6.1. Washing machines being tested and refurbished at CREATE, Liverpool.

7 Collection Trial Results

WEEE collection facilities were successfully established in partnership with County Councils at five different civic amenity sites around Ireland:

1. Kilcullen, County Kildare
2. Derrinnumera, County Mayo
3. Macroom, County Cork (Fig. 7.1)
4. Raffeen, County Cork
5. Youghal, County Cork

In addition to these collection sites, Kildare County Council also ran a one-day collection event in three towns within the county.

Overall, during the 12 months of collection, more than 450 tonnes of WEEE were collected from the public and recycled.

Experiences from these collection trials have been used to establish best-practice guidelines for the collection and monitoring of WEEE by local authorities and are available from the WEEE section of the Clean Technology Centre website at www.ctc-cork.ie/weee and in the main report for the project.

7.1 Composition of Collected WEEE

A high proportion of the WEEE collected (80% by weight, overall (Fig. 7.2a)) fell into the category of ‘large

household appliances’, which is mostly comprised of white goods such as washing machines, refrigerators and cookers. Large household appliances also represented over 50% of the number of items received at the five civic amenity sites participating in the trials (Fig. 7.2b).

There are several reasons for the dominance of this category of equipment in the collection trials. White goods are the more traditionally collected items of electrical equipment for which recycling has been in place for a considerable period in most locations. They are also the largest items of WEEE, making them harder to store in households and impossible to dispose of with normal household waste. They are also the heaviest items of WEEE and therefore dominate an analysis of composition by weight.

The next largest category of equipment (12.5% by weight) was ‘consumer equipment’, which was composed largely of television sets. As with white goods, televisions are difficult to dispose of with normal household waste and are banned from landfills, forcing people to find a recycling facility when disposing of them.

7.2 Low Levels of Small Items

Smaller items of equipment were collected in remarkably small quantities. The combined categories of small



Figure 7.1. Macroom Civic Amenity Site, County Cork.

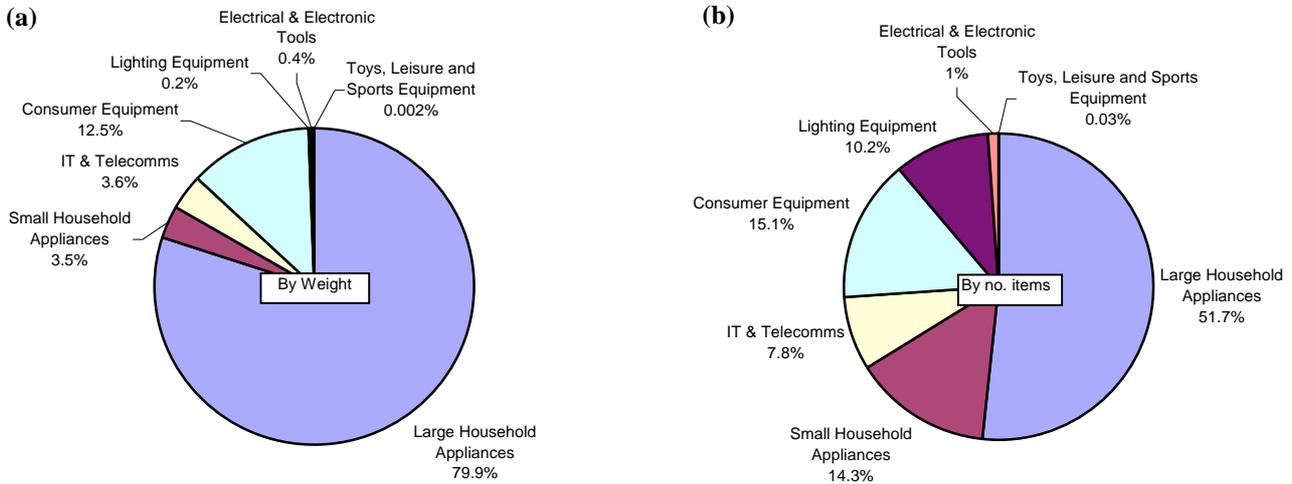


Figure 7.2. Overall composition of WEEE (a) by weight and (b) by number of items from the five collection sites.

household appliances, tools and toys, account for just 4% of equipment by weight. Even when analysed by number of items, they only account for less than 15% of all WEEE collected. Considering the range of items that fall under these categories, their relatively short lifespan, and the prevalence of such items in modern households, the number collected is low. Possible reasons are that such items are often not considered recyclable by the general public and are frequently disposed of with the general household waste, or individual disposal fees may be considered disproportionate. There is a need for general awareness-raising regarding the potential to recycle such items along with the more customary household recyclables.

7.3 One-Day Collection Event Yields a Different Mix of Equipment

Overall, a relatively small quantity of equipment (4% by weight and 8% by number) in the category information and communications technology (ICT) was collected at civic amenity sites. This category includes computers, monitors and their peripherals.

In contrast to this, a much larger quantity of such equipment was collected during the Kildare County Council one-day WEEE collection event. In the entire duration of the trial at the Kilcullen civic amenity site, just over 160 tonnes of WEEE were collected, of which ICT equipment represented 7.5%. During this collection event in three Kildare towns, more than 70 tonnes of mixed WEEE was collected in 1 day. ICT equipment

accounted for over 15.6 tonnes, or 22%, of this WEEE. More ICT equipment (by weight) was collected during the one-day event than in the entire 12 months of the collection trial at the Kildare County Council civic amenity site.

The dramatic increase in quantities of ICT equipment collected is most likely due to a lack of awareness regarding the ability to recycle this type of equipment at the Council’s civic amenity site. In addition to this, there is a perceived value in old items of ICT equipment and many items remain stored in anticipation of possible future use. It is only when presented with the opportunity to clear out such equipment, such as a one-day collection event, that people make the effort to do so. The use of well-promoted, one-off, collection events is therefore a valuable method of encouraging people to recycle items of equipment, such as ICT, that they would normally store and hold onto for longer periods of time. This method, used in conjunction with ongoing, permanent collection facilities, would increase the quantity of WEEE being collected. It also provides an opportunity to reach areas of the country without collection facilities.

7.4 The Impact of Increasing Fees

Previous international WEEE collection trials have found that charging disposal fees is likely to reduce the quantity of WEEE collected, unless the fees are ‘reasonable’. Research in Europe suggests that charging on a sliding scale of between €5 and €12 per item is considered reasonable.

All of the Irish collection trial sites charged a fee to customers when they were disposing of an item of WEEE. In January and February of 2003, midway through the collection trials, three sites increased their fees. Two of these three sites increased fees substantially (more than 400% for some items), while the third site increased fees by 33%. As can be seen in Table 7.1 below, one of the two sites with substantial increases in fees (Macroom) experienced a sudden decrease in the levels of equipment being collected (Fig. 7.3). This indicates an extreme negative reaction to the fee rise. However, the other site with a significant fee rise (Youghal) only experienced a 14% decrease in average monthly quantities (though from a lower collection rate).

The difference may be explained by the short period prior to the fee rise that Macroom had been open, which meant that the fee rise coincided with the end of a ‘clear-out’ period in the catchment of the facility. The results from

all three sites do, however, indicate that increased levels of charging will result in a reduction in public recycling.

This finding is in line with those of WEEE collection trials conducted elsewhere. Austrian collection trials, for example, found that a high charge on an item of equipment resulted in a low collection rate when compared with a collection system with no charge. The Austrian studies, however, also found that when charging a comparatively small fee, collection rates are not greatly affected. Similarly, when Cork County Council imposed a considerable increase in fees for the disposal of WEEE, the level of collection dropped significantly (see Fig. 7.3). Likewise, when Kildare County Council imposed a lesser fee increase, the level of collection dropped, but not as significantly.

In most cases, an increase in fees resulted in an immediate drop in quantities of WEEE received. However, after a period of time the level of collection

Table 7.1. The influence of fees on quantity of WEEE collected.

	Average monthly WEEE collection (tonnes)		
	Before fee rise	After fee rise	% Change
Macroom	7.29	4.21	↓42%
Youghal	4.47	3.86	↓14%
Kildare	20.1	17.9	↓11%

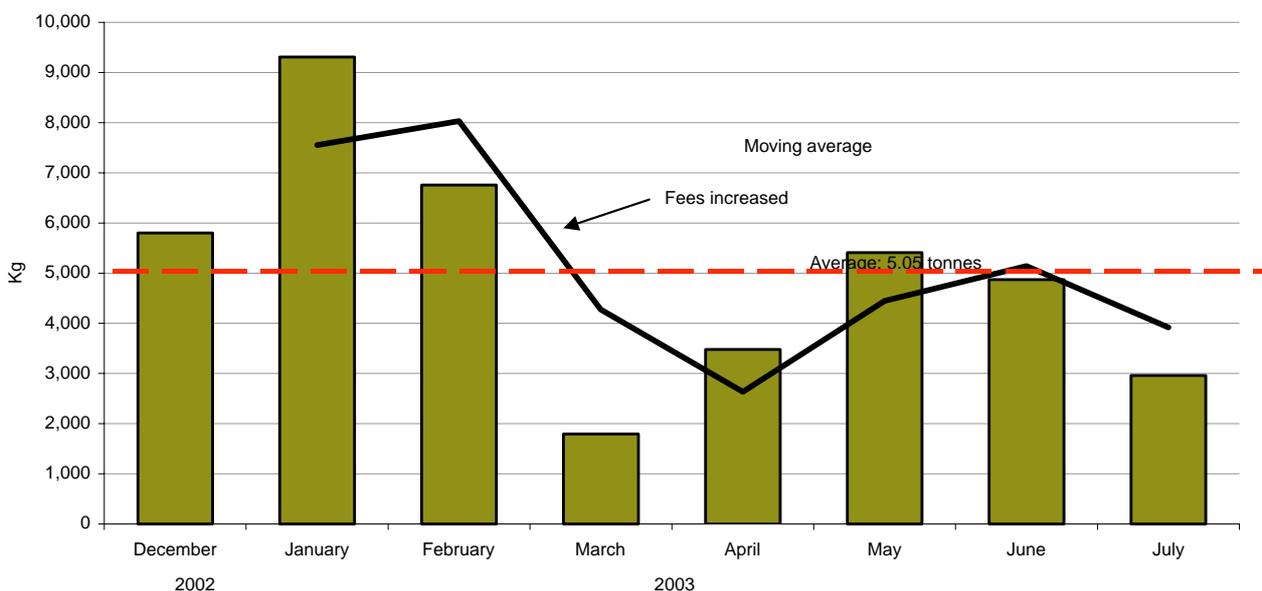


Figure 7.3. Temporal analysis of WEEE collected at Macroom civic amenity site.

returned close to that experienced prior to the fee increase. This is evidence of a ‘knee-jerk’ reaction to fee increases, which results in an immediate reduction in participation but an eventual acceptance of fee levels.

7.5 The Impact of Removing Fees

Fees for WEEE were temporarily removed at Derrinnumera civic amenity site. This resulted in a very significant increase in the quantity of WEEE being received at the site (Table 7.2, Fig. 7.4). This rise in quantities is partially explained by a ‘clear-out’ factor, because people were aware that the free disposal was only temporary and therefore made an effort to recycle during this time.

Taking this into consideration, however, the results imply that local authorities currently charging for items of WEEE will experience an increase in the quantity of equipment they have to deal with once free collection becomes obligatory nationwide. The sudden removal of fees may result in a short-term collection rate that could overwhelm the available local infrastructure.

The removal of fees at Derrinnumera also resulted in a change to the composition of the WEEE being disposed of (Fig. 7.5). A larger quantity of small items was received once fees were removed. This is an indication that people are less willing to pay for the recycling of

Table 7.2. The influence of fees on quantity of WEEE collected at Derrinnumera.

Average monthly WEEE collection at Derrinnumera (tonnes)		
Before fee removal	After fee removal	% Change
5.88 tonnes	23.01 tonnes	↑390%

small items, when they can more easily dispose of them with the household rubbish. Given the potential to recycle such items free-of-charge, people are willing to do so. This is an encouraging sign for the improved recycling of small items once fees are removed on a nationwide basis.

7.6 Site Opening Hours

An analysis of levels of participation at two civic amenity sites revealed that more items are collected on a Saturday than on any other day of the week. This is most obviously due to an increased opportunity for householders to make use of recycling facilities outside of working hours.

Given that many civic amenity sites only open for a half day on Saturdays and most are not open in the evenings, collection of WEEE and other household recyclables could be improved by the extension of opening hours at these facilities to take into consideration the needs of the public.

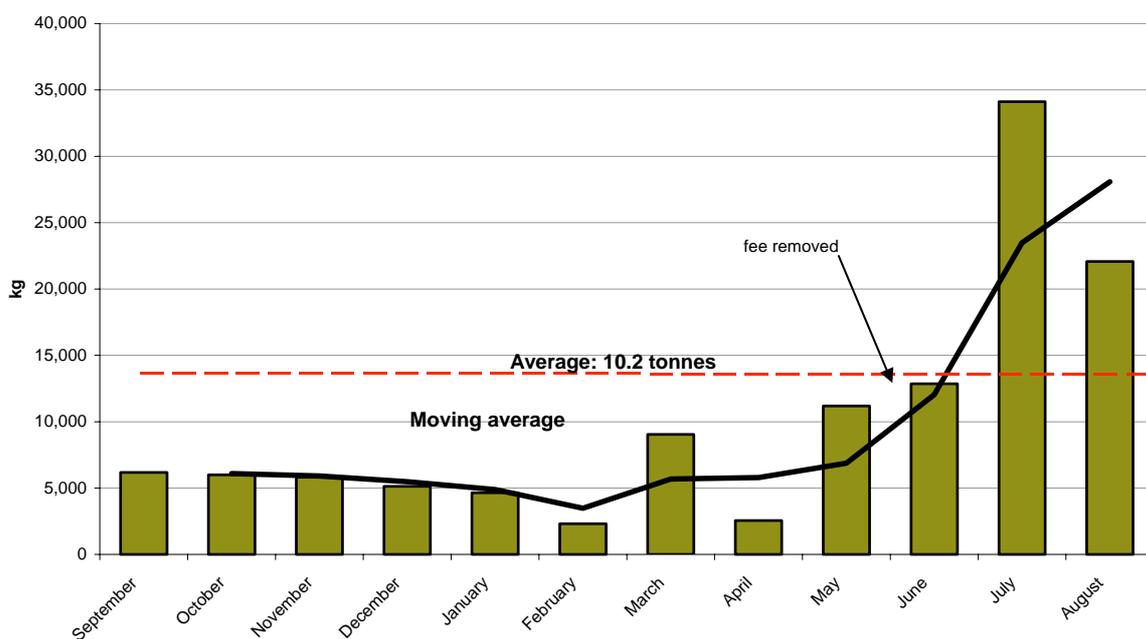


Figure 7.4. Temporal analysis of WEEE collected at Derrinnumera.

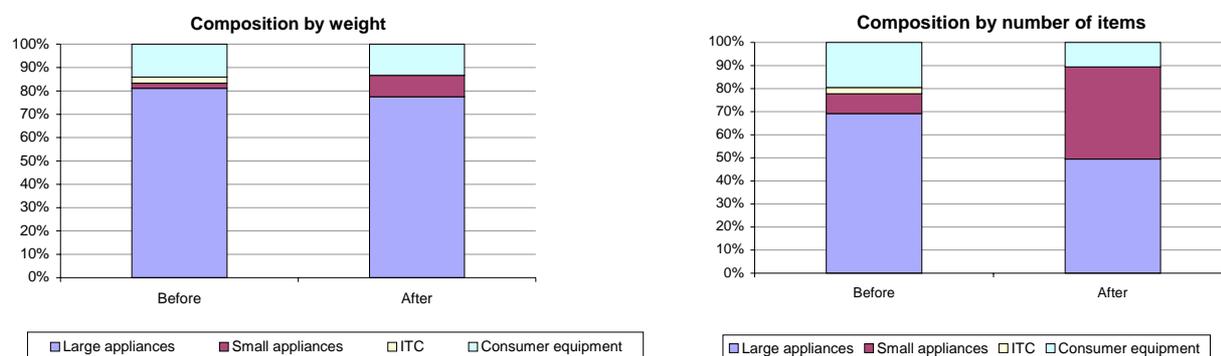


Figure 7.5. Compositional analysis of WEEE received at Derrinnumera civic amenity site, before and after charges were removed.

7.7 WEEE Collection Rates

In order to provide a comparison with the requirements of the WEEE Directive, an annual per person collection rate was calculated. This was based on an estimated local geographical catchment within which the potential population using the sites resides. This method is limited when assessing the potential of Ireland as a whole to achieve the 4 kg/inhabitant/year collection target, but does provide useful information on a site-specific level.

The five collection sites have achieved collection rates of between 2.1 and 3.5 kg/inhabitant/year, based on their estimated population catchments (Table 7.3). Youghal in County Cork, which is located in a rural town, experienced the lowest collection rate of 2.13 kg/person/year. Similarly, Derrinnumera, County Mayo, another highly rural location, had experienced the lowest collection rate of 1.55 kg/person/year until charges were removed in the final 2 months of the collection trial period. This resulted in a skewed collection rate for the 12-month trial of 3.28 kg/person/year. Higher rates were

achieved in more urban locations such as Rafeen, which is close to Cork City.

The low collection rates achieved in the rural locations participating in this project are indicative of the challenge facing Ireland to collect WEEE in the many rural, low-density parts of the country. The rates of 2–3.5 kg/person/year achieved during the WEEE collection trials suggest that the European Directive collection target of 4 kg/person/year is achievable within the catchments of the existing facilities. However, in order to achieve the target on a national basis it will be necessary to increase the number of facilities in order to reach a greater proportion of the population.

7.8 Extension to Retail Take-Back Trials

Concerted attempts were also made to extend the trials to other collection channels such as retail take-back and SME workplace collections. However, retailers and their representative bodies that were contacted during the course of the collection trials were unwilling to

Table 7.3. Overall comparison of collection results, five participating sites.

	Kilcullen	Derrinnumera	Rafeen	Macroom	Youghal
Quantity collected (kg)	216,000	122,377	63,016	40,294	49,958
Period (months)	12	12	7	8	12
Estimated annual quantity (kg)	216,000	122,377	104,616	60,580	49,958
County population	163,995	117,428	324,843	324,843	324,843
County population density (people/km ²)	97	21	60	60	60
Recycling facilities in county	1	1	5	5	5
Estimated site catchment (persons)	72,832	37,300	30,267	18,313	23,471
Collection rate (kg/person/year)	2.97	3.28	3.46	3.31	2.13

participate in the project. Retailers appear to be adopting a 'wait and see' approach to the WEEE Directive.

Contact with retailers throughout the period of the collection trials project revealed that there is some confusion over the implications of collecting and storing items of WEEE that are classified as hazardous waste (TVs/monitors, fridge/freezers, fluorescent lamps). Uncertainty over the requirements for handling such items may be creating a barrier to the involvement of retailers in the development of the national collection system.

It is probable that a national collection system for WEEE in Ireland will include an element of retail take-back and it appears that retailers are under-prepared for such a requirement. Urgent consultation and involvement of this sector is required in order to avoid conflict when implementing the WEEE collection system.

7.9 Overall Conclusions

Overall, collection results for the trial sites were encouraging. **Within the catchments of each facility,** collection rates of between 2.1 and 3.5 kg/person/year were achieved during the 12-month trial period. With further public awareness-raising and the removal of recycling fees, this suggests that, **on a local basis, the 4 kg/person/year target of the Directive is achievable.**

However, **on a national basis, the target becomes more problematic.** With no facilities in some counties, only four facilities in the major urban centre of Dublin and a generally limited number of collection facilities throughout the country, Ireland faces a challenge in meeting the Directive target. The use of retail take-back will be required to compensate for this lack of infrastructure, and alternative collection routes such as kerbside collection, and one-day collection events must also be utilised where necessary.

8 Recommendations

Based on the findings of the Irish collection trials project and the review of current European practices, a number of recommendations can be made. These will assist in the development of WEEE management and in the implementation of the WEEE Directive in Ireland.

Recommendations have been grouped according to actors potentially affected by actions taken. Government agencies and organisations will have responsibilities for implementing the recommendations across more than one category. In order to assist in identifying the relevant body to effect the recommendations, some indication has been given regarding the involved parties and potential lead organisations, but it is felt that this is better addressed at the level of the Irish WEEE implementation taskforce, established by the Minister for Environment, Heritage and Local Government, and composed of representatives from Government Departments, local authorities, manufacturers, recyclers and retailers.

It is important to stress the need for coordination and cooperation between **all** the different stakeholders in the development and implementation of a system to manage the take-back of WEEE. There is a particular need for such cooperation amongst producers in Ireland, and for the development of relationships between producers, retailers and local authorities in order to create a workable solution for all parties. Until the implementation of the Directive, costs of collection systems are being met by local authorities, who have the responsibility for collecting household waste. The WEEE Directive contains the requirement that members of the public must be able to dispose of items from their household completely free of charge. The costs of this system are due to be borne by the equipment manufacturers. With a potential annual cost of up to €7.8 million if the specified target of 4 kg/person/year is achieved, establishing an effective financing mechanism is critical.

8.1 Local Authorities

i Implement a standard method for monitoring WEEE collected at local authority civic amenity

sites. As a minimum, monitoring should include the following categories:

- (a) Refrigerators/freezers
- (b) White goods
- (c) Televisions & monitors
- (d) IT equipment
- (e) Fluorescent lamps
- (f) Other items

Monitoring of these categories should be by number and by weight, wherever possible.

- ii. Establish and maintain a national database on quantities of WEEE collected at civic amenity sites for the period leading up to the establishment of a national WEEE collection system.
- iii. Ensure that, as a minimum, hazardous waste is not mixed with non-hazardous waste on civic amenity sites. Hazardous waste includes televisions, monitors, refrigerators/freezers containing CFCs, and fluorescent lamps.
- iv. Raise public awareness of the potential to recycle items of WEEE, and in particular smaller items, as these are often discarded with general household waste.
- v. Prior to the implementation of the WEEE Directive, remove charges to the public at civic amenity sites for the recycling of WEEE, wherever possible. If the complete removal of charges is not possible, fees must be kept to a minimum.
- vi. Expand the waste collection infrastructure, particularly the number of civic amenity sites, with particular priority assistance being given to areas with no existing infrastructure.
- vii. Conduct kerbside WEEE collection trials in order to evaluate this method as a viable alternative to civic amenity site collection and assess the potential for such a method to compensate for the lack of WEEE collection infrastructure.

- viii. Subsidise local authorities from the Environment Fund to reduce charges to the public for WEEE prior to August 2005, in order to stimulate a gradual rather than a sudden increase in collection, as is likely to occur when charges are removed in 2005.
- ix. Extend civic amenity site opening hours, wherever possible, beyond normal working hours, especially weekends, evenings and holiday periods, in order to increase public recycling.
- x. Alter civic amenity site practices to facilitate equipment refurbishment, including improvements in the handling of WEEE, and the development of working relationships with refurbishers.
- xi. Local authorities should provide or facilitate regular, one-day collection events and integrate such events into the national WEEE collection system, as this avenue has been shown to be valuable for the collection of smaller and less traditionally collected items of WEEE.
- xii. Implement green public procurement for electrical and electronic products.
- xiii. Encourage the procurement and use of refurbished equipment by local authorities in, for example, local authority housing.
- xiv. Facilitate coordination between, and exchange of best practice among, local authorities.

8.2 Retailers

- i. Integrate retail take-back into the national WEEE collection system, as this is vital to addressing deficiencies in Ireland's WEEE collection infrastructure, particularly in more rural areas.
- ii. Assist retailers in becoming aware of their obligations and the potential impact the WEEE Directive will have on them.
- iii. Promote the marketing potential of WEEE collection at retail outlets. Overseas, the take-back of items of WEEE has been found to win customers and is often used as a marketing tool.
- iv. Encourage retailers to hold regular, one-day

collection events and integrate such events into the national WEEE collection system, as this avenue has been shown to be valuable for the collection of smaller and less traditionally collected items of WEEE.

- v. Clarify requirements for the handling of waste by retailers, and in particular items classified as hazardous waste (refrigerators/freezers containing CFCs, televisions/monitors, and fluorescent lamps), as this is currently causing confusion in the sector.

8.3 Recyclers, Treatment Facilities and Refurbishers

- i. Recyclers should be made aware of their obligations under the WEEE Directive and, in particular, of the potential impacts of the pre-treatment requirements of the Directive.
- ii. Develop recycler reporting requirements under the WEEE Directive by specifying a detailed reporting requirement to recyclers that they may integrate into their management information systems to satisfy the Directive.
- iii. Develop opportunities for the refurbishment and resale of collected WEEE in Ireland, with a particular focus on social economy benefits.
- iv. Develop and promote quality and safety marks for refurbished electrical and electronic goods in order to promote consumer confidence and encourage the purchase of refurbished equipment.
- v. Promote the low-cost provision of refurbished ICT products to disadvantaged areas or communities or sectors of society where there has been limited adoption of ICT.
- vi. Develop quality standards for recyclate from problematic materials, such as plastic and glass, in order to encourage the use of recycled materials in the manufacture of new products.
- vii. Provide assistance in research and development programmes for recycling technologies and processes.
- viii. Establish a national centre of excellence for EEE manufacturing and end-of-life management.

8.4 Producers (Manufacturers and Importers)¹

- i. Raise awareness in the manufacturing industry of their requirements under the WEEE and RoHS (CEC, 2003b) Directives.
- ii. Facilitate coordination and cooperation amongst producers, and between producers, retailers and local authorities.
- iii. Encourage the sponsorship of one-day collection events by manufacturers.
- iv. Raise awareness in the manufacturing industry on the potential for ecodesign and the use of materials recycled from WEEE in new products.
- v. Incorporate economic incentives for manufacturers to use recycled materials in new products into the national WEEE collection system.

1. The Directive defines a 'producer' as any person who (i) manufactures and sells electrical and electronic equipment under his own brand, or (ii) resells under his own brand equipment produced by other suppliers, a reseller not being regarded as the 'producer' if the brand of the producer appears on the equipment, as provided for in (i), or (iii) imports or exports electrical and electronic equipment on a professional basis.

- vi. Provide support and assistance to manufacturers to encourage ecodesign and to develop the use of recycled material in new EEE products.
- vii. Provide support and assistance to manufacturers to encourage and develop the use of recycled material in new (non-EEE) products.
- viii. Establish a national centre of excellence for EEE manufacturing and end-of-life management to facilitate research and development across all sectors of the industry.

8.5 Multi-Actor Responsibility – Public Promotion

- i. Raise public awareness of the potential to recycle items of WEEE. This public awareness-raising needs to be a shared responsibility of all stakeholders, including government agencies, retailers and producers.
- ii. Develop a single, national WEEE website.
- iii. Develop a coordinated strategy for communicating with the public and stakeholders on the introduction of the WEEE Directive.

9 Further reading

This report is a summary of the main report on this project. The Main Report expands significantly upon the material discussed in this summary and is recommended for further investigation of the topic. It is available on the

website of the Environmental Protection Agency, www.epa.ie, and the WEEE section of the Clean Technology Centre's website, www.ctc-cork.ie/weee.

10 References

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